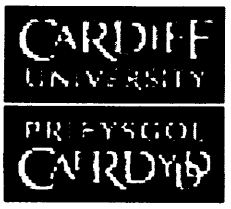

A Study of Total Quality Management (TQM) Application by Malaysian Small and Medium-Sized Manufacturing Enterprises (SMEs)

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A Thesis Submitted in Fulfilment of the Requirements for the Degree of Doctor of Philosophy

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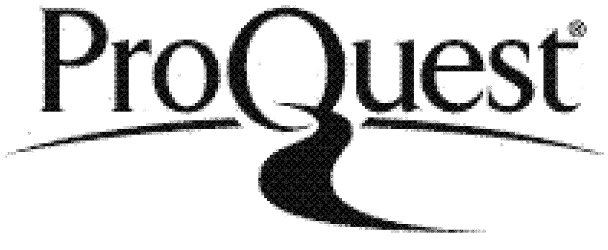

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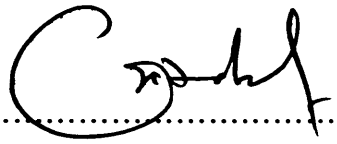
Signed :  (Azizan Abdullah)

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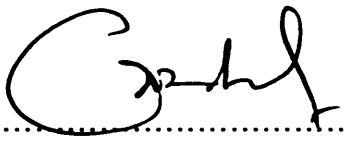
Signed :  (Azizan Abdullah)

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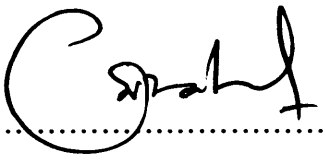
Signed :  (Azizan Abdullah)

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ABSTRACT

After 50 years since TQM began to be popularised in the management literature, companies still struggle to implement and sustain these programmes of continuous improvement despite the central importance of TQM to maintaining business competitiveness. Much of what has been written under the banner of TQM has been drawn directly from studies of large businesses and there remains a void as to how small and medium sized enterprises (SMEs) can engage such systems (in the absence of a large number of business managers and an established hierarchy of command). SMEs have therefore been left behind in the academic debate and few studies have truly attempted to investigate the models of TQM application at SME businesses.

Malaysia is an economy that is dependent upon SME businesses and the improved performance of these organisations to meet the challenges of the economy in the transition to a modern manufacturing state. Following an extensive literature review and interviews with academic experts in the field of TQM, the objectives of this study were designed to close this gap in knowledge and to identify the enablers of successful TQM implementation and how the models, engaged by Malaysian SME businesses. The survey questionnaire distributed to Malaysian and Welsh SMEs to gain a general understanding of TQM implementation and to identify the enablers from the perspective of senior business managers. The main section of this study concentrated upon eight purposively selected and in-depth case studies of Malaysian SMEs (3 award winners and 5 non-award winners) to determine differences in performance and the differences in features engaged at high and lower performing businesses.

The findings of this study show a series of enablers that correlate with higher performance and underpin a model of TQM that was later developed by the researcher. The analysis of the research clearly indicates three levels of TQM application starting with Quality Control (QC), then a broader application of management involvement with Quality Assurance processes (QA) and finally a system-wide application of Total Quality Management (TQM) which involves a high degree of strategic integration of TQM principles. The integration between functional areas in the factory, formalisation of activities and clear strategy were present at the TQM businesses and resulted in effective and efficient systems of customer service, operational excellence and human resource integration.

The conclusions of the study suggest there is a logic and structure to high performance businesses and the application of TQM and this finding has important implications for the future study of TQM application by SME businesses and how best to promote these concepts for the economic prosperity of Malaysia. With almost 100:1 better performance advantage enjoyed by the award-winning companies over their closest rivals the importance of promoting TQM on a national scale cannot be under-estimated and could bring about a renewed interest in the relationship between TQM implementation, SMEs improvement and national competitiveness for SMEs and for their larger customer businesses in Malaysia and abroad.

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List of Abbreviations

AQAP	: Allied Quality Assurance Publication
BOD	: Board of Director
BPR	: Business Process Re-engineering
BS	: British Standard
BSI	: British Standard Institution
CQI	: Continuous Quality Improvement
DEF-STAN	: Defend Standard
EFQM	: European Foundation of Quality Management
EQA	: European Quality Award
GDP	: Gross Domestic Product
HRDFC	: Human Resource Development Fund Council
IEM	: Malaysian Institute of Engineering
ISO	: International Organisation for Standardisation
JUSE	: Japan Union of Statistical Engineering
MBNQA	: Malcolm Baldrige National Quality Award
MIDA	: Malaysian Industrial Development Authority
MIL	: Military
MIM	: Malaysian Institute of Management
MITI	: Ministry of International Trade and Industry
MNCs	: Multinational Companies
MOD	: Ministry of Defence
NATO	: North Atlantic Trade Organisation
NDC	: National Development Council
NDP	: National Development Policy
NEP	: National Economic Policy
NIST	: National Institute of Standards and Technology
NMP	: National Mission Policy
NPC	: National Productivity Corporation

NVP	: National Vision Policy
OM	: Operations Management
PDCA	: Plan. Do, Check, Action
PPM	: Part Per Million
QA	: Quality Assurance
QC	: Quality Control
QMEA	: Quality Management Excellence Award
QMS	: Quality Management System
ROA	: Return on Asset
ROI	: Return on Investment
SIRIM	: Standard Institute of Research and Industry Malaysia
SME	: Small and Medium-Sized Enterprises
SMIDEC	: Small and Medium Enterprise Development Corporation
SPC	: Statistical Process Control
STS	: Socio-Technical System Theory
SWOT	: Strength, Weaknesses, Opportunity and Threat
TC	: Technical Committee
TQM	: Total Quality Management
U.S	: United States of America
WDA	: Welsh Development Agency
ZD	: Zero Defects

Key Terms

The following definitions are provided to assist the reader in understanding the basic concept of key terms used in this thesis.

Total Quality Management (TQM)

TQM is an approach where organization focuses on customer satisfaction through participation of all employees and suppliers for continuously improving product or services and cross functional business processes.

Quality

Quality refers to the performance of product or services in satisfying customer need and expectation.

Quality Activities

Quality activities refer to the methods or tool and techniques carried out by organisation for continuous improvement.

Business Management

Business management refers to the process of planning, organizing and controlling organisation activities toward achieving stated goal and objectives.

Quality Assurance

Quality assurance refers to the systematic activities carried out by organisation to provide confidence to customer that product or services meet customer requirements and expectations.

Operations Management

Operations management refers to the process of resources arrangement which is transform into product or services required by customers.

Human Resource Management (HRM)

Human resource management refers to the function that focuses on management, development, recruitment and providing direction for the people in organization.

Business Process Re-engineering (BPR)

Fundamental rethinking and radical design of business processes to achieve dramatic improvements on critical measures of performance such as cost, quality service and speed.

CHAPTER 1: INTRODUCTION

Chapter 1: Introduction

1.0 Introduction

This chapter provides an introduction to this thesis. It will explore the background to the main research problem and declare the main research questions that underpin the study, as well as the epistemological/methodological design issues that have shaped this research, before providing a logic trail and the structure of this thesis.

1.1 The Background of the Malaysian Economy

Malaysia consists of West Malaysia and East Malaysia with a total area of 329, 749 sq. km. There are 13 states and three federal territories. The government is a federal parliamentary democracy with a constitutional monarchy. The population in 2004 was 25.6 million and in 2010 the projection of the Malaysian population will be 28.96 million people based on an average growth rate of 1.6% per year. Malaysia is a multiracial country with several ethnic groups: Malay (50.8%), Chinese (23.8%), indigenous (10.9%), Indian (7.1%), non-Malaysian citizens (6.8%) and others (0.6%).

According to the Central Bank of Malaysia (2005), the economy grew by 7.1% (real GDP) in 2004 but growth slowed to 5% during 2005. The 2004 expansion was driven by the continuing strength of the manufacturing sector, notably the performance of the electronics and chemical industries and their associated U.S. exports. The current government initiative is to reduce its trade deficit and 2006 growth was projected at 5.5%, but with fears of rising inflation that could dampen the performance needed from SME businesses.

Malaysian energy prices have risen (the country is a net exporter of oil) and SME businesses have faced increased costs, which are difficult to pass on to export customers or local larger companies at the head of supply chains like automotive (Proton, Kia, Perodua use huge vendor bases of SME businesses located in Malaysia). The government has also passed on additional costs to domestic consumers through higher prices for oil and energy, which also makes imports more attractive and, consequently, Malaysian

businesses are now more prone to imports/competition and must improve to meet this challenge.

The achievements of the Malaysian government and indigenous manufacturers have been impressive and the country made the successful transition from a commodity-based economy to one focused on manufacturing in only the past 40 years. Today the Government of Malaysia seeks to make the leap to a knowledge-based economy and to increased value adding of manufacturing businesses. At independence, Malaysia inherited an economy dominated by two commodities--rubber and tin. In the 40 years thereafter, Malaysia's economic record has been one of the best in Asia.

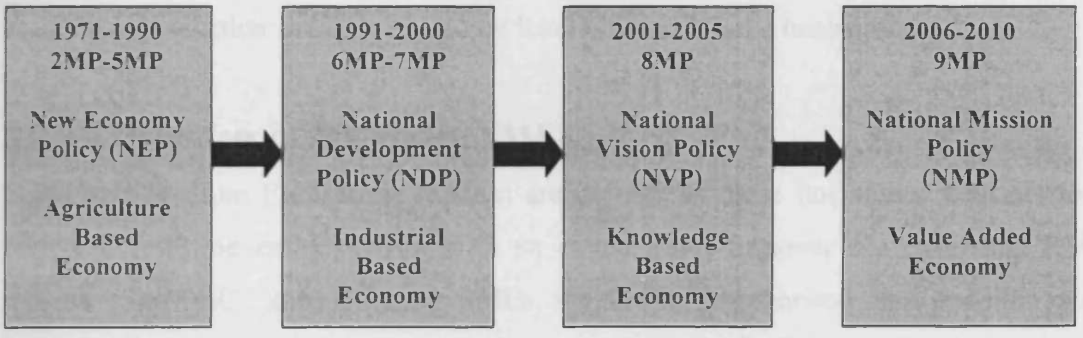
From the early 1980s through to the mid-1990s, the economy experienced a period of broad diversification and sustained rapid growth averaging almost 8% annually, which stimulated the growth of SME businesses. New foreign and domestic investment played a significant role in the transformation of Malaysia's economy as well and this brought with it new SME businesses with international owners. Since 1970, the manufacturing sector grew rapidly from 13.9% of GDP to 30.9% in 2003. However, the agriculture and mining sector, which together contributed 42.7% of GDP in 1970, dropped to 8.7% and 7.2%, respectively, in 2003. Malaysia is also one of the world's largest exporters of semiconductor devices, electrical goods, and appliances. The government has ambitious plans to make Malaysia a leading producer and developer of high-tech products, including software as well as an attractive destination for the outsourcing of manufactured goods.

The proactive government stance has been to guide the nation's economic development and also to promote good management practice in SME businesses. Malaysia's New Economic Policy (NEP), first established in 1971, sought to eradicate poverty and promote economic wealth through the creation of manufacturing businesses. The NEP was designed to enhance the economic standing of ethnic Malays and other indigenous peoples (collectively known as 'Bumiputeras' in Bahasa Malaysia or Prince of Soils) and to move the economy from the land to the higher value of manufacturing. Rapid growth

through the mid-1990s made it possible to expand the share of 'Bumiputeras' economy without reducing the economic attainment of other groups.

The government unveiled its National Development Policy (NDP) in June 1991 after the NEP expires. The new economic policy (NDP) contained many of the NEP's goals, although without specific equity targets and timetables. In April 2001, the government released a new plan, the 'National Vision Policy' as guidance for development over the period 10 years (2001-2010). The National Vision Policy targets education for budget increases and refocus the economy toward higher-technology production (Figure 1.1).

Figure 1.1: The transformation of Malaysia Economy (Ninth Malaysia Plan, 2006)



The country and its government is now at the mid-point in its journey towards achieving vision 2020 and to being an industrialised country; the new policy and implementation framework (Ninth Malaysia Plan: 2006-2010), 'National Mission Policy' (NMP) has been drawn up and outlines the goals for national prosperity over the coming 15 years. The aim of NMP is to obtain greater impact and performance from the country's development efforts towards achieving Vision 2020 and to enhance manufacturing value added through the adoption of programmes that enhance Malaysia's capabilities to compete globally and against more established producers (including Japan - a nation that has successfully integrated its vast SME supply base with a competitive advantage for automotive, electronic, and other supply chains).

The transformation and sustaining of the competitiveness of the manufacturing sector were among the major factors in determining the pace of economic activity for Malaysia. In the Eighth Malaysia Plan (2001-2005), the manufacturing sector contributed substantially to output growth, exports and employment creation despite the global economic slowdown in the early years of the plan. For the Ninth Malaysia Plan (2006-2010), the main goal is to upscale the manufacturing sector towards higher value added activities and by default to transform the performance of SMEs into strong knowledge-intensive, value-creating, manufacturing and service entities. Greater emphasis will be placed on technology and innovation especially investment in the new areas of growth and international networking – these changes will fundamentally redefine both the efficiency and effectiveness requirements of SME businesses located in Malaysia regardless of whether they are owned by local or international businessmen.

1.2 An Overview of Malaysian SMEs

Small and Medium Enterprises (SMEs) are defined as those businesses with not more than 150 full-time employees or with an annual sales turnover not exceeding RM25 million (SMIDEC, 2005). These SMEs are further categorised into medium sized enterprises, small enterprises and micro enterprises. The definition of each category is displayed in Table 1.1.

Table 1.1: Definition of Malaysian SMEs (SMIDEC, 2005)

Category	Definition
Medium sized enterprises	Companies with annual sales turnover between RM10 million and RM25 million or employing between 51 and 150 workers.
Small sized enterprises	Companies with annual sales turnover between RM250,000 and RM10 million or employing between 5 and 50 workers.
Micro enterprises	Companies with annual sales turnover not exceeding RM250,000 or with no more than 5 full time employees.

In 2005, the Malaysian economy recorded growth in its Gross Domestic Product (GDP) of 5.3% (Central Bank of Malaysia, 2005). All economic sectors with the exception of the construction sector registered growth. The manufacturing and service sectors contributed most to the growth with 4.9% and 6.5% respectively. On the other hand, the agriculture and mining sectors provided 2.1% and 0.8%. Table 1.2 shows the performance of the main economic sectors in Malaysia. Small and medium enterprises (SMEs) play an important role in enhancing the dynamism and competitiveness of the Malaysian economy especially in the manufacturing sectors. Over time, SMEs have built linkages with large corporations as well as with multinational companies (MNCs).

Table 1.2: Malaysian key economic indicators (Central Bank of Malaysia, 2005)

Sectors	**2003**	**2004**	**2005**
Real GDP	5.4%	7.1%	5.3%
Agriculture, forestry and fishery	5.6%	5.0%	2.1%
Mining and quarrying	5.8%	3.9%	0.8%
Manufacturing	8.4%	9.8%	4.9%
Construction	1.5%	-1.5%	-1.6%
Services	4.5%	6.8%	6.5%

In 2005, Malaysian SMEs comprised more than 90% of total manufacturing establishments. They contributed a 29.6% share of the total manufacturing output, a 25.9% share of the total added value and accounted for a 31.1% share of the total manufacturing employment (NPC, 2005). In the manufacturing sector, they comprise 93.8% of all establishments where 76% are small and 17.8% are medium sized enterprises (SMIDEC, 2002). The Eighth Malaysian Plan (2001-2005) estimated that 90% of all manufacturing establishments were SMEs and that they employed 868,000 workers or 38.9% of the total (Eighth Malaysian Plan, 2001-2005).

SMEs in the manufacturing sector are mainly involved in food products and beverages (32.8%), chemical and chemical products (14.1%), rubber and plastic products (10.4%), fabricated metal products (6.9%), basic metals (5.8%), non metallic mineral products (4.2%) and furniture (4.2%) (NPC, 2005). In 1990, SMEs significantly contributed to the economy about RM 4.3 billion or 20% of the Malaysian Gross Domestic Product (GDP). It was projected that by the year 2020, the contribution will have increased to 120 billion or 50% of GDP.

According to the Department of Statistics (2005), the total number of manufacturing companies in Malaysia was 39,219. Out of these, 37,866 (96.6%) companies were SMEs. Table 1.3 shows the distribution of SMEs in the manufacturing sector according to size.

Table 1.3: Distribution of SMEs in the manufacturing sector (by sized)

Type	Number of Establishments	Share (%)
Micro	12,685	33.5
Small	19,993	52.8
Medium	3,900	10.3
Total SMEs	**37,866**	**96.6**
Large	1,353	3.4
Grand Total	**39,219**	**100.0**

Source: Department of Statistics (2005)

In order to show its seriousness in helping and promoting SME businesses, the Malaysian Government initiated and developed the SME Development Planning and Evaluation Framework through the National Development Council (NDC). A total of 245 programmes were endorsed by the Council and the government was committed to investing RM 3.9 billion for these programmes. Moreover, the SME Bank, which commenced operations on 3rd October 2005, has the aim of providing financial and non-financial assistance including business advice and training and education. Figure 1.2

presents the framework of SME development in Malaysia. The ability of SME businesses to improve and to embrace the fundamental operations management principles of Total Quality Management is believed, by the government and also by the author to be prerequisite features of businesses to remain competitive in the Malaysian economy and also as a means of meeting international standards of performance. As such, TQM features and the models of TQM that have been introduced by SME businesses is a critical study that has importance to the government, practical relevance and a source of contribution to academic debate. It is noted, by the author, that Western businesses have struggled to implement TQM concepts and have also tried alternative approaches (such as Business Process Re-engineering – see Hammer 1990) but these failings tend to be associated with an attitude of implementing 'tools and techniques' rather than a systems approach to the business.

1.3 World Class Manufacturing

The concept of 'world class' manufacturing performance refers to the highest standard of efficiency and effectiveness (Maskell, 1991). The concept is difficult to operationalise with SME businesses due to the diverse nature and forms of small businesses, and has tended to be associated with larger businesses in sectors such as automotive production where processes are common and oligopolies exist. However, the inability to benchmark between SME companies in order to designate the highest performer as 'world class' does not preclude SME businesses from using this concept as a means of channelling improvement. There are many sources of influence that promote the need for SME businesses, especially in Malaysia, to become 'world class' in orientation even without comparative measures of direct foreign competitor performance analyses.

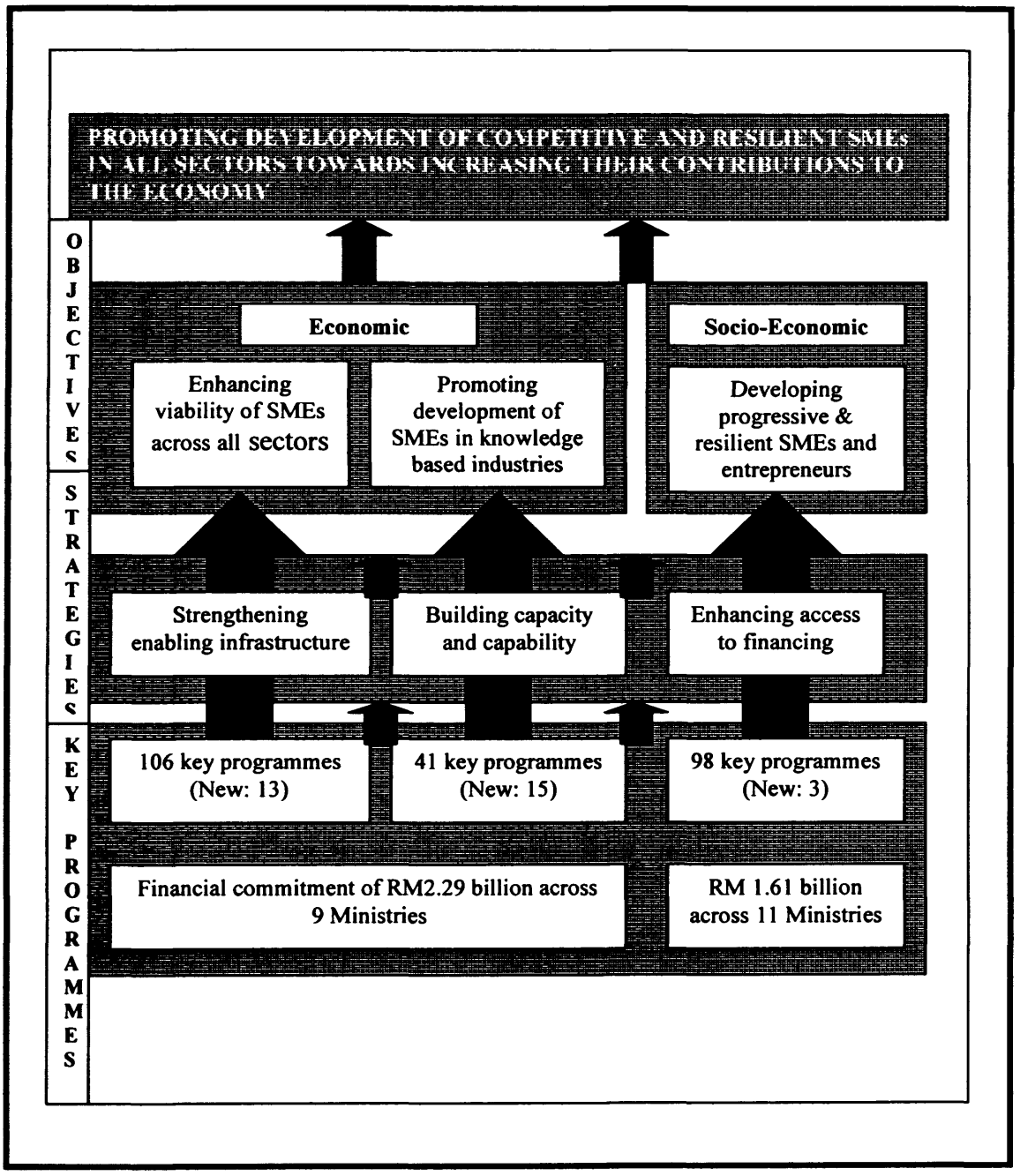
These pressures originate from a number of sources including national campaigns by the Malaysian Government, customer performance expectations, profitability and growth strategies by the firm and also the positions of competing businesses (domestic and international).

1.3.1 Government Initiatives to Promote World Class Performance by Malaysian SMEs

The Malaysian industrial revolution, which resulted in the move from an agrarian economy to a manufacturing economy, was at its height during the 1970s. Since then, the Malaysian manufacturing sector has grown significantly to play a major role in international trade in the region and also to 'catch up' with the performances achieved by the Japanese manufacturing economy. Initially, the Malaysian government's policy towards SMEs was limited and focused on promoting economic equity whilst reducing poverty among the indigenous population. Since the 1970s, the economic significance of the SME sector has grown and has resulted in positive government initiatives to enhance growth and productivity. The NPC Productivity Report (2005) recorded that there was a 6.5% increase in added value per employee, 2.4% in capital intensity, 4.6% in process efficiency, 4.9% in added value per labour cost and 1.6% in labour cost per employee. The Malaysian government has also deliberately addressed various development issues pertaining to SMEs through the NDC, which is an organization of such national importance that it is chaired by the Prime Minister. The Council decided to implement new policy guidelines for the development of SMEs, and has been pursuing this goal since 1992.

These critical guidelines promote four specific issues: the contribution to the development of a balanced economy and more equitable distribution of income for SMEs, the complement and support by SMEs for large scale, heavy and modern industries, enhanced quality and high value added products and services provision by SMEs for the domestic and the export market and finally the increase in productivity through modern technology and management practices. As a result of these central government promotions and guidelines, the Malaysian SMEs sector has experienced considerable pressure to achieve international equivalence in performance and to go beyond this point to joining manufacturing economies with a high population of 'world class' businesses. SMEs need to embark on productivity and quality programmes to be more competitive in the global market. Therefore, the Malaysian government has

Figure 1.2: Malaysian SMEs development: Strategies, key programmes and financial commitment in 2006 (Ninth Malaysia Plan, 2006)



encouraged SMEs to become involved in 'best practice' activities such as ISO 9000, TQM, TPM or to participate in the Organisational Excellence Award (for example, Quality Management Excellence Awards - QMEA).

1.3.2 Quality Management Excellence Awards (QMEA)

The Malaysian Quality Management Excellence Award (QMEA) was introduced by the Ministry of International Trade and Industry of Malaysia (MITI) in 1990. The National Productivity Corporation (NPC) was appointed as secretariat for the award. The objectives of this award are to:

a) Give recognition to excellent organizations
b) Enhance quality awareness and practices in the management of excellence
c) Encourage the production of quality products or services
d) Promote information sharing on successful performance strategies and strategy implementation benefits

This award, which is open to any organization registered under the Malaysian Companies Act 1965, is divided into four categories:

- Category 1: Local companies with an annual sales turnover not exceeding RM10 million.
- Category 2: Local companies with an annual sales turnover of between RM10 million and RM25 million.
- Category 3: Local companies with an annual sales turnover of between RM 25 million and RM 100 million.
- Category 4: Open (Local companies with an annual sales turnover exceeding RM 100 million and multinational company.

The first two categories specifically refer to SMEs and the other two are meant for large organisations and multinational companies (MNCs). Basically, the criteria used in this award were based on the system of the USA, that is, MBNQA[1]. However, some of the criteria were amended to suit the local environments. The following criteria are used for the award assessment:

[1] MBNQA is the award that was established in 1987 to United States Organisations for their achievements in quality and performance and to raise awareness about the importance of quality and performance excellence as a competitive edge.

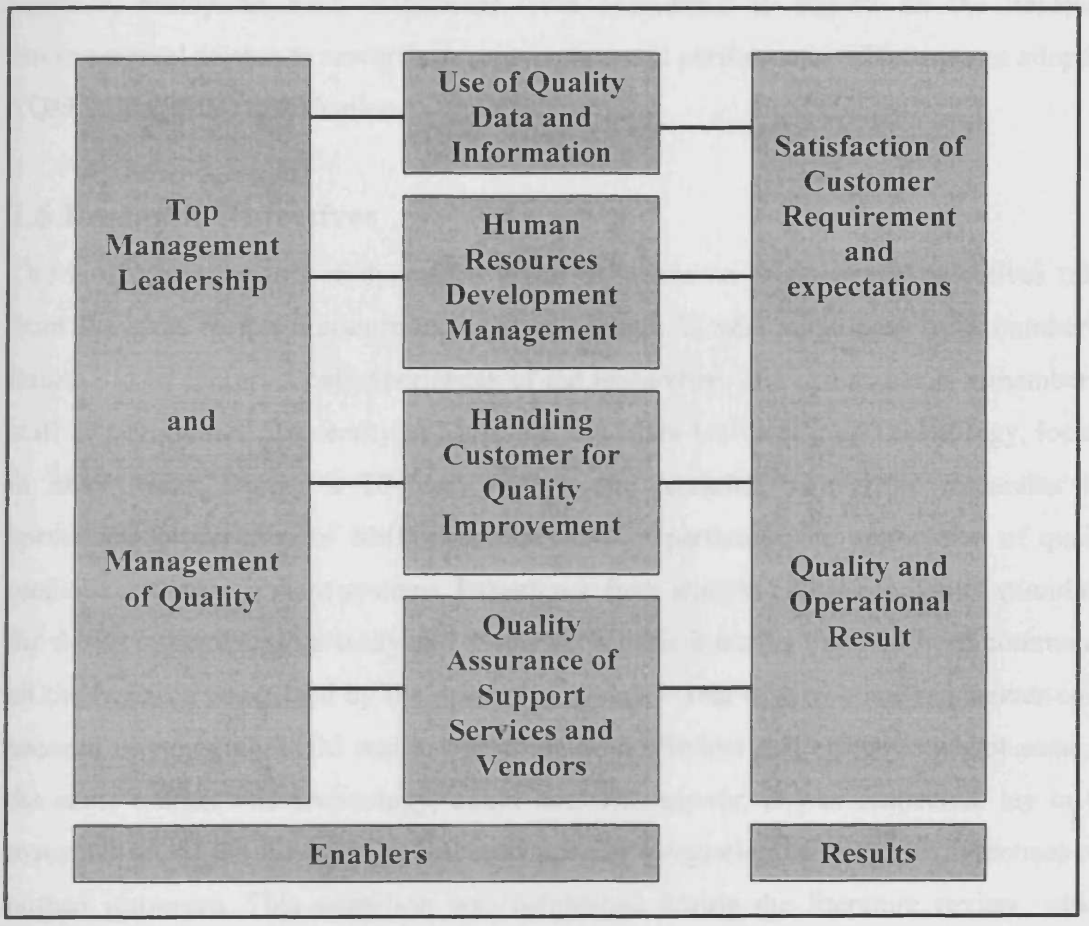
- ❑ Top management leadership and management of quality
- ❑ Use of quality data and information
- ❑ Human resource management
- ❑ Customer focus
- ❑ Quality assurance and external suppliers
- ❑ Process management
- ❑ Quality and operational/business results

To assist organisations in addressing these issues, organisational frameworks have been developed by the NPC (see Figure 1.3). This framework incorporates the necessary elements for attaining excellence and serves as a guide for organisations to enhance their performance. Through QMEA, a more focused set of priorities were developed for continuous improvement and to align people's efforts towards achieving excellence.

1.4 Customer Pressures for Change

Small and medium-sized enterprises (SMEs) also form elements of the supply chain to larger businesses and retail organizations. These customers, who control the output disposal of manufactured products, have also faced pressures to improve performance and profitability. Generally, these businesses have also engaged in Total Quality Management and have set supplier evaluation regimes to focus suppliers on improvement and to replicate quality practices for the materials they supply. As such, customers have also reinforced the improvement priority. These pressures have therefore taken the form of, at a minimum, conformance to international quality standards for customers with the achievement of these standards being an 'order qualifier' for business (Hill, 2000).

Figure 1.3: QMEA framework (NPC, 2003)



1.5 Internal Improvement Activities

The competitive environment of SME businesses has also added pressures to extract a profit and implement new ways of working to improve the performance of the firm. This imperative has been accelerated with increased international trade, low wage economy competition, domestic competitor positioning, and the few large-scale customers that buy products within the region. Internal improvement activity has therefore resulted in increased interest from SME businesses in terms of engaging with new models of manufacturing and the awareness created by national awards deliberately targeted at SMEs.

Given the combination of factors that promote 'awareness' and the 'commercial' need to improve, Malaysian SME businesses were considered to exhibit all the necessary environmental factors to research the application and performance of businesses adopting TQM in the SME classification.

1.6 Research Objectives

The motivation for this study, and a major influence on the research objectives taken from the gaps in the literature exposed in Chapter 2, was stimulated by a number of issues and by the practical experiences of the researcher. The researcher is a member of staff at a renowned University in Malaysia, the Mara University of Technology, located in Shah Alam. During a 10-year research and lecturing career, the researcher has specialised in the area of SME businesses and in particular the application of quality methods and management systems. Experience from studying local companies stimulated the desire to conduct this study and to answer a basic question that had been common to all the research conducted by the researcher to date – that of why some businesses could succeed in engaging TQM and in becoming both efficient and effective whilst some, in the same market and technology, could not. The answer, it was suspected, lay in the management of the business as a system and the integration of strategies, practices and human resources. This suspicion was heightened during the literature review, which, albeit lacking empirical work of any true qualitative depth from an SME perspective, highlighted the same types of general failings.

In parallel to the high economic importance of SME businesses and their future importance to the national economy of Malaysia, the motivation to study TQM application at SME businesses was firmly established as a research agenda of academic, management and national importance.

The following research objectives were crafted to capture the essence and focus the subsequent direction of the study:

1) To identify the enablers (and by consequence the inhibitors) of TQM implementation in SME businesses located in Malaysia[2].

2) To investigate how TQM has been implemented in the Malaysian SME context and to determine whether there are any differences between businesses that have adopted TQM and non-adopters.

3) To establish a model and evolutionary description of TQM implementation by SME businesses in the specific context of Malaysia.

1.7 Research Questions

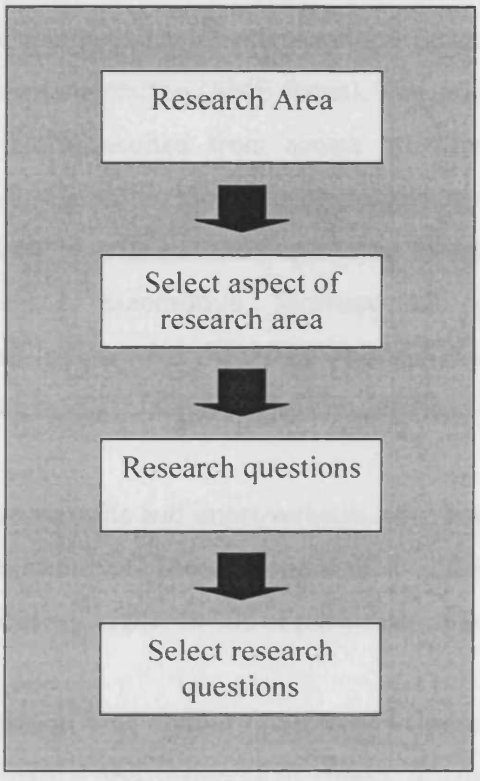
The development of research questions is a crucial stage in research because they identify the nature of the research problem and highlight issues upon which the study should focus. Poorly formulated research questions inhibit the outcome of the study, and therefore the researcher spent a long time reviewing the existing literature and the focus of previous studies in the field to avoid such pitfalls (Bryman and Bell, 2003; Hussey and Hussey, 2003) which will be discussed in Chapter 3. The researcher adhered to the prescriptions of Bryman and Bell (2003) in developing this research and adopted the proposed steps of these authors during the development of the research questions (see Figure 1.4).

From the literature review and the long-established perspective of organisational systems theory, it can be seen that TQM represents the interconnection of human (soft aspect) and technical (work processes) to result in high performance through the cause-and-effect relationship between improved quality performance resulting in fewer defects, higher productivity and fewer costs associated with waste (Pasmore, 1988). As such, large and

[2] The SME businesses engaged with this study were located in Malaysia although the study did not purposively selected businesses that were owned by Malaysian industrialists.

small businesses share the same intent, namely, to maximise performance based upon the effective design of a business system – the only difference is the reduced number of people employed at SMEs. The acceptance, by the researcher, of the systems approach (as valid to SME businesses) was seen as important to the study of businesses across countries and also to the study of SMEs in the Malaysian context.

Figure 1.4: Steps in selecting research questions (Bryman and Bell, 2003)



The main research question used to guide this study is based on the assumption that SMEs adopt TQM with the intention of improving organisational performance in a broad definition of the term performance (efficiency, effectiveness, profitability and indeed survival/sustainability).

To examine the output of performance improvement and to assess how, in what ways and to what extent performance improvement was achieved, the following two critical research questions were crafted:

1) What are the structural enablers for improving business effectiveness using TQM approaches by SME businesses as perceived by senior business managers with the authority to design business systems?

   Under this question, research was conducted with access to Malaysian and Welsh companies to determine what elements of the business models were important to effective TQM implementation (SME focus). The deliberate integration of the Welsh sample of businesses resulted from access provided by the Welsh Development Agency (WDA) and also the close correlation between the Welsh economy and the Malaysian economy in terms of the importance of the SME sector and also the high levels of packaging, automotive, furniture and general engineering of SME businesses. These issues were then used to focus and refine the study of the eight purposively selected and in-depth Malaysian case studies (Malaysian SME focus).

2) What performance benefits and improvements have been sustained as a result of TQM improvement programmes? Moreover, are there differences between the features of businesses that achieve higher levels of performance and those that do not?

   The research question was crafted because most previous studies had not examined improved performance and instead had simply accepted that the presence of TQM features that were associated with high performance did actually result in higher performance (Anderson and Sohal, 1999; Armitage, 2002; Samson and Terziovski, 1999). As such, this second question was used to focus the case study selection and examination of performance before then looking to assess whether certain features were associated with basic systems and other features associated with higher levels of sustained performance by Malaysian SME cases (using a cross comparative method). Further, the question highlights the need to develop a general model and potentially

evolutionary stages in the journey from basic quality routines to full TQM implementation and sustainable improvement.

1.8 Importance of the Study

The design of operations management systems to provide the highest levels of quality is the primary performance objective of a firm (Slack et al., 2004; Brown, 1998). The 'quality first' focus of manufacturing management is comparatively new within the operations management field of study and reflects a 'no trade-off' approach to excellence in operational management rather than the traditional cost-focus of the earlier mass production era of operations management thought (Skinner 1969; New 1992; Brown 1998). The 'no trade-off' approach contends that with quality as the primary performance objective of the firm there is no need to compromise between levels of quality and price, or compact delivery times, and even product variety. This new agenda reflects the increasing strategic importance of a Total Quality Management (TQM) approach to business design and control that can be traced to works by, now well-recognised, quality gurus such as Deming (1986), Juran (1986), Crosby (1979) and many others.

The modern importance attached to the management of business and process quality has been further heightened by the successful exploitation of these 'quality practices' by many of the leading Japanese manufacturers (such as Toyota, Honda, Nissan, Panasonic and Sony). The application of these quality concepts, principles and practices was so successful that the TQM approach underpinned the rapid domination of many global markets by these leading Japanese producers and the problems that this posed to more traditional Western models of manufacturing management. These Japanese businesses, with the strong corporate emphasis on TQM, have subsequently been declared as 'world class' businesses and have firmly connected the concepts of TQM with superior levels of performance and 'excellence' in manufacturing since the 1980s (Womack et al. 1990; Schonberger, 1996).

The combination of TQM and the practices developed by Japanese manufacturers has also had a strong influence on the development of business models that support high

performance leading to better efficiency and market effectiveness (Schonberger 1982, 1986). These models have challenged, especially for larger organizations, the dominance of traditional management designs and mass-production approaches. The latter were exposed as weak and as being inhibitors to high performance during many of the benchmarking studies conducted in the early 1990s (Womack et al. 1991; Andersen, 1993).

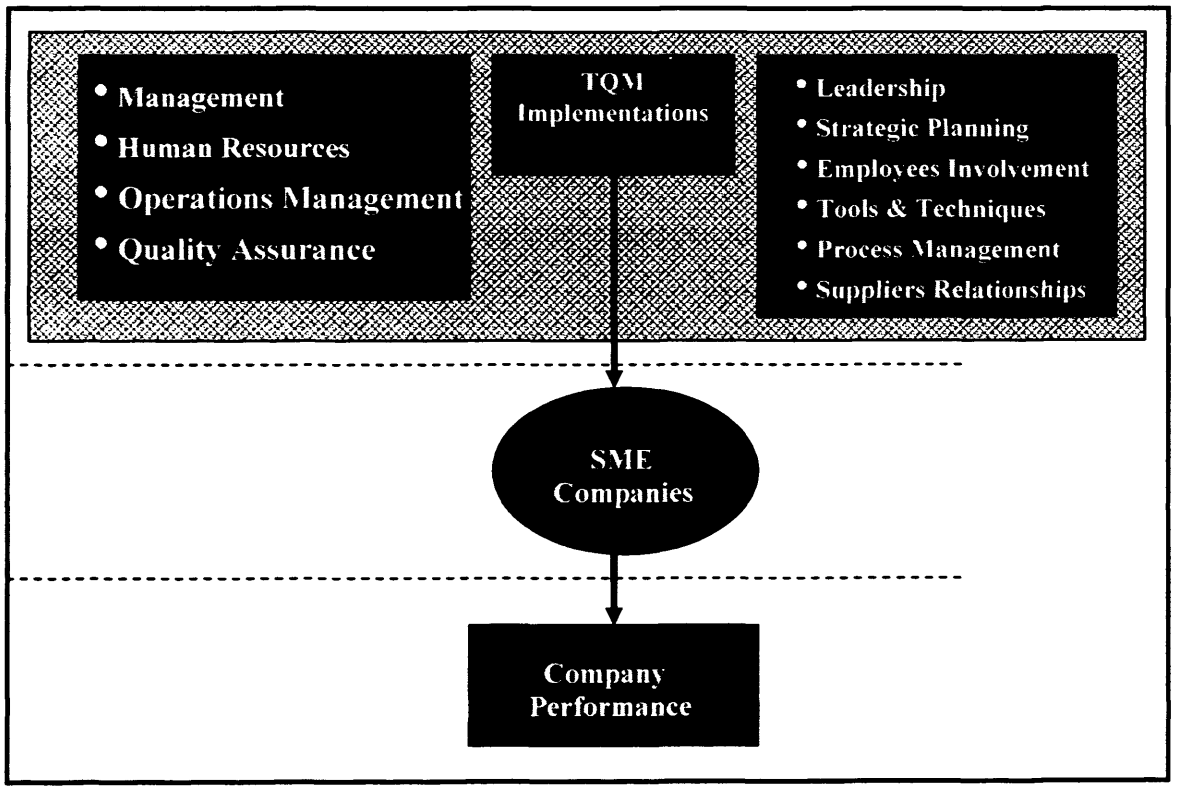
For the most part, these benchmarking studies and the research into Japanese TQM practices have concentrated upon the business models and performance of large-scale organizations with formalized management structures and access to financial, capital and human resources (Womack et al., 1991). However, with over 40 years of knowledge concerning the design and application of TQM to large businesses much less is known about how such an approach may be localized and effectively exploited within the context of small businesses (Ghobadian and Gallear, 1996; Ahire and Golhar, 1996; Husband and Mandall, 1999; McAdam, 2000).

Therefore, the focus of this study is the application of such practices and the performance of SMEs where much less is known about the practices and structures that support TQM. In particular, this study focuses upon the manufacturing nation of Malaysia where SME businesses are vitally important to the economy. Figure 1.5 shows the research framework of this study, which was adopted from Chileshe and Watson (2000). Their study focused on SME companies with the aim of investigating the TQM application and organizational performance. The framework contains the basic TQM elements of the literature review and the relationship of organisational design for high performance. The framework used for the empirical testing of SME businesses in the UK was therefore accepted as a basis upon which to develop this study.

This research employed a survey questionnaire and case studies of eight Malaysian SMEs. The investigation of TQM implementation was based on four main perspectives, namely, Business Management, Operations Management, Quality Assurance and Human Resource Management. These four main perspectives were drawn from the review of the

TQM literature and have been presented as crucial aspects of TQM implementation by previous research studies of large and smaller businesses (Ghobadian and Gallear, 1996; McAdam, 2000). These concepts formed a basic model that was related to the main output of TQM engagement – that of higher performance. The model, designed by Chileshe and Watson (2000), was duly accepted as the basis from which this study was crafted and these issues will be discussed in the literature review presented in Chapter 2.

Figure 1.5: Research framework of the study (adapted from Chileshe and Watson, 2000)



The importance of improved SME performance is particularly relevant to the Malaysian economy where SMEs currently account for 31% of the total output and employ a 55% of total workforce in both manufacturing and service sectors (Central Bank of Malaysia, 2005). Furthermore, these figures also report a growth of 9.4% in value-added for this classification of business and a further 3.8% growth in employment. As such, the SME business sector, and the subset of small and medium-sized industries (SMI), represents

the typical business within the country and this ensures this study has an external validity and usefulness for national policy making even though it is designed to offer improvements to the practice of management at SME businesses.

This thesis seeks to contribute to the understanding of TQM practices at the SME level (within the under-researched context of the Malaysian economy), to create a model of utility to academic research studies, and to narrow this gap in the body of knowledge. The secondary purpose of this study is to provide a model offering 'design advice' for professional managers who work within SME businesses. Finally, this thesis seeks to identify and inform areas of government policy that might assist the performance improvement of such firms in Malaysia. To pursue this aim, the study will solicit the opinions of Managing Directors and Managers of Malaysian SMEs on what are the enablers and inhibitors of TQM and on how it has been implemented.

1.9 The Importance of TQM to the Malaysian Economy

From the preceding analysis of the economic goals of the Malaysian government and the success of the economy already, it can be seen there are many implications of this study. The first notable influence upon the chosen research questions is that of the importance of the SME business and the need for a robust business model that is capable of reaching the next level of 'breakthrough' performance expected by the government. Unless the average performance of all SME businesses is to improve, then the goals of the government cannot be achieved. To 'step up' to global levels of performance and also to increase value-adding, SME businesses will need to build new competences in quality management and, if they are to improve continuously, they must develop a competence through the engagement of human resources to learn how to do things better and how to do things differently (a new dimension to the optimisation of performance through a 'systems approach'). It is noted that many Western businesses have experienced failures when attempting to introduce TQM systems even where their respective governments, customers and markets have depended upon businesses engaging with such systems. Despite these 'Western' failures, at the level of the firm, the Malaysian government has continued to promote TQM and this approach has been heavily influenced by the

evolution and rise of Japan as a manufacturing nation including the importation of Japanese advisers to help the Malaysian government control and focus its promotion activities. Consistent with the way in which Japan moved from an agrarian economy to that of a manufacturing 'superpower' –TQM promotion has been taken as the first stage (see Deming, 1986; Juran 1988).

The economic analysis also shows there are growing cost pressures that need to be met and that Malaysia will not succeed in its goal of reaching economic parity unless greater resources are assigned to the promotion of best practices and the improvement of value added performance by SME businesses. Due to the fact that Malaysian economy is dominated by SMEs, the implementation of improvement programmes for these types of business is important and reinforces the importance of this study not just in opening up the models of high performing SME businesses but in investigating and building a framework that is directly relevant to the Malaysian economy itself. The chosen route for promoting improvement and generating improvements by the SME population of suppliers has been via the government's promotion of TQM and provision of structural bodies to assist this awareness raising. As such, TQM has been selected over any other alternative form of improvement (such as lean production, Just In Time, and such like).

It is also true that many leading Malaysian and international enterprises (located in Malaysia) are also promoting the use of TQM and the achievement of quality systems that allow Malaysian SME businesses to reach comparable performance and systems with others located in different countries (international equivalence in systems). As such there is both a national policy of awareness (government 'push') as well as a 'customer pull' and an internal business need to be more effective for TQM (features and systems) to be introduced, embedded and converted into real improvement savings/better performance. From an operations management perspective, it will be argued in later chapters that the mastery of quality performance is the precursor for business improvement and is a fundamental action of factory management in designing systems for better quality performance (Slack et al., 2004). Without an effective quality management process and system, no other improvements can be made to shorten delivery lead times, shorten batch

sizes or offer meaningful cost improvements to customers (Hayes and Wheelwright, 1984).

In summary, TQM is important to the Malaysian economy because it directly improves the flow of materials from small companies in the economy to domestic final assemblers and the return on investment these big customers need to make as well as the revenue impact these factories have in terms of the Malaysian Treasury (31.1% of GDP results from the SME classification of businesses – see NPC, 2005). In parallel, TQM is necessary to compete within the Malaysian economy and to differentiate the performance of local domestic SMEs over the options to import such goods from established manufacturing nations (such as Japan). Less waste and better cost effectiveness using TQM is therefore a key stage in transforming the economy and in reaching parity with established manufacturing nations in the region. However, it is noted that a 'full mastery' of TQM is not easy to achieve and this is explored in the next chapter and there are many failures in reaching the status of TQM for manufacturing businesses but it is believed, by the researcher, that mastering the basics of quality management and then evolving towards a fully integrated TQM system is the key to competitive success for the business and the nation. Such a hypothesis is also conducive with the works of the leading operations management authors (Schonberger, 1996, Oakland and Dale 2003).

1.10 Brief Overview of Methods

The research strategy and methodology, defined as the systematic and orderly approach taken towards the collection of data, was derived from a realist and a case based approach to the study of TQM at SME businesses. There are four basic methods in research: case study, historical review, experiment and survey of which only the case study strategy offered the researcher the ability to study contemporary events concerning a poorly defined phenomena (Yin, 2003). As such, whilst there is no definitive rule when selecting the research strategy, just a test of whether the approach 'fits' the research subject and epistemology, the case study was considered the most appropriate means of capturing the depth and breadth of issues involved in the study of TQM. The nature and scope of this thesis, the multiple sources of the data required, the research questions and constraints

created by the pursuit of a full time doctorate therefore reinforced the selection of the case strategy (Jankowicz, 2000; Yin, 2003; Robson, 1994; Bell, 1993).

There are many types of case study (Yin 2003) but to complete the requirements of this study, a multiple case replication method was selected to allow case organizations to be compared and to allow variations/similarities between cases to be identified and explored (Leonard-Barton, 1992). The organizations for this study were selected using a purposive sampling approach (similar technology) to ensure that the Malaysian SMEs included both national TQM award winning businesses and non award winners. Pilot testing of the methodology was conducted with Welsh cases that were part of the Wales Quality Centre to ensure the methods would provide good data and meaningful results before the main field research in Malaysia was undertaken. In summary, the actual research methodology was designed to include a combination of methods to reinforce further and to strengthen the results achieved. These methods included:

a) Secondary data about the organization profile, which includes its product, customer and past performance.

b) Structured interview with managers (not in group) that control key elements of the technical process and social features of the case organizations.

c) Common questionnaires to all case (multiple sections covering production, human resource and quality assurance).

d) Observation of the system in action by factory tours and inspection of relevant documentation and evidence of practices.

e) Research day book evidence of additional materials and observation.

1.11 Chapter Structure

To assist the reader during the review of this work, the thesis has been divided into seven distinct chapters, which build incrementally to answer the research objectives and questions that have been presented in this chapter. This chapter represents an introduction to the research, the importance of the study, background of the research, and the main contributions to the body of knowledge sought at the design and outset of this research work.

Chapter 2 presents a comprehensive review of the literature concerning systems theory, quality management within the context of manufacturing operations management, TQM definitions, TQM evolution, performance measurement, SME characteristics and recent studies of SME businesses engaged with TQM. This chapter provides the context and the gaps in knowledge that have motivated this study and reinforces the importance and relevance of the research questions presented in this first chapter.

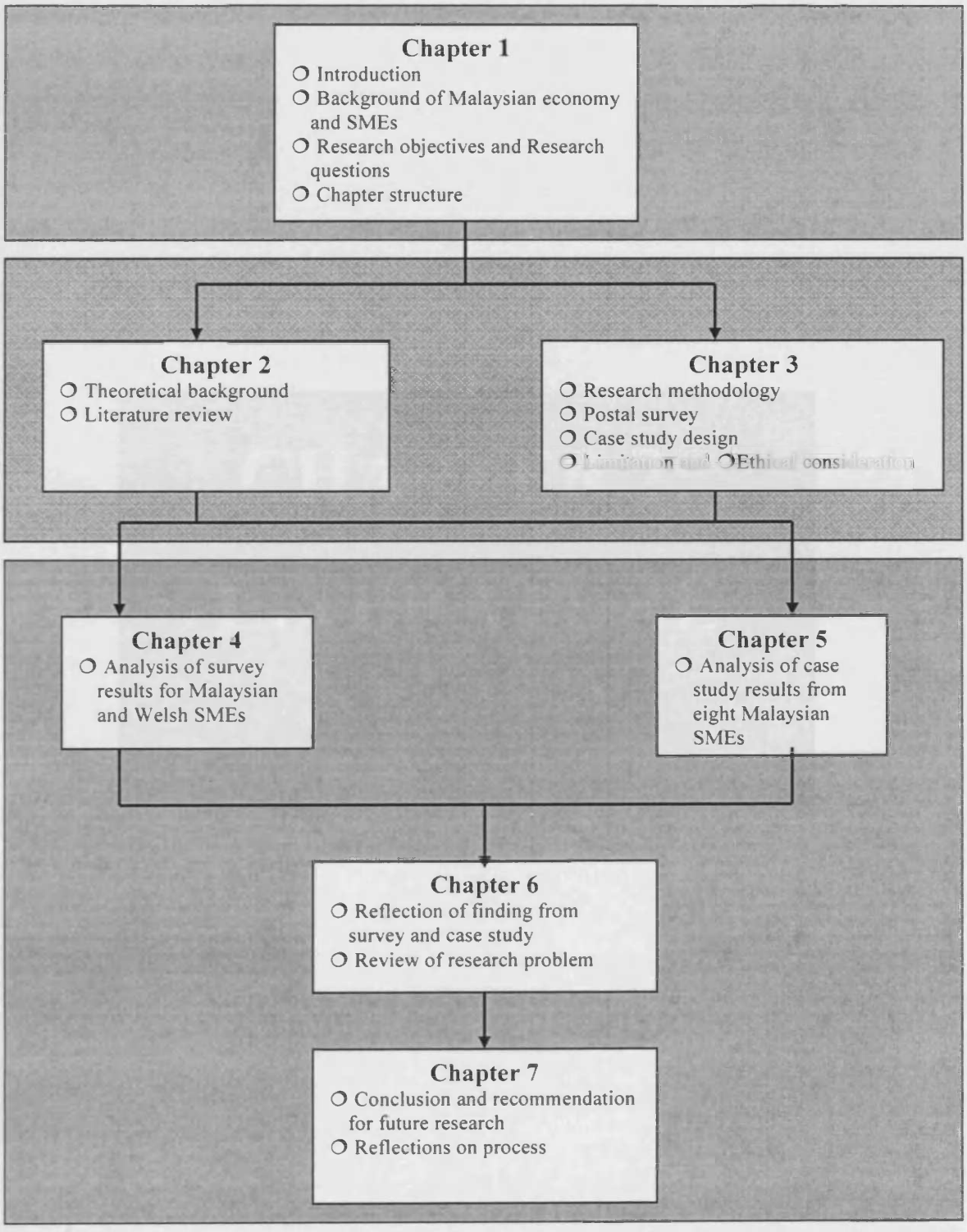
Chapter 3 contains a detailed description of the research strategy and design. This chapter outlines the chosen realist multiple case study strategy involving a triangulation methodology as the most appropriate design to probe the critical dimensions of TQM at SME businesses that were identified through the first round of survey data and the key issues discovered as research gaps in the literature review. This chapter also identifies the major design limitations of this study, and points out what considerations were made to ensure ethical compliance of this work.

The following three chapters then outline the findings from two survey questionnaires and the study of the Malaysian cases. Chapter 4 presents the analysis and discussion of the survey questionnaire. Chapter 5 provides an overview of each case by presenting company profiling, and describes the finding and analysis of the cases. Chapter 6 provides a reflection of the finding and contrasts it with the literature review, and the research question is answered directly. Finally, Chapter 7 concludes this research investigation, declares the implications of the study and reports upon the contribution made to the body of knowledge, and offers suggestions for future research.

1.12 Chapter Summary

In summary, this chapter has presented the overall introduction and scope of this study. The chapter was designed to contextualize the reader with the issues and general elements of the research. The chapter also provides an overall route map to the subsequent chapters during which more detail will be added to the research design considerations and defence of the research strategy, results, and analysis of the field research (the outline of the overall research was presented in Figure 1.6). The next chapter will provide a review of the literature and draw together the major issues and gaps in the current body of academic knowledge.

Figure 1.6: The outline summary of overall study



CHAPTER 2:

LITERATURE REVIEW

Chapter 2: Literature Review

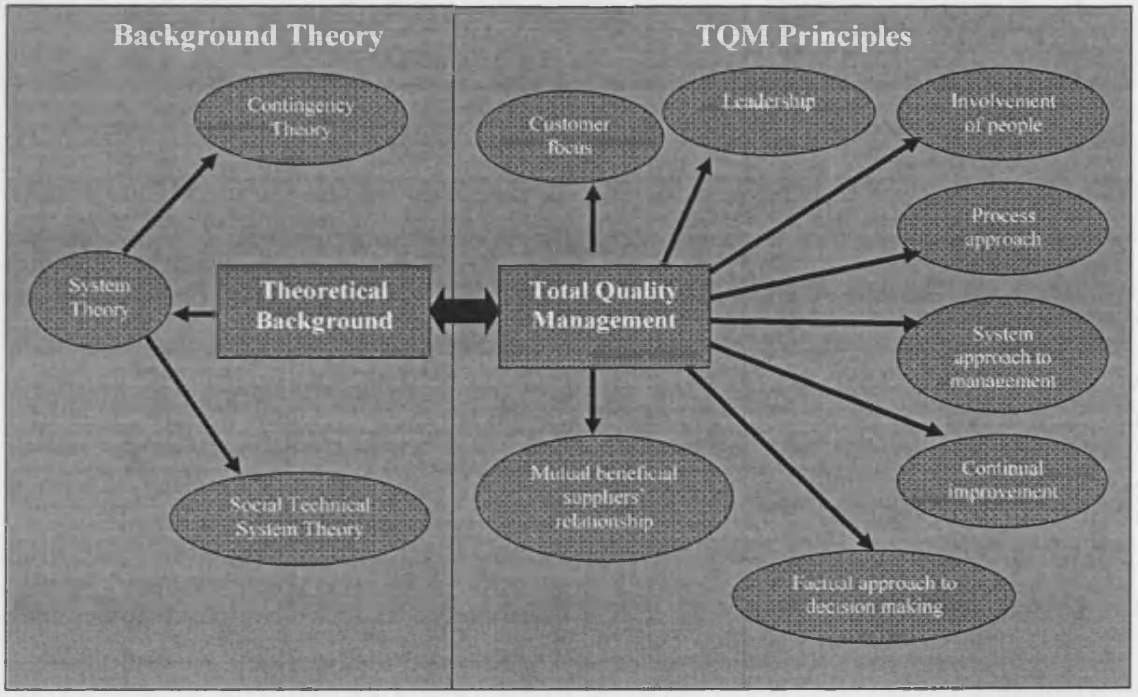
2.0 Introduction

The aim of a literature review is to locate and evaluate the current knowledge in the area of the research topic, which in this case is Total Quality Management within the context of SME businesses (with particular emphasis on Malaysian SMEs). The purpose of this chapter is to help the reader understand how the researcher generated and refined the research ideas and how these ideas were informed via a critical review of existing theories and studies (Sharp and Howard, 1996). The literature review serves to identify gaps in previous research and literature to facilitate development of the relevant research questions for this study, which were outlined in the previous chapter.

TQM has been associated with higher business performance and is deemed central to the competitiveness of manufacturing businesses (Slack, 1991; Womack and Jones, 2003) but TQM has long been criticized for suffering from a lack of guiding theories (Sitkin et al., 1994). Since the 1990s, many researchers have tried to put TQM under rigorous theoretical examination. Grant, Shani, and Krishnan (1994) compared TQM with traditional management theories; Hackman and Wageman (1995) criticised the coherence, distinctiveness and likely perseverance of the TQM philosophy, and, Dean and Bowen (1994) found a substantial overlap between TQM and management theory, all of which suggests TQM is a very important subject of study for operations management.

The subject matter of this research requires an understanding of the related literature and the broader range of theoretical underpinnings from a number of schools of thought. Therefore, background and focal literatures are required to identify key debates, apparent omissions and to prepare the ground for the research (context). The background theory framework (see Figure 2.1) was developed by the researcher to structure this literature review and is presented as a guide for the reader.

Figure 2.1: The relationship between background theory and TQM principles



Source: Researcher

There have been many schools of thought concerning the management of industrial quality but a common denominator is the treatment of quality and operations management as the critical and most important subsystems of an organization (Kast and Rosenzweig, 1972). This chapter will review the systems theory approach to the study of management and organizational phenomena before exploring related systems theories and how they inform this study and theoretical grounding. The remainder of this chapter will explore the theoretical background and then focus on debates related to TQM and SMEs business.

2.1 General System Theory (GST)

Modern management literature emphasises the metaphor that an organisation is 'a system' that is designed and controlled by managers. Since the 1960s, the 'systems' approach has dominated operations, quality and organisational development literature (Emery, 1969). After a lengthy review of the literature had been undertaken and after the Diploma in Research Methods had been completed, many background theories were

reviewed as the potential grounding for this study. Of the background literatures reviewed, systems theory was selected as the approach with most utility for this study and its research design. In the process of reviewing the literature and reading philosophical works, many theories were rejected. These theories included control theory and process theory. Control theory focuses on the management of people and not system design features which rendered it less useful as a theory within which to house a study of how well businesses had embedded TQM. Process theory, on the other hand, emphases the process of how implementation happens (and its associated decision-making) rather than addressing the organisational features and as such this was more relevant to the study of an evolutionary model of TQM. However the scope of this study and also the gap in the literature review clearly shows there is less knowledge as to which features are engaged by SMEs as opposed to a lengthy study whereby the student would have to stay at the case company (and restrict the number of cases) in order to witness this process of decision-making. Process theory was duly rejected as an inappropriate means of housing a theoretical contribution. Instead, this research concerns 'systems designs' and what are the features of TQM implementation and this best served from a systems perspective Emery, 1969). Therefore based this thorough review, the researcher rejected both control and processes theories as suitable bodies of knowledge and accepted systems theory as the means of housing the study.

The first theory that will be reviewed is the long established systems theory (Emery, 1969). Systems theory was selected because it underpins much of contemporary management thought and presents the argument that high performance derives from an effective business system design (Oakland, 2003). In short, it rejects the classical management approach that there is 'one best way' and promotes instead the role of managers in designing effective business systems, which, from an operations management perspective, is based upon a robust process of quality management.

General System Theory (GST) was first proposed in 1924 by the German physicist, Koehler using gestalt theory as a foundation. He argued that all living organisms displayed systems principles and sought to fit with their environment but he did not

transfer these ideas of a natural balance into a general context with relevance to the management of businesses as systems. The work of Koehler (1938) on 'open systems' was the first major attempt to promote the concept of systems interacting with their environment. Successful systems were those that matched, and could exploit, the environment for their own growth. From the perspective of biological and physical systems being open to the world around them and having to adapt to changes in order to survive and grow, General System Theory was later developed by Ludwig von Bertalanffy in 1968.

Von Bertalanffy outlined 'dynamical' system theory and provided mathematical descriptions of system properties such as 'wholeness', 'sum', 'growth', 'competition', 'allometry', 'mechanization', 'centralization', 'finality' and 'equifinality'. As a biologist, he was interested in developing the theory of "open systems", which he defined as the exchange of matter with the environment and the constant changes to meet the needs of the environment. The theory of open systems unites chemical kinetics and provides explanations for many problems in related areas (e.g. biochemistry and physiology). The research in this area contributed to the later development of system thinking and its application to business organisations (Rich, 2001).

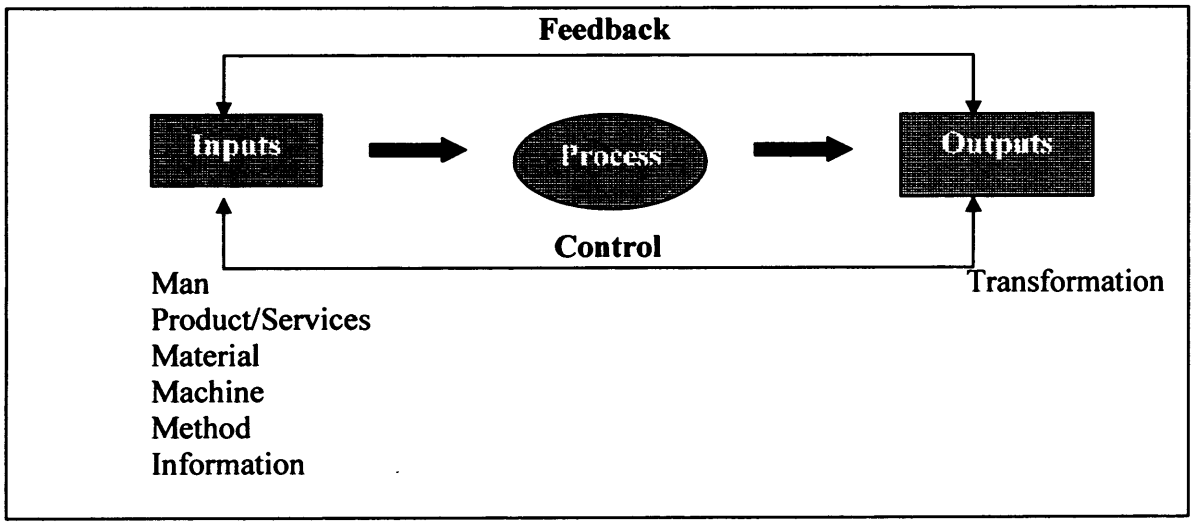
Modern 'systems' thinking regards the industrial organisation as an 'open system' due to its capacity for interacting and evolving with the environment (Sitkin et al. 1994). According to Emery (1969, p. 70), *"From the physical point of view, the characteristic state of the living organism is that of an open system. A system is closed if no material enters or leaves it; it is open if there is import and export and therefore change in the components. Living systems are open systems, maintaining themselves in exchange of materials with environment and in continuous building up and breaking down of their components"*.

The central belief of systems theorists is that 'a system' is an interrelated set of elements functioning as a whole. A system may be defined as *"an entity in its own right, with unique properties understandable only in terms of the whole, especially in the face of a*

more traditional reductionist or mechanistic focus on the separate parts and a more simplistic notion of how these parts fit. [A system is]....an organized, unitary whole composed of two or more independent parts, components, or sub-systems and delineated by identifiable boundaries from its environment supra-system. The term systems cover a broad spectrum of our physical, biological and social world" (Kast and Rosenzweig, 1985, p. 103-104). System theory is a meta-theory that can be used to bridge many simpler models with similar assumptions (Kast and Rosenzweig, 1972; Hansson, 1995; Kaynak, 2000).

During the literature review, it was accepted that an organisation is 'a system' in its own right and the researcher duly accepted systems theory as the foundation for this study. An organizational system receives five kinds of inputs from its environment, namely, manpower, material, machines, method and information. The organization then combines and transforms the inputs, returning them to the environment in the form of products or services. Finally, the system receives feedback from the environment regarding these inputs and adjusts its performance to meet these changes in the environment (see Figure 2.2). How well the organisation changes are, therefore, the determinant of its performance (Moorhead and Griffin, 2001).

Figure 2.2: System Theory (adapted from Moorhead and Griffin, 2001)



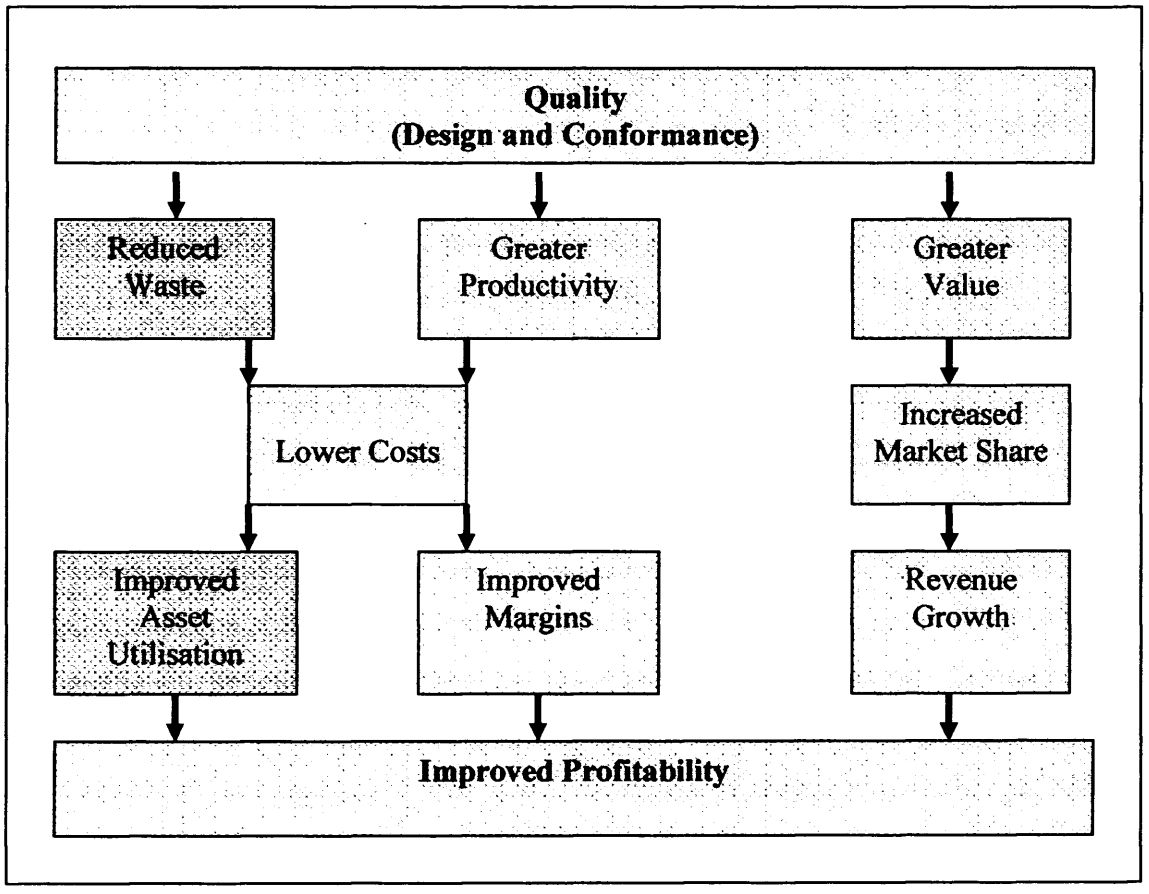
The cycle of "input-added value processing-output" is a concept that is central to the operations management and organisational management literatures. It has been argued that creating an efficient and effective value-adding process is fundamental to business survival and competitive advantage. The subfield of TQM literature (within operations and organisational literature) also implicitly accepts this approach. TQM therefore promotes the management of any system and its subsystems for efficiency and effectiveness by eliminating any inhibitors to high levels of materials flow (input to output) and any management activity that fails to control these processes and their variability.

As such, 'systems' thinking favours the study of the design of a business system to create high performance rather than individual elements of the system (promoting case study research approaches). For the study of modern TQM, the approach is important because it suggests 'output performance' is the result of how well the system is designed, the practices that support efficient and effective manufacturing and the decisions of management in reacting to the environment and controlling business resources. Thus, a fundamental purpose of a "TQM inspired" organisation is satisfying customers profitability and efficiency with an emphasis on human systems of quality management (Spencer, 1994; Evans and Lindsay, 2002). The use of TQM to assist the design of organisational practices to control the value-adding cycle therefore results in greater operational performance and theoretically greater profitability (see Figure 2.3). Whilst this study did not seek to compare the profitability of the cases studied, the literature review of systems theory and later systems theory and TQM promotes the view that total quality companies will have greater operating efficiency and also practices or processes that are aligned and focussed upon achieving zero losses. The latter is a key theme that will be explored during the focal literature review.

The major design implications of system theory include the following points:

a) Role of managers as designers of high performance organisations.
b) The management of input – process – output is critical for avoiding losses to the cycle.

Figure 2.3: Quality contributions to profitability (Slack et al., 2004)



c) High performance involves high levels of cross functional management (sub systems integration to enhance material and information flow).

d) The system must be managed and planned as a 'single' entity. The role of management is to conduct planning and align activities.

e) Efficient input – output systems are productive and therefore operate with less waste. As such, the system objective (performance) is the highest quality of materials flow.

f) To continue to be successful, management must develop a continuous improvement capability or there will be a mismatch between the organisation and its environment.

GST development in for business systems thinking became popular in the organisational literatures of the 1960's (Emery, 1969; Emery and Trist, 1965) and it was during this time period that books upon industrial quality were first written. These early quality books (Deming, 1986) echoed and accepted the systems approach (see Deming 14 points

in Appendix 4). The contribution of these quality authors will be reviewed after an analysis of the different organisational 'systems theory' literatures that emerged from the 1960s, namely, Contingency Theory and Socio-Technical System Theory (STS).

2.1.1 Contingency Theory

Contingency theory is the theory of understanding behaviour in organizations (Moorhead and Griffin, 2001). It rejected the dominant theory of the time (1960s) and rejected the dominant logic of scientific management. Scientific management proposed there was 'one best way' of managing and this was based on Industrial Engineering whereby all work was equal and humans were treated as money-motivated robots. Critics from the 'contingency school' argued that management practice needed to be contingent upon firm and management decisions, and not upon a prescriptive 'one best way' system of management. The theory is concerned with the overall management and administrative processes of organisations in achieving goals and objectives, and was developed in the UK (Thompson, 1967; Pugh et al., 1968). This theory offers *"important guidelines for organisational diagnosis and managerial actions in specific situations....contingency views recognise that the environment and internal subsystems of each organisation are somewhat unique and provide a basis for designing and managing specific organisations"* (Kast and Rosenzweig, 1985, p. 85). Early researchers discovered that, in organizations, most situations and outcomes are contingent and therefore they sought to find what contingencies influenced organisational designs and their performance (Kast and Rosenzweig, 1972).

Contingency theory proposes organisations will adopt different forms and practices that best match their environment and this literature will be used in this research as a guide to explore, investigate and identify why companies are different and why some achieve superior performance levels. As such, this literature is a way of profiling organisations and drawing out potential causal linkages between performance, structure and practice.

The main contingencies that make businesses different (even those making the same products), include management goals, high or low levels in the organisational structure,

technology and the fast/slow moving nature of the environment. Spencer (1994) proposed seven dimensions underpinning the TQM practices and examined the contribution of organisation models ('mechanistic' and 'organic') of TQM implementation. Table 2.1 shows the comparison between the two organisational models in relation to seven TQM dimensions. Spencer's work can be seen as being directly related to the work of Contingency Theory (Burns and Stalker, 1961).

Table 2.1: Organisational models and seven TQM dimensions (adapted from Spencer, 1994)

Dimension	**'Mechanistic model'**	**'Organic model'**
Organisational goals	Efficiency/performance goals	Organisational survival (requires performance)
Definition of quality	Conformance to standards	Customer satisfaction
Role/nature of environment	Objectives/outside boundary	Objectives/outside boundary
Role of management	Coordinate and provide visible control	Coordinate and provide invisible control by creating vision/system
Role of employees	Passive/follow orders	Reactive/self-control within system parameters
Structural rationality	Chain of command (vertical communication)	Process flow (horizontal and vertical communication)
Philosophy toward change	Stability is valued but learning arises from specification	Change and learning assist in adaptation

The review of the Contingency Theory literature showed the main operations management issues are concerned with how the management of the firm designs systems that support high performance input – process – output cycles and how this cycles is managed. The literature review highlighted the wide range of options that managers can take with reference to the business structures, integration of departments, as well as technology and human resource management practices when the business is designed to fit its environment.

From a TQM perspective, Contingency Theory suggests that, as modern environments are fast moving, business will integrate departments, focus on managing quality and engage in a much greater effort on human resource management and quality practices. Such integration ("organic") will, it is proposed, lead to a superior performance. The researcher duly notes that companies in the same sector with the same technology will, if following Contingency Theory design principles, look similar and use similar practices. This could be argued as being too prescriptive, but for a study of TQM this approach would suggest differences between companies in the same market will be small and that technological conditions will be similar leaving differentiated higher performance through better and more integrated human resource practices. So the implication is that a study of businesses in Malaysia in similar markets and with similar technologies should investigate differences in adapted models and how TQM influences performance. Given the shortcomings of Contingency Theory, another school of thought developed in 1960s was this was also reviewed (Emery and Trist, 1965; Pasmore, 1988). This school was called Socio-Technical System Theory and again it emphasised the role of managers in designing high performance organisations. The approach highlights the critical importance of management and human resource practices. The key themes from Contingency Theory and Socio-Technical System Theory are shown in Figure 2.4 and focus on the optimal balance of people, technology and processes.

2.1.2 Socio-Technical Systems Theory (STS)

The Socio-Technical Systems Theory approach views the organization as an open system (interacting with a changing environment) that is structured to integrate the two critical subsystems: the technical subsystem and the social subsystem. The technical subsystem consists of equipment and processes and the social system is concerned with the organisation of work and 'human-based' practices including the interpersonal relationships that develop among people in organizations (Ketchum and Trist, 1992). The combinations of both components (social and technical) are more desirable and resulted in a socio-technical perspective of organisations (Ketchum and Trist, 1992). STS is concerned with organisational effectiveness through a causal relationship between internal design and optimum production (see Table 2.2).

Figure 2.4: Contingency Theory and Socio-Technical System Theory (Rich, 2002)

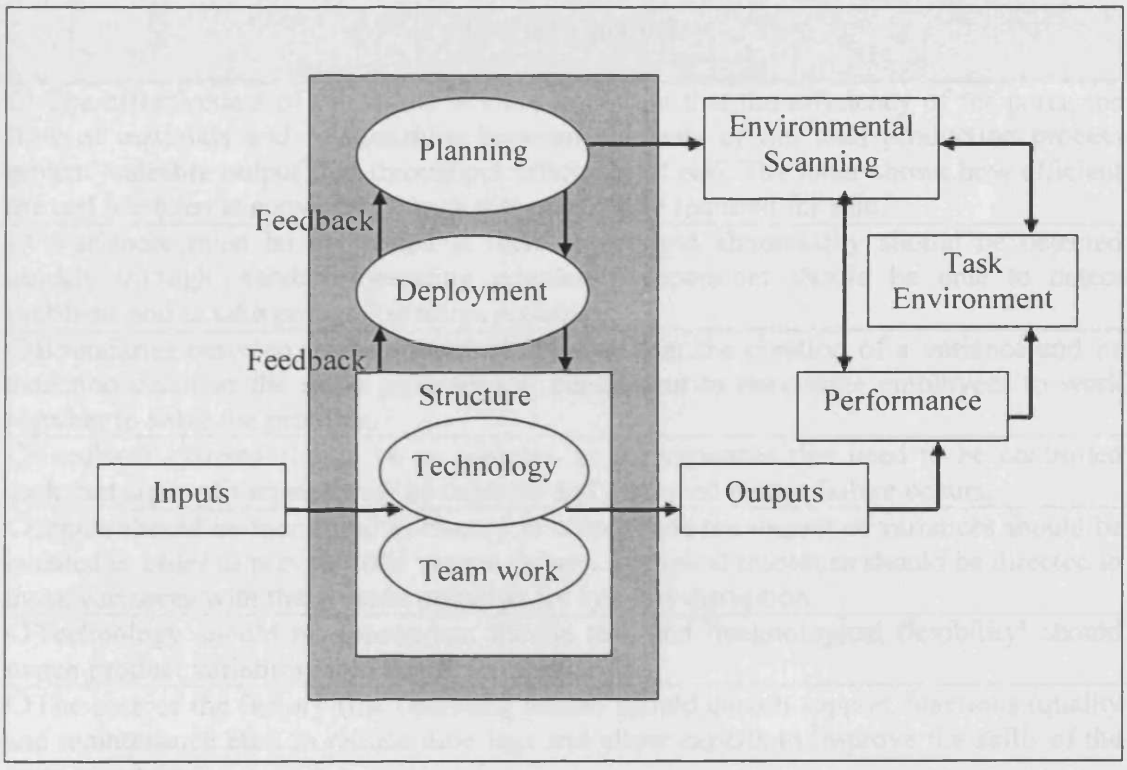


Figure 2.5 shows how the relationships among the environment, technical and social subsystems should be integrated according to the socio-technical system approach and there are obvious similarities with TQM models (Dale, 2003; Oakland, 2003; Garvin, 1988). Socio-technical systems literature developed in the 1960s in the UK and has an impact upon this study by suggesting the need to analyse and understand the structure of the firm, its technology as well as the human resource process (Emery and Thorsrud, 1976; Lawler, 1986; Walton, 1985). As TQM involves all employees in the process of improvement then this body of literature has a bearing upon how performance can be analyzed from the technological and human perspectives and as such this study will examine how the social and technical parts of a business must fit together to result in higher performance even by companies with the same technology and the same market.

Table 2.2 STS design principles (Pasmore, 1988)

Design Principles
O The effectiveness of the whole is more important that the efficiency of the parts; the flow of materials and relationships between elements of the total production process govern 'saleable output' not throughput efficiency at cell. The latter shows how efficient the cell has been at converting inputs that may not be required for sale.
O Variances must be controlled at their source and abnormality should be detected quickly through standard operating practices – operators should be able to detect problems and to take proper corrective action.
OBoundaries between teams should be set such that the creation of a variance and its detection occur in the same geographical department to encourage employees to work together to solve the problem.
OFeedback systems should be as complex as the variances that need to be controlled such that signs of variance may be detected and corrected before failure occurs.
OInputs should be monitored as closely as outputs and the impact of variances should be isolated in order to prevent total system failure. Technical resources should be directed to those variances with the greatest potential for systems disruption.
OTechnology should be appropriate for the task and 'technological flexibility' should match product variability and labour flexibility.
OThe core of the factory (the operating teams) should absorb support functions (quality and maintenance etc.) to reduce time lags and allow experts to improve the skills of the team members.

The key features of the STS approach include:

a) Organisation as a system

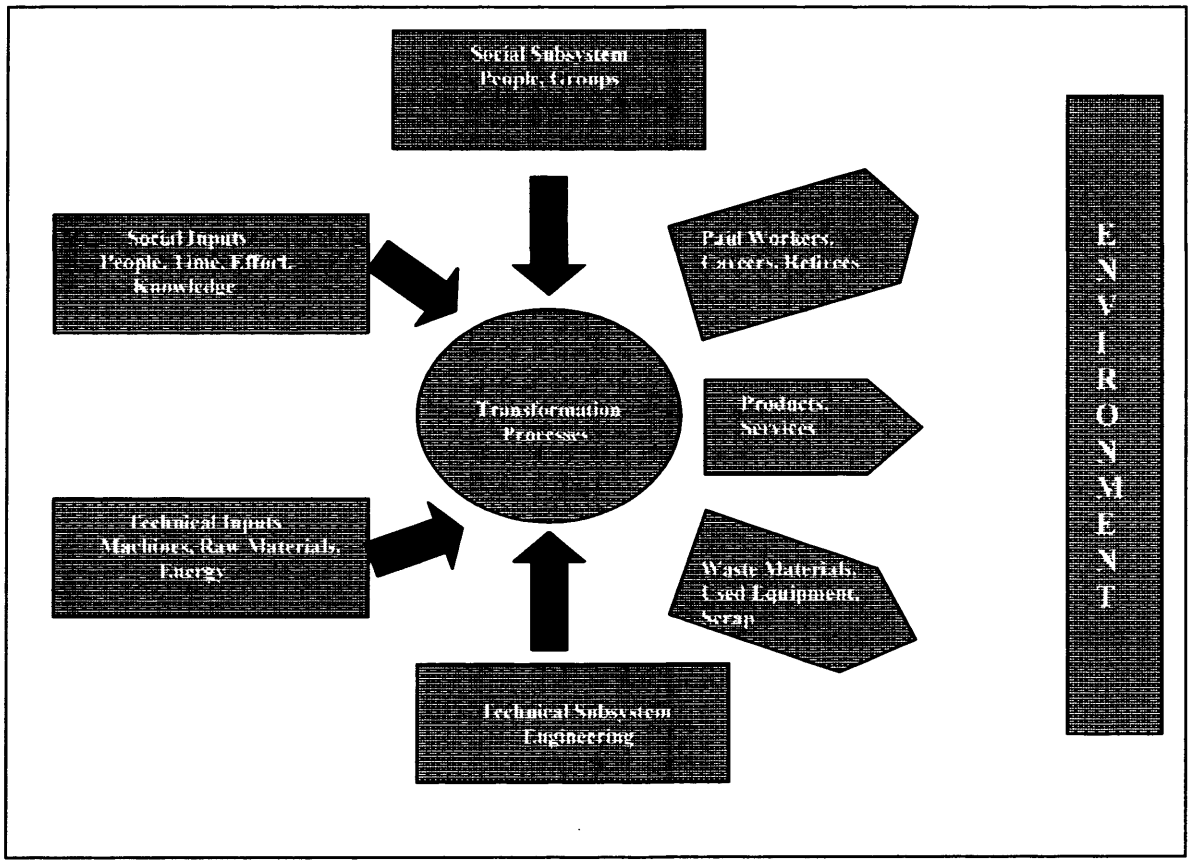
b) Organisation is structured via teams

c) Teams control mini cycles of input – process – output (Pasmore, 1988)

d) Teams must continuously improve and identify errors in the total system (Pasmore, 1988).

Table 2.3 shows the proposition of organisation and teams from STS and TQM perspectives.

Figure 2.5: Socio -Technical Systems-Integration of Social and Technical Subsystems (Moorhead and Griffin, 2001)



There are many parallels between STS and TQM. For TQM to work efficiently and effectively, the organisation must have good people who are proactively developed, and it must also have good, capable technology. If either is insufficient or the organisation is designed incorrectly then a less than optimal performance will be the result. An implication for this study is the need to look at human resource differences with core systems and, where possible, to investigate organisations with similar technologies.

The preceding review has demonstrated the critical importance of investigating businesses as systems. The review has also highlighted the key subsystem of input – process – output control or operations management, as the field of academic study is better known. Both organisation and operations literature are of critical importance to TQM and its role in achieving and sustaining (through continuous improvement) high performance. The next section of this review will deal with operations management and

TQM before addressing the specific contingencies of TQM studies with small and medium sized businesses.

Table 2.3: Organisational and teams from STS and TQM perspectives

Proposition	Socio-Technical System Authors	TQM Authors
Organisation as a system	Emery (1969); Pasmore (1988); Hackman and Oldham, (1980)	Deming (1986); Juran (1988); Dale (2005); Oakland (2003); Garvin (1988).
Organisation structured via teams	Perrow (1974); Blake and Mouton (1964); Burn and Stalker, (1961)	Deming, (1986); Crosby, (1979); Feigenbaum, (1983); Ahire and Golhar (1996); Hackman and Wagemen (1995).
Teams control mini cycles of input – process – output	Pasmore (1988); Skinner (1969); Emery (1969); New (1992)	Ishikawa (1985); Deming (1986); Imai (1986).
Teams must continuously improve and identify errors in the total system	Pasmore (1988); Hayes and Wheelwright (1988); Slack et al. (1998)	Crosby (1979); Oakland (2005); Powell (1995); Shingo (1985); Dale (2005).

2.2 Definition of Operations Management

Operations Management (OM) is a field of study concerned with the design and operation of systems for manufacture, transport, supply or service, in short, input – process - output (Wild, 1984). According to Drucker (1990), operations management is the management of direct resources associated with the physical operations process that adds to the economic value of materials, and Harrison (1996, p. 1) defines operations as *"the processes by which a range of inputs are converted into the products and services required by the customers of the organisation"*. These authors reinforce the importance of effective operations management (by design) and highlight the importance of human resource practices to support high performance. The conversion process requires people

to effect changes and at the same time plan and control the process itself. As such, technology may define the capacity but people define the efficiency of the system. This operations management model represents the fundamental subsystem that generates business performance (see Figure 2.6).

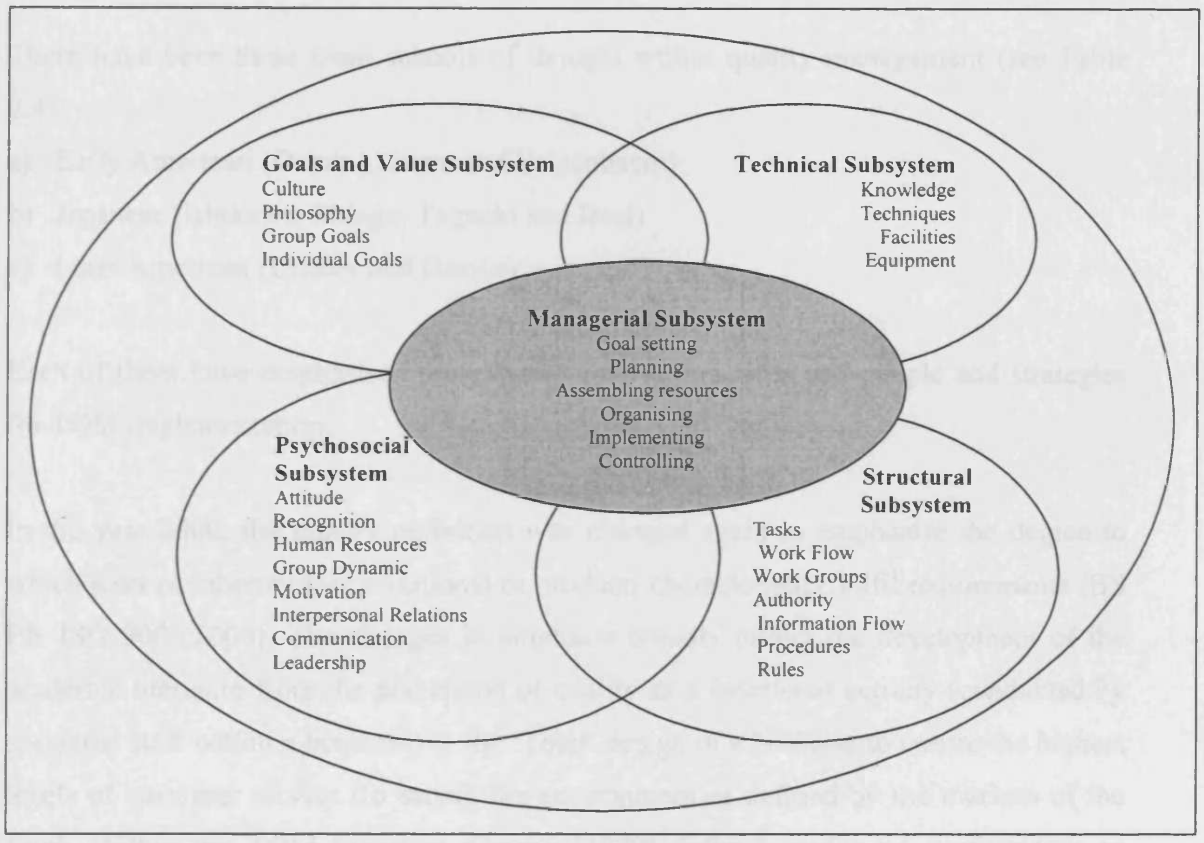
Operations management, from a literature review perspective, has developed from an explicit recognition of systems theory (Hill, 2000) and it is the major subsystem of any manufacturing business. In today's competitive world, operations management and its associated business model are seen as the keys to high performance and competitive advantage (Slack, 1991). In order to explain the role of operations in achieving competitive advantage, Slack (1991) proposes five performance objectives that focus on customer service instead of the optimisation of production cost. The five performance objectives include:

a) Quality advantage by making things right
b) Speed advantage by making things fast
c) Dependability advantage by making things on time
d) Flexibility advantage by changing and updating what is made
e) Cost advantage by making things cheaply

Slack's (1991) view is a modern approach to high performance operation management as, traditionally, only 'cost' performance was the focus of operations management under mass production and scientific management (Skinner, 1969). The modern approach rejects the single focus on 'cost' as this resulted in trade-offs such as short lead times and high cost or high quality and high costs. Slack et al. (2004) and others (New, 1991; Nakane, 1986) reject this view in favour of an approach whereby no trade-offs are necessary. The new approach commences with mastering the quality of the conversion process. Mastering the quality process is just the initial focus of a high performance operations system design. The other performance objectives that Slack shows form a ladder that others also recognise as being important if high performance is to be maintained (Collins and Schmenner, 1993; Hayes and Pisano 1994; Nakane, 1986;

Brown, 1998). As can be seen, the role and importance of quality for organisations with operations management systems is paramount. The remainder of this chapter will focus on TQM systems within the operations management literatures.

Figure 2.6: Key organisational subsystems (Kast and Rosenzweig, 1985)



2.3 Quality

2.3.1 Definition and Concepts

There are various definitions of quality management but no single one is universally accepted (Dale, 2003). The Oxford Dictionary defines quality as *"the degree of goodness or worth"*. It also states that quality is related to attributes, characteristics, special or distinguishing features. At the product level, quality has been traditionally associated with describing the attributes of a product such as its beauty, goodness, freshness and luxury. In the context of industrial quality, the governing body, namely, the British

Standard Institution (BSI) (BS 4778: Part 2: 1991) defines quality as the *"totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs"*. In 1995, BSI changed the definition of quality to include the totality of characteristics of an entity (a product and its manufacturing organisation) that affect its ability to satisfy stated and implied needs (BS 8402: 1995).

There have been three main schools of thought within quality management (see Table 2.4):

a) Early American (Deming, Juran and Feigenbaum)
b) Japanese (Ishikawa, Shingo, Taguchi and Imai)
c) Later American (Crosby and Garvin)

Each of them have emphasised process and control, practices and people and strategies for TQM implementation.

In the year 2000, the quality definition was changed again to emphasise the degree to which a set of inherent [organisational or product] characteristics fulfil requirements (BS EN ISO 9000:2000). The changes in emphasis broadly reflect the development of the academic literature from the perception of quality as a functional activity (conducted by specialist staff within a business) to the 'Total' design of a business to ensure the highest levels of customer service (to satisfy the environment as defined by the markets of the firm). Within the TQM literature, Crosby (1979) defined quality as conformance to requirements not as goodness, which reflects the product-focus of the quality definition. With the expansion of use of the term quality there has also been disagreement as to what is considered good or excellent performance at the product or business level.

The most important authors in the literature review included Crosby (1979), Deming (1986), and Juran (1988); their definitions were the accepted approaches, based on four absolutes of quality management, summarized as Table 2.5:

(a) Quality is defined as conformance to requirements

(b) The system for achieving quality is prevention not appraisal
(c) The only performance standard is zero defects
(d) The measurement of quality is the cost of quality

The work of Crosby (1979) remains important and influential and his view that quality must be perpetually improved reinforces the current operations management approach and the belief that higher quality always reduces costs and raises profits. In this manner, he promoted the measure of the 'cost of quality' as a performance indicator that can be used to understand how far a business has progressed towards good quality performance.

Another influential 'quality guru' is Deming (1986), who defines quality in terms of quality of design, quality of conformance and quality of sales and service function. His main argument is that by improving quality, it is possible to increase productivity and thus improve organizational competitiveness. Deming's hypothesis was that companies that use TQM would outperform those that do not. His work and lectures in Japan were fundamental in teaching such concepts to the current 'world class' large Japanese corporations, many of whom now hold the Deming Prize for industrial quality excellence.

Table 2.4: Quality management perspectives from quality gurus

Date	Figures	Methods	Themes	Focus
1950s – 1960s (USA) Focus on Process and Control	Deming	• Statistical process control •14 points for management	Process variability and control for high performance.	• Leadership • Measurement • Cost of quality • Continual improvement • Employee involvement
	Juran	• Project management • 10 steps for quality improvement		
	Feigenbaum	• System management • 10 points for total quality success		
1970s - 1980s (Japan) Focus on Practices and People	Ishikawa	• Seven quality control tools • Company wide quality movement • Quality control circles	Tools and techniques for problem solving and error proofing through continuous improvement teams.	• Team work • Problem solving • Continuous improvement • Customer delight • Adaptability people and technology • Optimizing production process
	Shingo	• Single minutes exchange of die (SMED) • Mistake proofing (Poka Yoke)		
	Taguchi	• Loss function • Off-line quality control		
	Imai	• Kaizen (continuous improvement)		
1980s – 1990s (USA) Focus on Strategy	Crosby	• Zero defects • 14 steps for quality improvement programme	Strategic models and TQM	• Management commitment • Cost of quality • Measurement • Prevention strategy
	Garvin	• Strategic quality management • Competitive edge		

Source: Researcher

Table 2.5: Definitions of quality by gurus (adapted from Hoyer and Hoyer, 2001)

Quality Gurus	Definitions of Quality
Crosby	Quality means goodness, or luxury or shininess or weight. The word quality is used to signify the relative worth of things in such phrases as 'good quality', 'bad quality' and that brave new statement 'quality of life'. If we are to manage it, quality is defined as 'conformance to requirements'.
Deming	Quality is defined in terms of customer satisfaction. Quality is multidimensional and it is virtually impossible to define the quality of a product or service in terms of a single characteristic or agent.
Feigenbaum	Quality is a customer determination, not an engineer's determination, not a marketing determination, or a general management determination. It is based upon the customer's actual experience with the product or service, measured against his or her requirements- stated or unstated, conscious or merely sensed, technically operational or entirely subjective - and always representing a moving target in a competitive market. Product or service quality can be defined as the total composite product and service characteristics of marketing, engineering, manufacture and maintenance through which the product and service in use will meet the expectations of the customer.
Ishikawa	Quality means quality of product which can satisfy the requirements of customers. Broadly interpreted, quality means quality of work, quality of service, quality of information, quality of process, quality of division, quality of people including workers, engineers, managers and executives, quality of system, quality of company, quality of objectives, etc.
Juran	Quality consists of those product features which meet the needs of customers and thereby provide product satisfaction. Quality consists of freedom from deficiency.
Shewhart	Quality is something that has to do with the consideration of a thing as an objective reality independence of reality of the existence of man and also has to do with what we think, feel or sense as a result of the objective reality.
Taguchi	Quality is the loss a product causes to society after being shifted ...other than any losses caused by its intrinsic function.

Deming was a statistician and advocated the measurement of quality by direct statistical measures of manufacturing performance against specification. He popularized statistical tools that can be used to reduce variation in all production processes. According to Saraph et al. (1989), Deming also introduced a 14-point approach in managing organizations effectively, and popularised the PDCA (Plan-Do-Check-Action) cycle (see Figure 2.7), which he believed enabled organisations to improve production and services continuously.

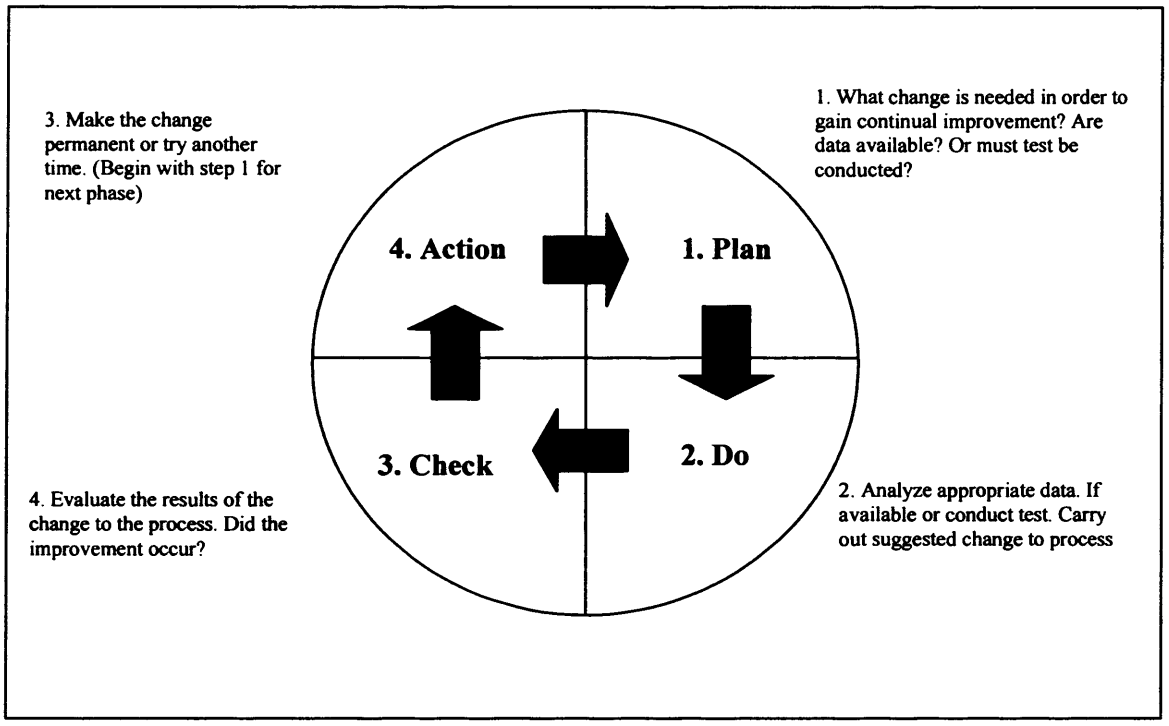
The work of Deming is therefore highly important to the design of this study and the features of high performance SME businesses in Malaysia. Juran (1988), a colleague of Deming and a fellow statistician, defines quality as 'fitness for use'. His approach was to increase conformance and decrease the cost of quality of the organizations – the source of Crosby's arguments. He proposed many techniques including the 'quality trilogy' of quality planning, quality control and quality improvement. This trilogy, he argued, was the concern of management and was directly related to 'breakthroughs' in operational performance. His approach focuses on three segments consisting of a programme to attack sporadic problems, one to attack chronic problems and an annual quality programme, which involves top management.

Within the literature, there are also many other influential quality figures, each with a slightly different definition and interpretation of industrial quality; these figures include Ishikawa, Feigenbaum and others. Their work will be reviewed and their 'high performance' design features of organisations added to the basic model that guides this study.

According to Garvin (1988), a broad approach to the study of performance quality must be examined. He proposes eight basic dimensions of quality as defined from the customer's perspective, namely, performance, features, reliability, conformance, durability, serviceability, aesthetics, and perceived quality. Organisations must meet one or more of these dimensions and it needs to determined which of these dimensions are

crucial to the organisation as seen by the customer (as such quality must be matched to the environment and customer base).

Figure 2.7: PDCA cycle (Schonberger and Knod, 1997)



He claims the organisation must take continuous steps to solicit feedback on these dimensions particularly the one that is critical to the organisation to enable it to respond to and serve the customer better. Again, this last point reinforces the systems approach and the role of management in designing effective organizations.

For the purpose of this study, quality management is taken to mean industrial not product quality and this study will use the term and measurements of organisational quality performance that are consistent with the socio-technical systems approach to the study of manufacturing organisations.

2.3.2 Quality Management Systems (QMS)

Many of the quality innovations since the 1960s have been codified into evaluation systems, especially quality management systems, to control the policies and practices of quality and to form a standard (often global) approach. These systems will now be reviewed to assist the reader and because they form the basic approach to quality with a factory.

A quality management system (QMS) is defined as a management system to direct and control an organization with regard to quality (BS EN ISO 9000:2000). This means the organisation must fulfil the customer quality requirements, applicable regulatory requirements, and enhanced customer satisfaction and must achieve continual improvement of its performance in order to qualify for the award. According to Munro-Faure and Munro-Faure (1992), QMS is the formal management system that defines the quality environment within an organisation. The quality assurance standard ISO 9000:2000 series is accepted worldwide as a foundation to establish a quality management system (Sun, 2000; Najmi and Kehoe, 2000). The main objective of quality assurance activity is therefore to build quality into the product, service and business processes and to give confidence to customers that a product and/or service meet international standards (Dale, 2003).

The latest revision is the ISO 9000:2000 version; a major rewrite enhanced the existing standards by introducing TQM philosophy and the concept of continuous improvement. The standard is based on eight quality management principles (BS EN ISO 9000:2000) and represents a move away from basic standards and towards a behavioural systems approach to quality.

From Table 2.6, it can be seen that the role of management is critical and this reinforced by the ISO 9000:2000 model. According to Dale (2003, p. 284), *"to make best use of the ISO 9000 series it is important that the implementation is carried out in the right spirit and for the right reasons. This is an area in which management commitment is vital. The*

solution to many of the reported difficulties, shortcomings and criticisms of the standard lies in the hands of an organisation's senior management team".

Table 2.6: TQM principles integrated in ISO 9000:2000 (Hoyle, 2001)

Themes	Definition	Key Support Authors
Customer Focus	Organisations depend on their customers and should therefore understand current and future customer requirements, meet these needs, and aim to exceed their expectations.	Deming (1986); Garvin (1988); Ahire et al. (1996); Oakland 2003); Dale (2003); Imai (1997); Powell (1995).
Leadership	Managers have to establish unity of purpose and company direction. They should create and maintain an environment in which people can become fully involved in pursuing the organisation's objectives.	Deming (1986); Juran (1988); Garvin (1988); Crosby (1979); Ahire et al. (1996); Zairi (2002).
Involvement of people	People at all levels are the essence of any organization and their full involvement enables their abilities to be used for the organisation's benefit.	Ghobadian & Gallear (1996); Gunasekaran (1999); Oakland (2003); Mann and Kehoe (1993); Dahlgaard et al. (1998)
Process approach	A desired result is achieved more efficiently when activities and related resources are managed as a process.	Ghobadian and Gallear (1996); Andersen (1999); Brah et al. (2002); Ishikawa (1985).
Systems approach to management	Identifying, understanding and managing interrelated processes as a system that contributes to the organisation's effectiveness and efficiency in achieving its objectives.	Oakland (2005); Slack et al. (2004); Saraph et al. (1989); Terziovski et al. (1999).
Continual improvement	Continual improvement of company performance should be a permanent objective of the organisation.	Juran (1988); Shingo (1985); Imai (1997); Feigenbaum (1983).
Factual approach to decision making	Effective decisions are based on the analysis of the data and information.	Hackman and Wageman (1995); Hendricks and Singhal (1997); Grant et al. (1994).
Mutually beneficial supplier's relationship	An organisation and its suppliers are interdependent, and a mutually beneficial relationship enhances the ability of both to create value.	Dale (2003); Saraph et al. (1989); Prajogo (2006); Mann and Kehoe (1993).

The ISO 9000:2000 series adapts the PDCA cycle as a foundation of TQM implementation and has an associated process model (consisting of four sections), which include:

a) Management responsibility (Section 5.0)

   This section requires management to demonstrate their commitment to the development and implementation of a quality management system and ensure its effectiveness.

b) Resource management (Section 6.0)

   Section 6 states that the organisation should provide sufficient resources in terms of skills and trained workers, a suitable infrastructure and appropriate working environment to maintain the effectiveness of the quality management system.

c) Product/service realization (Section 7.0)

   Section 7 requires the organisation to plan and develop processes for product or service realization. This is inclusive of customer related processes, design and development, purchasing, production and service provision and control of monitoring and measuring devices.

d) Measurement, analysis and improvement (Section 8.0).

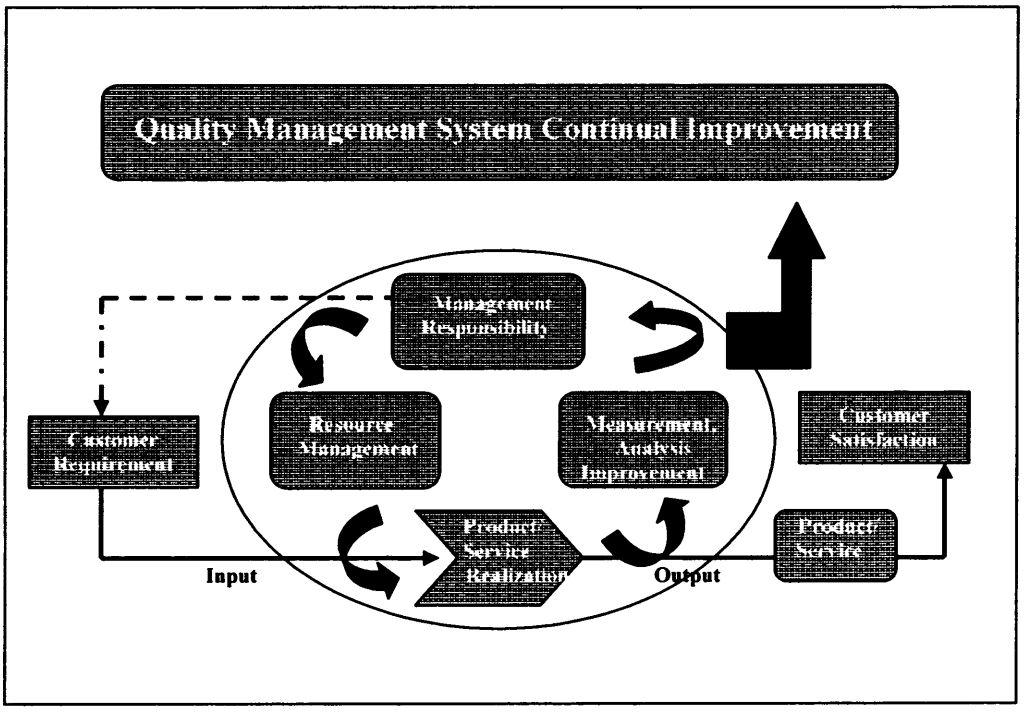
   This last section requires organisations to demonstrate product conformity through monitoring, measurement, analysis and process improvement.

The key themes were identified from the extensive literature review of TQM. However, it was found that most authors recognise most of these key themes but tend to highlight only two or three in their models of high performance. Imai (1997), for example, chooses to emphasise only customer focus and continuous improvement yet does so from a systems approach. Table 2.6 therefore brings together the holistic features associated with a model of high performance TQM. The holistic approach was taken to avoid focussing on simple or too few features of a Total Quality Management system.

Meanwhile, Figure 2.8 illustrates the quality management system process model and shows the linkages between the principle elements. A number of authors contend that ISO 9000:2000 makes a significant model and, indeed, it is the means of focussing this study (Beattie and Sohal, 1999; Briscoe et al., 2005; Gilbert and Sia, 2001). The researcher duly accepted this model as a system approach on which he based his study of organisational TQM. The significant contribution made by ISO 9000:2000 was also highlighted by other researchers such as Naveh and Marcus (2005), Briscoe et al. (2005), Singh and Mansour (2006) and Wiele et al. (2000).

Furthermore, a number of literatures sources considered ISO 9000 as a first step or stepping stone in implementing TQM (Costa and Lorente, 2004; Williams, 1997; Meegan and Taylor, 1997; Wiele et al. 1997). The importance of a QMS and key themes approach was duly accepted as a basis for evaluating industrial performance and practices (enablers and inhibitors).

Figure 2.8: Process model of ISO 9000:2000 (Pearch and Kitka, 2000)



2.4 Total Quality Management (TQM)

The difference between QMS and TQM has been narrowed by ISO 9000:2000 but TQM has a distinct set of concepts which now are reviewed.

2.4.1 Definition

The philosophy, theory, practice and terminology of TQM has emerged and continuously developed for the last 15 years (Boaden, 1997). However, again there is no common definition or consensus among the experts (Hellsten and Klesfjo, 2000; Rungtusanatham et al., 2005; Eriksson and Hansson, 2003). TQM has been defined as a philosophy and a set of guiding principles that integrates fundamental management techniques, improvement efforts and technical tools for reflecting a solid technical systems approach to management that involves continuously improving an organisation.

TQM is also portrayed as a strategic action that focuses on managing the total organization to provide customers with products or services that satisfy their needs through the mobilization of the individuals, management leadership and the cohesion of all the resources of the firm (Escrig-Tena, 2004). Zairi (1991, p. 67) defines TQM as *"a positive attempt by the organisation concerned to improved structural, attitudinal, behavioural and methodological ways of delivering to the end customer with emphasis on constituency improvements in quality, competitive enhancements, all with the principles and procedures has yielded many benefits, including more satisfied clients, expending market share, increased revenue and high staff morale"*.

Dahlgaard et al. (1998, p. 25) provide two further definitions of TQM. According to them, the first definition is that *"quality is a culture of the organization and the culture is focused on customer satisfaction and continuous improvements"*. The second definition is that *"TQM is a management philosophy that is characterized by scientific base, systematic base and covers the whole organisation"*. The first definition is often the approach deployed in Europe and the second definition is used in Japan. In addition, in 1995, Mears and Voehl argued that quality is not a management program (since there are other non-management personnel involved) and therefore an appropriate way to refer to

TQM according to them would be to call it Continuous Quality Improvement (CQI). This implies different approaches to the introduction of TQM and managers must select the most appropriate for the culture of their business.

Oakland (2003, p. 30) describes TQM as *"an approach to improving the competitiveness, effectiveness and flexibility of a whole organisation. It is essentially a way of planning, organizing and understanding each activity and depends on each individual at each level"*. He emphasises that to be a truly effective organisation, it is important to work together in achieving goals and everybody should realise that each person and each activity is affected by others. He acknowledges the systems theory concept of interdependence. Dale (2003, p. 284) relates TQM definitions to economic perspectives. According to him, *"TQM is the mutual co-operation of everyone in an organisation and associated business process to produce value for money products and services which meet and hopefully exceed the needs and expectations of customers"*. He refers to TQM as a process and not a programme of enforced continuous improvement in business operations.

Yang (2006) and Powell (1995) place more emphasis on 'integration' as they regard TQM as an integrated management philosophy and practices that include several factors such as continuous improvement, customer satisfaction, processes, employee participation, benchmarking, measurement and suppliers. Yusof and Aspinwall (2000a, p. 32), on proposing a conceptual framework for TQM implementation for SMEs, consider TQM as *"adopting a quality culture through the implementation of quality management initiatives in all aspects of the business with full consideration towards building a continuous improvement culture based on realistic resources, financial and human, and in anticipating and meeting customer needs according to priorities established for continued business success"*. For Haigh and Morris (1994), there are three complementary views of TQM:

a) Total - organization-wide process involving everyone from post room to boardroom.

b) Quality - establishing quality goals for each and every element in the process of product or service delivery so as to meet customer needs and expectations first time and on every subsequent occasion.

c) Management - commitment of senior management to quality goals and active involvement in pursuit of them.

The above TQM definitions are summarised in Table 2.7 by the researcher to highlight the elements focused on by authors.

Table 2.7: Summary of TQM definitions by several authors

Authors	**Emphasis**
Zairi (1991); Mears and Voehl (1995)	Continuous improvement
Dahlgaard (1998); Yusof and Aspinwall (2000a)	Culture
Oakland (2003)	Effectiveness and integration
Dale (2003)	Business process improvement
Yang (2006); Powell (1995)	Integration

Source: Researcher

All the views and suggestions so far have indicated that there is still no consensus regarding the definition of TQM and whilst some scholars consider TQM an overarching construct (with the various definitions and framework) and others see it as offering an alternative nominal definition (Rungtusanathan et al. 2005). The view of the researcher was to accept TQM as defined by Oakland (2003) and Dale (2003) – a company wide systems perspective was duly taken.

2.4.2 TQM Principles

A detailed review revealed that there were various TQM principles has been highlight in the literature. However, those principles are focussing on eight major elements which include:

a. Customer focus

Meeting the needs and requirements of customer is the main purpose of TQM. It is important for organisations to ensure customer satisfaction through the provision of quality product or services (Garvin, 1988; Ahire, 1996). Failure to satisfy customer needs and requirements will negatively affect business performance (Dale, 2003).

b. Leadership

The role of leadership in organisations has been emphasised as critical for successful TQM implementation (Deming, 1986; Oakland, 2003; McAdam, 2000). Deming (1986) insists managers to institute leadership rather than supervision and Juran (1988) considers a lack of involvement from senior management as a contributory factor in the failure of quality initiatives. Ishikawa (1985) reinforces the importance of commitment by senior executives and management 'buy in' whilst Taylor (1997) proposes TQM requires continuous effort from everyone in organisation but sees management as instrumental drivers of change. Therefore senior management need to demonstrate that they are serious about quality movement in organisation.

c. Involvement of people

Whilst the senior management role is critical to the process of TQM implementation, people involvement is often overlooked as part of the process (Zairi, 1999). It was noted by many authors that the impact of human resources in organisation depends greatly upon the empowerment of employees (Oakland, 2003; Dale, 2003; MacDuffie, 1995; McAdam, 2000). Therefore people involvement is important to keep and maintain TQM spirit and momentum.

d. Process approach

Senior management should reinforce process approach to all organisational activities and resources to achieve desirable results because processes deliver products and determine product flow. According to Oakland (2003) process approach help organisations to sustain efficiency and effectiveness.

e. Systems approach to management

Organisation processes are interrelated each other and need to be managed as a system if better performance is to result (Dahlgaard et al. 1998). The integration of processes, human resources and technical capabilities leads to long term business success (Feigenbaum, 1983).

f. Continual improvement

Continual improvement is a powerful concept of achieving greater customer satisfaction and reduces process variation. It requires management by facts and commitment of all employees with emphasis on teamwork, collaboration and dependency to promote a bottom-up thrust for quality improvement (Bekese and Cebeci, 2001; McAdam and Kelly, 2002).

g. Factual approach to decision making

Decision making is part of management processes and it is argued that senior management should make decisions based on data and analysis (Deming, 1986). The use of accurate data is widely correlated with higher performance organisation (Garvin, 1988; Taylor, 1997; Marchington and Wilkinson, 2002).

h. Mutually beneficial supplier relationships

Supplier involvement is important for the effectiveness of TQM implementation in organisations due to the significance of supplied materials. A supplier development programme needs to be properly planned and be systematic to ensure quality product supply and less reactive containment processes at customer operations (Ghobadian, 1996; Slack et al. 2004).

Many authors in the literature also argue about the relationship between the boundary of ISO 9000 standards and TQM implementation (Meegan and Taylor, 1997; Magd and Curry, 2003; Quazi et al. 2003). According to Laszlo (1996) ISO 9000 standards and TQM are totally different approaches where ISO 9000 implementation is associated with line workers and TQM related to top management. Furthermore ISO 9000 standards provide only compliance through auditing and certification as opposed to a basic approach to all aspects of the business (Stevenson and Barnes, 2001). On the other hand, TQM implementation has an emphasis on continuous improvement and achieving and maintaining customer satisfaction not necessarily to any given audit standard (Najmi and Kehoe, 2000). Yong and Wilkinson (2001) reinforce this view that TQM is much broader than a formal audit system and much cannot be detected by such audits. Therefore, it can be seen that a systematic approach is needed to managing all aspects of the firm if TQM is to be achieved and having ISO 9000 standards is not enough to achieve TQM. Realising the weaknesses of ISO 9000 standards, the new revision of the audit has incorporated TQM principles to harmonise all standards and lead to an organisational view of standard-based TQM success (Beckford, 2002).

2.4.3 TQM and Business Process Re-engineering (BPR)

Business Process Re-engineering (BPR) was first introduced by Hammer and Champy in 1990 and reflected the on-going criticism of TQM, its disappointing results, and seeming inability for large Western businesses to employ/sustain such a systems approach (Sutter, 1996; McAdam 2001). Hammer also proposed strong competition and globalization facing organisations were reasons to give up on a systems approach and instead turn to the tactical enactment of re-engineering existing processes that inhibited performance improvement (a switch away from systems thinking to reactive process improvement). Hammer and Champy (1990, p. 32) suggest BPR is the "*fundamental rethinking and radical design of business processes to achieve dramatic improvements on critical measures of performance such as cost, quality service and speed*". This definition reinforces a discontinuity in the performance of an organisation and Coulson-Thomas (1992) support this view – going further to argue that incremental changes are no longer enough and transformation cannot be achieved without fundamental change. BPR

therefore focuses on process and defined a process is a *"set of logically related tasks performed to achieve a defined business outcome"* (Davenport and Short, 1990, p. 63). The BPR view involves functional integration and emphasis on cross organisational working to improve work flows and process quality including the use of information technology infrastructure as an important in enabler – much of this approach relegates the role of the employee to that associated with scientific management practices (Sinclair and Zairi, 1995).

There were many debates in the literature focussing on the differences between TQM and BPR. The majority of authors believe both approaches could contribute to organisational success but it was not clear as to how different BPR was from TQM or whether it is in fact a subset of TQM (a technique rather than an approach). Table 2.8 summarises the differences between both approaches according to some aspects proposed by Jarrar and Aspinwall (1999) based on literature and personal observations by the researcher. From the table it shows the strength and weaknesses between the two approaches and the bias of BPR on information technology and innovation in contrast to the TQM focus on customer satisfaction using continuous improvement techniques (engaging more employees in the change programme).

Although known as a technique for radical improvement in organisations, BPR is still not, in the opinion of the researcher, qualified to substitute TQM because it adopts a narrow concentration on improving processes not full business features and systems (Allender, 1994). The researcher argues that if managers of organisations have a very good quality management system implemented then BPR would not be necessary. BPR might be significant subset of TQM if this approach is used as the intervention approach and as apart of a broader approach to business change using TQM (Al-Mashari and Zairi, 2001; McAdam, 2000). The integration of both TQM and BPR enables the weaknesses of each approach to be overcome and ensure that systems can radically change in parallel with smaller continuous improvements – both these are complimentary with a systems view of the firm and need to adapt to environmental change (Jarrar and Aspinwall, 1999).

Following an extensive literature review, the researcher found only one study was conducted into BPR practices in Malaysia which related to banking and finance industries (Kong and Richardson, 2003) but no single study has been conducted of Malaysian SMEs especially manufacturing sector. The researcher believed this situation occurred because lack of information technology infrastructure amongst Malaysian SMEs (which is vital important to BPR) is due to limited resources in term of financial, machines and human resources (Sinclair and Zairi, 1999; MacGregor, 2004). This finding further undermined the role of BPR as a key aspect of this study and instead reinforced the continued adoption of TQM and a systems view.

This research focuses to the features of TQM implementation rather than process improvement of the company. The researcher found BPR was not an appropriate context and strategy for this study which sought to identify these key features for SMEs. The researcher duly rejected the literature concerning BPR due to its theoretical limitations and seeming appropriateness to large businesses with codified system as opposed to small businesses where such bureaucracy is not typical nor do small businesses have high levels of managers that would require reengineering. As such BPR was rejected as a subject area that was worthy of study in this case – instead a TQM approach was taken which is conducive to a systems approach to studying business organisations.

Table 2.8: TQM versus BPR (Jarrar and Aspinwall, 1999)

Aspects	TQM	BPR
Initiated by	Conventional know-how Common sense	Panic External pressure from customers, competitors and stakeholders
Starting point	Existing processes-analyse, standardise and improve	Clean slate-throw everything out and start fresh (total redesign)
Frequency of change	Continuous and incremental	One- time (occasional)
Focus	Components of system Individual processes Activities	Macro processes Core processes
Customer focus	Equal emphasis on internal and external customers	Emphasis on external customer Internal customer are a distraction
Level of change	Incremental improvement for existing processes. Evolutionary	Radical change. Whole new process. Revolutionary
Employee involvement	Total involvement from everyone is essential (all individual, workgroups and some teams)	The BPR and implementation teams (not all employees are needed)
Participation	Bottom up (built within culture)	Top down (intensive)
Empowerment	Very important	Important in certain cases
Disadvantages	Difficult to get excited about and commit time to since it involves many small improvements	Could discard good with bad High cost in most cases
Advantages	Appropriate when resources are at their lowest Provides consistent improvement over time	Erases old paradigms Produces quantum improvement
Typical scope	Narrow, within functions. Process improvement efforts are often within single teams or a few functions	Broad/cross functional – a single BPR project sweep across many functions or the whole organisation
Risk	Moderate	High
Primary enabler	Statistical process control	Information technology
Payback period	Slow continuous small improvement	Quick dramatic payback

2.4.4 TQM Implementation

It is widely agreed that TQM is used as a way of continuous improvement (Goh and Ridgeway, 1994; Hackman and Wageman, 1995). Many organisations, especially large corporations, have benefited from TQM implementation (Benavent, 2006; Ahire and Golhar, 1996; Saraph et al., 1989; Yusof and Aspinwall, 2000b; Jabnoun and Sedrani, 2005). Amongst the large corporations that have implemented TQM are Motorola, IBM, General Motors, Hewlett- Packard and Rank Xerox and these businesses are often regarded as benchmarks including many whose practices have directly influenced modern models of TQM (Welch, 2005). It has been argued in the literature that there are several factors that trigger organizations to implement TQM and Lascelles and Dale (1993) identify four factors that motivate organizations to implement TQM:

a) The Chief Executive Officer (CEO) - directing policy towards a TQM model
b) Activities of competition
c) Customers demanding TQM implementation
d) Fresh-start situation

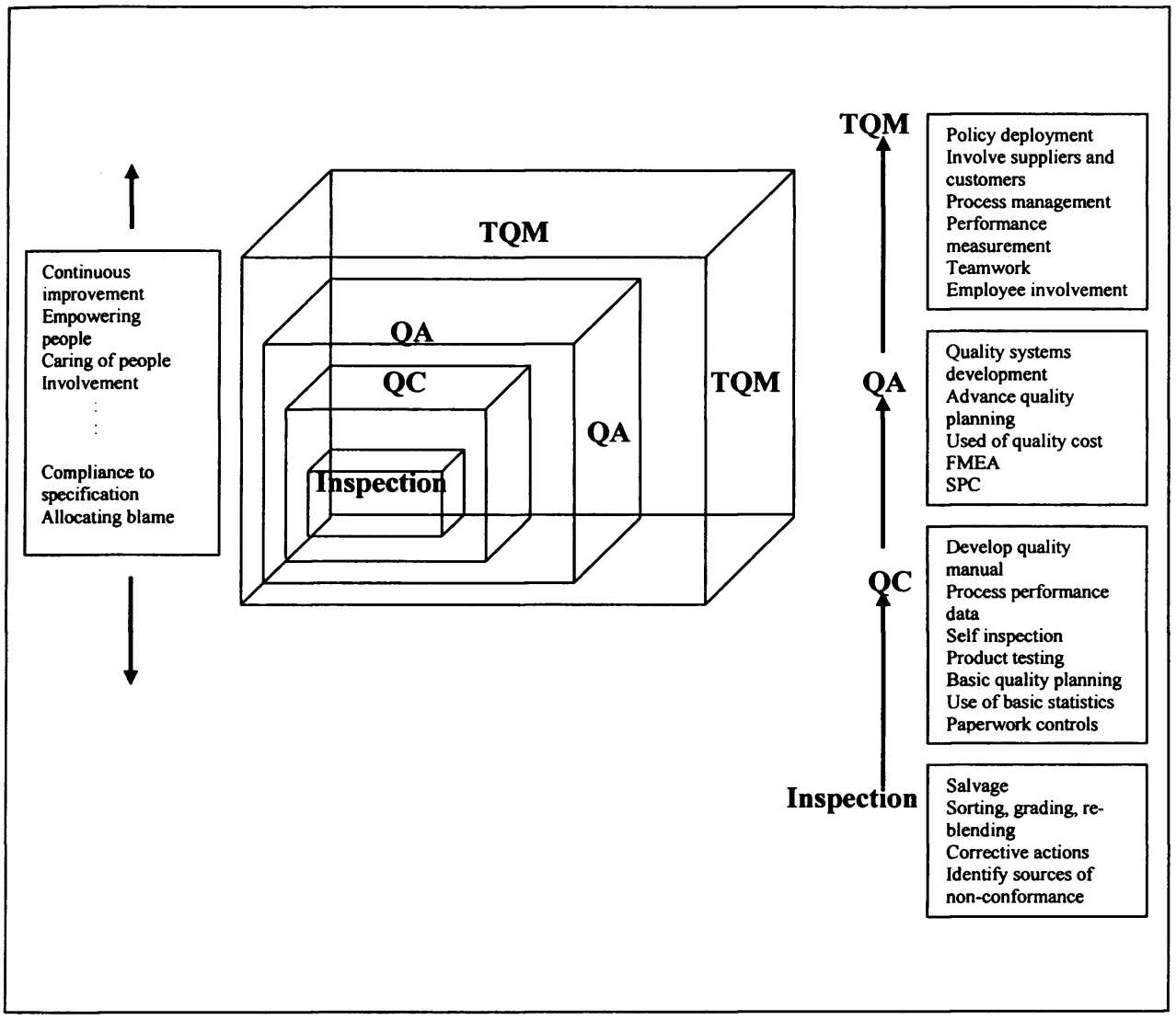
They emphasise the CEO plays an important role in improving quality in the organisation and must take the lead to implement improvements and act as the internal change agent within and beyond the organisation (with its customer/supplier interactions). For the organisation to be competitive it must meet customer demands and requirements. Demanding customers have a high expectation of products and services and they are able to change employees' attitudes toward continuous improvement through their needs and requirements by promoting waste-free service and TQM. Finally, the authors suggest a "fresh start" situation to provide the opportunity to change attitudes and build strong relationships. They contend the outcome of the four factors is organisational competitiveness and the capability to fulfil the needs of demanding customers.

Grant et al. (1994) suggest TQM implementation faces challenges from the redesign of existing work and organisational structures and the redefinition of organisational goals and objectives. The challenges are similar to other revolutionary change transitions and

the commitment of senior management is considered vital (Ahire et al., 1996; Saraph et al. 1989). Mann and Kehoe (1994) examined the process of TQM implementation in UK based organizations and concluded that there appeared to be no dominant approach to implementation – which suggests a contingency view. This argument was supported by Ghobadian and Gallear (2001) with a study of 31 organisations and they concluded that there is not a single definitive formula of success.

In considering the evolution of quality management during last two decades until now, Dale (2003) proposes four stages of TQM implementation, which can be identified as inspection, quality control, quality assurance and TQM (see Figure 2.9). According to Dale, inspection activities are related to examination, measurement, testing or assessment and ensure the product or service conforms to specified requirements. Under quality control, methods and systems are used as parts of self inspection as are tools and techniques. Quality assurance focuses on continuous improvement by systematic planning and preventing errors from occurring at root cause. He finally added that the highest level is TQM, which *"involves application of quality management principles to all aspects of the organisation including customers and suppliers and their integration with the key business processes"* (Dale, 2003, p. 26). Slack et al. (2004) consider the most powerful key concept of TQM to be the emergence of internal customers and suppliers. TQM is the highest level of system integration and performance. However neither authors goes further to define an evolutionary model towards TQM in any great detail of working practices and differentiation of levels.

Figure 2.9: Levels of TQM implementation (Dale, 2003)



Meanwhile, Escrig-Tena (2004) in her work on literature has grouped critical elements for TQM implementation into four dimensions: customer satisfaction, continuous improvement, focus on people and global vision of the organisation. According to her, these four dimensions are interrelated, mutually support each other, and contribute to success. Many other studies identify a positive relationship between TQM practices and superior firm performance (Tannock et al., 2002; Pun, 2002; Brah et al., 2002; Agus and Mokhtar, 2000). The studies conclude that firms that implement TQM effectively outperform non-TQM firms in terms of financial, communication, customer satisfaction and team work indicators (Chandler and McEvoy, 2000; Boon and Ram, 1998; Reed et

al., 2000). However, Powell (1995) argues that empirical studies have not shown that TQM firms consistently outperform others. Other studies have also indicated that there are no significant results produced after TQM has been introduced by organisations (Brown, 1993). Despite this confusion, the general consensus is that TQM contributes to the success of organisations' performance (Ahire and Golhar, 1996; Fuentes-Fuentes et al., 2004; Garvin, 1988; Ghobadian and Gallear, 1997).

From the literature reviewed thus far, it can be seen that TQM must be studied from a management perspective so that an appreciation of the holistic enterprise approach to TQM can be understood. The critical subsystems that have been identified by the authors in this field imply the need to view TQM from the perspectives of key subsystems and managers engaged in operations management, human resources and quality assurance as well as those at the highest level of the business who set out the strategy that must be followed (direction setters). Many authors contend these areas of business management are critical to the effectiveness of TQM implementation and the resultant performance (Oakland, 2003; Garvin, 1988; Tannock et al., 2002). Moreover, an effective TQM system needs a full and on-going commitment from every employee at all levels and functions in the organisation or it will degenerate and fail in its purpose of satisfying customers profitably (Eriksson and Hansson, 2003; Kaynak, 2000). However, the literature review so far has also identified a gap, that is, a lack of research concerning the key features of TQM, the sequence through which companies may evolve to become TQM businesses and also how businesses with TQM features outperform those without such features. As can be seen from the guiding questions of this study, this gap creates the need for a systems study of businesses to address these issues and also to aim this study towards SME businesses where the number of managers is small and, to understand SMEs in greater depth, to push the boundaries of TQM knowledge beyond the current focus on large businesses with much greater resources and managers. Such an approach would assist researchers to investigate the true TQM enablers and develop a model for this form of business, which is the dominant form of business for most developing and mature industrial economies.

2.5 TQM and Organisational Performance

The issues of TQM implementation have been discussed by many authors over the last two decades. However, the impact of TQM implementation on organisational performance is a recent focus (Rahman, 2001). The work of Garvin (1988) and Roth et al. (1990) on performance has led to many studies on the link between TQM implementation and improved performance. The previous organisational performance research highlights the importance of including top management commitment, customer satisfaction, employees' involvement, process management, continuous improvement, suppliers' relationship, manufacturing strategy and others in generating high performance (Rahman and Bullock, 2005; Brah and Wong, 2000; Ahier et al., 1996; Brown et al. 2007; Kaynak, 2000). Nevertheless, there were a number of studies that have measured organisational performance based on financial aspects such as sales, return on investment (ROI) and return on asset (ROA) (Agus and Mokhtar, 2000; Eriksson and Hansson, 2003; Hendricks and Singhal, 2000; Powell, 1995). These studies found TQM organisations make a significant contribution toward increasing sales, ROI, and ROA, compared to non-TQM.

Anderson and Sohal (1999) studied the relationship between TQM and performance in Australian small businesses and identified leadership, customer focus and quality system as having a positive influence on quality output. The authors also argue strategic planning, information and human resources did not contribute to organisational performance. In contrast, many studies related to the impact of strategic planning, human resources and information indicate the positive and significant relationship with organisational performance (for example, Sohal and Prajogo, 1999; Agus and Mokhtar, 2000; Ahmad and Schroeder, 2003; Brah et al., 2002; Fuentes-Fuentes et al. 2006). In relation to this study, and from the STS point of view, the researcher believes and accepts that human resource management is the key to performance output.

Chenhall (1997) argues that in order to enhance organisational performance, TQM practices need to be associated with others such as manufacturing performance measures. This argument is supported by Prajogo and Sohal (2006) in their study of the relationship between organisation strategy, TQM and performance. They suggest organisational

performance needs to be complemented by innovation activities (product and processes). In relation to these issues, Fuentes-Fuentes et al. (2006) suggest the integration of environmental factors (dynamism, munificence and complexity) and TQM principles leads to higher organisational performance. The authors conclude that environmental factors have an influence on TQM principles, and this was duly accepted by researcher. An implication of their study is the need to study businesses in similar sectors and of a similar size.

Samson and Terziovski (1999) also examined the effectiveness of TQM implementation and linked its practices and operations management to organisational performance. They found that TQM practices have a strong relationship with operations management and significantly contribute to organisational performance. Hendricks and Singhal (1997) in the study of 'award winners' and 'non-award winners' performance indicates that the introduction of TQM programmes improved operating performance.[1] The authors argue that criticisms of quality award systems are unnecessary and misplaced. They found award winners did have the better performance.

The impact of TQM practices on organisational performance has been determined by many studies. Thus, it is important for organisations to measure their performance in order to be competitive in the market. According to Taylor (2006), a high level of TQM success can be achieved through performance measurement. The next section reviews the impact of performance measurement on TQM.

From the above discussion, the implication can be made that TQM implementation has a positive impact on organisational performance. Effective leadership with a focus on human resources, operations management, quality assurance activities and measures leads to success in implementing TQM. These features support a socio-technical systems viewpoint and approach to the study of TQM implementation by SME businesses and suggest that a study would need to address these issues in a much deeper and more

[1] Award winners in this research (Hendricks and Singhal, 1997) were identified through on-line databases and direct contact with award providers. The participating companies must be in the Compustat Annual Industrial File and have six fiscal years of data.

qualitative manner than has previously been used by researchers. The literature review so far also highlights the need to investigate award-winning businesses in order to see how the noted inhibitors (Sebastianelli and Tamimi, 2003) have been managed to allow higher performance to be achieved. Such a gap in the literature offers a much greater insight into TQM application by SME businesses in the context of the research questions that have been used to guide this study.

2.6 TQM and Performance Measurement

In the past two decades, it has been reported that there has been a revolution in performance measurement (Maskell, 1991; Neely, 2002). According to Lingle and Schiemann (1996), research indicates that organizations using the balanced performance measurement system (as a basis for management) perform better than those that do not. The balanced scorecard reflects Deming's concern for system measures and the 'no trade off' operations management approach. For this reason, Neely (1998, p. 43) suggests that it is necessary for organizations to implement an effective performance measurement system that *"enables informed decisions to be made and actions to be taken because it quantifies the efficiency and effectiveness of past actions through acquisition, collation, sorting, analysis, interpretation and dissemination of appropriate data"*. These modern performance measurement systems are widely used by organisations to measure financial results, employee performance, attitude and absenteeism, customer service, quality of processes and product, innovation and creativity (Kermally, 1997). In contrast, Sinclair and Zairi (1995) further argue the critical importance of performance measurement systems to TQM. According to them, businesses' performance measurements are positively correlated with the successful implementation and execution of strategies such as TQM, since measurement provides the link between strategy and action. However, many companies including SMEs that have implemented TQM found that their traditional performance measurement does not provide this link and feedback is a neglected area of system design. Johnson and Kaplan (1987) argue traditional systems rely heavily on financial and accounting data for monitoring and controlling processes in the company and this link is critical to TQM.

In response to this issue, Kaplan and Norton (1992) proposed a balanced scorecard that consists of four perspectives: financial, internal customer, innovation and learning. This approach helps organisations identify the right measures and aligns them with the organisation's vision and strategy (Evans, 2004). This issue also is supported by Schalkwyk (1998) who argues for a differentiation between the traditional measurement system and TQM measurement system (see Table 2.9). From a managerial point of view, Atkinson et al. (1997) contend performance measurement serves three basic functions, namely, to coordinate, to monitor and to diagnose. Cupello (1994) provides four reasons why organisations need to conduct measurement including the need to plan, screen, control, and diagnose problems with the organisation. He claims planning measures are the responsibility of top management and addresses the issues related to whether the organisation is achieving its strategic plan or otherwise.

Screening measures, on the other hand, are targeted at measuring whether the functional areas of the organisation are in support of the organization's strategic plan. These measures are the responsibility of middle management. The performance of individual employees, machines, products, services and processes are classified as control measures. The purpose of diagnostic measures is to determine whether the organization's quality initiatives are achieving the desired result. The types of measure that come under this category are customer satisfaction measures, employee satisfaction measures, project performance measures and supplier performance measures. Brown et al. (1994) propose that the performance measurement process must not be just an exercise to collect data but must be used as an important source for decision making and for motivating staff and it must be linked to corporate strategy. The implication of this work is that the term 'management' must be decomposed to include different levels of management and to draw information from senior as well as key functional managers (operations management, quality assurance and human resources). The purpose of differentiating between the levels of management is to test, from a systems perspective, whether TQM is valued in the same way or implemented in a common and aligned manner throughout the controllers of the business subsystems.

Table 2.9: Traditional versus TQM Performance Measurement Systems (Schalkwyk, 1998).

Traditional Measurement Systems	TQM Measurement Systems
Financially driven (past focus)	Customer driven (future focus)
Limited flexibility: one system serves both internal and external needs	Dedicated to responsiveness and flexibility
Not linked to operative strategy	Linked to TQM strategies
Focus on shareholders	Focus on total customer satisfaction
Goal is to decrease costs	Goal is to improve performance
Vertical, top-down reporting	Horizontal, empowering reporting
Cost, output, quality viewed in isolation (quality often completely ignored)	Quality, delivery, time and cost evaluated simultaneously
Focus on individual punishment and incentives: individual learning	Focus on group incentives and organizational learning

Every organisation, regardless of type, should have six types of measures, according to Brown et al., (1994). They call for a balance of:

a) Customer satisfaction measures
b) Financial measures
c) Product/service quality measures
d) Employee satisfaction measures
e) Operational measures
f) Public responsibility measures

From the preceding review, it is clear that the term performance requires a multi-dimensional approach, and a study of the management subsystem is needed if a true understanding of how SMEs engage TQM for high performance is to be achieved. Martin et al. (2001) present a list of performance measurement frameworks and main characteristics proposed by several authors (see Table 2.10). It helps organisations to identify the appropriate measures to be used. Biazzo and Bernardi (2003) make a comparison between the performance measurement models proposed by Elzinga et al. (1995), Sinclair and Zairi (1996) and Gardner (2001). The main issues highlighted are

Table 2.10: Performance measurement framework (Martin et al., 2001)

Performance Measurement Framework	**Main Characteristics**
Performance Measurement Matrix (Keegan et. al., 1989)	-External and internal and cost and non-cost measures (balanced measurement) -Measures linked to strategy
SMART- Performance Pyramid (Cross and Linch, 1990)	-Internal efficiency and external efficiency measures -Measures cascade down organisation from strategy
Balanced Scorecard (Kaplan and Norton, 1992, 1996)	-Balanced measures grouped in fours perspectives -Explicit cause-and-effect relationship among perspectives based on strategy
Integrated Performance Measurement System (Bititci et. al., 1997)	-Strategy deployment to four levels (business, business unit, business processes and activities) generates measures considering four elements (stakeholders requirements, external monitor, objectives and performance measures)
Performance Prism (Neely and Adams, 2000; Kennerley and Neely, 2000)	-Stakeholders centric views of performance measurement -Strategy communication -Business process management approach

that companies tend to focus improvement methods on processes that do not substantially affect the capabilities to create value for the organisation.

Based on this, they propose a conceptual framework that integrates the key components of performance measurement; process architecture, process visibility, monitoring mechanisms and improvement mechanisms. The process architecture and process visibility focus people on processes, monitoring mechanism refers to the designing of a performance measurement system, and finally, improvement mechanisms determine how plans for process change will be selected. These features are important to this study (and its guiding questions) due to the emphasis on the integration of people and processes to achieve higher business performance. This is in parallel with the design principles of Socio-Technical System Theory and Contingency Theory that underpin this study. A close alignment, it has been argued, between TQM practices and business strategy allows organisations to have a clear direction and to remain focussed on the accomplishment of a

stated goal and objective. The concepts of integration and alignment (key system theory concepts) were accepted as two key focus points for this research and as concepts to probe deeper into the practices and perceptions of key business managers in introducing and sustaining TQM. These features will be discussed further in Chapter 6.

2.7 TQM Implementation Models

Many of the TQM models of implementation proposed in the literature have been derived from the study of larger organisations rather than SMEs, which is a drawback (Husband and Mandal, 1999; Wilkes and Dale, 1998). Whilst these models are useful, they lack the contingencies and constraints of the SMEs firm (resources, scale, standardisation, etc.) As a result, the rate of implementation of quality models is low compared to that of large organisations (Brown and Van der Weile, 1995; Terziovski et al., 1997; Ramsey, 1998). TQM implementation models help management to know the status of their organisation with regards to the development of TQM and the organisational features that lead to high performance. There are three main models that have been widely used throughout the world, namely, the Deming Award, the Malcolm Baldridge National Quality Award (MBNQA) and the European Quality Award (EQA).

The Deming Award was introduced in 1951 to recognise the contribution of Dr. W. E. Deming to Japanese industrial quality. The aim of this award is to recognise the outstanding performance improvement of companies or divisions of companies through the application of company-wide quality control (Deming Prize Committee, 1998).

Meanwhile, the MBNQA was established in 1987 to recognise the achievements in quality and performance of U.S. organizations. This award, which is managed by the National Institute of Standards and Technology (NIST), is used also to inculcate awareness about the importance of quality and performance excellence as a competitive edge. The criteria for the MBNQA are now accepted widely, not only in the United States but also around the world, as the standard for performance excellence.

The European Quality Award was introduced in 1991 to recognize companies showing a high level of commitment to quality. It is open to several categories, which include the public sector, factories, assembly plants, sales and marketing and research units. In 1997, this award was extended to SMEs, which were defined as companies of fewer than 500 persons. The EFQM excellence award is assessed by use of the EFQM excellence model, which was introduced in 1992. This model is the most widely used organizational framework in Europe and has become the basis for the majority of national and regional quality awards.

Each award focuses on the management activities of an organisation, behavioural and process rather than product or service perfection (Ghobadian and Woo, 1996). Table 2.11 indicates the criteria used for the assessment of each model. The criteria are based on the following management philosophy and principles:

Table 2.11: Assessment criteria used by Deming Award, MBNQA and EQA (Ghobadian and Woo, 1996)

Deming Award	**Malcolm Baldrige National Quality Award (MBNQA)**	**European Quality Award (EQA)**
Assessment Criteria		
Policies	Leadership	Leadership
Organisation	Strategic planning	Policy and strategy
Information	Customer satisfaction	People
Standardisation	Measurement and analysis	Partnership and resources
Human resource development and utilisation	Human resources	Processes
Quality assurance activities	Process management	Customer results
Maintenance/control activities	Business results	People results
Improvement		Society results
Effects		Key performance results
Future plans		

a) Top management to be responsible for creating an appropriate environment for quality and everyone in the organisation to be required to become involved in quality activities. They also need to demonstrate their commitment toward quality to the employees in the organisation.

b) To focus on customer satisfaction and conduct a benchmarking against competitors to understand customer needs and requirements.

c) To be active in team working and participating in training and education to enhance skills and knowledge.

d) To emphasise management by fact and encourage a clear understanding of clear processes.

There were some common features used by the three main awards as criteria for assessment (leadership, human resources and process management). The award criteria allow organisations to have an understanding of TQM and of the concepts underpinning the philosophy. The Deming Award emphasises policies, organisation implementation plans, information gathering, analysis and control, the effects of plan implementation and future plans for improvement. This award is prescriptive in terms of tools and techniques such as statistical process control, quality control tools and quality circles (Ghobadian and Woo, 1996). The MBNQA and the EQA focus on top management commitment in implementing strategic planning and policies for organisational goals and objectives. According to Ghobadian and Woo (1996), both awards are concerned with the customer's role in determining the quality levels of product or services. As such, customer satisfaction will be enhanced through quality improvement activities.

Business models and their associated assessment criteria influence the design of this study. These models already exist as a means of testing or accrediting companies to a certain level of standard quality management that is deemed (by the awarding body) to represent good management practice. These systems therefore reconfirm the enablers found previously in this literature review (see Table 2.6) and influence the direction of

managers seeking make their businesses better quality and higher performing businesses; these models also inform this enquiry because they emphasise the qualitative management approach rather than a prescriptive set of steps through which a company can engage TQM. As such, they state what standards are needed but not how to engage TQM, which leaves the gap in the literature of whether businesses with these TQM systems do then become better performers and there is also a gap in terms of the sequence in which these standards need to be engaged to result in better performance.

The main models were also developed and were drawn from large organisations rather than SMEs who face more difficulty in implementing those models due to a lack of resources, demarcation and management available within the business (Husband and Mandal, 1999). This study, therefore, aims to reduce the gap through developing a model based on SME cases. The enablers identified through this study might be useful and beneficial to small businesses for implementing TQM. Beside the main models, a few models have been developed by several authors in the literatures based on their studies. The main purpose of these models is to help organisations in implementing TQM. The models are described in the following section.

2.7.1 The 4Ps and 3Cs of TQM Model

The 4Ps and 3Cs of TQM was a new model for TQM implementation developed by Oakland (2003). There are seven components involved in this model, namely, planning, performance, processes, people (4Ps); culture, communication and commitment (3Cs) as shown in Figure 2.10. This model provides the combination of hard management and soft outcomes to help organisations move forward successfully. The model was based on the previous excellent work completed in the last century and it covers all aspects of organisations and their operations. Oakland argues that all components in this model are important to ensure the effectiveness of TQM implementation.

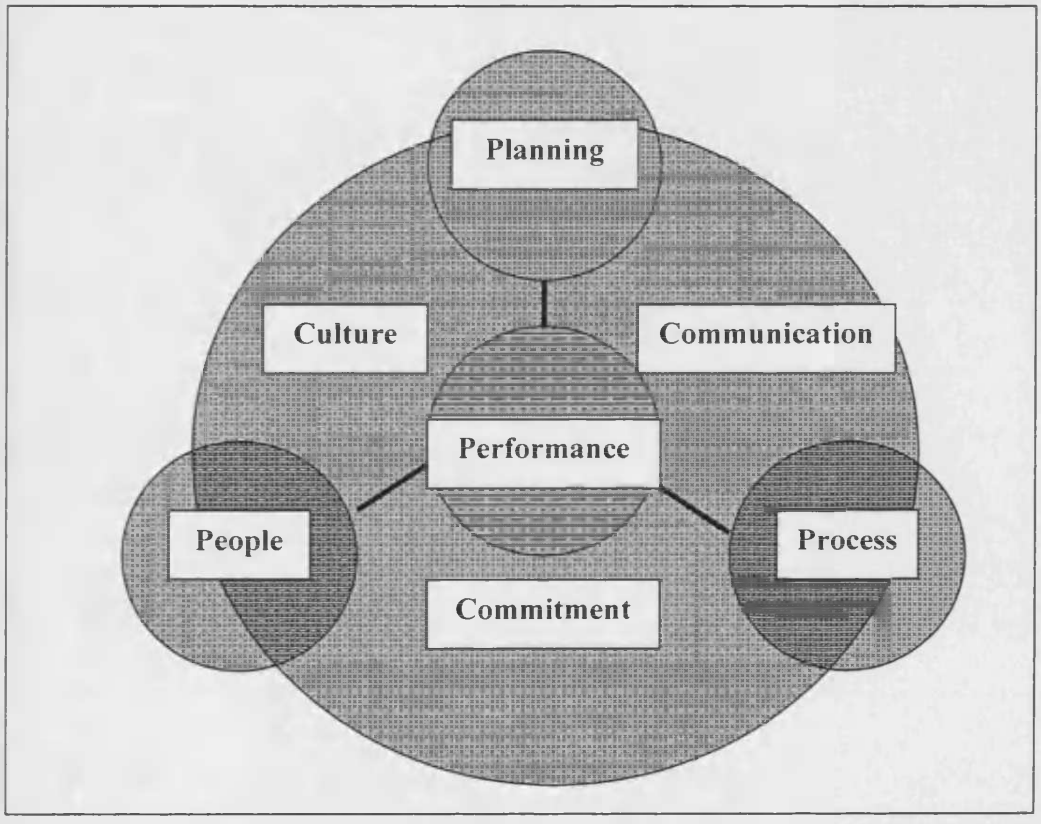
2.7.2 Non-Prescriptive Model of TQM Implementation Process

A non-prescriptive model was developed by Ghobadian and Gallear (2001), which proposes an 'outcome driven approach to management'. It was the first model to test

whether the model applied to SMEs. A structured postal questionnaire was employed with 31 organisation respondents that were widely known as leading exponents of TQM. According to the model, the introduction of TQM is based on three stages: pre-implementation, planned implementation and evolutionary implementation and development. It is important to understand these phases because the 'outcome driven' approach was proposed by the authors as an alternative to other strategies for TQM implementation. Pre-implementation stages concern the implications of introducing TQM to the organisation and they involve customer expectations, leadership, responsibilities and commitment, and TQM impact on the organisation. On the other hand, a pre-planned objective is to develop the internal improvement capability by focussing on the management process, people, communication, measurement, processes and customers.

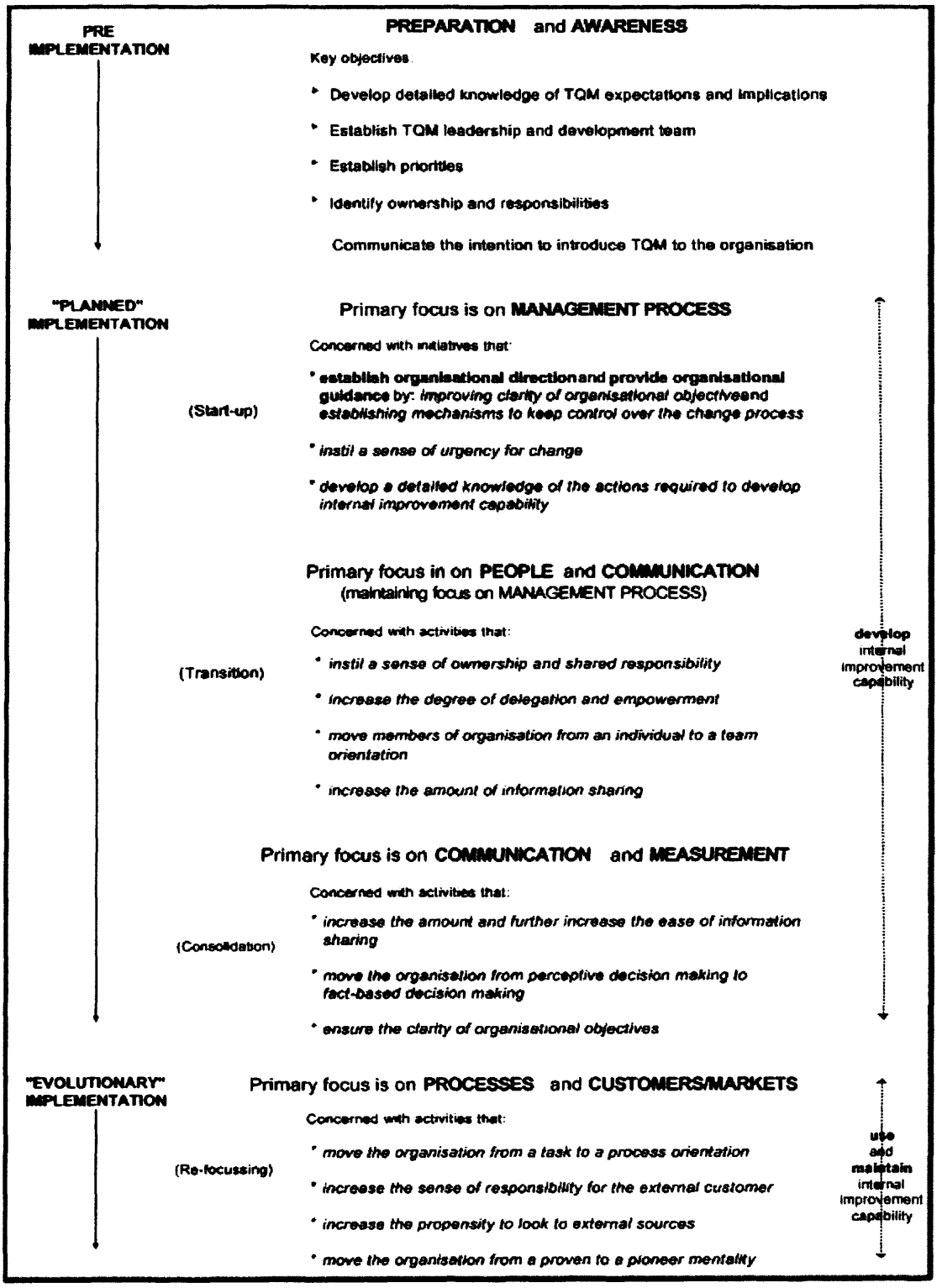
Finally, evolutionary implementation stages deal with participation, knowledge, skills and capabilities, and employee performance and evaluation. At this stage, an organisation

Figure 2.10: The TQM framework (Oakland, 2003)



is in the position of exploiting internal capabilities and improving processes to achieve customer satisfaction. Figure 2.11 displays the non-prescriptive model for TQM implementation. It is important to understand Figure 2.11 but it is equally important to understand the new questions it raises and also the limitations it presents for managers. The model is important because it suggests a much greater and top-down role of management in the early planning stages of TQM. However, the model is weak in that it portrays the sustainability of improvement (towards the TQM status) as merely the result of good planning, but, as the literature has clearly shown, there is much more to consider (Sebastianelli and Tamimi 2003). Evolution and sustainability still require good management and this reinforces Oakland's proposition that managers must make sense of TQM for themselves and set out their own road map to TQM. Therefore, there remains a large gap in the knowledge concerning the position of management design and how

Figure 2.11: A non-prescriptive model of TQM implementation process (Ghobadian and Gallear, 2001)



improvement processes lead to sustainable TQM and therefore to evolution. From the literature of socio-technical systems theory, it is clear that these two must be in balance

(Pasmore 1988). The latter is much more closely aligned to Oakland's position although Oakland's lack of prescription offers management no real understanding as to where to start the process of implementation. The chapter will now turn its focus to the investigation of empirical studies of TQM implementation.

2.7.3 Model of TQM Implementation (Based on Empirical Studies)

Thiagaragan and Zairi (2001) studied empirical implementation; organisations in this study had had two to three years of TQM implementation and these were considered to be 'established' programmes.[2] The framework is divided into soft and hard categories. Institute leadership and maximising internal stakeholders' involvement are considered soft categories and customer satisfaction, continuous improvement and driven processes are considered hard categories. The core elements (soft and hard) of the framework are generalised and can be used as a guide for the implementation of TQM at the early stage of implementation. The model proposed by Thaigaragan and Zairi (2001) is presented in Figure 2.12.

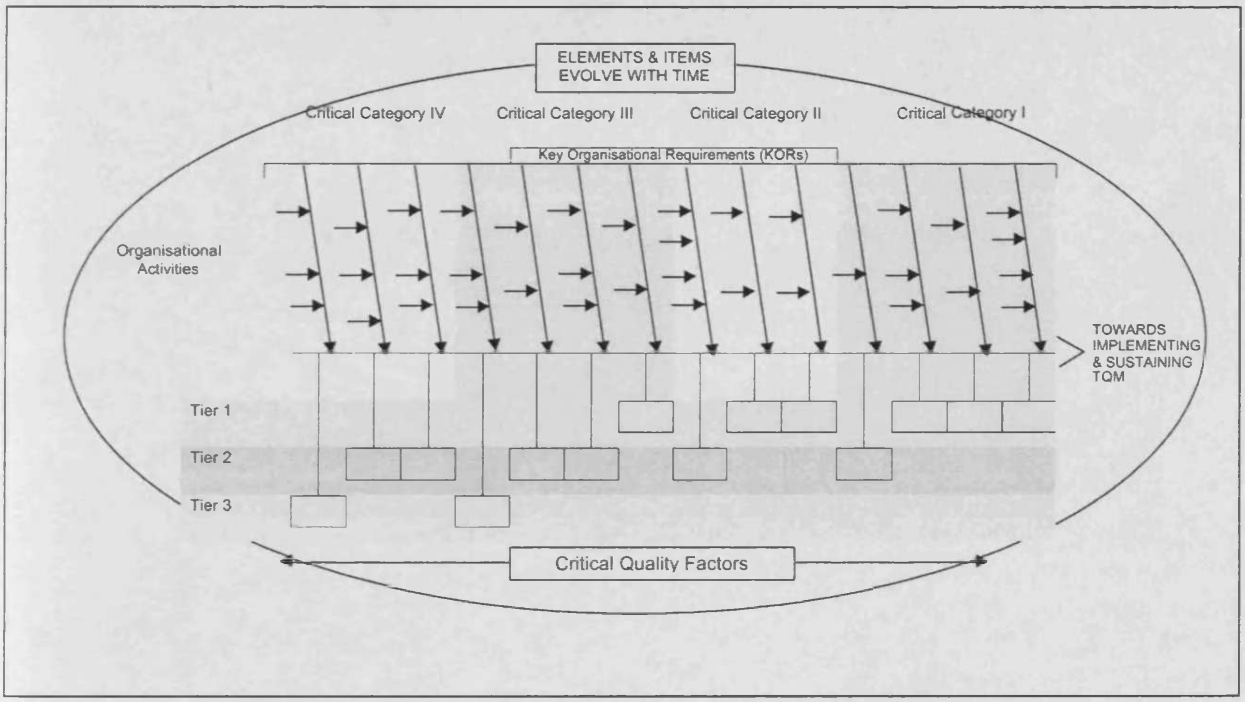
All of the models that focus on empirical studies are based on large organisations (McAdam, 2000; Husband and Mandal, 1999). Although some changes have been made in the main models to fit the needs of SMEs, their suitability and applicability are still in debate (Mann, 1997; Oakland, 1993). McAdam (2000), in his study of the application of TQM models (developed based on large organisations) to the 20 SMEs, discovered a number of problems in terms of mechanisation and flexibility. Moreover, Yusof and Aspinwall (2000a) note that the model introduced in literatures was too detailed and tool oriented.

The model for TQM implementation developed in this study is based on the survey and on the in-depth case study of SME businesses. The combination of both qualitative and quantitative methods would appear appropriate from the literature to date. Such a position has been argued by Miles and Huberman (1996) and it implies a cross comparative case

[2] The implementation of TQM in organisation for 2-3 years considered 'established' and this was accepted as definition for this study.

study approach would offer greater insight between cases especially regarding businesses that have gained awards relative to those that have not (non-award winners). Again, the key interest is that of management alignment and integration, which results in a system that is capable of self-improvement and is directed by management policy not simply the audit criteria used by any single business quality management standard.

Figure 2.12: TQM implementation model based on empirical studies (Thiagaragan and Zairi, 2001)



2.8 TQM Inhibitors

The transformation to a TQM organisation depends on the extent to which firms successfully implement certain quality management practices. These practices were highlighted by quality gurus such as W. Edwards Deming, Philip Crosby and J.M. Juran, and include leadership, product design, process management, supplier management, quality data and analysis, employee relationships and training. However, those practices constitute 'necessary' but 'insufficient' conditions for a successful TQM transformation. The critical issues found in the literature review concern in-depth understandings of the barriers that can impede an effective TQM transformation (Sebastianelli and Tamimi,

2003). Many authors in the literature highlight the difficulties in implementing TQM in organisations especially in mature western manufacturing economies and there is consistent agreement concerning the inhibitors to TQM implementation and its sustainability (see Garvin, 1988; Bateman and Rich, 2003; Taylor and Meegan, 1997; Adebanjo, 2001; Sun et al., 2003).

Brown (1993) provides ten reasons why two thirds of the companies in America have failed in their implementation of TQM. He claims the main failure was related to human relations and social design inconsistencies (effectively unbalanced socio-technical systems designs). As such, his arguments reflect the importance of organisational management focussing more attention to the design of human resource management polices and practices to result in successful TQM implementation and this argument is reinforced by the research of Yang (2006). Peter Senge (1995) presenting the results of work conducted by Arthur D. Little and MacKensie Consultancies (a large scale survey research to the 500 American companies) shows only one third of respondents had successfully implemented TQM and two third had not. The cause of these failures, it was claimed, was due the lack of top management commitment, unrealistic expectations about time frame of TQM implementation and the cost of TQM implementation. Other failures which contributed to an inability to implement TQM also included an over/under reliance to statistical methods and failure to develop a business culture which supported and sustained a quality orientation of employees. Again these failings concern an imbalanced socio-technical systems design.

Later studies by Sun et al. (2003) proposed the main contributory failure sources in European countries originate from bureaucratic systems which inhibited adaptation and change especially from employee empowerment. As such, rigid quality systems and the formalisation of these processes proved difficult to change and therefore too slow to convert employee innovation into new working practices. Such an argument reinforces earlier criticisms of inflexible quality management systems made by McCabe and Wilkinson (1997). Again, it can be seen these issues affect the social side of TQM implementation and sustainability and the researcher argues that flexibility of TQM

should allow managers and employees of all departments integrate and support continuous improvement – designing or leaving inflexible systems in place is therefore considered to be a management failing that could be changed by new policies or new formats for the quality management system to allow a controlled approach to such daily innovations and reported changes needed to working practices.

Further, a study of 600 companies (from 20 European countries) shows the a very consistent use of TQM practices regardless of country-specific issues (socio-economic) and also formats of business (Blackmon et al., 1998) and this finding suggests successful TQM implementation is less about tools and techniques and more to do with the management integration of these features to generate an effective and continuously improving management system of TQM. The importance of 'management design' and leadership has been reinforced by many studies and again reinforces the imperative of an integrated and consistent systems approach (Meegan and Taylor, 1997; Dale et al. 2000; Aylsworth, 1998).

Harari (1993) also deals with the issue of why a TQM programme fails and offers ten reasons which again show an emphasis on failures by senior management in their role as change agents/designers in transforming organisations using TQM principles. Again, this research is consistent with other critical studies of TQM failures and highlights weaknesses in the management subsystem of the business and a general lack of planning for TQM interventions and processes of sustainability (combined weaknesses in leadership and human resource management).

In order to identify 'roadblocks' in the paths of companies that strive to use TQM for competitive advantage, Fuchs (1993) identifies two root causes that affect the implementations of TQM, namely, lack of focus on strategic planning and core competencies and obsolete and outdated cultures. Both factors are also considered critical in TQM by many authors (Oakland, 2003; Slack et al., 2004). Katz (1993) concludes that the failure of TQM implementation in organisations is due to ignorance of the basics of good management practice and he points out eight pitfalls of TQM that are directly

related to the management. These include delegation of TQM responsibility by the CEO, failure to recognise the difference between company and environment, application of TQM tools at the wrong time, training conducted without the support and involvement of all levels of management, overemphasis on technical tools, failure to involve suppliers and success not being celebrated. Whalen and Rahim (1994) cited common implementation and development barriers of TQM, which include poor planning, lack of management commitment, resistance of the work force, lack of proper training, teamwork complacency, use of an off-the-shelf programme, failure to change organisational philosophy, lack of resources and lack of effective measurement of quality improvement.

Another reason for failure in some organisations was found to be the incorrect focus on results rather than on processes at the implementation stage (Brown, 1993). TQM is a long-term organisational improvement strategy and therefore quick results would not be apparent within a short period of time. This can lead to disillusionment and the cessation of change. Managers with a mind set on short-term financial results, therefore, inhibit progress. They focus their efforts on trying to achieve these short-term outcomes rather than spending their resources on activities that produce long-term gains in quality and customer satisfaction, according to Brown, (1993). He further argues that failure to implement TQM can occur in any of the following three phases, that is, Start-Up, Alignment, and Integration, and these will now be explored:

1) Start-Up stage failure relates to the poor commitment from management toward TQM implementation and to the reasons for TQM implementations being unclear and the timing being incorrect. Furthermore, the company focuses on activities rather than on results.

2) Alignment stage failure relates to the treatment of TQM as a different agenda from that of daily management and fail integrated into the organisational structure. The organisation tends to concentrate on what is easy to measure rather than on what should be measured. This could generate inappropriate data and lead to a misleading interpretation. In addition, this stage also involves appraising the performance of

employees. Failure to appraise performance may lead to frustration and reduced motivation among employees.

3) Integration stage failure relates to the inability of management to delegate authority and responsibility to the teams. Senior Managers should trust employees by giving them a chance to make a decision or by involving them in decision making. As a result, this situation will contribute to frustration among team members and thus their ultimate disillusion with TQM.

Sebastianelli and Tamimi (2003) conclude from their research that an understanding of the barriers is necessary to ensure the sustainability and survival of TQM programmes in an organisation. They propose five barriers of TQM success, namely, inadequate human resources development and management, lack of planning for quality, lack of leadership for quality, inadequate resources for TQM and lack of customer focus. These barriers represent the negative dimensions of the key enablers that this review has already identified in Table 2.6 and therefore these issues were duly accepted as important areas of study for this research programme.[3] There were a number of inhibitors presented by authors in the literatures and most of them focus on leadership and human resource management. This indicates that those two factors are critically important for implementing TQM and also that the appropriate alignment and integration need to be considered to avoid failure.

Having provided an understanding of TQM success and failure, the chapter will now focus on studies of SME businesses.

2.9 Small and Medium Enterprises Characteristics

Small and medium enterprises (SMEs) have their own unique characteristics that are different from those of large organisations (MacGregor, 2004). The most typical factor that distinguishes SMEs from larger organisations is the organisational environment

[3] The high correlation between the enablers described in Table 2.6 and the inhibitors of Sebastianelli and Tamimi (2003) was so close that these were deliberately integrated into the questionnaire stage of the study and were later used to focus the case research.

operating system in which they operate (Hudson and Smith, 2001). The operating system includes flat structures, with few management layers, flexible and adaptable processes that meet changing market needs, high potential for innovation, informal dynamic strategies and a fire-fighting mentality (Ghobadian and Gallear, 1997; McAdam, 2000; Wiklund and Wiklund, 1999). SMEs tend to be more dynamic than do larger businesses.

In a discussion of small business performance, Westhead and Storey (1996, p. 16) state, *"the small firm is not a 'scaled-down' version of a large firm. In short, theories relating to SMEs must consider the motivations, constraints and uncertainties facing smaller firms and recognise that these differ from those facing large firms"*. Yusof and Aspinwall (2000b) analyse the work of Ghobadian and Gallear (1996) and divide the characteristics of SMEs into five categories; they then discuss the advantages and disadvantages of each category. The categories consist of structure, systems and procedure, culture and behaviour, human resources, and markets and customers. Table 2.12 shows the characteristics of SMEs as prepared by Ghobadian and Gallear (1996).

In terms of culture, SMEs are considered to have a unified culture with a high degree of personal authority among staff and management due to a lack of formality caused by company size (Storey and Skyes, 1996; Jennings and Beaver, 1997). SME senior managers are fully involved in daily operations in the company due to the size of the company and it also has been argued that SMEs are recognised as having a shortage of skills among staff and a deficit in management expertise (McAdam, 2000; Curran, 1987; Huang and Brown, 1999). A number of studies (Reynolds et al., 1994; Murphy, 1996; Bunker and MacGregor, 2000) have shown that SMEs tend to have small management teams that are strongly influenced by the owners and have a little control over their environment. Jennings and Beaver (1997, p. 65) say, "*.....in SMEs, strategic management becomes primarily an adaptive process concerned with manipulating a limited amount of resources, usually, in order to gain the maximum immediate and short term advantage*".

Table 2.12: Characteristics of SMEs (Ghobadian and Gallear, 1996)

Characteristics	Advantages	Disadvantages
Structures Flat with very few layers of management, top management highly visible and close to the point of delivery. Less delegation. Division of activities limited and unclear. Low degree of specialisation. Flexible structure and information flows. Strategic process incremental and heuristic.	Faster communication line, quick decision making process, faster implementation. Short decision making chain.	Low specialisation may result in lack of expertise in change initiatives. Need for outside assistance. Owner controls everything and lacks delegation, can stifle growth.
Systems and Procedures Activities and operations not governed by formal rules and procedures. Low degree of standardisation and formalisation. People dominated. Simple planning and control system. Incidence of "gut feeling" decisions more prevalent. Informal evaluation, control and reporting procedure. Flexible and adaptable processes.	Simple system allows flexibility and fast response to customer needs	Lack of proper system-difficulty in ensuring efficiency of work and high variability in work outcome. "Gut feeling" approach may result in wrong decisions.
Culture and Behaviour Operations and behaviour of employees influence by owners'/managers' ethos and outlook. Organic, not strong departmental/functional mind-set, corporate mind-set. Unified culture. Results oriented.	Corporate mind set is conducive for new change initiatives, i.e. company first. Unified culture can be a good starting point for TQM.	Uncommitted or dictatorial owner/manager ethos can damage new initiatives
Human Resources Personal authority mainly high. Few decision makers. Dominated by pioneers and entrepreneurs. Individual creativity encouraged and high incidence of innovativeness. Modest human capital, financial resources and expertise. Individuals normally can see the results of their endeavours. Low incidence of unionisation. Low degree of resistance to change. More generalist - some staff may cover more than one department.	High authority and responsibility can ensure job is done. Innovative environment will support improvement culture. Early union involvement needed to ensure success. Fewer employees-better relationship, knows almost everyone.	Lack of financial support e.g. no training budget, *ad hoc* planning and small scale approach can stifle improvement efforts. Improvement needs investment in human resources
Markets and Customers Span of activities narrow. Limited external contacts. Normally dependent on a small customer base. Close contact, easily accessible and many known personally. Mostly local market, few national or international.	Immediate feedback from customers. Able to respond quicker. Understand better customer needs.	International marketing expensive, after sales support not as extensive as large businesses. Easily suppressed/dictated by larger multinationals (if they are customers) e.g. imposed ISO 9000, QS 9000, EMS, etc.

SMEs are dynamic but lack the formalisation/resources and role definitions associated with TQM. Based on an extensive review of the literature, MacGregor (2004) classifies SMEs as having critical internal and external dimensions to the business that impact upon TQM (see Table 2.13a and 2.13b). Internal features include management, decision-making and planning processes and the acquisition of resources and on the other hand,

Table 2.13a: Features unique to SMEs (MacGregor, 2004)

Features	Reported By
Features related to management, decision making and planning processes	
a. SMEs have small and centralized management with a short-range perspective.	Markland (1974); Reynolds et al. (1994); Bunker and MacGregor (2000); Welsh and White (1981).
b. SMEs have poor management skills.	Blili and Raymonds et al. (1993).
c. SMEs exhibit a strong desire for independence and avoid business ventures which impinge on their independence.	Dennis (2000); Reynolds et al. (1994).
d. SME owners often withhold information from colleagues.	Dennis (2000).
e. The decision making process in SMEs is intuitive, rather than based on detailed planning and exhaustive study.	Reynolds et al. (1994); Bunker and Mac Gregor (2000).
f. The SME owner(s) has/have a strong influence in the decision making processes.	Reynolds et al. (1994); Murphy (1996); Bunker and Mac Gregor (2000).
g. Intrusion of family values and concerns in decision making processes.	Dennis (2000); Bunker and Mac Gregor (2000) and Reynolds et. al. (1994).
h. SMEs have informal and inadequate planning and record keeping processes.	Reynolds et al. (1994); Tetteh and Burn (2001); Miller and Besser (2000); Markland (1974); Rotch (1987).
i. SMEs are more intent on improving day to day procedures.	MacGregor et al. (1998).
Features related to resource acquisition	
a. SMEs face difficulties in obtaining finance and other resources and as a result have fewer resources.	Cragg and King (1993); Welsh and White (1981); Gaskill and Gibbs (1994); Reynolds et al. (1994); Blili and Raymonds et al. (1993).
b. SMEs are more reluctant to spend on information technology and therefore have limited use of technology.	Walczuch et. al. (2000); Dennis (2000); MacGregor and Bunker (1996); Poon and Swatman (1997); Abell and Limm (1996); Brigham and Smith (1967).
c. SMEs have a lack of technical knowledge and specialist staff and provide little IT training for staff.	Martin and Matlay (2001); Cragg and King (1993); Bunker and MacGregor (2000); Reynolds et al. (1994); Blili and Raymonds et al. (1993).

external features related to the market (product/services and customer) and the environment (risk taking and uncertainty). Even SME literature, whilst sparse, emphasises STS theory and design principles.

Table 2.13b: Features unique to SMEs (MacGregor, 2004) - Continued

Features	Reported By
Features related to products/services and markets	
a. SMEs have a narrow product/service range.	Bunker and MacGregor (2000); Reynolds et al. (1994).
b. SMEs have a limited share of the market (often confined to a niche market) and therefore rely heavily on a few customers.	Hadjimonolis (1999); Lawrence (1997); Quayle (2002); Reynolds et al. (1994).
c. SMEs are product oriented, while large businesses are more customer oriented.	Reynolds et al. (1994); Bunker and MacGregor (2000); MacGregor et.al. (1998).
d. SMEs are not interested in large shares of the market.	Reynolds et al. (1994); MacGregor et al. (1998).
e. SMEs are unable to compete with their larger counterparts.	Lawrence (1997).
Features related to risk taking and dealing with uncertainty	
a. SMEs have less control over their external environment then have larger businesses and therefore face more uncertainty.	Westhead and Storey (1996); Hill and Stewart (2000).
b. SMEs face more risks than do large businesses because the failure rates of SMEs are higher.	Brigham and Smith (1967); DeLone (1988); Cochran (1981).
c. SMEs are more reluctant to take risks.	Walczuch et al. (20000; Dennis (2000).

SME businesses therefore face many constraints that inhibit the implementation of TQM but they also have organisational features which accelerate the implementation to such systems when compared with larger businesses. Addressing the constraints that affect small businesses, it can be seen that small businesses do not have easy access to production technology, customers can become concerned when they are dependent upon a small businesses and the lack of available free management resources means that few managers have time to do anything other than help the day-to-day process of order fulfilment rather than business development. The lack of resources has a fundamental impact upon TQM implementation for instance busy managers do not have time to attend lectures, business systems are less formalised, computerization is lower, and the impact of the customer (in demanding certain practices be introduced is much higher). According to Storey (1992) these issues do have a bearing on TQM uptake and call for much greater management involvement and sacrifice so that the systems can be designed and embedded by managers who themselves do not have much free time. These constraints were considered to benefit this study because the pivotal role of management as system designers implies those managers that took the time to design effective systems would out perform other businesses. The engagement of management is promoted by all studies of large organisations as a critical feature that is pivotal to higher performance – this issue was integrated with the design of this study involving SME businesses.

In summary, the main impact of the SME context on the design, introduction, and sustainability of TQM include management time, access to expert resources from within or commissioning of such resources from outside experts, the ability to influence the performance and practices of customers and suppliers (that would lead to improved performance such as changes to product designs or materials specifications). Having conducted the review of these issues, it was considered that they represented management issues of design and that careful design of the business system to support TQM remained the management prerogative and the context of the SME business was to some degree less relevant than that of manager's n small businesses and their choice of TQ features.

In the light of these constraints and the nature of SME businesses (defined as less than 150 persons), it was duly accepted by the author that during the study design it would be better to focus on businesses that were close to the higher employment limit than those of micro businesses where so few people were employed that it would be difficult top study the design of the firm and the role of management in the design of key TQM business features. SMEs with higher employment rates were considered more likely to have a small management system that was formalised with procedures rather than very small and informal businesses. Such a consideration is noted as an impact and potential limit to the generalisation of the study results.

2.10 TQM Models and Framework for SMEs

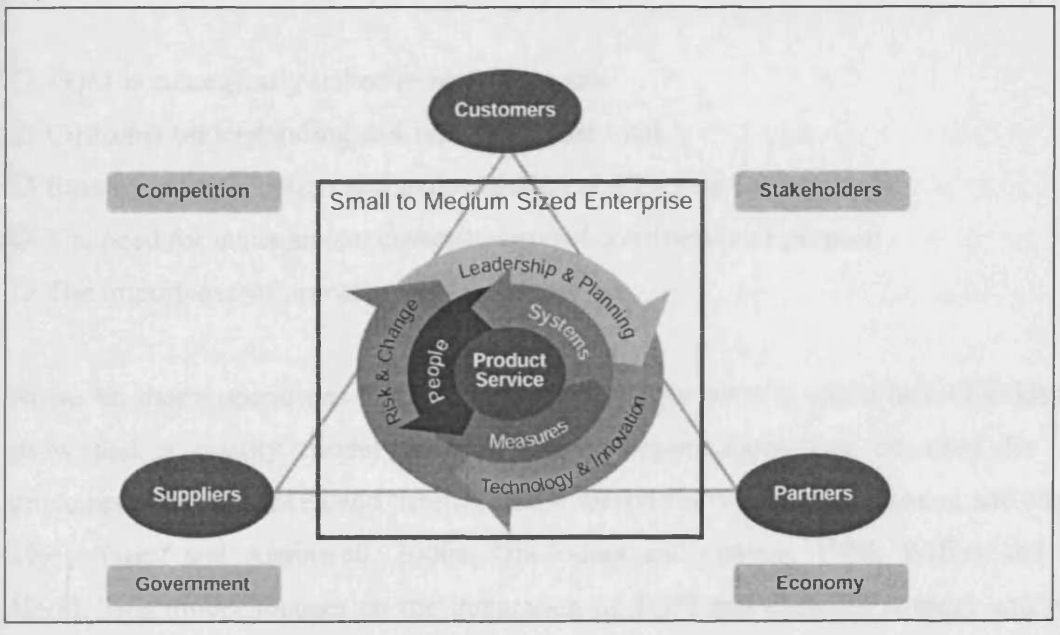
Numerous TQM models and frameworks were proposed in the literature but very few focused on SMEs (Ghobadian and Gallear, 2001; Yusof and Aspinwall, 2000a). Similarly, not much has been written on the implementation of TQM in Malaysian SMEs (Eng and Yusof, 2003). The majority of the models are based on large organisations with the perception that they would be logically applicable to small businesses. However, there is no evidence to support the view that the TQM model or framework applies to SMEs; instead, there are many inconsistencies related to the models of large businesses (Husband and Mandal, 1999). Based on the debate and on inconclusive evidence, there is the need for this thesis to propose a framework for TQM implementation in SMEs.

Through an extensive literature review, a few models and framework for SMEs were discovered and these will now be reviewed. Standards are universal and application is more likely to be to a large company. SMEs tend to be forced into TQM by customers or competitors so they tend to implement such systems reactively (at a request or because if they do not then they will lose business). There is also a conflict between bureaucracy and standards with the need for flexibility for SMEs. Also, it is difficult to manage and delegate implementation so senior managers must plan and lead the change. Quality standards are not enough.

2.10.1 Quality Integrated Management Model (Husband and Mandal, 1999)

The main objective of Husband and Mandal's 1999 paper was to provide a TQM model that integrates a number of dimensions including core, structural, fundamental, sustainability, integrative and external features. The model, they claimed, can be used to gain attention, arouse interest, build a desire or induce positive action in implementing quality methods. Core and structural dimensions explain the reasons small businesses begin to implement TQM and define the uniqueness of SMEs. Fundamental dimensions provide secondary means, which include systems, people and measures, whereas sustainability dimensions relate to leadership and planning, risk and change, and technology and innovation. The model also takes into consideration external factors (customers, suppliers and partners) and uncontrollable factors (competition, stakeholders, government and economy) of SMEs through integrative dimensions and external dimensions (see Figure 2.13). This model provides a link between SMEs and quality methods through the integration of all dimensions. The author emphasises leadership, systems, measures and people in contributing to quality methods. The suitability to small businesses and how the model fills the gap in existing quality models is highlighted.

Figure 2.13: Model for quality integrated management (Husband and Mandal, 1999)



There was an argument in the literature that SMEs do not understand and practise quality methods well, and that SMEs find them very hard to implement. The model proposed by the authors is based on that argument and on the assumption it will 'fit' SME businesses. Concerning the weaknesses of the model, there are many including the production of the model without any field research and it being simply the result of a literature review. Such a methodology does not add to its credibility as a means of positioning or predicting how SMEs should evolve and of identifying the key features of TQM. Further, the model concentrates upon the features that enable TQM implementation and does not acknowledge the presence or sources of any inhibitors. As such, the model was considered merely a summary of the literature reviewed and as having limited utility for this form of study. However, it does show that the key themes shown in Table 2.6 remain valid and are integral to this literature review model.

2.10.2 Quality Models in the SME Context (McAdam, 2000)

Another key model is proposed by McAdam (2000) and it is a model based combined from two selected models from large organisations (Business Excellence Model and Balanced Scorecard Model). The critical discussion made by the author focuses on the context of SMEs. Fundamentally, TQM principles are incorporated into the model namely:

- TQM is strategically linked to business goals
- Customer understanding and satisfaction are vital
- Employee participation and understanding at all levels are required
- The need for management commitment and consistency of purpose
- The importance of processes and measures

However, many operations management authors argue there is still a lack of evidence to show that a quality model based on large organisations can be used for TQM implementation by SMEs and herein lies the reason for this study (Husband and Mandal, 1999; Yusof and Aspinwall, 2000a; Ghobadian and Gallear, 1996; Wilkes and Dale, 1998). This model focuses on the integration of TQM and business strategy and on the

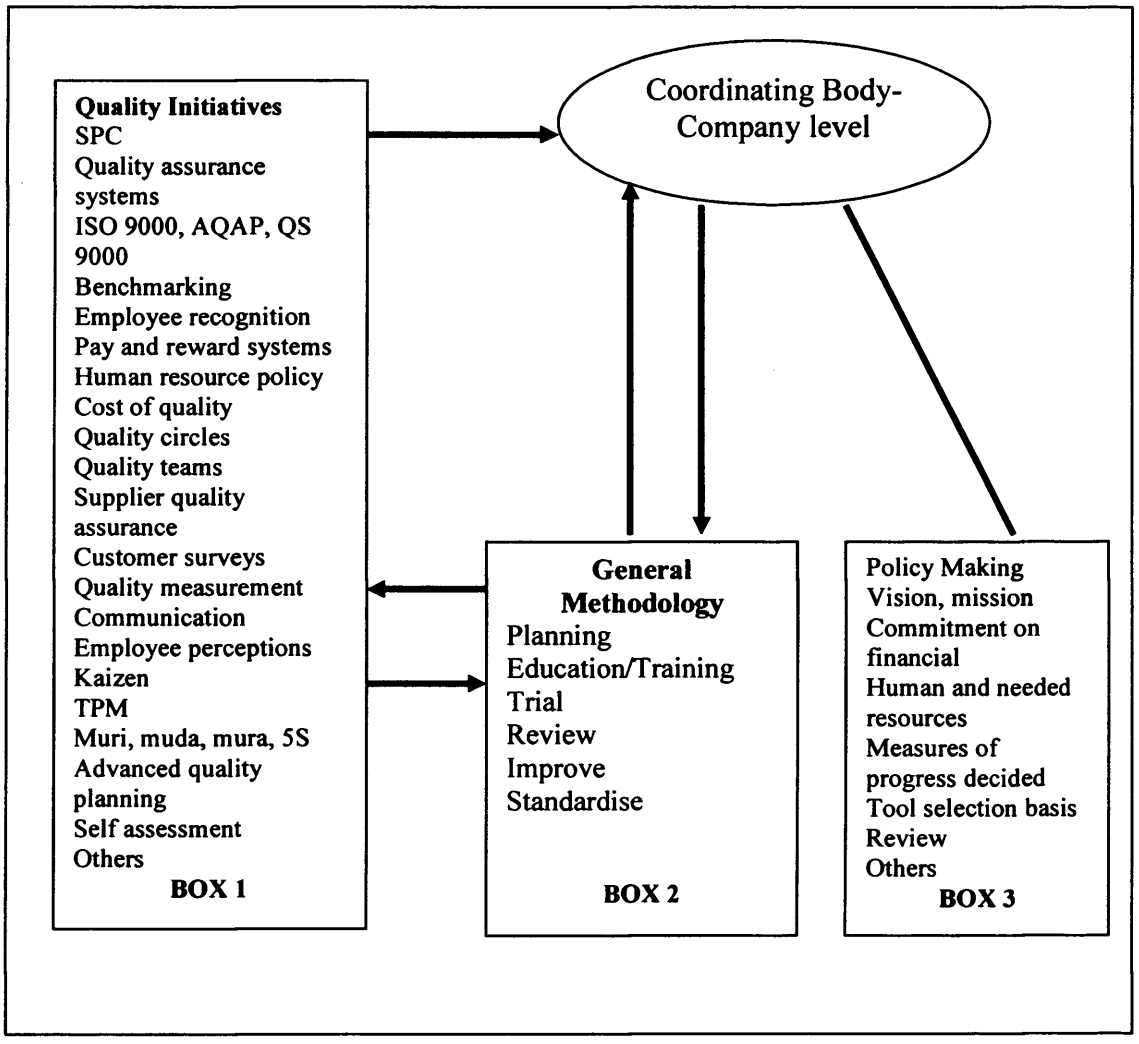
formalisation of the system that leads to the success of implementation. Understanding customer needs and employee involvement throughout the organisation generates strong relationships and less stress. The role of management commitment to align processes and measures creates a fast moving environment toward achieving organisational vision. According to McAdam (2000), the model can be applied to other quality models within SMEs and thus provide a significant contribution to TQM.

2.10.3 Conceptual Framework for TQM Implementation in SMEs (Yusof and Aspinwall, 2000a)

Yusof and Aspinwall (2000) propose a framework based on three main elements: quality toolbox, general methodology and central co-ordinating body (see Figure 2.14). According to the authors, many of the frameworks published in the literature have not considered SMEs. In this model, the 'quality box' consists of various quality tools and techniques for the effectiveness of TQM implementation. In order to implement the necessary tools, they propose there should be a central co-ordinating body (usually led by senior management) that is responsible for overall quality activities in the organisation. The general methodology of the framework covers the integration of planning, education, trial, review, improvement and standardisation as part of organisational practice to improve performance. Again, the model emphasises leadership leading to high performance.

This research seeks to address this gap in the body of knowledge by focusing on the application, features and performance of SME businesses. A summary of the elements involved in the models and framework proposed by several authors in the literature that was discussed earlier is presented in Table 2.14. The table indicates that leadership, customer satisfaction, human resources, process management, strategic planning, measurement, partnership with suppliers and continuous improvement were the most frequent elements used in the models. This shows that those elements are very important and necessary to ensure the success of TQM implementation. Meanwhile, leadership, strategic planning and measurement allow organisations to have a clear direction in achieving goals and objectives (Deming, 1986; Juran, 1988; Crosby, 1979).

Figure 2.14: A conceptual framework for TQM implementation in SMEs (Yusof and Aspinwall, 2000a)



According to Agus (2004), customer satisfaction will be achieved through the understanding of the current and future needs of customers and the continuous improvement of process management to ensure a quality product. As such, employees in the organisation need to be trained to enhance their skills and knowledge. This could be done through proper human resource planning and effective policies (Ahire et al. 1996; Chandler and McEvoy, 2000). Finally, the relationship with suppliers must be strategic and strong through partnership, as this would help both parties to be successful in the marketplace.

Whilst the model is derived from a theoretical study of the literature it can be challenged as an approach for SME businesses. Many of the features of the model are large company features and the model was applied to UK SMEs. Features such as policy making, advanced statistical tools, Japanese working practices and TPM are all associated with heavy organisational investments (Womack, et al. 1990; Slack et al. 2004) which derive form large businesses. As such this model was not taken forward as a model with which to ground this study based largely on the theoretical and practical relevance of the model for SME businesses. Also by predefining the features in this way potentially opens the study to bias. As such this model was considered interesting but insufficiently useful for the purpose of this study of Malaysian SME businesses. Further, it could not be assured that Malaysian SMEs would adopt Japanese or any other form of working practice and also that simply emulating large businesses does not allow the study of management as system designers (in this case managers just emulate what they think may be successful).

Table: 2.14: Summary of common features used by business excellence award and researchers (Source: This Research)

Features	Large Organisations						SMEs		
	Deming Award (Japan) (1951)	**MBNQA (USA) (1987)**	**EFQM (UK) (1991)**	**Oakland (2003)**	**Ghobadian & Gallear (2001)**	**Thiagaragan & Zairi (2001)**	**McAdam (2000)**	**Yusof & Aspinwall (2000)**	**Husband & Mandal (1999)**
Leadership	✓	✓	✓	✓		✓	✓	✓	✓
Strategic Planning	✓	✓	✓	✓					✓
Customer Satisfaction		✓	✓	✓	✓	✓	✓	✓	✓
Information and Analysis	✓	✓							
Human Resources	✓	✓	✓	✓			✓	✓	✓
Process Management		✓	✓	✓	✓		✓	✓	✓
Business Results		✓	✓				✓	✓	
Standardization	✓								
Quality Assurance Activities	✓			✓				✓	
Maintenance/Control Activities	✓								
Continuous Improvement	✓			✓	✓	✓		✓	
Effects	✓			✓					
Future Plans	✓			✓					
Partnership and Resources			✓	✓	✓				✓
People Results			✓	✓	✓		✓	✓	
Society Results			✓						
Stakeholders Involvement					✓	✓			✓
Measurement		✓	✓	✓	✓		✓		✓

2.11 Empirical Studies of TQM Implementation in SMEs

TQM implementation has been debated in the literature with regards to the size of the firm. Welsh and White (1981, p. 23) argue that small businesses are not 'little' large businesses, and that the differences in structures, policy making procedures and the utilisation of resources are such that the "*application of large business concepts directly to small businesses may border on the ridiculous*". In the case of TQM implementation, this argument was extended by Ghobadian and Gallear (1997), as they found that no differences in TQM implementation could be attributable to firm size. Although large organisations have traditionally led the way in the implementation of TQM and business excellence, there is enough research to show that TQM principles also apply to SMEs (Sturkenboom et al. 2001; McAdam, 2000; Husband and Mandal, 1999; McTeer and Dale, 1996). However, TQM implementation in SMEs lags far behind that of large organisations (Yusof and Aspinwall, 2000; Moreno-Luzon, 1993; Ghobadian and Gallear, 1997) due mainly to a lack of resources and human resources (Duncalf, 1984). Shea and Gobeli (1995) offer several reasons why SMEs embark on TQM and identify company performance, management perception towards customers and employees, changes in customer expectations and enjoyable working environments as key motivators. On the other hand, Taylor (1997), from his study of 113 organisations, offers a different perspective. According to him, the reasons why SMEs should pursue TQM were associated with cost efficiency rather than customer satisfaction.

Duncalf (1984) suggested for some years that the adoption of TQM and associated methods is less widespread in smaller organisations. However, Ahire and Golhar (1996) observed that smaller companies have adopted TQM practices as effectively as larger companies have. Yusof and Aspinwall (2001, p. 722) suggest that "*the development of TQM implementation frameworks for SMEs is found lacking and those implementation frameworks developed have been primarily focussed on the characteristics of large companies*". Moreover, Quazi and Padibjo (1998) highlight the importance of TQM for SMEs in improving their business practices for long-term survival.

2.12 Quality Management System and SMEs Quality Systems

The Malcolm Baldrige National Quality Award (MBNQA) and the European Foundation for Quality Management (EFQM) model have incorporated advanced business and quality management principles and have a broader scope than has the traditional view of TQM to promote good working and management practices. These models and awards are not restricted to just large businesses.

Taylor and Adair (1994) examined the success of quality awards and self-assessments used by SMEs in Northern Ireland and concluded that very few were prepared to apply for quality awards. Smaller companies typically feel uncomfortable with the assessment and have limited management resources available for preparation (Wilkes and Dale, 1998). They used a case study approach to research the EFQM model application for seven SMEs in England. The research found that the award and its documentation were not ideal for SMEs and were daunting and complex for small businesses. McAdam (2000) suggests that SMEs may see TQM as adding a degree of formal assessment and bureaucracy that will compromise their flexibility and responsiveness. In short, QMS may inhibit the dynamism and competitive advantage of the firm.

In terms of inhibitors to TQM implementation, unlike large organisations, SMEs face many constraints in terms of management capabilities, incentives and resources (Quazi and Padibjo, 1998). Haksever (1996) suggests the main reasons for SMEs' failures in TQM implementation were the lack of knowledge and experience in business, financial instability, shortage of human resources and insufficient time. The studies of TQM implementation by SMEs have been reviewed and presented thoroughly in the previous sections and so the next two final sections will highlight the key issues discussed in literature related to SMEs and this chapter will conclude with a chapter summary.

2.13 SME Synopsis

At this point in the literature review, the systems approach to the implementation of TQM by SME businesses has highlighted the importance of:

a) Leadership in demonstrating the commitment towards implementing TQM in organisations and in determining the priorities for the whole organisation (Deming, 1986; Juran, 1988; Rahman and Bullock, 2005).

b) Strategic planning to direct organisations towards achieving business goals and objectives (Oakland, 2003; Grant et al., 1994; Garvin, 1988).

c) Employee involvement (through teamwork) and commitment by everyone responsible for quality improvement in the organisation (Oakland, 2003; Yusof and Aspinwall, 2000a).

d) Continuous improvement in sustaining TQM in the long run (Dahlgaard, 1995; Mears and Voehl, 1995; Ahire and Golhar, 1996).

e) Process management to ensure the output meets customer requirements and specifications (Dale, 2003; Husband and Mandal, 1999; McAdam, 2000).

f) Developing and strengthening supplier's relationship through partnership and working together towards achieving common goals and objectives (Dale, 2003; Husband and Mandal, 1999).

g) Human resources policies and strategies that develop and enhance employees' knowledge and skills in order for them to make significant contributions to the organisation (Fuentes- Fuentes et al., 2004; Garvin, 1988; Ghobadian and Gallear, 1997).

h) Aligning TQM and business strategies to achieve higher performance and competitiveness in the market (Evans, 2004; Brown et al. 1994; McAdam, 2000).

i) Integration of enablers and formalisation of quality activities leading to the success of TQM implementation (Fuentes and Fuentes et al., 2004; Oakland 2003; Dale, 2003; Brown et al., 1994).

j) Performance measures, as being crucial to successful TQM implementation (Sinclair and Zairi, 1995; McAdam, 2000).

This literature review has highlighted the key features and general enablers to improve theoretically the performance of SMEs. Many of these features are beyond the responsibility and control of operations managers alone and represent organisational features. The vast majority of empirical studies have tended to describe the features of TQM at large companies and have ignored SMEs. The purpose of this study is to concentrate on SMEs where opinion is divided concerning the features and management practices of small businesses:

a) Many authors have proposed conceptual models that do not include modifications for the particular context of SMEs. They are distilled from large company models.

b) Empirical work on SMEs in Malaysia is very poor (Deros et al., 2006). From an extensive literature review, the researcher found only one research study was conducted related to the implementation of TQM among Malaysian SMEs. As such, there remains a large gap in the current body of knowledge.

c) There were very few empirical studies using the systems approach and the focus has been on quantitative studies. Studies that have missed the qualitative aspects of TQM are embodied in the behavioural TQM models (Deming Award, EQA and MBNQA). Simply looking at the issue of TQM using quantitative methods does not help identify research gaps beyond that of tools and techniques.

Here are the research questions and their importance to the contribution to the body of knowledge:

1) What are the structural enablers for improving business effectiveness using TQM approaches by SME businesses as perceived by senior business managers with the authority to design business systems?

2) What performance benefits and improvements have been sustained as a result of TQM improvement programmes? Are there differences between the features of businesses that achieve higher levels of performance and those that do not?

Most of the models reviewed appear to have been insufficiently tested and also insufficiently evolved in terms of concepts and models of SME businesses; therefore, a qualitative study is needed. To do this properly, the study would need to compare similar businesses of similar sizes and in similar environments in order to determine the similarities and differences in socio-technical systems (that lead to better or worse performance). Ideally, SMEs would be drawn from similar technologies, regions, markets, and customers to create a robust study of the performance and extent of TQM application.

2.14 Chapter Summary

This chapter has described the background theory underpinning this research. The literature review commenced with a review of General System Theory, Contingency Theory and Socio-Technical System Theory as the key foundations of this study. The literature review has highlighted the importance of a holistic systems approach to studies of high performance manufacturing companies (from operations management and TQM perspectives) and has identified as critical an understanding of correctly designed and matched business systems to the environment. From a structural perspective, each theory has, to a greater or lesser extent, acknowledged the superiority of an 'organic' administrative/operational design and the benefits of efficient information processing/improvement activities. Such a design is most likely to be found at SME

businesses where it is not possible to have large numbers of staff in the various departments.

The chapter has also examined the definition and concepts of quality, which were coined from gurus such as Deming, Juran, Feigenbaum and Ishikawa and has explored the weaknesses of their works with regards to SMEs and the particular constraints of their businesses. Furthermore, the absence of any major study of Malaysian SMEs and indigenous business is confusing given the critical role these companies play in the GDP and the national economy. As such, a study of this type would add to our understanding of businesses in this region.

The key themes identified in the literature for TQM[4] implementation show it has not been holistically highlighted by authors. Moreover, the proposed model portrays the role of management as being critical to TQM implementation. This situation indicates that there is a need for in-depth research to fill the gap.

Returning to the main research questions and the context of this study (high is declared as SME businesses in Malaysia) it can be seen that Malaysia is a suitable national for the study of SMEs because the economy is dependent upon this type of business and the Government/industrial customers/competitive market combine to make Malaysia a dynamic environment to see how businesses, from simple starting points, have engaged with the principles of TQM and whether real differences exist between adopters and non-adopters. Returning to the earlier studies (Blackmon et al, 1998) this is important because many businesses adopt the same practices in the West but get vastly differing levels of performance – as such Malaysia is a new manufacturing economy and businesses could all adopt the same practices yet not improve or it may be the case that adopters have far greater competitive abilities, flexibility and performance against non-adopters. Also, access to a truly domestic group of companies was considered an important advantage with Malaysia and therefore an ability to avoid studies of practices that have been imposed by foreign national parents of businesses in the region.

[4] The definition of TQM used and adopted by this research is the definition proposed by Oakland (2003)

Further, in terms of world class manufacturing performance – little is known about Malaysia and there have been even fewer studies of what features of TQM have been adopted by these companies. In terms of inter-country comparisons – Malaysia has many similarities with that of the UK and Europe in terms of its SME populations and high dependency upon large international customers (especially those in the automotive sector) (Aziz et al. 2000). The presence of mass production customers in Malaysia (Proton etc.) it was considered, by the researcher, that Malaysia represented a very suitable context in which to study the features of TQM as adopted by small businesses that were independent of their customers (either in equity ownership terms). In this manner, customers can only convince the management of SMEs to improve – they have no direct control over these SME businesses – and therefore this context represented an ideal opportunity to see what features had been adopted, embedded and what resultant performance outcomes had been achieved relative to businesses that had not engaged in TQM.

Accepting the legitimacy of the Malaysian context to this study, the researcher conducted many literature reviews to assess whether the focus should remain on the development of a TQM model for Malaysian SME businesses or whether it should switch and follow the path set by Dale (2003) and attempt to discover an evolutionary pathway for SMEs as a result of TQM adoption/adaptation. After long consideration, and discussions with expert academics in the field (including world-expert Professor Bessant at the BAM Conference 2005) such an evolutionary model was considered to lack appropriateness at this juncture. The main cited reason was until the design features of TQM engaged by Malaysian SME had been conducted first then it would not be appropriate to look at the change process itself or indeed whether such changes resulted in any meaningful improvement using established operations management indicators. By assessing the features of SME businesses the student could then move towards an evolutionary understanding but without a study of the features (and business performance) it was considered impossible to understand what delineates a TQM business from any other of Dale's (2003) three categories. It is also noted that no such evolutionary model has been effectively tested and detailed in a manner whereby the model can be tested. In this regard, Dale's work is

theoretical and not based upon a rugged methodology (qualitative or quantitative). With this in mind, the student accepted the model as a means of framing the stages of TQM implementation but, from the perspective of the total literature review, no evolutionary model was found to have any significant field testing and in this respect the field of study is incomplete. The literature requirement was therefore to establish the features of different stages of TQM implementation and to assess these differences rather than study a longitudinal change programme and its stages. As such, the lack of work in this field is 'flagged up' as a gap in the literature to which this study would seek to contribute greater understanding.

The research decision was taken, conducive with the lack of existing knowledge, to pursue a study of system features and not a process theory approach to how businesses evolve over time. A further consideration was also the inability to identify and access such businesses and whether the companies would authorise such a prolonged period of study as well as the practicalities of only being able to study one business (with concerns that the results of the study could not be generalised properly).

It should be further noted that, as a result of this literature review and general disagreement between the academic authors, the researcher did not attempt to bias the study by segregating the many features of TQM into Dales (2003) classifications and instead remained with a broad definition of TQM. This chapter has provided an overview of the concepts that underpin TQM but the key definition used by this study is as follows:

"TQM is an approach where an organisation focuses on customer satisfaction through participation of all employees and suppliers for continuously improving product or services and cross functional business processes." (Oakland 2003).

The above definition, with precedence with other studies of this type (Deming, 1986; Juran, 1988; Dale, 2003), encapsulates the key approach and intent of this study. This need to define TQM in such a way as to allow scope for the study without adopting a very tight definition, was also debated at length with Professor Bessant (2005) and it was

agreed this definition allowed the maximum degree of freedom (without pre-bias) when conducting research with small rather than large businesses.

The next chapter will outline and defend the research strategy and methodology employed by this study. It will also make transparent the limitations and key design aspects that overcome the problems associated with the existing empirical work presented in this chapter and the identified gaps in the body of knowledge.

CHAPTER 3:

RESEARCH METHODOLOGY

Chapter 3: Research Methodology

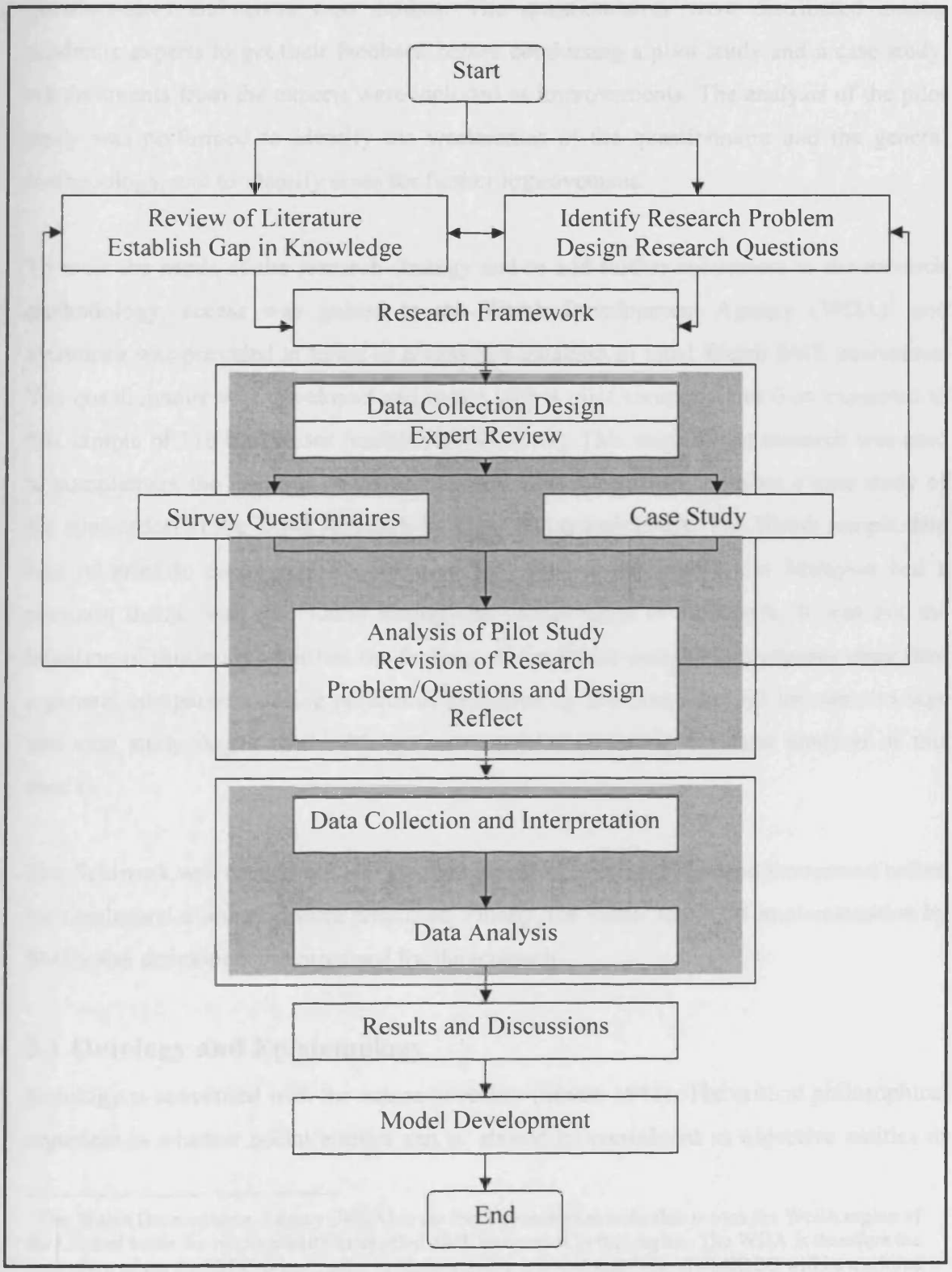
3.0 Introduction

This chapter will present and defend the research strategy and methodology designed to address the research objectives and research questions. The chapter begins with an explanation of the philosophical background to the research, the design of the questionnaires, research strategy, conceptual framework, pilot testing, reliability and validity issues, and methods of data collection. The chapter will also present the study limitations and finally will review the study from an ethical perspective.

The chapter will begin with a review of the epistemological issues before exploring the research methods employed to form the overall research strategy. According to Saunders et al. (2003), research method refers to the tools and techniques used to obtain and analyse data; tools include questionnaires, observations, and interviews whereas techniques consist of statistical and non-statistical analysis. Meanwhile, research methodology refers to the theory of how research is undertaken. There are several research methodologies in social science research and these include surveys, experiments, histories, analysis of archival information and case studies. Each of the methods has its own strengths and weaknesses depending on the type of research question, the control an investigator has over actual behavioural events and the focus on contemporary as opposed to historical phenomena (Yin, 2003). The methods employed in this research are a postal survey and case study.

Figure 3.1 displays the research process involved in this study to assist the reader during this chapter. The research began with an extensive review of the literature to establish the knowledge gap as well as to identify the research problem and design research questions. The research framework was designed according to the information gathered during the previous steps.

Figure 3.1: The research process (adapted from Silverman, 2006)



The approach continued with the design of the data collection process which involved questionnaires and cross case studies. The questionnaires were distributed among academic experts to get their feedback before conducting a pilot study and a case study. All comments from the experts were included as improvements. The analysis of the pilot study was performed to identify the weaknesses of the questionnaire and the general methodology, and to identify areas for further improvement.

To meet the needs of the research strategy and to add further robustness to the research methodology, access was gained to the Welsh Development Agency (WDA)[1] and assistance was provided in terms of access to a database of local Welsh SME businesses. The questionnaire was developed and tested with a pilot company and then expanded to this sample of 116 businesses (usable returns of 34). This stage of the research was used to complement the findings of the main study. The main study includes a case study of the application of the TQM approach by eight Malaysian SMEs. The Welsh sample data was returned to on several occasions to see whether the findings in Malaysia had a common theme with that found during this earlier stage of fieldwork. It was not the intention of this study to utilise the findings of the Welsh sample for purposes other than a general comparison during periods of reflection by the researcher (at the sample stage and case study stages of the Malaysian research and during the final analysis of this thesis).

The fieldwork was carried out and the data gathered were analysed and interpreted before the results and discussion were presented. Finally, the model for TQM implementation by SMEs was developed and proposed for the research.

3.1 Ontology and Epistemology

Ontology is concerned with the nature of reality (Sayer, 1984). The critical philosophical argument is whether social entities can or should be considered as objective entities or

[1] The Welsh Development Agency (WDA) is the local government body that covers the Welsh region of the UK and holds the responsibility to develop SME businesses in this region. The WDA is therefore the equivalent of the SMIDEC organization in Malaysia (the role and activities of SMIDEC will be explored within this chapter).

social constructions. Objective entities have a reality external to social actors and social constructions built up from the perceptions and actions of social actors. Burell and Morgan (1979) suggest this philosophical argument has two main and opposing ontological perspectives:

i) There is one reality and it is observable by an inquirer who has little if any impact on the object being observed

ii) A reality consists of an individual's mental constructions of the objects with which they engage, and the engagement impacts on the observer and the situation being observed.

Epistemology is, therefore, a philosophy concerned with the nature, origin and scope of knowledge and 'how we know what we know'. Burell and Morgan (1979) suggest the relationship can be established by accepting that knowledge can be viewed as being either objectively knowable or only subjectively knowable. In relation to this, Healy and Perry (2000) conclude that ontology is the 'reality' under study, epistemology is the relationship between that reality and the researcher, and methodology is the technique employed by the researcher to investigate that reality.

Wass and Wells (1994) present a comprehensive account of these competing theories by defining the relevancy of three epistemological viewpoints, namely, positivism, realism and naturalism to management research. Table 3.1 developed by Wass and Wells (1994) displays the differences between the perspectives. The detail of each perspective will be discussed in the following sections.

3.1.1 Positivism

The positivist approach originates from the natural sciences and a belief that only objective 'value free' and empirical evidence of the world is legitimate forms of knowledge (Swamidass, 1991; Meredith, 1993; Fillipini, 1997; Scrudder and Hill, 1998).

Table 3.1: Research perspectives in business and management research (Wass and Wells, 1994)

Epistemological Perspectives	Ontological Assumptions	Epistemological Assumption	Scientific Objectives	Nature Of Scientific Knowledge	Cycle Of Enquiry	Methodology	Type Of Data	Techniques For Data Collection	Bias
Positivism	Ethic 'realist', real world exists independently of subjective consciousness; this latter is irrelevant to explanation; enquiry can coverage on reality	i)Phenomenalism: only that that is objectively observable is valid knowledge ii) Empiricism: explanation comprises of causal laws inferred from empirical regularities; subjects subservient to definition of knowledge, subjective consciousness is meaningless	Nomothetic with natural science; abstract from subjective idiosyncrasies to uncover general laws; replicability generalizability	From hermeneutics, to uncover and explain individual conceptualizati on and interpretation of external factors; internal validity and ecological validity	Deductive: Abstract theories Operational hypotheses Observations Inference using statistical tests 'predictive'	Nemothetic: e.g : census or sample survey, quasi experiment, operationalism; outsider looking in; extensive and general	Quantitative , systematic and precise; directly observable and measurable	Self completion questionnaires, structured interviews, simulation, use of secondary data	Concern to account for measurement error and missing data; use of statistical controls
Realist	Real world exists independently of subjective consciousness but experience of the real world is through subjective consciousness	i) Knowledge includes the observable and the intangible ii) General laws are not deterministic, they only partially explain human action; equally subjective interpretations are partially explained by the external world; human action open to various interpretations; possibility of indeterminates	Inclusion of subjective in traditional model of science to uncover laws and how these are interpreted by subjects; laws are tendencies, i.e. not deterministic; often applied research, practitioner driven	Personal, value bound, multicausal, plausible, indeterminate, particular	'Retroductive': Iterative cycle Observation Theory	Methodological pluralism, triangulation, iterative, participatory, action research; method determine by subject of research	All data that are relevant to subject; quantitative and qualitative observable and interpretative	Complete tool kit of techniques often in context of a case study	Methods are combined with a view to compensate for weaknesses in a single method
Naturalism	Emic 'idealist' real world does not exist outside of consciousness of the individual, hence multiple conceptions of reality and enquiry cannot converge on a single reality	i) Phenomenalism: valid knowledge comprises individual comprehension of the external world. ii) Empericism: explanation comprises causal laws inferred from actors' subjective perception of their social world; definition of knowledge is determined by the subject; generalization beyond context is meaningless	From hermeneutics, to uncover and explain individual conceptualizatio n and interpretation of external factors; internal validity and ecological validity	Personal interested, value-bound, uncertain, non-rational, indeterminate and particular	Inductive: theory grounded in empirical world Observation Reflection Construction of abstract concepts 'descriptive' explanations	Ideographic: e.g. ethnography' insider seeking 'verteshen' with subjects	Qualitative, intangible, subjective conceptions and interpretations of actors; intensive and contextual, detailed, penetrating 'processual' written texts	Participant observation, unstructured interviews, textual analysis	Concern to account for reactivity and reflexivity in data; and reflective accounts

Positivism used valid knowledge as a basis upon which predictions and hypotheses could be based and tested or disproved to generate new hypotheses (see Table 3.2). Furthermore, the positivist belief in objective analysis, which emphasizes the use of quantifiable observations, allows statistical treatment of the collected data. Statistical manipulation includes data tests of reliability and validity that are used to discern broad patterns of behaviour to test hypotheses (Ragin, 1994). It is a position that holds that the goal of knowledge is simply to describe the phenomena of experiences. A positivist researcher considers 'reality' to be external to the individual, and therefore focuses on manifest patterns of behaviour that form a structure of determinate relationships between ontology, epistemology and methodology (Kolakowski, 1993). The positivist uses deductive reasoning to postulate theories that they can test. Based on the results of their studies, they may learn that their theory does not fit the facts well and needs to be revised for better prediction reality. Positivists believe in 'empiricism' -- the idea that observation and measurement is the core of scientific endeavour. The key approach of the scientific method is the experiment, the attempt to discern natural laws through direct manipulation and observation. The main methods used by positivists are large-scale surveys, comparative studies and 'controlled' experimentation.

This approach was not considered appropriate for the research due the inability to control the subject of the study and the requirement that the study provide in-depth analysis. Moreover, the subject is not well understood and there are no agreed arguments/instruments of measurement (operationalised constructs).

Table 3.2: The deductive positivist research model (Cresswell, 1998)

Researcher Test A Theory
Leading To
Researcher Tests Hypotheses or Research Questions Derived From The Theory
Leading To
Researcher Operationalises Concepts or Variable Derived From The Theory
Leading To
Researcher Uses An Instrument To Measure Variables In The Theory

3.1.2 Naturalism

The naturalist approach is directly opposed to positivism and represents a comparatively new branch of knowledge that accepts subjectivity consciousness. From the point of view of naturalists, 'value freedom' cannot be assured and the ability to manipulate human systems, such as industrial organizations, in the same manner as biological experiments is not possible (Layder, 1994). For the naturalist, reality cannot be measured through observed behaviour structures, nor can it be subject to statistical analysis. Instead, reality may be understood only at the individual level and only patterns may be identified. In supporting the approach, Morgan and Smircich (1980, p. 491) argue that "*Once one relaxes the ontological assumption that the world is a concrete structure and admits that human beings far from merely responding to the social world may actively contribute to its creation, the dominant models become increasingly unsatisfactory and indeed inappropriate. The requirement for effective research in these situations is clear; scientists can no longer remain as external observers measuring what they see; they must move to investigate from within the subject of study and employ research techniques appropriate to that task*".

Table 3.3 presents the naturalist form of research. The approach consists of a wide range of methods including participant observation, symbolic interactionalism and linguistics. This form of research, therefore, allows the researcher to enter the world and reality of the subject of study. This approach was considered inappropriate for this research due to difficulties during the interpretation of results and problems with narrowing and refining the research project. Furthermore, it would not be clear when the study had ended (the point of saturation) and this would generate additional problems for an inexperienced researcher (Glaser and Strauss, 1967). Miles and Huberman (1996) also suggest that the naturalist approach is not recommended for young, inexperienced or doctoral researchers due to the conflict between reconciling epistemological issues and practical considerations during research. In addition, the researcher was unable to extract himself from the 'politics' of the organisation or social setting to manage interaction with individuals.

Table 3.3: The inductive research model (Naturalism) (Cresswell, 1994)

Researcher Gathers Information
Leading To
Researcher Asks Questions
Leading To
Researcher Forms Categories
Leading To
Researcher Looks For Pattern (Theories)
Leading To
Researcher Develops a Theory or Compares Pattern With Other Theories

3.1.3 Realist

The realist perspective occupies an intermediate position, between positivism and naturalism. The emergence of this approach contributed a new dimension of thinking to the research area. Realists argued that a synthesis of extremes is possible and occurs naturally during most field research (Giddens, 1984; Wass and Wells, 1994). Realists contend that positivism provides only a partial account of reality and no form of science relies exclusively on empirical evidence; therefore, realists propose that valid knowledge consists of both observable and non-observable data.

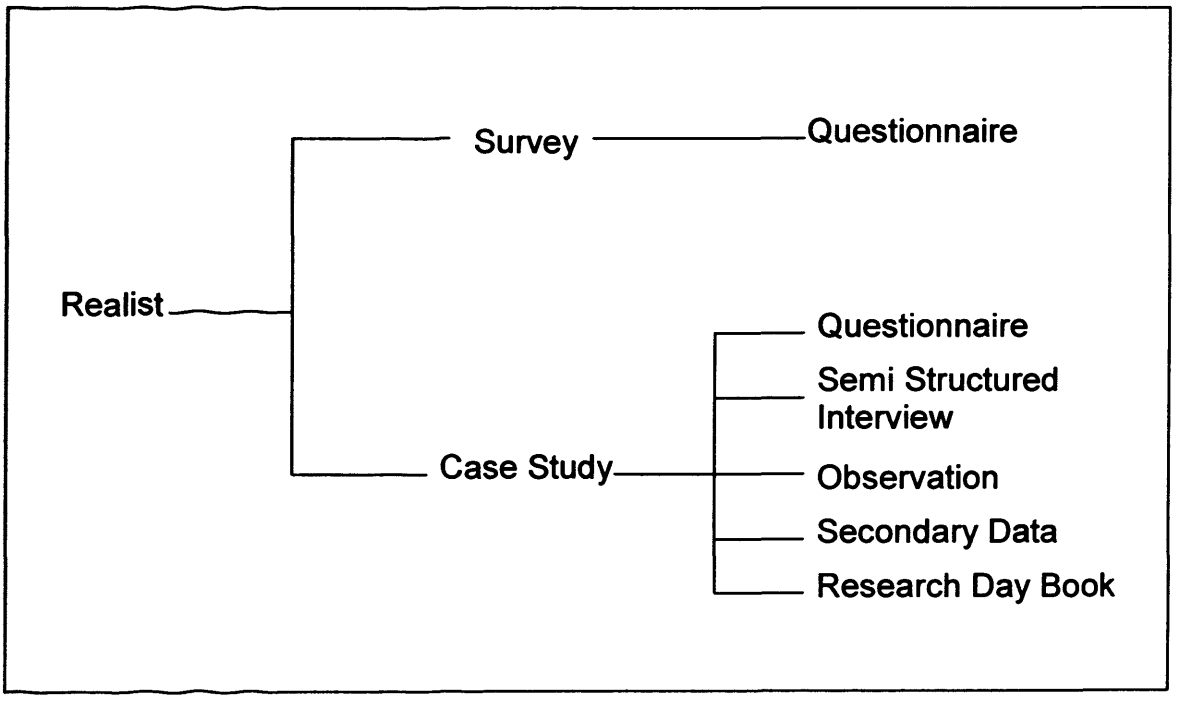
Realist approaches are promoted by Bhaskar (1978) who proposes three overlapping domains of reality: empirical domain, actual reality and events, and also real structures. The empirical domain relates to the experiences and observation of realty and actual reality. The approach believes (Bhaskar, 1978):

a) No positivist study can be free of subjectivity; there is no value freedom
b) Anecdote; rich source of theory building
c) Positivism only works when constructs and variables are well known
d) People's perceptions influence the features that positivists test
e) Positivist studies were average

The 'cycling' between qualitative and quantitative observation is a powerful way in which the realist approach can gain greater insight into complex social phenomena (Miles and Huberman, 1996).

In relation to this research, the researcher employed a realist approach because it was the most appropriate paradigm for generating in-depth understanding of the complex social phenomenon of TQM implementation by Malaysian SMEs (Yin, 2003; Miles and Huberman, 1996; Leonard-Barton, 1992) including the study of unexplored management practice (leadership, process management, human resources and culture management by Malaysian SMEs). The realist approach also offered a much greater range of methods and techniques with which to triangulate data and yet be flexible and allow the researcher to explore in greater depth and with greater insight (Wass and Wells, 1994). Positivism was discounted due to its reliance on established measures and naturalism rejected because of the organisational (not individual) level of study needed.

Figure 3.2: Summary of the research philosophy adapted and design for this research



According to Bloor (2001) from a practical point of view, it is difficult to triangulate qualitative and quantitative data and identifies problems in term of "comparability and meaning". However, the researcher decided that such methods could be combined using qualitative data to reinforce quantitative findings. Based on this argument, the realist approach was selected as the most appropriate grounding for this study and united the elements of the main research question that are identifying the features of TQM implementation and offering insight into management practices.

Furthermore, operations management literature support focused upon the advantages of the realism in generating in-depth understanding of complex phenomena and avoidance of positivist "snapshot" and subsequent data "smoothing" (Scudder and Hill, 1998; Sousa and Voss, 2001). The realist perspectives therefore allowed a deeper exploration of issues and deviant "outlier" cases and this would improve the understanding of the TQM implementation in organisation. The realist and case based approach was selected and this selection was in parallel with doctoral studies in similar field that have employed a mixed methodology and cyclical approach to investigation (Rahman and Tannock, 2005; Hussey and Hussey, 2003).

In conclusion, the realist approach offered many advantages over that of positivism and permitted a holistic system perspective to be taken in the context of organisational complexities and dynamism of SME businesses. A reductionalist or monist approach was rejected because data would be hard to triangulate and also qualitative observations inform quantitative data that was collected about the process/management system (Easterby-Smith et al., 2002). If positivist approaches have been undertaken then the study risked eliminating or smoothing away 'outlier' businesses that may have performed much better or much worse than any others. These businesses are highly interesting to theory building researchers whereas the positivist tends, in the main, to take a theory and test its null hypothesis. The positivist approach is not suitable for the research questions and theory building approach to this study. Naturalism and the engagement of shop floor operatives to understand what is meant by TQM would have been a viable alternative but such employees do not design systems and also such a qualitative approach would better

be suited to a study grounded in human resources or organisational behaviour rather than operations management. A naturalist study was duly rejected because it did not suit a management focus and also the testing of employee understanding of TQM was not conductive with assessing organisational features and how such features generated superior performance (as defined by measures adopted by operations management authors see Brown (1996) or Slack et al. (2004)).

3.2 Triangulation

As described earlier, the realist approach permits the combination of qualitative and quantitative methods. The combination of both methods is known as multi-methods or triangulation (Patton, 1990; Denzin et al., 2000; Bryman and Bell, 2003; Miles and Huberman, 1994). Ghauri and Grønhaug (2002, p. 181) and Hussey and Hussey (1997, p. 74) suggest triangulation is the combination of methodologies or the use of different research approaches in the study of the same phenomena so as to improve the reliability of results. Saunders et al. (2003) suggest there are two major advantages to employing multi-methods in the same study. Firstly, the researcher can employ different methods for different purposes and secondly, the data can be triangulated to ensure that it tells what is supposed to be told. This approach improves the accuracy of judgements as well as results through different methods of data collection. Hammersley (1992) suggested *"triangulation refers to the attempt to get a true fix on the situation by combining different ways of looking at it or different findings"*.

Meanwhile, Miles and Huberman (1996, p. 267) point out triangulation is supposed to support a finding, not work against it. According to them, triangulation is a way to obtain the finding in the first place by seeing or hearing from different sources by different methods. Denzin et al. (2000) further argue that the use of different methods by a number of researchers (studying the same phenomenon) with the same conclusions leads to greater validity and reliability compared to the single methodological approach. As such, realists use multiple methods deliberately to increase triangulation and the reliability of the results.

Easterby-Smith, Thorpe and Lowe (1991) identify four types of triangulation:

a) Data triangulation refers to the data being collected at different times or from different sources in the study of a phenomenon.

b) Investigator triangulation refers to the use of different researchers working independently to collect data on the same phenomenon and compare the results.

c) Methodological triangulation refers to when both quantitative and qualitative methods of data collection are used.

d) Triangulation of theories refers to when the theory taken from one discipline is used to explain a phenomenon in another discipline.

However, Hussey and Hussey (2003) argue that triangulation might not be suitable for further replication especially when generating qualitative data. Furthermore, they claim that such data collection and analysis is very costly and time consuming. With regards to the study, the methodology triangulation was employed through the use of questionnaires, semi structured interviews, observation and a research day book for primary data collection. In addition, secondary data such as annual reports, newsletters and magazines were also gathered for references and clarification. The strategy of this research design was to triangulate the methods used but not to engage in comparative triangulation between the Malaysian questionnaire sample and that of the Malaysian cases. The main sample of Malaysian companies, by questionnaire, was facilitated by the SMIDEC and it should be noted that five of the eight cases took part in both the Malaysian questionnaire and the case study rounds of field research. Access to the award winning businesses (which form part of the case study section) was facilitated by the National Productivity Corporation (NPC). The triangulation between the questionnaire sample and cases was not integrated into this design strategy because not all the cases

answered the survey questionnaire and the cases were selected using purposive sampling (drawing the 'award winners' from the national awards operated by NPC)[2].

3.3 Methodology

A methodological design involves the philosophical evaluation of investigative techniques employed to acquire knowledge and manipulate data (Dictionary of Sociology, 1995). The design of a methodology also implies that certain methods for data capture are selected whilst others are not and become redundant, superfluous or inappropriate to meet the objectives of the study. The quality of management research can be affected if the researchers fail to think through philosophical issues (Easterby-Smith, et. al., 1993). Wass and Wells (1994, p. 18) argue a research design is *"a technical decision whereby the strengths and weaknesses of various techniques, in relation to the research problem are optimally combined"*.

Table 3.4 displays the previous study carried out by several authors on TQM issues in SMEs. The majority of the research employed only one method, focusing on a survey questionnaire or a case study (single or multiple cases). The number of cases involved ranged from one company to four companies. However, this research employed two methods, which included a survey questionnaire and a multiple case study (eight cases). It was thought the integration of methods could offer a better understanding of the phenomenon being researched (Bryman and Bell, 2003) and thus the research would be considered more robust (Miles and Huberman, 1996). Both methodologies were deemed necessary to achieve the objectives of the study and to answer the research question. The questionnaires survey permitted the identification of important and emerging issues that required further explanation by those who were directly involved in TQM implementation. The case study gained in-depth information from the informants. It was

[2] It is acknowledge that the lack of triangulation between the survey and the cases is deliberate design limitation of the study. It is the purpose of this research to provide an in-depth case analysis of TQM at Malaysian SME businesses.

Table 3.4: Methods used by several authors in previous studies related to TQM for SMEs (Source: This Research)

Authors	Research	Respondents	Methods	Number of Companies (Response rates)
Yusof and Aspinwall (2001)	Development of a framework for TQM implementation in SME businesses.	UK SMEs automotive industries	Multiple Case Study	Cases: 4 companies
Sohail and Hoong (2003)	TQM practices and organizational performances of SMEs in Malaysia	Malaysian SMEs	Survey Questionnaire	80 companies (16.0%)
Quazi and Padibjo (1998)	A journey toward TQM through ISO 9000 certification- a study on SMEs in Singapore	Singaporean SMEs	Survey Questionnaire	41 companies (20.0%)
Eng and Yusof (2003)	A survey of TQM practices in the Malaysian electrical and electronic industry	Malaysian SMEs	Survey Questionnaire	60 companies (24.2%)
Anderson & Sohal (1999)	A study of the relationship between quality management practices and performance in small businesses	Australian SMEs	Survey Questionnaire	62 companies (9.23%)
Aziz et al. (1998)	Quality practices in the manufacturing industry in the UK and Malaysia.	UK & Malaysian large and SME companies	Survey Questionnaire	UK: 55 companies (31.0%) Malaysia: 145 companies (27.0%)
Tannock et al. (2002)	The development of TQM in Thai manufacturing SMEs: a case study approach.	Thai SMEs	Multiple Case Study	4 companies
Rahman and Tannock (2005)	TQM best practices: Experiences of Malaysian SMEs	Malaysian SMEs	Multiple Case Study	3 companies
Gunasekaran et al. (2000)	Improving operations performance in a small company: a case study	French SMEs	Single Case Study	1 company
This Research (2007)	A study of TQM application by Malaysian SMEs	Malaysian and Welsh SMEs	Multiple Case Study and Survey Questionnaire	Cases : 8 companies (M'sian) Survey: 45 companies (21.2%-M) 34 companies (29.3%-W)

decided the combination of both methods would contribute to the rigorousness of the finding and would reduce or eliminate the deficiencies of using a single research method. In selecting the combination of methods, the author rejects the utility of a single questionnaire approach (favoured by the positivist) and also observational data without qualitative triangulation (favoured by the naturalist) and therefore uses the strengths of both individual approaches whilst minimising the weaknesses of each. This was considered a better approach to the study that using a single method and without cycling between qualitative and quantitative methods. Such an approach ensures that data is not contaminated or researcher-bias leads to poor interpretation of the data or seeing in the data what the researcher would like to see.

3.4 Survey Methods

The survey method is a primary data collection technique with good versatility. It consists of various methods including personal interviews, telephone interviews and questionnaires. According to Ghauri and Grønhaug (2002), the survey is an effective tool for obtaining opinions, attitudes and descriptions as well as for identifying cause and effect relationships. Nevertheless, Saunders et al. (2003, p. 191) argue, *"the data collected by the survey strategy may not be as wide ranging as those collected by other research strategies"*. Table 3.5 displays the advantages and disadvantages of each method as described by Cooper and Schindler (2001).

The main reasons for undertaking a survey for this research were as follows:

a) To investigate the extent of TQM implementation by SME businesses.
b) To identify the enablers for TQM implementations.
c) To explore the relationship or association between the enablers and TQM implementations.

The survey method was considered a useful way of collecting data in a short time period whilst allowing respondents the ability to give their answers. Alternative methods including group interviews or semi structured questionnaire with open-ended response

boxes could have been engaged at this stage. Following a deep methodological review these latter methods were considered inappropriate because there was little consistency and commonality between the questions posed and the theoretical underpinning of this study., As such a very open-ended questionnaire is less likely to truly identify the presence of TQM features than a survey which addresses the key areas of TQM (from the literature review of large and small businesses). Also the ability to analyse open-ended questions is much more limited than the use of a mixed questionnaire which was duly adopted by the student (the actual questionnaire administered is held in the appendices of this document).

3.4.1 Questionnaire Design

The questionnaire is the most widely used survey type data because each respondent is asked to answer the same set of questions (Saunders et al, 2003). A questionnaire is defined as a list of questions that has been carefully designed and tested with the aim of obtaining responses from a chosen sample (Hussey and Hussey, 2003). Oppenheim (1992) proposed a broader perspective by integrating the planning and questions in the research design stage. He regarded the questionnaire as a measurement tool and a way of collecting data directly from an earlier research design. According to Malhotra (1996), questionnaires are a formalised set of questions for obtaining information from respondents. In designing the questionnaire, standard guidelines proposed by several authors such as Bryman and Bell (2003), Saunders et al. (2003), Ghauri and Grønhaug (2002), Hussey and Hussey (2003) and Oppenheim (1992) were taking into consideration. Common issues pointed out by those authors in designing questionnaire are:

- Avoid long and ambiguous questions.
- Avoid double-barrelled questions and ensure that each question deals only one dimension.
- Questions should not direct or lead the respondent towards an answer.
- Questions should be specific, and very general questions should be avoided.

Table 3.5: Advantages and disadvantages of survey methods (Cooper and Schindler, 2001)

	Personal Interviews	Telephone Interviews	Surveys
Advantages	O Good cooperation from respondents. O Interviewer can ask questions about surveys, probe for answers, use follow-up questions and gather information by observation. O Special visual aid and scoring devices can be used. Illiterate and functionally illiterate respondents can be reached. O Interviewer can pre-screen respondent to ensure he/she fits the population profile.	OLower cost than personal interview. OExpanded geographic coverage without dramatic increase in costs. OUses fewer, more highly skilled interviewers. OReduced interviewer bias. Fastest completion time.	OAllows contact with otherwise inaccessible respondents. OIncentives may be used to increase response rate. O Often lower cost option. OExpanded geographic coverage without increased in cost. O Perceived as more anonymous. O Allows respondents time to think about questions. O Respondent who cannot be reached by phone may be accessible. O Sample frame lists viable locations rather than prospective respondents.
Disadvantages	O High costs. O Need for highly trained interviewers. O Longer period in the field needed for collecting data. O Follow-up is labour intensive. O Not all respondents are accessible. O Some respondents are unwilling to talk to strangers. O Questions may be altered or respondent coached by interviewers	O Response rate is lower than for personal interview O Higher costs if interviewing geographically dispersed sample O Interview length must be limited O Many phone numbers are unlisted or not working, making directory listings unreliable. O Some target groups are not available by phone. O Responses may be less complete. O Illustration cannot be used.	O Low response rate in some modes O No interviewer intervention available for probing of explanation O Cannot be long or complex O Accurate mailing lists needed O Often respondents returning survey represent extremes of the population-skewed responses. O Anxiety among some respondents.

- Questions should be relevant and straightforward.
- Avoid negative or sensitive questions.
- Ensure questions presented according to the right or logical order.
- The layout of the questionnaire should be neat and tidy.

The questionnaire developed for this study was based on the extensive literature review with some modifications to tailor the questions to this specific research need. The questionnaire was validated by internal and external experts. Internal experts included the professors, senior lecturers, and lecturers from the research department of Cardiff Business School. External experts included reviewers such as SME experts from the WDA and professors from Cranfield University. Moreover, this questionnaire also was presented to the PhD circle group at Cardiff Business School for their comments and suggestions. Feedback and reviews from all of these were used to strengthen the questionnaire.

The steps in developing the questionnaire were based on Churchill (2002) as in Figure 3.2. The questionnaire basically consisted of seven sections, which included:

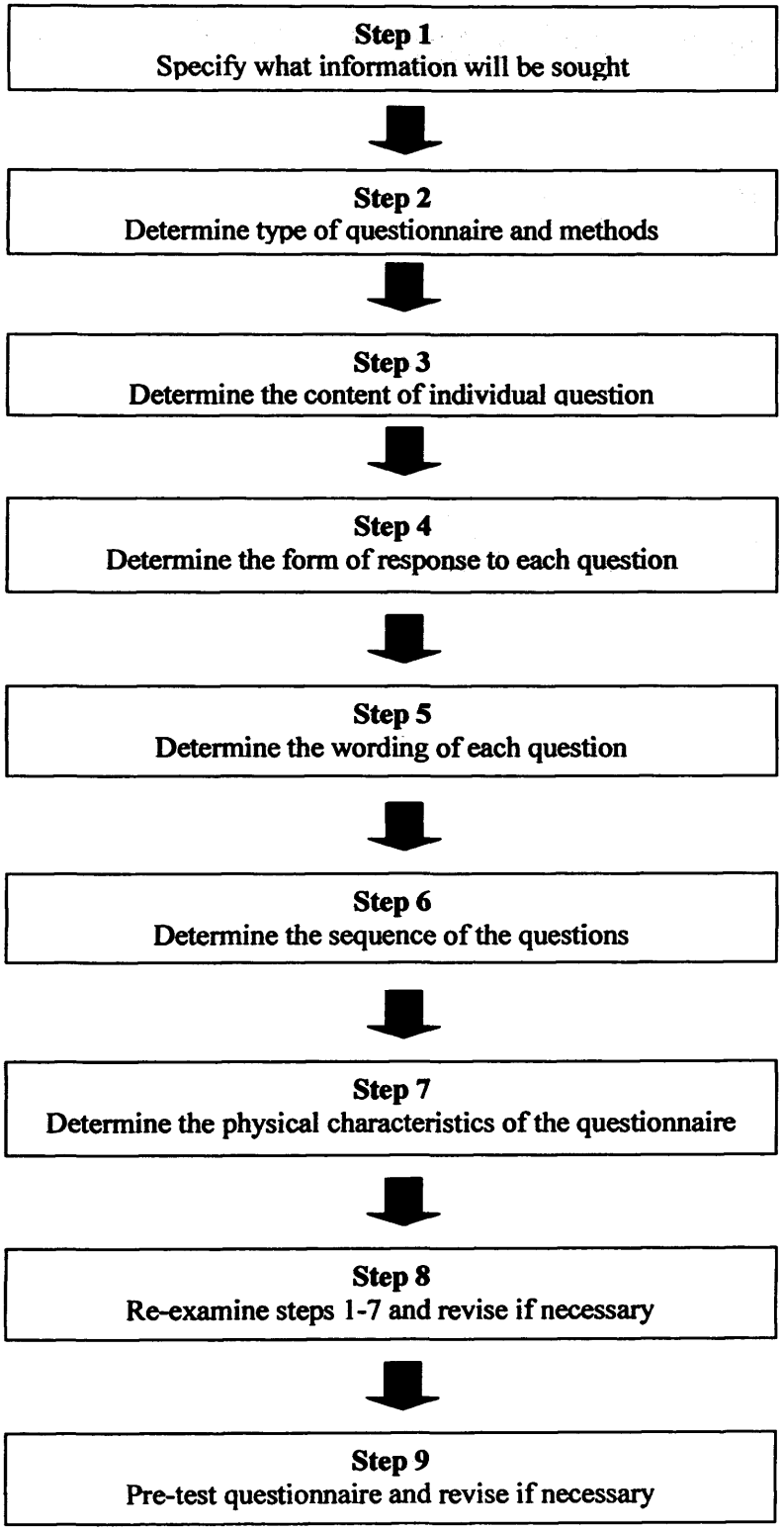
- Section A: Company overview

  This section consisted of twelve questions intended to discover general information about or the background of the company and its activities. The questions asked were related to the name of the company, year of establishment, nationality, main business activity, total number of full time workers, ownership, customers and quality management systems employed.

- Section B: The Total Quality Management practices

  This comprised seven questions concerning the timing of business projects and perceived outcomes of TQM initiatives. The questions provided the researcher with information about the basis of TQM implementation and issues during implementation.

Figure 3.3: Procedure for developing a questionnaire (Churchill, 2002)



- Section C: Company performance

  Key performance indicators that cover the market and internal operations of the factory processes were the focus of this section. The six questions measured the company performances compared to the industry norm. The aim of these questions was to identify what key performance indicators were used to measure performance. In addition, these questions explored the status of the company performance as compared to that of the industry

- Section D: Process management, continuous improvement and techniques

  This section explored the different elements of the quality management to find out what practices were used within the factory. This section asked six questions to enable the researcher to identify the tools and techniques used for continuous improvement.

- Section E: Human resources

  This section was related to the management of human resources including methods of selecting new workers, induction schemes, performance appraisal, employment features provided by companies and training effectiveness. Questions also covered problem-solving teams' activities, and reward schemes. The purpose of these questions was to understand and explore the human resource practices in the company (socio systems).

- Section F: Leadership

  This section was designed to understand the perceptions concerning leadership in the company due to the importance of leadership in all previous studies. Seventeen different statements were provided with a five point Likert scales to assess the informant's views as follows: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5= strongly agree.

- Section G: Inhibitors to TQM

  Finally, section G of the questionnaire identified the respondent's opinions about inhibitors to the TQM implementation and its sustainability. As with section F, this section also provided a five point Likert scales ranging from 1 = strongly disagree to 5 = strongly agree, with 14 different statements.

At first, the questionnaire was prepared on A4 sized paper; however, the researcher realised that it seemed to be long and that this could contribute to a low response rate. After several discussions with the thesis supervisor, it was decided to reproduce the questionnaire in double-sided booklet form (B4 sized paper). The front layout of the questionnaire consisted of the Cardiff University emblem, research title, instruction about returning the questionnaire, the name and addresses, telephone number, fax number and e-mail address of the researcher. The front layout was designed in a professional manner to provide a level of confidence to the prospective respondents and to demonstrate the credibility of the researcher. Although 'Bahasa Malaysia' is the national language in Malaysia, the questionnaire was presented in English. This was due to the issue of misinterpretations that might arise during the translation process. The decision was influenced by the fact that English is the language of communication among the Malaysian private sector in day-to-day business operations.

The questions used in this survey questionnaire were based on and drawn from the extensive literature review. Table 3.6 displays the source of questions generated by previous authors that have been included in this study. Since the type of questions asked were related to the strategy of the companies and the reasons for implementing TQM, the target group for the survey were Managing Directors, and General Manager or Managers of SME companies (Rahman and Tannock, 2005). Moreover, managers and staff at senior management level in organisations have more objective perceptions of the TQM implementation levels (Harel and Tzafrir, 1999). These informants also represented designers and controllers of major business subsystem and as such, this is appropriate with that of a socio-technical system approach.

Table 3.6: Source of questions used in survey questionnaire

Questions	Authors
Section A: Company Overview	
Q1 – Q7	Ahire et al. (1996); Yusof, S. (2000); Quazi and Padibjo, (1998); Leonard and Mc Adam, (2003); Miyagawa and Yoshida, (2005); Jeng, (1998).
Q8 – Q12	Dewhurst et al., (2003); Miyagawa and Yoshida, (2005); Wu and Choi, (2005), Grandzol and Gershon, (1998).
Section B: Total Quality Management Practices	**Authors**
Q1 – Q7	Claver et al., (2002); Sousa et al., (2005); Quazi and Padibjo, (1998); Ahire et al. (1996); Yusof, S. (2000); Powell, (1995); Grandzol and Gershon, (1998); Ahire et al. (1996); Kulkarni, (2005).
Section C: Company Performance	**Authors**
Q1 – Q6	Agus, (2004); Martinez et al., (2000); Sousa et al., (2005), Powell, (1995); Kaynak, (2003); Wu and Choi, (2005); Chenhall, (1997); Sila, (2005).
Section D: Process Management, Continuous Improvement and Techniques	**Authors**
Q1 –Q4	Miyagawa and Yoshida, (2005); Escrig, (2004); Sila (2005); Chenhall, (1997); Baidoun and Zairi, (2003); Leonard and Mc Adam, (2003); Jeng (1998).
Q5 – Q6	Sila, (2005); Martinez et al., (2000); Yusof, S. (2000); Sousa et al., (2005).
Section E: Human Resources	**Authors**
Q1 – Q21	Deshpande and Golhar, (1994); Sila, (2005); Soltani, (2005); Smyth and Scullion (1996); Martinez et al., (2000); Kaynak, (2003); Baidoun and Zairi, (2003); Miyagawa and Yoshida, (2005); Escrig, (2004); Dewhurst et al., (2003); Ahmad and Schroeder (2003).
Section F: Leadership	**Authors**
Q1 – Q17	Jeng, (1998); Ahire et al., (1996); Powell, (1995); Claver et al., (2002); Quazi and Padibjo (1998); Kulkarni, (2005); Grandzol and Gershon, (1998); Issac et al. (2004).
Section G:	
Inhibitors to TQM	
Q1 – Q14	Schalkwyk (1998); Jun et al. (2004); Bateman and Rich (2003); Amar and Zain (2002).

The researcher excluded operational employees because they were not system designers from STS perspective. This class of personnel are neither involved in strategic planning of the company nor the selection of features. The inclusion of managers was important to answer research objectives and research questions concerning selected features. In addition the informants involved in this research (managerial level) ensure reliability and validity of data collected and avoidance of contaminated. By allowing the engagement of shop floor personnel the study would have incurred many additional problems such as the practicalities of interviewing such operational shop floor personnel and also how relevant their perceptions were to the actual presence/absence of a feature and overall operations management performance. It was decided that by including shop floor workers the results would only show which features were used more frequently than others and which resulted in the greatest TQ achievements by the teams but would offer limited insight into the design of the business system and how its socio-technical configuration resulted in higher performance (hence the need to study management selection of features and output performance).

An introductory letter was attached to the questionnaire (see Appendix 1) that provided the following details:

a) Introduction
b) The purpose of the study
c) Assurance of confidentiality
d) A contact phone and fax number (were the respondent to require further information)
e) Closing comments and administration

Each respondent to the questionnaire was offered a short report about the survey finding after the study was completed.

Data collection using questionnaires can be carried out through personal interview, telephone interview and postal forms. A postal questionnaire was selected because it was the most appropriate method for accessing Malaysian and Welsh businesses. This

technique also helped to enhance the generality of the data and ensured greater levels of veracity in the respondents' answers (Masons and Bramble, 1978). Moreover, this questionnaire allowed greater geographical coverage of respondents without any increase in costs and time. This questionnaire also allowed the researcher to become more sensitised to the case before visiting the informants later. The advantages and disadvantages of postal questionnaire are listed in Table 3.7.

Table 3.7: Advantages and disadvantages of postal questionnaires (Oppenheim, 1992)

Advantages	**Disadvantages**
Inexpensive mode of data collection and processing.	No opportunity to correct misunderstanding.
Able to avoid interviewer bias.	No control over the sequence of questions answered.
Able to reach respondent who are widely dispersed geographically.	No check on incomplete questionnaires.

In order to minimise the weaknesses and to increase the response rate of the postal questionnaire, the Total Design Method (TDM) developed by Dillman (2000), which involved two steps, was adopted. Firstly, each aspect of the survey process that might have affected either the quality or quantity of the responses was identified. Secondly, the survey efforts were organised so that the design intentions were carried out in complete detail. This method has been used extensively and is capable of producing high response rates (Dillman, 2000; Cragg, 1990; Mc Kiernan and Morris, 1994).

The implementation of TDM involved the following procedures:

a) The questionnaire was personalised to the respondent together with a covering letter that provided details of the study and emphasised the importance of the respondent participating in the study.

b) A prepaid envelope was included for the respondent to return the questionnaire.

c) A booklet type questionnaire was used with an attractive cover and no questions on the front and back covers.

d) Follow-up letters were sent four weeks after the first post date (to reduce the number of non- respondents).

e) A summary report was offered to all participating companies to allow them access to the findings.

f) Clear instructions were provided to guide the respondent through the questionnaire.

From the results, it was found that the respondents who answered the questionnaire were experienced persons who had an interest in the study. The details of the survey results are discussed in Chapter 4.

3.4.2 Sampling Techniques

Sampling techniques are very important to increase the validity of the data collection and ensure the sample is representative of a population. Sampling techniques reduce the amount of data to be collected and allow a conclusion about the whole population to be drawn (Zikmund, 1997; Saunders et al. 2003).

Saunders et al. (2003) provide two types of sampling techniques:

i) Probability sampling

This method is most commonly used in survey-based research and the researcher needs to make a statistical inference from samples about populations in order to answer the research questions. Probability sampling consists of four steps:

a) Identify a suitable sampling frame
b) Identify a suitable sample size
c) Select the appropriate sampling techniques, and,

d) Ensure the sample is representative of the total population

ii) Non-probability sampling

Non-probability sampling techniques are used in qualitative research to gain in-depth information and a deep understanding about the cases being researched. There is a range of alternatives among these techniques, which include:

a) Quota sampling

Certain subgroups of units are represented in the sample used in the same proportions as those the in population.

b) Snowball

This method is commonly used when the potential respondents of the desired population are difficult to identify.

c) Self selection sampling

The cases are allowed to identify their desire to take part in the research through appropriate advertising in the media, or they are asked to participate.

d) Convenience sampling

Convenience sampling occurs when the selection of respondents is convenient for some reason, for example, they have a personal contact.

e) Purposive sampling

This method is commonly used with case studies that involve a small number of samples. It enables researchers to select cases that will help in answering research questions or achieve key research objectives. These cases are most likely to have a connection with the phenomena being studied. Such an approach was duly accepted and this implied the student would need to find access to companies that were most likely to exhibit TQM implementation and therefore ability to access companies where the features of TQM could be studied effectively. Ideally these businesses

would have won awards for the effectiveness of their TQM implementation when compared with an outside accrediting body of repute.

Since this research involved both a survey questionnaires and a case study, the researcher employed both probability and non-probability sampling techniques. Probability sampling techniques allowed the researcher to draw valid inferences regarding the population and non-probability, thus providing useful insights into the sampling (Ghauri and Grønhaug, 2000).

For the survey questionnaire, the list of potential respondents was obtained from SMIDEC for Malaysian respondents and the WDA for the Welsh respondents. SMIDEC was established by the Malaysian Government due to the need for a specialised agency to promote and develop SMEs by Malaysia. The responsibility of this agency includes the provision of advisory services, fiscal and financial assistance, infrastructural facilities, market access and other support programmes. Hence, many programmes were developed with the aim of improving the competitiveness and development of SMEs by SMIDEC. One of the programmes organised by SMIDEC was the Enterprise 50 award, an award given to the 50 companies that are selected as winners when ranked by company management and performance. The award, which was introduced in 1998, aims to recognise Malaysian SMEs that are high achievers (SMIDEC, 1998). The award also indicates that the companies were best in class, and remained focussed, agile and highly competitive (MITI, 2005). In addition, the majority of the companies in Enterprise 50 are ISO 9001 certified (SMIDEC, 2005).

The respondents for this research were selected from among the winners of "Enterprise 50" from 1998 to 2005, focusing on manufacturing base companies only. This was due to the significant contribution of the manufacturing sector to both GDP and employment (Shamsuddin et al., 2004; Saleh and Ndubisi, 2006). Moreover, under the Ninth Malaysia Plan (2006 - 2010) SMEs in manufacturing received greater emphasis from the Malaysian Government to upscale production toward higher value added activities (The Star, March 31, 2006).

In selecting the SMIDEC population of companies it is recognised that the sample taken was considered representative of the general population of SMEs in the Malaysian economy. However, it is also noted that no test of representativeness were used to strictly compare the SMIDEC sample with the general economy. The reason why no such comparison was undertaken because the purpose of this first phase of research was to identify the common issues faced by SMEs and not for these results to be generalised nor for them to be used for later analysis against a sample drawn from the Welsh Development Agency (it was not the intent of this study to infer about cultural practices but rather to shed light and knowledge concerning the features that had been implemented by small businesses). Any such differences (which were tested statistically) were used to show cultural differences in approach rather than what could not or could be implemented as a feature (so therefore it was considered more important to see if continuous improvement could be implemented by small businesses rather than whether the Welsh could not engage continuous improvement for cultural reasons). As such, similarities of small businesses were more important to this study than real differences in actual application or country differences.

On the other hand, the companies for the case study were selected through purposive sampling. The detailed description of purposive sampling techniques is presented in section 3.7 of this chapter. However, the strengths and weaknesses of qualitative data collection techniques suggested by Yin (2003) are displayed in Table 3.8.

3.4.3 Sample Selection

As mentioned previously, the list of respondents was provided by SMIDEC for Malaysian SMEs and by WDA for Welsh SMEs. The number of Malaysian SMEs awarded Enterprise 50 from 1998 to 2005 was 400 companies. However, only 212 companies were involved in manufacturing activities. The questionnaires, therefore was distributed to the 212 Malaysian manufacturing SMEs.

Table 3.8: Synopsis of qualitative data collection techniques: strength and weaknesses (Yin, 2003, p. 86)

Source of Evidence	Strengths	Weaknesses
Documents	-Stable and can be reviewed repeatedly -Unobtrusive and not created as a result of the case study -Exact and contain exact names, references and details of an event -Broad coverage and long span of time, many events and many settings	-Retrievability can be low -Biased selectivity if collection is incomplete -Reporting bias reflects (unknown) bias of the author -Access may be deliberately blocked
Archival records	**Same as above for documentation** -insightful provides perceived causal inferences	**Same as above for documentation** -Accessibility due to privacy reasons
Interviews	-Targeted and focus on case study topic -Insightful provide perceived causal inferences	-Bias due to poorly constructed questions -Response bias -Inaccuracies due to poor recall -Reflectivity-interviewee gives interviewer what they want to hear
Direct observations	-Real and cover events in real time -Contextual and cover context of event	-Time consuming -Selectivity unless broad coverage -Reflectivity event may proceed differently because it is being studied -Cost –hours needed by human observers
Participant observation	**Same as above for direct observations** -Insightful into interpersonal behaviour and motives	**Same as for direct observations** -Bias due to investigators' manipulation of events
Physical artefacts	-Insightful into cultural features -Insightful into technical operations	-Selectivity -Availability

The list provided by WDA consisted of 143 Welsh SMEs of which only 116 were involved in manufacturing activities; the questionnaire was distributed to all 116 selected companies in the list.

The researcher was assured that the databases were regularly updated for both organisations. The results of the survey and the case studies are presented and discussed in Chapter 4 and Chapter 5.

3.4.4 Pilot Testing

The data collection phase of the research process typically begins with pilot testing. According to Oppenheim (1992), studies that have been inadequately piloted or not piloted at all will find that a great deal of effort has been wasted. Pilot testing also is used to refine the questionnaire and ensure the validity and reliability of the data collected (Saunders et al., 2003). In this research, pilot testing was conducted in the UK and Malaysia to ensure that any discrepancies in the questionnaires during design were rectified and corrected before the actual survey was conducted. According to Fink (1995), the minimum number for pilot testing is 10. Therefore, in this research, a total of 10 questionnaires were sent out to the Managing Directors of Welsh SMEs. The companies were selected based on the list of companies provided by WDA. As suggested by Hussey and Hussey (2003), the most appropriate group to conduct the pilot testing is the one that is similar to the actual study sample. From the 10 questionnaires that were sent out, 5 companies responded (response rate of 50%).

In the case of Malaysia, 10 questionnaires also were sent to the Managing Directors of companies and 3 companies responded (response rate of 30%). For both cases, the issues identified focussed on the length of the questionnaire, sentences being too wordy, ambiguity, and double-barrelled questions. All the comments were analysed and used as a tool for improving the final questionnaire.

3.5 Reliability and Validity of Quantitative Data

Any questionnaire needs to be tested to ensure its consistency and accuracy and ensure that it measures what it is purported to measure. The main criteria used for evaluating questionnaires are as follows.

3.5.1 Reliability

A reliability test is used to measure the accuracy and precision of the questionnaire through internal consistency analysis. There are several ways to test reliability, such as the test re-test method, the split-halves method and the internal consistency method (Hussey and Hussey, 1997; Zikmund, 1997; Sekaran, 1992). Internal consistency analysis was the most popular and was widely used in the majority of previous research (Bryman and Bell, 2003). This approach to measurement was adopted by Saraph et al. (1989) to test the reliability of their questionnaire. They reported that internal consistency analysis works well in field studies and most general forms of reliability estimation. As argued by Litwin (1995; p. 24), *"Coefficient alpha measures internal consistency reliability among a group of items combined to from a single scale. It is a statistic that reflects the homogeneity of the scale. That is, it is a reflection of how well the different items complement each other in their measurement of different aspects of the same variable or quality"*. Thus, reliability can be calculated through Cronbach's coefficient alpha values (Cronbach, 1951), which refer to the degree of homogeneity of a sample. The acceptable value for Cronbach's alpha is 0.70 although some studies have used 0.60 (Hair et al., 1992). The results (Table 3.9) show the reliability of the questionnaires used in this research. The Cronbach's alpha value ranged from 0.7476 to 0.8601; therefore, it was within the acceptable level and the results of the study were considered reliable.

3.5.2 Validity

Validity refers to the extent to which a test measures what it actually wishes to measure. Three major forms of validity are normally used: content, construct and criterion validity (Flynn et al., 1990). On the other hand, Sarantakos (1998) suggests there are two ways to measure the validity of a questionnaire: empirically (criterion validity, concurrent validity and predictive validity) and theoretically (face validity, content validity, construct

validity, internal and external validity). The questionnaire in this research used content validity and criterion validity for the validation process.

Table 3.9: Internal consistency analysis (Cronbach's alpha)

Sections	Factors	No. of items	Alpha value	Items deleted	Alpha value after items deleted
A	TQM Practices	23	0.7546	None	0.7546
B	Performance	23	0.7476	None	0.7476
C	Process Management	17	0.8317	None	0.8317
D	Human Resources	35	0.6312	4 items	0.8116
E	Leadership	17	0.8601	None	0.8601
F	Inhibitors	14	0.8459	None	0.8459

a) Content validity

Content validity refers to the items to be scaled and scales to be used. In this study, the questionnaires were based on an extensive literature review critically evaluated by experts and graduate students in the Logistics and Operations Management Section (LOM), Cardiff University. All the comments and suggestions were reviewed and the necessary amendments were included.

b) Criterion validity

Criterion validity, which is also known as predictive validity or external validity, is concerned with how well scales, representing the various quality management practices, are related to measures of quality performance. In order to measure criterion validity, correlation coefficients between the TQM constructs were performed and Table 3.10 indicates that there were significant relationships among TQM constructs.

The postal survey produced valuable information specific to individual companies and groups of companies; however, due to the limitations of quantitative research generally (and postal surveys specifically) the researcher found it more appropriate to employ the case study strategy to obtain in-depth information about the subject of interest.

3.6 Case Study Strategy

A second methodology used in this research was that of a case study strategy. This strategy, as employed by the researcher, was intended to obtain in-depth information and a clear understanding about the case companies and TQM (Easterby-Smith et al., 1991). A case study is one of the research strategies that focus on understanding the dynamics of an environment or situation and was appropriate for this research given its guiding questions and objectives. Several previous researchers have used the case study approach. Such studies include Ghobadian and Gallear (1996), who examined the TQM implementation by SMEs; Yusof and Aspinwall (2000b), who explored UK SMEs and TQM implementation; and also, Tannock et al. (2002), who examined the Thai SMEs attempt to implement TQM.

Table 3.10: Correlation between TQM constructs (criterion validity)

Elements	TQM Practices	Performance	Process Management	Human Resource	Leadership	Inhibitors
TQM Practices	1.00					
Performance	0.299*	1.00				
Process Management	0.270	0.473**	1.00			
Human Resource	0.347	0.256*	0.125	1.00		
Leadership	0.114	0.413	0.267	0.118	1.00	
Inhibitors	-0.090	-0.174	-0.236	-0.186	-0.244**	1.00

Punch (1998) supports this approach especially where one or more cases are studied in detail using appropriate methods to answer specific research questions. It is an acceptable approach in social science research with regards to manufacturing organisations in particular (Bryman, 1989; Hines, 1995; Massey, 2000). Yin (2003, p 23) states a case study offer "*an investigation of a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident*". Furthermore, he argues, a case study approach is more suitable to answering 'how' and 'why' questions and where the researcher has little control over the events or

subjects. In fact, the case study can be used to measure many variables under conditions that make experiments or surveys inappropriate (Bonoma, 1985).

According to Eisenhardt (1989, p. 534), case studies are *"particularly well-suited to new research areas or research areas for which existing theory seem inadequate. This type of work is highly complementary to incremental theory building from normal science research. The former is useful in early stages of research on a topic or when a fresh perspective is needed, while the latter is useful in later stages of knowledge"*. She also stresses theories can be constructed using the case study approach and the case study approach provides a roadmap for achieving it. Since the main objectives of this study were to answer 'how' questions, a case study was considered a suitable approach. Table 3.11 shows the appropriateness of different research strategies as suggested by Yin (2003) and shows the cross case study is the most appropriate for this study. In addition, his approach, which was accepted and duly followed, describes the steps involved in developing a case study, as displayed in Figure 3.4.

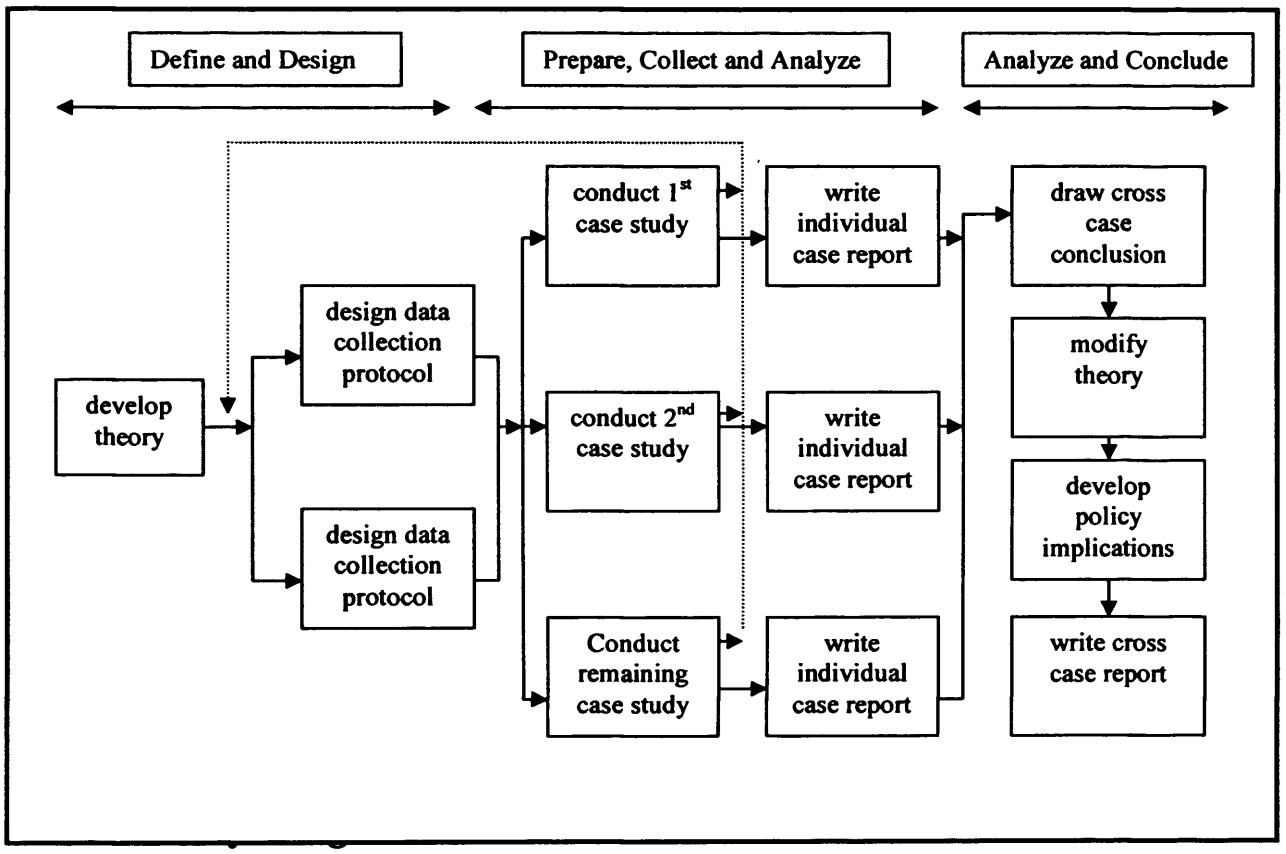
Table 3.11: Relevant situations for different research strategies (Yin, 2003)

Strategy	**Forms of Research Question**	**Requires Control of Behavioural Events?**	**Focuses on Contemporary Events?**
Experiments	How, why?	Yes	Yes
Survey	Who, what, where, how many, how much?	No	Yes
Archival analysis	Who, what, where, how many, how much?	No	Yes/No
History	How, why?	No	No
Case study	How, why?	No	Yes

Research design is very important to every study, providing guidance to the researcher regarding the logical path to be followed. The researcher must design questions to be answered and read so that an ultimate conclusion can be drawn. Stake (2000) puts forward the argument that case study research is concerned with the complexity of the

case in question. He identifies three different types of case study: the intrinsic case study, the instrumental case study and the collective case study. According to him, the intrinsic case study makes no attempt to generalise beyond the single case or theory building. The instrumental case study provides insight into issues of interest, and the collective case study employs a number of cases to investigate general phenomena.

Figure 3.4: Case study method (Yin, 2003)



On the other hand, Yin (2003) prepares four types of case study design as shown in Figure 3.5 and as follows:

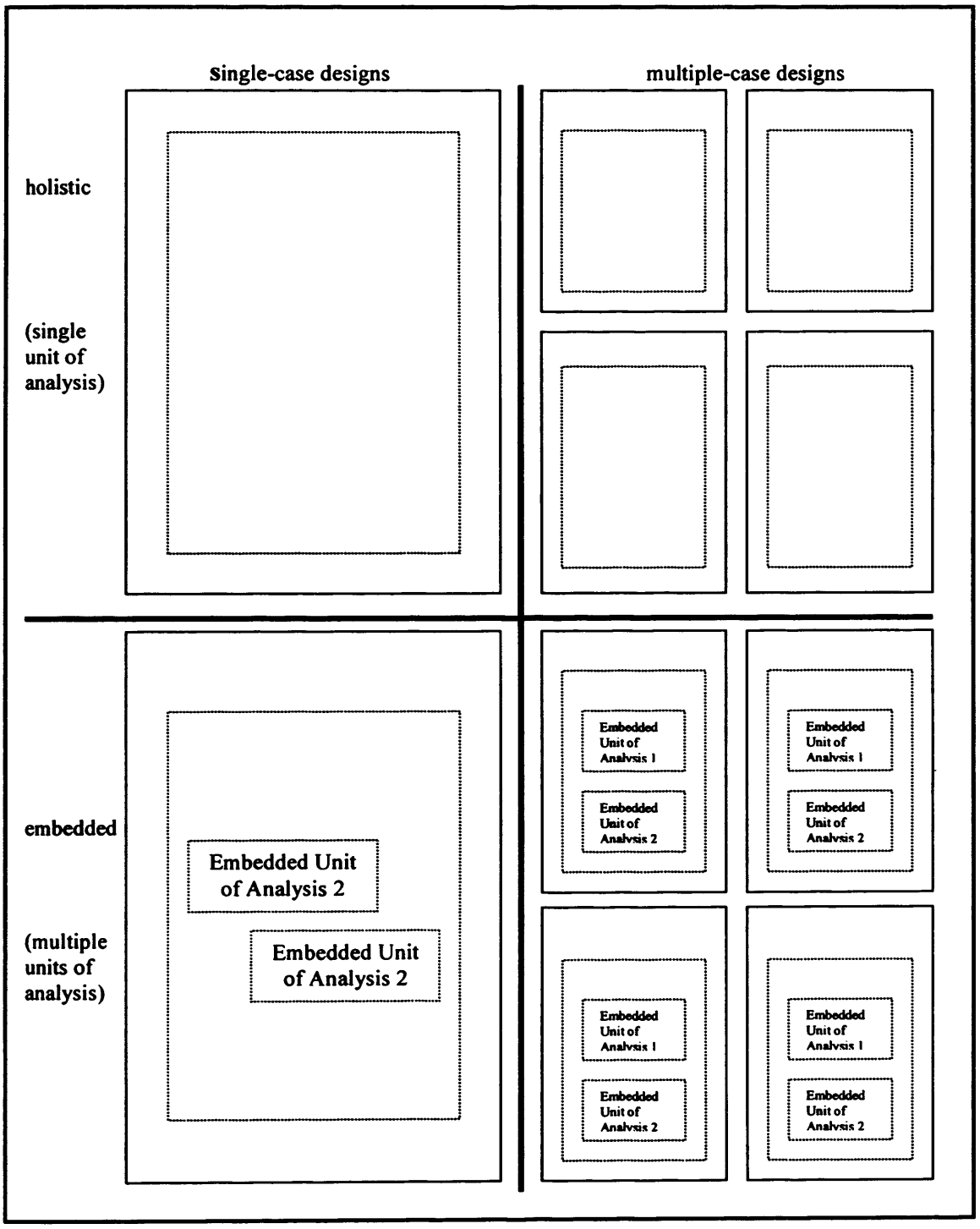
a) Type 1: single case (holistic) designs

b) Type 2: single case (embedded) designs

c) Type 3: multiple case (holistic) designs

d) Type 4: multiple case (embedded) designs

Figure 3.5: Types of design for case study (Yin, 2003)



The selection of single case or multiple cases is made according to the objectives of the research, the research questions to be answered, and the availability of resources in conducting a study. The researcher believed multiple cases represented a more robust approach to the qualitative study and later development of the TQM model (Herriott and Firestone, 1983; Yin 2003). In relation to this research, the case study design employed was Type 3, that is, multiple case (holistic) designs. A total of eight SME manufacturing companies were involved in this study. Thus, the study offers rich information from different perspectives in terms of the strategies, plans and approaches of TQM implementations (Larson and Sinha, 1995).

In this case study, questions were divided into four sections, namely, 'managing the business', 'quality management', 'operations management' and 'human resources'. The questions were designed thus because from the literature review it could be seen that those functional activities play a very important role in implementing TQM (Bou and Beltran, 2005; Dale, 2003; Oakland, 2000; Anderson and Sohal 1999; Dahlgaard, 1998).

Each set of questions was designed differently according to each functional area; this was to ensure that the right questions would be asked of the right informant. The information gathered from different perspectives within one organisation was replicated in each case. Table 3.12 indicates the personnel involved in the case study and why they were selected.

Below are the outlines of the question design for the case study interview. These questions were divided into four sections:

- Section 1: General information

  The first section consisted of nine questions. The questions asked were related to general information about the company such as company name and age of establishment, owner's nationality and type of ownership, main activity, number of full time employees, customers, and quality management system. The aim of these questions was to get a brief idea about company background and activities.

Table 3.12: Personnel involved in case study

Who?	Why?	References
Managing Director	Responsible in managing, controlling directing and leading the whole employees toward achieving goal and objectives of the organisation.	Deming (1986); Juran (1988); (Oakland (2003); Dale (2003); Ahire et al. (1996).
Operations Manager	Responsible in planning, decision making and the overall management of production department in organisation.	Brown et al. (2007); Schonberger (1997); Slack et al. (1998); Maskell (1991).
Quality Assurance Manager	Responsible for the implementation of quality management practices in organisation.	Quazi and Padibjo (1998); Saraph et al. (1989); Ahire et al. (1996).
Human Resource Manager	Responsible for planning, recruitment, training and development, performance appraisal and compensation of employees in organisation.	Chandler and McEvoy (2000); MacDuffie (1995); Marchington (2002); Delbridge and Turnbull (1992).

- Section 2: Managing the business

  The second section had thirty questions, which focussed on processes of strategy, leadership, and business structure and business performance. The intention of this section was to identify how company strategy was developed and reviewed, what business practices and business culture were employed and what indicators were used for business performance.

This information was used to investigate the role of top management in managing the business, which is reflected in the TQM implementation.

- Section 3: Human resource management

This third section had six sub-sections and was concerned with human resources and employee relations. The questions were related to planning, recruitments, training and development, and factory practices. The questions identified the role of human resources in supporting the success of TQM implementation.

- Section 4: Quality management

  The fourth section had thirty-two questions and focussed on most aspects of quality practices in the factory. The questions were concerned with quality planning, quality approach, quality practices, quality standard and quality and supply chain management. The aim of these questions was to explore the quality management practices and policies in the factory.

- Section 5: Operations management

  The fifth section was concerned with operational data specific to the process of production and its management. This section consisted of 22 questions and was divided into four sub-sections. This included the overview of operations management, planning operations management, operations performance, and working practices. The purpose of these questions was to identify how operations management were carried out in the factory.

3.7 Case Study Selection

The cases in this study included eight Malaysian manufacturing SMEs. According to Eisenhardt (1989, p. 536), *"there is no ideal number of cases; a number between 4 and 10 cases usually works well. With fewer than 4 cases, it is often difficult to generate theory with much complexity and its empirical grounding is likely to be unconvincing unless the case has several mini-cases within it. With more than 10 cases, it quickly becomes difficult to cope with the complexity and volume of the data"*. Therefore, eight cases were appropriate for this research to gain in-depth information about the issues of interest. Each of the cases was selected using the purposive sampling method, which is suitable for a realist approach, and to gain the most insight into the phenomenon (Denzin and Lincoln, 2000). Denzin and Lincoln argue, *".....many researchers*

employ....purposive and not random sampling methods. They seek out groups, settings and individuals where...the processes being studied are most likely to occur". Purposive sampling is often used when small samples are involved such as in case study research (Neuman, 2000). Such was the logic for this study and Neuman's advice was duly accepted.

The purposive selection criteria and the main purpose were shown in Table 3.13. The informants were selected from senior and functional management with responsibility for developing strategic planning, operations management, quality assurance and human resource management. The cross-functional approach was adapted to allow a cross-informant comparison to be made in every case as well as between cases (Leonard-Barton, 1992).

The NPC population of award winning companies was selected purposively because this organisation and its awards were considered the most likely place to find good practice in terms of TQM. The award adopted by NPC is a derivative of an existing and reputable measurement system – the Malcolm Baldrige Award – which has been adopted by American businesses and internationally as an evaluation system which is associated with high and even 'world class' performance.

3.8 Interviews

An interview is defined as *"a conversation between interviewer and respondent with the purpose of eliciting certain information from the respondents"* (Moser and Kalton, 1985). According to Hussey and Hussey (2003, p. 156), *"interview is a method of collecting data in which selected participants are asked questions in order to find out what they do, think or feel".* Interviewing comes in a variety of forms and uses; the most common form of interviewing includes structured, semi-structured and unstructured interviews (Saunders et al., 2003, p. 246; Ghauri et al., 2002, p. 100).

Table 3.13: Purposive sampling criteria

Criteria	Main Purpose	Companies							
		A	B	C	D	E	F	G	H
Principle technology employed	To ensure that all cases have almost similar and simple technology.	✓	✓	✓	✓	✓	✓	✓	✓
Number of employees	To increase the probability that a formal management structured existed.	✓	✓	✓	✓	✓	✓	✓	✓
Year of establishment	To assure that all cases are matured enough in doing a business.	✓	✓	✓	✓	✓	✓	✓	✓
Customers	To ensure that all cases supplied to the same customers.	✓	✓	✓	✓	✓	✓	✓	✓
Locations	To ensure all cases manufactured and supplied products to domestic customers.	✓	✓	✓	✓	✓	✓	✓	✓
Ownerships	To assure that the decision making processes and strategy development are not influenced by outsiders.	✓	✓	✓	✓	✓	✓	✓	✓

Structured interviews use pre-determined questionnaires (or questions that have been prepared beforehand). However, the semi-structured interview does not have the standard format of the structured interview and so is more flexible. The unstructured interview is normally conducted informally and respondents are free to talk about issues of interest. According to Burgess (1984), interviews provide the researcher with the opportunity to explore new perspectives or dimensions of a problem and to secure vivid, accurate inclusive accounts based on personal experience. Since the interviewing approach to acquiring information or data is widely used, it has been claimed that we live in an 'interviewing society' (Atkinson and Silverman, 1997; Silverman, 2000). In the case of this research, the approach for data collection employed was the semi-structured

interview due to the complex nature of the concept and subjects discussed. This allowed the researcher more freedom to explore issues and interesting angles during the interview whilst keeping to a script. Moreover, the semi-structured interview offered an in-depth understanding of the research subject and, through its flexibility, allowed interesting avenues of exploration to be opened.

The interview process was carried with individuals rather than with a group to create a suitable environment that would enable the informants to express freely their views about the company. Bryman and Bell (2003) observe that a group interview often leads to an argumentative discussion and to interviewees challenging each other's views; this situation affects the interview session and means the researcher cannot complete the interview process. This was considered to be a risk and so an individual approach was used. The informants were selected from the Managing Directors, Human Resource Managers, Quality Assurance Managers and Operations Managers. The interview was sometimes pre-arranged with the informant and sometimes took place on an 'ad-hoc' basis due to time constraints. The length of each interview ranged from one hour to two hours depending on time availability. The interviews were recorded on audio tape to ensure the accuracy of the data. Many interviews were conducted during the three months periods of field research in Malaysia. The tapes allowed better analysis to be made.

3.9 Additional Methods

In addition, selected secondary data were collected during the interviews such as company profile, training data, internal memos and other printed sources of data. Churchill (2002) puts forward the argument that research should start with primary data and proceed with secondary data when primary data is exhausted. However, in the case of this research, the researcher collected secondary data during the fieldwork because it saved money and time (both were constraints to this study). Moreover, during fieldwork, the researcher was able to identify the documents relevant to the research and informants also volunteered supporting data.

During the field research, the researcher also had many opportunities to go on plant tours guided by informants. These tours helped the researcher to understand the production process, machine set-ups, problem-solving activities and other phenomena as they happened. The purpose of both methods was to validate data collected from the interviews and questionnaire.

3.10 Methods of Data Analysis

The aim of data analysis is to determine and examine patterns and explore relationships among variables (May, 1997). Data management and analysis for the survey questionnaire was performed using the Statistical Package for Social Science (SPSS) for MS Windows version 12.0. The analysis used non-parametric measures due to the small sample size and the non-normal data distribution as in Pallant (2005).

In the case of qualitative data, Miles and Huberman (1996) suggest that three critical steps are needed for analysis:

- Data reduction: the data that appears in the writing up of field notes or transcriptions are selected, focussed, simplified, abstracted and transformed.

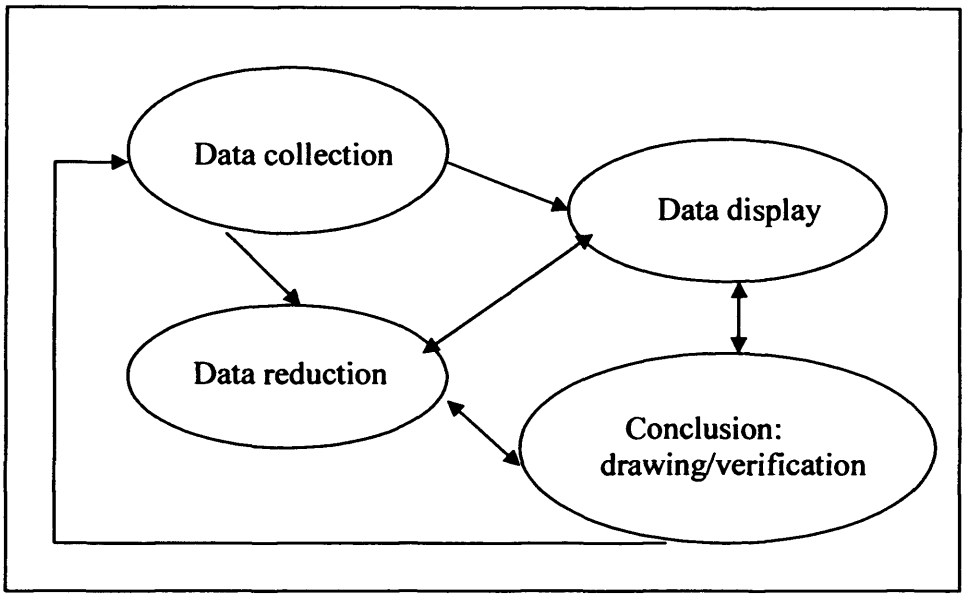
- Data display: information is organised, compressed and assembled to permit conclusions to be draw and action taken if needed.

- Conclusion drawing and verification: the researcher is able to explain the actual phenomenon and verify it.

The three types of components in qualitative data analysis were displayed in Figure 3.5. The approach was accepted as robust by the researcher and was followed according to the analysis protocol. With regards to this research, the case study data were analysed using the steps suggested by Miles and Huberman (1996). The researcher was also aware of qualitative data analysis packages, such as NUD*IST and NVivo, for analysing qualitative data. Due to the limited use of this software, the simpler and more practical

alternative was chosen following a review of these qualitative packages with lecturers and doctoral students at the British Academy of Management (BAM) Conference 2005 in Oxford and Northern Ireland, United Kingdom in 2006.

Figure 3.6: Three types of components in qualitative data analysis (Miles and Huberman, 1996)



3.11 Reliability and Validity of the Case Study

The reliability and validity of survey questionnaires was discussed earlier in this chapter. The positivist researcher generally assumes that the research finding is valid and reliable if the results can be replicated and are statistically significant (Silverman, 2000). However, this argument has been criticised by Popper (1989, p. 83) with the statement *"what characterises the empirical methods is its manner of exposing to falsification, in every conceivable way, the system to be tested. Its aim is not to save lives of untenable systems but, on the contrary, to select the one which is by comparison the fittest, by exposing them all to the fiercest struggle for survival"*. Bryman and Bell (2003) suggest reliability and validity depend on to what extent the researcher feels the case evaluation is appropriate. Hammersley (1992, p. 42) stated, *"validity is another word for truth and reliability refers to the degree of consistency with which instances are assigned to the same category by different observers or by the same observer on different occasions"*.

Therefore, to overcome the validity and reliability issue, Yin (2003) provides tactics to validate the case studies. He summarised the different types of validity as follows:

a) Construct validity, related to 'establishing' correct operational measures for the concepts being studied.

b) Internal validity, related to 'establishing' a causal relationship whereby certain conditions are shown to lead to other conditions as distinguished from spurious relationships.

c) External validity, related to 'establishing' the domain to which a study's finding can be generalised.

d) Reliability, related to 'demonstrating that the operation of a study - such as the data collection procedures - can be repeated with the same results'.

With regard to this research, the validity and reliability of the case study were based on the suggestions by Yin (2003). Table 3.14 demonstrates the steps taken to ensure the validity and reliability of the research.

Table 3.14: Research tactics and protocols adapted (Yin, 2003, p. 34)

Tests	**Case Study Tactic**	**Phase of Research in Which Tactics Occurs**	**The Research Design**
Construct validity	-Use multiple sources of evidence	Data collection	Yes
	-Establish chain of evidence	Data collection	Yes
	-Have key informants review draft case study report	Composition	Selected only
Internal validity	-Do pattern matching	Data analysis	Yes
	-Do explanation building	Data analysis	Yes
	-Do time series analysis	Data analysis	Yes
External validity	-Use replication logic in multiple case studies	Research design	Yes
Reliability	-Use case study protocol	Data collection	Yes
	-Develop case study database	Data collection	Yes

3.12 Limitations of the Study

No research study is free from limitations. This section examines the limitations of the research design, which were identified from the beginning. In addition, the counter measures taken to minimise the impact of these issues are also described. The limitations of this research are summarised as follows:

a) Research design limitation is evaluated in terms of the breadth and depth of the study and the limit to the number of cases studied. However, the actual number of cases was within the number recommended by Eisenhardt (1989).

b) Bias in informant responses needed to be considered during the research. As a counter measure to this limitation, the researcher adopted a multiple informant approach and investigated further any 'outlier' responses.

c) The knowledge of TQM among SME companies was very limited. This situation had an impact on the response rate of questionnaire and general access to the research topic. Therefore, the researcher conducted semi-structured interviews to validate the quantitative data as well as to explore issues in greater depth.

d) Accessibility to the participating companies also needed to be addressed as a limitation. At first, two of the participating companies were not ready to accept the researcher, giving the reason they were too busy with the production process. After explaining in detail to the Managing Director why and how the research was to be conducted, finally, they agreed and gave their full commitment to the research.

e) Availability of funds to conduct the research was very limited. This was due to the budget constraint that had been allocated to PhD students. The researcher needed to bear some of the cost especially during the three months of field work in Malaysia.

f) This research was focussed on SME companies that employed simple technology such as plastic injection moulding and metal stamping. Therefore, the finding of this research could be generalised between similar businesses in similar industries.

3.13 Ethical Considerations

Ethical issues always need to be addressed and considered in social science or management research; this is directly related to the integrity of the research and the subject matter (Bryman and Bell, 2003). The ethics are relevant to all situations and activities and can affect anybody (Churchill, 2002). Professional associations such as the American Psychological Association (1997) and the British Sociological Association (2001) have formulated codes of ethics for their members. These codes of ethical conduct provide guidelines to researchers conducting research.

In this research, a few ethical issues arose during the design and conduct of the investigation. Firstly, the participating companies were informed of the objectives of the research and the role of the researcher. The permission to access to the company was obtained prior to the interview session and before the appointments with informants be made. Secondly, the overall findings of this study were not reported to the participating companies. However, a summary report was sent to individual companies for their references and feedback (validation purposes). Furthermore, the company and respondents' names were not identified. Finally, no professional advice was given to the companies during the whole process of the research. Ghauri and Grønhaug (2002, p 18) emphasise that *"researchers have a moral responsibility to explain and find answers to their questions honestly and accurately. They have to point out the strengths of their methods and models but also have to inform us about the weaknesses and reliability of their results"*. On many occasions and during reviews, ethical issues were discussed with the supervisor.

3.14 Chapter Summary

This chapter began with the discussion of the philosophical approach to do social science research, which included positivist, naturalist and realist perspectives. The perspectives

section differentiated between each of the approaches and demonstrated how they influenced this research. A realist approach was chosen for this research; the detailed discussion and defence were then made. The chapter continued with the research strategy employed including the survey questionnaire and case study for triangulation. The discussion also addressed the reliability and validity issues of the methods used. At the end of the chapter, the limitations and ethical issues were highlighted and the counter measures identified. The next two chapters will focus on the results and analysis of the study drawing from the survey questionnaires and case studies.

In addition, the researcher also had presented papers at the 11^{th} and 12^{th} World Congress for TQM which was held in Canada (2005) and New Zealand (2006). The aim of the researcher was presented by these papers and was used to gain a feedback and comments from experts and academia at the congress. The expert reviewers included many of the quality gurus explored in the literature review including the TQM systems theorist Professor Oakland. All comments and critiques then were use by the researcher to strengthen this study. In this manner, the researcher was confident that the methodology and research design were valid and met with the rigours needed to explore this little known but important area of management in Malaysia and with the international community of TQM researchers.

Chapter 4: Survey Results

4.0 Introduction

The previous chapter discussed, in detail, the strategy and methodologies designed for this research. The structure included data collection through a survey questionnaire and interviews. This chapter will present the findings from the survey questionnaire that was distributed to Malaysian and Welsh manufacturing SMEs. In the case of the Malaysian SMEs, the companies list was provided by SMIDEC. Meanwhile, the list of Welsh companies was supplied by WDA. The questionnaire employed for this study can be seen in Appendix 2.

The first section of this chapter examines the general descriptive data of the responding companies in terms of years of establishment, employment size, ownership, and customers. The second section presents the results of the approaches and the benefits resulting from TQM implementation. The third section explores company performance including the performance indicators used to cover delivery, lead time and quality inspection. The fourth section reviews the tools and techniques used for developing and formulating strategy, problem solving and continuous improvement. The fifth section discusses the human resource practices of the company. This section offers methods for recruiting new workers, features of employment, training, problem-solving teams, suggestion schemes and rewards. Finally, the last section examines the perception respondents have of leadership style and inhibitors of TQM implementation.

Further analysis was carried out using the chi-square independent test to examine the relationship between perceived TQM and selected variables that have been highlighted in the literature (see Table 4.1). The chi-square independent test was the most appropriate means of analysis for this research due to the very small size of the samples involved and the data having a non-normal distribution (Pallant, 2005). The companies that had implemented TQM were identified through questions in Section B of the survey questionnaire (these required respondents to state their perception of whether their business was TQM organisation or not. This obviously is a reflection of an individual's

viewpoint but this question was cross compared to ensure that the individual's belief was in accordance with other tests of TQM performance. The test was carried out by the researcher to identify enablers of TQM implementation and answer the research questions. Other variables such as size, nationality, sector, year of establishment and principle activities were not important and not tested in this phase of the study.

The purpose and outcome of the work presented in this chapter is to identify the broad themes and issues regarding enablers that influence TQM implementation, in particular the themes associated with effective and non-effective TQM implementation. Then From this foundation, issues were explored in greater depth with participating informants during the field research into the case study companies in Malaysia.

The tests of TQM implementation cover a number of soft and hard measures and do not rely solely on the perception of the manager completing the questionnaire. These measures are grounded in the literature and reflect the most significant works concerning TQM for large and small businesses (Blackmon, 1998; McAdam, 2004; Husband and Mandall, 1999). In addition – to ensure the person who was named on the questionnaire was the person completing it, several checks were conducted using follow-up telephone calls and other means of ensuring data integrity (internet checks via company records).

It should be noted, and has been previously stated, that no statistical tests were engaged to assess differences between the Welsh and Malaysian SME samples because the importance of this phase of the study was to see what techniques and features were similar and therefore not subject to cultural barriers. It is noted though that this activity would have been undertaken if an outcome of this study was the production of a culturally specific model of TQM implementation in Malaysia. Such differences were rejected in favour of the development of a general model for TQM implementation and features for Malaysian businesses.

Table 4.1: Tested variables against perceived TQM organisation

TQM Implementation	Tested Variables	Authors
Perceived TQM	Employment size	Oakland (2003); Dale (2003); Garvin (1988)
	Quality management system in operation	Beattie and Sohal (1999); Idris et al. (1996); Kanholm (2000)
	Approaches to TQM implementation	Agus and Mokhtar (2000); Bayazid (2003)
	Number of years of implementing TQM	Agus (2001); Ismail and Hashimi (1999)
	Source of TQM awareness	Yusof and Aspinwall (2000b); Gunasekaran (1999)
	Results of TQM implementation	Ahire (1996); Hackman and Wageman (1995)
	Awards received	Ghobadian and Woo (1996); Mann and Voss (2000); Wilkes and Dale (1998)
	Capability to design product	Oakland (2003); Dale (2003)
	Product received on time by customer	Anderson and Sohal (1999); Hansson and Klefsjo (2003)
	Lead time offered to customers	Sousa et al. (2005); Kaynak (2000)
	Product returned from customers as warranty claims	Hendricks and Singhal (1997); McDuffie and Pil (1997)
	Product failing final inspection	Sousa et al. (2005); Yusof and Aspinwall (2000b)
	Industry average performance comparison	Sousa et al. (2005); Agus (2004)
	Company strategy	Agus (2004); Oakland (2003); Garvin (1988)
	Tools and techniques used in formulating strategy	Ahmad and Hassan (2003); Sousa et al. (2003)
	Strategy review	Agus (2004); Lau and Idris (2001);
	Formal training of employees	Marchington and Wilkinson (2002); MacDuffie (1995)
	Average age and length of service	Marchington and Wilkinson (2002); Yang (2006)
	Methods of selecting new workers	Ahmad (2002); Chandler and McEvoy (2000)
	Use of a Formal induction scheme	Ahmad and Schroeder (2003); Bou and Beltran (2005)
	Features employment provided	Marchington and Wilkinson (2002); McDuffie (1995)
	Use of a Formal performance of appraisal	McDuffie (1995); Soltani et al. (2006); Ogboro and Obeng (2000)
	Use of a Formal problem solving teams	McDuffie and Pil (1997); Imai (1997)
	Use of a formal Suggestion scheme	Sousa et al. (2005); Sila and Ebrahimpour (2005)

CHAPTER 4:
SURVEY RESULTS

As a summary, the tests undertaken during this phase of the research included Chi Square tests but the Mann Whitney U test and Kruskal Wallis tests were not conducted because these latter tests are inappropriate for the data set (Pallant, 2005). The main reason why they are unsuitable is because they are appropriate for two populations not one and the student did not intend to compare the Welsh manufacturers with the Malaysian businesses. The decision not to compare the two sets was take early in the design of the research strategy for the main reason that the tests were not to compare between nations but, in this phase of the research, the testes were to detect the presence of absence of features (of perceived TQM companies) that could inform the main research concerning case studies in phase two. In retrospect, this decision to not conduct the testing between the two populations was considered a potential limitation to the work but this was rejected because whilst of interest to comparative researchers it did not contribute to the main research intent which concerns TQM features and performance not national characteristics of differences between Eastern and Western interpretations of TQM.

4.1 General Descriptive Statistics of Respondents

4.1.1 Background of respondents

This study focussed on Malaysian and Welsh manufacturing SMEs. Initially, the sample list provided by SMIDEC consisted of 400 registered Malaysian companies, which included manufacturing, services, construction and financial organisations. After a de-selection process, it was found that only 212 companies were involved in manufacturing and had processes similar to those of the Welsh SMEs. The list provided by the WDA consisted of 143 companies but only 116 were involved in manufacturing. Therefore, a total of 212 questionnaires were distributed to Malaysian SMEs and 116 questionnaires to Welsh SMEs. Initially, the number of responses received was very low for both samples. Remedial action was taken to increase the response rate by sending a reminding letter and a follow-up telephone call. After this action had been taken, the number of responses received increased. For the Malaysian SMEs, the total response rate was 45 companies or 21.2% and for the Welsh SMEs, it was 34 companies or 29.3% (see Table 4.2).

The majority of the respondents to the survey, for both cases, were Managing Directors and Managers (Human Resources, Quality Assurance and Operations Management). The results show that information was gathered from persons who had authority for decision making and TQM change initiatives in the company. The response rate satisfied the rule proposed by Roscoe (1975) and Sekaran (1992: p. 253) who suggest a sample size larger than 30 and less than 500 is representative for most research of this nature.

The response rate was similar to that of the study carried out by Aziz et al. (2000) who studied TQM for SMEs but did not research the case studies in greater depth. The research was employed to identify the differences and similarities of quality practices among UK and Malaysia manufacturing companies, and managed to obtain a 31.0% (UK) and 27.0% (Malaysia) response rate.

Table 4.2: Analysis of responses by respondent category

Categories	**Total questionnaires issued**	**Usable responses received**	**Usable responses received pre-reminder 1**	**Usable responses received pre-reminder 2**	**Total usable responses**	**Total usable response rate**
	Frequency	**Frequency**	**Frequency**	**Frequency**	**Frequency**	**Percentage**
Malaysia	212	20	14	11	45	21.2%
Wales	116	12	13	9	34	29.3%
Total	**328**	**32**	**27**	**20**	**79**	**24.1%**

Similarly, the response rate for both samples was similar to those of other major studies in the field (Sohail and Hoong, 2003; Rahman, 2000; Yusof, 1999).

4.1.2 Year of Establishment (Maturity of the Companies)

The first analysis was carried out to test the maturity of the businesses and to identify new businesses where TQM can have been 'designed in' rather than having evolved. Table 4.3 shows that participating companies in both Malaysia and Wales had mature business systems with 95.4% (Malaysian) and 94.2% (Welsh) having more than 5 years of establishment. Respondents with less than 5 years of establishment were considered immature businesses and represented 4.4% of Malaysian and 5.8% of Welsh respondents. For instance, there was a higher percentage (82.6%) of Welsh respondents that had been operating for more than 15 years as compared to 51.0% of Malaysian respondents. The results indicate that the majority of Welsh SMEs had greater experience and a more stable business than had Malaysian SMEs. These findings parallel those of the study by Aziz et al. (2000) wherein 86.0% of UK respondents had been in operation for more than 15 years as compared to 56.0% of Malaysian respondents. Business maturity is one indicator with which the study was concerned. Another influence upon TQM implementation and sustainability is the ownership of the firm especially nationality; countries like Japan have a long tradition of TQM.

Table 4.3: Company year of establishment

Establishment	Malaysia		Wales		Classification
	No. of respondents	Percentage	No. of respondents	Percentage	
Less than 5 years	2	4.4%	2	5.8%	Immature Companies
5 – 10 years	6	13.3%	2	5.8%	Mature Companies
11-15 years	14	31.1%	2	5.8%	
More than 15 years	23	51.0%	28	82.6%	
Total	**45**	**100%**	**34**	**100%**	

4.1.3 Company Ownership and Nationality

Ownership is associated with the very definition of what characterises a small business. The majority of small businesses are managed by their owners as compared to large firms

(Murphy, 1996). On the other hand, nationality is membership of a particular nation (Oxford Dictionary, 1994). With regards to this research, the participating companies' ownership consisted of private limited companies (commercial imperative for profit), public limited companies, partnerships and subsidiaries (see Table 4.4). Most of the respondents were private limited companies in both samples and were operated by local businessmen. This result ensured the business culture among participating companies was that of an SME rather than a small subsidiary of a large corporation.

4.1.4 Company Principles Activities

The activities of participating companies were quite diverse and ranged from plastic component production, metal based component production, furniture, food, electronic and rubber production. Table 4.5, shows that plastic based components was the main activity in which respondents in Malaysian SMEs were involved (42.0%) and the manufacture of metal based components was performed by the highest percentage (29.0%) of Welsh SMEs. Both these modes of production involve simple and mature technology with short process flows (Slack, 1991; Hill, 2000).

Table 4.4: Company ownership and nationality

Ownership	**Malaysia**		**Wales**	
	No. of respondents	**Percentage**	**No. of respondents**	**Percentage**
Private Limited	45	100%	30	88.2%
Public Limited	-	-	3	8.8%
Partnership	-	-	1	2.9%
Subsidiaries	7	15.5%	10	29.4%
Nationality				
Local	42	93.3%	23	67.6%
Foreigner	3	6.7%	11	32.4%

Table 4.5: Main business operated by respondents

Main Activity	Malaysia		Wales	
	No. of respondents	Percentage	No. of respondents	Percentage
Plastic components	20	42.0%	3	8.7%
Metal components	16	35.4%	10	29.0%
Furniture	4	8.8%	3	8.7%
Food	3	6.6%	1	2.9%
Electronic and Rubber	2	6.6 %	8	23.2 %
Others	-	-	9	26.1%
Total	**45**	**100%**	**34**	**100%**

Thus, the research is summarised as industry-established SMEs with simple production systems.

4.1.5 Employment Size

Although the definition of SMEs is not uniform across countries, employment size is normally used to define SMEs (Ayyagari et al. 2005). For example, the Australian government defined SMEs as companies with fewer than 100 employees while the Japanese government, on the other hand, defined SMEs as companies employing not more than 300 people. In the case of Malaysia and Wales, both countries also defined SMEs based on employment size. The definition of SMEs in Malaysia was employment size less than 150 workers and in Wales it was not more than 500 persons. Table 4.6 indicates that all of the responding companies for Malaysia and Wales had fewer than 150 and 500 persons respectively. Hence, the results fit with the definition of SMEs by the Malaysian and British governments, but it is noted that the majority of respondents in this research were medium sized companies (Malaysian, 69.1%; Welsh, 55.5%).

The chi-square analysis shows that there were no statistically significance differences (at 5% level) between the number of employees and perceived TQM organisation (χ^2 = 8.654, p = 0.803). This indicates the number of employees had no influence on TQM implementation.

Table 4.6: Number of employees in companies

Malaysia				**Wales**			
Number of employees				**Number of employees**			
Less than 50 persons	51-100 persons	101-150 persons	**Total**	Less than 100 persons	100-299 persons	300-499 persons	**Total**
30.9% (14)	17.6% (8)	51.5% (23)	**100.0% (45)**	43.5% (15)	46.8% (16)	8.7% (3)	**100.0% (34)**
Small Sized	Medium Sized			Small Sized	Medium Sized		

4.1.6 Respondents' Positions in Companies

The questionnaire also enquired about the respondent's position in the company to determine whether the respondent was the right person to answer questions. The analysis (see Table 4.7) exhibits the status of respondents in their right level in the business as a management level employee of the responding company. Generally, the respondents belonged to the rank of middle management and above, which ensured the results reflected the views of system designers. In the case of Malaysia, 77.8% of the respondents were in the middle management group. This group plays an important role in the management and operational matters of the company, including the management and control of key business systems. Conversely, 64.6% of Welsh respondents belonged to the top management group, that is, the group responsible for the overall management of the company. This result indicates the majority of the respondents were responsible for company management and could be considered as system designers. The responsibilities of systems designers include strategic planning and development, decision making,

policy deployment, human resource development, quality assurance and operations management of the company. Thus, the level of respondents in the company indicates they are authoritative sources of information on the issues of interest and system designers.

Table 4.7: Respondents position in companies

Positions	Malaysia		Wales		Category
	No. of respondents	%	No. of respondents	%	
Chief Executive Officer	-		1	2.9%	Top Management
Managing Director	8	17.8%	18	52.9%	
General Manager	2	4.4%	3	8.8%	
Manager	26	57.6%	11	32.1%	Middle Management
Assistant Manager	3	6.6%	1	2.9%	
Engineer	2	4.4%	-	-	
Executive	4	8.8%	-	-	
Total	**45**	**100%**	**34**	**100%**	

4.1.7 Work Experience

The respondents were also asked about their level of experience with their particular company. The length of service was used to indicate the level of experience and how familiar each respondent was with their responsibilities and with the working environment in the company. It can be seen in Table 4.8 that Welsh respondents were very experienced as compared to respondents in the Malaysian sample. Of the Malaysian respondents, 82.4% had less than 10 years' experience in their respective company. It is interesting to highlight that, as stated in section 4.1.2, the majority of Malaysian companies had been established for more than 15 years. Therefore, the result indicates these managers did not design the initial business systems and they must therefore have adapted these systems or helped them to evolve. In contrast, the proportion of Welsh respondents with more than 10 years' service was 66.0%. This shows that majority of

Table 4.8: Levels of experience

Years of Service	Malaysia		Wales	
	No. of respondents	Percentage	No. of respondents	Percentage
Less than 5 years	19	42.2%	8	23.5%
5 – 10 years	18	40.2%	7	20.5%
11-15 years	4	8.8%	5	14.5%
More than 15 years	4	8.8%	14	41.5%
Total	**45**	**100%**	**34**	**100%**

Welsh respondents were involved in designing the initial business system and were present during this initial design stage which is important from a systems theory perspective because these individuals set the first system in place using TQM.

4.2 Quality Management System Operated

4.2.1 Quality Management System Certification (QMS)

Much has already been written in the literature about quality management systems and standards (Dale and Oakland, 1994; Davies 1997; Rothery, 1993). Nevertheless, most of the literature and discussion on the implementation of quality management systems has focussed on large organisations, with little emphasis on SMEs (Lee and Palmer 1999; Van der Wiele and Brown, 1997). This research, therefore, examined the quality management system certification to see the level of system formalisation.

The quality management system ISO 9000 series is accepted worldwide as a foundation to establish TQM (Sun, 2000b; Najmi and Kehoe, 2000). ISO 9000 has attracted attention as the quality standard of choice of industrial businesses and industrial customers (Khan and Hafiz, 1999; Brown and Anders, 1994). The goal of SME businesses when adopting quality management systems is to improve quality practice and show customers their capability of meeting needs and quality process expectations (Tata et al., 2000). The

research found that almost 80.0% of the responding companies were certified with the ISO 9000 standard (see Table 4.9). This shows the majority of respondents in this research had a quality management system implemented in their company. This might be due to the directives from the senior management of the company as well as customers' demand for a quality product (Tan and Gilbert, 2001). Some authors suggest the reasons for companies gaining ISO 9000 certification was for improvement and to stay competitive in the market (Idris et. al. 1996; Poksinska et al. 2002). However, many authors in the literature argue ISO 9000 only provides a basic quality system and SMEs must move forward with formalised strategies and planning to ensure competitiveness in domestic and international markets (Dale, 2003; Rahman, 2001; Ramsay, 1998; Williams, 1997). Thus, SMEs with the advantages of ISO 9000 certification should take a step towards developing and implementing TQM.

Table 4.9: Quality management system certification

Quality Management System	**Malaysia**		**Wales**	
	No. of respondents	**Percentage**	**No. of respondents**	**Percentage**
ISO 9000	35	77.8%	28	82.4%
QS 9000	8	17.8%	8	23.5%
TS16949	4	8.9%	8	23.5%
ISO 14000	1	2.2%	13	38.2%
BSI Kite Mark	-	-	3	8.8%
BSI Standard	-	-	5	14.7%

The result was in keeping with that of the study by Aziz et al. (2000) where they claimed the number of UK respondents with ISO 9000 certification was high (70.0%) when compared with Malaysian respondents (32.0%). In addition, there were more Welsh ISO 9000 certified companies in this research than there were in the study conducted by Drew and Healy (2006) on Irish organisations. Drew and Healy discovered that only 46.0% of respondents had implemented ISO 9000 in their organisations. This might indicate that the majority of Welsh SMEs are aware of the importance of quality improvement and

want to stay competitive in the market. The support from senior management also might contribute toward improvement. Van de Wiele (1997) suggests ISO 9000 is a good foundation for SMEs to begin the quality improvement process.

In terms of QS 9000 and TS16949 standards, these were 17.8% and 8.9% for Malaysian respondents and 23.5% (both certifications) for Welsh respondents. The result suggests the levels of awareness and the use of quality management systems among SME companies were very high. The two quality management systems not adopted by Malaysian respondents were the BSI Kite Mark and the BSI standard and it may be because these systems are not well known among Malaysian SMEs as compared to ISO 9000 and QS 9000. Moreover, BSI Kite Mark and BSI Standard are specific to the UK environment. Of the Welsh respondents, only 8.8% and 14.7% had implemented the BSI Kite Mark and BSI Standard respectively suggesting that these management systems are not widely adopted in the UK SMEs and may be specific to a certain segment of industry. This result is similar to that of the study of Irish organisations by Drew and Healy (2006), which discovered only 11.0% had achieved the Irish Quality Mark. It is not surprising that some respondents had not implemented any quality management system at all and the study revealed that the proportion of Malaysian respondents with no quality system was 20.0%, and 8.8% of Welsh. Thus, the majority of SMEs claimed to use a formal QMS.

Further examination through the chi-square independent test shows there is a statistical significant difference (at the 5% level) between QMS and perceived TQM organisations ($\chi^2 = 18.287$, $p = 0.05$). This implies QMS has an impact on TQM implementation. The result is similar to that of a number of studies, which suggests there is a relationship or association between quality management systems and TQM implementation (Gotzamani and Tsiotras, 2001; Lewis et al., 2005, Magd and Curry, 2003; Quazi and Padibjo, 1998; Clarver et al., 2002; Dale and Lancelles, 1997; Wiele et al., 1997). The study therefore involved established businesses with established management and formal QMS.

4.2.2 Achievements of Quality Management System (QMS)

The length of quality management system implementation shows the awareness and maturity of the systems at sample companies. Table 4.10 shows 53.2% of the Malaysian respondents had implemented ISO 9000 for less than 5 years and 52.9% of Welsh respondents had held the award for more than 5 years. This situation implied that most of the Welsh SMEs in this study were mature in practising a quality management system and allowed for system stability in the company. In the case of QS 9000 and TS16949 achievement, more than 75% of respondents had no certification. Although the majority of respondents' main customers were from automotive industry, and QS 9000 was specifically designed for automotive production, it was not widely used among SMEs. This implies customers do not emphasise or require QS 9000 certification from their suppliers (SME businesses) as compared to ISO 9000 (Van de Wiele, 1997). The TS16949 quality system, on the other hand, is still at the early stages of implementation in Malaysian companies as well as in Welsh. In general, a new quality system introduced to industries might need a certain period before it can be understood, adopted and implemented by companies.

Table 4.10: Quality management system achievement

Years of Achievement	Malaysia				Wales					
	ISO 9000	**QS 9000**	**TS16949**	**ISO 14000**	**ISO 9000**	**QS 9000**	**TS16949**	**ISO 14000**	**BSI Kite Mark**	**BSI Standard**
No certification	22.2% (10)	82.2% (37)	93.4% (42)	97.8% (44)	17.6% (6)	76.5% (26)	76.5% (26)	61.8% (21)	91.2% (31)	85.3% (29)
Less than 5 years	53.2% (24)	15.5% (7)	6.6% (3)	2.2% (1)	29.3% (10)	5.8% (2)	17.6% (6)	11.8% (4)		
5 – 10 years	22.2% (10)	2.2% (1)			38.3% (13)	17.7% (6)	5.9% (2)	26.3% (9)	2.9% (1)	11.8% (4)
More than10 years	2.2% (1)				14.6% (5)				5.8% (2)	2.9% (1)
Total	**100% (45)**	**100% (45)**	**100% (45)**	**100% (45)**	**100% (34)**	**100% (34)**	**100% (34)**	**100% (34)**	**100% (34)**	**100% (34)**

The research findings suggest the length of QMS achievement by companies leads to systems stability and maturity and gives the customers confidence that the product manufactured meets the quality standard and requirements. Thus, QMS is a basic requirement for quality improvement and is needed by SME businesses for them to be competitive and stay in the market (Hoyle, 2001; Evans and Lindsay, 2002).

The chi-square test reveals that there were no statistically significant differences (at 5% level) between the number of years in implementing QMS and perceived TQM organisation (χ^2 = 25.487, p = 0.412). The findings indicate the number of years implementing QMS practices has no influence on TQM implementation.

4.3 Customers

4.3.1 Main Customers of the Business

The customer was found to be the main reason for an organisation meeting customer needs and future expectations when engaging in TQM (Dale, 2003; Chris and Hakes, 1991). The research shows that the main customers of respondents were drawn from six categories such as the automotive industry, electronics industry, furniture industry, food industry, government departments and others. Table 4.11 shows the majority of the main customers of the responding companies belonged to the automotive industry for both cases (Malaysian - 53.5% and Welsh - 52.9%). The proportion of respondents dealing with government departments was 15.4% and 11.8% for Malaysian and Welsh companies respectively. This indicates SME businesses in this research were not dependent on the government market despite the government having a positive bias towards domestic SMEs' development (Smallbone and Welter, 2001). For instance, the Malaysian government strongly encourages SMEs to create their own market niche locally or internationally to help boost the economy for the whole nation (MITI, 2005).

Table 4.11: Main customers of the business

Customers	Malaysia		Wales	
	Number of respondents	Percentage	Number of respondents	Percentage
Automotive industries	25	53.5%	18	52.9%
Electronic industries	8	17.7%	10	15.6%
Furniture industries	4	8.9%	3	8.8%
Food industries	3	6.7%	4	11.8%
Government department	7	15.4%	4	11.8%
Others	5	11.1%	8	23.5%

4.3.2 Trading Relationships and Annual Sales

The trading relationships and annual sales between the companies and their main customers (the top five customers) were explored to see how dependent the businesses were on their main customer base and therefore whether customers could impose standards and practices. It was found that more than half of the respondents had more than 10 years' relationship with their main customers and this indicates a strong relationship was established with these main customers.

A General Manager of one of the case study companies stated:

"Maintaining and improving customer relationship is top priority of our company. We are looking forward to go beyond their expectation and happy to hear their feedback of our product".

In addition, most Malaysian respondents managed to generate annual sales of more than 50.0% as compared to Welsh respondents, who generated less than 50.0%. Table 4.12 explains the trading relationship and annual sales for both respondents.

Table 4.12: Trading relationship and annual sales

Trading Relationships With Customers	Malaysia		Wales	
	Number of respondents	Percentage	Number of respondents	Percentage
Less than 5 years	6	13.3%	2	5.9%
5 – 10 years	16	35.4%	13	37.7%
More than 10 years	23	50.9%	19	55.3%
Total	**45**	**100%**	**34**	**100%**
Annual Sales	**Number of respondents**	**Percentage**	**Number of respondents**	**Percentage**
Less than 50%	3	6.6%	20	58.0%
51% - 75%	28	62.1%	12	34.8%
More than 75%	14	31.3%	2	5.8%
Total	**45**	**100%**	**34**	**100%**

The result shows that the relationships were well-established and that they supported a stable customer base. This is important for SMEs to portray their capability of building and maintaining a good relationship with customers.

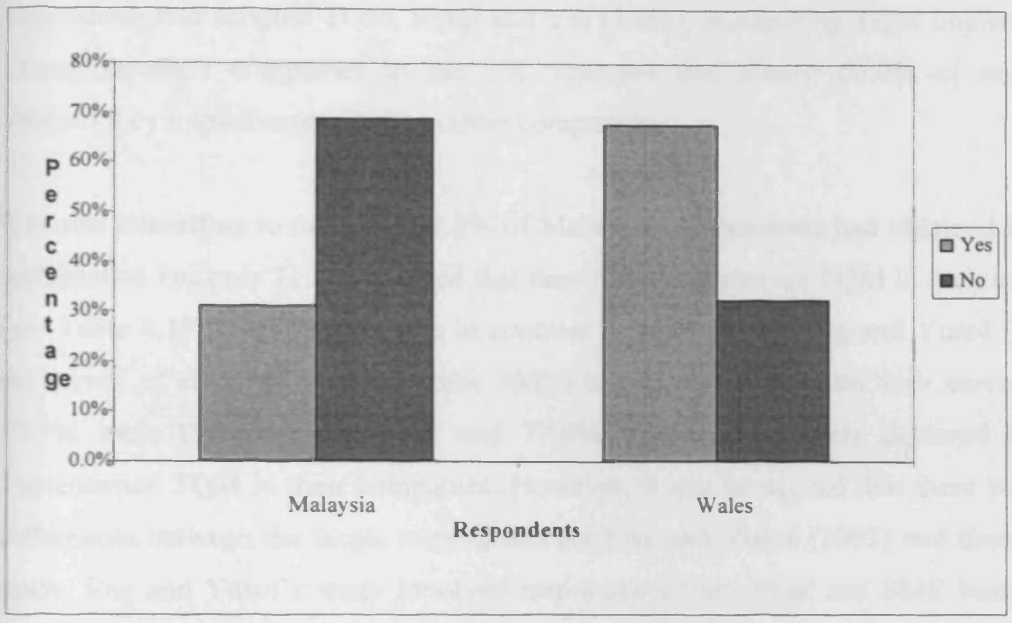
4.4 TQM Practices in the Companies

These questions were asked to find out whether the companies implemented TQM, and to discover the approaches adopted and sources of awareness used.

4.4.1 Perceived as TQM Organisation

Since one of the aims of this research was to understand the status of TQM implementation by SMEs, the respondents were asked questions that related to the perceived benefits of TQM to organisations. As Figure 4.1 shows, only 31.1% of Malaysian respondents claimed they were TQM organisations while 68.9% declared they

Figure 4.1: Perceived TQM implementation



were not. The result was higher than that of the studies conducted by Idris et al. (1996) and by Tan and Sia (2001), which also focused on Malaysian SMEs. Both studies indicated 13.0% and 19.0% of the respondents had implemented practices they believed to be TQM in their companies. However, the Welsh respondents recorded results that were the opposite of those of Malaysian respondents. A high proportion of the respondents (67.6%) claimed they were TQM companies and 32.4% did not; this was a high result compared to the results of the studies by Yusof and Aspinwall (2000b) and Beheshti and Lollar (2003). Yusof and Aspinwall (2000b) studied UK SMEs (England) and found that only 40.0% had implemented TQM. However, Beheshti and Lollar (2003) discovered a much lower proportion, that is, 26.0% in US SMEs. This reflects the strong foundation, maturity and stability of the quality management systems in place that have led Welsh SMEs to be advanced regarding TQM practices (see section 4.2.1). This is confirmed by the studies in the literature that show that a quality management system is a basis of TQM implementation (Beskese and Ceberi, 2001; Costa and Lorente, 2004; Magd and Curry, 2003).

A number of similar studies show TQM implementation was much higher in the UK than in Malaysia. For example, Whyte and Witcher (1992) and Witcher (1993) studied TQM

implementation in Northern England and Scotland and found almost 65.0% of the respondents had adopted TQM. Kanji and Yui (1995), researching TQM implementation among Japanese companies in the UK, reported that almost 60.0% of respondents claimed they implemented TQM in their companies.

It is also interesting to note that 77.8% of Malaysian respondents had obtained ISO 9000 certification but only 31.1% claimed that they had implemented TQM in their companies (see Table 4.13). This finding was in contrast to the study by Eng and Yusof (2003) on the survey of electrical and electronic SMEs in Malaysia. Based on their survey results, 37.5% were ISO 9000 certified and 77.0% of all respondents declared that they implemented TQM in their companies. However, it can be argued that there were slight differences between the target respondents for Eng and Yusof (2003) and those for this study. Eng and Yusof's study involved respondents from large and SME businesses of the electric and electronic industries and identified the differences in TQM implementation. On the other hand, respondents for this study were SME businesses that involved in more than two industries.

In the case of the Welsh respondents, the results were higher than were those of the study by Beskese and Cebeci (2001) and Ismail and Hashimi (1999). Beskese and Cebeci (2001) found that almost 75% of Turkish respondents' organisations had attained ISO 9000 certification but 30.3% were actively implementing TQM. Similarly, Ismail and Hashimi (1999) in their report revealed that 66.0% of Irish respondent companies had ISO 9000 certification but only 19.0% implemented TQM. The findings of this study show more than 80.0% of Welsh SMEs were ISO 9000 certified and more than 60.0% implemented TQM. Again, Welsh SMEs were ahead of the others implemented ISO 9000 and TQM.

Table 4.13: Comparison between ISO 9000 and TQM implementation

Countries	ISO 9000			TQM			ISO 9000 and TQM		
	Yes	No	Total	Yes	No	Total	Yes	No	Total
Malaysia	77.8% (35)	22.2% (10)	100% (45)	31.1% (14)	68.9% (31)	100% (45)	31.1% (14)	68.9% (31)	100% (45)
Wales	82.4% (28)	12.6% (6)	100% (34)	67.6% (23)	32.4% (11)	100% (34)	61.8% (21)	38.2% (13)	100% (34)

4.4.2 Approaches to TQM Implementations

From the literature review, it can be seen there are two different ways of approaching TQM: introducing either quality control processes or company wide implementation (Dale, 2003; Oakland, 2003). According to Hakes (1991), quality control processes are part of TQM implementation and involve only the process owners. The company wide approaches to TQM are applied to every branch and at every level of an organisation (Garvin, 1988; Dale, 2003).

The majority of Malaysian respondents (66.7%) approach TQM implementation through quality control processes rather than company wide implementation (see Table 4.14). This result reflects those of the study carried out by Spencer and Loomba (2001), who found SMEs appear to be focused more on the controlling process than on TQM. Conversely, most of the Welsh respondents (67.6%) approached TQM through the company wide approach. The results indicate that the majority of Welsh respondents had more advanced quality systems in approaching TQM. This might reflect the good experience of managers, which contributes to the success of a quality system as mentioned in section 4.1.7. Further analysis was conducted to examine the association between the approaches and perceived TQM. The chi-square test shows that there were statistically significant differences (at 5% level) between approaches to TQM and

Table 4.14: Approaches to TQM implementations

Approaches	Malaysia		Wales		Chi-Square	p value
	No. of respondents	Percentage	No. of respondents	Percentage		
Quality control of processes	30	66.7%	11	32.4%	32.779	0.000*
Company wide	15	33.3%	23	67.6%		
Total	**45**	**100%**	**34**	**100%**		

* $p < 0.05$

perceived TQM organisation ($\chi^2 = 32.779$, $p = 0.000$). This indicates that approaches to TQM have an influence on TQM implementation.

4.4.3 Number of Years of Implementing TQM

The research attempted to discover when the respondents began the TQM implementations in their companies. This question was to help the researcher to identify the maturity of TQM practices in the respondents' companies. There was consensus among authors in the literature that a company can be placed according to stages of TQM maturity (Dale, 2003; Oakland, 2003). However, there was no agreement regarding the definition of maturity (Chung, 2001). Table 4.15 shows that the majority of Malaysian respondents (55.6%) had implemented TQM for less than 5 years whereas for Welsh respondents, the proportion was only 26.4%. The majority of Welsh samples in this study had implemented TQM for more than 5 years (73.6%).

Further analysis in Table 4.16 shows that Malaysian respondents had a lower mean (5.53) as compared to Welsh respondents (10.97). Again, this shows that Welsh respondents had more experience in TQM implementation and the result supports the previous finding in sections 4.1.7 and 4.4.2. The overall mean for both cases was also calculated and the result was higher (7.9 years) than for the study reported by Yusof, (2000) of UK SMEs

Table 4.15: Number of years in TQM implementation

Number of Years	Malaysia		Wales		Category
	No. of respondents	Percentage	No. of respondents	Percentage	
Less than 2 years	5	11.1%	1	2.9%	Immature
2 - 5 years	20	44.5%	8	23.5%	
6 - 9 years	14	31.1%	9	26.5%	Matured
More than 10 years	6	13.3%	16	47.1%	
Total	**45**	**100%**	**34**	**100%**	

Table 4.16: Mean for number of years of TQM implementation

Countries	Number of Years of TQM implementation	
	Mean	S.D
Malaysia	5.53	3.03
Wales	10.79	6.27
Average	7.91	5.46

Note: S.D: Standard Deviation

(7.6 years) and than that of Eng and Yusof (2003) for SMEs in Malaysia (less than 3 years).

The chi-square test shows that there were no statistically significant differences between the number of years in implementing TQM and perceived TQM organisation (χ^2 = 20.563, p = 0.423). This shows TQM implementation has no association with the number of years. This result was consistent with findings in the literature (for example, Ismail and Hashimi, 1999).Brah et al. (2002) reached the conclusion in their study that companies with more experience in TQM implementation performed better in terms of quality and

operational performance. This study shows the Welsh respondents were more experienced and had a higher maturity stage of TQM implementation than did the Malaysian sample. This might indicate Welsh SMEs have a better performance and more stable TQM practices when compared with companies in the Malaysian sample.

4.4.4 Sources of TQM Awareness

In this study, the question regarding TQM awareness has been addressed and the result tabulated in Table 4.17. These questions were asked to understand of what was the source of support at the beginning of TQM implementation.

The analysis revealed both samples agreed that TQM awareness was prompted by customers with the dominant percentage of 88.9% for Malaysian respondents and of 67.6% for Welsh respondents. This indicates that customers have a greater influence on the implementation of TQM than previously suspected. It has been argued that SMEs have the advantage of being closer to customers, thus enabling a personal relationship to develop due to the size of the company (McAdam, 2000).

Table 4.17: Source of TQM awareness

Sources	Malaysia		Wales	
	No. of respondents	Percentage	No. of respondents	Percentage
Customers	40	88.9%	23	67.6%
External Consultants	27	60.0%	7	20.6%
Seminar and Conferences	24	53.3%	9	26.5%
Government	13	28.9%	13	28.9%
Competitors	6	13.3%	9	26.5%
Parent Company	6	13.3%	11	32.4%
Trade Association	5	11.1%	3	8.8%
Industry Data & Exhibitions	5	11.1%	5	14.7%

The source of information regarding stages of implementation shows the use of external consultants was equally important for Malaysian respondents with a percentage of 60%. However, Welsh respondents indicated that only 20.6% used external consultants. This shows that the majority of Malaysian respondents relied on external consultants to help them implement TQM.

As was said by a Managing Director to one of the informants,

"..... We need a consultant to trained and guide us throughout the implementations. Our people tend to listen from external sources rather than internal".

As a means of implementing TQM, Dale (2003) argues the role of the consultant is to transfer knowledge and skills and it is the responsibility of the senior management team to own the improvement process and exercise leadership. It was not surprising that trade association, industry data and the exhibitions factor were the least frequent source of awareness for both cases. This situation implies that SMEs were not relying on trade association or industry data to obtain knowledge and information about quality improvement; instead, the companies used an association to get business or to expand their network (Abdullah, 1999).

The chi-square independent test shows that the source of TQM awareness had no statistical difference (at 5% level) with perceived TQM organisation ($\chi^2 = 12.453$, $p = 0.815$). This indicates that source of awareness has no impact on TQM implementation.

4.5 Outcomes

4.5.1 Results of TQM Implementations

Numerous studies in the literature found the implementation of TQM has a positive impact on business results (Powell, 1995; Ahire, 1996; Agus, 2004; Oakland et al. 2000; Bugdol 2005). Although the majority of the studies focused on large organisations, it has been argued the results are applicable to SMEs (Ghobadian and Gallear, 1996; Yusof and Aspinwall, 2000a). The main factors with a positive impact on business performance

include customer satisfaction, financial aspect, product quality and employee participation. In the case of this study, it was found that the percentage was very high regarding the increase in customer satisfaction for both cases with 93.3% (Malaysian) and 88.3% (Welsh) (see Table 4.18). This finding was in contrast with that of Sila and Ebrahimpour (2005) who conducted an empirical study of US manufacturing companies and discovered 'customer focus' has no direct effect on TQM implementation.

Table 4.18: TQM implementations results

Outcomes	Malaysia		Wales	
	No. of respondents	Percentage	No. of respondents	Percentage
Increased Market Share	38	84.4%	14	41.2%
Increased Customer Satisfaction	42	93.3%	28	88.3%
Gained Sales	39	86.7%	22	64.7%
Faster Delivery	18	40.0%	11	32.4%
Improved Productivity	33	73.3%	27	79.4%
Improved Employee Morale	15	33.3%	10	29.4%
Lower Stock Levels	14	31.1%	18	52.9%
Lower Staff Turnover	8	17.8%	11	32.4%
Fewer Defects	40	88.9%	29	85.3%
Better Team Work	38	84.4%	19	55.9%
Less Wastage	38	84.4%	25	73.5%
Better Cash Flow	6	13.3%	13	38.2%

The achievement of fewer defects in production was the next main contribution of TQM after customer satisfaction for both countries, with the proportions of 88.9% (Malaysian) and 83.5% (Welsh). Other significant contributions for both countries included less wastage (84.4%; 73.5%), gained sales (86.7%; 64.7%) and improved productivity

(73.3%; 79.4%). The lowest percentages of outcomes were for better cash flow at 13.3% (Malaysian) and improved employee morale at 29.4% (Welsh). The chi-square test result illustrates the association between outcomes and perceived TQM organisations showed a statistically significant difference (at 5% level) ($\chi^2 = 52.226$, $p = 0.042$). The result shows the outcomes of TQM implementation has an influence on TQM practices.

In this research customer satisfaction was found to be the most contributing factor of TQM implementation. Thus, small businesses need to give a priority to customer expectations and requirements to ensure satisfaction. In addition, defects in the production line should be reduced, and this could be achieved through necessary control at all stages of inspection.

4.5.2 Awards Received by Participating Company

The type of awards gained by respondents can be divided into two categories; customer awards and government awards. Table 4.19 shows that Malaysian respondents had a higher proportion (75.5%) of awards than had Welsh respondents (58.0%). An achieved quality award is used by many organisations for self-assessment purposes and to enhance their competitive position in the global market (Khoo and Tan, 2003).

Table 4.19: Awards held by respondent companies

Awards	**Malaysia**		**Wales**	
	No. of respondents	**Percentage**	**No. of respondents**	**Percentage**
Customer award	25	52.8%	13	37.7%
Government award	9	22.7%	7	20.3%
Non- award	11	24.5%	14	41.2%
Total	**45**	**100%**	**34**	**100%**

It was also interesting to note that the number of Welsh non-award winners was almost double (41.2%) that of non-award winning Malaysian small businesses (24.5%). This implies that the majority of Welsh SMEs did not participate in award competitions although they are good companies. This might due to SMEs not fully understanding the award system or how they can derive benefit from self-assessment (Wilkes and Dale, 1998).

There were no statistically significant differences (at 5% level) in the chi-square test between awards received by a company and perceived TQM organisation ($\chi^2 = 32.743$, $p = 0.531$). Thus, it seems the wining of awards makes no contribution to TQM implementation. In summary, established businesses with QMS processes had not all progressed to gain awards for the effectiveness of TQM implementation.

4.6 Capability to Design Products

A design is defined by The Oxford Dictionary (1994) as a 'drawing or outline from which something may be made' and the ability to design a product for customers is one of the keys to being competitive in the market (Oakland, 2003). Oakland (2003, p. 76) further argued, *"Design can be used to gain and hold on to a competitive edge, save time and effort, deliver innovation, stimulate and motivate staff, simplify complex tasks, delight clients and stake holders, dishearten competitors, achieve impact in a crowded market and justify a premium price"*. Table 4.20 indicates that half of the Welsh respondents were involved in product design compared to less than half of the Malaysian respondents (38.9%). This result may suggest that the Malaysian respondents still lacked the capability in terms of technology and skilful employees to lead the design process as compared to Welsh respondents. In fact, the Malaysian government encourages SMEs to supply themselves with high technology equipment such as Computer Aided Design (CAD) systems that enable them to perform engineering design and analysis (MITI, 2005). Design management helps TQM performance by eliminating sources of defects and Welsh SMEs were better at controlling that key process.

The chi-square test shows no significant difference (at the 5% level) between the capability to design products and perceived TQM ($\chi^2 = 17.416$, $p = 0.713$). Thus, design capability has no impact on TQM implementation.

Table 4.20: Involvement in product design by respondents

Product Design	Malaysia		Wales	
	No. of respondents	Percentage	No. of respondents	Percentage
All	3	6.7%	13	38.2%
Some	10	22.2%	4	11.8%
None	32	71.1%	17	50.0%
Total	**45**	**100%**	**34**	**100%**

4.7 Company Performance

4.7.1 Performance Indicators Measured

The questions concerning company performance indicators were asked to provide an understanding of the criteria used by managers to measure performance regularly. These indicators have been identified repeatedly in the literature as enablers of high performance (Slack et al. 2004; Sousa et al. 2005).

Table 4.21 displays the results for performance indicators used by respondents' companies. The result was ranked according to the frequency of the respondents' agreement. The majority (93.3%) of Malaysian respondents emphasised defects in the production processes as the main performance indicator, followed by production costs (88.9%), on time delivery to customers (82.2%) and warranty return from customers (75.6%).

Meanwhile, Welsh respondents emphasised costs (91.2%), on time delivery to customers (88.2%), defects in the production processes (85.3%) and factory productivity (82.4%). It was noticed that companies in both countries emphasised similar top three indicators, namely, defects in production processes, production cost and on time delivery to

customer. This indicates the common measures used that reflect an integrated system approach within the key subsystem. Any defect in the process needs to be controlled and monitored because it may become a source of waste and increased production costs (Slack et al. 2004).

Table 4.21: Performance indicators measured by responding companies

Ranking	Malaysia		Wales	
	Performance Indicators	**%**	**Performance Indicators**	**%**
1	Defect in process	93.3% (42)	Production costs	91.2% (31)
2	Production costs	88.9% (40)	On time delivery to customer	88.2% (30)
3	On time delivery to customer	82.2% (37)	Defect in process	85.3% (29)
4	Warranty returns from customers	75.6% (34)	Factory productivity	82.4% (28)
5	Lead time	62.2% (28)	Warranty returns from customers	79.4% (27)
7	Factory productivity	44.4% (20)	Factory safety and employee morale	67.6% (23)
8	Factory safety and employee morale	37.8% (17)	On time delivery from suppliers	61.8% (21)
6	On time delivery from suppliers	36.6% (16)	Warranty returns to suppliers	52.9% (18)
9	Warranty returns to suppliers	24.4% (11)	Lead time	47.1% (16)

4.7.2 Product Received on Time by Customer

Hosford (1993) suggests that good delivery performance is a key attribute of the development of partnerships. This question focuses on company performance on product delivery to customers. Responding companies were required to choose one answer according to the options given as follows: not measured; < 50%; 51% - 75%; 76%- 95%; 96% - 98% or 99% - 100%. During the analysis, each of the options was given a score as follows: 0 = not measured; 1 = < 50%; 2 = 51% - 75%; 3 = 76% - 95%; 4 = 96% -98%

and 5 = 99% - 100%. As displayed in Table 4.22, businesses in the Welsh sample performed much better than did those in the Malaysian sample (33.3%) with half of the respondents able to deliver to customers almost 100% on time. This implies that Welsh respondents emphasised on time product delivery to customers. It was also noted that a

Table 4.22: Product received on time by customer

Product Received On Time	Malaysia		Wales	
	No. of respondents	Percentage	No. of respondents	Percentage
51%-75%	3	6.7%	2	5.9%
76%-95%	14	31.1%	5	14.7%
96%-98%	12	26.7%	9	26.5%
99%-100%	15	33.3%	17	50.0%
Not measured	1	2.2%	1	2.9%
Total	**45**	**100%**	**34**	**100%**

small percentage of SMEs for both cases did not measure the delivery performance at all. According to Hudson et al. (2000), there could be several reasons SMEs fail to measure performance, such as limited resources, unfamiliarity with performance indicators and potential staff turnover. Further analysis of the chi-square test shows that product received on time by customer showed a statistically significant difference (at 5% level) with perceived TQM organisation ($\chi^2 = 9.475$, $p = 0.050$). This indicates product received on time by customer has an influence of TQM implementation.

4.7.3 Lead Time Offered to Customers

After testing delivery performance, respondents were asked about lead times offered to customers. Lead time is the time required to perform a task or job (Schonberger et al.; 1997, p. 514) and it varies from one company to another and according to the type of business activity. Similar to the product received on time question, this factor also was given a score for each option as follows: 0 = not measured; 1 = more than 29 days; 2 = 15 days – 28 days; 3 = 6 days – 14 days; 4 = 3 days – 5 days and 5 = less than 2 days. Table 4.23 presents the lead times that had been offered to customers by respondents. More

than 40% of Malaysian respondents offered lead times of less than 5 days as compared to the proportion of companies in the Welsh sample, which was about 17.6%. As indicated in Table 4.5 section 4.1.4 of this chapter, the main activities of respondents from both samples were almost the same.

Table 4.23: Lead time offers to customers

Lead Time Offer	Malaysia		Wales	
	No. of respondents	Percentage	No. of respondents	Percentage
Less than 2 days	4	8.9%	3	8.8%
3-5 days	15	33.3%	3	8.8%
6-14 days	16	35.6%	4	11.8%
15-28 days	7	15.6%	11	32.4%
29+ days	2	4.4%	11	32.4%
Not Measured	1	2.2%	2	5.9%
Total	**45**	**100%**	**34**	**100%**

Therefore, the results show Malaysian respondents offered the shortest lead times to customers. In addition, there were also a very small percentage of respondents that did not measure their lead time. A statistically significant difference was found to be exist (at 5% level) between lead times offered to customers and perceived TQM organisations (χ^2 = 10.951, p = 0.050) and those offered by others. Thus, lead time offers to customers have an impact on the implementation of TQM. The results support the findings of Sousa et al. (2005) who, in their study of Portuguese SMEs, suggest lead time is an enabler of TQM implementation.

4.7.4 Products Returned from Customers as Warranty Claims

The sample companies were also required to give feedback regarding products that were returned by customers in the form of warranty claims. The aim of this question was to assess whether the business that was perceived to be a TQM organisation actually performed with low levels of product failures found at customers' premises. The options

given to respondents ranged from 0.0% to more than 1%. As in section 4.7.2, each option was given a score from 0 to 4 where 0 = not measured; 1 = more than 1%; 2 = 0.5% - 1%; 3 = 0.1% - 0.5% and 4 = 0% - 0.1%. Malaysian respondents recorded very high (33.3%) for more than 1% of products returned as compared to Welsh respondents (5.9%) (see Table 4.24). The results may suggest that the Welsh respondents produced a better quality product for their customers than did companies in the Malaysian sample. It is also interesting to note that, although the majority of Malaysian respondents offered a very short lead time to customers (see Table 4.23 of this chapter), however, the proportion of products returned by customers was very high. This situation shows that Malaysian respondents focussed on meeting the target date but sacrificed product quality. This is against Slack's (1991) performance objectives principles, which suggest every company must produce a quality product (quality advantage) within the minimum time (speed advantage) to achieve an operation-based advantage.

The question regarding warranty claims also shows a statistically significant difference (at 5% level) with perceived TQM organisation ($\chi^2 = 9.825$, $p = 0.043$) and this adds to the growing model of critical enablers that now include.

Table 4.24: Warranty claims from customers

Product Returned	Malaysia		Wales	
	No. of respondents	Percentage	No. of respondents	Percentage
0%-0.1%	13	28.9%	20	58.8%
0.1%-0.5%	12	26.7%	5	14.7%
0.5%-1%	4	8.9%	4	11.8%
1% +	15	33.3%	2	5.9%
Not Measured	1	2.2%	3	8.8%
Total	**45**	**100%**	**34**	**100%**

4.7.5 Products Failing Final Inspection

The ISO 9000:2000 standard defines inspection as *"the degree to which a set of inherent characteristics fulfils requirements"*. There are three type of inspection: in-coming, in-

process and final inspection (Deming, 1986). The process of in-coming inspection deals with the raw materials supplied. Meanwhile in-process inspection is conducted during the production cycle and final inspection is employed before the product is delivered to customers. The ultimate aim of all inspections is to make sure the product is examined, measured, tested and compared to specification or performance standards (Dale, 2003). If a product does not conform to specification, it may be rejected, scrapped or reworked.

With regards to this research, the question asked related to the internal control of quality. The question offered several options and each option was given a score as follows: 0 = not measured, 1 = > 1%, 2 = 0.5% - 1 %, 3 = 0.1% - 0.5% and 4 = 0% - 0.1%. Table 4.25 indicates that the majority (55.6%) of Malaysian respondents had more than 1% of products failing the final inspection. In contrast, more than half of the Welsh respondents had less than 0.5% of products failing the final inspection. Again, this finding supports the earlier results in section 4.7.2 and 4.7.4. The chi-square analysis indicates that products failing the final inspection had a statistically significant difference (at 5% level) with perceived TQM organisation ($\chi^2 = 16.183$, $p = 0.003$). This indicates that products failing final inspection have an influence on TQM implementation.

Table 4.25: Product fails final inspection

Products Failing Final Inspection	**Malaysia**		**Wales**	
	No. of respondents	**Percentage**	**No. of respondents**	**Percentage**
0%-0.1%	6	13.3%	4	11.8%
0.1%-0.5%	8	17.8%	15	44.1%
0.5%-1%	5	11.1%	8	23.5%
1% +	25	55.6%	6	17.6%
Not Measured	1	2.2%	1	2.9%
Total	**45**	**100%**	**34**	**100%**

Further analyses were carried out to present the comparative data between Malaysian and Welsh SMEs in terms of products received on time, lead times offered to customers, products returned by customers and products failing final inspection. Table 4.26 shows

the mean and standard deviation for each case and the average of samples for both countries. The mean score ranged from 1.84 to 4.12 with Welsh respondents having a mean above the average for products received on time (4.12), products returned by customers (3.09) and products failing final inspection (2.85). Meanwhile, Malaysian respondents had only one criterion above the average, namely, lead times offered to customers (3.20). The overall result suggests Welsh respondents performed much better than did companies in the Malaysian sample and the management systems employed were more effective and more embedded than were those in the Malaysian businesses.

4.7.6 Industry Average Performance Comparison

This question also covered the comparison of SMEs performance with the industry norm. The criteria for company performance were compiled from the previous studies (Agus, 2001; Saraph et al., 1989; Ahire et al., 1996; Rahman and Tannock, 2005; Thiagaragan and Zairi, 2001; Warwood and Robert, 2004; Prajogo and Brown, 2004) and respondents were asked to indicate company performance as compared to the perception of general industry performance. The level of performance was ranked by the researcher based on the following scores: 1 = worst; 2 = average; 3 = better.

The mean score for Malaysian respondents ranged from 1.73 to 2.76 and for Welsh respondents from 2.29 to 2.76. Table 4.27 reveals that after sales customer service was the highest rating for Malaysian respondents (2.76) but on the other hand the ability to cope with a large variety of product requirements was the highest for Welsh respondents (2.76). Although after sales customer service was claimed to be important to Malaysian respondents, the means for products returned from customers (warranty claims) and products failing final inspection were relatively low (see Table 4.26). This result indicates Malaysian respondents do not practise what they preach and do not fully understand the meaning of effective after sales customer service. Further analysis shows that there was a statistically significant difference (at 5% level) between the industry performance indicators and perceived TQM organisations ($\chi^2 = 23.589$, $p = 0.023$). The analysis shows that industry performance indicators have an association with TQM implementation.

Table 4.26: Comparative data of company's performance

Criteria	Malaysia		Wales		Overall Average	
	Mean	S.D	Mean	S.D	Mean	S.D
Products received on time by customer	3.80	1.12	4.12	1.18	3.94	1.15
Lead times offered to customers	3.20	1.10	2.12	1.37	2.73	1.33
Products returned by customer as warranty claims	2.47	1.29	3.09	1.33	2.73	1.34
Product failing final inspection	1.84	1.17	2.85	1.35	2.28	1.34

Table 4.27: Company performance as compare to industry

Industry Performance Indicators	Malaysia					Wales				
	Mean	S.D	W (%)	A (%)	B (%)	Mean	S.D	W (%)	A (%)	B (%)
On time delivery	2.53	0.55	2.2	42.2	55.6	2.68	0.54	2.9	26.5	70.6
Lead times offer to customers	2.36	0.48	0.0	64.4	35.6	2.47	0.56	2.9	47.1	50.0
Warranty return	2.47	0.55	2.2	48.9	48.9	2.67	0.54	3.0	27.3	69.7
Ability to increase output when needed	2.71	0.51	2.2	24.4	73.3	2.56	0.56	2.9	38.2	58.8
Ability to cope with a large variety of product requirements	2.64	0.65	8.9	17.3	73.3	2.76	0.43	0.0	23.5	76.5
Speed in getting new products to customers	2.31	0.60	6.7	55.6	37.8	2.45	0.56	3.0	48.5	48.5
After sales customer service	2.76	0.44	0.0	24.4	75.6	2.38	0.65	8.8	44.1	47.1
Safety management	1.73	0.69	40.0	46.7	13.3	2.29	0.46	0.0	70.6	29.4
Employee welfare and development	2.09	0.29	0.0	91.1	8.9	2.41	0.56	2.9	52.9	44.1
Environmental performance	1.89	0.71	31.1	48.9	20.0	2.41	0.61	5.9	47.1	47.1

Note: S.D = Standard deviation; W = Worst; A = Average; B = Better

4.8 Process Management, Continuous Improvement and Techniques

The next section of questions covers the strategy of companies, their review and formulation, and the use of tools and techniques for quality improvement.

4.8.1 Company Strategy

A strategy is very important to organisations regardless of their size as it establishes the direction of the system and its purpose. The strategy directs the organisation towards achieving a stated goal and objective. The process of formulating and developing a strategy is the responsibility of the senior management team in the company who act as system designers. Without a strategy, the company has no direction and is often unable to compete in the global market (Deming, 1986). Many researchers in the literature argue that the majority of unsuccessful TQM practices occur when the company has failed to link TQM with a business strategy (Oakland, 2003; Amar and Zain, 2002; Whalen and Rahim, 1994). Unfortunately, very few researchers in the literature have discussed the relationship between TQM and organisational strategy (Prajogo and Sohal, 2006). In this research, questions related to company strategy were also asked. Table 4.28 shows more than 85.0% of responding companies had a formal written strategy.

Table 4.28: Company strategy

Strategy	Malaysia		Wales		Chi-Square	p value
	Formal	Written	Formal	Written		
Yes	86.7% (39)	86.7% (39)	91.2% (31)	91.2% (31)	16.183	0.003*
No	13.3% (6)	13.3% (6)	8.8% (3)	8.8% (3)		
Total	**100% (45)**	**100% (45)**	**100% (34)**	**100% (34)**		

* $p < 0.05$

Further examination, with the chi-square test, indicates that company strategy has a statistically significant difference (at 5% level) with perceived TQM organisation ($\chi^2 = 10.768$, $p = 0.005$) and this finding was similar to that of Prajogo and Sohal (2006) who studied Australian firms in which they concluded TQM implementation is significantly related to organisational strategy. This finding implies that company strategy has an impact to TQM implementation. The company strategy, therefore, needs to be associated with TQM implementation.

4.8.2 Tools and Techniques Used in Formulating Strategy

Tools and techniques are necessary when formulating and developing a company strategy. In fact, the senior management team of a company should play an important role in the selection of tools and techniques to help focus attention on selecting the appropriate improvement. Tools and techniques employed by the sample respondents included quality control tools, management review meetings, customer and industry data information, reports (from customers, banks, parent company and sales), SWOT analyses, benchmarking, balanced score cards and costing reviews. The purpose of the question was to increase understanding of how sophisticated the planning analysis processes were. These processes were clearly identified in the socio-technical system and quality literatures as important (Bou and Beltran, 2005; Sousa et al. 2005).

The study shows there was a high proportion (79.9%) of quality control tools used by Malaysian respondents as well as by Welsh respondents (38.2%) in formulating a strategy (see Table 4.29). Although a number of researchers (Ahmed, 2002; Kanji and Sa, 2002; Andersen et al., 2001) claimed that the balanced score card, which was introduced by Kaplan and Norton (1992), is the most popular framework, this was not found to be useful for Malaysian and Welsh SMEs. Respondents from both samples recorded only 2.2% and 5.9% respectively regarding the use of the balanced score card. The finding also revealed that 35.3% of the Welsh respondents used reports as a basis in formulating a strategy. This implies quality control tools are vital and influence SMEs in determining and formulating business strategy.

The chi-square test shows a statistically significant difference (at 5% level) between tools and techniques and perceived TQM organisation ($\chi^2 = 15.365$, $p = 0.005$) and this indicates an association between tools and techniques and TQM implementation.

Table 4.29: Tools and techniques used in formulating strategy

Tools and Techniques	Malaysia		Wales	
	No. of respondents	Percentage	No. of respondents	Percentage
Quality control tools	36	79.9%	13	38.2%
Management review meeting	15	37.6%	3	8.8%
Customer and industry data	4	8.9%	9	25.0%
Reports	5	11.0%	12	35.3%
SWOT analysis	6	13.3%	2	5.9%
Benchmarking	1	2.2%	4	11.8%
Balanced score card	1	2.2%	2	5.9%
Cost	2	4.4%	6	17.6%
Others	5	11.1%	11	32.4%

4.8.3 Strategy Review

The literature concerning systems and socio-technical systems highlights the importance of feedback systems. Company strategy should be reviewed in order to discover the status and performance of the company. In the case of this research, the company strategy review processes varied (see Table 4.30); however, more than 90% of respondents did have a formal programme to review their strategy. Malaysian respondents recorded more than 90.0% for review processes twice a year or less. The Welsh respondents reviewed their strategy more often than did Malaysian companies with the percentage of Welsh respondents of 44.1%. It was surprising that 4.4% and 5.9% of Malaysian and Welsh companies respectively did not review their strategy at all. It was also found that the mean score for strategy review of Malaysian respondents was much lower (1.29) than that of the Welsh respondents (4.24). Again, the result indicates that Welsh respondents reviewed their strategy more often than did the Malaysian respondents, and therefore

increased their ability to adjust performance to meet market changes. This is in accord with the socio-technical design advice offered by Pasmore (1988).

Table 4.30: Strategy review by respondents

Strategy Review	Malaysia		Wales	
	No. of respondents	Percentage	No. of respondents	Percentage
Not reviewed	2	4.4%	2	5.9%
Once a year	31	68.9%	6	23.5%
Twice a year	10	22.2%	11	32.4%
Three times a year	1	2.2%	2	5.9%
Four times a year	1	2.2%	4	11.8%
More than four times a year	-	-	9	26.4%
Total	**45**	**100%**	**34**	**100%**

In addition, the chi-square test shows a statistically significant difference (at 5% level) between strategy review and perceived TQM organisation ($\chi^2 = 24.938$, $p = 0.001$) and indicates that review of strategy has a major enabling relationship with TQM implementation.

4.8.4 Formal Training of Employees in Quality Management Processes and Techniques

Training and education is part of a company's strategic activities to enhance the skills and knowledge of employees and to equip employees with the ability to improve continuously. Such a feature has previously been recognised by authors such as Yusof and Aspinwall (2000a), Ghobadian and Gallear (1996) and Ahire et al. (1996). The identification of training needs is normally carried out through a training need analysis. This activity ensures that the company provides training that is appropriate and suited to the continuous improvement of employees. According to Smith and Dowling (2001), changes to work organisation can affect the level and type of training. The study by

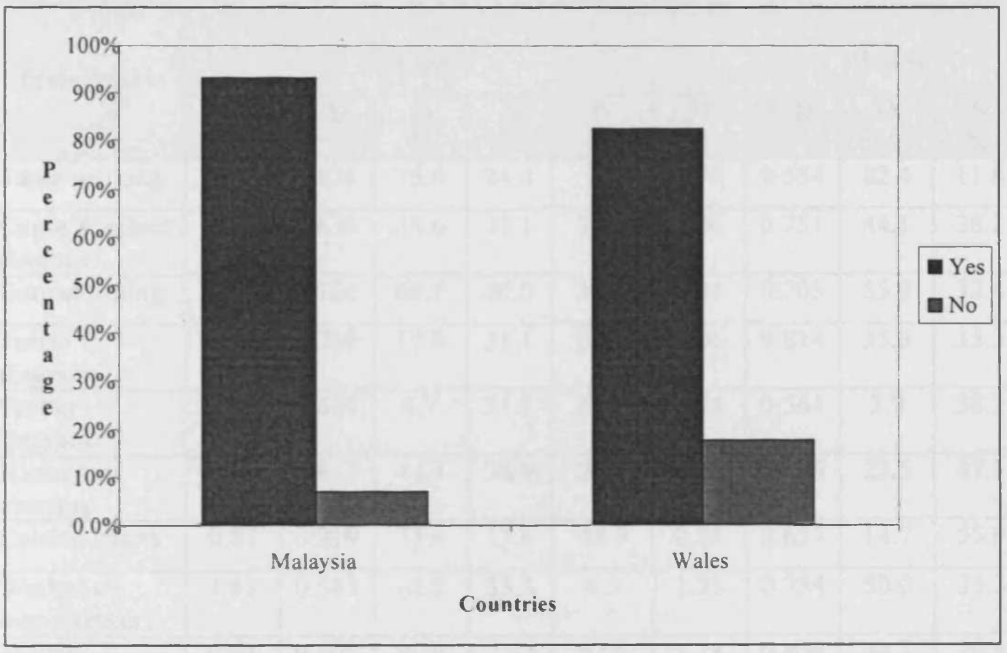
Smith et al. (2003) also found that training has a positive link with business strategy and leads to a wide range of activities. Quality management training typically includes processes and techniques to improve the awareness and understanding of the concepts, skills and competencies needed for TQM and the sustainability of improvement. It also helps to trigger the employee's mind regarding what improvement activities can be employed in their area of responsibility.

The majority of responding companies in both countries agreed that training was important to the company with the percentages of 93.3% (Malaysian) and 82.4% (Welsh) respectively (see Figure 4.2) and the result implies that training programmes were widely used by the participating companies. Furthermore, the chi-square test shows there was a statistically significant difference (at 5% level) between training and perceived TQM organisation ($\chi^2 = 4.938$, $p = 0.003$). This finding is reinforced by evidence from the literature that training has a significant relationship with TQM implementation (Hamzah and Ho, 1994; Palo and Padhi, 2003). However, this finding is in contrast to that of the study carried out by Jones (2005) of Australian manufacturing SMEs; Jones concluded that TQM implementation has no statistically significant correlation with training programmes. The statistical test indicates that training has an influence on implementing TQM practices.

4.8.5 Problem Solving Tools and Techniques Used by Operational Employees

The literature review, especially the section concerned with the influence of Japanese authors, highlights the repeated use of quality tools and techniques. Problem solving tools and techniques are used to support, develop and advance a process of continuous improvement and therefore the implementation/evolution phases of TQM are simple and others are more complex (Dale, 2003: p. 308). Respondents were asked to rank the frequency of use of tools and techniques by operational employees as 'often', 'sometimes' or 'never'.

Figure 4.2: Involvement in quality management training



The tools and techniques list was used by previous studies (Sousa et al.; 2005; Dale, 2003; Oakland, 2003). Similar to the previous sections, a score was assigned to each of the levels according to the following scales: 1 = Never; 2 = Sometimes and 3 = Often. The research found the mean score ranged from 0.44 to 1.76 for both cases (see Table 4.31). Interestingly, the lowest and the highest score for both parties were for similar techniques, that is, scatter diagram (lowest) and team working (highest). This implies Malaysian and Welsh samples emphasised team working to the employees rather than technical tools such as scatter diagrams.

Table 4.31: Problem solving tools and techniques used by operational employees

Techniques	Malaysia					Wales				
	M	S.D	O %	S %	N %	M	S.D	O %	S %	N %
Team working	1.76	0.435	75.6	24.4	0.0	1.76	0.554	82.4	11.8	5.9
Cause & effect diagram	1.02	0.839	35.6	31.1	33.3	1.26	0.751	44.1	38.2	17.6
Brainstorming	1.53	0.726	66.7	20.0	13.3	1.44	0.705	55.9	32.4	11.8
Pareto diagram	0.67	0.769	17.8	31.1	51.1	1.06	0.814	35.3	35.3	29.4
Scatter diagram	0.44	0.624	6.7	31.1	62.2	0.44	0.561	2.9	38.2	58.8
Histogram charting	1.18	0.834	44.4	28.9	26.7	0.94	0.736	23.5	47.1	29.4
Control charts	0.87	0.919	35.6	15.6	48.9	0.85	0.657	14.7	55.9	29.4
Workplace organisation	1.47	0.583	62.2	33.3	4.3	1.35	0.734	50.0	35.3	14.7
Visual management	0.62	0.806	20.0	22.2	57.8	1.18	0.834	44.1	29.4	26.5
Mistake proofing	1.36	0.802	55.6	24.4	20.0	0.91	0.830	29.4	32.4	38.2
FMEA	0.89	0.885	33.3	22.2	44.4	0.71	0.719	14.7	41.2	44.1
Kanban/Lean production	1.07	0.863	40.0	26.7	33.3	0.94	0.814	29.4	35.3	35.3

Note: M = Mean; S.D = Standard deviation; O = Often; S = Sometimes; N = Never

The analysis of the mean rank scores displayed (see Table 4.30) indicates the top three techniques most often used by operational employees in both countries, namely, team working (Malaysian, 1.76; Welsh, 1.76), brainstorming (Malaysian, 1.53; Welsh, 1.44) and work place organisation (Malaysian, 1.47; Welsh, 1.35). This result may imply operational employees are comfortable with simple rather than advanced tools and techniques of quality control (control chart, pareto diagrams and scatter diagrams) in problem solving (see Ishikawa, 1985). The results show the lack of understanding of advanced tools was a barrier to improvement amongst operational employees. This result is consistent with the findings of the study carried out by Sousa et al. (2005) among

Portuguese SMEs. They concluded that generally their SMEs respondents used easy and simple tools rather than complex tools to understand and implement TQM. The lowest mean (0.44) of the usage of scatter diagrams for both Malaysian and Welsh companies is because this tool provides information on the variability of critical variables; the low usage could result in a lack of control and hinder the increase of knowledge about the process and its control.

4.9 Human Resources

4.9.1 Average Age and Length of Service

Based on the analysis of responding companies, the average age of management and workers could be divided into three categories: less than 30 years, between 30 to 35 years and more than 35 years. Similarly, length of service was also categorised into three types: less than 5 years, between 5 to 10 years and more than 10 years. Table 4.32 compares the results from the Malaysian and Welsh respondents in terms of the average age and length of service. The majority of management team's respondents were more than 35 years of age. In contrast, workers from the Malaysian samples were mainly younger than 30 years of age. However, Welsh respondents workers were mainly more than 35 years of age. Mann and Kehoe (1993) argue that an 'old' workforce may not accept a change in the organisation as quickly as a 'young' workforce will. This is because the 'old' workforce may feel threatened to learn new responsibilities and use new methods. More than 70.0% of Malaysian respondents agreed that the continuous service of the management group and workers were similar: between 5 to 10 years. However, Welsh respondents claimed their management group had been in place for more than 10 years of service and workers for between 5 to 10 years. This indicates the management group of Malaysian SMEs was less experienced in managing a business as compared to Welsh SMEs. This implies the majority of Welsh management team respondents were the system designers of the processes in the factory.

There was no statistically significant difference (at 5% level) for the chi-square test of average age and length of service in company and perceived TQM organisation (χ^2 = 16.743, p = 0.514). This implies both factors have no influence on TQM implementation.

Table 4.32: Average age of management and workers

Countries	Average Age						Length of Service					
	Less than 30 years		30 – 35 years		More than 35 years		Less than 5 years		5 – 10 years		More than 10 years	
	M	W	M	W	M	W	M	W	M	W	M	W
Malaysia	2.2% (1)	68.8% (31)	28.9% (13)	28.9% (13)	68.8% (31)	2.2% (1)	4.4% (2)	26.7% (12)	71.2% (32)	73.3% (33)	24.4% (11)	-
Wales	-	20.5% (7)	11.8% (4)	35.2% (12)	88.2% (30)	43.8% (15)	20.5% (7)	26.5% (9)	32.3% (11)	44.0% (15)	47.2% 16)	29.5% (10)

Note: M = Management; W = Workers

4.9.2 Annual Turnover of Employees

Table 4.33 presents the annual employee turnover for Malaysian respondents, which was higher than that of the Welsh respondents. It was recorded that almost 80.0% of Malaysian respondents claimed their annual employee turnover ranged from 5.0% to 10.0%. However, 64.5% of Welsh respondents said their employee turnover was less than 5.0% a year, which is a stable figure. Annual staff turnover of less than 10% is regarded as one of the better human resource outcomes as a result of human resource practices (Arthur, 1994; Beer et al., 1984).

Table 4.33: Annual turnover of employees

Annual Turnover	Malaysia		Wales	
	No. of respondents	Percentage	No. of respondents	Percentage
Less Than 5%	5	11.1%	23	64.5%
5%-10%	36	79.9%	8	23.4%
11%-15%	2	4.4%	2	5.8%
More Than 15%	2	4.4%	1	2.9%
Total	**45**	**100%**	**34**	**100%**

4.9.3 Methods of Selecting New Workers

Recruitment is integral to a dynamic organisation and ensures a supply of talent to the business. The objective of the recruitment process is to identify the right person for the right job within the business. In selecting new workers, MacDuffie and Pil (1997, p. 15) emphasise using previous experience in a similar job, willingness to learn new skills and ability to work with others as the main criteria. Quality improvement of an organisation can be achieved through recruiting high quality, committed and appropriate staff and is an especially critical activity for socio-technical systems theorists (Dale, 2003). The literature is not clear as to whether an existing workplace can be developed to perform at world class levels or whether recruitment of good TQM focussed personnel must come first (Oakland, 2003).

All of the respondents in this research used the interview as the most common method of evaluating potential new workers (see Table 4.34). This result is similar to that of the study carried out by Deshpande and Golhar (1994). However, the interview process is not an effective approach and multiple methods are associated with 'world class' businesses in the literature (Dale, 1992). Moreover, interviews were amongst the most widely criticised methods, especially in terms of planning and when conducted by untrained and unprepared interviewers (Marchington and Wilkinson, 1996). Apart from interviews, other methods used for selecting workers included recommendations (Malaysian, 84.4%; Welsh, 82.4%), skill assessment (Malaysian, 40.0%; Welsh, 58.8%) and references (Malaysian, 31.1%; Welsh, 55.9%). However, respondents from both countries seemed less likely to adapt meeting the team as a method for selecting new workers. This might reflect that meeting the team is time consuming and relatively costly.

The analysis of the chi-square test generated a statistically significant difference (at 5% level) between methods and perceived TQM organisation ($\chi^2 = 26.935$, $p = 0.000$). This implies the methods of selecting new workers have an impact on TQM practices.

Table 4.34: Methods of selecting new workers

Methods	Malaysia		Wales	
	No. of respondents	Percentage	No. of respondents	Percentage
Interview	45	100%	34	100.0%
Recommendations	38	84.4%	28	82.4%
Skill assessment	18	40.0%	20	58.8%
References	14	31.1%	19	55.9%
Psychological test	5	11.1%	7	20.6%
Meeting the team	2	4.4%	-	-

4.9.4 Formal Induction Scheme

After the new workers selection process, respondents were requested to answer questions relating to the use of an induction scheme at the business. The purpose of an induction scheme provided by a company is to expose new employees to the nature of the work practices and the environment (Skeats, 1991: p. 16); it is a means of conditioning. Table 4.35 reveals that the majority of respondents had implemented an induction scheme at their companies with 77.8% of Malaysian respondents and 85.3% of Welsh respondents having done so. This indicates the majority of the respondents realised the necessity of ensuring new workers were aware of the company vision, mission, policies and procedures. Plumbley (1991) argues that, apart from introduction to company environment and work practices, induction schemes indirectly 'push' the human resource manager to try to 'settle the new persons in quickly'.

In addition, the chi-square test shows that there was a statistically significant difference (at 5% level) between the use of an induction scheme and perceived TQM organisation ($\chi^2 = 5.355$, $p = 0.021$). This indicates that a formal induction scheme is a major enabler in association with TQM implementation.

Table 4.35: Induction scheme programmes

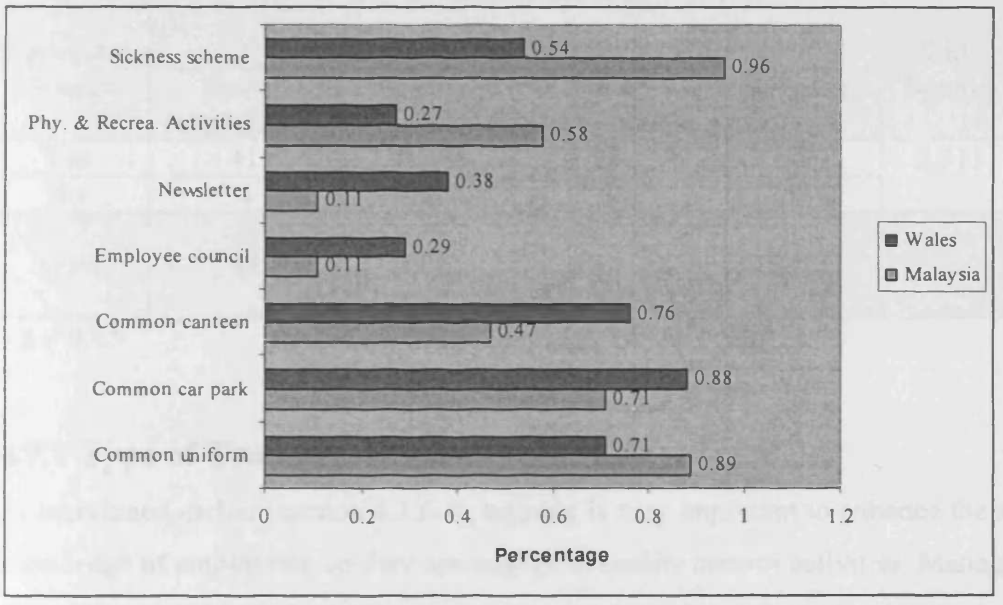
Countries	Formal Induction Scheme			Chi-Square	p value
	Yes	No	Total		
Malaysia	77.8% (35)	22.8% (10)	100.0% (45)	5.355	0.021
Wales	85.3% (29)	14.7% (5)	100.0% (34)		

4.9.5 Features Employment Provided

Even though SMEs are known as businesses with limited resources (Ghobadian and Gallear, 1997; MacGregor 2004; Smallbone, 1993), questions related to the features of employment provided by the company were also asked. These questions helped the researcher to get a clear picture of employee well-being in the companies. This is important to STS theorists and is correlated with higher performance (Emery and Trist, 1965). Figure 4.3 shows Malaysian respondents had a high percentage of sickness schemes (96.0%), common uniforms (89.0%) and physical recreational activities (58.0%). Responding companies in Wales had greater levels of common car parks (88.0%), common canteens (76.0%), newsletters (38.0%) and employee councils (29.0%). This situation shows respondents from both countries engage in 'common practices' as an integral element of recruit socialisation (MacDuffie, 1997).

Further analysis indicates that the features of employment provided showed a statistically significant difference (at 5% level) with perceived TQM organisation ($\chi^2 = 32.586$, $p = 0.051$). This demonstrates the features of employment provided by an organisation have an impact on TQM implementation.

Figure 4.3: Common features provided by companies



4.9.6 Formal Performance Appraisal System

Many organisational researchers have suggested that a performance appraisal system is important and one of the key tools in a management system to ensure sustainable performance improvement (Waldman and Kenett, 1990; Carson et al., 1992; Graber et al., 1992). Performance appraisal systems help in human resources planning and reward decisions (Fombrun et al., 1984) and it is argued that such a system is necessary for dynamic organisations to improve performance (Dale, 2003). Table 4.36 shows more than 80.0% of Malaysian and Welsh respondents in this research employed a performance appraisal system to assess their employees, maintain a balance, and focus on improvement. The finding suggests SMEs can and do use tools for advanced human resource management that are associated with large businesses (Oakland, 2003).

The chi-square independent test indicates there was a statistically significant difference ($\chi^2 = 3.311$, $p = 0.050$) between formal performance appraisal and perceived TQM organisation. This shows formal performance appraisals have an association with TQM implementation.

Table 4.36: Formal appraisal system employed by respondents

Appraisal System	Malaysia		Wales		Chi-Square	p value
	No. of respondents	Percentage	No. of respondents	Percentage		
Yes	41	91.1%	28	82.4%	3.311	0.050*
No	4	8.9%	6	17.6%		
Total	**45**	**100%**	**34**	**100%**		

* $p < 0.05$

4.9.7 Type of Training Attended

As mentioned earlier (section 4.1.6.4), training is very important to enhance the skills and knowledge of employees, so they can engage in quality control activities. Management of companies should view training programmes as an investment in developing human resources (Bramley and Newbay, 1984; Buckley and Caple, 1994). Moreover, training programmes need to be planned properly to ensure that every employee is provided with the right level and standard of training, so they can make a contribution. Table 4.36 indicates the types of training and the levels of employees involved. Seven different categories were used to assess the companies, including management, marketing, skill, quality, business strategy, technical, self- development and health and safety.

The analysis (see Table 4.37) shows the majority of top management attended a training related business strategy for both samples (Malaysian, 44.0%; Welsh, 52.9%). Middle management in Malaysian respondents were found to be more focussed on quality related training (80.0%) but Welsh respondents were more likely to engage in general management training (40.9%). The results portray top management focussed on strategy related programmes because this could help in managing the company and ensure the achievement of business goals and objectives. Most of Malaysian middle management concentrated on quality related training and this implies a lack of knowledge needed to strengthen QMS in the company. Welsh samples indicate more stability in QMS and therefore they concentrated on general management training as a means to enhance knowledge and skills. This argument is supported by the results shown in Table 4.12,

Table 4.37: Type of training programmes attended

Type of Training	Malaysia				Wales			
	TM	MM	SV	OP	TM	MM	SV	OP
Management	28.7% (13)	18.4% (38)	12.4% (6)	2.2% (1)	38.0% (13)	40.9% (14)	14.5% (5)	-
Marketing	11.0% (5)	35.7% (16)	-	-	12.0% (4)	25.6% (8)	-	-
Skill	11.0% (5)	39.7% (18)	84.5% (38)	2.2% (1)	17.4% (6)	2.9% (1)	52.9% (18)	55.1% (19)
Quality	24.2% (11)	80.5% (36)	73.0% (33)	19.9% (9)	25.8% (9)	14.5% (5)	5.8% (2)	37.7% (13)
Business strategy	44.0% (20)	24.5% (11)	-	-	52.9% (18)	28.6% (10)	-	-
Technical	8.8% (4)	19.9% (9)	38.8% (18)	80.0% (36)	2.9% (1)	8.7% (4)	43.5% (15)	45.6% (15)
Self development	4.4% (2)	48.8% (22)	31.0% (14)	4.4% (2)	5.8% (2)	14.5% (5)	17.4% (6)	2.9% (1)
Health and safety	6.5% (3)	15.5% (7)	18.6% (8)	6.4% (3)	5.8% (2)	5.5% (2)	14.5% (5)	11.5% (4)

Note: TM = Top Management; MM = Middle Management; SV = Supervisor; OP = Operators

which indicate more than 60% of Welsh respondents implemented ISO 9000 and TQM as compared to companies in the Malaysian (31.1%).

In the case of supervisor and operator levels, Malaysian responding companies emphasised quality (supervisors, 73.0%) and technical training (operators, 80.0%) whereas Welsh respondents agreed skill and technical training were the most frequent courses attended among supervisors (skill, 52.9%; technical, 43.5%) and operators (skill, 55.1%; technical, 45.6%). Again, the supervisors attended similar types of training, which supports the previous argument. The overall results in this sub-section suggest training is important to enhance employee skills and knowledge at every level of the company. Although organisational size has a strong impact on the volume and type of training, however, it is not a determinant factor of training needs in organisations (Smith and Hayton, 1999). The right types of training attended by the right level of employees ensure effectiveness (Dale, 2003). Thus, SME businesses need to focus on planning and

identifying the training needs of employees as well as integrating training with a business strategy for greater company success in the long term.

4.9.8 Indicators Used to Assess Training Effectiveness

The type of training undertaken represents an aspect of improving human resource skills. The next test was to see how effectively these training sessions were reviewed and to what extent training was practised. The evaluation of training effectiveness is one of the most critical steps in the training process (Oakland, 2003); the responding companies still employed this method as part of a strategy for future improvement and therefore used similar processes to those of much larger businesses.

This research identifies six categories of indicators used by responding companies to evaluate training effectiveness. The indicators used include feedback from an employee after the training session has been completed, performance of the employee, knowledge gained from the training, number of projects launched and employee flexibility to the task assigned. These indicators also have been highlighted in the literature by previous authors (Bramley and Newbay, 1984; Huang, 2001; Palo and Padhi, 2003; Jones, 2005).

The result in Table 4.38 reveals that performance (Malaysian, 86.7%; Welsh, 69.9%), feedback (Malaysian, 66.7%; Welsh, 49.3%) and knowledge (Malaysian, 50.6%; Welsh, 37.7%) were the top three indicators used in training effectiveness. The results show SME businesses were concerned about performance after training when assessing effectiveness. This might be due to the lack of skilled and trained workers in SMEs, which leads to the ineffectiveness of company operations (Palo and Padhi, 2003). The findings also indicate feedback after training sessions and knowledge gained were important to respondents from both countries. Feedback helps to improve training programmes in the future and knowledge gained focuses on what has been learnt from the course (Easterby and Mackness, 1992).

Table 4.38: Indicators used to assess training effectiveness

Indicators Used for Training Effectiveness	Malaysia		Wales	
	No. of respondents	Percentage	No. of respondents	Percentage
Feedback after training session	30	66.7%	17	49.3%
Performance	39	86.7%	24	69.6%
Knowledge gained	23	50.6%	4	37.7%
No. of project launched	18	40.0%	6	17.4%
Flexibility to the task assigned	1	2.2%	2	5.8%

4.9.9 Formal Problem Solving Teams

Problem solving teams are important features of TQM and high performance businesses (Imai, 1986; Ishikawa, 1985). These features are used to sustain continuous improvement and they involve a lot of the workforce. Problem solving teams are mentioned in connection with various aspects of TQM in the literature such as quality control circles (Juran, 1988), small group activities (Nakajima, 1989), quality improvement teams (Ishikawa, 1985), kaizen teams (Imai, 1986), cross-functional teams and many more. The function of these teams is to identify ways and techniques for continuous improvement in the company and to represent the key feature of corporate approaches to TQM by making full use of the skills and knowledge of employees (Dale, 2003).

This research demonstrates (see Table 4.39 and Table 4.40) that Welsh respondents had a higher percentage (64.7%) of problem solving teams than did Malaysian respondents (40.0%). This might indicate the commitment from management teams of Welsh respondents to encouraging employees to be involved in quality improvement activities. Participating companies in both samples agreed that these teams included those at senior management, middle management, and technical specialist, designer, and operator levels. In the case of Malaysian respondents, 66.7% had involved senior management, 3.3%

middle management, 24.4% technical specialists and 61.1% operators. Welsh respondents recorded 45.5% of senior management, 77.3% middle management, 100.0% technical specialists and 90.9% operators. Comparison of Malaysian and Welsh companies shows that Malaysian companies have a greater involvement by senior management but less by middle management. Pasmore (1988) suggests management engagement may be more important due to the role of middle managers as system designers. The involvement of technical specialists in problem solving teams was also very important for both cases. Matlay (1997) argues that the absence of technical specialist personnel might lead to the failure of integrating a technical aspect into working strategies formulated by the firm.

It was also interesting to note the involvement of outsiders in problem solving teams such as external people and suppliers' staff. The percentages were 22.2% and 11.1% for Malaysian respondents and 13.6% and 54.5% for respondents from the Welsh sample. The finding shows respondents from the Welsh sample involved more suppliers in problem solving teams than did Malaysian respondents. This might reflect how the strong relationship between both parties (samples and suppliers) leads to involvement in problem solving teams. The table also shows the number of active teams, number of employees in a team, number of meetings per month, number of projects per year and projects completed in each case.

The chi- square test shows a statistically significant difference between problem solving teams and perceived TQM organisation ($\chi^2 = 7.985$, $p = 0.005$). This indicates that problem solving teams have an association with TQM implementation.

4.9.10 Suggestion Scheme

The use of a suggestion scheme is another means of improvement of company performance by integrating employee innovations. It offers a chance to the employees to think and input their ideas for the company's benefit. It has been argued by Ho (1995)

Table 4.39: Problem solving teams in factories (Malaysian)

Problem solving team	%	Classes involved	%	No. of active teams	%	No. of employees per team	%	Meetings per month	%	No. of projects per year	%	No. of projects completed	%
Yes	40.0%	Senior Management	66.7%	Fewer than 2 teams	38.9%	Fewer than 5 persons	22.3%	Fewer than 2 meetings	33.3%	Fewer than 2 projects	38.9%	Fewer than 2 projects	44.4%
		Middle Management	83.3%	2-5 teams	50.0%	5-7 persons	50.1%	2-5 meetings	61.2%	2-5 projects	44.4%	2-5 projects	50.0%
		Technical Specialist	24.4%	More than 5 teams	11.1%	8-10 persons	22.3%	More than 5 meetings	5.6%	6-10 projects	11.1%	More than 5 projects	5.6%
No	60.0%	External Person	22.2%			More than 10 persons	5.6%			More than 10 projects	5.6%		
		Designers	5.6%										
		Operators	61.1%										
		Suppliers Staff	11.1%										
Total	**100%**				**100%**		**100%**		**100%**		**100%**		**100%**

Table 4.40: Problem solving teams in factory (Welsh)

Problem solving team	%	Classes involved	%	No. of active teams	%	No. of employees per team	%	Meetings per month	%	No. of projects per year	%	No. of projects completed	%
Yes	64.7%	Senior Management	45.5%	Fewer than 2 teams	22.7%	Fewer than 5 persons	31.8%	Fewer than 2 meetings	22.7%	Fewer than 2 projects	18.1%	Fewer than 2 projects	18.1%
		Middle Management	77.3%	2-5 teams	45.5%	5-7 persons	54.6%	2-5 meetings	72.7%	2-5 projects	54.6%	2-5 projects	54.6%
		Technical Specialist	100.0%	More than 5 teams	31.8%	8-10 persons	9.1%	More than 5 meetings	4.5%	6-10 projects	9.1%	More than 5 projects	27.3%
No	35.3%	External Person	13.6%			More than 10 persons	4.5%			More than 10 projects	18.2%		
		Designers	54.5%										
		Operators	90.9%										
		Suppliers Staff	54.5%										
Total	**100%**				**100%**		**100%**		**100%**		**100%**		**100%**

that the management teams of organisations should value all suggestions from employees by displaying them on a notice board and giving a reward as a token of appreciation. Table 4.41 (Malaysian) and Table 4.42 (Welsh) provide the results of suggestion scheme practice by respondents' companies. The results show more than half (54.5%) of Welsh respondents had implemented suggestion schemes as compared to Malaysian respondents (49.9%). This suggests the majority of Welsh respondents encourage their employees to be innovative and creative through idea generation. Apart from that, employees also have an opportunity to understand better their work and the basic quality control tools (cause and effect diagram, scatter diagram, pareto, etc.). Both samples show more than 60% had fewer than 30 suggestions a year from employees. However, Welsh respondents had a higher percentage (83.3%) for the rate of implementation of more than 50% of suggestions a year as compared to implementation by Malaysian respondents (68.1%).

In terms of rewards for the successful suggestions, these were given to employees as individual or team payments. These imply the respondent's company values employees' ideas and the suggestions are treated as a method of continuous improvement. The recognition of successful suggestions increases levels of motivation and satisfaction among employees (Evans and Lindsay, 2002). According to Table 4.40, most of the rewards go to the employee as an individual (63.6%) rather than to teams (27.3%) as in the Malaysian case. This was surprising, as TQM is based upon the team approach (Oakland, 2003). Meanwhile, Table 4.42 indicates that Welsh respondents recorded the same percentage of individuals and teams receiving a reward (44.4%).

Similarly, as the chi-square test shows, suggestion schemes were a statistically significant difference with perceived TQM organisation ($\chi^2 = 4.687$, $p = 0.03$). This indicates that the implementation of a suggestion scheme has an impact on TQM practices.

Table 4.41: Suggestion scheme activities in the factory (Malaysian)

Suggestion scheme	**%**	**No. of suggestion per year**	**%**	**Implementation rate per year**	**%**	**Type of rewards**	**%**
Yes	48.9% (22)	No suggestions	18.2% (8)	Not implemented	18.2% (8)	No formal reward	4.5% (2)
		Fewer than 15 suggestions	45.5% (21)	Less than 50% implemented	13.6% (6)	Financial rewards to individual	63.6% (29)
No	51.1% (23)	15-30 suggestions	18.2% (8)	50%-70% implemented	45.4% (20)	Financial rewards to team	27.3% (12)
		31-45 suggestions	11.1% (5)	More than 70% implemented	22.7% (11)	Certificate of recognition	54.6% (10)
		More than 45 suggestions	7.1% (3)				
Total	**100% (45)**		**100% (45)**		**100% (45)**		

Table 4.42: Suggestion scheme in factory (Welsh)

Suggestion scheme	**%**	**No. of suggestion per year**	**%**	**Implementation rate per year**	**%**	**Type of rewards**	**%**
Yes	54.5% (19)	Fewer than 15 suggestions	38.9% (13)	Less than 50% implemented	16.7% (6)	No formal reward	16.7% (6)
		15-30 suggestions	27.8% (10)	50%-70% implemented	33.3% (11)	Financial rewards to individual	44.4% (15)
No	45.5% (15)	31-45 suggestions	20.6% (7)	More than 70% implemented	50.0% (17)	Financial rewards to team	44.4% (15)
		More than 45 suggestions	12.7% (4)			Certificate of recognition	27.8% (10)
Total	**100% (34)**		**100% (34)**		**100% (34)**		

4.10 Leadership

This research also explored the respondents' perceptions about leadership in their companies. Leadership is a critical TQM concept that is associated with high performance (Deming, 1986). The questionnaire provided many different statements about leadership in connection with organisations and respondents. They were required to give their opinion by placing a tick according to the following scale (Likert Scale): 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree or 5 = strongly agree. The questionnaire consisted of positive and negative statements. The positive and negative blend of questions was designed in such away as to cross check that responding companies answered what they were supposed to answer. Before performing the statistical analysis, the negative statements were reversed to prevent response bias. In this section, eight negative statements were reversed and marked as 'R'. The reversing of a negative statement was carried out as follows:

Old value 1	⟶	New value 5
Old value 2	⟶	New value 4
Old value 3	⟶	New value 3
Old value 4	⟶	New value 2
Old value 5	⟶	New value 1

Table 4.43 presents the mean and standard deviation of Malaysian and Welsh respondents ranging from 2.68 to 4.49. Both Malaysian and Welsh respondents had very high means for the statement of 'senior managers actively encourage change' with 4.49 and 4.41 respectively. The statement of 'senior managers giving customer' value had a high mean for Malaysian respondents (4.40) as compared to Welsh (4.26). This indicates both samples emphasised the role of senior management in introducing change in the factory as well as customer satisfaction. Introducing change in the factory is critical especially for SME businesses due to the limitation of resources and finances (Temtime and Solomon, 2002). Thus, senior management need to have formalised strategic

Table 4.43: Leadership perceptions

Statements	Malaysia		Wales	
	Mean	S.D	Mean	S.D
Senior managers actively encourage change.	4.49	0.59	4.41	0.50
Senior managers develop and support a culture of trust.	4.18	0.78	4.29	0.52
Senior managers do not encourage employee involvement and commitment to the company. (R)	4.27	0.96	4.32	0.81
Senior managers actively try to eliminate barriers between individuals and departments.	3.96	0.82	3.97	0.97
This company actively seeks out and engages best practices.	4.07	0.86	4.21	0.64
This company reacts to a crisis by "fire-fighting". (R)	3.73	1.21	2.68	1.12
Senior managers are focused on giving customer value.	4.40	0.69	4.26	0.45
Senior managers are rarely involved in quality activities. (R)	4.16	0.99	3.79	1.12
Senior managers continuously reinforce, promote, and communicate quality values	4.11	0.91	4.00	0.78
This company has a mission statement that has been communicated throughout the company	4.11	1.17	3.94	0.983
Majority of employees do not understand the company mission statement. (R)	3.49	1.04	3.41	1.08
This company has a comprehensive and structured planning process that regularly sets short and long-term goals.	3.98	1.12	3.59	1.05
This company very seldom reviews its performance and key performance indicators. (R)	3.98	1.06	4.09	1.03
This company considers its operational capabilities, customer requirements, and community needs when developing business plans, policies, and objectives.	4.20	0.66	4.00	0.74
Internal business departments and plans are not aligned with the overall business mission at this company. (R)	4.07	1.21	3.85	0.82
Inadequate resources are assigned to the key improvement projects of the business. (R)	3.20	1.18	3.32	0.98
Business measures cause conflicts between departments. (R)	4.04	0.98	3.06	1.21

Note: (R) – Reverse Value

planning and to integrate available resources in achieving business goals and objectives. The lack of commitment from senior management leads to the failure to manage change.

It was also interesting to note that Welsh respondents tend to agree with the statement of 'the company reacts to a crisis by fire fighting' with the score of 2.68. This might indicate that Welsh samples adopted the fire fighting approach to resolve a crisis. Welsh respondents also had a high mean (4.29) for the statement of 'senior manager develops and support a culture trust' as compared to the mean of Malaysian respondents (4.18), which shows Welsh SMEs emphasised trusting their employees. Chami and Fullenkamp (2001) argue that the engagement of a trust culture between an organisation and its employees leads to efficiency and satisfaction. Thus, a trust culture is important for small businesses to build a good relationship with employees as well as with suppliers.

4.11 Inhibitors Perceptions

The research also aimed to identify the inhibitors to the implementation and sustainability of TQM. A number of statements were designed to ask for respondents' opinions based on a given Likert scale. The negative statements then were reversed mark with 'R' to indicate the reversing of negative statements as in section 4.10 before a statistical analysis was performed.

The mean of each statement (see Table 4.44) ranged from 2.65 to 4.26. Malaysian respondents scored higher (4.24) for the statement of 'quality systems do not slow down the change process in the company'. This indicates that quality systems help the company in process improvement. The results do not support the negative perceptions from a few authors who claim that quality systems detract from continuous improvement in organisations (Avery, 1994; Brown, 1993; Reedy, 1994). From the literature, it can be seen that formal quality systems have been associated with higher performance (Juran, 1988; Imai, 1986) but also the significance of unnecessary bureaucracy (slowing change) has been identified by authors such as Kast and Rosenzweig (1972). The results also show that both Malaysian and Welsh respondents strongly agreed that 'their company has clear quality goals identified by the senior manager'. The mean for Malaysian and Welsh

respondents was 4.24 and 4.26 respectively. The result shows the role of senior management in identifying and leading toward achieving quality goals was very significant (Temtime and Solomon, 2002; Lau and Idris, 2001) confirming the findings of many previous studies on how a lack of senior management commitment is considered an obstacle to TQM implementation (Harari, 1993; Fuchs, 1993; Katz, 1993). This study found Malaysian and Welsh samples had no obstacles to senior management commitment. Senior management from both samples showed themselves to be very committed toward continuous improvement activity. This is in keeping with Dale's (2003) argument that senior management should demonstrate their commitment for quality improvement in order to get participation from all employees in the company. In terms of staff with a technical skill, both of the samples agreed that they had a shortage of the staff necessary to sustain improvements (the mean for Malaysian respondents was 2.86 and for Welsh respondents 2.65).

4.12 Chapter Summary

The aim of this chapter was to make a comparative study of TQM implementation between Malaysian and Welsh manufacturing SMEs with the focus on identifying enablers that have an association or relationship with TQM implementation irrespective of country. Therefore, to achieve this aim a survey was conducted amongst Malaysian and Welsh manufacturing SMEs with a response rate of 21.2% and 29.3% respectively. An analysis shows that the majority (67.6%) of Welsh SMEs implemented TQM compared to Malaysian SMEs (33.3%). Further examination indicates that in general Welsh SMEs were much better than Malaysia SMEs in TQM implementation. For example, Welsh SMEs had a higher percentage (14.6%) in implementing ISO 9000 for more than 10 years as compared to Malaysian SMEs (2.2%). In other words, Welsh SMEs were more experienced and knowledgeable about ISO 9000. Moreover, the majority of Welsh SMEs employed a company wide approach rather than process control in approaching and implementing TQM. The effectiveness of these practices could be seen through the element of products failing final inspection where Welsh SMEs managed to control less than 0.5% as compared to more than 1% for Malaysian SMEs.

Table 4.44: Inhibitors Perceptions

Statements	Malaysia		Wales	
	Mean	S.D	Mean	S.D
The behaviour of senior managers does not reinforce a commitment to quality improvement activities. (R)	4.09	0.99	4.12	0.95
Meeting production schedules is more important than quality performance. (R)	3.93	1.03	3.12	1.23
This business only engages in reactive problem-solving when instructed by customers. (R)	3.98	1.12	3.56	1.12
Operational teams have the quality problem-solving skills necessary to sustain improvement activity.	3.78	0.93	3.79	0.91
The business has a shortage of technical skills to sustain improvements. (R)	2.86	1.07	2.65	1.35
Problems are caused at this factory by differing customer standards. (R)	3.73	1.03	3.09	1.38
Customers do not understand the problems of small businesses in finding the time and resources for improvement activities. (R)	3.16	1.13	2.71	1.22
The suppliers to this business are disinterested in solving problems with us. (R)	3.60	1.03	3.50	1.29
The quality systems of this business slow down the change process. (R)	4.24	0.96	3.56	1.19
This company has no clear quality goals identified by senior manager. (R)	4.24	0.96	4.26	0.86
It is difficult to relate improvement activities to business profits or true cost savings for customers. (R)	3.80	1.04	3.29	1.17
Skilled and trained workers always leave for better jobs elsewhere. (R)	2.78	1.20	3.74	0.93
Most team-based improvement activities are unproductive 'social time' away from the workplace. (R)	3.93	1.12	4.03	0.83
Individual pay should be linked to quality performance improvements.	3.96	0.98	2.76	1.23

Note: (R) – Reverse Value

In the case of identifying enablers that have an association or relationship with TQM implementation, a chi-square test was employed. The result shows that majority of tested enablers had a statistically significant difference (at 5% level) with TQM implementation for both cases. The summary of significant enablers is presented and discussed in Chapter 6.

CHAPTER 5:

CASE STUDY RESULTS

Chapter 5: Case Study Results

5.0 Introduction

The previous chapter discussed the detailed survey results. This chapter focuses on the background of participating companies to assist the reader and to provide a contextual sensitisation to the group of cases. The case studies were drawn from a purposive sampling of award winners (access provided by the Malaysian support agency the NPC) and non-award winners with access provided by SMIDEC. The description of each company's background includes its establishment, main activities, location, number of employees and numbers of customers. For each case, key informants were drawn from business directors, operations management, quality assurance and human resource management. The sample of case study questionnaire that employed for this research can be seen in Appendix 3. It is noted that these businesses are 'larger' employers when rated against the SME definition of 150 persons or less (discussed in Chapter 2). Another feature of the SME businesses was that, although they were separate legal entities with no equity relationships with large customers, they all serviced the automotive industry and common customers. No business engaged in this section of the research was a subsidiary of a large multinational business – these companies were excluded from this study. Such a finding ensures that each business faced similar customer pressures for change and therefore differences between high and low performance (from a TQM perspective) would be the result of better or worse management practices. These businesses were not considered to be vertically integrated with the customers and they operated with significant degrees of freedom of management choice in selecting what TQM features could and should be implemented or sustained.

Although the questionnaire survey produced information valuable to the research objectives, the amount of information was limited due to the lack of control over the process of completion and the low response rate (Oppenheim, 1992). Thus, a deeper understanding and case study methodology was considered appropriate for the later research. The case approach is best used when the field of study defies simple quantification and can provide insights that may not become apparent when other

methods are employed (Scott, 1997; Gable, 1994; Galliers, 1991). A multiple case design was employed rather than a single case design due to the need for a deeper understanding of the processes and outcomes within a natural setting (Yin, 2003; Babbie; 1995; Miles and Huberman; 1996). According to Leonard-Barton (1992), a multiple case replication method allows case organizations to be compared, and permits variations or similarities between cases to be identified and explored, and so this approach was duly accepted.

Eight companies were selected for this study using a purposive sampling approach (Malaysian SMEs with simple technology) with both national TQM award-winning businesses and non-award winners. Furthermore, purposive sampling rather than random selection was used due to the need for information rich cases (Perry and Coote, 1994; Patton, 1990). The criteria of selection and its limitations are presented in Table 3.13 of Chapter 3.

The main aim of the case study stage of the research was to investigate and seek further explanation of what and how TQM practices were carried out at participating organizations by focussing on award winning and non-award winning companies. The award winning companies were identified through NPC Malaysia because NPC is the agency responsible for organising, evaluating and selecting the award winners. Award winners were selected, as these businesses were most likely to exhibit advanced features and practices of TQM. The researcher personally addressed a letter to the Managing Director of the six award-winning companies, whose names were provided by NPC, asking if they would participate in this research.

However, only three companies agreed to participate (the others were too busy with their production schedules). On the other hand, the five non-award winners were selected from among 45 respondents who agreed to participate in follow-up research and in the case study stage; the statement of agreement from respondents was written at the bottom of survey letter. The selection of non-award winners was from the survey respondents but there was no intention on the part of the researcher to triangulate the findings from the

survey and the cases. A simple analysis of the two phases of the research showed much synergy and complimentary evidence between these two activities.

Finally, the total number of companies participating in this research was eight companies (comprising three award winners and five non-award winners). All of the participating companies were contacted three months prior to the fieldwork (May 2005 to July 2005). The names of the participating companies were not disclosed due to issues of confidentiality and ethics. Therefore, instead of the company name, the informants were identified using letters in alphabetical order from A to H. The background of each participating company will be presented in the next section to provide the reader with a general overview and understanding of main activities.

Although the researcher faced difficulties in accommodating informants' times for research during the fieldwork, the case studies were successfully completed by the end of July 2005. Some secondary data was collected after this time.

5.1 Company Overview

5.1.1 Company A (Award Winner)

This family-owned company was established in 1989 with its core business involvement in precision plastic injection moulding. It is located in Shah Alam, Malaysia, and is the leading supplier of the engineering plastic parts (engine components), interior trim (pillar, grill, bumpers and seat components) and exterior trim (radiator grill, mudguards, trunk lid covers, weather strips, wheel caps and many more).

In terms of basic QMS, the company was certified for ISO 9001 in 1996 and for QS 9000 in 2001. The company has 138 committed and long-term employees. They also look forward to supplying new customers regionally and globally. The company vision is to be a progressive and dynamic plastic automotive component manufacturer, renowned in the region (Case A, 2002). In recognising that rapid industrialisation, new innovations and futuristic designs pose new challenges to the automotive industry, the business has a strong emphasis on research and development to remain at the forefront of technology

and to provide customers with value added and state of the art engineering standards. The secondary data and initial socialisation confirms employees were seen as the company's most valuable assets and the Human Resource Department was dedicated to cultivating a highly motivated team spirit, enthusiastic attitude to change and a service-oriented environment among team members. The Human Resource Department programmes inculcate quality principles to the employees through training and education to ensure the achievement of the company vision and mission.

5.1.2 Company B (Award Winner)

The company commenced trading in 1995, having been established by a group of professionals with vast experience in and knowledge of the manufacturing of metal stamping parts and components of various shapes, sizes and material grades. Currently based in Klang, Malaysia, the company specialises in the manufacturing of metal stamping parts for electrical and electronic components, audio visual parts, home appliances, automobile parts and components for various car manufacturers, and metal construction parts. The company has invested heavily in research and development in order to provide a personalised service specifically tailored to the requirements and satisfaction of individual clients. In order to achieve these objectives, the company maintains a workforce consisting of manufacturing engineers of various disciplines, highly trained technical supervisors and capable machine operators handpicked by the management. In addition, experienced administration staff, modern office equipment and, machineries have enabled the company to provide courteous prompt service and competitively priced quality products within the specified delivery schedule.

The strategy of the company is to participate in and play its part in fulfilling the government's vision of a fully industrialised nation by 2020. This target is being realised through the concerted support, combined efforts and co-operation among all employees of the company to improve business performance.

As an ISO 9002 certified (1994) company, the quality assurance and quality control measures emphasize the need for proper procedures of documentation and the recording

of all details from the administration department and facilities right up to the manufacturing processes. Engineering documentation is periodically reviewed and updated including all engineering drawings and documents to ensure optimum work processes that meet and surpass product quality criteria. The quality control department carries out periodical calibration exercises on the measuring and test equipment devices in order to maintain precision and conform to customers' specifications. The company employs a workforce of 44 personnel and is able to produce up to a capacity of medium sized parts.

5.1.3 Company C (Award Winner)

Company C was incorporated in 1991 and its core expertise is in the manufacturing and supply of roll-formed plastic co-extruded mouldings for the technology-intensive automotive industry. The company's production capability is equipped with state-of-the-art facilities, employing cutting-edge technology in roll-forming, flocking and stretch bending processes. The company, with a workforce of 110 people, is located in Nilai, Malaysia, and is the only manufacturer with the technical competencies and expertise to produce these products in Malaysia. The business is confident of its capability to cater for the regional automotive components market.

The senior management is committed to excellence and continuously seeks to provide a wide range of technical and engineering products and services in the automotive component manufacturing sector suited to the requirements of the automotive industry for quality, cost and delivery. With a clear vision and mission in its business and corporate direction, the company has forged ahead in the strategic positioning of the business. The case also has close collaboration with its technical partners ensuring that they keep abreast with the latest technology. This technological excellence is further cemented through close relationships with key clients where they take on the challenge to 'design in'. With the strong vision and mission, this company is very competitive and sometimes becomes a threat to its competitors. The company is also involved in the production of components that are jointly developed with clients. This has given the

company the edge in product development, and it ensures products of high quality and of international standards.

To ensure the commitment to quality improvement, this company was certified for ISO 9001 and QS 9000, and is in the process of implementing TS16949. The ultimate objective of this company is to satisfy customers' needs and therefore steps have been taken to involve all employees and all suppliers in quality improvement programmes.

5.1.4 Company D (Non-Award Winner)

Company D was established in 1992 and is a leading manufacturer and assembler of plastic parts and components for the automotive, electrical, and electronic and telecommunications industries. The company has 149 workers and offers a comprehensive package of services to customers, encompassing product design, development, production and assembly. Located in Shah Alam, Malaysia, the two factories are well positioned within the industrial hub of Malaysia, serving local and multinational companies. The company is committed to continuous improvement in order to remain competitive and this is reinforced by the company strategy. It is supported by a team of highly innovative and motivated employees, utilizing the most advanced technological equipment. The facilities (advanced technology equipment) available at both factories ensure the production of quality products that meet international standards. To exceed customers' requirements, the business focuses on customer relationship management programs and steps have been taken to ensure that each and every product delivered has passed a stringent quality test and inspections. This is attained by constantly monitoring the manufacturing processes, continuous improvement in product quality and frequent audits on processes and products.

Recognising that continuous innovation in design is the key to staying competitive, the company has strengthened its design and development activities by adopting a multifunctional approach involving cross department discussions and brainstorming at all levels. Moreover, with such a strong vision and mission, this company is very competitive and sometimes becomes a threat to its competitors.

5.1.5 Company E (Non-Award Winner)

Company E is owned by a Japanese corporation and was established in 1989. The factory is based in Shah Alam, Malaysia, and the main activity is the manufacturing of metal components for the automotive industry. Currently, the total number of employees is 40 people and a high investment has been made in obtaining modern equipment and machinery. Customer satisfaction is considered crucial and the management try very hard to fulfil customer needs and requirements. Thus, the company's main aim is to be the best in manufacturing and to provide a quality product to the customer as set out by the management plan. The quality management system implemented is based on the Japanese Industrial Standard (JIS) and at the moment, there is no intention to apply for ISO 9001 certification or any other quality system. In terms of training, the company provides internal and external training but only for the management.

5.1.6 Company F (Non-Award Winner)

Company F is involved in the manufacturing of metal components for the automotive industry such as bracket fuel tanks, hanger mufflers, hook fuel fillers and others. Established in 1983, the company has acquired a wealth of experience and technical expertise to provide services in product design and prototype fabrication. The company ensures the right levels of quality and consistency of its products by developing effective production systems. From the secondary research, it can be seen that the company policy is 'to achieve the highest level of quality'; they built the quality management system and the business was certified as ISO 9001 in 2003. In addition, all requirements and standards set by customers are met through internal quality and process audits and employee training programmes. The company has successfully worked and developed a broad base of customers in the automotive industry. With a workforce of 83 persons, the company offers prompt delivery at a competitive price.

5.1.7 Company G (Non-Award Winner)

Company G was established in 1992 with the core business involvement in designing and manufacturing plastic parts for the automotive industry. The total number of employees is 130 persons and the factory is in the Klang Valley, Malaysia. The main products

manufactured include interior and exterior door handles, bracket ashtrays, clips, connectors and cable tight. The main clients are car manufacturers and to fulfil customer requirements, this company has enhanced its research and development capabilities in developing new products and has a wide range of modern equipment and machinery. Furthermore, the business has also implemented quality management systems and places strong emphasis on having an efficiently managed store, which results in a first-in-first-out (FIFO) storage system and just in time (JIT) system.

The company has been certified ISO 9002 since 1997 and QS 9000 since 2001. Special design capabilities can also be made to order, given IQM high-tech appliances and well-equipped factories, which are supported by the company's highly skilled and trained staff. IQM places a high priority on the welfare of staff. Besides motivational and on-the-job training programmes, staff are rewarded for their commitment and excellent performance.

5.1.8 Company H (Non-Award Winner)

Company H was incorporated in 1983 and located in the Klang Valley. The main activity is production of a plastic based product for the automotive industry. At the initial stage, this factory runs its production with only three machines and with the latest technology; this company also owns complete production lines comprising injection moulding machines. It is among the most reputable SME companies in the Klang Valley, Malaysia, producing plastic components for the automotive industry (Proton, 2002). The main goal of the company management is to ensure quality products to meet the industry standards and to fulfil customer needs and satisfaction as well as to be the leading plastic components manufacturer in empowering and innovating the industry as a whole within Malaysia as a recognised benchmark site. The business holds the ISO 9001:2000 award (achieved in 2003) and this shows the company maintains a commitment to produce quality products, but is behind the other cases in the use of established QMS processes.

Table 5.1 shows the profiles of the case study companies including the number of employees, age of business, principle technology, main customer base, quality

management system certification, size, ownership and whether an award winner or non-award winner.

The table indicates a similarity between the award winners and the non-award winners in terms of the average number of employees, average age of business, principle technology employed and main customer base. As such a close relationship assists this study by limiting variations that might lead to different business models (size of employment, technical complexity and so on.) – thus increasing the comparability of the data collected. This result will be elaborated upon further in the next section of this chapter.

Table 5.1: The summary of case company profiles

Criteria	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
No. of Employees	138	44	110	149	47	83	129	49
Age of Business	16	10	10	13	16	14	13	12
Principal Technology	Injection Moulding	Metal Stamping	Injection Moulding	Injection Moulding	Metal Stamping	Metal Stamping	Injection Moulding	Injection Moulding
Main Customers Base	Klang Valley	Klang Valley	Klang Valley	Klang Valley	Klang Valley	Klang Valley	Klang Valley	Klang Valley
ISO 9000 Certification	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Company Size	Medium	Small	Medium	Medium	Small	Medium	Medium	Small
Ownership	Malaysian	Malaysian	Malaysian	Malaysian	Japanese	Malaysian	Malaysian	Malaysian
Award Winner	Yes	Yes	Yes	No	No	No	No	No

The most common operations management systems employed were metal forming and plastic moulding. A sample of a process flow chart for metal stamping and plastic injection moulding is shown in Figures 5.1 and 5.2. The purpose of displaying the flow chart is to show the steps involved in the processes of metal forming and injection moulding thud providing a greater understanding to the researcher as well as to the reader

Figure 5.1: Process flow chart for metal stamping

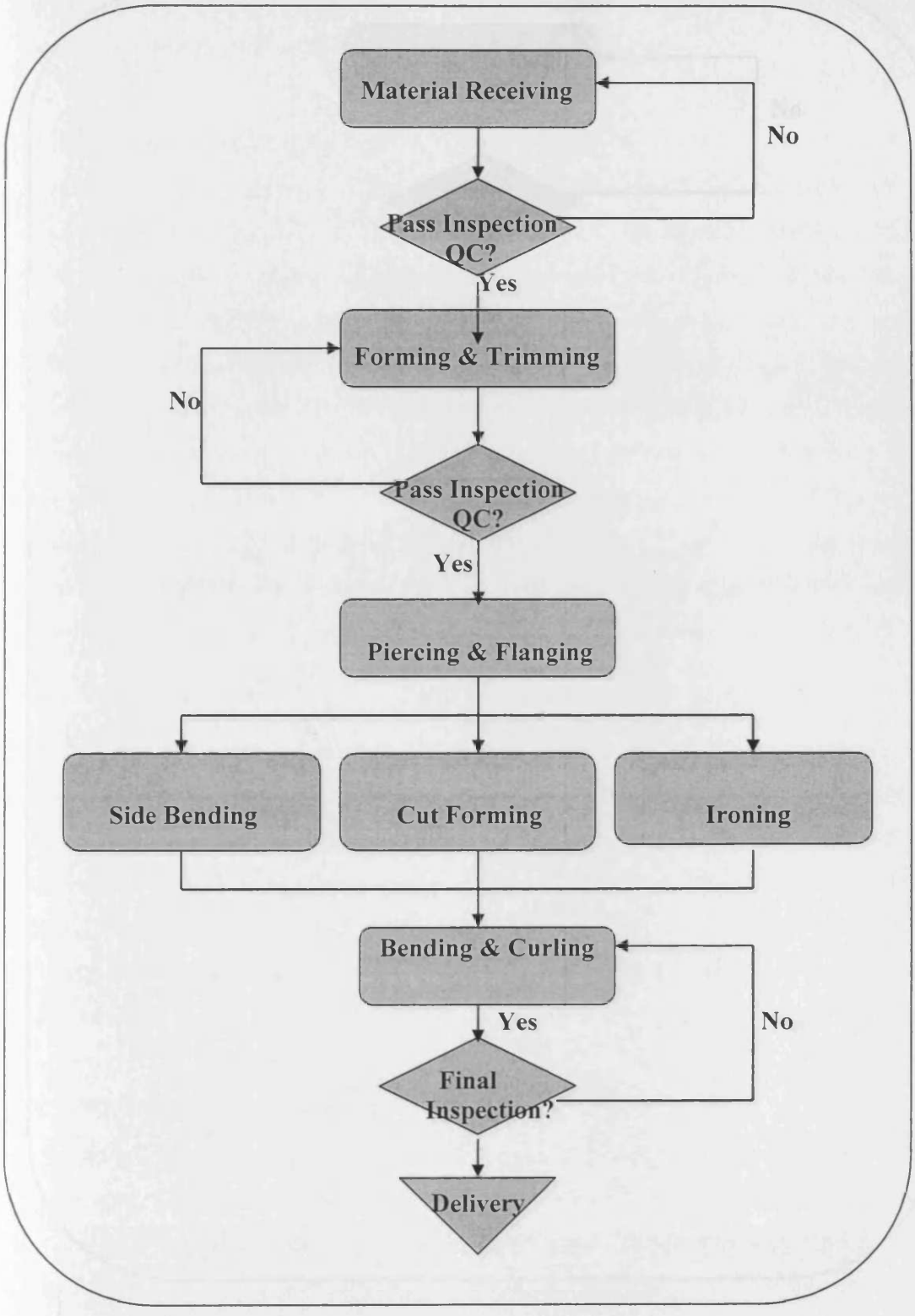
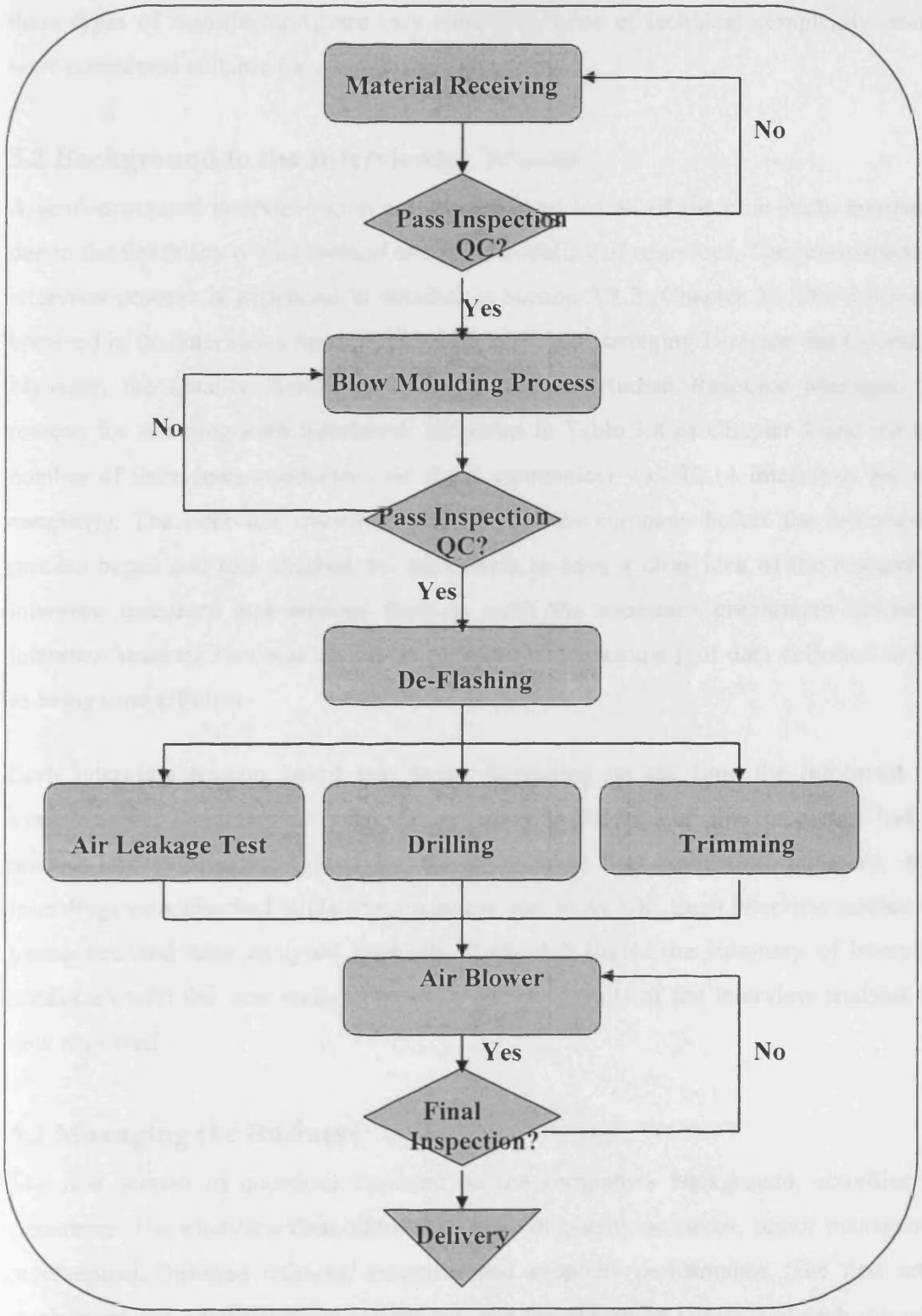


Figure 5.2: Process flow chart for plastic injection moulding



of the principle activities employed by the cases (contextual sensitisation). As shown, these types of manufacturing are very similar in terms of technical complexity, and so were considered suitable for a cross case comparison.

5.2 Background to the Interviewing Process

A semi-structured interview approach was adopted for all of the case study companies due to the flexibility of this method and the availability of resources. The semi-structured interview process is explained in detailed in section 3.8.2 (Chapter 3). The informants involved in the interviews for each company were the Managing Director, the Operations Manager, the Quality Assurance Manager and the Human Resource Manager. The reasons for selecting such informants are given in Table 3.8 of Chapter 3 and the total number of interviews conducted (for the 8 companies) was 32 (4 interviews for each company). The interview questions were sent to the company before the interviewing process began and this allowed the informants to have a clear idea of the researcher's interview questions and enabled them to make the necessary preparation before the interview session. This was deliberate to improve the accuracy of data collected as well as being time efficient.

Each interview session lasted two hours depending on the time the informant was available, and the interview was tape recorded to ensure that the researcher had not missed any information given by the informants. For validation purposes, these recordings were checked whilst the researcher was in the UK. Each interview session was transcribed and later analysed manually. Table 5.2 shows the summary of interviews conducted with the case study companies and the results of the interview analysis will now reviewed.

5.3 Managing the Business

The first section of questions focussed on the company's background, activities and customers. The interview then addressed issues of quality practices, senior management involvement, business cultures, measures and suppliers performance. The first set of semi-structured interviews was carried out with the Managing Director of each company.

This section attempts to give the view of about TQM related activities from the perspective of the top management of companies.

5.3.1 Company Profile

The company profile was explored by the author to provide an understanding of the basic background to the business and the roles of the informants. The information gathered included year of establishment, owner's nationality, company ownership, activity and number of employees. This information provided a strong foundation and sensitisation to the case. The analysis in Table 5.3 shows that participating companies were set up between 10 years to 16 years ago and indicates that all of the companies were well-established and stable businesses. The majority of the companies were owned locally (Malaysian) except one company, which was owned by a Japanese business. All cases were registered as private limited companies but three of the companies were subsidiaries.

Table 5.2: Summary of interviews conducted in case companies

Companies	No. of interviews	Job descriptions				Company size	Award winners?
		MD	HRM	QAM	OPM		
A	4	✓	✓	✓	✓	Medium	Yes
B	4	✓	✓	✓	✓	Small	Yes
C	4	✓	✓	✓	✓	Medium	Yes
D	4	✓	✓	✓	✓	Medium	No
E	4	✓	✓	✓	✓	Small	No
F	4	✓	✓	✓	✓	Medium	No
G	4	✓	✓	✓	✓	Medium	No
H	4	✓	✓	✓	✓	Small	No
Total	**32**	**8**	**8**	**8**	**8**	**8**	**8**

Note: MD –Managing Director; HRM-Human Resource Manager; QAM-Quality Assurance Manager; OPM- Operations Manager

The principle activity of participating companies was plastic injection moulding or metal stamping (simple technology) and the number of employees ranged from 47 persons to 149 persons. Therefore the basic checks of 'fitness' and definition of SMEs by the Malaysian government were confirmed (see Table 1.2 of Chapter 1).

Table 5.3: Profile of respondents

Profile	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Year of Establishment	1989 (16 yrs)	1995 (10 yrs)	1995 (10 yrs)	1992 (13 yrs)	1989 (16 yrs)	1991 (14 yrs)	1992 (13 yrs)	1993 (12 yrs)
Owner's Nationality	M'sian	M'sian	M'sian	M'sian	Japanese	M'sian	M'sian	M'sian
Company Ownership I	Private Limited	Private Limited	Private Limited	Private Limited	Private Limited	Private Limited	Private Limited	Private Limited
Company Ownership II			Subsidiary				Subsidiary	Subsidiary
Activity	Plastic Injection Moulding	Metal Stamping	Plastic Injection Moulding	Plastic Injection Moulding	Metal Stamping	Metal Stamping	Plastic Injection Moulding	Plastic Injection Moulding
No. of Staff	138	44	110	149	47	83	129	49

The average age of the award-winning companies was 12 years and of the non-award winners was 13.6 years. The companies in both categories were considered mature and established (non-award winner companies had been established on average 1½ years earlier than award winners). Thus, both classes of case had had similar amounts of time to evolve TQM systems and award winners were not younger businesses that benefited from a new site TQM implementation. In terms of an average number of employees, there was not much difference, with 97 persons for the award-winning companies and 91 persons for the non-award winners. Again, this confirms no vast differential in favour of the award winners.

5.3.2 Main Customer Base

The main customers of participating companies were the companies in the automotive industry and cases provided many types of plastic and metal parts for car assembly lines such as interior trim, exterior trim, engine components and engine compartment areas and

others. The common customer base therefore benefited this study by ensuring the rate of change and pressure to adapt TQM was broadly similar for all cases. Since the main customers were located in the Klang Valley, Malaysia, most of the participating companies operated in the same area as well.

In Malaysia, the Klang Valley is known as the 'Golden Triangle' area and enjoys a strategic location (near the capital city of Kuala Lumpur and other major cities). It is easy to access by road, highway and various types of transportation. Customers of participating companies were also located in the northern region and east coast of Malaysia. This indicates that customers of participating companies in this research were located in various parts of Malaysia. Table 5.4 displays the main customers and location of the business.

The fact that the largest business customer was 'local' also serves to limit problems when case companies service mainly foreign and export customers, and feel their influence on the ways of working in the business. The comments by the Managing Director of Company B (award winner) reinforced the importance of locality and proximity to the customer in terms of supplier development and co-ordination. He proposed:

"Although we needed to spend a lot of money on this place (factory) a few years ago, however, with the strategic location we managed to increase our market share and be more competitive. I think it was a wise investment."

Having a close proximity to the customers permits easier communication and also permits a system of buffer-less lean production to be developed.

Table 5.4: Main customers and locations of the businesses

Customers	Companies							
	Award Winners			Non Award Winners				
	A	B	C	D	E	F	G	H
Automotive Industries	✓	✓	✓	✓	✓	✓	✓	✓
Non Automotive Industries								
Locations								
Klang Valley	✓	✓	✓	✓	✓	✓	✓	✓
Northern Region				✓			✓	✓
East Coast Region								✓

5.3.3. Quality Management System Certification (ISO 9000)

Quality is essential to customer satisfaction and competitive success regardless of the size of the business (Tan et al. 2001; Kumar et al. 1999). However, as stated in section 4.2.1 of Chapter 4, most of the discussion in the literature regarding the implementation of QMS focussed on large organizations and very little attention has been paid to SMEs. Quality management standards are pertinent to sustaining competitiveness, ensuring product quality and certification in order to gain access to a wider market share (Briscoe et al., 2005; Gotzamani and Tsiotras, 2001; Mo and Chan, 1996). These systems were associated with TQM models during the survey stage where the findings showed they made a significant contribution to the TQM implementation. A study conducted by NPC (2005) showed that the main reasons companies adopt standards are to provide quality products, increase customer satisfaction, and meet industry requirements, and for conformity and transparency.

In the case of this research, all participating companies adopted ISO 9000 except Company E (non-award winner); the Managing Director of this company argued:

"Why should I apply for ISO 9000? It will make me and my staff stressed and a lot of time is needed to get used to documenting the system. We have a quality system in the factory with the Japanese Industrial Standard (JIS). It also helps us to adopt quality practices. No matter what standard we use, as long as our customers are happy with our product, I think that's more than enough".

In the tradition of case research, this case study represents an 'outlier' and it is interesting to note this business performed least well compared with all the cases. This result indicates that the participating companies that adopted ISO 9000 were committed to ensuring a quality management system was established in the factory to fulfil customer satisfaction and offer a basic level of management control. Although Company E disagreed with the benefits gained from ISO 9000 implementation, they believed quality practices not documented standards lead to customer satisfactions.

According to the Managing Director of Company C, whose opinion reflected the view of most of the cares;

"We adopted ISO 9000 to ensure our processes, records and documentations are done in a systematic way. Through documented guidelines, we believe that we are able to gain customer confidence and increase our market share. We are nowhere without customer trust and might left behind in the industry."

The Managing Director of Company G also reinforced this view when giving his opinion regarding ISO 9000:

"Nowadays ISO 9000 is a must for SMEs, not like 13 years ago when I started this business. If I am not mistake, then the majority of SMEs in this area (Klang Valley) are ISO 9000 certified. Although it is very costly, and SMEs are known as businesses with

limited resources, they still go for it. We are aware customers today have very high expectations and they keep making comparisons among us to get the best suppliers. Implementing ISO 9000 helps in achieving customer satisfaction."

The perceived benefits of a QMS were reinforced by the longevity of the systems being used at the cases. The companies believed QMS allows them to fulfil customers' expectations and to gain benefits. As indicated in Table 5.5, the average number of years of certification for the award-winning companies was three times higher (10.33 years) than for the non-award winning companies (3.4 years). Although the non-award winners

Table 5.5: Quality management system certification

Companies	Quality Management System							
	ISO 9000	Year	QS 9000	Year	ISO 14000	Year	TS 16949	Year
A	✓	1994	✓	2001			✓	2004
B	✓	1996						
C	✓	1994	✓	2001				
D	✓	2002					✓	2005
E								
F	✓	2003						
G	✓	1996			✓	1998	✓	2004
H	✓	2003						

Note: Cases A, B and C – Award Winners; Cases D, E, F, G and H – Non-Award Winners

were established earlier as businesses (see Table 5.3) they were left behind in terms of the implementation of quality management systems and basic quality control. This situation might reflect the leadership of senior management in the non-award winning companies, which had not really emphasised the development of ISO 9000 or provided the necessary direction to the employees to implement it. The NPC (2005) study suggests that the reason for small companies not adopting quality standards is due to several factors including the cost of implementation being too high, being unaware of the standard requirements, being unable to obtain standard information, and confusion about the terms

used (too technical to understand). All the case study businesses, therefore, even Company E, had achieved a formalised and documented control system.

The participating companies not only implemented ISO 9000 but also other standards such as QS 9000 (quality standard for automotive industry), ISO 14000 (quality standard for environmental management) and TS16949 (quality standard for customer satisfaction). For instance, Companies A and G had three certifications and Companies C and D had two certifications. This indicates the seriousness and commitment of those companies regarding quality improvement. The cases therefore each represented mature users of quality control systems and this benefited the study such that each case was in an evolutionary/improvement stage and not an introduction/imposition stage of development.

5.3.4 Strategy

The questions related to strategy were asked to increase understanding of how the company strategy had been developed and reviewed. Formal planning and reviews have been previously identified in the literature as being important for high performance (Pasmore, 1988; Emery and Thorsrud, 1969; Oakland, 2003). The absence of a strategy therefore creates a vacuum between the direction set at the systems level of the firm and change management. The informants needed to answer whether a formal written vision and strategy existed and to indicate which personnel were involved in strategy development (elite or business wide approach). The company wide approach is that associated with TQM according to Dale (2003) and Oakland (2003). Table 5.6 shows that all the award-winning companies had a vision and strategy in a written form whereas there was no vision or strategy two of the non-award winning companies (Companies E and F).

Companies A, B and C (award winners), and D and G (non-award winners), agreed that their written strategy emphasised TQM. In the development and formulation of the strategy, Companies A, B, C, D and G involved all managers in the factory to get their ideas and commitment toward implementing and achieving those strategies. This shows

senior management in the case study companies valued the ideas and views from middle management groups rather than being recipients of receiving request for change. The integration of middle management with the strategy formulation is termed as middle management creativity. This term refers to the managers who know about best practice and have the capability to interact with other departments to ensure the strategy will comply with continuous improvement proposals (Rich, 2002). Strategy developed by involving other management groups is considered more effective as everyone is responsible and accountable for the achievement (Kay, 1993). The majority of case study companies agreed that their strategy was reviewed once a year.

According to the Managing Director of Company D (non-award winner):

"We did the company strategic planning every year. All Managers in this factory are obliged to attend the yearly company strategic meeting. I personally monitor the attendance for all of them. We normally spend a few days outside the factory to do a brainstorming session and to plan for the future."

Table 5.6: Strategy development by participating companies

Strategy	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Written vision	✓	✓	✓	✓	×	×	✓	✓
Written strategy	✓	✓	✓	✓	×	×	✓	✓
Emphasis TQM	✓	×	✓	✓	×	×	✓	×
Involvement in strategy development	All Factory Managers	All Factory Managers	All Factory Managers	All Factory Managers	No Strategy	No Strategy	All Factory Managers	All Factory Managers
Strategy review	Once a year	Once a year	Once a year	Once a year	Not reviewed	Not reviewed	Once a year	Not review

Furthermore, he added:

"The beauty of involving all the Managers is the commitment to and responsibility for what has been planned. The ideas were from them and they are responsible for making sure that what has been planned will be achieved."

These statements emphasise the importance of commitment from middle management to ensure business strategy accomplishment. Kay (1993) argues the involvement of managers to develop strategy and alignment with external relationships (suppliers, customers, competitors and environment) leads to the success of the firm's strategy.

The Managing Director of Company E (non-award winner) looked at strategic planning from a different perspective. He argued:

"Company strategic planning review is only for big organizations. We are small and have no luxury time to spend on that kind of activity."

Again, this negative position is reinforced in the literature (Newall and Dale, 1991; Harari, 1993; Bateman and Rich, 2003) but a lack of planning is seen as an inhibitor to TQM.

The Managing Director of Company F (non-award winner) also did not agree about reviewing their strategy and he stressed:

"I would rather use that time (strategy reviewing) to concentrate on production or other beneficial activities in the factory".

Such an attitude to operational rather than strategic management suggests SMEs do not often regard the business strategy as resulting in proactive management, and the failure to

link business strategy with daily operational activities makes small businesses perceive the review of strategy as a waste of time.

Those statements were in contrast to comments made by the Managing Director of Company G (non-award winner). He emphasized that:

"Company strategic planning and review is a must for every organization no matter how big or small. We know the past history and performance of our company and are able to use the data for future planning. In fact, if we had more time I would wish to have it more than once. The more you review, the better you are".

This statement indicates that more frequent reviewing of strategic planning leads to better adaptation (STS). This finding supports the survey results in Chapter 4, which claimed that company strategy influences TQM implementation.

5.3.5 Benchmarking

Benchmarking is a continuous process of reference or measurement of standards used for comparison and for identifying what needs to be improved. The aim of benchmarking is to identify, understand and adopt the best practices and processes that will lead to superior performance (Oakland, 2003). In this research, two of the award-winning companies practiced benchmarking. The area of interest for benchmarking was processes, quality practices, efficiency, effectiveness and cost management. Meanwhile, three non-award winning companies benchmarked other businesses in terms of productivity, rejection rate, turnover, processes, technology, technical capability and cost. The findings show that the award-winning companies focus on efficiency and effectiveness for improvement. These results were consistent with suggestions by many authors in the literature (Oakland, 2003; Ahire and Golhar, 1996; Ghobadian, 1996; Hackman and Wageman, 1995). The results also indicate that the company that benchmarked (and been admired as a benchmark by participating companies) was Company C. This situation might suggest that Company C was among the best companies practising quality improvement activities. Therefore, Company C became a point of reference for other

companies to learn the best practices implemented in its factory. Table 5.7 presents benchmarking activities among participating companies.

Table 5.7: Benchmarking practices

Practices	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Benchmarking	✓	×	✓	✓	✓	×	✓	×
Practices	Processes Quality practices Efficiency	×	Processes Quality practice Efficiency Effectiveness	Productivity Rejection rate Turn over	Process Technology	×	Technical capability Rejection rate Cost	×
Whom	Company C	×	Subsidiaries Companies Katayama	Company C	Yao Company Ltd	×	Company C	×
Business admired	Company C	×	Katayama	Company C	Yao Company Ltd	×	Company C	×

According to the Managing Director of Company A (award winner):

"Benchmarking helps us to know our position in the industry and it is important for customer satisfaction. By practising benchmarking we were aware of what other people have done and are not left behind or stay far from the group".

This opinion was supported by the feedback from the Managing Director of Company C (award winner):

"Although many companies visit us to learn best practices that we have implemented, I still keep reminding my staff that we cannot just satisfied by looking at ourselves only. We need to go out and look at what other people have done and based on the information gathered during the visit, the management should encourage them to innovate and implement it in the factory."

Although both companies were award winners (Companies A and C), they still wanted to learn from other firms and share the knowledge of best practices. This shows benchmarking permits companies to develop strategies and reduce the gap in performance level that they have identified (Zairi, 1994).

Nevertheless, the Managing Director of Company F (non-award winner) argued:

"I don't believe in benchmarking. It will let competitors know about our strengths and weaknesses. This will lead to unhealthy competition in the market."

This statement shows that Company F is unconvinced about the credibility of a quality improvement system in the company. Senior management attitudes demonstrate a fear of competitors and competition and an unwillingness to share good management practices.

According to Zairi (1994), benchmarking is a very powerful tool to help a company to compete in the market and prevent unjustified complacency. Thus, SMEs should see benchmarking as one of the vehicles for quality improvement and use it to strengthen internal and external capability through the integration with TQM.

5.3.6 Industrial Networking and Design Capability

The aim of the questions regarding networking and design capabilities was to investigate the capability of cases to design customers' products. The ability to design products represents an ability to decrease the number of defects and errors. Strong industrial networking and the ability to design customers' products also represents trust. The majority of the respondents claimed that they had a network with other businesses in similar industries.

The networking was built through automotive-related associations of suppliers such as the Proton Vendor Association (PVA) and Perodua Vendor Club (PVC). The aim of these associations is to foster closer relationship amongst members, the auto component industry and government agencies. SMEs are encouraged to join any association related

to their activities because it will help strengthen networking and relationships with other companies (MITI, 2005). The associations therefore represent ways of learning.
According to the Managing Director of Company H (non-award winner):

"I am a member of the Malaysian Plastic Manufacturing Association (MPMA) but not very active. If there were 10 meetings in a year, I would manage to attend three meetings only. Involvement in the association is very time consuming. You need to attend various meetings and functions that have been planned for a year. As a small company, I need to spend more time with the company. No doubt the networking is good for business but with limited resources I need to set a priority."

Meanwhile, the Managing Director of Company G (non-award winner), who has a significant amount of experience with the associations, said:

"Networking is very important in business. I have been a member of the Proton and Perodua Associations since 1992. I can see a lot of benefits and advantages especially in terms of the relationships among members, training and development, discussion about our problems as well as getting new projects. We should use the association as a vehicle to strengthen our business."

This informant's views show the vital roles played by networking in strengthening business practices. Thus, some of the SMEs took part in networking through an association because they consider it a very effective method as well as being cost effective.

Capability in product design means a company is able to plan and develop concepts of products or services requested by customers, and it is a main integrated relationship that goes beyond traditional adversarial relations. Table 5.8 shows only one company (Company A) declared they were capable of designing customer products and this is because the company concerned has design facilities and trained personnel and is perceived by customers as trustworthy. Design can be used to add value for customers,

deliver innovation and gain competitiveness in the market according to Oakland, (2003). Thus, Company A is increasingly an 'outlier' with a fully integrated strategy process and features that go well beyond a basic QMS.

5.3.7 Quality Practices

All of the case study companies had implemented quality management practices at their factory operations. It was found the award winners had started their quality management practices between 1994 and 1996 and the non- award winners between 2000 and 2003, suggesting the award winners had sustained quality improvement activities. The average number of years in quality management practices was calculated and was found to be10.3 years for the award winners as compared to 4.2 years for the non-award winners. The study shows the award winners placed a greater emphasis on planning and execution (practice). This finding also indicates that the award winning companies had a greater

Table 5.8: Industrial networking and design capability

Practices	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Industrial network	✓	✓	✓	✓	×	✓	✓	✓
Members of Associations	1.Malaysian Plastic Mfg. Association 2.Proton Vendor Association	1. Proton Vendor Association 2. Perodua Vendor Club	1. Proton Vendor Association 2. Perodua Vendor Club	1.Malaysian Institute of Management 2.Proton Vendor Association 3.Perodua Vendor Club	None	Malaysian Automotive Component Mfg.	1. Proton Vendor Association 2. Perodua Vendor Club 3. M'sian Plastic Mfg. Association	Malaysian Plastic Mfg. Association
Design capability	✓	×	×	×	×	×	×	×
Other business design product	Has design capabilities	Proton and Perodua	Proton and Perodua	Proton and Perodua	Proton	Proton Toyota Honda	Proton and Perodua	Proton

Note: Mfg.: Manufacturing

experience in quality management practices than had the non-award winners although both sets had sustained some improvements. The year in which quality management practices were initiated for all companies was the same year as quality management system certification (see Table 5.5) as stated in Table 5.9. It shows that the informants claimed to be engaging in quality management practices after the company had been certified in ISO 9000 by the certification body.

According to the Managing Director of Company A (award winner):

"We started the quality journey in this factory with awareness training for all of our staff and a follow-up with system documentation. It took us almost a year to complete the documentation processes."

Table 5.9: Quality practices in the factory

Practices	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Engage in quality practices	✓	✓	✓	✓	✓	✓	✓	✓
First begin quality practices	1994	1996	1994	2002	2000	2003	1996	2003
First promoted?	1.Customer satisfaction 2. Process improve 3. Business survival	1.Customer satisfaction 2.Cont'ous improve 3.Systematic Workflow	1.Customer satisfaction 2. Cont'ous improvement 3. Business survival	1.Enforced by customer 2.Minimise internal rejection	Reduce rejection rate	Enforced by customer	Enforced by customer	Enforced by customer
Remain customer focussed?	1.Fewer complaints 2. Prompt action 3. Right spec. 4.Staff training on customer needs	1.Reduced no. of complaints 2. On time delivery with right spec. 3.Good relationship	1.Right first time every time 2.Zero complaints 3.Reduced no. of non conformance on customer audit	1.Quality product 2.Right pricing 3.On time delivery	1.Quality product 2.On time delivery	1.Quality product 2.Good price	1.Quality system 2.On time delivery 3.Right spec.	1.Quality product 2.Right pricing 3.Good relationship

According to the Managing Director of Company B (award winner):

"Quality management practices in this company begin with 5S (house keeping concept) and started from the basic and simple activities before engaging in the higher one. It looks simple but is very effective and the staffs were very happy and comfortable. This was our strategy to ensure that the quality system can be maintained and sustained in the long run."

Both award-winning companies had their own approaches to beginning their quality practices in the factory. This was to the ensure quality practices introduced were accepted by employees in daily activities and could be sustained for a long time. As such, senior management needed to formalise the quality system and integrate it with daily activities for it to be successful.

The follow-up questions with interviewees concerned the factors that inspire the business' management to adopt quality management practices in the factory. The award-winning companies agreed that customer satisfaction was the main factor that drove them to implement quality management systems, followed by process improvement, continuous improvement, systematic workflow and business survival as drivers. On the other hand, the non-award winning companies focussed on internal factors such as a reduced or minimised rejection rate. The majority of them also agreed that they had been forced by customers to put the systems in. This indicates that customers dictate much of the improvement activity in the factory rather than other services including benchmarking/government promotion or consultants.

As the Managing Director of Company F (non-award winner), observed:

"We installed our quality management system in the factory because it was a requirement by our customers. We have no project or contract without a quality management system."

The informants were also asked about the activities carried out to remain customer focused; most of the practices of the award-winning companies were related to customer satisfaction such as reducing the number of complaints, on time delivery, staff training on customer needs and maintaining a good relationship with customers. Activities conducted by the non-award winning companies to remain customer focussed were mainly based on the quality of the product. This shows the non-award winners were still struggling with the basic problems of operations. Other factors considered important to remain customer focussed included pricing, on time delivery and having a good relationship with customers. Again, this shows a bias towards the strategic management for award winners and the tactical for non-award winners.

5.3.8 Senior Management Involvement in TQM

TQM implementation in organizations requires the involvement of senior management teams to ensure effectiveness and sustainability over a longer period (Powell, 1995; Ahire et al., 1996; Van der Wiele and Brown, 2000; Agus, 2004; Iwaardeen et al., 2006). Senior management must create the organizational environment, atmosphere and values in which TQM can achieve its potential (Dale, 2003) and senior management teams also must demonstrate to the employees that they are serious about quality (Oakland, 2003). Table 5.10 presents the finding concerning senior management involvement in quality activities. Senior management at the award-winning companies were active in quality management practices in the factory, but in three of the non-award winning companies (Company E, F and H) were not active at all. This portrays the responsibility and commitment of senior management at the award-winning companies for quality improvement. Samson and Terziovski (1999) argue that the commitment and the involvement of senior management have a strong relationship with company performance. Thus, effective leadership is needed for small businesses to ensure the success of TQM implementation as well as of the organization as a whole.

It was found that senior management for both the award and the non-award winning companies who were involved in monitoring quality activities chaired the steering committee and management review meeting. According to Oakland (2003), senior

management should initialise commitment to the change process and this was so for Companies A, B and C (award winners) and D and G (non-award winners). Senior management in these companies were leading change initiatives and promoting new ways of working techniques. For example, the Managing Director of Company C took responsibility for introducing and giving a briefing on the concepts and principles of TS16949 to all of his employees at every level. The personal commitment demonstrated by senior management could encourage employees to participate and could reduce existing barriers (Dale, 2003, Juran, 1988; Crosby, 1979).

Table 5.10: Senior management involvement

Involvement	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Active in quality management practices	✓	✓	✓	✓	×	×	✓	×
Examples of involvement	Monitoring of quality activities Chairman of steering committee	Involved directly in quality issues discussion	Monitoring of quality activities in the factory Morning briefing to the staff Chairman of management review meeting	Monitoring of quality activities in the factory	Not involved	Not involved	Monitoring of quality activities in the factory Involved in brainstorming on quality issues	Not involved
Leading change and promoting new ways of working	✓	✓	✓	✓	×	×	✓	×
Relationship between senior management leaders	A well integrated and team approach to business management	A well integrated and team approach to business management	A well integrated and team approach to business management	A well integrated and team approach to business management	The business led by single manager	The business led by single manager	A well integrated and team approach to business management	The business led by single manager

In addition, the majority of informants agreed that the relationship between senior management and middle management was a "well integrated" and "team approach" to business management which reinforces the findings of high performance larger companies (See Imai, 1986; Deming, 1986; Juran, 1988). However, the similar group of cases (E, F and H) claimed that the business was led by a single manager and the senior manager did not delegate the responsibility in managing the business to employees. This might suggest that the level of trust was very low within these cases and not integrated with the planning process. Dale (2003) suggests that TQM is renowned for being based on principles that lead to high trust and relationships through the integrated and team approach. It would appear from the results that the award winners were engendering a culture of trust and integration.

Concerning the senior management commitment, the Managing Director of Company D (non-award winner) suggested:

"Quality activities in the factory are very important to me and I do encourage all employees to take part. Although not chairing a steering committee, I did a monitoring activity through the monthly report that has been sent to me. I am ready if they need help in terms of ideas as well as monetary issues (depending on case and budget allocation)".

Again, it shows commitment from senior management is vital for the success of quality activities in companies.

5.3.9 Business Culture

The aim of this section of the interviews was to understand the business culture created by the company, and questions covered the average age of the Boards of Directors (BOD), membership of professional bodies, attitude towards change, progress as a quality business, commitment to TQM and resistance to implementation of TQM. Table 5.11 shows that the average age of members of the award winning companies' Boards of Directors ranged from 45 to 50 years old, and from 40 to 55 years old for the non-award

winners; therefore, award winners all belonged to a common age group. The directors had been with the company since it started and had never worked anywhere else during

Table 5.11: Business culture

Business Culture	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Average age of BOD	45	48	50	40	40	55	45	45
Educational background	Diploma	Degree	Master	Degree	Degree	Diploma	Diploma	Diploma
Work at only this business	✓	✓	✓	✓	✓	✓	✓	✓
BOD in professional bodies	×	×	✓	✓	×	×	×	×
Which bodies?			Institute of Engineering Malaysia	Malaysia Institute of Management				
Positive attitude toward change	✓	✓	✓	✓	×	×	✓	✓
Quality business	Total quality approach	Total quality approach	Total quality approach	Good quality processes and system	At the beginning	At the beginning	Good quality processes and system	Good quality processes and system
Total quality of working	✓	✓	✓	✓	×	×	✓	✓
Resistance	Lack of management commitment Employees turnover Inadequate resources	Lack of management commitment Poor planning Employees turn over Lack of customer focus	Leadership Inadequate resources Lack of commitment Poor customer service	Inadequate human resource development Employees turnover Poor relationship with suppliers	No commitment High of employee turnover No clear goal and objectives	High turnover Lack of skill in problem solving technique	Inadequate resources Lack of commitment No link between pay and performance	Bad Planning Lack of skill workers Lack of communi-cation

Note: BOD- Board of Director

their career. The finding indicates that the BOD in both the award-winning and the non-award winning companies were experienced persons who were mature in business experience. In addition, all of them had graduated with a Diploma, Degree or Master level from institutions of higher education, and had showed they were well educated and capable of leading the company.

The purpose of the questions relating to membership of professional bodies was to ascertain whether professional bodies influence senior management's approach to TQM. The results show the BOD from only two companies (C and D) belonged to professional bodies such as the Institute of Engineering Malaysia (IEM) and the Malaysia Institute of Management (MIM). Both institutes are well known in Malaysia for engineering and management associations.

In terms of change in the company, the award-winning companies agreed that their employees had very positive attitudes but Companies E and F (non-award winners) did not agree. The researcher asked further questions regarding this matter and the cause was found to be the level of education (lower level especially operators) and complacency with their own style of work. Furthermore, the older employees sometimes did influence the younger ones not to accept any changes introduced, but this was nor tested further.

According to the Managing Director of Company E (non-award winner):

"We have a problem with employees' attitude especially at the operator level. They are the most difficult person to persuade to accept any change in the factory. For example, a year ago, the management team decided that every employee must clean the machines and floor 15 minutes before finishing their work. We gave instructions and explained the reasons through a memo. It took us almost eight months to inculcate this culture throughout the factory. I think they were comfortable with their own style of work. They could not be bothered about dirty machines and a dusty floor."

This view of the situation also was shared by the Managing Director of Company F (non-award winner). According to him:

"As far as I am concerned, the majority of our employees have a negative attitude toward change. I say this sincerely because, in my experience, they (employees) view any changes introduced as a burden to them because they need to follow this and that. If we pushed them to accept changes, they would resign and work somewhere else especially with our competitors. As you know, nowadays it is very difficult to get workers (operators). Therefore sometimes we need to tolerate them as long as it does not affect the product quality."

The statement from the non-award winners shows that they faced difficulties in introducing change to the workers. This might reflect the ineffective role of senior management to inculcate a quality culture among the workers. Ahire and Rana (1995) argue the change introduced in an organization is either accepted or rejected based on the first few employees' experience of it, and postulate that employee attitude is critical in TQM implementation (Ghobadian and Gallear 2001).

Table 5.11 indicates that all the award winners claim that their company was progressing towards a total quality approach and that employees in the factory were very committed to this drive. However, the non-award winners' progress was not up to total quality approach but ranged from beginning the process of change to having good quality processes and system despite many years of TQM experimentation.

Since the majority of cases would agree that the philosophy and principles of TQM are sound (Anderson and Sohal, 1999; Chileshe, 2000; Bayazid, 2003; Bernal et al., 2004; Agus, 2004), the resistance to implementing TQM was also tested by the researcher. Many studies have focussed on the resistance to TQM (Katz, 1993; Matta et al., 1996; Bateman and Rich, 2003; Tamimi and Sebastianelli, 2003; Haupt and Whiteman, 2004; Jun et al. 2004). The reasons for the resistance that were experienced by all participating companies in implementing TQM at the factory were very similar. These inhibitors

included lack of commitment from senior management, high employee turn over, poor planning for the factory, inadequate resources, lack of skilled workers, failure to link pay and performance, no clear goal or objectives, poor customer service, poor relationships with suppliers and lack of communication. The majority of the participating companies agreed that senior management commitment was the ultimate factor of resistance in implementing TQM. It is important for senior management to understand the principles of TQM and leads the organization in achieving its goals and objectives. This finding reflects the work of Brown (1998), Ghobadian and Gallear (2001), Hackman and Wagemen (1995); Ahire et al. (1996). This finding was in keeping with the questionnaire survey results presented in Table 4.43 of Chapter 4. It was also similar to the results in previous studies by several authors (Tamimi and Sebastianelli, 2003; Jun et al., 2004; Amar and Zain, 2002).

The results so far show that the award-winning companies engaged QMS much earlier than did the non-award winners, with continuous improvement and customer satisfaction as motivating factors. The business strategy was developed through the involvement of all managers in the factory. This shows the award-winning companies had a strategic planning and integrated approach to business management. The non-award winners, on the other hand engaged in QMS due to customer enforcement. This reinforces the lack of senior management involvement in quality improvement programmes, which leads to poor business planning and integration.

5.3.10 Business Measures

Business measures are important to ensure that the product or services fulfil the specified requirements and that the business measures up to and perform well against critical measures of success. Oakland (2003) suggests, *"Customer satisfaction must be a primary measure of system output and internal audits should be used as a primary tool for evaluating ongoing system compliance."* Therefore, it is very important for organizations to ensure that their measurement system reflects the current environment and strategies (a critical point identified by the work of Kennerly and Neely, 2001).

With regards to this research, the informants were asked open-ended questions to explore the type of indicators used and identify the most improved performance indicators. Table 5.12 shows the results of participating companies. Indicators such as customer satisfaction survey, internal audit report, number of complaints and warranty claims were used by the award-winning companies and by two of the non-award winners. It is believed that the measures used to demonstrate and gain customer confidence in product quality were identified through the information and data collected.

Further questions required participating companies to list the indicators used by customers in assessment and the company's own performance indicators. The results show very similar indicators were used by the award winner's customers and the non-award winner's customers to evaluate their suppliers (for example, product quality, delivery, cost and technical capabilities).

Table 5.12: Business measures

Business Measures	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Indicators for customer satisfaction	1.Customer satisfaction survey 2.Audit report 3. No. of complaints	1.Warranty claim 2.Defect claim 3. No. of complaints	1.Customer satisfaction survey 2.No. of complaints 3.Warranty claim 4. Audit report	1.Customer satisfaction survey 2. No. of complaints	No indicator used	No indicator used	1. No. of customer complaints 2. Audit report	No indicator used
Business performance indicators used by customers	1.No. of non compliance 2.No. of complaint 3.Technical capabilities	1.Product quality 2.Delivery 3.Cost	1.Product quality 2.Delivery 3.Cost	1.Product quality 2.Delivery 3.Processes 4.Technical capabilities	No indicators used	No indicators used	1.Product quality 2.Delivery 3.Processes 4.Machine capability	No indicators used
Business performance indicators used by company	1.Efficiency 2.Technology 3.Productivity	1.Efficiency 2.Effective 3.Productivity	1.Efficiency 2.Effective 3.Productivity	Productivity Sales Reject rate	1.Sales 2. Product quality	1.Sales 2.Deliver	1.Efficiency 2..Effective 3.No of project	1.Sales 2.Service
Most improved indicators in past three years	Efficiency and Effectiveness	Efficiency and Effectiveness	Efficiency and Effectiveness	Sales	Sales	Sales	Efficiency	Sales

The result may suggest that the indicators used were very common and, therefore, TQM represents how well the managers of businesses design quality features and practices. Customer audits were carried out at suppliers' premises with the intention to offer contracts to purchase goods or services (ISO 9001:2000). Nevertheless, the indicators used by the award-winning companies were different from those used by the non-award winners. The award winners' indicators emphasised efficiency and effectiveness, whereas those used by non-award winners focussed on sales and product quality. Again, this implies the award winners emphasised the strategic aspect and the non-award winners focussed on the tactical aspect as seen in section 5.3.7 of this chapter.

The research shows non-award winning companies still concentrated on fundamental issues and claimed the most improved indicators in their companies for the past three years were sales despite a lack of TQM systems. This is a traditional style of measurement that focuses only on sales and profit whereas the literature suggests TQM businesses will include measures of the socio and technical systems (Imai, 1986; Wang, 2004).

5.3.11 Suppliers Performance

SMEs are often suppliers of goods and services to larger organizations and any lack of product quality would adversely affect the competitive ability of the larger organizations (Ghobadian and Gallear, 1996). At the same time, they also have their own suppliers that supply goods and services. Dale (2003) declares that an organization's success in the marketplace depends on the product or services provided by suppliers. Therefore, suppliers are critical to the competitiveness and performance of the purchaser's product and services. In order to ensure that suppliers consistently provide a quality product or services, their performance needs to be assessed (Modi and Mabert, 2006). Modi and Mabert (2006) further give an interesting analogy about suppliers:

"Suppliers are like fish in the ocean and customers are the fisherman who wants to catch the fish. The main challenge facing customers during the fishing is how to put out the

right bait, so that it can pull up the right suppliers at the right time and get them help to produce a quality product".

The analogy reflects the importance of a supplier's role to the customers. The selection processes need to be carried out carefully to ensure the right suppliers are chosen, that is, suppliers that can help to provide a quality product. This research explored the issues of supplier's performance measurement and the difficulties faced by participating companies when working with them. It is normal for organizations to carry out a performance measurement of their suppliers periodically to ensure customer needs continue to be met and to develop a partnership (Oakland, 2003). Table 5.13 shows the award-winning companies agreed that they carried out a performance measurement of suppliers, whereas the non-award winners did not, except for Company G. The criteria used by the award-winning companies were based on quality and management excellence awards, and included process capability, systems employed, resource availability, management, machine capacity and stock control. It can be said that the criteria used by the award-winning companies could help suppliers achieve continuous improvement. On the other hand, the criteria used by the non-award winning companies were based only on product quality, rejection rate, delivery, man- power and cost. Similarly, this situation also applied when the cases were asked about the biggest difficulties faced when dealing with suppliers. The award winners' problems with suppliers were more advanced and again related to continuous improvement. For example, the difficulties faced by Company A included of ineffective quality system implementation, low level of technology used and slowness in taking action with regards to suggestions for improvement.

Table 5.13: Suppliers performance measurement

Suppliers Measurement	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Measure suppliers performance	✓	✓	✓	x	x	x	✓	x
Measurement used	1.Process capability 2.System employed 3.Resources availability 4.Quality inspection 5. Delivery	1.M'gement 2.Resources availability 3.Machice capacity 4.Stock control 5. Delivery	1.Management 2.Processes 3.Technology 4.Quality inspection 5. Delivery	No Measures	No Measures	No Measures	1.Product quality 2.Delivery 3. Cost 4. Man power	No Measures
Biggest difficulties	1.Ineffective quality systems 2.Low in technology used 3.Slow action taken against suggestions for improvement	1.Poor of reliability information 2.Inability to resolved problem 3.Less man power and machine	1.Inculcate quality way of working 2. Lack of communication system 3.Quality system not effectively implemented	1.Product quality 2.Delivery on time 3.Poor com'cation 4. Respond negatively to feedback	1.Meet specification 2.High rejection rate 3. Late delivery	1.Late delivery 2. Poor quality of product 3. Lack of understanding of minor problem	1.Late delivery 2.High rejection rate 3. Poor communication	1.Late delivery 2.Poor quality of product

According to the Managing Director of Company A (award winner):

"We treat our suppliers as a business partner. We developed together to maintain competitiveness as well as satisfied end customers. I believe that through partnership we can share common objectives and reach an understanding among each other".

This statement was supported by that of the Managing Director of Company C (award winner), who said:

"Our suppliers have been with us for almost 10 years. We understand each other very well. Although it has been a little bit difficult for them to absorb a quality way of working but they accept our comments and suggestions during auditing processes and we look forward for improvement."

Despite their small size, the award winners wanted to do business with the right type of supplier. Thus, suppliers were treated as business partners, showing that a trust culture was established through the relationship. According to Oakland (2003), effective partnership is a key success criterion.

Meanwhile, fundamental or common issues such as poor product quality, late delivery and a high rejection rate are still significant difficulties for the non-award winners when dealing with the performance of suppliers.

The Managing Director of Company D (non-award winner) made the following comment:

"Poor product quality and late delivery are common issues to our suppliers. I think they were used to it due to the pressure from other customers. We have an approved suppliers list and conduct an audit regularly but the result is still almost the same."

Company E (non-award winner) and Company F (non-award winner) also faced the same problem as Company D (non-award winner) with regards to suppliers.

According to the Managing Director of Company E (non-award winner):

"More than 100 times I kept reminding my suppliers to produce a quality product and deliver on time. They (suppliers) repeated the same mistake and indirectly affected my company performance."

The difficulties faced by the non-award winning companies might reflect their role and capability to assist suppliers. The performance of suppliers moreover was not measured (except by Company G) and this indicates that there were no supplier development programmes at the non-award winning companies.

5.4 Quality Assurance

Questions in this section focussed on the quality assurance activities in the factory and semi-structured interviews were carried out with the Quality Assurance Manager in each company. The analyses of the findings will now be reviewed. These features are critical to having an understanding of the functional policies and practices and how this ensures quality assurance becomes a business capability (Slack, 1991).

5.4.1 Quality Planning

This section began with the question of whether the participating companies had a formal quality policy. Just like a formal business strategy, a formalised quality plan is associated with high performance (Oakland, 2003; Juran, 1988). As indicated in Table 5.14, all participating companies agreed that they had a formal quality policy except Company E (non-award winner). According to Hoyle (2001, p. 230), a quality policy is the statement of *"overall intentions and direction of an organization related to quality as formally expressed by top management."* Oakland (2003, p. 31) suggests that *"quality policy is a fundamental requirement, if an organization is to fully implement TQM. Every organization should develop and state its policy on quality, together with arrangements for its implementation. The content of the policy should be made known to all employees. The preparation and implementation of a properly thought out quality policy, together with continuous monitoring, make a smoother production or service operation minimise errors and reduce waste".*

In terms of the first year of a written quality policy, the study found it was the same year that the ISO 9000 certification was gained (see Table 5.5). This may suggest that the management developed and wrote the policy during the ISO 9000 documentation and implementation process to satisfy the requirements of the standard (ISO 9001, clause 5.1b). It also shows the award-winning companies had an average of 7 years more experience in developing a quality policy than had the non-award winners and so had benefited from a quality policy for longer. A quality policy is not a standard document and can vary greatly. The research, therefore, investigated the depth and breadth of the policy.

Table 5.14: Quality planning

Quality Planning	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Have formal quality policy	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
First written	1994	1996	1994	2002	0	2003	1996	2003
Customer satisfaction	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Product quality	Yes	Yes	Yes	Yes	No	Yes	Yes	No
Employee development	Yes	Yes	Yes	No	No	No	No	No
Measurement	Yes	Yes	Yes	Yes	No	Yes	Yes	No
Reviewed	Once a year	Once a year	Once a year	Once a year	No	Once a year	Twice a year	Once a year
Who conducts it?	All Managers	All Managers	All Managers	QA Manager & teams	None	Managing Director	Managing Director	Managing Director
Dissemination of quality policy	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Visually displayed	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes

In terms of the elements covered by the quality policy, the participating companies were given a selection of features, namely, customer satisfaction, product quality, employee development, measurement or other than given elements. The features given were based on the criteria of QMEA developed by NPC (2000) and Oakland's Quality Model. The result shows that the award-winning companies had a quality policy that included all four elements as suggested by NPC (2000) and Oakland (2003) thus reflecting an integrated systems approach. However, companies F, G and H (non-award winners) did not consider employee development and measurement activities in their quality policy. This might suggest the non-award winning companies had no proper planning or intention to

develop employees to be skilful and knowledgeable, and able to work for the benefit of the company. It was also noted that Company H (non-award winner) did not cover product quality elements in its quality policy. Again, this might imply those companies (non-award winners) were not concerned with, and did not emphasise to employees the importance of producing a quality product. Below are two examples of quality policies, one for Company B (award winner) and the other for Company F (non-award winner); they show the vast differences in emphasis.

*"To design and manufacture **quality products** that will meet the **customer satisfaction** through **trained** or **skilled workers, appropriate measurement and continuous improvement** to remain fit for purpose throughout their specified life."*

(Company B Quality Policy)

*"Strive to enhance **customer satisfaction** through **continuous improvement** in **product quality, measurement** and services through the compliance of Quality Management System."*

(Company F Quality Policy)

Table 5.15 shows the differences in the quality policy at participating companies and the different quality improvement elements emphasised.

It has been recommended that the quality policy be subject to review at least once a year to ensure it is up-to-date and relevant to the current situation (Hoyle, 2001). All participating companies (excluding Company E) reviewed the policy once a year except Company G, which reviewed it twice a year. The revision was conducted by all Managers in the award winners and by only the Managing Directors in the non-award winners. All participating companies agreed that they communicated the quality policy throughout the factory and displayed it at strategic places. Therefore, there were no differences in the basic promotion of the quality policies.

Table 5.15: Differences elements emphasised in quality policy

Emphasised Elements	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Customer Satisfaction	✓	✓	✓	✓	×	✓	✓	✓
Product Quality	✓	✓	✓	✓	×	✓	✓	×
Employee Development	✓	✓	✓	×	×	×	×	×
Measurement	✓	✓	✓	×	×	✓	✓	×
Continuous Improvement	✓	✓	✓	✓	×	✓	✓	✓

With specific reference to the promotion of the quality policy, the Quality Assurance Manager of Company G said:

"At the initial stage, we were facing difficulties to make our employees understand the policy. If they don't understand the policy, it is very hard for us to inculcate a quality way of working in this factory. They had a briefing session and we displayed the policy throughout the factory and even on the back of their identity card. Now, the majority of employees understand the policy and are able to explain to new ones."

This statement shows Company G took serious action to promote and give understanding of the quality policy to employees with the intention of obtaining full support for the quality programme in the factory.

Quality policy is very important in TQM implementation because it shows commitment toward achieving organizational goals and objectives for quality (Evans and Lindsay, 2002). Senior management should accept responsibility for and commitment to quality policy (Dale, 2003). Therefore, a quality policy is considered to mirror the leadership in the factory. This study found all the award-winning companies had a written quality

policy and emphasised vital elements in quality improvement activities. The necessary action had been taken to promote and inculcate a quality culture and awareness amongst employees. The non-award winners, on the other hand, also had a written quality policy (except Company E) but there was less emphasis on the quality improvement elements especially employee development and measurement. This might reflect the non-award winners' capability to train skilled workers that were able to contribute to company success.

5.4.2 Quality Approaches

a) Methods of Quality Approaches

These questions were asked by the researcher to improve the understanding of methods employed by informants in quality practices. Table 5.16 describes the award-winning companies and Company G have moved beyond no system of formal standards (a pass/fail inspection methods) to the deployment of empowered checking by more people who are closer to the work itself (not specialists who work off-line). The result shows a greater affinity to TQM and the shortening of reaction times by giving employees a better understanding of when products and processes have moved out of tolerance and control. The non-award winners showed a bias towards having no systems or bureaucracy but these reflect the presence or absence of rules.

The Quality Assurance Manager of Company C (award winner) gave his opinion:

"All workers in this company were trained to be self certified regarding products and processes. They know what to do if products or processes are out of control or specification. It helps the company to reduce the reject rate and increase productivity and, at the same time, our workers also have a better understanding of quality product and processes."

This indicates award-winning companies give authority to the workers to make decisions about products and processes and this result may reduce the dependency of employees on

their superiors and increase motivation and a sense of responsibility for the company output amongst workers (Robertson et al., 1992).

b) Measurement of Customer, Business and Supplier Performance

Measurements should be implemented by organizations to demonstrate that the products or services conform to specified requirements (Oakland, 2003). The questions in this section sought to identify the measurements used in terms of on time delivery, quality defect rates, warranty returns and lead times. These resources were applied to customers, suppliers and the business itself.

Table 5.17 indicates the award-winning companies (and Company G) engaged a much broader range of measures than do the non-award winning companies. These measures reflect the keys features of Slack (1991) and by getting quality and delivery right, these companies have been able to drive down, across the supply chain, the time needed to produce products. The award winners showed a tendency to measure performance to reinforce the importance of stability and reliability of supply. Therefore, the award winners can be seen as optimising systems whereas the non-award winners seek to stabilise material flow.

5.4.3 Product Return by Customers

The motivation for these questions was to identify the rate of returned products from customers. This would allow the researcher to reveal the efficiency and effectiveness of company processes. All participating companies have had experience of product returns by customers during the last 12 months. This situation suggests even the award winners still have systems that are not mistake-proof. However, the average rate of return varied greatly among companies (see Table 5.18). The award winners' average rate of return ranged from 0.01% to 0.03%. These measures reflect the efficient and effective process management in the factory. The non-award winning companies showed a higher rate of product return with 0.05% to 0.80%. The higher rate of return suggests many possible causes such as inefficient management, non-skilled workers, incorrect methods or machine capability; each is an STS failing by management.

Table 5.16: Quality Approaches

Practices	Companies																							
	Award Winners									Non-Award Winners														
	A			B			C			D			E			F			G			H		
	S.M	I.P.M	C.P	S.M	I.P.M	C.P	S.M	I.P.M	C.P	S.M	I.P.M	C.P	S.M	I.P.M	C.P	S.M	I.P.M	C.P	S.M	I.P.M	C.P	S.M	I.P.M	C.P
No formal quality system													✓	✓	✓									
Inspection of production										✓	✓	✓				✓	✓	✓				✓	✓	✓
Self certification	✓	✓	✓	✓	✓	✓	✓	✓	✓										✓	✓	✓			

Note: S.M - Supplied Material; I.P.M – In Process Management; C.P – Customer Process

Table 5.17: Measurement of customer, business and supplier performance

Practices	Companies																							
	Award Winners									Non-Award Winners														
	A			B			C			D			E			F			G			H		
	S	B	C	S	B	C	S	B	C	S	B	C	S	B	C	S	B	C	S	B	C	S	B	C
On time delivery	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗	✓	✓	✓	✓	✓	✗	✗	✗
Quality defect rate	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Warranty and return	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✗	✗	✗
Lead time	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✓	✓	✓	✗	✗	✗

Note: S- Suppliers; B- Business; C-Customer

Table 5.18: Product returned by customer

Product Return	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Returned product by customer	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Rate of product returned	0.03%	0.03%	0.01%	0.10%	0.80%	0.80%	0.05%	0.07%
Average product returned	0.02%			0.36%				

The Quality Assurance Manager of Company F with seven years' experience gave his feedback:

"High turnover among factory workers was the main reason why we have a very high product return from customers. When someone resigns especially skilled worker and it will affect the production line. If more than one person resigns a month, you figure up what will happen."

The total average rates of product return for both the award winners and the non-award winners were calculated and the result shows a very significant difference between them with 0.02% (award winners) to 0.36% (non-award winners). This indicates the award winners' systems and process management and control were effective and efficient as compared to those of the non-award winners. Oakland (2003) claims good process management and control reflects the capability of a company to ensure process systematically, improve targets, and focus on innovation and creativity to improve processes.

5.4.4 Factory Quality Practices (Management)

There are a variety of quality practices to help organizations improve their product and services as part of a continuous improvement capability. The use of quality tools and techniques in an organization depends partially on its understanding of quality (Okes, 2002) and is a vital component of any successful improvement process (Bunney and Dale, 1997). This section required informants to select the best answer about quality practices in the factory. They were given three options and needed to indicate only one, that is, 'often' 'sometimes' or 'never' to the list of quality practices provided. The option selected was then given a mark as follows:

Often = 2; Sometimes = 1; Never = 0.

As indicated in Table 5.19, the management in Company C were the ones to use quality practices most often in the factory, followed by Companies A and B. Almost all listed quality practices had been used by the management of Company C. These are high performance 'outliers'. Meanwhile, the management in Company E was the one to use quality practices least frequently in the factory. These results reinforce earlier findings of a disjointed STS. However, Company G's management were much better, often using half of the listed quality practices. The findings in Table 5.19 show the award-winning companies were very active in quality practices as compared to non-the winners. This suggests the management in the award-winning companies were trained and had the capability to practise quality improvement activities in the factory.

5.4.5 Factory Quality Practices (Factory Workers)

The same questions were also put to the Quality Assurance Manager but with the focus on the need for factory workers to understand quality improvement activities employed at the lower level. The analysis performed in these sections was similar to that discussed in section 5.4.4. Table 5.20 describes the quality practices used by factory workers and again, Company C factory workers used the quality practices most often, followed by factory workers of Companies A and B. Company G showed a good indication with a number of quality activities having been practiced by factory workers. The companies

Table 5.19: Quality practices in the factory (Management)

Practices	Companies																							
	Award Winners									Non-Award Winners														
	A			B			C			D			E			F			G			H		
	O	S	N	O	S	N	O	S	N	O	S	N	O	S	N	O	S	N	O	S	N	O	S	N
Brainstorming	✓			✓			✓				✓			✓		✓	✓		✓			✓		
Team working	✓			✓			✓			✓			✓			✓	✓		✓			✓		
Cause and effect diagram	✓			✓			✓			✓					✓		✓		✓					✓
Quality function deployment	✓			✓			✓				✓				✓			✓	✓					✓
Value analysis/ Value engineering			✓			✓			✓			✓			✓			✓			✓			✓
Six Sigma		✓			✓		✓					✓			✓			✓			✓			✓
Lean production	✓			✓			✓				✓				✓			✓		✓				✓
BPR		✓				✓	✓					✓			✓			✓			✓			✓
SPC	✓			✓			✓			✓					✓			✓	✓					✓
Policy deployment	✓			✓			✓				✓				✓			✓			✓			✓

Note: O – Often; S – Sometimes; N – Never

Table 5.20: Quality practices in the factory (factory workers)

Practices	Companies																							
	Award Winners									Non-Award Winners														
	A			B			C			D			E			F			G			H		
	O	S	N	O	S	N	O	S	N	O	S	N	O	S	N	O	S	N	O	S	N	O	S	N
Brainstorming	✓			✓			✓			✓				✓		✓			✓			✓		
Team working	✓			✓			✓			✓			✓			✓			✓			✓		
Cause and effect diagram	✓			✓			✓				✓				✓		✓		✓					✓
Charting including bar charts and pareto analysis	✓			✓			✓				✓				✓	✓			✓					✓
Quality circles	✓			✓			✓					✓			✓		✓			✓				✓
Workplace organization	✓			✓			✓			✓			✓				✓		✓				✓	
SPC		✓			✓		✓				✓				✓			✓		✓				✓
Daily team briefing	✓			✓			✓			✓					✓		✓		✓				✓	

Note: O – Often; S – Sometimes; N - Never

whose factory workers used quality practices with the least frequency were Companies E and H. The results show factory workers of the award-winning companies used the most quality practices as compared to the non-award winners. This indicates those workers had adequate skills and training in quality and were able to practice process improvement. Inverse findings indicate the non-award winners implemented fewer quality practices. However, factory workers of Company G were shown to be different from others in the group regarding quality practices, being instead similar to those of the award winners ('outliers').

5.4.6 General Quality Practices

Questions were also asked about how quality improvement activities were identified and focussed for the business to provide an understanding of the level of company seriousness toward implementing these activities. This was an important TQM feature as proposed by authors in the literature (Deming, 1986; Garvin, 1988; Dale, 2003). The questions focussed on customer and internal benefits gained from quality improvement activities. The results in Table 5.21 demonstrate that there are a number of ways and means to identify the quality activities of participating companies. The quality activities were identified through customers and employee feedback, monthly reports, management reviews, benchmarking, training and audit reports (Sousa et al. 2005; Husband and Mandal, 1999; Drew and Healy, 2006). In terms of benefits gained from quality improvement activities, the cases claimed that both customers and internal operations benefited. Customer benefits included greater satisfaction, service beyond expectations, good relationships with manufacturers, better product quality and on time delivery. In the case of internal benefits, these included satisfaction among employees, understanding of current and future needs of customers, better team working, systematic workflow, effective communication and others.

The research found case companies provided a different perception of customer benefits with regards to quality activities. The award winners were concerned about customer satisfaction and maintaining the relationship whereas the non-award winners focused on product quality and delivery (fundamental issues). This suggests that the award winners

Table 5.21: Identifying quality improvement and benefits gained

Statements	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Identifying quality activities	1. Monthly report 2. Customer complaint 3Bsm 4. Training 5.Bmk 6.Feedback from workers	1.Monthly report 2.Customer feedback 3.Feedback from employees	1. Weekly and monthly review 2. Customer feedback 3. Current issues 4. Feedback from employees 5. Bmk	1.Monthly management meeting 2.Customer feedback	1.Communication with workers 2.Understand the process 3.Monitoring	1.Weekly and monthly report 2.Management review meeting 3.Customer feedback	1.Monthly report 2.Customer feedback 3.Audir report 4.Bsm	1.Management review meeting 2.Customer feedback
Customer benefits	1.Satisfied 2.Get more than required 3.Good relationship 4.On time delivery	1. Satisfied 2.Get more than required 3.Good relationship	1. Satisfied 2.Get more than required 3.Good relationship	1.Quality of product 2. On time delivery 3.Less cost	1. Quality of product 2. On time delivery	1. Quality of product 2. Delivery on time	1. Satisfied 2.High quality of product 3.On time delivery	1.Quality of product 2. On time delivery
Internal benefits	1. Satisfied 2.Understand current & future customer needs 3.Better team working 4.Increased productivity 5. Better performance 7.Safety 8. Process improvement	1. Satisfied 2.Understand customer needs 2.Better team work 3.Conducive working environment 4.Incresed performance 5 Systematic work flow 6. High commitment	1. Satisfied 2. Increased productivity 3.Reduced gap 4.Better team work 5. Good comm.. 6.Increased performance 7.Systematic work flow 8. High commitment	1.Increased productivity 2. Fewer rejects 3.On time delivery 4.Reduced cost	1.Increased productivity 2.More sale 3.Fewer rejects 4.Quality product 5.On time delivery 6. Reduced cost	1.Quality product 2.Reduced cost 3.Fewer rejects 4. On time delivery	1.Systematic process flow 2.Better team work 3.Increased performance 4.High commitment 5.Good relationship	1.Quality product 2.Reduced cost 3.Less reject 4. On time delivery

Note: Bsm = Brainstorming; Bmk = Benchmarking

had fewer problems with products and deliveries as compared to the non–award winners. This argument is supported by the results shown in Table 5.18 sections 5.4.3 of this chapter with regards to the product return by customers. Similarly, the case companies showed the same concern for internal benefit gained from quality practices. This might demonstrate the award winners gained more benefit from quality practices than did the non-award winners

5.4.7 Quality Standards

Questions regarding quality standards were put to respondents to improve the understanding of the perception of documentation and the involvement of production workers in improvement activities. These were considered important by previous researchers (Beattie and Sohal, 1999; Gotzamani and Tsiotras, 2001; Najmi and Kehoe, 2000). All participating companies had formal written standards for the manufacture of products and process improvement except Company E (see Table 5.22). This suggests the majority of participating companies' process improvement activities were documented and this was reflected in the implementation of ISO 9000 in their factories. The systems compliance requires companies to establish a system of documentation that continuously updates and tracks quality practices and progress but it is resource intensive and not always seen as compatible with SMEs (Lee and Palmer, 1999).

The majority of the non-award winning cases claimed that such systems slowed down the improvement process and did not save money. Conversely, all the award winners stated that ISO 9000 did not slow down the improvement activities and at the same time saved money. The non-award winners' perception indicates a failure to integrate the system into a business strategy. This is important to ensure both are working in parallel toward achieving business goals and objectives (Oakland, 2003).

There were debates in the literature regarding ISO 9000 implementation and its contributions toward company performance. In 1996, Dun and Bradstreet conducted a comprehensive survey of all ISO 9000 certified U.S organizations and found that companies benefited from the implementation (ISO 9000 survey, 1996). However, Terziovski et al. (1999) concluded that there was no difference in performance between ISO certified and non-certified companies. Sun (2000), Khan and Hafiz (1999), McAdam and McKeown (1999) found that ISO 9000 implementation improves product quality and reduces costs. However, Zhang (2000), Simmons and White (1999), Terziovski et al. (1999) claimed that ISO 9000 implementation also does not yield improved productivity, quality or profitability. Elmuti (1996) agreed productivity, quality of product and quality of work improved due to certification.

Table 5.22: Quality standards implementations

Standards	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Formal written standard of manufacture product	✓	✓	✓	✓	✓	✓	✓	✓
Process improvement documented	✓	✓	✓	✓	×	✓	✓	✓
Documentation does not slow improvement process	✓	✓	✓	×	×	×	✓	×
Quality management saves money	✓	✓	✓	×	×	×	✓	✓
Skill in problem solving techniques	✓	✓	✓	×	×	×	✓	×
Hours involved in problem solving techniques (hours/month)	12	12	18	3	0	2	4	4
Train other people	10	5	15	6	0	0	5	0

Note: Cert = Certificate

In the case of this research, the opinion given by the award-winning companies was based on their experience of having implemented ISO 9000 for more than 10 years (see Table 5.5). They believed that they gained benefits from the implementation of ISO 9000 such as a very low rate of product return by customers as compared to the non-award winners (see Table 5.18). More evidence can be seen through the discussion of operations management in section 5.5 of this chapter.

As the Quality Assurance Managers in the factories, these informants were responsible for monitoring quality related activities by other departments (such as production). The researcher investigated how the skills and the ability of QA people were used to train other people in problem solving techniques. These questions also related to the number of hours per month involved in quality activities with production workers to test the integration of the department. The results in Table 5.22 show that the non-award winning companies felt the production workers were not adequately skilled in problem solving techniques as compared to the award winners. Thus, the number of capable persons available to train others ranged from 0 to 6. For instance, in the award-winning companies, the number of capable persons available to train others ranged from 5 to 15. The estimated average number of hours that production workers were involved in problem solving was very different.

Production workers in the award-winning companies were involved for between 12 to 18 hours per month whereas production workers of the non-award winning companies were involved for between 0 to 4 hours per month. It is believed that the more effort organizations put into quality activities may help them to sustain TQM and achieve a competitive advantage in the long run (Temtime and Solomon, 2002). This result confirms the award winners were more formal, more integrated and more active users of TQM processes.

5.4.8 Quality and Supply Chain Management

Supply chain management is the simultaneous integration of customer requirements, internal processes and upstream supplier performance (Handfield and Nichols, 1998). It is important to the TQM model because supply chain management improves the effectiveness and efficiency of how company operations function through a reduction in lead times and costs and the upgrading of product quality (Kannan and Keah, 2005). In the competitive global market, organizations have downsized and focussed on core competencies but small businesses have rarely downsized. The results in Table 5.23 show the award-winning companies and Companies D, F and G participated in quality activities organised by customers. Activities included seminars, discussions, briefings,

Table 5.23: Quality and supply chain management

Standards	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Participates in customer quality activities	Yes	Yes	Yes	Yes	No	Yes	Yes	No
Type of activities	1.Seminar 2.Discussion 3.Briefing	1.Seminar 2.Discussion 3.Briefing	1.Seminar 2.Briefing 3.Discussion 4.Brainstorming	1.Briefing 2.Seminar 3. Discussion	None	1.Seminar 2.Briefing	1.Supplier quality improvement programme 2.Seminar 3. Discussion	None
Involved with customers during product design process	Yes	Yes	Yes	Yes	No	No	Yes	No
Visits other businesses to benchmark quality process	Yes	Yes	Yes	Yes	Yes	No	Yes	No
Respected as benchmark for quality performance	Company C	Metal stamping company with TS 16949 certified	1. Subsidiaries company(internal) 2.Katayama(external)	Company C	Yao comp. limited	None	Company C	None
Developing quality capability of suppliers	Yes	Yes	Yes	No	No	No	No	No
Activities facilitated	1.System improvement 2.Technology & expertise transfer 3.Joint problem solving activities 4. Improving communica-tion and network 5.Training 6.System auditing	1.Training 2. Advisory services 3.Product & delivery improvement 4.System Auditing	1.Technology transfer 2.Improving networking 3.Training 4.Improve product & delivery performance 5.Intergration business practices 6. Joint problem solving teams 7. System auditing	None	None	None	None	None
Used experts and specialists for quality activities	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Type of service procured	Training and consulting in ISO 9001 & TS16949	Training and consulting in ISO 9001 documentation and certification	1.Technical advice 2. Consulting in ISO 9001&TS16949	Technical advisor TS 16949 ISO 9001:2000	None	Training and consulting services of TS16949 and ISO9001	1.Technical advice from Lotus Engineering 2.TUV Consultant in TS16949	1.Training 2.Consult-ing

brainstorming and other activities. It was interesting to note that the award winners were invited for brainstorming activities with customers, whereas the non-award winners were limited just to common activities. These results reflect the elements of 'trust' and confidence by customers toward the award-winning companies. In addition, the award winners and Companies D and G were involved during the customer product design process, and this implied that those companies had a strong relationship with customers. In terms of benchmarking, most participating companies implemented benchmarking except Companies F and H. Interestingly, Company C was the most respected as a benchmark for quality improvement by Companies A, D and G; this situation suggests that Company C had been successful in implementing TQM and so was admired by other SMEs.

The Quality Assurance Manager of Company D (non-award winner) said:

"Company C is the best to be benchmarked for SME businesses because they demonstrated a good quality management system in the factory."

This statement was supported by Company G's (non-award winner) Quality Assurance Manager:

"They (Company C) implemented quality system effectively and receive strong support from top management. We learn a lot of things from them."

In developing the quality capability of suppliers, the award-winning companies and Companies D and G again claimed they facilitated those activities and the award-winners carried out more supplier development activities as compared to the non-award winners. These activities related to system development, technology transfer, training and education, and other improvement activities. They gained the knowledge from university-educated staff or from an external consultant who was engaged to help them in implementing quality activities especially in terms of training and consulting in ISO 9000 and TS16949.

These results indicate the award-winning companies actively engaged with customers' programmes and at the same time developed suppliers' capabilities. This portrays a greater integration of award winners with customers and suppliers and is in keeping with STS.

5.5 Operations Management

Operations management was reviewed and investigated because it is the sub-system that controls the conversion process.

5.5.1 Operations Management Overview

The research investigated the system design, technology employed and layout of the factory. Table 5.24 shows both the award and the non-award winners had a small batch production and mass production. Small batch production design involves the production of semi standard items using hand and machine technology whereas mass production design relates to a large-scale production of standard products using technology and some labour. Generally, a company produces small batches through a job shop process flow pattern (Hayes and Wheelwright, 1984). Continuous production is the type of process technology in which a business is able to produce a high volume of production with limited part variety. Slack et al. (1998) considered continuous production as an advanced form of mass production.

Company B (award winner) and Companies E, F and H (non-award winners) employed small batch production. This system design requires flexibility of operation as each batch requires a difference in manufacturing methods. However, this method requires organizational skills and an ability to cope with the variety of batches at different stages of completion in the factory. On the other hand, mass production systems designs were used by Companies A and C of the award-winning companies and Companies D and G of the non-award winners. This suggests it is not the mode of production but the management and systems. Adopting the system requires companies to have high levels of technical skill to make the operating system efficient and economic. In addition, the system permits the production of large volumes of output at regular intervals. Whichever

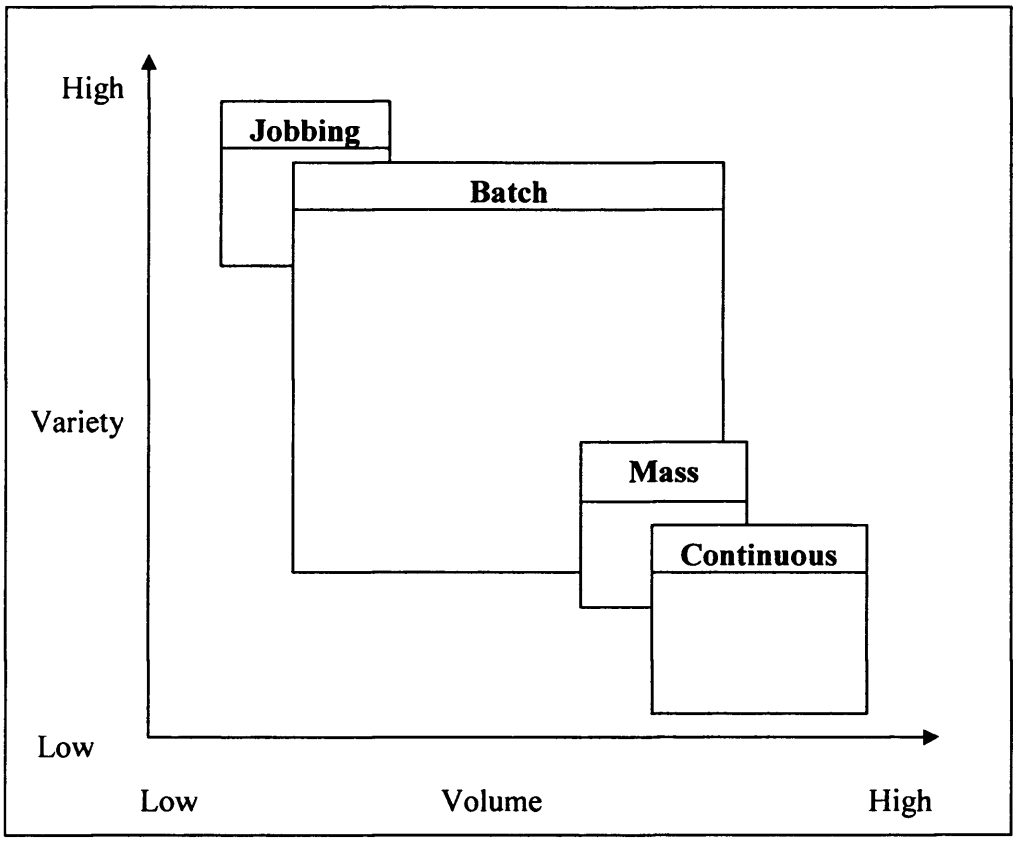
Table 5.24: Factory system design

Operations Management	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
System Design								
Small batch production		✓			✓	✓		✓
Mass production	✓		✓	✓			✓	
Continuous production								
Principle Technology	Plastic injection moulding	Metal stamping	Plastic injection moulding	Plastic injection moulding	Metal Stamping	Metal Stamping	Plastic injection moulding	Plastic injection moulding
Layout								
Project or jobbing shop		✓		✓		✓		
Technology								
Process	✓		✓		✓		✓	✓

mode is adopted, it is important to be aware that any mistakes in the production line can be very expensive even when detected early on. Thus, quality control can be very demanding in mass production (Harrison, 1996). None of the participating companies had adopted a continuous production system design as a manufacturing process as this system design needs a very high investment in equipment and maintenance (automation) as per the model. The classification of system design in manufacturing by Slack et al. (1998) is displayed in Figure 5.3.

In terms of principal technology, two types were employed by the companies, namely, plastic injection moulding and metal stamping (simple technology). The layout of the factory for both categories was based on process and project or on a jobbing shop. Layout based on process means grouping the machines by a final product to form a cell or flow line. Again, these forms reflect a management choice. General purpose machinery with various flows of work between machines is known as a project or a jobbing shop.

Figure 5.3: Type of process in manufacturing operations (adapted from Slack et al., 1998)



5.5.2 Planning Operations Management

This section explored the planning of operations department and its contribution to the success of the business. It was also used to identify the performance criteria used to measure operational performance in the factory. The purpose of these questions was to test TQM alignment.

Table 5.25 shows the award-winning companies and Companies D and G (non-award winners) had a written strategy for manufacturing in the relevant department. A written strategy is necessary to make known to all employees the flows of the business and to obtain their commitment (Ho, 1995). The award-winning companies placed the emphasis on the strategy being in line with business goals and objectives, proper planning of production and processes, trained and skilled workers and a systematic workflow. Again,

Table 5.25: Planning operations management

Operations Management Planning	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Written strategy	Yes	Yes	Yes	Yes	No	No	Yes	No
Operations department contribution toward business success	1.Strategy in line with business goal 2.Trained more multi skilled workers 3.Good process management 4.Proper planning for production, controlling warehouse, incoming materials and outgoing product 5.Right the first time every time	1.Strategy in line with business goal and objectives 2.Proper planning and stock control on material, man and machines 3.Systematic process flow 4.Efficient & effective production system	1.Satisfied customer needs through design features 2. Set strategy in line with business goal. 3.Systematic work flow 4.Trained more multi skilled workers 5.Proper production planning	1.Production, planning and control according to schedule 2.Minimised rejection rate 3.Efficient in changing mould 4.Less down time 5.Delivery at the right time, quality as well as quantity	1.Produced quality product 2.Delivery on time 3.Fewer rejects	1.Fewer rejects 2.Achieved target 3.On time delivery	1.Proper production planning 2.Fulfilled customer needs 3.Efficient system	1.Quality product 2.Achieved target 3. On time delivery
Operations management is core competence	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
operations management system superior to that of competitors	Yes	Yes	Yes	Yes	Yes	No	Yes	No
Emphasis on quality management over production quotas	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Production planned	Based on customer forecast	Based on customer forecast	Based on customer forecast	Based on customer order	Based on customer order	Based on customer order	Based customer order	Based on customer order
Customer orders erratic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Customer hold stock	No	No	No	Yes	Yes	Yes	No	Yes
Duration stock held	0	0	0	7	14	14	0	7

the formal strategy was deemed important to the award-winning companies to ensure operations management contributed to the success of the business. This suggests award-winning companies integrate a formal operations management strategy and TQM programmes to perform better in business.

All participating companies claimed that their operations management was a core competence and better than that of their competitors. They also agreed that their company emphasised quality management rather than production quotas. It is a good strategy to ensure the product delivered to customers has been assured. Goodman et al. (2000), based on their studies, make two conclusions about quality. Firstly, quality improvements can be directly and logically linked to enhanced revenue within that company and, secondly, the higher quality allows companies to obtain higher profit margins. It is clear the non-award winning companies do not have processes of formal operations management integration despite seeking it as core compliance.

In terms of production planning, the award-winning companies based their plan on customer forecasts whereas the non-award winners based their plans on customer orders. According to the Oxford Dictionary (1994), to forecast means *"to tell in advance what is expected to happen or predict with the help of information and refers to a request to make or supply goods."* The difference between forecasts and real orders from the customer's point of view is the trust and strong relationship needed to work to order. Customers are obliged to provide sufficient information including production, and to use processes of integration such as partnerships (Burnes and Dale, 1998). The results indicate that award-wining companies have strong relationships with their customers and this also supports the earlier findings in Table 5.23 sections 5.4.8 of this chapter.

The award-winning companies and Company G purported that their customers did not hold stock and this reflects trust in supply agreements. However, in the case of Companies D, E, F and H, customers held stock between 7 days to 14 days. Items held in stock could deteriorate, become obsolete and sometimes just get lost. Moreover, stock takes up valuable space in the factory. Table 5.26 shows that all participating companies

Table 5.26: Operational performance measurement criteria

Performance Measurement	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Productivity	✓	✓	✓	✓	✓		✓	
Quality	✓	✓	✓	✓	✓	✓	✓	✓
Cost	✓	✓	✓	✓	✓	✓	✓	✓
Delivery	✓	✓	✓	✓	✓	✓	✓	✓
Safety	✓	✓	✓				✓	
Morale	✓	✓	✓					
Environmental	✓		✓					
New product development	✓		✓					

measured their operations performance. The award-winning companies all had listed measurement criteria except for Company B, which had no measurements for environmental and new product development. However, the non-award winning companies only measured productivity, quality, cost and delivery except for Company G. This shows non-award winners focus on stability and are not holistic or process focussed. The results show that more measurement criteria were used by the award-winning companies to measure company operational performance as compared to the non-award winners. The performance measurement criteria used by the award-winning companies was almost double as compared to the non-award winners. This might suggest that award-winning companies make an extra effort to measure beyond productivity, quality, delivery and cost. It allows the companies to have a better understanding of the impact of TQM implementation on business performance.

5.5.3 Operations Performance

Apart from the criteria used for performance measurement, the questions posed also covered the operations performance of the company and found failure of final inspection, production scrapped, failure of supplied product, delivery, number of accidents, storage,

and inspection routines were carried out by the companies. As indicated in Table 5.27, products failing final inspection ranged from 0.01% to 0.03% for the award winners and for the non-award winners ranged from 0.05% to 3.00%. Again, there was a major difference in the case of production with scrap; the performance ranged from 0.02% to 0.03% for the award-winning companies and 0.1% to 3.5% for the non-award winners. On the other hand, the failure of supplied products to the award winners ranged from 0.01% to 0.04% and for the non-award winners was from 0.05% to 3.00%. This is a major finding and clearly shows differences between integrated and award winners' systems.

The results of product failed final inspection, production scrapped and failure of supplied product reflects the capability of companies to produce quality products at an optimum cost (lowest defects), thus meeting customer specifications. Award-winning company performance shows very low results in product failed final inspection, production scrapped and failure in supplied products whereas the non-award winning companies produced a very high rate of rejection. The ratio of the three factors (product failed final inspection, production scrapped and failure of supplied product) for the award-winning and the non-award winning companies was 100:1, 74:1 and 65: 1 respectively (see Table 6.4 of Chapter 6). In the case of product failed final inspection, the ratio indicates that the award-winning companies had one product failure compared to the non-award winning companies, which produced 100 failed products. Similarly, regarding production scrapped and failure in supplied product, the non-award winners had 74 and 65 as compared to the award winners. The finding proves award-winning companies perform better in operations than do non-award winners. This interesting result shows a great difference between the two categories especially in terms of TQM implementation in the factory. The result shows the implementation of TQM in non-award winning companies is not effective, and is poorly implemented and poorly integrated as an STS.

The award-winning companies not only had the lowest rejection rate but also better delivery of finished products. Late delivery to customers ranged from 0.02% to 0.04% as compared to the non-award winners with 2.00% to 5.00%. Late delivery results in bad

Table 5.27: Measurement practices

Measurement	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Product failed final inspection process	0.02%	0.03%	0.01%	1.50%	2.00%	2.50%	0.05%	3.00%
Production scrapped	0.02%	0.02%	0.03%	2.00%	1.00%	2.00%	0.10%	3.50%
Late arrival to customer	0.03%	0.04%	0.02%	10.0%	3.00%	5.00%	2.00%	5.00%
Frequency of delivery to customer	3 trips a day	3 trips a day	3 trips a day	2 trips a day	Twice a month	1 trip a day	1 trip a day	3 times a week
No. of accidents per year	0%	0%	0%	0%	0.01%	0.01%	0%	0.02%
Finished goods held in factory	0	0	0	7	14	7	7	14
Raw material held in factory	7	7	5	7	14	7	14	14
Failure of supplied products	0.01%	0.04%	0.02%	1.00%	2.00%	2.50%	0.05%	3.00%
Inspection routines on supplied materials	Inspection carried out based on certificate and AQL-10%	1.Certificate 2.Size & thickness 3.Viscosity 4.Gred	1.Certificate 2.Size & thickness 3.Viscosity 4.Gred	1.Certificate 2.Dimension 3.Appearance	1.Length 2.Sharpness 3.Surface	1Appearance 2.Dimension 3.Surface	1. Cert. 2.Size & thickness 3.Viscosity 4.Gred	1. Cert. 2.Quantity 3.Thickness

reputation, increased costs and affects relationships with customers. The lowest percentage of late delivery for the award-wining companies reflects the ability of the system employed to meet customers' datelines. They might have a good and efficient system, for example, kanban or just in time (JIT) practices, to ensure the customers receive the product on time. In the case of the number of deliveries, the award-winning companies managed to deliver three trips a day and the non-award winners varied from one trip a day to as few as twice a month.

All companies had very low accident rates with the lowest percentage 0% and the highest 0.02% a year and this indicates they were safe places to work. In terms of finished goods and raw materials held in the factory, there were very different results with between 0 days and 7.6 days for the award-winning companies and between 9.8 days and 11.2 days

for the non-award winners. This indicates non-award winning companies have high buffers, which could lead to more expenses and poor quality of supply (Harrison, 1996, p. 152). This reflects the ineffective management practices of the company. It is believed that kanban practices contribute to the effectiveness and efficiency in managing the storage of finished goods and raw materials (Imai, 1986; Shingo, 1985).

5.5.4 Working Practices

The last part of this section required participating companies to indicate the working practices employed in the factory; 14 activities were listed including problem-solving groups, mistake proofing, quick changeover, autonomous maintenance, kanban, job rotation, safety programmes, workplace organization, visual management, six sigma, failure modes and effect analysis (FMEA), planned maintenance, multi skilled and self inspection. These practices were considered important by previous studies including Ho (1995); Agus and Mokhtar (2000); Ahire and Golhar (1996); Aziz et al. (2000); and Sousa et al. (2005). Table 5.28 displays the working practices used by participating companies. Company C of the award winners claimed it had employed all the types of practice listed. Companies A and B (award winners), however, conducted similar practices to Company C except for six sigma.

According to the Production Manager of Company A (award winner):

"Six sigma is too technical to practice and very time consuming. At the moment we are not ready to go for those practices".

Company B's (award winner) Production Manager also gave feedback:

"It is not suitable in our case now because the production line is small and only a few people have a basic six sigma knowledge."

Table 5.28: Working practices employed in the factory

Practices	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Problem solving groups	✓	✓	✓	✓		✓	✓	
Mistake proofing devices	✓	✓	✓	✓		✓	✓	✓
Quick changeover	✓	✓	✓	✓			✓	
Autonomous maintenance by operators	✓	✓	✓				✓	✓
Pull production/ Kanban	✓	✓	✓				✓	
Worker job rotation	✓	✓	✓	✓			✓	
Safety management programme	✓	✓	✓				✓	
Workplace organization	✓	✓	✓	✓	✓	✓	✓	✓
Visual management	✓	✓	✓					
Six sigma			✓					
FMEA	✓	✓	✓	✓			✓	
Planned maintenance conducted by specialist	✓	✓	✓					
Multi skilled Workers	✓	✓	✓	✓	✓		✓	
Self inspection of work	✓	✓	✓	✓			✓	

The feedback from these two award winners reflects the readiness amongst employees to implement six sigma activities at the factory was still low although they intended to adapt

the system in the future. Wessel and Burcher (2004) argue that SMEs have two basic problems for six sigma implementation; the lack of knowledge and the firm itself not fulfilling six sigma requirements. Thus small businesses need to modify the six sigma approach to suit their environment.

The non-award winning company's practices ranged from just two to three activities. Company G had the greatest number of activities with 11 practices followed by Company D with 8 activities. The Production Manager of Company G (non-award winner) agreed they only practiced what was relevant to them. According to him:

"We are not eager to practise many activities which could end up being ineffective and inefficient. We focus on activities that are necessary and relevant to our companies".

Company H (non-award winner) had different reasons for not adopting the practices. The Production Manager of this company said:

"The production is more important than working practices. Our focus now is to increase production and meet the company target. We normally practise if the production line is not so busy."

This company (non-award winner) was concerned only with meeting the company target and looked at working practices as a part-time activity. This indicates that the company's management had failed to integrate the good working practices and business operations that would lead to better performance.

The research highlights that only workplace organization practices were employed by all participating companies. The researcher believed that they (participating companies) practised workplace organization or 5S[1] to help them sort out simple and short term problems of daily operations (e.g., cleanliness, machine downtime, storage, etc.).

[1] 5S is the Japanese concept for good housekeeping in the factory to create a comfortable working environment. The 5S stand for *seiri* – organization; *seiton* – neatness; *seiso* – cleaning; *seiketsu* – standardization; *shitsuke* – discipline.

Workplace organization is a prerequisite for effective quality assurance and mirrors other activities in the factory (Ho and Cicmil, 1996; Dale, 2003). The results suggest both award winners and non-award winners have basic quality activities to help them implement more advanced quality improvement activities such as ISO 9000, SPC, TQM and others.

5.6 Human Resource Management

These questions were asked to improve understanding of the role of human resource management in small businesses and its contribution toward accomplishing company goals and objectives. This section provides an analysis of human resource processes and policies in the factories. The interviews were conducted with the Human Resource Manager in each company. This research involves human resource systems and the managers because they are important as the designer of the socio subsystem and its impact on business efficiency and effectiveness (Pasmore, 1988). The questions covered employee statistics, human resource planning, employee recruitment, employee training and development, factory practices and business culture in the factory.

The analyses of the findings are discussed in the following sections:

5.6.1 Employee Statistics

a. Job Classifications

Table 5.29 shows the analysis of job classifications of the award winning and the non-award winning companies. The results indicate the number of Directors ranged from two to three persons and Managers from three to four persons in both cases. The table also shows not all cases had General Managers (Company B, E and H) or Engineers (Company A, E and H). This indicates both positions were not critical to small businesses and depended on the company's needs. The total number of employees for the award-winning companies ranged from 44 to 138 persons and for the non-award winners were 47 to 149 persons. As mentioned in section 5.3.1, the numbers of employees for participating companies were in line with the definition of SMEs by Malaysian

government. The average numbers of workers for the award winners and the non-award winners were very similar with 97 persons and 91 persons respectively.

Table 5.29: Positions in factory

Positions	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Directors	2	3	3	3	2	2	3	2
General Manager	1	0	1	1	0	1	1	0
Managers	4	3	4	4	3	4	4	3
Engineer	0	1	2	6	0	2	3	0
Supervisors	4	3	3	4	3	3	5	3
Technicians	5	2	4	6	3	2	6	2
Clerk/Typist	8	3	3	7	2	2	6	4
Operators	109	25	86	112	34	64	98	35
Others	5	4	4	6	0	3	3	0
Total	**138**	**44**	**110**	**149**	**47**	**83**	**129**	**49**

b. Average Age, Length of Service and Rate of Absenteeism

The award winners' average age of workers, as shown in Table 5.29, ranged from 21 to 23 years and from 39 to 43 years for management. The average age of the non-award winners' workers was between 25 and 30 years and between 35 and 55 years old for management. This shows both categories had employees of similar ages. Length of service for workers in the award-winning companies was 5 years and between 9 to 10 years for management. Meanwhile, the length of service for the non-award winners' workers was between 4 to 8 years and from 5 to 16 years for management. Similarly, both categories of participating companies had the same number of years of working experience. In terms of absenteeism, the management for both categories recorded 0.0%.

This may imply that absenteeism did not affect factory management for either category and employees were committed to the job. It is a good social aspect to job design.

However, the rate of absenteeism for workers was ranged from 0.3% to 1.5% for the award winners and from 2.5% to 10.0% for the non-award winners. The average shows that the award-winning companies had 0.76% as compared to the non-award winners with 5.5%.This indicates that the non-award winning companies had a very high rate of absenteeism among factory workers and this could affect quality improvement activities. Management are responsible for high levels of absenteeism if they fail to take necessary action to overcome the problem. Thus, it is important for management to set-up a control mechanism through the identification of absenteeism measures in understanding the root cause of the problem (Marchington and Wilkinson, 1996).

The Human Resource Manager of Company F (non-award winner), which had the highest rate of absenteeism said:

"Absenteeism is very high in this company due to workers' attitude that has become a habit among them. Quite a number of workers in this factory won't come to work especially the day after they receive their salary. We have tried a few actions and strategies to overcome the problem but they were not effective."

Company G's (non-award winner) Human Resource Manager gave his view with regards to this matter:

"Absenteeism is like a cancer in our body where we can't see the infection in the short period of time. If we are not in control from the beginning, it will become very serious and could kill the company in the long term."

Both the non-award winners' statements portray the seriousness of absenteeism in each company. According to Marchington and Wilkinson (1996), high absenteeism might be due to poor attitude, less commitment, and conflict at work with peers or superior.

The award winning companies, on the other hand, had fewer problems with absenteeism. According to the Human Resource Manager of Company A (award winner):

"We don't have any serious problem with employees not turning up for work (absenteeism). The company encourages them to come to work by providing incentives such as allowances for attendance, transport to workplace, in-house group training and getting them involved with small group activities to inculcate a team working spirit."

This shows award winners' company management were concerned about absenteeism amongst employees. Therefore, they had a strategy to reduce these diseases by providing incentives to the workers. As a result, the rate of absenteeism was very low as compared to that of the non-award winners (see Table 5.30).

5.6.2 Human Resource Planning

These sections of questions covered the issues of decision-making, human resource strategy, change management and total quality practices. The detailed discussion of each issue is now reviewed:

Table 5.30: Average age, length of service and rates of absenteeism

Factors	Companies															
	Award Winners						Non-Award Winners									
	A		B		C		D		E		F		G		H	
	W	M	W	M	W	M	W	M	W	M	W	M	W	M	W	M
Average age	21	39	22	43	23	42	25	35	30	40	29	55	29	34	30	35
Length of service	5	10	5	9	5	10	5	5	8	16	12	14	4	8	5	10
Rate of absenteeism	0.5%	0%	1.5%	0%	0.3%	0%	2.5%	0%	5%	0%	10%	0%	5%	0%	5%	0%

Note: W = Workers; M = Management

a. Decision Making

Eisenhardt and Zbaracki (1992) suggest that decision making is important in terms of the actions taken, the resources committed or precedents set. This is important because it shows the value of trust between management and employees; job satisfaction and a sense of responsibility will be increased if employees are allowed to make decisions, according to Marshall et al., (2006). Table 5.31 displays the decision making in the participating companies with the majority of the cases showing human resources policy remained a functional decision human resource department. However, Company H (non-award winners) was dependent on the head office (in Malaysia) for decision making. No companies agreed the decision making of the human resource department was the responsibility of another department in the factory, which may have been the case for very small businesses.

Human Resource Manager of Company A (award winner) made the following comment:

"The top management had given us a freedom in decision making especially that related to human resources. Therefore the decision in this department was independent of management input."

Table 5.31: Decision making

Decision Making	Companies							
	Award Winners			Non Award Winners				
	A	B	C	D	E	F	G	H
Human resource department within factory	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
From head office in Malaysia								Yes

The feedback indicates the award-winning companies were given an authority by management for decision making within their own department. This situation allowed employees to set their own goals and objectives (in line with company directions). They were responsible for ensuring the achievement of their own target.

On the other hand, the Human Resource Manager of Company F (non-award winner) suggested:

"To be trusted is really important in decision making. Management should trust the employees' decision making capability."

This quotation from a non-award winner highlights that the culture of trust is vital in decision making and this is regarded by many TQM authors as critical in an organization (Storey, 1992).

b. Strategy and Change

All the participating companies agreed that they had a strategy for human resource development except Companies E, F, and H of the non-award winners (see Table 5.32). This is important because it sets out a formal policy for human resource development and improvement areas for the business. A case with a human resource strategy claimed that change management was a key focus of the integration with business strategies. This reflects that change initiatives introduced in the organization should take into consideration the involvement of human resources. Without an integrated business strategy, decisions might conflict with change initiatives. This is an important feature of previous studies (Chandler and McEvoy, 2000; Yang, 2006). Moreover, most of the studies in the literature conclude that there needs to be integration between change and business strategy (Marchington and Wilkinson, 2002). This process of alignment with business strategy is the key for success.

Table 5.32: Strategy and change

Strategy	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Strategy of human resource development	Yes	Yes	Yes	Yes	No	No	Yes	No
Dimension of change is adequately integrated with business strategies	Yes	Yes	Yes	Yes	No	No	Yes	No
Number of human resource staff	14	8	8	14	3	6	10	5
Member of professional bodies	No	No	No	No	No	No	No	No
Total quality practice	1.Organised training for all staff 2.Cont'ous evaluation after training 3 Increasing employee involvement	1.Training (internal & external) 2.Monitor after training	1. Estb. HR Policy for staff 2.Conducting TNA 3. Employee involvement in decision making	1.Plan of staff training 2.Control of training record	Training for staff	1.Training evaluation 2.Monitoring of performance after training	1.Training 2.Monitoring after training	Plan a training

The number of employees in the human resource department ranged from 8 persons to 14 persons for the award-winning companies and from 3 to 14 persons for the non-award winners. There were some significant indications of effort by human resources to support strategy thus showing the importance of human resources to TQM. The average number of employees was slightly higher (10 persons) for the award winners as compared to the non-award winners (7 persons). When comparing this figure with the total number of employees (see Table 5.3), it shows that number of human resource staff for the award-winning companies represented 3.4% of the entire staff and for the non-award winners the proportion was 1.5%. Again, the results show a greater allocation of personnel to developing the employee base and necessary skills.

Nevertheless, none of the staff at any case were members of professional bodies. In the case of total quality practices by the human resource department, the award-winning companies were more strategic than were the non-award winners with strategy development activities, empowerment and the general involvement of the workforce. These more integrated aspects of TQM included continuous training evaluation, establishment of human resource policy and employee involvement in decision making. The features reinforce Oakland's (2003) view of TQM business features. The practices of the award-winning companies were also towards a long-term continuous improvement of human resources whereas the non-award winners focussed on daily activities. Again, these practices reinforced the difference between improvement and development versus stabilisation.

5.6.3 Employee Recruitments

Questions were asked about employee recruitment and how new labour enters the business. These questions were important because they contributed to the understanding of how recruitment processes were conducted by participating companies to select the right person for a particular job. Recruitment and selecting people to fill new and existing positions is a crucial element of personnel and development activity in all organizations irrespective of their size, structure or orientation (Marchington and Wilkinson, 1996). Large organizations sometimes use organizational psychologists or consultants to improve the effectiveness of the selection process. Nevertheless, it has been argued that SMEs' selection processes are made on an informal, *ad hoc* basis and in a reactive manner (Marchington and Wilkinson, 2002). With regard to this research, the questions asked in this section included what methods of recruitment were used, the response rates from advertisements, difficulties in recruiting skilled workers, induction programmes and probationary periods so that incorrect selections of employees can be resolved.

a) Methods of Recruitment

Recruitment processes are critical to STS models of high performance and need to be managed properly to ensure staff employed possess high quality characteristics, and are committed to and suitable for the advertised job (Dale, 2003; Ahmad and Schroeder,

2003; Yang, 2006). The appropriate staffs help an organization to achieve quality and continuous improvement. Therefore, the recruitment and selection of employees should be among the first factor identified in the human resource strategy (Oakland, 2003). However, Watson (1994) argues, *"Recruitment provides the candidates for the selector to judge. Selection techniques cannot overcome failures in recruitment; they merely make them evident"*. Therefore, the research takes in broader and more holistic views of human resource practices than have previous studies of SMEs (Chandler and McEvoy, 2000; Deshpande, 1994; Hill and Steward, 2000).

The questions in this section were put to four groups of people in relation to recruitment methods, namely, management, supervisors, line workers and specialists. Thus, the group represented employees in the company as a whole. Tables 5.33 and 5.34 show the methods of recruitment for the award winners and the non-award winners. As indicated in Table 5.33, Companies B and C (award winners) employed five methods of recruitment for management staff, specialists and supervisors. The methods included interviews, references, skill assessment, recommendation and psychology tests. This reflects the thoroughness of the selection process conducted by both companies to ensure the right candidate was selected. This implies the use of more methods to select the right type of worker and TQM culture fit.

The results parallel the findings of the questionnaire survey in section 4.9.3 of Chapter 4. It is important to ensure the candidate has the appropriate skills and knowledge to support the human resource strategy. Similarly, Company G also employed five methods for recruiting specialists and line workers and four methods for management and supervisors.

Table 5.33: Employee recruitments (award winners)

Methods	Companies											
	A				B				C			
	Management	Supervisor	Line Worker	Specialist	Management	Supervisor	Line Worker	Specialist	Management	Supervisor	Line Worker	Specialist
Interview	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
References					✓	✓		✓	✓	✓		✓
Skill assessment		✓	✓		✓	✓		✓	✓	✓		✓
Recommendation		✓	✓		✓	✓	✓	✓	✓	✓		✓
Psychological test	✓			✓	✓			✓	✓			✓
Meeting the team		✓		✓		✓	✓			✓		

Table 5.34: Employee recruitments (non-award winners)

Methods	Companies																			
	D				E				F				G				H			
	M	S	LW	Sp	M	S	LW	Sp	M	S	LW	Sp	M	S	LW	Sp	M	S	LW	Sp
Interview	✓	✓		✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
References													✓	✓	✓	✓				
Skill assessment	✓	✓		✓											✓	✓			✓	✓
Recommendation	✓	✓	✓	✓	✓	✓	✓						✓	✓	✓	✓				
Psychological test	✓			✓									✓	✓	✓	✓				
Meeting the team																				

Note: M = Management; S = Supervisor; LW = Line Workers; Sp = Specialist

b. Response Rates to Advertisement

Questions were asked to see if cases could select from a pool of good potential employees or had to take anyone. These questions focussed on the number of responses received from the last advertisement for production workers (see Table 5.35). The award-winning companies received a response from 7 to 50 persons per vacancy (average = 22.3) and the non-award winners from 0 to 20 persons (average = 9.4). This implies that the advertisements from award winners are able to attract replies from many candidates to work with the company.

The Human Resource Manager of Company A (award winner) said:

"A few strategies have been used for advertising a job to get more response such as banners, news papers, flyers, through labour office and internet. We have more responses through internet especially for management post."

Company A used more than three methods to persuade individuals to respond to their advertisement; it was a significant 'outlier' and managed to get 50 applications per vacancy, therefore, there was competition for jobs at this 'well respected' and benchmark business. However, Company G had a different strategy about advertisements. Company G's (non-award winner) Human Resource Manager adds:

"The purpose of the advertisement is to attract or encourage potential candidates to apply for jobs. It is important for the advertisement to have a good design and convey a realistic and accurate image of the organization and the job itself."

Companies E and H (non-award winners) had almost no responses to their last advertisements. According to the interviews at these cases, they still could not justify why the response rate to the advertisement had been so low; they had done their best to

Table 5.35: Number of responses to advertisement

Factors	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Last application	50	7	10	6	1	20	20	1
Difficulties in recruiting skilled workers	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Problem faced in recruiting skilled workers	1.Language barrier 2.Weak on technical knowledge 3. Less working experience 4. Not well prepared 5. High demand	1. Less experience 2. Lack of technical skill 3. Lack of comm. skills 4. High demand	1. Less experience 2. High demand 3. Low reply rate 4.High competition from other companies	1.No certificate 2.High demand 3.Low reply rate	Weak on technical knowledge	1.High demand 2.Experience not meeting with company requirement	High demand	High demand

attract applicants. Unfortunately, the result was not encouraging. The inability to attract recruits is therefore a fundamental management weakness given these cases were in the same region as Company A. According to Lewis (1985: p. 22-23), there are four rules for cost-effective advertising:

a) Target the right audiences
b) An adequate number of replies should be generated
c) Minimise the number of wasted replies
d) Organization should be promoted as a good employer

Although the award winners were able to attract more candidates, they also faced similar problems to the non-award winning companies in recruiting skilled workers. The problem facing cases included high demand, language barriers, lack of technical knowledge, less

working experience and many more issues that restricted the available talent pool. As we can see here, the award-winning companies list more problems as compared to the non-award winners. This result indicates that the award-winning companies had set up many criteria in recruiting skilled workers and as part of their human resource strategy were filling vital aspects and gaps in knowledge in management selectively.

c. Induction and Probation Programmes

Skeats (1991) argues induction programmes allow new employees to familiarise themselves with the organization especially the section or department in which they are going to work, the safety rules and general conditions of employment. It is a process of cultural integration of the new worker. Lack of systematisation in induction programmes can lead employees to feel isolated and confused (Marchington and Wilkinson, 1996). This is important in the models of Dale (2003) and Oakland (2003) and is a feature of high performance. In the case of this research, only one company among the non-award winners had conducted formal induction programmes (see Table 5.36).

Meanwhile, all the award-winning companies claimed that they organised induction programmes for new employees, again showing award winners pay more attention to STS 'fit'. The duration of induction programmes ranged from 3 hours to 30 hours for the award winners and 0 hours to 6 hours for the non-award winners. The different average of hours for both categories was very high with the ratio of 17 hours (award winners) to 1.2 hours (non-award winners). This indicates that award-winning companies in this research place real emphasis on formal induction programmes. They invest time and money to make sure new recruits are ready to become used to and work within the company culture. This feature has been highlighted by Dale (2003) and Oakland (2003) as a sign of a high performance business. As can be seen, award winners do more than achieve a qualification/award and have robust systems for the integration of new employees, a sign that people are the number one asset (Deming, 1986; Juran, 1988).

Table 5.36: Induction and probation programmes conducted

Programmes	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Induction programmes	Yes	Yes	Yes	Yes	No	No	Yes	No
Duration (hours)	3	30	18	6	0	0	18	0
TQM education included	Yes	Yes	Yes	Yes	No	No	No	No
Probationary	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Duration (months)	3	3	3	3	3	3	3	3

It was mentioned by Human Resource Manager of Company C (award winner) that:

"The company considers training and induction programmes as an investment for the future. We have a comprehensive schedule for the programme to educate and train new employees to understand the company's vision and goal. On top of that, they are also exposed to the working culture and environment in the factory."

This view was supported by Company A's (award winner) Human Resource Manager:

"The benefits gained by the company from induction programmes far outweigh the cost of recruiting new employees."

However, the non-award winners had different views regarding induction programmes, which were revealed during the semi structured interviews.

The Human Resource Manager of Company H (non-award winner) argued:
"Induction of new employees does not help them in understanding their job and responsibilities. After they report for duty, new employees straightaway can start their work. They will learn about the job and responsibility through their friends during working time."

Furthermore, the Human Resource Manager in Company F (non-award winner) gave very similar feedback:

"We don't want to waste our time by giving induction to the new staff when one or two month later he or she will leave the company. It is really annoying."

From the opinion of the non-award wining companies, it can be seen that they did not understand the purpose of formal induction programmes. Moreover, they also overlooked the fact that the induction programme is a tool to integrate new employees into companies and gain their commitment. Delbridge and Turnbull (1992) argue that formal induction programmes develop loyal and trusting members of staff. This could suggest that these factors contribute to the high turnover of staff of non-award winning companies (see Table 5.30). The study by Guimaraes (1996) highlights that employee retention is reduced after implemented TQM. Moreover, the findings from the survey questionnaire in this research indicate that induction programmes have an influence on TQM implementation (see section 4.9.4 of Chapter 4).

In terms of a probation period, both the award winners and the non-award winners carried out a three-month probation period. The aim of probation is to ensure that new employees are equipped with the necessary skills and knowledge before being offered a permanent job. During the probation period, they will be regularly evaluated in terms of their performance, attitude and skills.

Company A's (award winner) Human Resource Manager explained:

"From probation activities we are able to identify individual characteristics in terms of skills, knowledge and attitude. This will determine whether they can perform or not when permanently assigned to the workplace. Therefore we need 3 months to observe and put the right people in the right place"

This shows that award-winning companies consider the integration of people and the workplace as important for better performance. Guest and Hoque (1994) argue strategic integration between personnel and the workplace leads to business success.

5.6.4 Training and Development

Post recruitment training is needed to equip employees for continuous improvement and also managers need training to keep them up to date with key TQM practices. Training and development has been defined by Buckley and Caple (1994) as *"a planned and systematic effort to modify or develop knowledge, skill and attitude through learning, experience to achieve performance in an activity or range of activities."* Studies of TQM that have addressed this issue include those by Palo and Padhi (2003), Chandler and McEvoy (2000) and Prajogo (2006). These authors highlight the importance of training for a high quality working environment and for managing customer relationships, which leads to the success of TQM. Training also is essential for creating awareness, developing organizational communication, competence building, and generating enthusiasm for and commitment to the company (Palo and Padhi, 2003). It is also believed that training can facilitate a company's expansion and capabilities, and enhance profitability (Cosh et al., 1998).

In the case of this study, the questions regarding training were categorised into top management, middle management, supervisor and operators sections. Tables 5.37 and 5.38 show the training programmes attended by all categories of worker in a year. The training programmes attended (internal and external) was based on yearly planning by the human resource department (formal) or on an *ad hoc* basis (informal).

According to the Human Resource Manager of Company C (award winner):
"We plan the training programmes one year ahead to ensure we have sufficient time to determine the type of training for employees at every level in this company. The employee can suggest the type of training they need but management will determine what is proposed."

The Human Resource Manager of Company E (non-award winner) shared his opinion:

"This company doesn't have a special budget allocation for training purposes. The training is identified through the brochures and flyers that are sent to us by a training consultant."

These quotations suggest the award-winning companies had a systematic and formal training plan for employees to enhance skills and knowledge. This fits with TQM practices and is in line with Deming's (1986) 14 points to instituting training programmes for employees (see Appendix 4). Training programmes for the non-award winners were more informal and were identified through information gathered from a third party (training consultants). This approach limited the training courses that could be attended by employees due to less information being available.

Based on Dale's (2003) work, training programmes attended by employees from both award-winning and non-award winning companies can be divided into four categories:

1) Quality concept training
   Quality concept training relates to the understanding and awareness of quality (for example, quality management, continuous improvement, understanding of quality and TQM implementation).

2) Quality techniques training

Quality techniques training relates to the methods of improving quality in companies (for example, ISO 9000, problem solving, statistical process control, supervisory skills, TS16949, and on the job training).

3) Teamwork training

Teamwork training relates to combined efforts toward achieving continuous improvement (for example, leadership, team building, communication skills and motivation).

4) Business management training

Business management training relates to the opportunity and expansion of the business (for example, business opportunity, management techniques and strategic management).

The award winning companies shows that top management spent an average of 14 hours attending quality concept training and 20 hours in business management a year. Middle management attended 12 hours of both quality concept and teamwork training and 16 hours of quality techniques training. Supervisors attended 12 hours of quality concept training and teamwork and 30 hours of quality techniques and operators just focussed on training of quality techniques for 18 hours (on the job training) a year.

Table 5.37: Employee training and development (award winners)

Levels	Companies					
	A		B		C	
	Training	**Hours**	**Training**	**Hours**	**Training**	**Hours**
Top Management	Quality management	12	Quality management	12	TQM implementation	18
	Business opportunity	12	Business opportunity	6	Business outlook	6
	Strategic management	12	Management techniques	12	Strategic management	12
Middle Management	Quality management	12	Understanding Quality	12	Quality management	12
	7 quality control tools	18	Statistical process control	12	TS16949	18
	Leadership	12	Interpersonal skills	12	Team building	12
	Communication	12	Leadership	12	Leadership	12
Supervisor	Quality management	12	Continuous improvement	12	Continuous improvement	12
	TS16949	18	ISO 9000	18	Problem solving	18
	Supervisory skills	12	Supervisory skills	12	Supervisory skills	12
	Team building	12	Communications skills	12	Leadership	12
Operator	On the job training	18	On the job training	18	On the job training	18

Table 5.38: Employee training and development (non-award winners)

Levels	Companies									
	D		E		F		G		H	
	Training	Hours	Training	Hours	Training	Hours	Training	Hours	Training	Hours
Top Management	Seminar on business opportunity	6	Seminar on trading	12	Seminar on business opportunity	6	Seminar related to business opportunity and expansion	6	Management techniques	12
	Business management	12	Strategic management	12	Continuous improvement	6	Quality management	12	Accounting	12
									Marketing strategy	12
Middle Management	Team building	12	Effective supervision	12	Core tools linkage system practical	12	Self development	12	Team building	12
	TS 16949	12	Constructing paper work	12	TS 16949	12	Motivation	12	Occupational safety & health	12
									Motivation	12
Supervisor	Supervisory skill	12	Supervisory skill	12	Effective supervision	12	Supervisory skill	12	Supervisory skill	12
	Team building	12			New 7 QC tools	12	Problem solving	12	Self development	12
	ISO 9001:2000	12								
Operator	On the job training	6	On the job training	6	On the job training	6	On the job training	12	On the job training	6

Meanwhile, top management of the non-award winning companies spent an average of 3.6 hours in quality concept training and 19.2 hours in business management training. This finding shows top management of the award-winning companies spent almost more than four times as much time as compared to top management of the non-award winners in attending quality concept training. The result shows that top management in the award-winning companies tended to focus on quality concept training programmes, which would help reinforce TQM and direction of change. It is believed that quality concept training programmes help in implementing TQM in an organization (Dale, 2003). Middle Management spent only 7.2 hours in quality techniques, 14.4 hours in teamwork and 4.8 in business management training programmes. However, the non-award winning companies spent a higher number of hours in teamwork training programmes as compared to the award winners. The average number of hours spent by supervisors for award winners on quality techniques training was 19.2, and 4.8 hours for teamwork. Operators in the non-award winning companies attending on-the-job training programmes (quality techniques) spent 7.2 hours, which was far less than the time spent by operators in award winning companies (18 hours). On-the-job training allows trainees to learn how to perform their job under direct supervision and can be implemented through apprenticeship training, job rotation and assignment to a task force team.

A summary of the number of hours spent in training programmes is displayed in Tables 5.39 and 5.40 for both categories. The finding shows that the majority of participating companies spent a significant number of hours in training programmes at all levels continuing their investment in human resources. These results contrast with those of Westhead and Storey (1997) who argues employees in SMEs are much less likely to receive training than are their counterparts in large organizations. According to them, this situation is due to two possibilities: ignorance and market forces. Ignorance refers to business owners being unaware of the training benefits and market forces relate to the costs of training, which may exceed the benefits. In the case of Malaysian SMEs, there were a number of training incentives provided by the government to enhance skills and knowledge (for example, claimable training fees incurred through HRDFC, double tax deduction, grants for research and development and others). Thus, Malaysian SMEs must

be proactive to take advantage of this opportunity and train more employees. This study shows these findings to be questionable from the non-award winner's perspective and TQM management features of high performance businesses.

5.6.5 Training Effectiveness

The effectiveness of training programmes is very important to indicate the value of training to a broader business strategy and objectives and to make a return on investment through continuous improvement. Unfortunately, training effectiveness for SMEs has attracted very little attention in the literature (Cosh et al. 1998; Westhead and Storey, 1996). Bramley and Newby (1984) propose five reasons organizations should conduct training effectiveness measurement:

a) Feedback from trainers and trainees with regards to relevancy of the programme to their work.

b) Enables organizations to identify whether training programme were cost effective and related to problem solving.

c) As an input for valuable research purposes.

d) Used as a basis for organizational intervention in evaluating current approaches and policies related to training.

Table 5.39: Summary of number of hours spent in training programmes a year (award winners)

Training Programmes	Companies											
	A				B				C			
	TM	MM	SV	OP	TM	MM	SV	OP	TM	MM	SV	OP
Quality concept	12	12	12		12	12	12		18	12	12	
Quality techniques		18	30	18		12	30	18		18	30	18
Teamwork		12	12			12	12			12	12	
Business management	24				18				18			

Note: TM = Top Management; MM = Middle Management; SV = Supervisor; OP = Operator

Table 5.40: Summary of number of hours spent in training programmes a year (non-award winners)

Training Programmes	Companies																			
	D				E				F				G				H			
	TM	MM	SV	OP	TM	MM	SV	OP	TM	MM	SV	OP	TM	MM	SV	OP	TM	MM	SV	OP
Quality Concept									6				12							
Quality techniques		12	24	6			12	6		12	24	6			24	12		12	12	6
Teamwork		12	12			24				12				24				24	12	
Business management	18				24				6				6				36			

Note: TM = Top Management; MM = Middle Management; SV = Supervisor; OP = Operator

Table 5.41 presents the training effectiveness activities carried out by participating companies. The result shows that training effectiveness was conducted by the award winners and Company G only. This implies the companies conducted reviews for continuous improvement. The indicators used by the award winners to measure training effectiveness were knowledge, efficiency, satisfaction, safety, communication skills and the number of complaints. The indicators used were consistent with what has been discussed in the literature (Huang, 2001; Jones, 2005). On the other hand, the non-award winners used indicators that were related to wastage, absenteeism, turnover and profitability. The finding indicates that most of the award winners' indicators were used for preventive action strategy and those of the non-award winners for corrective action measures.

Three companies (E, F and H – non-award winners) used no indicators for training effectiveness. During the interviews, the Human Resource Manager of Company H said:

"We don't measure training effectiveness because it is a very time consuming activity. This company has very limited staff and it is enough just to provide them with training."

This opinion was supported by the Human Resource Manager in Company E (non-award winner). He gave his feedback as follows:

"We did measure training effectiveness before but it was halfway through. This is because we were busy with our production line and very little time remained for those activities. Moreover, this company has a very high turnover at this time."

Table 5.41: Training effectiveness

Factors	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Assess training effectiveness	Yes	Yes	Yes	Yes	No	No	Yes	No
Indicators used	1.Knowledge 2.Work efficiency 3. Job satisfaction 4.Safety 5.Communication skills 6.No. of complaints	1.Knowledge 2. Motivation 3.Satisfaction 4..No. of complaints	1.Knowledge 2.Productivity 3. Efficiency 4.Communication skill 5.No. of complaints 6.Satisfaction	1. Skills 2. Wastage 3.Profitability 4. Turnover	No indicators	No indicators	1.Knowledge 2.Skills 3. Absenteeism 4.Interpersonal skill	No indicators

The situations of three companies (E, F and H) reinforced findings from earlier studies and the previous authors cited at the beginning of this section that SMEs are fragmented and ignore the human side of STS. It seems that the companies look at these activities as a burden to them and see no profit in monetary terms (a cost).

5.6.6 Employee assessment

Employee assessment ensures fit of skills to market needs (Pasmore, 1988; Kast and Rosenzweig, 1972). Employee assessment or performance appraisal for employees is criticised by Deming (1986) as one of the 'deadly diseases' of Western industry. He argues that performance appraisal contributes to fear, demolishes teamwork and competition. Nevertheless, with the focus on performance management in the current market environment many organizations explicitly link employees and performance. Managers and employees need to outline their performance plans, which should be in line with the organization's strategic plan and alignment of goals and performance (Dale, 2003). Oakland (2003) points out that performance appraisal are the alignment of personal, team and corporate goals coupled with appraisals to help individuals achieve their full potential. However, Deming (1986) is critical of assessment using targets because it creates hostile relationships and causes low quality work and productivity.

All participating companies in this research appraised their employees' performance once a year (see Table 5.42). The criteria used were very similar in the award-winning companies and Company G. Again, the criteria most frequently used were knowledge, attitudes and relationships with others in the company. Other criteria considered

Table 5.42: Employee Assessment

Factors	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Employee Appraisal	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Frequency	Once a year	Once a year	Once a year	Once a year	-	Once a year	Once a year	Once a year
Criteria used to assess individual	1.Leadership 2.Knowledge 3.Attitude 4.Skill 5.Communication Skill 6.Responsibility 7. Relationship with others	1.Performance 2.Attitude 3.Responsibility 4.Knowledge 5.Relationship with others 6.No. of complaints	1.Performance 2.Attitude 3.Relationship with others 4.Leadership skill 5.Knowledge 6.Communication skill 7.No. of complaints	1.Attendance 2.Discipline 3.Skill	No formal criteria	No formal criteria	1.Leadership 2.Attitude 3.Knowledge 4.Skill 5.Relationship with others	No formal criteria

important were technical and communication skills, responsibility and the number of complaints.

Nevertheless, Companies E, F and H had no standard criteria for evaluation. Their evaluations were based on verbal reports from respective department managers. This indicates the non-award winners' management treated employees' assessment as an informal activity that lacked integration. This is contradictory to TQM organization, which requires a closely monitored performance appraisal process toward achieving continuous improvement (Evans and Lindsay, 2002). In addition, performance appraisal requires teamwork engagement because the reward is based on the evaluation of strength and weaknesses of personnel as well as of teams.

According to the Human Resource Manager of Company F (non-award winners):

"The employee performance is evaluated every year in this company but there were no standard or formal criteria used. The reason for there being no standard criteria for performance appraisal is that there is no form available in this company for evaluation purposes. It depends on the verbal report of the Manager from the department concerned."

The Human Resource Manager of Company E (non-award winners) said:

"The management of this factory evaluate employees based on recommendations from supervisors. They know better the performance of their subordinates."

Both companies (E and F) relied solely on the Manager and Supervisor to make a decision about an employee's performance. This situation creates favouritism caused by the closeness of the relationship between appraiser and employees. Such an approach is not aligned with the TQM literature (MacDuffie, 1995; Dale, 2003). Employee assessment is very important not only to the company but also to the employees themselves. It allows the company to determine who deserves to receive an appropriate

return for their performance such as promotion, increments, bonuses and training needs (Marchington and Wilkinson, 2002). On the other hand, the employees also benefit from and are motivated by receiving such rewards and acknowledgement from the company.

5.6.7 Employee Benefits

The benefits were listed in the questions and required respondents to select an option related to their company. Benefits to employees were a target of the questions regarding the understanding of how employees were treated at work and whether there was a team approach, lower demarcation from managers to workers (car park) and differences between jobs (common uniform). These are all indications of integration. The results shown in Table 5.43 show that the award-winning companies provided a similar pattern of facilities to their employees such as a company uniform, common car park, team briefing, suggestion scheme, canteen, sickness scheme, newsletter, social activities and individual career development plans. The non-award winning companies provided only half of the listed facilities and excluded a company newsletter, employees' social activities and individual career plans. The findings reveal that employee councils were not considered important by either the award-winning or the non-award winning companies and this result was against the 14-steps quality improvement programme suggested by Crosby (1979) (see Appendix 4). The findings prove that the three award-winning companies had no employee council and yet were still successful in TQM implementation; thus, a critical feature of award winners is their better employee welfare, appraisals and integration.

The above welfare benefits can be divided into three categories:

a) Communication (employee council, team briefing, and newsletter)

b) Morale (canteen, common car park, company uniform and employees' social activities and sickness scheme)

c) Improvement (suggestion scheme and individual career development)

Table 5.43: Facilities provided by company

Facilities	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Company uniform	✓	✓	✓		✓		✓	
Common car park	✓	✓	✓		✓		✓	✓
Employee council								
Team briefing	✓	✓	✓	✓		✓	✓	✓
Suggestion scheme	✓	✓	✓	✓			✓	
Canteen facilities	✓	✓	✓					
Sickness scheme	✓	✓	✓	✓	✓	✓	✓	✓
Company newsletter	✓	✓	✓					
Employees' social activities	✓	✓	✓	✓				
Individual career development plans	✓	✓	✓					

In order to determine the level of facilities provided by the companies (high, medium or low) for each category; a score was given as follows:

If a company provided 'yes' answers to the factor in each category, they received 1 mark (maximum) and 0 mark (minimum) were given for 'no' answers. If a mixed answer was provided (some answering 'yes' and some saying 'no') then the mark was averaged out to obtain the total. Finally, the levels were determined based on the following ranges:

Communication:

0.0 – 0.9 marks = Low; 1.0 - 1.9 marks = Medium; 2.0 and above = High

Morale:

0.0 – 1.9 marks = Low; 2.0 – 3.9 marks = Medium; 4.0 and above = High

Improvement:

0.0 – 0.9 marks = Low; 1.0 – 1.9 = Medium; 2.0 and above = High

Table 5.44 presents the results of each case for the employees' benefits and shows the award-winning companies scored 2 marks for both communication and improvement and 5 marks for morale. Meanwhile, the non-award winning companies scored 0.8 marks for communication, 2 marks for morale and 0.4 marks for improvement. As we can see here, the award-winning companies scored highly in each category as compared to the non-award winners who achieved low scores. This result suggests the award-winning companies provided better facilities to their employees than did the non-award winners and paid more attention to the integration of the workforce and the creation of a happy environment. It can be said that providing better facilities to the employees is one of the factors that keeps them with the companies (low turnover) and exploring TQM knowledge over a longer period results in effective continuous improvement.

5.6.8 Suggestion Scheme and Problem Solving Skills

Capturing the innovations of employees is critical to effective TQM, and Japanese models have shown this to be a major human resource feature associated with high performance (MacDuffie, 1995). This section required respondents to answer questions related to suggestion schemes, problem solving skills and their business culture. Table 5.45 presents those activities that were carried out by the award winners and the non-award winners. It was noted that suggestion schemes were not adopted by Companies D, E and H. The author sought some information from the companies as follows:

Table 5.44: Ranking of categories of facilities provided

Categories	Facilities	Award Winners	Level	Non-Award Winners	Level
Communication	Employee council	1	High	0	Low
	Team briefing	1		0.8	
	Newsletter	0		0	
	Total	**2**		**0.8**	
Morale	Canteen	1	High	0	Low
	Common car park	1		0.6	
	Company uniform	1		0.4	
	Employees' social activities	1		0	
	Sickness scheme	1		1	
	Total	**5**		**2**	
Improvement	Suggestion scheme	1	High	0.4	Low
	Individual career development	1		0	
	Total	**2**		**0.4**	

Company D's (non-award winner) Human Resource Manager argued:

"We did implement a suggestion scheme two years ago but the responses were very frustrating and the management decided to stop."

When the author provoked further discussion to know why the company had such very low responses, he added:

"I did a quick survey to discover what was the reason they did not respond to the suggestion scheme and the answers I received were related to the limited time to think

because of employees being busy with routine work; they had no idea of what to suggest, were scared their idea would be laughed by peers, and the rewards were not interesting."

Table 5.45: Suggestion scheme and problem solving skills

Factors	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Suggestion Scheme	Yes	Yes	Yes	No	No	Yes	Yes	No
Last year received	25	12	265	0	0	1	2	0
No. of suggestions implemented	20	7	110	0	0	1	2	0
Skills to solve problems	Yes	Yes	Yes	Yes	No	No	Yes	No
Resources	Yes	Yes	Yes	Yes	No	No	Yes	No

The Human Resource Manager of Company E (non-award winner) replied:

"The company does not implement a suggestion scheme at all because we just want them to focus on their own work and achieve targets".

This demonstrates the company management had a negative attitude to employees and did not try to provide a platform for them to give ideas for the benefit of the company. Bessant and Francis (1999) argue that suggestion schemes are not effective because organizations tend to focus on 'big' ideas only (larger impact on organization). The management should reward the behaviour itself rather than the suggestion to encourage employee participation.

Meanwhile, most cases with a suggestion scheme had received a number of suggestions ranging from 1 to 265. Company C (award winner) received the highest number of suggestions in the last year (265). It was followed by Company A (award winner) with 25 suggestions and Company B (award winner) with 12 suggestions. This reflects an ability to collect ideas through problem-solving teams and is a formal TQM system of integration of employees and team. The lowest number of suggestions belonged to Company F (non-award winner) with two suggestions. The ratio between the number of suggestions and the number of employees was also calculated and tabulated in Table 5.46 to see how active the workforces were regarding continuous improvement. The results show the ratio of employees and suggestions of Company C was 2.4, for Company B was 0.27 and for Company A was 0.18 (award winners). On the other hand, Company F and Company G had only 0.012 and 0.015 and Companies D, E and H had 0 ratios respectively (non-award winners). The high ratios of suggestion schemes by the award-winning companies reflect the encouragement and motivation of management for employees to share their ideas for the benefit of the company. This reinforces the findings of Bessant and Francis (1999), which also showed integration.

According to the Human Resource Manager of Company C (award winner):

"I am really surprised that we got a very high number of suggestions from employees. I think this was related to our TQM activities in the factory such as 5S, small group activities, management review meetings and many more continuous improvement programmes. On top of that, we rewarded the best suggestion for individual and groups. It was personally presented by our Managing Director during the annual dinner."

In terms of the implementation of suggestions, however, Companies F and G had 100% implementation of such a scheme, whereas Company A had only 80% (20 suggestions) implemented, Company B with 58% (7 suggestions) and 41.5% (110 suggestions) for Company C. This situation was due to the number of suggestion received by each company. Both Companies F and G had only 1 and 2 suggestions a year, therefore it was easier for them to implement all the suggestion as compared to Companies A, B and C.

The award winners were more active in the implementation of change and this reflects the integration of ideas.

Table 5.46: Ratio of number of employees and suggestions

Categories	Companies	Number of employees	Number of suggestions received	Ratios
Award Winners	A	138	25	0.18
	B	44	12	0.27
	C	110	265	2.40
Non-Award Winners	D	150	0	0
	E	40	0	0
	F	83	1	0.012
	G	130	2	0.015
	H	45	0	0

In the case of skills to solve production problems, the award winners agreed that their employees had the ability to do this activity and enough resources were provided by companies to support them. Similarly, for the non-award winning cases, only Companies D and G claimed the same approach, again indicating an integrated approach.

5.6.9 Perceived Level of TQM Implementation

An analysis was carried out of all the cases and cross case comparisons between the award winners and the non-award winners concerning the perceived achievement of the company. During the analysis stage, the questionnaire of each case was given a score based on the respondent's perceptions. For example, if the question required them to mark one of the options given ('often', 'sometimes' or 'never') for the use of quality tools in the factory, the score for 'often' was 2 marks, 'sometimes' 1 mark and 'never' was given 0 marks. For the 'yes' or 'no' question a score of 1 mark was given for 'yes' answers and 0 marks for 'no' answers. Table 5.47 displays an example of how marks were given to the questions relating to the length of time quality practices had been implemented (see Table 5.9) in the factory:

Table 5.47: Score for the length of quality practices

Ranged	Marks
Less than 5 years	1 mark
5 years – 10 years	2 marks
More than 10 years	3 marks

In the next stage, all of the scores were totalled to obtain the sum for each case. Finally, the average score of the award winning and the non-award winning companies were calculated to obtain the levels of perception from Managing Director, Human Resource Manager, Quality Assurance Manager and Operations Manager as tabulated in Table 5.48. The table indicates, based upon a perceptual profile of each manager, a whole host of major differences in the systems designs of these two groups of businesses especially the formalisation of processes (planning and control), attention to human resource management and the management of the SME business within the supra-system of the supply chain.

The perceptual study also permitted the creation of radar charts to show the direction and gap between the award-winners and the non-award-winners in terms of business designs (see Figure 5.4). Here the manipulation of the data collection, confirmed by the qualitative interview process, revealed fewer gaps in the operations of technology (supporting the view that technology establishes the basic efficiency performance of the firm) whilst the attention to direction and people engagement establishes the actual performance efficiency and customer service effectiveness of the business.

Tables 5.49 and 5.50 display the score of each company for levels of perception. Table 5.49 shows the score of business management activities in the companies and Table 5.50 shows functional activities. The breakdown of marks is derived from the score given for

each company activities. The information from both tables allowed the researcher to indicate the levels of TQM implementation of each company and position them according to a scale of QC, QA and TQM. This will be discussed further in Chapter 6 of the thesis.

5.7 Chapter Summary

This chapter began with a brief description of the SME cases and their backgrounds. The total number of participating companies was eight purposively selected businesses. The criteria for selection included location, customers, technology (simple technology) and size. Three of the selected companies were award winners and the other five non-award winners. The background offered a general understanding to the reader about each company's management, activities and practices. A summary of each case was tabulated in the form of a matrix table and this indicated the differences between all the companies in terms of employment size, business establishment, technology, customers, quality management of the system, size, ownership and status.

The chapter continued with detailed findings for each case. The aim of this section was to gain an in-depth understanding of TQM implementation in SME businesses and make a comparison between the two categories (award winners and non-award winners). Therefore, the questionnaire design focussed on the aspect of functional areas that covered managing the business, quality assurance, operations management and human resources management.

In terms of surprises, presented by the findings of the study and what was expected to be found from the literature review, some major differences were detected between the award and non-award winning companies. The sheer performance differential across the input-process-output cycle was orders of magnitude different than could have been expected from the literature review.

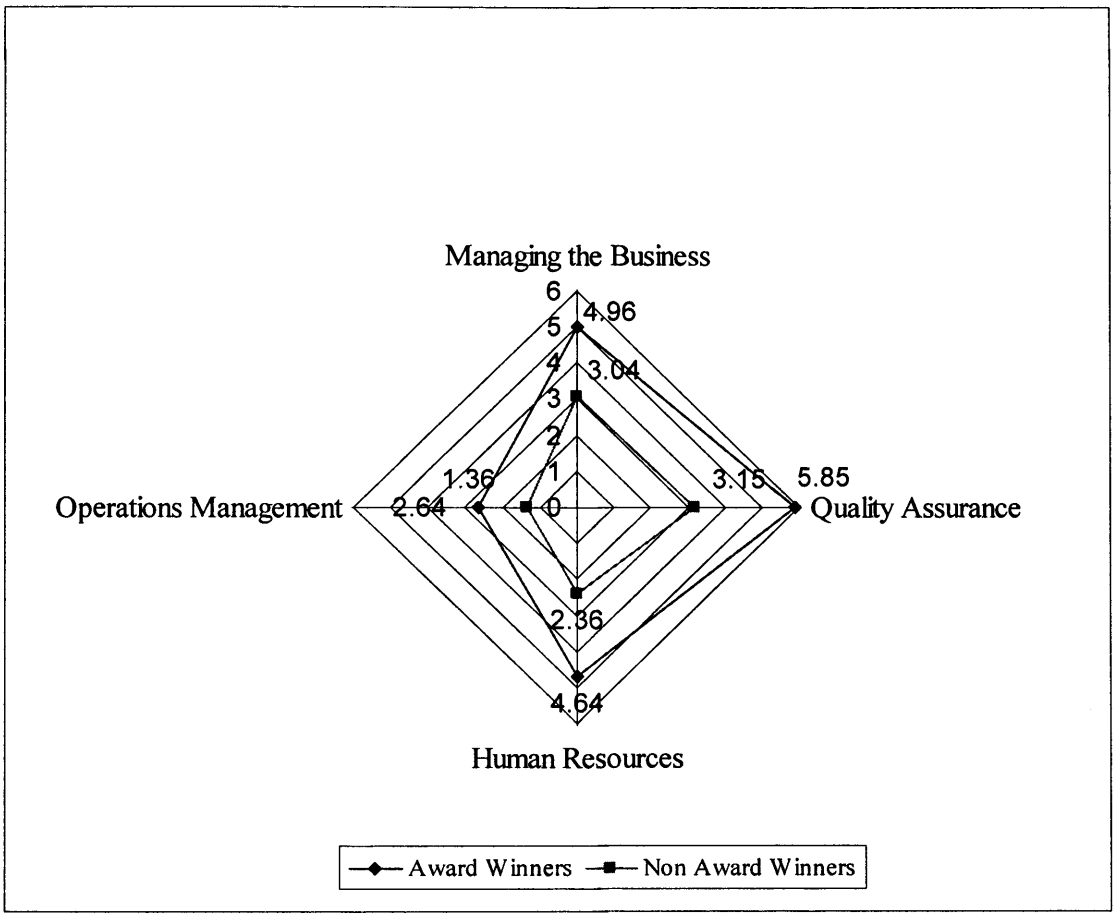
In addition the features of the award winners were very closely associated with the features of large companies reviewed in the literature – this suggests small businesses can act like large ones at this size of organization (nearly 150 persons). It is noted that, as

Table 5.48: Score for levels of perceived of TQM Implementation

TQM Elements	Level of Perceptions		
Managing The Business	**Award Winners**	**Non-Award Winners**	**Sources**
Strategy	0.64 (7.7)	0.36 (4.4)	Table 5.6
Benchmarking	0.55 (4.4)	0.45 (3.7)	Table 5.7
Industrial Networking	0.61 (3.7)	0.39 (2.4)	Table 5.8
Quality Practices	0.63 (10.0)	0.37 (6.0)	Table 5.9
Senior Managers Involvement	0.68 (6.0)	0.32 (2.8)	Table 5.10
Business Cultures	0.56 (10.7)	0.44 (8.4)	Table 5.11
Business Measures	0.66 (11.3)	0.34 (5.8)	Table 5.12
Suppliers' Performance	0.63 (8.0)	0.37 (4.8)	Table 5.13
Total	**4.96**	**3.04**	
Quality Assurance			
Quality Planning	0.65 (14.7)	0.35 (7.6)	Table 5.14
Quality Approaches	0.67 (6.0)	0.33 (3.0)	Table 5.16
Quality Measurement	0.67 (12.0)	0.33 (5.8)	Table 5.17
Product Returns	0.61 (4.0)	0.39 (2.6)	Table 5.18
Quality Tools Used by Factory Management	0.70 (16.3)	0.30 (7.0)	Table 5.19
Quality Tools Used by Factory Workers	0.62 (15.3)	0.38 (9.2)	Table 5.20
Quality Management Benefits	0.60 (14.7)	0.40 (9.8)	Table 5.21
Quality Standards	0.67 (10.3)	0.33 (5.0)	Table 5.22
Supply Chain Management	0.66 (12.0)	0.34 (6.2)	Table 5.23
Total	**5.85**	**3.15**	
Operations Management			
Planning Operations Management	0.60 (8.0)	0.40 (5.4)	Table 5.25
Performance Measurement Criteria	0.65 (7.3)	0.35 (4.0)	Table 5.26
Operations Performance	0.68 (20.0)	0.32 (9.6)	Table 5.27
Working Practices	0.71 (13.3)	0.29 (5.4)	Table 5.28
Total	**2.64**	**1.36**	
Human Resource Management			
Decision making and Strategy and Change	0.61 (7.0)	0.39 (4.4)	Table 5.31 and 5.32
Methods of Recruitment	0.63 (15.3)	0.37 (9.0)	Table 5.33 and 5.34
Recruitment and Induction Programmes	0.61 (12.0)	0.39 (7.6)	Table 5.35 and 5.36
Training and Development	0.58 (9.0)	0.42 (6.6)	Table 5.37 and 5.38
Employee Assessment	0.68 (5.0)	0.32 (67.6)	Table 5.42
Employee Well Being	0.70 (9.0)	0.30 (3.8)	Table 5.43
Suggestion Scheme	0.79 (7.7)	0.21 (2.0)	Table 5.45
Total	**4.64**	**2.36**	

Note: ( ) average score of award and non-award winners from the sources table.

Figure 5.4: Differential in business design



stated at the beginning of this chapter, these businesses were at the larger end of the SME definition but they were independent businesses albeit that certain customers dominated the demand for goods from these factories (they were not quasi-owned). It is noted that the size of the cases in employment terms does have a bearing on the representativeness of these businesses to SMEs in general but as previously noted these businesses shared very similar technological and market conditions so differences result from management action in the context of what are small businesses. These findings support the literature review which suggests performance differentials result from a better 'designed fit' of the socio technical design of the firm by management. The study also confirms the work of Blackmon (1998) concerning larger business and suggests companies may well select common 'tool based' features but performance differentials concern the management and

planning of the business system by SME managers as much as it explains differentials for large businesses.

Another surprise concerned the intermediate position (QA case) and the real difference of formalised management planning and leadership which denoted the business as no yet reaching TQM levels – whereas input-process-out performance was actually very comparable with the award winning businesses. On all indicators, shown in table 5.48, the survey results of the questionnaire stage involving Welsh and Malaysian businesses, would suggest these businesses did not, on any indicator, equal that of the award winning cases. This may be, in part explained by the use of statistical methods to 'average away' any high performing outlier in the questionnaire phase but does suggest that the award winning companies have designed and implemented organizational features (especially social and managerial) that are superior to any other business engaged with this study.

The results also confirm the classes of TQM application as identified by Dale (2003) and support his thesis that there are classifications of business but it does not indicate that there is a smooth transition towards TQM nor does it deny that you have to move through each stage in succession. As previously noted, this evolution was beyond the scope of this project but the surprise result was that the classifications were (based upon performance differentials) so easy to identify and contrast.

The finding of the case studies was that the award-winning companies had a business strategy and emphasised formalised TQM implementation. Senior management played an important role in developing strategy and involved all managers in the factory. In addition, they ensured that all other strategies (human resources, quality assurance and operations management) were integrated and aligned with the overall business strategy. Senior management also were actively involved in quality practices and continuous improvement activities in the factory. Therefore, the award-winning companies were able to perform well in production (product fail final inspection) with the ratio of 100:1 better than were the non-award winners.

On the other hand, senior management in the non-award winning companies could be considered less committed toward quality practices in the factory except for Company G. It could be seen through the development of a business strategy that they placed no emphasis on quality or on continuous improvement. Moreover, the business strategy was developed solely by the Managing Director and all managers were required simply to follow what had been planned for the company. Thus, the companies were unable to perform well in every functional area (management, quality assurance, operations management and human resource management) as compared to the award-winning companies.

The overall results in this chapter show the award-winning companies performed better than did the non-award winners. This confirms the effectiveness of the TQM implementation by award-winning companies therefore leading to better performance.

The key themes identified in this chapter were integration, formalisation and alignment, which needed to be adopted for the success of TQM implementation.

Reflecting upon the earlier survey phase, which it is noted is not part of the study but is a good practice to reflect upon the differences and similarities of these two activities, it is found that the award winning TQM cases do not show similarities with participants of the survey that perceived themselves to be TQM businesses. There were however many common features between the survey respondents and the non-award winning category (QC and QA businesses). These similarities included lack of management involvement, poor process control, low human resource commitment and low operations management performance (input, process and customer service output).

The next two chapters (Chapter 6 and Chapter 7) will offer the reader the analysis of and reflections on the research findings for both the survey and the case studies and will conclude with the implication and recommendations for future research. The research questions are discussed and answered in Chapter 6.

Table 5.49: Overall score on business management activities

Companies	Managing Business								TOT
	ST	BMK	IN	QP	SMI	BC	BMB	SP	
A	0.22	0.24	0.28	0.23	0.22	0.17	0.21	0.21	**1.78**
B	0.19	0.00	0.16	0.19	0.19	0.17	0.21	0.21	**1.32**
C	0.22	0.34	0.16	0.21	0.26	0.22	0.23	0.21	**1.85**
D	0.13	0.14	0.13	0.09	0.11	0.10	0.12	0.09	**0.91**
E	0.00	0.11	0.00	0.06	0.02	0.07	0.04	0.05	**0.35**
F	0.00	0.00	0.07	0.06	0.02	0.07	0.04	0.05	**0.31**
G	0.13	0.15	0.13	0.12	0.14	0.09	0.12	0.13	**1.01**
H	0.10	0.00	0.07	0.08	0.02	0.09	0.04	0.06	**0.46**

Note: ST : Strategy
BMK : Benchmarking
IN : Industrial Networking
QP : Quality Practices
SMI : Senior Management Involvement
BC : Business Culture
BMB : Business Measures and Benefit
SP : Supplier Performance

TOT : Total

Table 5.50: Overall score on quality assurance, operations management and human resources activities

Co.	Quality Assurance									Operations Management				Human Resources							
	QPL	QA	QM	QTM	QTW	QMB	QST	SCM	TOT	POM	PMC	OP	WP	TOT	STC	MR	IP	TD	EA	EW	TOT
A	0.22	0.22	0.22	0.23	0.20	0.22	0.22	0.22	**1.75**	0.20	0.24	0.23	0.23	**0.89**	0.23	0.16	0.20	0.19	0.23	0.24	**1.25**
B	0.21	0.22	0.22	0.21	0.20	0.16	0.22	0.22	**1.66**	0.20	0.18	0.23	0.23	**0.84**	0.18	0.25	0.20	0.19	0.23	0.24	**1.29**
C	0.22	0.22	0.22	0.26	0.22	0.22	0.24	0.22	**1.82**	0.20	0.24	0.23	0.25	**0.92**	0.20	0.22	0.20	0.19	0.23	0.24	**1.28**
D	0.09	0.07	0.07	0.09	0.09	0.07	0.07	0.10	**0.63**	0.10	0.07	0.05	0.09	**0.31**	0.12	0.02	0.11	0.08	0.11	0.06	**0.50**
E	0.00	0.00	0.03	0.11	0.04	0.09	0.04	0.02	**0.32**	0.08	0.07	0.05	0.02	**0.22**	0.04	0.05	0.05	0.08	0.00	0.05	**0.27**
F	0.08	0.07	0.06	0.06	0.08	0.07	0.05	0.06	**0.51**	0.06	0.05	0.06	0.04	**0.21**	0.07	0.03	0.07	0.08	0.05	0.03	**0.33**
G	0.11	0.13	0.13	0.19	0.11	0.10	0.10	0.12	**0.99**	0.10	0.12	0.11	0.12	**0.45**	0.11	0.15	0.10	0.10	0.11	0.11	**0.68**
H	0.07	0.07	0.03	0.03	0.05	0.07	0.07	0.03	**0.41**	0.06	0.05	0.06	0.04	**0.21**	0.05	0.05	0.05	0.09	0.05	0.05	**0.34**

Note:
QPL : Quality Planning
QA : Quality Approaches
QM : Quality Measurement
QTM : Quality Tools (Used by Management)
QTW : Quality Tools (Used by Workers)
QMB : Quality Management Benefits
QST : Quality Standard
SCM : Supply Chain Management

POM : Planning Operations Management
PMC : Performance Measurement Criteria
OP : Operational Performance
WP : Working Practices

TOT : Total

STC : Strategy and Chain
MR : Methods and Recruitment
IP : Induction Programme
TD : Training and Development
EA : Employee Assessment
EW : Employee Well Being

CHAPTER 6:

ANALYSIS AND REFLECTIONS

Chapter 6: Analysis and Reflections

6.0 Introduction

The previous chapter outlined the major sub-systems design and performance findings of eight case studies of companies that were carried out in Malaysia. The results clearly indicated a major difference between the higher performing businesses (cases known as 'award winners') that used better systems designs and 'ways of working'. The purpose of this chapter is to bring together these case studies and to present a review of the businesses as systems and to reflect upon the research questions that have guided this study. Therefore, this chapter will seek to answer the guiding research questions that were mentioned in Chapter 1.

6.1 Enablers of TQM Implementation

6.1.1 Research Question One:

Returning to the main research question of 'what are the structural enablers for improving business effectiveness using TQM approaches by SME businesses as perceived by senior business managers with the authority to design business system?'. This section will now offer insights into this question.

In this research, the TQM enablers for improving business effectiveness were identified through the chi-square independent test in Chapter 4 (significant results summarized in Table 6.1). The enablers were divided into four functional activities in an organization, such as business management, quality assurance, operations management and human resource management. Table 6.1 indicates that the human resources and operations management functional activities had more significant enablers than did business management and quality assurance, reinforcing the importance of an effective socio-technical systems design.

From the management perspective, the enablers were then grouped into six categories, which were classified as planning formalization, review formalization, analytical

Table 6.1: Summary of statistically significant results of TQM enablers

Functional Activities	Enablers	Chi-Square Test	p value
Business Management	Formal strategy	10.779	0.000*
	Review of strategy	24.938	0.001*
	Tools and techniques used	15.365	0.005*
Quality Assurance	Quality management system	18.287	0.050*
	Approaches to TQM implementations	32.779	0.000*
Operations Management	On time delivery	9.475	0.050*
	Lead time	10.951	0.050*
	Performance indicators	23.589	0.023*
	Warranty claim	9.825	0.043*
	Final inspection	16.183	0.003*
	Outcome	52.226	0.050*
Human Resources	Induction programmes	5.355	0.021*
	Performance appraisal	3.311	0.050*
	Recruitment	26.935	0.000*
	Problem solving teams	7.985	0.005*
	Suggestion scheme	4.687	0.030*
	Training	4.938	0.003*
	Features provided	32.586	0.001*

Note: *p<0.05

formalization, integration formalization, system formalization and methodology formalization.

The classifications of each of the categories which were presented in Table 6.2 are now reviewed:

a) Planning formalization

Planning formalization involves the development of strategy by senior management to direct the company towards achieving common objectives and goals as well as to bring TQM into existence/reinforce TQM sustainability.

b) Review formalization

Review formalization relates to how often the strategy is revised and updated to determine the performance gaps relevant to the current needs of the company and its environment.

c) Analytical formalization

Analytical formalization is concerned with the tools and techniques used by senior management to formulate strategy including the number and type of analysis tools. The right tools and techniques give reputable and reliable results when integrated within a systems approach to the business and its environment.

d) Integration formalization

Integration formalization involves the commitment and participation of employees in quality improvement activities and therefore the involvement of employees in improvements as a form of customary practice. This will lead to the success of TQM practices in the company and the sustainability of improvement processes including organizational learning processes.

Table 6.2: Classification of TQM enablers

Functional Activities	Enablers	Categories	Authors
Management	Formal strategy	Planning Formalization	Deming (1986); Dale (2003); Oakland (2003).
	Review of strategy	Review Formalization	Garvin (1988); Dale (2003); Oakland (2003).
	Tools and technique used	Analytical Formalization	Deming (1986); Ishikawa (1985); Imai (1997).
Quality Assurance	Quality management system	System Formalization	Hoyle (2001); Evans and Lindsay (2002).
	Approaches to TQM	Methodology Formalization	Oakland (2003); Zairi, (1991).
Operations Management	On time delivery	Delivery	Imai (1997); Ishikawa (1985).
	Lead time	Cost	Crosby (1979); Juran (1988); Ishikawa (1985).
	Performance indicators	Quality	Atkinson (1997); Batitci et al. (1997); Evans and Lindsay (2002).
	Warranty claim		
	Final inspection		
	Outcomes		
Human Resources	Induction programmes	Review Formalization	Marchington and Wilkinson (2002); MacDuffie (1985).
	Performance appraisal		
	Recruitment		
	Problem solving teams	Integration Formalization	Oakland (2003); Dale (2003); Chandler and McEvoy (2000).
	Suggestion scheme		
	Training		
	Features provided		

e) System formalization

System formalization relates to the employment of quality management standards in the company such as ISO 9000, TS 16949 and so forth. This quality system provides a strong foundation for quality assurance activities and creates a baseline for improvement. This feature was common to most businesses but serves only as a skeleton framework of processes that bind together the procedures of a business.

f) Methodology formalization

Methodology formalization is concerned with the approaches adopted by the company in implementing TQM as a means of intervention and improvement.

g) Quality

Quality is concerned with activities or action taken by companies to ensure their product meets customer requirements and expectations. It is a primary link to the environment and the output of high performing systems, and confirms the view proposed by Slack (1991).

h) Delivery

Delivery relates to the frequency with which customers receive products on time and a faultless physical customer service. These interactions with the environment create the second level of performance mastery as proposed by Slack (1991).

i) Cost

Cost involves the countermeasures applied by companies to ensure they are properly managed in achieving product quality and for businesses to avoid unnecessary reworking, defect production and such like. High performance award-winning businesses perform at much greater levels of performance in this area of management design than do their rival cases. Cost is added to the model as an output finding based upon the vast performance differentials and the reduced effort needed to maintain a business' high performance.

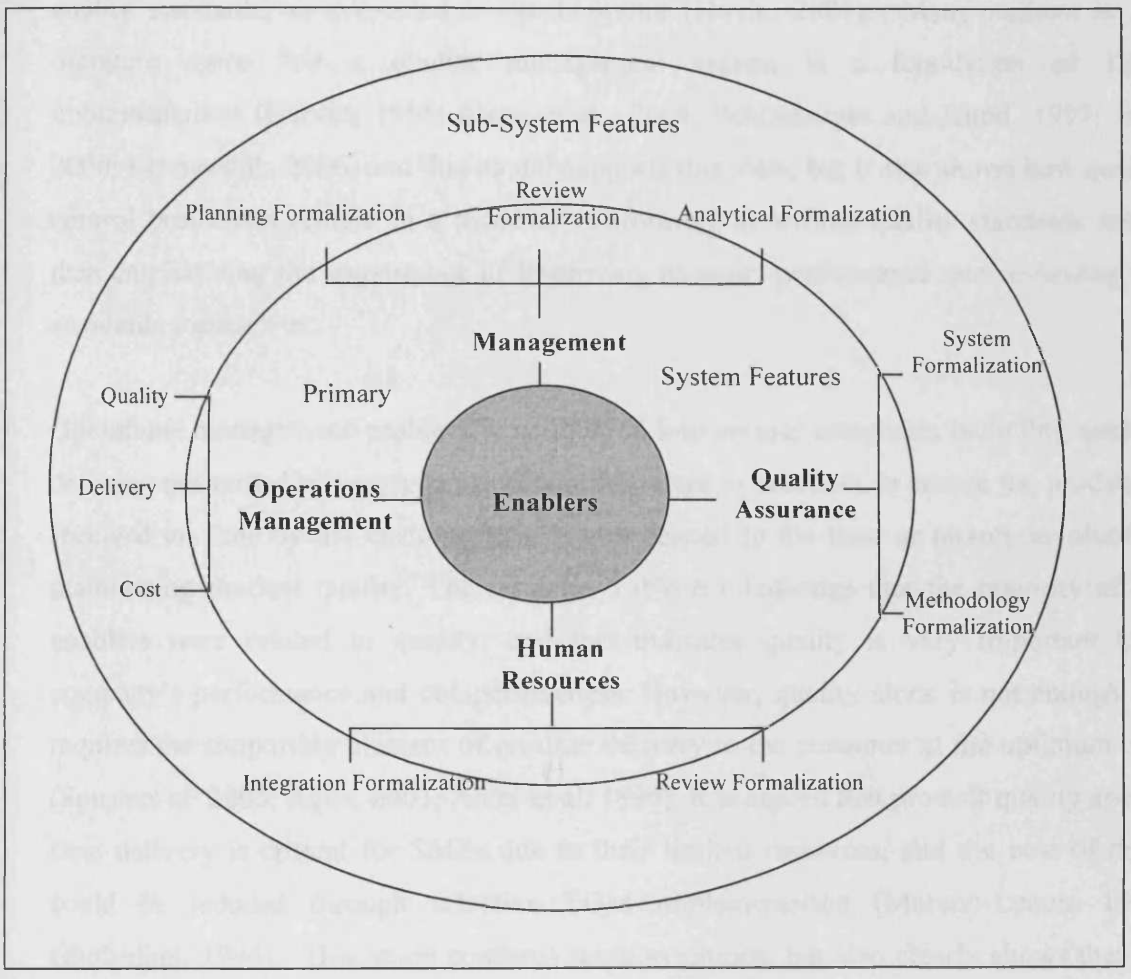
6.2 The General Model of TQM Implementations for SMEs

Many authors in the literature consider TQM practices as a strategic approach by an organization to business success (Oakland, 2003; Dale, 2003; Garvin, 1988; Ahire et al., 1996). The identification of enablers by this research shows that TQM companies reinforce integrated management planning processes and alignment/congruence in the design of execution systems that originate from business plans. The results also show the combination of planning and an operational system (formalization and alignment) forms a balance between control and improvement, and these (formalization and alignment) represent an integrated systems approach to the company. The key enablers have been classified and combined to form a generic model of TQM implementation for Malaysian SMEs (see Figure 6.1).

The model in Figure 6.1 indicates that there is management emphasis on the formalization of planning, review procedures and analytical processes. Planning allows a business' management to forecast what they intend to do in light of the environment and its changes, to estimate the resources needed to enact company change and to set and deploy the objectives to be achieved across the entire organization (Slack et al., 2004). The tools and techniques used to support an integrated approach to the development of planning and strategy include the routine use of tools and techniques that ensure changes in the environment and business performance can be identified and used to prompt and enact change quickly and effectively (reliable and consistent methods of business review). The planning process, as a set of activities, was subject to formal revision once or more times a year (dependent upon the specific company) to ensure that what was needed as a performance improvement was actually in line with business and market requirements. Such an approach to formalized reviews is also a major feature of high performance businesses and helps to evaluate company position against internal measures as well as against general industry and manufacturing sector practice.

Within the model, there is a qualitative difference between the use of quality management systems and particularly the more proactive management of quality assurance rather than

Figure 6.1: General TQM Implementation Model for SMEs



reactive quality control processes. The aim of quality assurance is to make every person understand the importance of personal responsibility and accountability for the quality of processes within the business. Such an approach leads to quality being built into the product and results in the customer being confident that the product concerned will perform as expected or be produced in a consistent manner. Quality assurance can be achieved through the implementation of quality standards such as ISO 9000, QS 9000, TS16949 but this maintains only a basic control. For this model, quality assurance goes beyond written operating procedures and includes the integration of employee improvement activities to ensure continuous and sustainable process development. These

processes of quality assurance therefore extend the mere procedural bias proposed by quality standards, as presented in the literature (Hoyle, 2001). Many authors in the literature agree that a quality management system is a foundation of TQM implementation (Garvin, 1988; Slack et al., 2004; Schonberger and Knod, 1997; Sun, 2000; Lewis et al., 2006) and this model supports this view, but it also shows how quality control businesses remain in a mode of conforming to written quality standards rather than emphasizing the importance of improving business performance and reviewing the standards themselves.

Operations management enablers were divided into several categories including quality, delivery and cost. Delivery process capability refers to practices to ensure the product is received on time by the customer and is cost related to the time or money involved in maintaining product quality. The result in Table 6.1 indicates that the majority of the enablers were related to quality, and this indicates quality is very important to a company's performance and competitiveness. However, quality alone is not enough but requires the supporting element of on-time delivery to the customer at the optimum cost (Sousa et al. 2005; Agus, 2001; Ahire et al. 1996). It is argued that product quality and on time delivery is critical for SMEs due to their limited resources, and the cost of these could be reduced through effective TQM implementation (Moreno-Luzon, 1993; Ghobadian, 1996). This study confirms these assertions, but also clearly shows that the mastery of on-going and strategy-led quality improvements to the business and its performance differentiates award winning business designs from all others.

Human resources show a major and significant group of TQM enablers are a prominent feature concerning the successful and sustained implementation of TQM. These enablers were grouped into two categories: integration formalization and review formalization. According to Mullins (1996), the term 'integration' refers to 'the need for people to act together with unity of action' and therefore it is used, in this study, to refer to the alignment and congruence of improvements with strategy (vertical alignment) and across the business (horizontal alignment). The design of features to integrate employees into a quality culture and continuously reinforce the values of quality improvement facilitates

the sustainability and step-change performance improvement that can be achieved by a systems-wide and strategy-led quality process. Through the implementation of a quality culture, everyone in an organization shares a commitment to continuous improvement and the achievement of customer satisfaction. The number was greater and the depth of such practices at award winning cases was far more sophisticated and routinely practiced relative to the other cases where there were significant gaps in this part of the socio-technical design.

Review formalization within the human resources category of the model includes recruitment of the 'right type' of employee. This is alignment with a TQM way of thinking/working; induction programs to reinforce the value of TQM within the business and performance appraisal to ensure the results of a TQM culture are being exploited by the business and so will result in better performance. Poor selection decisions affect the business as a whole and result in a lack of alignment or shared values between the workers and management, which inevitably leads to conflict and is expensive in terms of management time needed to deal with disciplinary cases, to retrain poor performers and to replace individuals who choose to leave the company soon after starting work.

It should be noted that all the high performance cases in this research exhibited high levels of management design and features that reinforced the integration and formalization of system practices across the entire business. Of all these features, the most important areas of management that directly influenced high performance were found, through statistical and qualitative analysis to include the major subsystems of

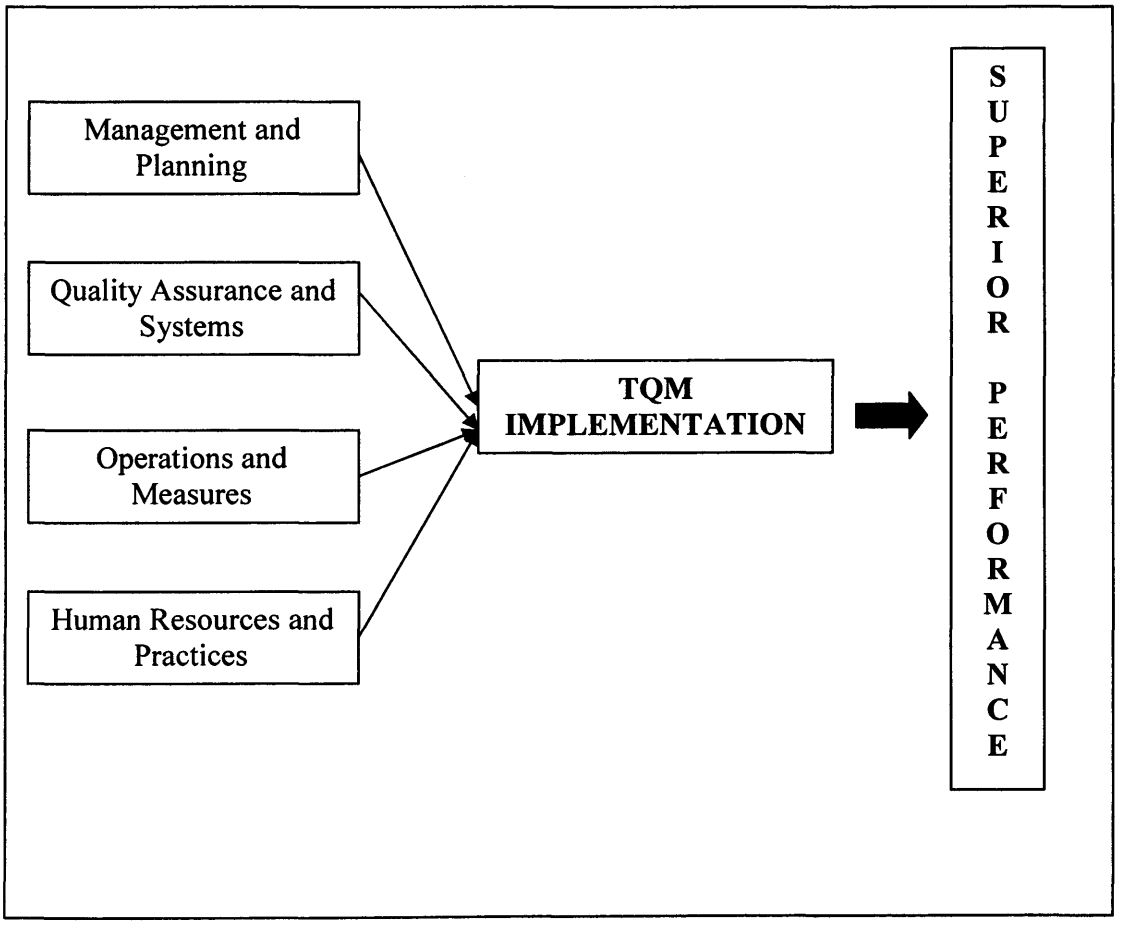
a) Management and planning
b) Quality assurance and systems
c) Operations management and measures
d) Human resources and practices

Therefore, based on the findings of this research, it is argued that integration and highly formalized systems of management, technical designs and human resource integration

were the features for TQM implementation at award winning Malaysian SMEs (see Figure 6.2). These features provide an initial map of the basic system design that underpins demonstrated higher performance and confirms a superior socio-technical design for these businesses that share the same technology, customers, and geographical location.

The model shows, in response to research question one, the major socio-technical design features of high performing businesses, but the model does not seek to show the chronological sequence needed to achieve high performance by businesses that were

Figure 6.2: Integration and formalization of systems



declared as 'quality control' and 'quality assurance' types. However, the major differences relate to the subsystems of planning and a management-led approach to employee-based continuous improvement and the view that strategy should dictate the structure of quality systems within a business. The study confirms that the performance differentials between award winners and all other businesses are such that they may be explained only by good and effective subsystem integration and formal management as opposed to 'luck' or some other form of serendipity including simpler products, less demanding customers, or better machinery. Even if these chance factors were present, they could not explain why award winning companies sustain their improvement activities at a level much higher than those of rival cases; these are the outcomes of integrated management and a TQM culture based on integrated human resource management.

6.3 Case Study Companies

6.3.1 Research Question Two

The second research question concerns the benefits gained by a company through TQM implementation and the question is:

What performance benefits and improvements have been sustained as a result of TQM improvement programmes? Are there differences between the features of business that achieve higher levels of performance and those that do not?

The cases in this research were similar in terms of technology, customers, location, number of employees and size (see Tables 5.1, 5.2 and 5.3 of Chapter 5). As such, the major organization design contingencies were similar and consistent (Kast and Rosenzweig, 1972). Major sources of differentiation between award winners and non-award winners included design of business and structures, and leadership and human resources. Management involvement in improvement activities was very significant across subsystems and for performance objectives, being aligned effectively for award winners. For example, the award winning companies had been involved in quality practices for more than 10 years and customer satisfaction was the main focus throughout

all business activities (see Tables 5.8 and 5.9 of Chapter 5). Senior management or the leadership of change in the factory was found to be 'top down' and biased towards promoting new ways of working. Integrated approaches to business management in the top down approach were combined with a much greater attention to gaining the full participation of all business managers (alignment of subsystems) and to gaining this integration through a formal process of annual planning. Such an approach to change management and leadership, which is focused on both business efficiency and effectiveness, reinforces the work of Oakland (2003) who directly associates this behaviour and feature with business success.

Human resource management has received great attention in the literature and it reinforces the view that the right type of people is needed to perform the tasks for continuous improvement and to reinforce the values of TQM (Marchington and Wilkinson, 2002; MacDuffie, 1995). From the findings of this study, a clear argument can be made that a greater number of methods and a formalized approach for recruitment were typical of the award-winning businesses and that such cases deliberately removed potential new employees who would conflict with a TQM culture (see Tables 5.31 and 5.32 of Chapter 5). Such attention to the human resources of the award-winning businesses was manifest in the approach to training provided (where a higher variety and high number of hours were expended) for team leaders and supervisors of the award winners as compared to those of the non-award winners (see Tables 5.36, 5.37, 5.38 and 5.39 of Chapter 5). As such, much attention and expenditure was aimed at the front-line management of TQM and the deployment of TQ values by those persons in charge of the value-adding production processes and those personnel with a direct influence upon customer service. Such strong findings support the works of Huang (2001) and Palo and of Padhi (2003). Both these studies proposed a causal link between employee training for continuous improvement and higher performance. This study clearly indicates this aspect of socio-technical design to be very important to business success and the sustainability of improvement.

Performance appraisal happened more formally for the award-winning companies and was carried out at all organizational levels of management especially front line and senior management. Even by the standards of Randell (1994), these features were more cohesive than those previously found in the TQM literature. In addition, it was found that the award winning companies spent more time leading and communicating business goals and used this feature to prepare their employees for change and to reinforce improvement throughout the business. As a result, the number of suggestions per employee was higher than in the non-award winners, which indicates a trust in management and shows the fruits of focused training as well as the ability of personnel to link training to the exploitation of improvement (see Table 5.44 of Chapter 5). It also shows that the non-award winning companies did not have this feature and thus it exposes a weakness in the leadership and design approach to the business. Once again, this finding clearly indicates the pivotal role of management in designing and promoting TQ across the business and suggests an integrated management team with formalized processes and an approach to the deployment of improvement targets clearly differentiates an adequate performer from an award winning business.

The existence of secondary features with which to capture further employee innovations (such as the suggestion scheme) reinforces management attention to finding ways of integrating and allowing employees to identify problems and take control of their own roles within the business. To exploit such systems, skilled workers are needed who feel happy and comfortable with being innovative and suggesting improvements (including questioning previous management decisions that now inhibit performance improvement). Suggestion schemes operated by award winner's show very significant differences in this feature of employee innovation as compared to non-award winners (see Table 5.45 of Chapter 5). Again, from the management point of view, these features allow the largest groups of employees to exploit their training over the long term, and allow these personnel to contribute directly to the improvement of business performance in a manner that is proactive and more dynamic than systems designed by managers at non-award winning businesses.

These findings confirm the widespread view in the TQM and socio-technical systems literature that 'human resources is the only source of continuous improvement and competitive advantage' owned by a business. Within award-winning businesses, this feature receives high investment even by SME standards and reflects the practices adopted by studies of businesses that are many times bigger (MacGregor, 2004; Murphy, 1996). Further, this study shows that high performance SME businesses perceive the outcomes of human resource development and employee innovation to be so important that training and development is a continuous investment (from management level to shop floor). No previous study of SME businesses has detected such a design and approach to employee management or has discussed how these systems are aligned and exploited effectively from a socio-technical perspective.

In the case of problem solving teams, the feature of continuous improvement was engaged widely by award winning companies. Although this feature is associated with reactions to problems/events, the feature ensures an elimination of losses and operational weaknesses. The purpose of this activity is to eliminate problems, to introduce countermeasures to catastrophes and interruptions to the value adding input-process-output and to restore the process to stability. Non-award winners had not managed to maintain a level of stabilization and therefore could not improve effectively because of inevitable failures and distractions to management time. From the operations management point of view, the award winners were 100:1 better than were the non-award winners at formalized problem solving and techniques of continuous improvement.

The amount of training was higher in high performance award winners who already had 100:1 better performance than had non-award winners. This suggests training leads to continuous and sustainable high performance in the form of a virtuous circle (Dale, 2003). The award-winning companies were very stable and improving and due to continuous training, continuous maintenance of measures and of best practices they did not stop improving. Moreover, the attention to treating human resources very well through features of employment, methods, and ways of working (employee integration, suggestion scheme, problem solving team, communication and perpetual review and

appraisal) was more integrated at the award winners, suggesting award winning companies have better STS than have non-award winners. Pasmore (1988) reinforces the view of human resources integration for high performance businesses and the role of senior management in developing and realizing company vision, mission and objectives mirrors the commitment toward continuous improvement. Furthermore, Deming (1986) and Crosby (1979) stress that senior management should be responsible for quality improvement and be involved at all stages of the process; this study confirms the importance of the involvement of senior management to ensure the success of TQM, a feature absent from the non-award winning cases.

Technology and structures set the basic social technical system (which defines the constraints, capacity, and other operations management design issues); and from the work of Pasmore (1988), it can be argued that social designs make the difference between what technologies can do technically and what they can achieve in terms of efficiency. Thus, people and technology management processes determine operations management efficiency.

In the case of this research, the non-award winners were not efficient as compared to the award winners and had an imbalanced technical and social system with many differences being exhibited in the management and employee side of the design. However, according to Oakland (2003), it is not enough to be efficient; efficiency should followed by effectiveness. Effectiveness reflects the achievement of a desired result (output) by a company or by process owners. This implies that the strategy of award winners is more strategic and formalized than that of non-award winners. Oakland furthermore suggests, "*Efficiency is concerned with the percentage resource actually used over the resources that were planned to be used*". Effectiveness relates to output and efficiency focuses on input. The integrated nature of business departments with the company strategy is important and the award winners had more aligned systems of planning, feedback and key performance indicators than had the non-award winners. Deming (1986) suggested his 14 points (see Appendix 3) for management to breakdown barriers between departments and work as a team, and stressed many of the alignment features that were

common to the award winners in this study. Horizontal alignment (shared goals/measures across departments) and vertical alignment (shared integrated goals from management to operations) were found to be characteristics of the highest performance award winners. It was also found that human resource practices reflected the business strategy and customer focus; these are the characteristics of a business design that takes a system approach (MacDuffie, 1997; Lau and Anderson, 1998).

This study involved, by design, businesses with a common technology which, when classified by Hayes and Wheelwright (1988), were simple technologies as opposed to process/dedicated technologies. With common customers in the automotive sector, each case also faced similar pressures and constraints when attempting to manage and exploit the conversion process (plastic injection moulding and metal stamping for the automotive industry); therefore, differences in performance result from better planning or human resource sub-systems. With regard to technology, this research did not expect to find major differences due to the purposive sampling used, but key features were identified that differentiated the award winners from the non-award winners. The main differences involved the integration of human resources with the technology and the on-going and more extensive use of commercial training as well as a much more pivotal role for the team leaders within the high performance businesses.

The award winners were also found to use a systems approach to the management of performance measures such that the key objectives of quality as the primary measure were emphasized and not just efficiency (which was the focus of the non-award winning companies). Further, the higher performance companies monitored more varied measures than did the non-award winners (these additional measures included lead time, delivery and cost performance of the system versus mere productivity of labour). This implies award-winning companies have the ability to manage a range of performance indicators. Therefore, the award-winning companies were much better able to supply customers with what they wanted (see Table 5.25) and without the stock buffers that the non-award winners needed. The award winning companies were much better at managing product quality, warranty and delivery of finished product (see Table 5.17 of Chapter 5). In

addition, they also had no stock at customer premises, whereas customers kept non-award winners' stock almost eight days on average. This indicates the systems of the award winners were more reliable than were those of the non-award winners due to no stock being held at customer premises. This suggests a good technical supply chain and better improvement process – both resulting from a greater involvement and alignment of management.

Again, a systems approach was found to be operated with the suppliers to the award winning businesses and the main measures of quality, delivery and cost were used to assess suppliers as well as internal management departments. Such an approach is consistent with the views of Deming (1986) and the treatment of suppliers as extensions to the factory itself. It was also found that the supply chain models of the award-winning businesses did not operate with zero defects, but these businesses were engaged in filtering out poor supplier quality performance to ensure bad quality of products was not passed to customers. It should be noted that in non-award winning companies, this filtering activity was at a vastly lower level than the defects coming in, being produced and finally shipped to the customers and that the levels of warranty returns (the most expensive form of quality failure) also showed award winners to have a significant advantage over non-award winners(see Table 5.25).

Suppliers to the award winners also performed better even though they made identical products to the materials bought used by the non-award winners (and the interview process discovered many of the award and non-award winning businesses shared common suppliers). The award winners filtered out poorer quality products thoroughly to ensure fewer warranty returns from customers. As a result, the award winners had a much lower average (230 ppm) of failure of supplied product than had the non-award winners (15000 ppm). The award winners' system was robust regarding quality, delivery and cost. It is therefore argued by the author that award winners reinforce the mastery focus proposed by Nakane (1986) and Demeyer et al. (1991) involving the emphasis on quality first, approval before delivery and cost performance objectives.

Suppliers to the award winners were more integrated and shared common measures and strategies with their award-winning customers. Because 80% of final product cost and content was delivered by suppliers it is argued that award winners have a different business model and one that can be declared as 'collaborative' whereas much attention is paid to employee integration and to suppliers (integration of system). The non-award winners had a poor quality of delivered product due to ineffective filtering of incoming goods leading to the need for reactive chasing and for management involvement to correct errors. Operations managers cannot make the necessary output, and consistently try to find other work to do to maintain the increase in productivity. Thus, non-award winner's shows an over focus on internal efficiency rather than customer service effectiveness and the true exploitation of TQM. This situation leaves managers less time to manage and creates constant fire fighting situations among employees. Thus, sending customers what is ready and chasing outstanding work, ending with significant amounts of stock are characteristics of the unstable non-award winners (Schonberger and Knod, 1997). Such a system is consistent with employee teams that cannot enact improvements and management that are distracted and unfocused in their improvement objectives.

The award winners emphasised quality and delivery with no stock being held at customer premises and with material flows to operations and operations being uninterrupted due to the right work being completed in the right sequence, resulting in orders being despatched in the right order with good quality products and on time. Thus, these systems were stable and without buffers; they were also reliant upon proactive improvements by employees. A single failure without any buffer stocks would make the award winners very vulnerable to any slight disruption to material flow (even failures at suppliers). Therefore, this study shows how management systems of TQM can eliminate large amounts of waste by the implementation of good design and reliance upon employee skills to improve continuously and eliminate any weaknesses or potential for material flow interruption – such an approach is a vastly different business model to that operated by the non-award winners.

In the case of quality improvement tools, award winners used more tools for analysis such as cause and effect diagrams, pareto analysis and statistical process control. As mentioned previously, the quality improvement tool was used by senior management to formulate strategy and planning. A systems approach is the key for quality improvement. However, Ishikawa claimed people (shop floor), Deming promoted senior management, and Juran argued the middle management committees are most important for quality improvement (Dale, 2003). However, this research found that both top down and cross functional management are effective systems and enabled the award winners to master key objectives (quality, delivery and cost) (Slack et al., 2004). The objectives of the business, shared human resources, systematic quality assurance and efficient operations management were aligned.

In summary, it is logical to argue and defend the assertion that the award winning companies had much more integrated systems that resulted in 100:1 levels of performance and with much less buffer stocks and much greater integration of socio systems performance in a business that is aligned at the level of business strategy.

6.4 Review of Systems Performance

The next section will provide, in greater detail, the reviews of the benefits achieved from effective TQM implementation and will review the data collected from the management informants.

The relationship between the highest manager (business owner or Managing Director) and the remainder of the management team showed interesting insights into the design effectiveness of the business model and importantly the integration of business subsystem owners (see Table 6.3). Here it was found that the award-winning businesses engaged in much broader and deeper cross functional management processes; these managers had a greater combined score than that of the other businesses (based upon perceptual rankings by each of the key business problems and opportunities in the same manner).

Table 6.3: Management alignment perceptions

Functional Activities	Companies							
	Award Winners			Non-Award Winners				
	A	B	C	D	E	F	G	H
Managing The Business	1.78	1.32	1.85	0.91	0.35	0.31	1.01	0.46
Total	**1.78**	**1.32**	**1.85**	**0.91**	**0.35**	**0.31**	**1.01**	**0.46**
Quality Assurance	1.75	1.66	1.82	0.63	0.32	0.51	0.99	0.41
Operations Management	0.89	0.84	0.92	0.31	0.22	0.21	0.45	0.21
Human Resources	1.25	1.29	1.28	0.50	0.27	0.33	0.68	0.34
Total	**3.89**	**3.79**	**4.02**	**1.44**	**0.81**	**1.05**	**2.12**	**0.96**
Grand Total	**5.67**	**5.11**	**5.87**	**2.35**	**1.16**	**1.36**	**3.13**	**1.42**

Note: The score of each company were adapted from Table 5.49 and 5.50 of Chapter 5.

From the data collected, the views of the Managing Director (MD) were plotted vertically and the combined views of the middle management team were plotted horizontally (see Figure 6.3). Here the results confirmed the earlier findings and suggested that all of the award winning businesses (Companies C, A and B) operated with much more integrated management systems but it also showed Company G to be close to award winning designs and far above that of the general SME cases. Upon reflection and after cross case comparisons of these businesses, it was found that they did exhibit all the major features of award winners but lacked a means of deploying business strategy and focusing on the direction of the firm. From the research finding, it was also clear that award winning cases were defined in this study as non-award winners that had subsequently met the tests of performance at levels that were far superior to those of the other companies and were the results of the implementation of TQM as identified during the literature review. To emphasize the levels of performance achieved by these TQM companies, the businesses scored over 100:1 better in the major tests of system performance devised during this study (see Table 6.4) than did the non-award winners.

Meanwhile, Companies E, F, G and H were in the QC level and were considered to have the lowest ranking overall. In the last section, the researcher looked at average and common features of the high performance award winners and of the non-award winners.

Table 6.4 Overall system performances

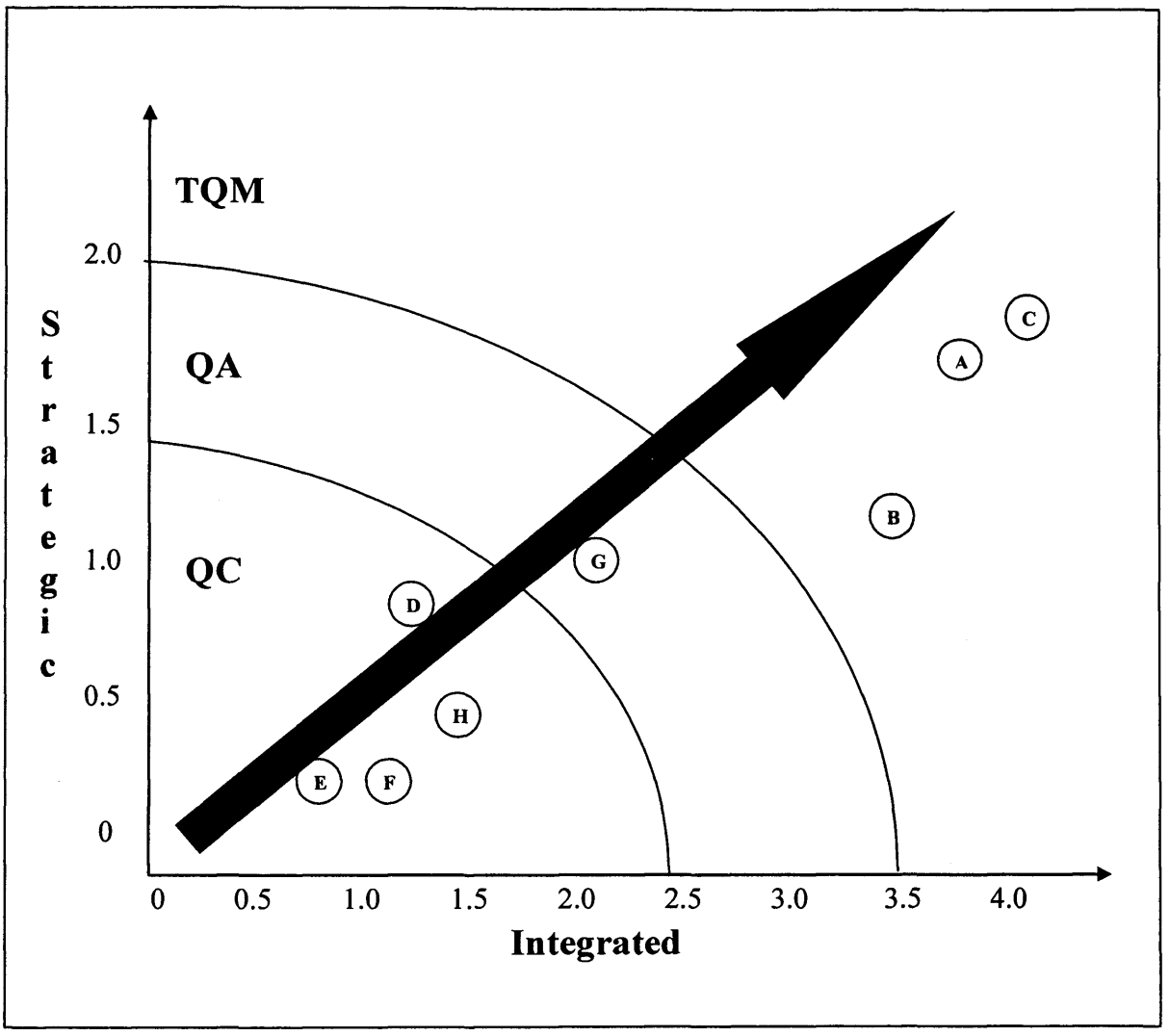
Companies	Measurement (ppm)			
	Product fails final inspection process	**Production scrapped**	**Failure of supplied products**	**Total**
A	200	200	100	500
B	300	200	400	900
C	100	300	200	600
D	15000	20000	10000	45000
E	20000	10000	20000	50000
F	25000	20000	25000	70000
G	500	1000	500	2000
H	30000	35000	20000	85000

Note: The data of each company were adapted from Table 5.27 of Chapter 5.

Striking differences were found between the award winners and the non-award winners even though both types of cases showed an average via statistical manipulation.

This research will now explore the system difference across the three groups the researcher has identified and will then articulate the gaps. These three groups have been termed as the Quality Control, Quality Assurance and Total Quality Management stages of development. The three stages are displayed in Figure 6.3. To assist the reader in understanding the differences between case categorizations during the remainder of this chapter, a simple definition of each category is offered in Table 6.5. As Table 6.5 clearly indicates, these businesses achieved a higher performance consistently in every area of the system design and flow of materials from suppliers to customers, which again creates the need to study the management design of the firm to eliminate any conceivable possibility that these systems resulted from luck rather than design.

Figure 6.3: Stages of TQM implementation among case study companies



Note: QC = Quality Control; QA = Quality Assurance; TQM = Total Quality Management

The study findings were configured and indexed to create a natural grouping of businesses (see Figure 6.3). Based upon the indicators shown in Table 6.3, the relative positions of the cases were recorded and tested against the known operational performances of each case. Three clear classes of business emerged and these findings confirmed the overall superiority of the TQM based award winning businesses.

Table 6.5: Categorization definitions

Category Cases	Companies	Definition
Quality Control (Basic)	D,E, F and H	A case study with basic control and documentation of work systems but without continuous improvement capability. Poorest definition of material flow from suppliers to customers.
Quality Assurance (Intermediate)	G	A case study with basic control systems and engaged human resources, but activities are contained within business departments and unlinked to business strategy.
Total Quality Management (Advanced)	A, B and C	A case study where business strategy and senior management lead a business that focuses on customer satisfaction through the management and continuous improvement of cross functional business processes. These businesses have the most precise and capable performance of the material flow systems from suppliers to customers.

Source: Researcher

6.5 Case Study Categorization

During the review of the cases, it was clear that certain classes and groups of cases had begun to cluster, and using pattern-matching, it was possible to determine a basic level for business performance (achieved by all companies), which was a stage that the researcher deemed closest to 'quality control' using the definitions of Juran (1988), Ishikawa (1985) and Feigenbaum (1983). These systems were very inwardly focused and emphasized the productivity of machinery and compliance to basic quality management systems. The next cluster was that of the full TQM businesses that met the main criteria for a fully integrated and aligned system of management (Deming, 1986; Oakland, 2003). Having identified these two outlier categories, it was not possible to position Company

G. Company G had superior operational performance more closely associated with an award winner and all the practices of a high performance business, which separated it from the QC class. During the review and pattern-matching of this case to the literature, it became evident that the case represented an intermediate position that had all the features of a Quality Assurance business. The systems operated by Company G therefore performed at a level below that of the TQM businesses, yet had many of the features common to TQM. What were missing were the integration of management and the extension of the TQ system to include suppliers. The researcher therefore deemed this a major design weakness of Company G and so created an intermediary group known as Quality Assurance.

These categories were selected to describe the different system performance levels following the formal review of this study. The following sections will help to show how these businesses were graded. It is important to note at this stage of the thesis that these businesses all shared common features. These features and constraints are duly identified as follows:

a) The businesses were all SMEs that employed generic technology (stamping or injection moulding) and therefore the managers of these businesses faced the same or similar technical management difficulties.

b) The cases all serviced similar customers and procured materials from similar suppliers (polymer or steel) and therefore the customer-supplier aspects of the system environment were similar.

c) The cases were located in the same geographical region and therefore had access to the same local government and support agency assistance programmes and were affected by the same employee mobility of the local area (Klang Valley). On average, the number of employees at the businesses declared as award winning TQM was the same as at the non-award winning quality assurance and quality control businesses.

With such a degree of commonality between the cases and the common problems faced by management (in designing a business to compete effectively), the researcher believed this offered the greatest insight into effective TQM implementation in a manner that was far superior to the methods engaged by previous studies, which were limited either by the depth or the scope of the investigation (Boggs, 2004; Ahire, 1996; Ghobadian and Woo, 1996; Goh and Ridgway, 1994).

6.6 Management Focus

Throughout the literature review of TQM at large and small businesses, the role of management focus was regarded as a critical enabler although this is an under-explored theme of recent SME studies (Temtime and Solomon, 2002; Ugboro and Obeng, 2002). From a systems perspective, such a focus is important to the performance and leadership of the case study (Pasmore, 1988). This study shows that the TQM companies operated with a management team that was clearly supportive and externally focused in its view and approach to the importance of manufacturing as a competitive weapon. Such a finding reinforces the assertions of Hayes and Wheelwright (1984) and confirms the relationship between an aligned set of business and departmental strategies is correlated with higher performance (see Table 6.6).

Each case study was duly given a 'focus stage' rating to comply with the classifications used by Hayes and Wheelwright (1984) and it can be clearly seen that the TQM award-winning companies achieved a Stage 3 class of systems integration and focused alignment of subsystems with the strategies of the business (see Figure 6.4). However Companies D, G and H were in Stage 2 with less integration and low focused alignment. Only Company E and F in Stage 1 had no system integration and no focused alignment. Each stage will now explained detailed.

Stage 1 - Internally Neutral (Companies E, F and H)

A position whereby the business regards manufacturing as neutral at best and seeks to minimize the negative impact on competitive success but does not make any significant

Table 6.6 Subsystem strategies and aligned focus

Focus	Companies							
	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**
Written Business Strategy?	Yes Formal	Yes Formal	Yes Formal	Yes Formal	No	No	Yes Formal	No
Quality Strategy Focus	Yes Aligned	Yes Aligned	Yes Aligned	Yes Aligned	No	No	Yes Aligned	Yes Aligned
Customer Service	Yes Aligned	Yes Aligned	Yes Aligned	Yes Aligned	No	No	Yes Aligned	No
Internal Efficiency	Yes Efficient	Yes Efficient	Yes Efficient	Yes Efficient	Not efficient	Not efficient	Yes Efficient	Not efficient
External Efficiency	Yes Efficient	Yes Efficient	Yes Efficient	No	No	No	No	No
Operations Strategy Focus	Yes Aligned	Yes Aligned	Yes Aligned	Yes Aligned	No	No	Yes Aligned	No
Human Resource Strategy Focus	Yes Aligned	Yes Aligned	Yes Aligned	Yes Aligned	No	No	Yes Aligned	No
Focus Stage	**3**	**3**	**3**	**2**	**1**	**1**	**2**	**1**

Sources: Tables 5.6; 5.7; 5.9; 5.11; 5.12; 5.14; 5.15; 5.16; 5.17; 5.18; 5.19; 5.20; 5.21; 5.25; 5.26; 5.27; 5.28; 5.32; 5.36; 5.40; 5.41.

positive contribution. They have no real commitment to manufacturing and would use an external expert for strategic manufacturing issues.

Stage 2 - Externally Neutral (Companies D and G)

A position whereby the management of the factory acknowledge the operational importance of manufacturing but are ambivalent to ownership and expect the operations to be as good as any benchmarked competitor. External neutral position helps businesses to obtain ideas and knowledge of best practices from competitors.

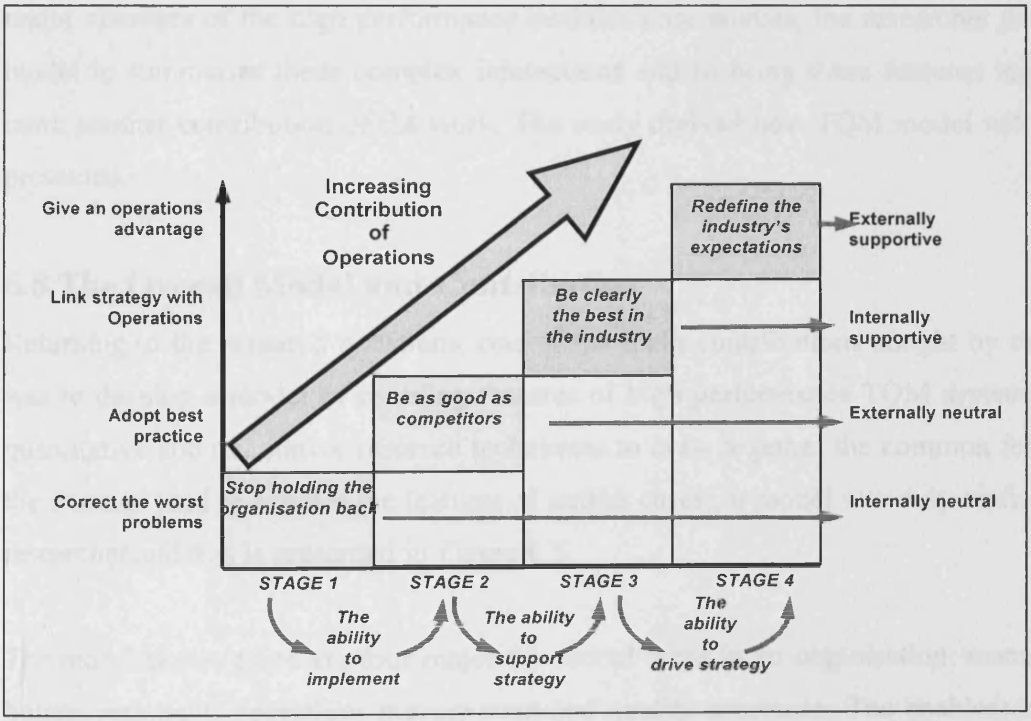
Stage 3 - Internally Supportive (Companies A, B and C – Award Winners)

A position whereby the business expects its manufacturing processes to provide credible and significant support to its overall competitive strategy. The management tries to achieve the position of best in market through a clear view of the business' competitive or strategic goals.

Stage 4 - Externally Supportive

A position that supports the integration and strategic alignment of the manufacturing operations with all the major business processes and that regards 'manufacturing as a source of competitive advantage'. Operations management involvement is sought during every major business decision and new product introduction. The management tries to keep 'one step ahead' of competitors in the way they create products or services and organize their operations.

Figure 6.4: The four stages of high performance (Slack et al., 2004)



The survey stage of the research also confirmed, with statistical validity, the importance of management focus in defining and guiding high performance businesses.

6.7 Performance Measures

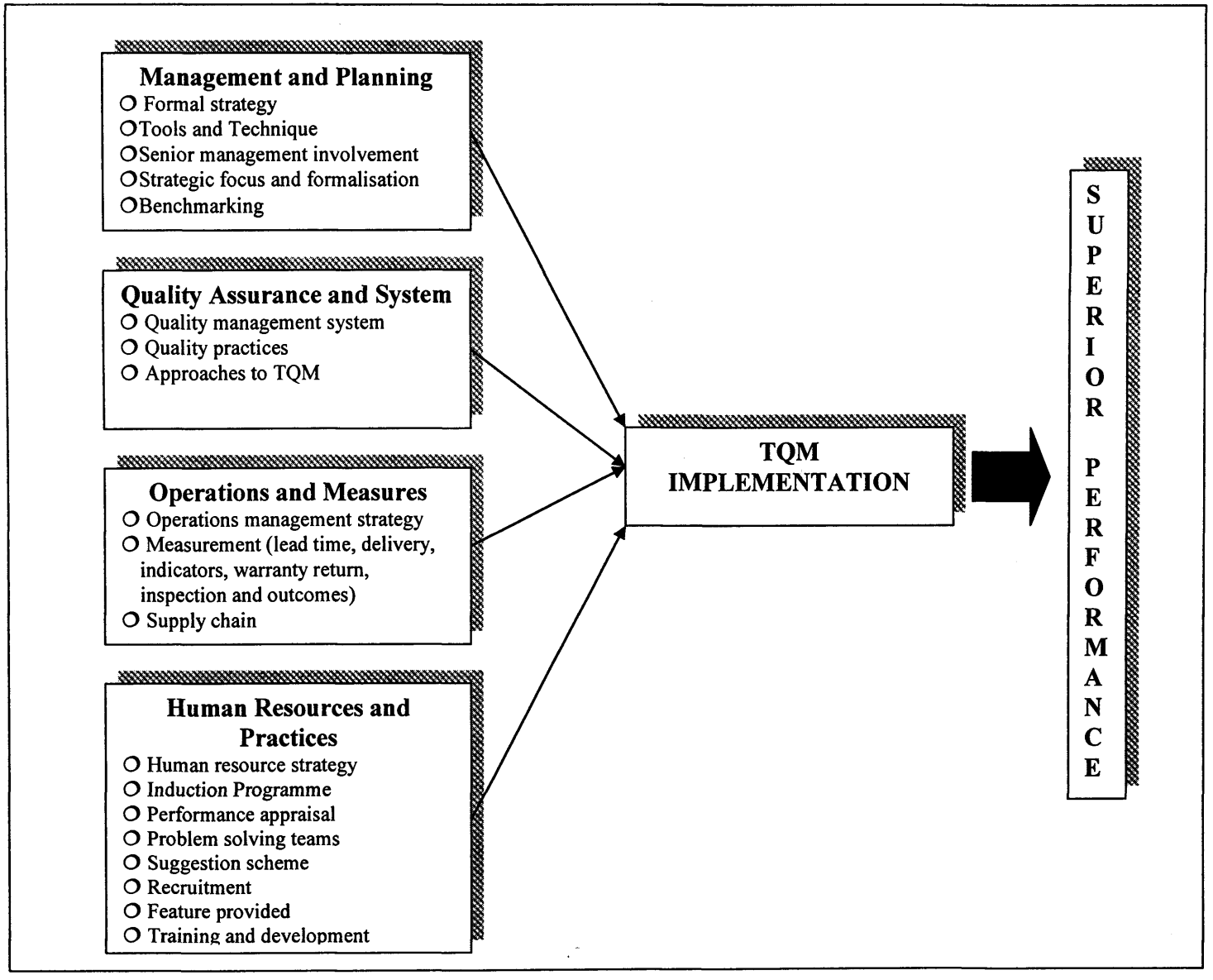
The management of business feedback systems was a major source of difference between the TQM cases, which included the award winning companies and Company G; all shared a common approach to performance objective measurement. This approach emphasized the role and importance of quality (dominating four of the seven measures), which reinforces the view that the quality first agenda of performance management is observed even at small businesses (New, 1982; Schonberger, 1996) whereas the QC businesses remained caught up in the problems, trade-offs and dysfunctions of a primary focus on cost management. Furthermore, the formalization of measures at the high performing TQM companies also involved a much greater range of indicators for management than in the QC businesses and this suggests they had a more detailed view of the business as a system than had the QC companies, which focused on the management of tasks rather than business processes. Having identified and explored the major elements of the high performance business case studies, the researcher prepared a model to summaries these complex interactions and to bring these features together to mark another contribution of the work. The study derived new TQM model will now be presented.

6.8 The Overall Model and Contribution

Returning to the research questions, one of the main contributions sought by this study was to develop a model of enabling features of high performance TQM systems. Using quantitative and qualitative research techniques to draw together the common features of the systems (and to explore the features of outlier cases), a model was duly crafted by the researcher and this is presented in Figure 6.5.

The model shows there are four major functional areas in an organisation: management, human resources, operations management and quality assurance. The enablers indicated in the model are essential for implementing TQM. The model was broken down

Figure 6.5: A propose TQM framework for SMEs (based on survey and case study results)



according to functional area and each of the key enablers used in the construction of the model will now be reviewed.

6.8.1 Management System, TQM and High Performance

Management system is important to the planning and design of a company so that it fits its environment (Kast and Rosenzweig, 1985). Senior management, therefore, are responsible to ensure output performance and input configuration (human resource and technology) are integrated and are continuously improving performance (Pasmore, 1988). This research found there were four key enablers of a management system that can influence TQM implementation and lead to high performance (see Figure 6.6):

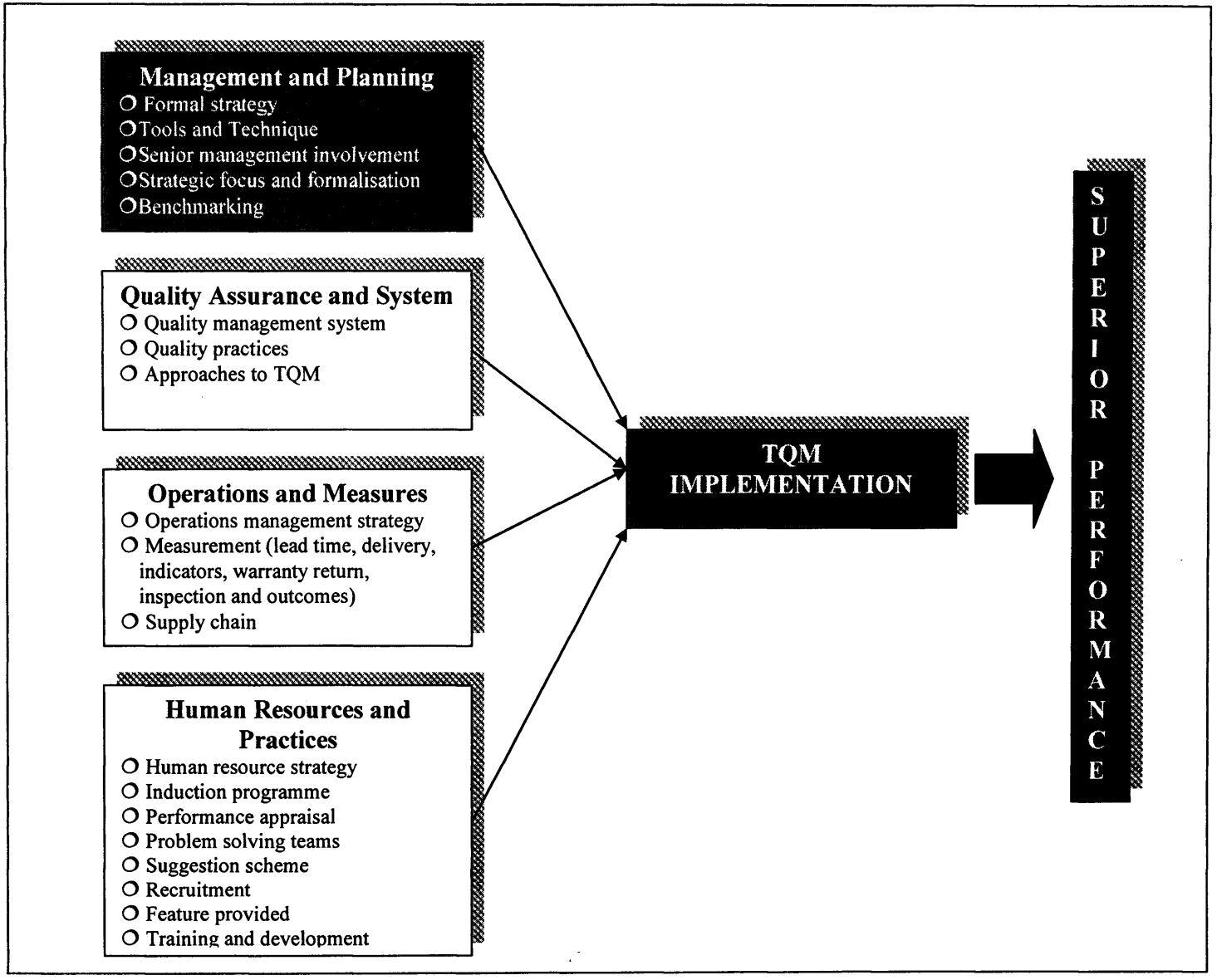
a) Senior Management Involvement

Senior management strongly influence TQM implementation in the company through active involvement. Both survey results and case studies show senior management lead change innovation and have a good relationship with employees including middle management. The interaction between middle management and senior management increases motivational factors, learning processes across the company and results in higher performance (Skinner, 1969; Hayes and Wheelwright, 1984; Garvin, 1992). Although much research explores the role of senior management in TQM implementation, however, the studies focus on large organisations and research is rarely extended to small businesses (Ghobadian, 1996; McAdam, 2000; Deros et al. 2006). Thus, this research provides an understanding of how a company can sustain high performance, and thus reduces the knowledge gap in the literature.

b) Strategic Focus and Formalisation

The strategic focus of the business management and the formalisation of strategy were the next major findings of this research and it identifies the differentiators between award-winning and non-award winning businesses – these duly became part of the model. The findings reveal the importance of having a focus upon key business improvements and formalised planning for the overall performance of the firm. According to Emery (1969), a high performance company needs to employ vision,

Figure 6.6: Management system, TQM and high performance



consensus management and formalised planning for business improvement. He further argues for the alignment of a common set of performance measures to create an integrated approach to business improvement.

c) Management Strategy

The management are responsible for developing the strategy for a clear direction and for communicating effectively throughout the company (Oakland, 2003; Garvin, 1988). This study demonstrates management strategy significantly contributes to TQM implementation. The majority of samples in this research had a written strategy that led to achieved business goals and objectives.

d) Benchmarking

The research also reveals successful TQM companies need benchmarking with others in similar industries to understand the current level of achievement and be competitive in the market. Benchmarking practices are most effective when integrated with company strategy and performance improvement efforts (Meybodi, M.Z., 2005). Moreover, benchmarking is a pre-requisite of TQM implementation according to Deros et al. (2005).

Most of the case study companies in this research implemented benchmarking to learn best practices from other companies as well as to fulfil demands from customers for better product quality, on-time delivery and shorter lead times. Thus, this helps companies to identify their strengths and weaknesses and take appropriate counter measures for continuous improvement.

6.8.2 Quality Assurance, TQM and High Performance

Quality assurance action provides confidence to customers that products meet specified requirements by reinforcing preventive action at source. This proactive approach could stop the company from producing and delivering non-conforming products to customers (Dale, 2003; Garvin, 1988; Evans and Lindsay, 2002).

The engagement of formalised quality assurance activities (quality control tools, statistical process control, FMEA and ISO 9000) was also a differentiator for award winners and these systems are needed to help improve the performance of a company. Senior management are responsible for the communication and emphasis of measurement activities and the integration of these systems within a TQM approach that itself leads to high performance.

There were three key enablers found in this study that contribute to TQM practices (see Figure 6.7):

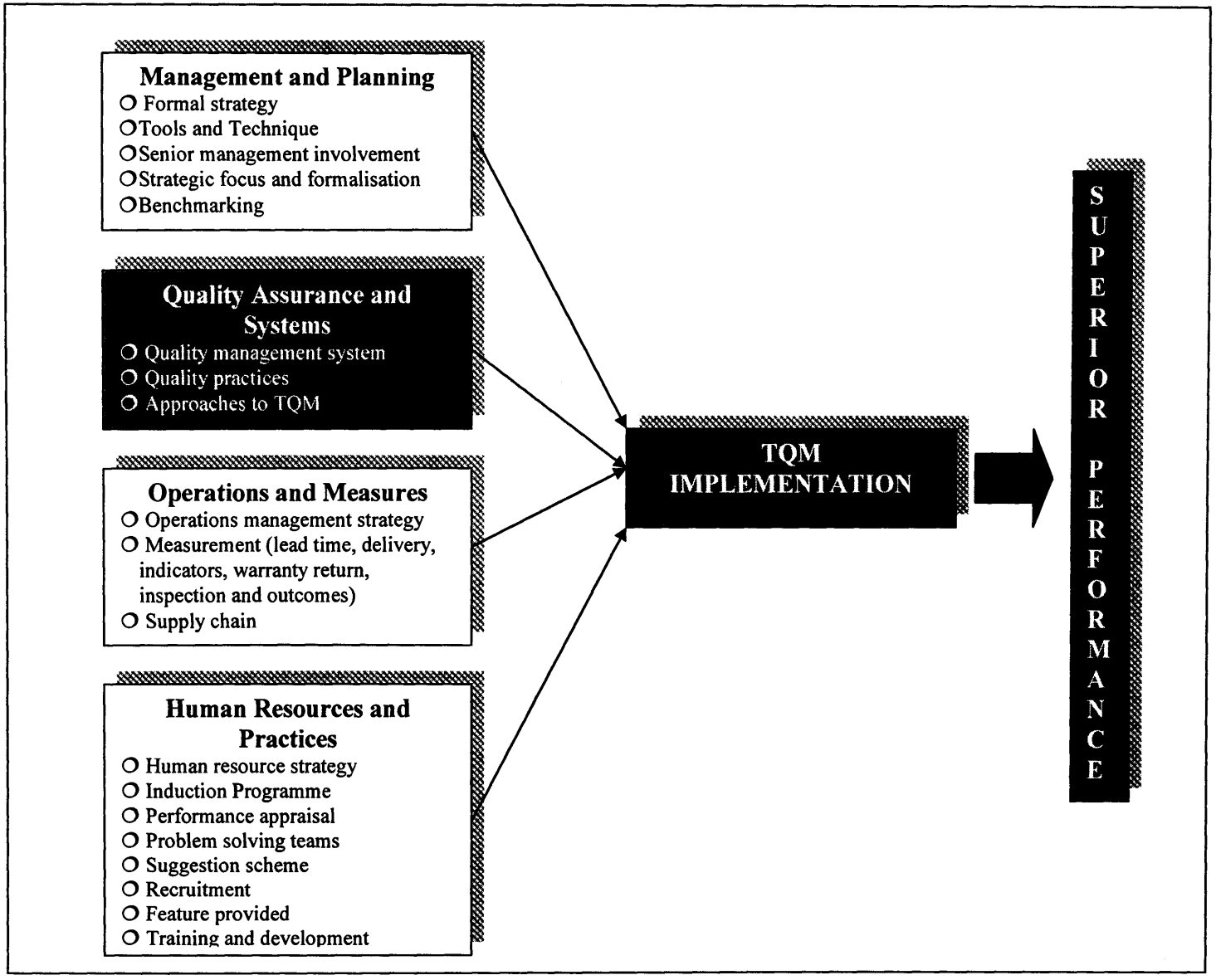
a) Quality Management Systems

Quality management systems are needed to provide guidance for the company to organise and control factors affecting quality (management, workers and technology). The integration of these factors ensures quality is 'built into' the whole organisation's operations and processes and this permits organisations to manufacture products or provide services that meet customer needs and expectations (Slack et al., 2004). The adoption of a quality management system is a strategic decision by company management that leads to high performance.

b) Quality Practices

There is much evidence in the literature review that quality practices are vital for continuous improvement (Sousa, 2003; Yusof and Aspinwall, 2000a). The findings of this research show quality practices are important for high performance businesses but are of much less importance if they are not aligned with the business strategy or if there is no active senior management involvement with the business (including the identification of what to improve and the provision of continuous training to ensure employees are capable of making the improvements). Thus, this study does not agree with all other studies in this field of study but again refers back to the role of management and of a strategy-led or top down socio-technical system design and alignment of all functional areas with TQM strategies.

Figure 6.7: Quality assurance, TQM and high performance



c) Approaches to TQM

The research shows the TQM companies adopted a company-wide approach for implementing TQM. This approach is in line with the previous suggestion by several authors in literature (Dale, 2003; Oakland, 2003; Lau and Anderson, 1998; Sitkin et al. 1994). It is concluded that the integration leads to the successful of TQM implementation. Again, this study confirms the criticality of formalisation, integration and a strategy-led approach to an effective TQM model at SME businesses.

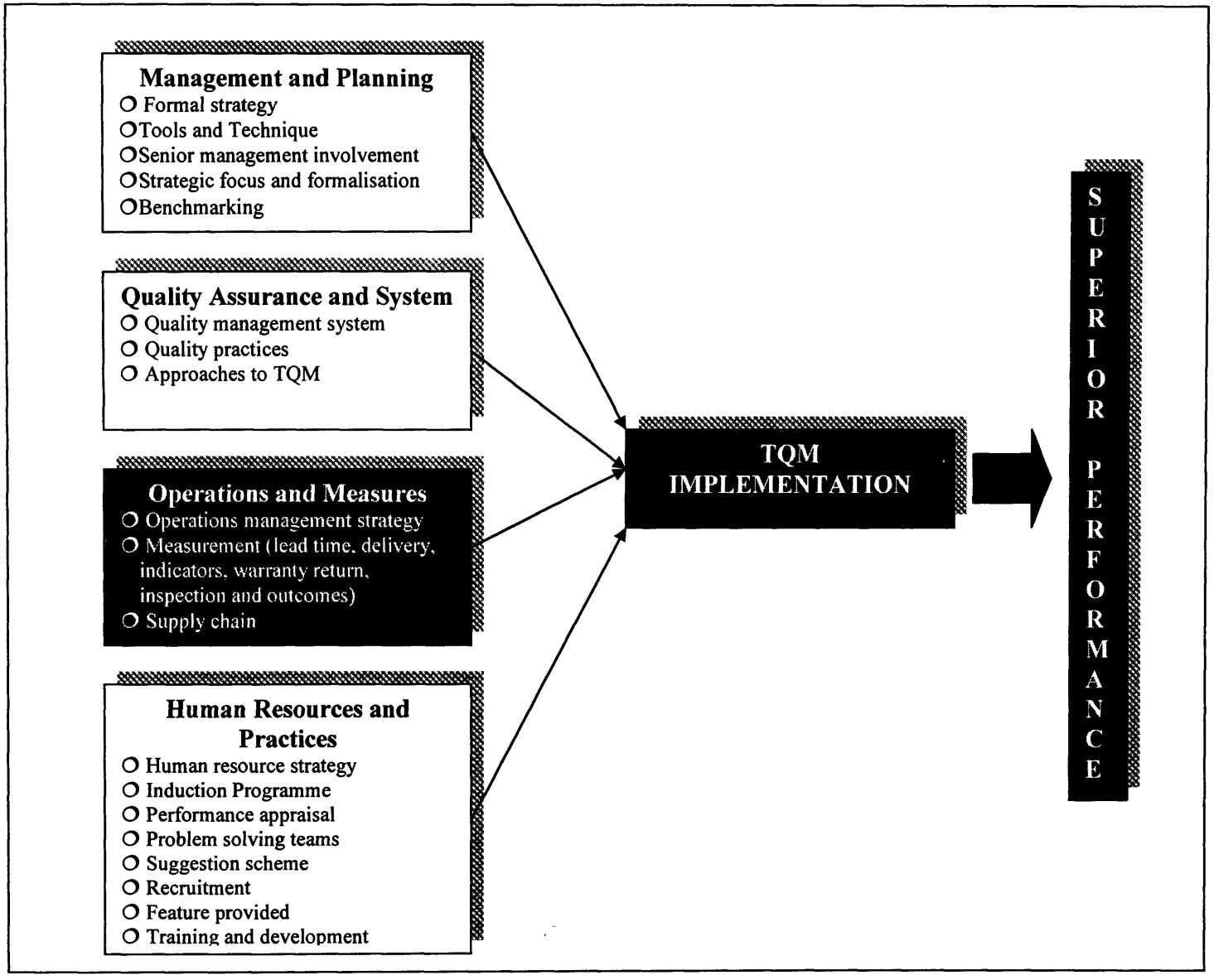
6.8.3 Operations Management, TQM and High Performance

Many authors in the literature suggest operations management must be integrated with the wider business management of the organisation in order to achieve high performance (Schonberger and Knod, 1997; Hill, 2000; Slack et al., 2004). From a systems point of view, the efficiency of operations management through the input-process-output cycle maintains a 'fit' to its environment. Regarding the strategy of operations management, Emery (1969) argues that the performance of a firm needs formalised planning to improve. The study found three enablers for TQM implementation related to operations management (see Figure 6.8):

a) The strategy of operations management

Each functional unit company needs to develop its own strategy in line with the business strategy of the company (Oakland, 2003). The aim of operations management strategy is to reduce the reject rate and to rework and produce output that satisfies customer needs. The products delivered are assured by quality assurance. Operations management and quality assurance practices support the business strategy through a determined and measured system in the factory to ensure operations management is systematic and effective (Slack, 1991; Brown, 1998). The research indicates that operations management strategy helps to determine the objectives and activities of operations to support the business strategy of the company.

Figure 6.8: Operations management, TQM and high performance



b) Measurement

Many authors in the literature contend that small businesses lack the ability to measure company performance (Hudson and Smith, 2001; Sousa et al., 2005). Thus, SMEs face difficulties in evaluating their own performance and thus in being competitive in similar industries. The research shows award winning SMEs practise a systematic measurement not only within the company but also with suppliers. This leads to better performance for both parties (see Tables 5.12, 5.13 and 5.17).

c) Supply chain management

Supply chain management add a value to the customers through the integration of business processes and suppliers. These reinforce the importance of synchronising customer requirements with a supplier's process flow and thus gaining a competitive advantage in the chain (Cooper et al., 1997). The study indicates supply chain management helps companies to develop suppliers' capability to produce quality products and deliver on time to the customer. Thus, the integration of both parties (business and suppliers) provides a strong relationship and improves the efficiency and effectiveness of operations.

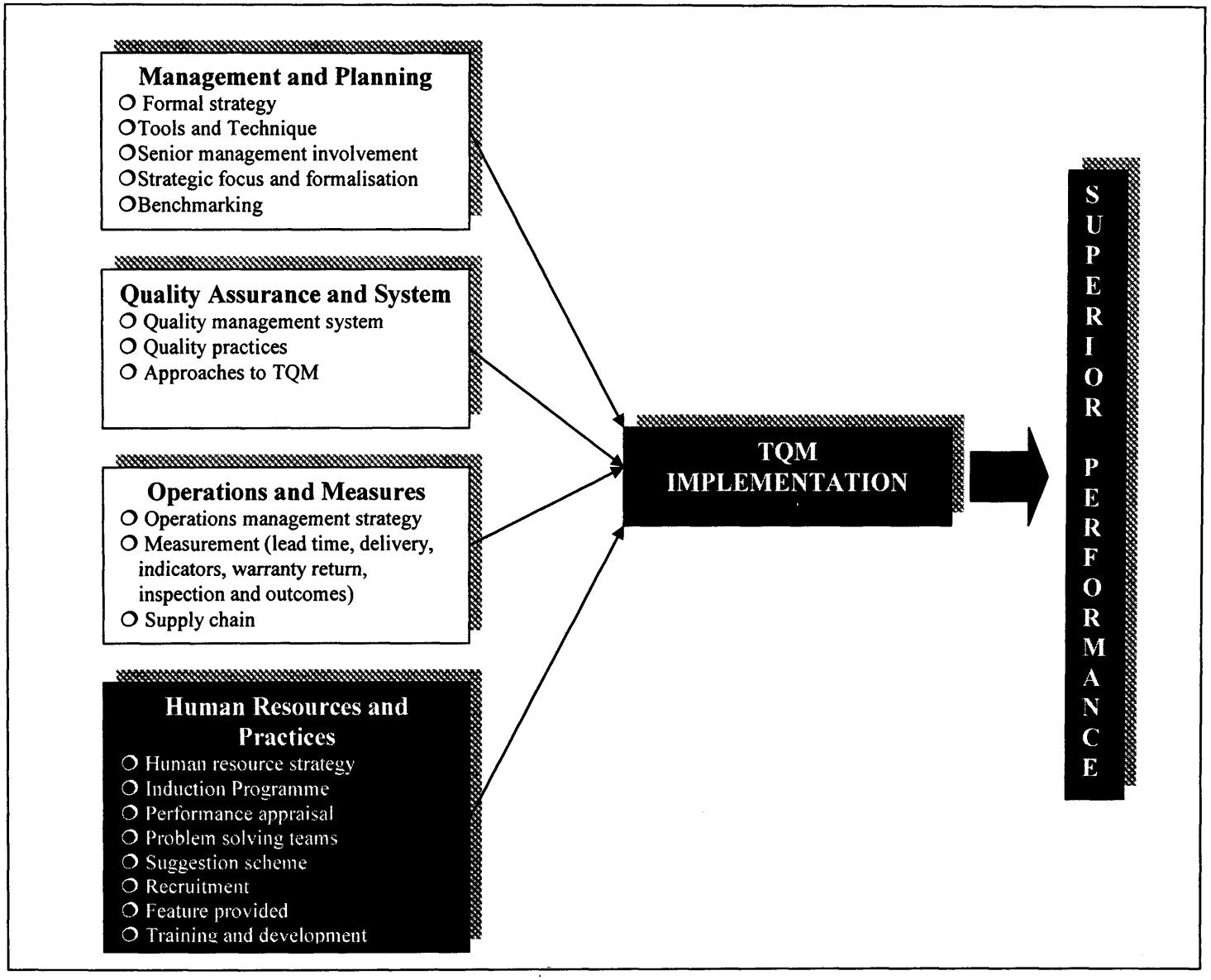
6.8.4 Human Resources, TQM and High Performance

The contribution of human resources to high performance organisations has been highlighted by many authors in the literature (MacDuffie, 1995; Yang, 2006). Human resources reinforce continuous improvement and flexibility through developing a supportive infrastructure of employment and remuneration systems. The key elements have an association with TQM implementation and shown on the model are (see Figure 6.9):

a) Human Resource Strategy

Human resource management is important to determine the operational efficiency of human resource strategy (Pasmore, 1988). The management should ensure the alignment of a formalised human resource strategy with the business strategy to achieve business

Figure 6.9: Human resources, TQM and high performance



success. The key elements of policies and strategies for human resources, which incorporate recruitments, induction programmes, performance appraisal, features provided and training and development, allow an organisation to have skilled and trained employees capable of contributing to organisational success.

This research indicates the majority of case study companies employed a human resource strategy that was aligned with an overall business strategy.

b) Recruitments, Induction Programme, Performance Appraisal and Features Provided

The findings in this research show recruitments, induction programmes, performance appraisal and features provided to employees have an influence on TQM implementation. The majority of cases and survey samples carried out human resource activities to ensure selected workers had a parallel mindset and supported the vision and mission for business success. Employee performance needs to be monitored. Previous research proved the failure of TQM implementation was due to the inability to select the right workers.

c) Problems Solving Teams and Suggestion Scheme

Problem solving teams that involved everyone in the organisation provide a strong relationship between management and workers, thus reducing the existing gap between the two levels (Bou and Beltran, 2005; Snape et al., 1995). The study confirms that there was high participation amongst employees in problem solving teams as well as the suggestion scheme of award-winning companies. These findings support MacDuffie's high involvement work practice indicators amongst workers.

d) Training and Development

Training and development play important roles in TQM implementation for skills and knowledge enhancement (Agus, 2001). Thus, it is necessary for a company to have systematic training and a development plan for employee benefits. This research reveals that award winning companies make a significant investment (in terms of time and

money) to train their employees. As a result, award winning companies are able to perform better than non-award winners are. The survey results also support this finding by showing a significant association with TQM implementation.

6.9 Chapter Summary

This chapter has brought together the study by reviewing the findings of the research, relative to the guiding research questions and the background literature upon which this study has been grounded. The chapter has offered many contributions to the study of TQM at SME businesses, most notably closing Oakland's acknowledged gap that exists at SMEs and also investigating his view that a systems approach is critical to management understanding (Oakland, 2003). This study has identified the different classes and a performance level associated with three generic models of TQM and has shown how these models differ from both a qualitative and quantitative perspective. Such a contribution goes much further than previous studies, which have been limited in the scope of cases or have preferred a positivist approach to questionnaire methods and therefore lacked any true depth of understanding.

Another contribution is made to the evolution of businesses that have successfully engaged TQM activities and this fills directly the gap in the body of knowledge identified by Bessant (2005) and the criticisms of this eminent scholar during interviews the researcher held with him during the design of this study.

In summary, the study has and continues to reinforce the role of management as systems designers and shows how important these managers are in designing effective systems that are capable of sustaining levels of high performance. No other study of SME businesses, in Malaysia or elsewhere, has investigated this subject area to such an extent thanks to the case access during this study. Having established the main findings and outlined the key design characteristics of high performing SME businesses, the next chapter will bring the study to a conclusion and expand upon what has been found regarding the implications for managers and academics alike. The concluding chapter will also outline a new research agenda and the new opportunities that follow this study.

CHAPTER 7:

CONCLUSIONS AND RECOMMENDATIONS

Chapter 7: Conclusions and Recommendations

7.0 Introduction

The preceding chapters have outlined the background to this study and have then positioned this research within the context of the established academic literature. In parallel with the literature review was presented a review of the philosophy of research. The chapters that followed presented the significant results from the Welsh and Malaysian SME businesses. These chapters also presented the major findings from the focal Malaysian case studies and, during the analysis and reflection stage, presented a new model to close the gap in the knowledge and make a contribution to the understanding of TQM implementation by Malaysian SMEs. This final chapter will present the conclusions of the study and further reflect upon the contribution made to knowledge by offering advice to other researchers about the methodology and future research now required to extend our knowledge in this area. This chapter will therefore discuss the implications of the study for academics and professional managers as well as for Malaysian national policy makers and consider how the generalisations of this work may be extrapolated into other environments; it also includes recommendations for future research.

7.1 Research overview

The journey to this concluding chapter has been built from six chapters that incrementally build upon each other. In Chapter 1, the motivations and general background of TQM implementation at Malaysian SME businesses was discussed and the importance of this study was highlighted before the challenges facing SMEs were explored. At this point, the research objectives were then crafted by locating the research problem of TQM implementation within the broader philosophical and management literatures. The key gaps identified during the extensive literature review included the lack of a systems approach to TQM implementation by previous authors (Yusof and Aspinwall, 2001; McAdam, 2000; Husband and Mandall, 1999) and a focus upon superficial case studies, using single methods (Ghobadian and Gallear, 1996; Gunasekaran, et al., 2000; Tannock et al., 2002), or large scale questionnaires (Escrig, 2004; Ahmed et al. 2004, Quazi and Padibjo, 1998; Sohail and Hoong, 2003); neither of these approaches have resulted in

significant insights into the dynamics and features of effective implementation in the small business context.

Further, many studies have focused on the applications of tools rather than on real managerial insights into how effective systems are designed and how they evolve (Yusof and Aspinwall, 2001). It is important to note that these previous studies have not included cases that have been declared or calibrated as being high performance or award winning businesses and therefore the resultant models have traditionally lacked any credibility that those cases studied were successful in commercial terms (see Figure 7.1).

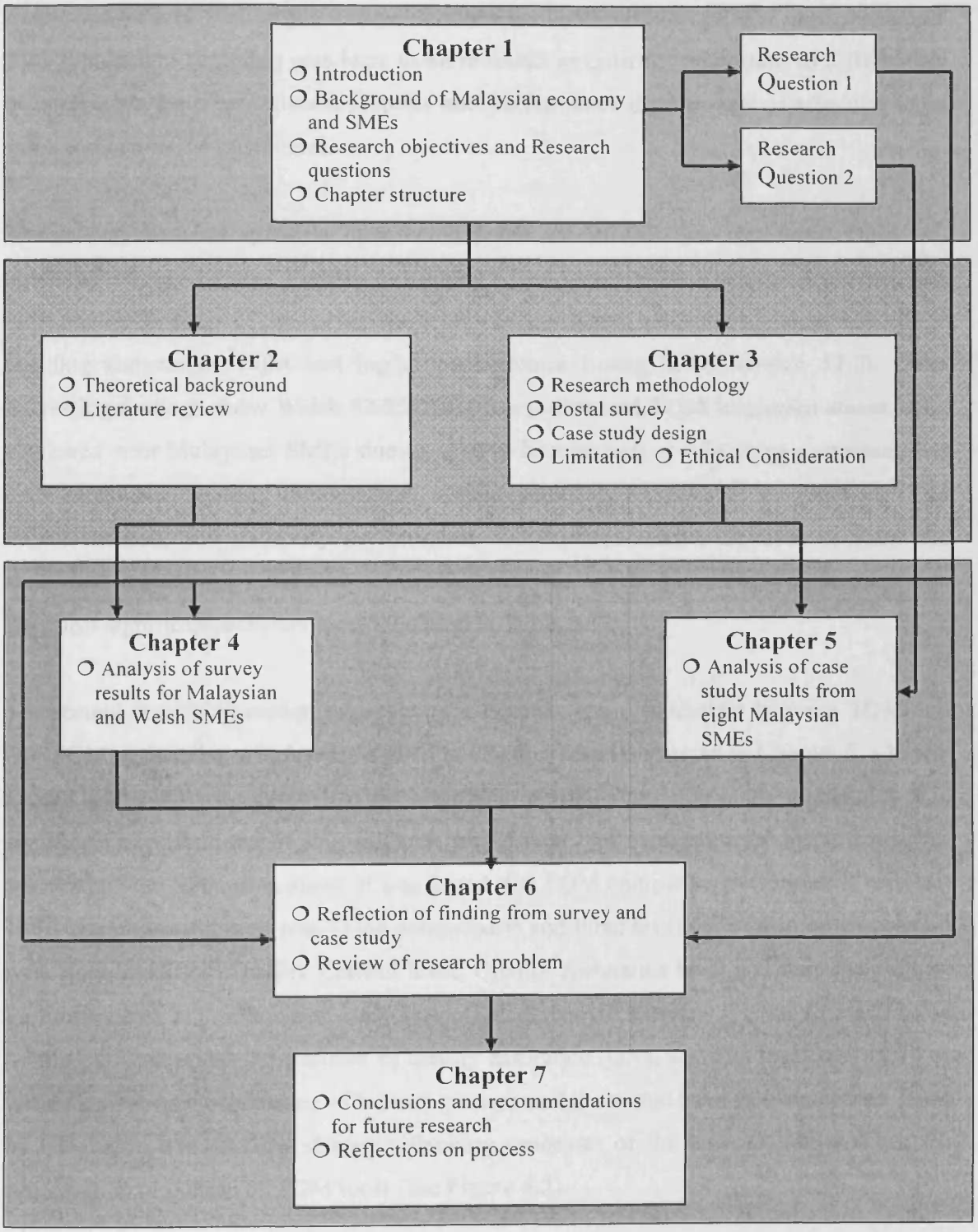
The two major research questions that have formed the boundaries of and guided and shape the contribution of this thesis were declared as follows:

- What are the structural enablers for improving business effectiveness using TQM approaches by SME businesses as perceived by senior business managers with the authority to design business systems?

- What are the performance benefits and improvements that have been sustained as a result of TQM improvement programmes and are there differences between the features of businesses that achieve higher levels of performance and those that do not?

To ensure the integrity of the study and the usefulness of the results, Chapter 3 declared and defended the chosen research strategy of a multiple case study as the most effective means of studying the phenomenon of TQM implementation using case studies of companies. During this chapter, particular care was taken to design-out any limitations that had affected previous studies and to ensure a management-informant approach where it could be certain that the key subsystem designers were involved with the study, which is conducive to a systems approach to methodological design. One of the distinct properties of this study was the use of purposive sampling to ensure a number of high performance

Figure 7.1: The outline summary of overall study (drawn from Figure 1.6)



cases could be reviewed and that common features and 'outlier' businesses allowed much deeper insight into what organisational features had led to effective TQM implementation. This approach to sampling was later to be revealed as critically important to differentiate between both the organisational features and performance differentials of effective TQM cases and non-TQM businesses.

The primary research question concerning perceived enablers for successful TQM was answered during Chapters 4 and 6. In Chapter 4, the survey phase data was presented. The most notable findings of the survey show high levels of statistical significance between the enabling features of TQM and higher performance (using SPSS version 12.0). Other interesting findings show Welsh SMEs have more advanced TQM implementations when compared with Malaysian SMEs due to several factors such as how long a company has been established, quality management system achievement, number of years in TQM implementation, and company performance. Chi-squared tests were used to show the significant relationships and associations between the enablers and TQM implementation (the most significant enablers were tabulated in Table 6.1).

The second research question addressed the benefits and differentials between TQM and non-TQM businesses, which were shown in Chapter 5 and discussed in Chapter 6. Chapter 5 dealt with the background of eight Malaysian participating case study companies. The significant contributions of this research phase were the stark contrast in performances achieved by the Malaysian cases. It was found that TQM companies performed at levels of 100:1 better than did their non-TQM counterparts and three levels of TQM implementation were duly identified: Quality Control level, Quality Assurance level and then the Highest Performance of TQM. One non-award winning company (Company G) was found to be an 'outlier' and occupied the position of quality assurance (QA), and this result shows a key difference between businesses with basic systems and those that have fully embraced TQM by integrating it within the strategic planning processes of the business and not just the successful exploitation of TQM tools (see Figure 6.2).

The culmination of these phases of research and reflection were presented in Chapter 6 where the new model of TQM implementation was declared to meet the key output objective of this research, that is, to offer a practical insight into TQM in practice (see Figure 6.5). Chapter 6 further discussed the eight case studies and provided deeper insight into the critical cross-functional subsystems of the firms (managing business, quality assurance, operations management and human resource management). Furthermore, the results were compared with the interviews conducted with the Managing Directors (often owners) to show a vertical alignment of plans and actions with the horizontal integration of subsystems using cross-functional integration. The vertical and horizontal alignment of TQM companies was found to be much better than was those of non-TQM companies. A contribution of this chapter is the crafting of the TQM enabler model. The chapter also presented the four stages of classification of high performance companies in a model that extends that of Hayes and Wheelwright (1984) (see Figure 6.4).

In this final chapter, the conclusions of the study will be presented and reflections upon the experience of conducting this thesis will be explored.

7.2 Research Contributions

This research offers a number of contributions to the field of study and these will now be reviewed:

7.2.1 Contribution to the Background Literatures

During the literature review, few studies that addressed the implementation of TQM were found and only one study of TQM implementation was found concerning Malaysian SME businesses (Rahman and Tannock, 2005). Instead, much of the previous literature has often focussed on large organisations. Moreover, there was a general lack of discussion or presentation of models that could help SMEs to engage in such a transformation programme. One of the objectives of the research was to close the gap in bringing together a thorough review of published works in the field of study that addresses TQM implementation and established implementation models for SME businesses.

Therefore, one of the objectives of this research was to establish a model that might be used by small businesses to implement TQM in their factory. The final model was presented in Chapter 6 where the survey questionnaire and case study phase analyses were used to identify enablers. Therefore, the contribution claimed is the presentation of a general model where generalisation is based upon the theoretical generalisation between similar businesses in similar industries. This contribution marks a major addition to the study of TQM implementation by SME businesses.

7.2.2 Contribution to the Theory

The second contribution of this research is to the promotion of contemporary systems theory within the context of the modern and small organisation. Systems theory in this study provides a strong foundation in understanding complex phenomena and the vagaries of TQM implementation in Malaysia. The approach offers a number of key concepts that are important for this study such as system performance, a holistic approach to major subsystems study and the integration of management planning processes. The systems approach has a major problem in operationalising this concept due to the level of abstraction. The researcher took great care to address each of these major concepts through current literature related to the organisational system design (Beer, 1972). Thus, the study contributes to the application of systems theory principles to aid understanding of complex modern organisational system design (Katz and Rosenzweig, 1985).

7.2.3 Contribution to Research Design and Methodology

The study contributes to the research design and methodology by adopting a multi-method approach set in the context of a multiple case replication method. The survey questionnaire (quantitative method) offers a general understanding of TQM implementations amongst SMEs. The questionnaire was found to be a robust instrument and, unlike in other studies, it was used during several stages of research with similar and statistically confirmed utility.

The methods therefore provided statistically significant relationships between enablers and TQM companies and, on the other hand, the case strategy (qualitative methods) provided a rich contextual understanding of the organisations' uniqueness. The twin approach,

therefore, allowed quantitative data to be interpreted in a much more effective manner and gave an insight into why certain features of TQM exist, as opposed to traditional studies which focus exclusively on the existence (or not) of tools.

The use of a multiple case replication method added further confidence in the results, and strengthened the precision, validity and stability of the study findings, which is conducive with the quality tests offered by Miles and Huberman (1996), thereby avoiding the known problems of generalisation from a single case study. The data gathering within the context of a multiple case replication proved that the research design employed in this study was effective and efficient especially when compared with the methodological limitations of traditional studies in this growing area of academic research interest.

From the review of the literature, it can be seen that this study was unique in its use of a purposive sampling framework and the ability to access award winning companies as a designed-in element of the research strategy, which mediates the problems of previous studies and their methodological weaknesses. The chosen methodology is therefore unique in this field of study and makes a minor contribution in translating this approach into the subject area of TQM implementation by SME businesses. The qualitative data analysis through data reduction and data display (Miles and Huberman, 1996) was highly recompensed and recommended as a means of manipulating multi-dimensional data sets, and worked effectively with the inclusion of the observation, secondary data and researcher day book methods when enriching and understanding the findings derived from the questionnaire.

Reflecting upon the achievements of this piece of research, it is acknowledged that the businesses engaged with the study were not small businesses but were closer to the medium definition (150 persons or less). These businesses were deliberately targeted because with a business of less those 100 persons it is unlikely that formalised processes and features exist. A criticism of this work could be that a very distinct subset of businesses was engaged with the study these businesses being medium sized and dependent upon a few large automotive customers. Such a criticism would be unfair and

unjust – these businesses were fully independent and capable of engaging TQM or not. The fact that non award winners had failed to engage such features shows a general management failing and a failing to react to customer requests or strategic direction. As such, the student if confident that the cases studied are not biased in this manner. In terms of generalisation, it is acknowledged that the justification for generalisation is that of 'similar company: similar technology' rather than claiming the award winners to be a representative blend of businesses that reflect the make up of the Malaysian economy (textiles, food production, electronics etc). Quite the contrary, these businesses were purposively selected (with many variables held constant including location, sophistication of technology etc.). As such the claim being made is not that of a truly general model of TQM for SME businesses but rather a general model with caveats regarding businesses of similar size operating simple capital intense technology. The testing for the model therefore falls part of the next steps in this research and future publications from additional research with these businesses and an extended population of Malaysian companies. The contribution of this work, given the notable gaps in the literature of SME businesses is that of a model that can, through later generations of research, be confirmed or disproved. This will be rectified with the future research plans of the author.

7.3 Implications of the Research

Every research study offers implications for academic researchers, teaching and education, and the practice of professional management or support to industry provided by national policy makers, and this section will identify the main implications for these stakeholder groups.

7.3.1 Implications for Researchers

Operations management researchers have traditionally used large-scale survey questionnaires (Hill, 1985), but more recently there has been a change in emphasis to more qualitative and case-based research designs. This change marks a movement from quantifying and testing relationships between variables to acknowledging that operations management is an imprecise activity, and that an in-depth understanding of the phenomenon known as TQM is needed. This also suggests the actual definition of TQM

has not yet reached a point of agreement in the academic community and therefore remains incapable of effective capture/manipulation by traditional research methods/approaches.

In reality, both quantitative and qualitative approaches need to 'mixed and matched' (Saunders et al., 2003) to enhance the validity of the research and to avoid 'superficial' treatment of phenomena – especially 'outliers' - by statistical averaging and the tendency to smooth away interesting new and high performance (or very low performance) TQM cases.

An implication of this study is to offer new insights into the use of mixed methods and to advise new researchers to adopt a contextually-rich and holistic approach to investigating modern manufacturing organisations especially small businesses engaging with complex concepts like TQM. The researcher would recommend the use of mixed methods as a means of generating more robust results, leading to a better understanding of new perspectives on the research problem of TQM implementation by SME businesses. At the current stage of academic understanding, it is better to maintain a qualitative approach that attempts to capture the dynamics and complexities of TQM using a questionnaire alone.

7.3.2 Implications to the Teaching and Education

Total Quality Management is traditionally treated as a subtopic within operations management as a taught subject in Business Schools, Engineering Schools and at institutions of higher learning. This situation, however, restricts the students from having a full understanding of the concepts, principles and philosophy behind TQM and reinforces the current research pre-occupation with tools and techniques rather than systems designs. Moreover, operations management has it own concepts and language that prevent students from seeing the overall picture or enterprise design. To be able to understand the engagement of TQM from an enterprise perspective is important if the education system is to result in managers that can learn from cases and apply what is needed for their businesses in a sequence that unlocks high performance. This thesis supports the position that TQM should stand alone as a taught subject so that TQM within different contexts can

be used – by case teaching – to show what works and what does not. It is the researcher's view that TQM should not be taught as a subtopic under operations management alone.

A syllabus, therefore, should include a view and application of TQM from other functional viewpoints such as human resource management and business management as well as TQM implementation models. As such, MBA programmes should consider case studies as a means of student learning and also engage students with tours to award winning companies to see how TQM has been implemented and to discover, from the perspective of practising managers, the pitfalls of different approaches and different contexts (for example, large and small companies, services and manufacturing businesses and so on). This could help equip students with knowledge of TQM so they are better prepared to serve manufacturing industries in the future, to take better decisions and to think of TQM from the viewpoints of other key subsystem managers.

7.3.3 Implications to the Professional Management Practitioners

The next implications are for the professional management practitioners who are directly or indirectly involved with TQM implementation and its sustainable evolution. The study identifies that senior management commitment and responsibility is important especially in leading changes that support the stated goals and objectives of the company. This study found that TQM companies operated a much greater involvement of managers with the effective leadership of change in the business and the greater involvement of all managers in formulating company strategy (such that these individuals took ownership of the plans and changes themselves in a greater way than in any other form of case found by this study). A fully integrated strategy, therefore, is a hallmark of a TQM company that uses this approach to be competitive and exploit advantages in the market.

The professional management practitioners also should focus on developing skilled and multi-skilled workers due to difficulties faced in recruiting and retaining high numbers of specialists (and also the penalties associated with the high turnover of these workers as was experienced in Malaysia). Such an implication supports the most recent observations of Brown et al. (2007). The company should treat them as an asset and use their knowledge

and skills to train other people; in this way, barriers between departments and subsystems can be broken down and removed to leave a management team that works together and does not limit its thinking and scope of change by artificially setting organisational boundaries.

Another quality improvement tool and practice, associated with higher TQM performance by larger companies that the professional management practitioners at small businesses should take into consideration is benchmarking. Monkhouse (1995) reported that only 59% of SMEs claimed to have conducted benchmarking activities and he argues this situation occurred because benchmarking involves a lot of processes and activities that are complex. Without an external or 'outside in' view of the firm, it is not always easy to direct the changes of the business, and the author of this research would advise companies to benchmark their performance continuously with the best in the industry in order to stay ahead of the competition or match future customer expectations of performance.

A contribution made by this study was the presentation of an evolutionary model and this also has a significant impact upon professional management and overall company performance. The evolutionary model provides good insight into 'what comes next' and can trigger the minds of professional management practitioners to think about the conditions necessary to take the step and ensure their company steps up to the next level of performance and the status of a TQM award-winning company.

7.3.4 Implications to Policy Makers

The Ministry of Industrial Trade and Industries (MITI), through its agency, Small and Medium Development Corporation (SMIDEC), is responsible for the development and improving the competitiveness of Malaysian SMEs, and is a beneficiary of this study. The industry-focussed corporation has a significant impact on and makes an influential contribution to strengthening the Malaysian economy, which is known to be dominated by SME businesses. In order to encourage SMEs to be competitive, Malaysian Government initiatives must encourage SMEs to produce quality products and increase productivity through modern technology and good management practice.

At the time of this final chapter, there were several programmes planned by the Malaysian government to help SMEs to be more competitive in the market and the number of these needs to be increased through greater investment in the National Productivity Corporation (NPC) to encourage and promote good TQM practice by SME managers. These initiatives should include a mix of initiatives aimed at increasing productivity and quality effectiveness through programmes such as TQM, ISO 9000, TPM, and should shift to the production of higher value added products and others (NPC Productivity Report, 2005).

However, many of the current initiatives do not allow Malaysian SMEs to catch up with the aspirations of the government due to lack of TQM knowledge in implementing quality programmes and the 'over technical' nature of information concerning management practices. As such, the national improvement framework should be more systematic and applicable to small businesses (NPC Productivity Report, 2005; Deros et al. 2006).

The implications of this study suggest that the government or policy makers should emphasise training (with incentives) to management level, such as Managing Director and all managers in organisations because they are system designers and need to be aware of all the design alternatives that result in high performance TQM business models. These organisational employees have a decision-making authority and must be capable of and receptive to leading the TQM change programme as well as disseminating the knowledge of quality to all other employees.

The government or policy makers also should introduce a simple framework of TQM implementation that can be adopted by SMEs. According to Kraipornsa (2002), SMEs are in a more advantageous position than are large organisations in terms of adopting quality practices because their structure facilitates a faster line of communication, a quick decision-making process, flexibility, and faster implementation. If the government is, therefore, to change the aggregate performance of the economy, it must engage with SMEs and seek to accelerate their change programmes and the speed of learning TQM approaches.

Furthermore, the government or policy makers should strongly encourage SMEs to participate in Organisational Excellence Awards such as the Prime Minister Award, the Quality Management Excellence Award and Productivity Award. Participation in these awards will expose the companies to the criteria of organisational excellence and, at the same time, allow them to receive feedback from experts with regards to the current performance of TQM practices. The government should also promote TQM activities not only through printed matter and electronic media, but also through networks and visits to hosted company talks by other SME industrials, and personally invite senior managers of SME businesses to participate in the award competitions. The researcher believes it is only through proactive management that the government or policy makers can increase the number of SMEs participating in organisational excellence awards and therefore improve levels of supply and financial performance.

7.4 Future Research

This section proposes the agenda for future research to be explored by new generations of researchers that can base their activities upon the knowledge and experiences gained from this study. Even with the same limitations that affected this study (described in Chapter 3, such as time, access and money), there are many fruitful directions in which future research can extend the research findings presented here.

Firstly, the case study conducted was based on the automotive components industry and therefore the model proposed could be further tested to determine whether these findings have a more general application to other industries (to create a new robustness of generalisation to, for example, the electronics sector where Souza (2003) conducted his studies).

Secondly, it would be beneficial to replicate this study with a greater number of Malaysian case companies and add other manufacturing industries such as textile, food, and so on, where there are known populations of SMEs that add significantly to the wealth generated by Malaysian SMEs. The purpose of this expansion and replication is to provide a greater

confidence in the findings and to refine the constructs so they are more suitable to positivistic studies and quantitative phases of research.

Thirdly, the study also could be extended to include SMEs in other countries such as Thailand, China, Japan, Sweden, German and Spain. This comparative research would be informative by exploring and validating the identified features from an international dimension and the impact of national culture upon the evolution and speed of change at SMEs in different countries. Such a study would show whether national culture influences company culture and whether different approaches to the support of SMEs by other governments have shown better results than that of Malaysia.

Fourthly, it would be interesting to conduct a study on how the knowledge of TQM and TQM practices has been and is transferred through the sharing of experiences among SMEs. The understanding of how knowledge is transferred and how practices become known to SME managers, especially how new practices are shared amongst the elite award winning companies, might provide a new dimension of how TQM models will evolve in the future and whether sharing will mean high performance SMEs will begin to look more homogenous or whether will offer a new 'breakthrough' stage for these businesses by finding what is different from the other QA and QC businesses again. In short, it would be interesting to discover whether TQM businesses learn faster and implement faster so that they will never be caught up by the implementations of TQM at non-award winning businesses.

Fifthly, in terms of quantitative data, the study was based on a database provided by SMIDEC and it is recommended that future researchers use other sources/databases such as NPC, MIDA or SIRIM to get more respondents from more varied types of industry and extend the geographical coverage of the sample group beyond the Klang Valley.

Finally, the model proposed as a result of this study does not describe the sequences in implementing TQM and therefore future research should close this gap and could focus on longitudinal studies of TQM implementation using the model and investigate whether

similar performance results are achieved. Although a longitudinal approach is relatively very time consuming and costly, it offers huge benefits in understanding the dynamics and cumulative effects of business models and their underlying TQM constructs.

7.5 Conclusion

SME businesses are vitally important to the Malaysian economy, and contribute to the growth of GDP performance. The majority of large organisations depend upon SMEs to support them with the goods and services needed to produce international standards of quality of final products and remain competitive in the world market for manufactured goods. The implementation of TQM therefore might help SMEs to be continuously more effective and more efficient, and able to sustain the competitive advantage of Malaysia as a manufacturing economy. The majority of TQM models proposed by previous researchers were derived from studies of large organisations and at the start of this study; these were considered to be ineffective for resource-constrained SME businesses. Even though there were a few emerging TQM models recently developed in the literature for SMEs, these were complicated, prescriptive, tools-oriented and relatively imprecise. Many of these models were also produced from single method research approaches (whether quantitative or qualitative) and many were the result of rather vague questionnaire methods. This study employed both quantitative and qualitative methods and has counteracted these weaknesses to ensure the proposed model is relevant and applicable to SMEs.

The multiple case approach (eight manufacturing companies) used was more robust and able to provide a greater understanding of the TQM phenomenon and its different levels of achievement. The informants who were involved from the cases were the key personnel from four cross-functional areas, which included Managing Director, Quality Assurance Manager, Operations Manager and Human Resource Manager so as to give a much deeper insight into the effective design of the SME to exploit TQM. In addition, the model developed also considered the nature of SMEs in terms of structures, processes and resources that was often ignored by the existing literature. Finally, this study has also attempted to identify the level of TQM implementation and has proposed an evolutionary

model that could lead the practitioners to think of what necessary actions need to be taken in the future for company success and to provide a contribution to the Malaysian economy.

As a conclusion and parting contribution, the researcher would like to offer this study as a new opportunity and new dimension of study that is a strong platform for the integration of existing research and a springboard for future systematic research in the TQM implementations field of study with particular relevance to the growing importance of SMEs in Malaysia and worldwide. It is hoped this research will help channel the thinking and also the approaches to the study of TQM in the future.

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APPENDIX 1:

SAMPLE OF INTRODUCTORY LETTER

Company Name & Address

Date

Dear Sir,

RE: Total Quality Management & Small & Medium Enterprises Survey

When it comes to the world of quality management, it's the large firms that dominate thinking and attract the most interest. Paradoxically, it is the performance of the small manufacturing businesses in Malaysia upon which the health of the economy depends. Not much is known about the practices and unique pressures that face the small manufacturing businesses and this sets the scene for this study.

The purpose of contacting you is to ask for your participation with this study. We would like to know your views and perceptions about managing quality practices and processes within a small manufacturing business environment. By helping out, you will be assisting my doctoral studies and I hope you'll take advantage of the summary report I will write shortly after the closing date.

We hope you will take part in this study and duly attach a questionnaire. The questionnaire should take no more than 20 minutes to complete. Thank you for your time and patience.

Would you like a summary copy of our findings? **YES / NO**

Would you be willing to take part in 'follow-up' research following this questionnaire? **YES / NO**

Please would you return this questionnaire by: 31st May 2005

Please would you use the reply-paid envelopes to return this questionnaire or fax it through to 03-55225467. If you would prefer this questionnaire to be sent to you via e-mail please contact abdullaha@cf.ac.uk. Thank you very much for your time and effort. Please feel free to contact me if you'd like to talk about the study or have any questions.

Yours Sincerely,

Azizan Abdullah
Dr. Nick Rich (Supervisor)

APPENDIX 2:

SAMPLE OF SURVEY QUESTIONNAIRE

Total Quality Management Survey

SECTION A. Company Overview

This section of the questionnaire collects general information about the company and its activities.

1. Name of the company: _____

2. Year of establishment: _____ 3. Your Job Title: _____

4. Years of Service: _____ 5. Your Gender: Male / Female

6. Please indicate with a '✓' the Ownership of this business:

Ownership	'✓'	Ownership	'✓'	Ownership	'✓'
Sole-Proprietorship		Public Limited		Private Limited	
Partnership		Joint Venture		Subsidiary	

7. What is the nationality of Owner of this business: _____

8. What is the main business activity of the company and its principal manufacturing technology? (i.e. Manufacturing of Rubber Seals for Automotive engines / Hot Pressing)

9. What is the total number of full time employees working at this factory? _____Persons

10. Who are the main customers to this business?

11. Please indicate the length of trading relationship and sales attributable to your main customers:

Customer Category	Average Number of Years	Approx. % of Annual Sales
Main Customer	Years	%
Top Five Customers	Years	%

12. Please indicate which Quality Management Systems are operated at this site by entering the date accreditation was achieved or is expected to be achieved?

System	Date	System	Date	System	Date
ISO9000:2000		QS 9000		TS16949	
BSI Kitemark		BSI Standard		ISO14000	
Other: Please Specify					

SECTION B: Total Quality Management Practices

This section concerns the timing of business projects and the perceived outcomes of quality management initiatives.

1. Do you perceive your business as a 'Total Quality Management' organisation? **Yes/No**

2. Please indicate with a '✓', the approach to quality management at this business?

   Quality Control of processes ☐ Company Wide ☐ Neither ☐

3. In which year did this business begin to implement quality management practices? _____

4. From which source(s) of influence did the business management get awareness of Quality Management practices?

Source	'✓'	**Source**	'✓'	**Source**	'✓'
None		Customers		Parent Company	
Competitors		Trade Association		External Consultants	
Government Sources		Seminars & Conferences		Industry data & Exhibitions	
Other: Please Specify					

5. Please indicate with a '✓' which benefits have resulted from the implementation of a *Quality Way of Working*:

Outcome	'✓'	**Outcome**	'✓'	
Increased Market Share		Lower Stock Levels		Other(s), please specify
Gained Sales		Lower Staff Turnover		
Faster Deliveries		Less Defects		
Increased Customer Satisfaction		Better Team working		
Improved Productivity		Less Wastes		
Improved Employee Morale		Better cash flow		

6. Please specify any awards held by this business:

7. Does this company design its own products? ALL ☐ SOME ☐ NONE ☐

SECTION C: Company Performance

This section asks questions about your business performance in terms of key performance indicators that cover the market and internal operations of the factory processes.

1. Which of the following performance indicators are measured formally by this company?

Indicator	'✓'	Indicator	'✓'	Indicator	'✓'
On Time In Full Delivery to Customers		Warranty Returns from Customers		Lead Time	
Defects in process		Factory Productivity		Factory Safety and Employee Morale	
Production Costs		On Time In Full from Suppliers		Warranty Returns to Suppliers	

2. What is the average percentage of products received 'on time' by the customer:
   ❒ <50% ❒ 51-75% ❒ 76 - 95% ❒ 96 - 98% ❒ 99 – 100% ❒ Not Measured

3. What is the average lead time offered by this factory to its customers from receiving an order to its delivery?

   ❒ < 2 days ❒ 3 – 5 days ❒ 6 – 14 days ❒ 15 – 28 days ❒ 29+ Days ❒ Not Measured

4. What percentage of product is returned from the customer as Warranty claims?

   ❒ 0 – 0.1% ❒ 0.1 - 0.5% ❒ 0.5 – 1% + ❒ 1%+ ❒ Not Measured

5. What is the average percentage of products that fail the final inspection process at this factory?

   ❒ 0 – 0.1% ❒ 0.1 - 0.5% ❒ 0.5 – 1% + ❒ 1%+ ❒ Not Measured

6. How would you rate this business compared with industry average performance?

Performance Indicator	Better'✓'	Average'✓'	Worse'✓'
On Time Delivery to Customers			
Lead time offered to Customers			
Warranty Returns from Customers			
Ability to increase output when needed			
Ability to cope with a large variety of product requirements			
Speed in getting new products to customers			
After-sales Customer service			
Safety Management			
Employee welfare and development			
Environmental performance			

SECTION D: PROCESS MANAGEMENT, CONTINUOUS IMPROVEMENT & TECHNIQUES

This section of the questionnaire explores the different elements of your quality management to find out what practices are used within the factory.

1. Does this business have a formal strategy? **Yes/No**

2. Does this business have a formal and written quality/manufacturing strategy? **Yes/No**

3. What tools and techniques are used, by senior factory managers, in planning and formulating the strategy of the business?

4. How many times per year is the strategy of the firm reviewed to assess performance?
____ / Year

5. Does the business formally train employees in quality management processes and techniques? **Yes/No**

6. Please indicate with a '✓' the techniques used by operational employees and specialists within the factory to solve problems or engage in improvement activities:

Operational	**Often**	**Sometimes**	**Never**
Team working			
Cause and Effect Analysis			
Brainstorming			
Pareto Chart			
Scatter Diagram			
Histogram Charting			
Control Charts			
Workplace Organisation/ 5S			
Cellular Manufacturing			
Visual Management			
Mistake Proofing/Poka Yoke			
Failure Modes Effect Analysis (FMEA)			
Kanban and/or Lean Production			
Other: Please Specify			

Section E. Human Resources

This section concerns the human resource management and small group activities that has been carried out in your company.

1. What is the approximate average age of the following factory employees?
   Workers _____**Years** Management _____**Years**

3. What is the approximate average length of service for?
   Workers _____ **Years** Management _____ **Years**

4. What is the annual turnover of employees at this factory? _____**% of workforce**

5. What methods are used for selecting new workers?

Methods	'✓'	**Methods**	'✓'	Other; please specify
Interview		Recommendation		
References		Psychological test		
Skill assessment		Meeting the team		

6. Does this company have a formal induction scheme? **Yes/No**

7. What features of employment provided by the company?

Features	'✓'	**Features**	'✓'
Common Uniform		Company newsletter	
Common Car Park		Sickness Scheme	
Common Canteen		Physical and recreational activities	
Employee council			
Other: please specify			

8. Does this company have a formal appraisal system? **Yes/No**

9. What types and duration of training is undertaken by workers in the factory per year?

Worker Type	**Type Of Training**	**No. of Hours**
Top Management		
Middle Management		
Supervisor		
Operators		

10. What indicators are used to assess the effectiveness of training and education activities?

11. Do you operate formal problem-solving teams? **Yes/No**

If 'No' the please move on to question 19

12. Which classes of worker are involved in problem-solving teams?

Worker Type	'✓'	Worker Type	'✓'	Worker Type	'✓'
Senior Management		Technical Specialists		Operators	
Middle Management		Designers		Supplier Staff	
External Person		Others:			

13. How many problem solving teams are typically active at the factory? _____

14. On average, how many employees are there per team? _____/ Team

15. On average, how many times would these teams meet per month? _____ /Month

16. Approximately how many projects would be started per year? ____

17. Approximately how many projects would be completed per year? ____

18. Does the company operate an employee suggestion scheme? **Yes/No**

19. What is the **average** number of suggestions per year? _____ per year

20. What is the implementation rate? _____% **(average)**

21. How are successful suggestions rewarded? (Please '✓' those that apply)

Type Of Rewards	'✓'		'✓'	
No formal reward		Financial rewards to team		**Other**: Please specify
Financial rewards to individual		Certificates of recognition		

SECTION F: Leadership

This section was designed to understand your views concerning many different statements about leadership in organisation. Please represent your opinion by placing a '✓' in the relevant box.

Statement	Strongly Disagree	Disagree	Don't Know	Agree	Strongly Agree
Senior managers actively encourage change.					
Senior managers develop and support a culture of trust.					
Senior managers do not encourage employee involvement and commitment to the company.					
Senior managers actively try to eliminate barriers between individuals and departments.					
This company actively seeks out and engages best practices.					
This company reacts to a crisis by "fire-fighting"					
Senior managers are focused on giving customer value.					
Senior managers are rarely involved in quality activities.					
Senior managers continuously reinforce, promote, and communicate quality values.					
This company has a mission statement that has been communicated throughout the company					
Majority of *employees* don't understand the company mission statement.					
This company has a comprehensive and structured planning process that regularly sets short and long-term goals.					
This Company very seldom reviews its performance and key performance indicators					
This company considers its operational capabilities, customer requirements, and the community needs when developing business plans, policies, and objectives.					
Internal *business departments* and plans are not aligned with the overall business mission at *this company*					
Inadequate resources are assigned to the key improvement projects of the business					
Business measures cause conflicts between departments					

SECTION G: INHIBITORS TO TOTAL QUALITY MANAGEMENT

This section of the questionnaire asks for **YOUR OPINION** concerning the inhibitors to the implementation and sustainability of quality management systems using a series of propositions. Please '✓' the position which closest matches your view.

Statement	Strongly Disagree	Disagree	Don't Know	Agree	Strongly Agree
The behaviour of *senior managers* does not reinforce a commitment to quality improvement activities.					
Meeting production schedules are more important than quality performance.					
This business only engages in reactive problem-solving when instructed to by customers.					
Operational teams have the quality problem-solving skills necessary to sustain improvement activity					
The business has a shortage of technical skills to sustain improvements.					
Customers do not understand the problems of small businesses in finding the time and resources for improvement activity					
Problems are caused at this factory by differing customer standards					
The suppliers to this business are disinterested in solving problems with us.					
The quality systems of this business slow down the change process.					
This company has no clear quality goals identified by senior manager.					
Individual pay should be linked to quality performance improvements.					
It is difficult to relate improvement activity to business profits or true cost savings for customers.					
Workers we have skilled and trained workers always leave for better jobs elsewhere.					
Most team based improvement activities are unproductive 'social time' away from the workplace.					

Thank you very much for spending the time completing this questionnaire.

Thank you very much for your assistance.

APPENDIX 3:

SAMPLE OF CASE STUDY QUESTIONNAIRE

Semi Structured Interview
For Small and Medium Enterprises

Introduction:
This questionnaire was designed to understand how quality management practices are used by Small and Medium Sized businesses. This is an exploratory study and there is no right or wrong answers. The questionnaire is broken into xx sections to understand your strategic, operations, human resources and other practices. The questionnaire should take no longer than 20 minutes to complete. Thank you for your time and help with this study.

SECTION A. General Company Information

This section of the questionnaire collects general information about the company and its activities.

1. Name of the company: _____

2. Year of establishment: _____ 3. Owner nationality: _____

4. Please indicate with a '✓' the Ownership of this business:

Ownership	✓	Ownership	✓	Ownership	✓
Sole-Proprietorship		Public Limited		Private Limited	
Partnership		Joint Venture		Subsidiary	

5. What is the main business activity of the company?

6. What is the total number of full time employees working at this factory? _____Persons

7. Who are the main customers to this business?

8. Does your organization have?

System	Date	System	Date
ISO9000:2000		QS 9000	
ISO14000		TS16949	
Others: Please specify			

SECTION B: TOP MANAGEMENT LEADERSHIP

This section examines senior management leadership and involvement in developing and maintaining excellence organization.

1. How the senior management personnel are personally involved in developing and maintaining an environment for quality excellence?

   a. Planning and goal setting

   b. Teamwork

   c. Giving education and training

   d. Receiving education and training

   e. Recognition of employees

f. Meeting with customers and suppliers

2. Please indicate the involvement of various levels in organization in quality management:

a. Top management

b. Middle management

c. Supervisory

d. Operators

SECTION B: HUMAN RESOURCES

This section concerns the human resource management and small group activities that has been carried out in your company.

1. Position in company: _____

2. Year of service: _____ 3. What is the percentage of annual turn over? _____%

4. Please indicate the employee's classification:

Classification	Number	Classification	Number	Classification	Number
Managing Director		Supervisors		Typist	
General Manager		Technicians		Operators	
Managers		Clerk		Others	
				TOTAL =	**Persons**

5. What is the approximate average age of the:

Workers at the factory _____ **Years**

Management of the factory _____ **Years**

6. What is the approximate average length of service for?

Workers at the factory _____ **Years**

Management of the factory _____ **Years**

7. Which are the following methods are used for recruiting new workers?

Methods	✓	Methods	✓	Other; please specify
Interview		Recommendation		
References		Psychological test		
Skill assessment		Meeting the team		

8. Do you have difficulties in recruiting skilled workers? **Yes/No**

9. If yes, what are the problems facing?

10. What is annual rate of absenteeism? _____%

11. How many training hours per year is allocate to:

Categories	No. of hours	Categories	No. of hours	Categories	No. of hours
Managerial		Technical		Operators	
Supervisory		Administrative		Others	

12. What are the types of training and no. of hours spend by employees per year?

Worker Type	Type Of Training	No. of Hours
Top Management		
Middle Management		
Supervisor		
Operators		

13. Did you access the effectiveness of training activities? **Yes/No**

14. If yes, what are the indicators used?

SECTION C: OPERATIONS MANAGEMENT

This section concerns the operations management of company

1. Position in company: _____ 2. Year of service: _____

3. What is the technology employed by this factory? e.g: injection moulding, metal stamping etc.

4. How would you describe your production runs?

Productions	✓	Productions	✓
Mainly single unit or small batch		Mass production	
Mainly large batch			
Other: Please specify			

5. Does your company inspect for quality? **Yes/No**

6. If yes, what type of inspection runs?

Type of Inspections	✓	**Type of Inspections**	✓
Incoming inspection		Final inspection	
In-process inspection			
Other: Please specify			

7. What is the percentage of reject rate for each inspection last year?

Type of Inspections	**%**	**Type of Inspections**	**%**
Incoming inspection		Final inspection	
In-process inspection			

8. During the last 12 month have your customer returned any of your products? **Yes/No**

9. If, so what is the average of returned products? _____%

10. Do you measure your delivery performance to customers? **Yes/No**

11. If yes, what percentage of your finished product was delivered on time last year? ____%

12. Do you operate a customer complaint handling process? **Yes/No**

13. How many complaints do you received from a customer for the last year? _____ Year.

14. What type of complaints received by your company?

15. Did your factory audited by customer? **Yes/No**

16. If yes, how many times per year? _____ Year

17. What criteria used in measuring company performance?

Performance Criteria	✓	Performance Criteria	✓
Productivity		Safety	
Quality		Morale	
Cost		Environmental	
Delivery		New Product Development	
Other: Please specify			

18. How frequent were the performance of your company measured in a year?

19. Do you have suggestion scheme within the company? **Yes/No**

20. If yes, how many suggestions did you received last year? _____

21. How many suggestions were implemented? _____

SECTION E: PROCESS MANAGEMENT, CONTINUOUS IMPROVEMENT & TECHNIQUES

This section of the questionnaire explores the different elements of your quality management to find out what practices are used within the factory. Please '✓' in the appropriate box provided.

Tools and Techniques	Yes	No	Frequency of Use		
Strategic Management			**Often**	**Sometimes**	**Never**
SWOT Analysis					
Business Process Re-Engineering					
Policy Deployment					
Benchmarking					
Other: Please Specify					
Design Management			**Often**	**Sometimes**	**Never**
Quality Function Deployment (QFD)					
Value Analysis/Value Engineering (VA/VE)					
Taguchi/Design of Experiments					
Other: Please Specify					

Operational			**Often**	**Sometimes**	**Never**
Cause and Effect Analysis					
Brainstorming					
Pareto Chart					
Scatter Diagram					
Histogram					
Statistical Process Control/ Run Charts					
Workplace Organisation/ 5S					
Cellular manufacturing					
Visual Management					
Mistake Proofing/Poka Yoke					
Failure Modes Effect Analysis (FMEA)					
Kanban and/or lean production					
Six Sigma DMAIC Methodology					
Autonomous and /or Planned Maintenance					
Quick Changeover					
Other: Please Specify					

Thank you very much for spending the time completing this questionnaire. Please send this completed questionnaire to:

Mr. Azizan Abdullah
Lean Enterprise Research Centre
Cardiff Business School
Cardiff University, Colum Drive,
Cardiff CF10 3EU

Would you be interested in receiving a copy of the findings of this research? **Yes/No**

Would you be prepared to take part in a follow-up interview concerning this study? **Yes/No**

Thank You very much for your assistance.

Azizan Abdullah
December 2004

APPENDIX 4:

LIST OF STEPS FROM QUALITY GURUS

Deming's 14 Point for Management

1. Create constancy of purpose towards improvement of products and service with the aim to become competitive, stay in business and to provide jobs.
2. Adopt the new philosophy – we are in a new economic age. Western management must awaken to the challenge, learn their responsibilities and take leadership for future change.
3. Cease dependence an inspection to achieve quality. Eliminate the need for inspection on a mass basis by building quality into the product in the first place.
4. End the practice of awarding business on the basis of price tag. Instead minimise total cost. Move towards a single supplier for any one item on a long relationship of loyalty and trust.
5. Improve constantly and for ever the system of production and service to improve quality and productivity and thus constantly decrease costs.
6. Institute training on the job.
7. Institute leadership (see point 12): the aim of supervision should be to help people, machines and gadgets to do a better job. Supervision of management as well as supervision of production workers is in need of overhaul.
8. Drive out fear, so that everyone may work effectively for the company.
9. Break down barriers between departments. People in research, design, sales and production must work as a team to foresee problems of production and problems in use that may be encountered with the product or service.
10. Eliminate slogans, exhortations and targets for the workforce that asks for zero defects and new levels of productivity. Such exhortations only create adversarial relationships as the bulk of the causes of low quality and low productivity belong to the system and thus lie beyond the power of the workforce.

11a. Eliminate work standards (quotas) on the factory floor, substitute leadership instead.

11b. Eliminate management by objectives, by numbers and by numerical goals; substitute leadership instead.

12a. Remove barriers that rob the hourly worker of his or her right to pride of workmanship. The responsibility of supervisors must be changed from sheer numbers to quality.

12b. Remove barriers that rob people in management and in engineering of their right to pride of workmanship. This means inter alia, abolishment of the annual or merit rating and of management by objectives.

13. Institute a vigorously programme of education and self-improvement.
14. Put everybody in the company to work to accomplish the transformation. The transformation is everybody's job.

Source: Dale (2003)

The Juran 10 Methods

1. Build awareness of the need and opportunity for improvement.
2. Set goals for improvement.
3. Organise to reach the goals.
4. Provide training.
5. Carry out projects to solve problems.
6. Report progress.
7. Give recognition.
8. Communicate results.
9. Keep the score.
10. Maintain momentum by making annual improvement part of the regular system and processes of the company.

Crosby's 14 Steps Quality Improvement Programme

1. Management commitment
2. Quality improvement team
3. Quality measurement
4. Cost quality evaluation
5. Quality awareness
6. Corrective action
7. Establish an ad hoc committee for the zero defects programme
8. Supervisor training
9. Zero defect day
10. Goal setting
11. Error cause removal
12. Recognition
13. Quality councils
14. Do it over again

Feigenbaum's 10 Benchmarks for Total Quality Success

1. Quality is a company-wide process
2. Quality is what the customer says it is
3. Quality and cost are sum, not a difference
4. Quality requires both individual and team zealotry
5. Quality is a way of managing
6. Quality and innovation are mutually dependent
7. Quality is an ethic
8. Quality requires continuous improvement
9. Quality is the most cost effective, least capital intensive route to productivity
10. Quality is implemented with a total system connected with customers and suppliers.

Source: Dale (2003)