



Assessing quality management in China with MBNQA criteria

Quality
management in
China

R.S.M. Lau

*Department of Information and Systems Management, Hong Kong University
of Science and Technology, Clear Water Bay, Hong Kong, China*

Xiande Zhao

*Department of Decision Sciences and Managerial Economics,
The Chinese University of Hong Kong, Shatin, Hong Kong, China and*

Ming Xiao

*Survey and Statistics Institute, Beijing Broadcasting Institute (BBI),
Beijing, China*

699

Received April 2003
Revised August 2003

Keywords Baldrige Award, Quality management, China

Abstract *This study reports a recent survey of the current state of quality management implementation and practices in China with reference to the Malcolm Baldrige National Quality Award (MBNQA) criteria. Comparisons are made between firms in three different stages of the development of a quality system: firms that focus on inspection, statistical quality control, and total quality management. The results support the common wisdom that firms practising total quality management have superior performance in leadership, strategic planning, customer and market focus, information and analysis, human resource focus, process management, and business results. The survey results also indicate that most Chinese firms still lack a full understanding of strategic quality management although a higher percentage of them claim that they are total quality management companies. To further the quality movement in China, quality managers and professionals should take a leading role in promoting contemporary, strategic quality management concepts and practices.*

Introduction

After China became a member of the World Trade Organization (WTO) in December 2001, it became obvious that all Chinese firms, including the state-owned and those collectively owned, would have to adapt to a new competitive environment. Many firms have undertaken initiatives to enhance their competitiveness so that they can meet the global challenge. Quality improvement has often received the highest priority consideration. Understanding how these Chinese firms operate is both important and challenging to academics and practitioners. It is important because China represents the largest and fastest growing transitional economy in the world. China is currently the largest producer and exporter of many consumer products and its future market potential is equally large given the sheer size of its population. It is also challenging because the transition of China's economy has been largely planned by a government that still maintains an active involvement in basic business affairs. Any meaningful study of Chinese firms must consider these social, economic, and political influences and their complex interactions with business policies and practices.

Taking a clue from the success of Japanese firms, Chinese firms are paying more attention to quality while remaining one of the lowest cost producers in the world.



International Journal of Quality &
Reliability Management
Vol. 21 No. 7, 2004
pp. 699-713

© Emerald Group Publishing Limited
0265-671X

DOI 10.1108/02656710410549064

Since China is also heavily engaged in foreign trade and investment, domestic firms are frequently exposed to contemporary practices of quality management. However, only limited scholarly work has been done to track the progress of the quality management efforts in China. This study will report on a recent survey of the current state of quality management implementation and practices in China using the Malcolm Baldrige National Quality Award (MBNQA) criteria for reference. Comparisons will be made between firms in three different stages of the development of quality system (i.e. firms that focus on inspection, statistical quality control, or total quality management). The purpose of this research is to determine the quality performance of Chinese firms with various degrees of emphasis on quality management, using the MBNQA criteria. In addition, suggestions will be made to promote the further understanding of quality management in China.

Quality management in China

When the many marvelous achievements of ancient China are considered, ranging from architecture, literature, and innovative products, to scientific instruments, it is evident that, throughout the nation's long history and civilization, high quality has been important. However, traditional Chinese quality control practices, with their focus on craftsmanship, may not be effective and efficient enough for contemporary industrial production systems. Liu (1994) suggests that modern quality control concepts and approaches were first introduced into China in 1957. Until then, inspection was the primary way to control the product quality, and this was carried out by specially trained quality inspectors. Neither the manufacturing nor the engineering functions would take an active role in quality assurance. After the Chinese government adopted the "open door" policy in 1976 to encourage the inflow of foreign investment and the establishment of businesses, many Chinese firms were exposed to quality related technology and management know-how as well as international quality standards and practices (Lee *et al.*, 2001).

To meet the new requirements of a market-driven economy, Chin *et al.* (2001) believe that Chinese firms need to transform themselves into ones that are consistent with the total quality management (TQM) paradigm. For example, Chinese firms should shift their emphasis from inspection to process quality. However, as Pun (2001) points out, making such a transformation to TQM is difficult for Chinese firms because it often requires not just a change of techniques, but also a change of corporate cultures, systems and practices.

Comparative studies of quality management in China and other developed countries have received a great deal of attention in recent years. Chin *et al.* (2002) reported differences between Hong Kong and Shanghai manufacturing firms in their quality practices, in which Hong Kong firms paid more attention to market and customer feedback. Solis *et al.* (2001) used data from small and medium enterprises in China and four other countries and found that the human resources aspect of quality management was still a common weakness among the top quality companies. Lee and Zhou (2000) compared total quality management firms and traditional firms and found many differences in their manufacturing strategies and quality practices. While quality management has received a great deal of attention in manufacturing and service firms in China, the progress of its implementation has not been clear (Chin and Pun, 2002). As China's economy continues to grow at an extraordinary rate, with ever evolving

business practices, more research is needed to document and provide guidance for a successful transition. This study is the first of its kind to apply the MBNQA criteria to evaluate the quality practices and performances of Chinese firms. In addition, we hope that the survey results will lead to some action plans for extending the current efforts to implement quality management in China.

Stages of the quality movement

In recent years, quality has emerged as a formal management function, with the quality concepts and practices evolving from a reactive and inspection-oriented approach to a more proactive and strategy-oriented approach for quality management. Firms tend to develop their own quality management systems based on many factors, including their business strategies, external requirements, and internal operating environments. It is no surprise that quality practices vary greatly from one firm to another even within the same industry. As this development of quality has been gradual and continuous, firms that are in different stages of development of their quality practices may coexist and even compete in the same market. Firms emphasizing different quality control and management approaches can be classified into four broad categories, inspection, statistical quality control, quality assurance, and strategic quality management (Garvin, 1988). A recent research study of Yeung *et al.* (2003) also establishes four similar stages of the development of quality based on empirical data from the Hong Kong electronics industry. Chin *et al.* (2002) used a self-assessment scoring scheme to classify total quality management implementation into five stages, unaware, uncommitted, initiator, improver, and achiever.

According to the seminal work of Garvin (1988), the first stage in the move toward quality is inspection. For many years, formal inspection procedures had been essential to ensure the conformance to quality of mass produced, standardized products. Specially trained quality inspectors were hired to carry out the necessary inspection work that primarily focused on narrow, simple activities such as counting, grading, and sorting.

The second stage in the move toward quality is characterized by the application of statistical techniques, including process control charts, and sampling techniques. The goal of using these statistical tools is to evaluate and improve quality in a scientific and economical way. The basic idea of using statistical quality control charts is to detect changes in the mean or variability of the process while production is still going on rather than after production is finished. By identifying probable assignable causes of variation, problems that cause the processes to produce defective products will be eliminated before too many defective units are produced. These statistical quality control techniques were commonly used after the Second World War to cope with the surge in demand for industrial and consumer products.

Quality assurance is the third stage in the move toward quality. At this stage quality is no longer a narrow, manufacturing-based discipline. Instead, quality professionals recognize the need for total quality control in areas ranging from new product design to customer service, with much broader implications for management. Much attention is now placed on designing the quality products and monitoring all the production-distribution processes. All departments in the organization are now encouraged to work together for quality assurance while top management is peripherally involved in designing, planning, and executing quality policies (Garvin,

1988). Aside from quality control techniques, management philosophy, emphasizing greater human contributions and higher expectations of quality (such as zero defects), begins to prevail in this stage of the progression toward quality.

The fourth stage in the move toward quality is strategic quality management. In this stage, the strategic aspects of quality are recognized and embraced by top management in the strategic planning process. Instead of viewing quality in a defensive, negative way, quality can now be used to maximize a firm's competitive opportunities. As a result, quality needs to be defined from the perspective of market competition and customer expectation, instead of in terms of predetermined, internal standards or design specifications. To reach this stage in the move toward quality requires a change in corporate culture and an organizational commitment to the continuous improvement of quality. Although no one has introduced a formal way for classifying where firms are in the strategic quality management stage, the MBNQA is widely acknowledged as an excellent framework through which firms can evaluate their progress toward achieving strategic quality management.

The original design of our research was to investigate the approaches and performances used by Chinese firms according to the above four stages in the development of a quality system. During the pre-test phase of our research project, many of the respondents found it difficult to distinguish between the quality assurance and strategic quality management stages. In view of that, we modified our questionnaire and asked responding firms to assign themselves to one of the following three stages of quality management:

- (1) Inspection (INS).
- (2) Statistical quality control (SQC).
- (3) Total quality management (TQM).

A description of these three stages of development and their characteristics follow closely those defined by Garvin (1988) and they can be found in Table I. The preliminary data analysis revealed that there were 53 INS firms (8.8 per cent), 129 SQC firms (21.5 per cent), and 418 TQM firms (69.7 per cent). There are two reasons for the relatively large number of TQM firms in our sample. First, we might have received completed survey questionnaires mostly from firms that performed better in quality. Although we stressed the confidentiality of the survey results, it is common for Chinese managers to ignore requests for them to complete the survey accurately if they knew their firm's quality was inferior to that of their competitors. Second, we used only three stages instead of four for the movement toward quality and this might have caused more respondents to choose to be TQM firms if they believed their firms had gone beyond the SQC stage.

Sampling procedures and characteristics of respondents

This research uses data collected jointly by the China Association of Quality and our research team, in October 2001. The sampling frame was constructed using the results of the first national reconnaissance survey for basic establishments carried out by the State Bureau of Statistics. Firms included in this research were those with an annual sales turnover of five million Renminbi (about US\$600,000) or above. There were about 143,000 manufacturing and service firms that met this criterion and they are typically considered to be medium to large firms in China.

Characteristics	Stage 1: quality inspection	Stage 2: statistical quality control	Stage 3: total quality management
Primary concern	Detection	Control	Strategic impact
View of quality	A problem to be solved	A problem to be solved	Competitive opportunity
Emphasis	Product uniformity	Product uniformity with reduced inspection	Market and consumer needs
Methods	Gauging and measurement	Statistical tools and techniques	Strategic planning, goal setting, and mobilizing the organization
Role of quality professionals	Inspection, sorting, counting, and grading	Troubleshooting and the application of statistical methods	Goal-setting, education and training, consultative work with other departments, and program design
Who has responsibility for quality?	Inspection department	Manufacturing and engineering departments	Everyone in the organization, with top management exercising strong leadership
Orientation and approach	"Inspects in" quality	"Controls in" quality	"Manage in" quality

Note: The different stages of the development of quality are adopted (with some modifications) from Garvin (1988, Table 2.1, p. 37)

Table I.
Stages of development of quality

A pilot study of six firms was conducted to pretest the content validity of the questionnaires. As the sampling frame involved firms from all over China, a professional business research company, which has a nationwide network in China, was in charge of conducting the survey. The survey respondents were quality managers or senior executives in charge of quality management in their firms. The researchers contacted these people by phone before sending them the questionnaires. After sending the questionnaires, repeat calls were made to remind the respondents to fill them out and to answer any questions they might have concerning the survey.

Due to the budget constraints of our research, the number of responding firms was limited to 600 in 29 provinces and autonomous regions in China. We used a stratified PPS (probability proportional to size) sampling method to select firms for inclusion in the survey. Thanks to the persistent efforts of the professional business research company and the influence of the China Association for Quality, we managed to achieve a response rate of 73 per cent. Of those 600 firms included in our research, 452 were in the manufacturing sector and 148 were in the service sector. Table II shows a summary of the profiles of the sampled firms.

Quality management has received a great deal of attention especially in the manufacturing industry, where 92 per cent of the surveyed firms had a dedicated department with this responsibility. In addition, the quality management department accounted for, on average, 4 per cent of the total workforce, but it was mainly responsible for quality inspection. For those smaller firms without a quality management department, an overwhelming 97.3 per cent of them claimed to have at least one person designated to carry out this responsibility.

IJQRM
21,7

704

Table II.
Profile of sampled firms

	Manufacturing	Service	Both
<i>Sample size</i>			
Frequency	452	148	600
Distribution (%)	75.3	24.7	100
<i>Ownership</i>			
State-owned (%)	34.5	52.7	39.0
Joint-stock (%)	24.6	31.1	26.2
Joint-venture (%)	22.3	4.1	17.8
Collective/affiliated/private (%)	18.6	12.1	17.0
<i>Number of employees</i>			
Median	900	193	600
Maximum	140,000	10,000	140,000
Minimum	16	15	15
Export-oriented business (%)	41.8	18.9	36.2
ISO 9000 certified (%)	67.3	21.6	56.0

The respondents of our survey were mostly professionals working in the area of quality management. The profiles and backgrounds of these respondents can be found in Table III, providing more insights into how the quality movement may evolve over the years to come. Quality managers or professionals in China were about 39 years old, and 78 per cent of them had completed either a university or junior college education. Not only were they highly educated professionals, but 89 per cent of them also held positions in the middle management level or above. Their profiles suggest that quality management has been perceived as an important function in their firms. This is especially true for the manufacturing industry, where the quality management practitioners' median number of years of work experience in the field is nine. Both the

Table III.
Profile of respondents

	Manufacturing	Service	Both
<i>Age</i>			
Median	38	39	39
Maximum	76	59	76
Minimum	20	22	20
<i>Highest level of education attained</i>			
University or above (%)	39.6	29.7	37.2
Junior college (%)	38.1	49.3	40.8
High school (%)	20.6	18.9	20.2
Junior high or below (%)	1.7	2.1	1.8
<i>Quality management experience (years)</i>			
Median	8	5	7
Maximum	38	36	38
Minimum	1	1	1
<i>Position held in the firm</i>			
Top management level (%)	17.0	17.6	17.2
Middle management level (%)	73.0	69.6	72.2
Junior management level (%)	10.0	12.8	10.6

median number of years of quality management experience and the education levels of the respondents in the manufacturing firms were comparatively better than those of their counterparts in the service firms.

Identification and testing of the MBNA criteria variables

The MBNQA criteria represent a comprehensive framework of seven categories that are used to evaluate an organization's performance. The categories cover:

- (1) leadership;
- (2) strategic planning;
- (3) customer and market focus;
- (4) information and analysis;
- (5) human resource focus;
- (6) process management; and
- (7) business results.

As it is now widely publicized around the world as a standard for performance excellence, the MBNQA framework has received much attention from academic researchers; among many others, see for example, Evans and Jack (2003) and Wilson and Collier (2000).

A principal component analysis with varimax rotation method was performed to identify and confirm the seven MBNQA criteria. Table IV shows the resulting scale variables used in this study.

All scale variables were tested for reliability and internally consistency before they were used for further analysis. Scale reliability refers to the internal consistency of the items that are used to measure a factor (Dunn *et al.*, 1994). High internal consistency of the scale variables is necessary to ensure the accuracy or precision of the scale. The Cronbach's alpha (α) coefficient is most commonly used to assess scale reliability and is given by:

$$\alpha = kp/[1 + p(k - 1)]$$

where k is number of items and p is the mean inter-item correlation. The value of Cronbach's alpha is between 0 and 1 and a higher level of α indicates a higher reliability of the scale. As a rule of thumb, Nunnally (1978) states that alpha levels as low as 0.6 are acceptable for new scales. As Hughes *et al.* (1986) note, it would be difficult to justify a proposed indicator of a scale variable even in exploratory research if its reliability measures were less than 0.5. As seen in Table IV, all the α values range between 0.8108 and 0.9402 and thus all the scale variables show a relatively high level of internal consistency.

After internal consistency was confirmed, we combined the individual items on each scale into unidimensional variates, which could be treated as single entities representing each scale, for further analysis. Carmines and Zeller (1979) suggest the following four criteria for establishing the unidimensionality of scales:

- (1) The first factor should explain a large proportion (> 40 per cent) of the variance in the items.

<i>Leadership</i> (Cronbach's alpha = 0.8108)		
1.1	Senior executives always emphasize the importance of customer orientation	0.660
1.2	Senior executives take our product and service quality seriously	0.822
1.3	Senior executives adapt their business strategies to market trends	0.682
1.4	We always use ethical business practices	0.788
1.5	We anticipate public concerns about our products, services, and operations	0.735
1.6	We participate enthusiastically in social and community services	0.600
1.7	Senior executives take employees' feedback and surveys seriously	0.710
<i>Strategic planning</i> (Cronbach's alpha = 0.9046)		
2.1	We have clear strategic objectives for our organization	0.855
2.2	In defining our strategic objectives, we carefully considered various potential factors such as market trends, competitive environment, and our capability	0.890
2.3	We develop realistic short-term and long-term plans and corresponding actions	0.902
2.4	Every employee in our organization is clear about our strategic objective and the action plans to accomplish it	0.819
2.5	Every employee in our organization agrees with and supports our strategic objective and action plans	0.806
2.6	When selecting our suppliers, their capability to meet our quality requirements is the primary consideration	0.711
<i>Customer and market focus</i> (Cronbach's alpha = 0.9011)		
3.1	We understand our target customers, customer groups, and market segments well	0.801
3.2	We take our customers' opinions and suggestions seriously	0.857
3.3	We study our customers' requirements and disseminate our customer knowledge in a timely manner	0.815
3.4	We have a well-established communication channel with our customers, allowing customers to seek help and information, or to make a complaint	0.803
3.5	We have an effective customer management system, which solves customer complaints or problems in a timely manner	0.765
3.6	We closely monitor our competitors' actions	0.767
3.7	We are fully aware of market trends	0.811
<i>Information and analysis</i> (Cronbach's alpha = 0.9058)		
4.1	We have an effective system to assess our business performance	0.785
4.2	We have a clear appraisal system for every department, unit, and employee	0.898
4.3	All employees understand their performance indicators well and take them seriously	0.885
4.4	We adjust our performance indicators and appraisal systems according to the evolving internal and external business environment	0.866
4.5	Senior executives adjust policy and strategy by analyzing information and facts	0.840
<i>Human resource focus</i> (Cronbach's alpha = 0.9026)		
5.1	We empower our employees	0.644
5.2	We have an transparent and effective appraisal system for recognizing and rewarding employees for their efforts	0.810

Table IV.
Scale listing

(continued)

			Quality management in China
5.3	We stress teamwork and team spirit	0.847	707
5.4	Our management motivates employees and fully develops their potential	0.871	
5.5	We train our employees in quality concepts, taking care of their needs and developing their competencies	0.832	
5.6	We provide training for our employees to improve their competency	0.873	
5.7	We provide a safe and healthy work environment	0.752	
5.8	We provide special training for employees to serve our customers well	0.671	
<i>Process management</i> (Cronbach's alpha = 0.9402)			
6.1	When designing business processes, we carefully consider various factors, such as design quality, process cycle time, costs, new technology, and productivity	0.850	
6.2	Before applying a new production or delivery process, we conduct comprehensive tests to assure its quality	0.880	
6.3	We have appropriate management measures to control and improve the production or delivery processes	0.910	
6.4	We continuously improve our production or delivery processes, enhancing the overall product and service quality	0.920	
6.5	We share our experience in process improvement with other departments or units	0.832	
6.6	We improve our business processes to achieve better performance and to keep them up to date with business needs and directions	0.820	
6.7	We closely cooperate with our suppliers	0.815	
<i>Business results</i> (Cronbach's alpha = 0.9263)			
7.1	Customers are satisfied with our products and/or services	0.683	
7.2	Our company's profitability is quite good	0.775	
7.3	Our remuneration and benefits are quite good	0.830	
7.4	Employees are satisfied with the department for which they work	0.874	
7.5	Our business has been growing steadily	0.859	
7.6	Our product quality has been improving steadily	0.817	
7.7	Our productivity has been rising steadily	0.852	
7.8	Customer evaluation of our performance has been improving	0.873	

Note: Factor loadings in parentheses

Table IV.

- (2) Subsequent components should explain fairly equal proportions of the remaining variance, except for a gradual decrease.
- (3) All or most of the items should have sizable loadings (> 0.3) on the first factor.
- (4) All or most of the items should have higher loadings on the first factor than on subsequent factors.

After a careful examination of each scale variable, the unidimensionality of the scales was supported.

Assessment of quality management in China

To assess and compare the current status of quality management among the companies in the three different stages of the development of a quality system, we first investigated the performances of these companies in each of the seven areas of the MBNQA criteria, using the scale variables described in the previous section. Table V summarizes the performance differences of the Chinese firms according to the seven

Table V.
Comparisons based on
MBNQA criteria

MBNQA criteria	Stage 1 INS firms	Stage 2 SQC firms	Stage 3 TQM firms	<i>F</i>	<i>p</i>
Leadership	7.55	8.09	8.42	31.23	< 0.001
Strategic planning	6.94	7.38	8.00	24.91	< 0.001
Customer and market focus	7.38	8.08	8.38	26.65	< 0.001
Information and analysis	7.12	7.60	8.18	24.22	< 0.001
Human resource focus	7.07	7.53	8.09	25.35	< 0.001
Process management	6.15	7.45	7.93	30.60	< 0.001
Business results	6.55	7.29	7.80	25.90	< 0.001
Computed MBNQA scores	681	750	801	36.38	< 0.001

MBNQA criteria. Stage 1 (INS) firms primarily used inspection to ensure quality. Stage 2 (SQC) firms applied statistical quality control to achieve a more cost-effective method for quality assurance. Only Stage 3 (TQM) firms embraced the strategic quality management philosophy and its practices.

As mentioned earlier, each MBNQA criterion was represented by multiple items in the questionnaire and confirmed by factor analysis. The response to each questionnaire item was rated on a scale of 1 (completely disagree) to 9 (completely agree). A higher mean value indicates a closer match (agreement) between the statement and the quality practice. In examining each criterion, the results show that, among the three groups of firms, the TQM firms adopted to the greatest extent those quality management practices that were valued by the MBNQA. The quality practices of the SQC firms were also more consistent with the MBNQA criteria than those of the INS firms. The results suggest that as firms in China evolve from focusing on inspection to statistical quality control, and then to total quality management, their quality practices become more consistent with the MBNQA criteria.

The current MBNQA scoring system emphasizes business results (450 points), which account for almost half of the total point value of 1,000. All other criteria have a point value ranging from 85 to 120. Using a self-assessment of their business performances, TQM firms had a mean response of 7.80 on a scale of 1 to 9 for business results. The difference between the business results of the three groups of firms was significant ($F = 25.90$, $p < 0.001$).

When applying the MBNQA scoring system, with a maximum point value of 1,000, and the appropriate weight for each criterion, the results show that the INS firms would have received a score of 681 points, the SQC firms, 750 points, and the TQM firms, 801 points. Note that the point values represent the self-assessment by one individual in each sampled firm and should be interpreted with caution. If these firms had been assessed by external examiners, following the strict guidelines established by the National Institute for Standards and Technology (NIST) that administers the MBNQA, then the point values would likely be much lower. However, the results clearly show the superior performance of the TQM firms in the computed MBNQA scores ($F = 36.38$, $p < 0.001$).

From their own assessments, based on the descriptions of the three stages of the development of quality, 69.7 per cent of our respondents classified their own firm as a TQM firm. To verify the validity of their claims, the respondents were presented with seven statements on commonly accepted TQM philosophy and practices on the same

questionnaire. They were then asked to what degree they agreed with each of the statements, using a scale of 1 (totally disagree) to 5 (totally agree). These seven statements, along with the proportions of respondents who were in total agreement with the statements (they assigned the statement a 5 on the scale), can be found in Table VI.

While we expected that most TQM firms should be in total agreement with the statements, the results suggest that the current level of understanding of quality management is still lacking among TQM firms. In general, TQM firms adhered more to the strategic quality management philosophy and practices than the INS and SQC firms, but the gaps in understanding might not be significant in many areas. In fact, the TQM firms could only clearly distinguish themselves from other firms (69.4 per cent vs 49.6 per cent and 45.2 per cent) in their response to one statement, "All departments are directly or indirectly responsible for quality." The relatively low proportion of respondents from the TQM firms who were in total agreement with the commonly accepted strategic quality management concepts, suggests that most Chinese firms still lack a full understanding of strategic quality management and that they have only a superficial knowledge of the connotations of some quality dimensions.

Given the increasing customer expectations and competitive intensity, Chinese firms need to implement customer-focused and market-driven quality strategies. However, our survey results showed that a firm's involvement in customer and market research activities was yet to increase. From Table VII, it is clear that many firms have not completely broken away from the business practices developed for the planned economy. For example, only 27.5 per cent of the firms in our study used questionnaire surveys to systematically identify customer requirements and market trends. Only 50.8 per cent of the firms provided customer service hotlines for customers to reach them. These results indicate that most firms do not actively measure their customers' satisfaction level nor do they have any system to collect and analyze customer information.

Aside from the customer service deficiency, many firms also overlooked the importance of new product/service design and development. As the market environment continues to evolve rapidly and unpredictably, firms that are incapable

	Stage 1 INS firms (%)	Stage 2 SQC firms (%)	Stage 3 TQM firms (%)
All departments are directly or indirectly responsible for quality	45.2	49.6	69.4
Quality is more important than quantity	47.2	47.3	52.4
Customer expectations and complaints are important factors for us to raise the quality level	52.8	54.3	54.1
Quality is the ability to satisfy customer requests, needs, expectations	62.3	51.9	61.2
Defective products should not be allowed to leave the factory	67.9	69.0	71.8
Higher quality can improve a company's profitability	54.7	58.1	60.8
Average	53.1	52.8	59.4

Note: This Table shows the percentage of respondents who are in total agreement with the generally accepted quality concepts and practices

Table VI.
Degree of understanding
of quality management

of actively developing and upgrading their products and services will be put under tremendous competitive pressure. In subsequent data analysis, we determined that only 57.2 per cent of the firms operate a market research function, and 69.2 per cent have a design and development function. Considering the much broader, contemporary meaning of strategic quality management, our findings suggest that not many Chinese firms were embracing a holistic approach to manage their product/service quality.

Managerial implications

Using a multiple-item questionnaire, this survey shows that although quality management in China has made progress over the years, the current level of understanding of key quality management concepts is still not sufficiently high. Many firms have not fully recognized modern quality ideas, and serious deficiencies still exist in fundamental quality work, such as the establishment and implementation of quality strategies, awareness of customer requirements, surveys of customers' satisfaction, and the design and development of new products. Without a more developed and widespread understanding of modern quality management, Chinese firms will encounter difficulty in advancing the development of quality in China. In view of the current state of the quality management practices in China and the increasing global competitive pressures, we believe the following actions must be taken if Chinese firms are to successfully continue their current quality development:

- raise the level of understanding of quality management at the national level;
- implement customer-focused and market-driven quality strategies; and
- strengthen education and training in quality management.

Raise the level of understanding of quality management at the national level

Because our survey results showed there is still a lack of understanding of strategic quality management, raising the level of understanding of strategic quality management at the national level is essential for further development of quality initiatives in China. This awesome task requires the active participation and support of the relevant government agencies. A successful example of such participation and support is the involvement of the US Congress in establishing the MBNQA. In a similar move, the China Association of Quality established the first Chinese National Quality Award in 2001, based on reference to the successful experiences of advanced foreign countries. Five firms, including Baoshan Iron and Steel, Haier, Qingdao Hisense, Shanghai Volkswagen, and Qingdao Harbor Bureau, received the first Chinese

Table VII.
Involvement of customer
and market research
activities

	Frequently (%)	Sometimes (%)	Rarely (%)	Never (%)
Questionnaire survey	27.5	37.9	20.1	14.5
Discussion with customers	55.7	35.0	7.3	2.0
Analysis of customer complaints	60.8	27.4	6.5	5.3
Establishment of customer service hotlines	50.8	13.8	11.2	24.2
Regular visit to major customers	65.2	26.6	5.3	2.9
Learning about customers through contacts with their staff	66.3	28.1	4.4	1.2

National Quality Awards. More firms in China have been applying for the award since then. However, the current support for this award is far from satisfactory and its mission has not been fully recognized and understood by Chinese firms.

Implement customer-focused and market-driven quality strategies

Not until the adoption of the “open door policy” in 1976 had the government exerted a great deal of influence on business through state ownership and reciprocal benefits. Although government influence has diminished gradually since then, with the major shifts in business ownership, and the growing exposure to global market forces, the business community, as a whole, still preserves many market imperfections and sustains a fragmented economy with little competition (Child and Tse, 2001). Many quality standards and product specifications are still controlled by different government agencies instead of being driven by the needs of the markets and the customers. As China continues to open up its domestic consumer market to foreign competition, consumer rights have begun to take root and the expectation of quality products and service has been on the rise (Ho, 2001). Chinese firms must recognize the changing quality requirements and respond promptly to maintain their competitiveness. For them to compete in the global market place, they have to actively measure their customers’ satisfaction levels and systematically collect and analyze customer information. Only when they can systematically use customer feedback to improve the design of products/services and the process of producing those products or delivering those services, can they then deliver better quality and value to their customers, making them more competitive in today’s highly competitive marketplace.

Strengthen education and training in quality management

Establishing a learning culture in the organization is instrumental to achieving strategic quality management. Although most quality managers in China have attained a relatively high level of education, they might not be effective enough in managing quality due to their current level of understanding of strategic quality management philosophy and practices, as was shown earlier. As quality management is fast evolving, firms must provide timely training to their managers and workers in the appropriate knowledge and skills.

Different levels of education and training are needed for quality management to meet the challenges it faces. For example, everyone in the firm should acquire the basic concepts of quality management and quality control/improvement techniques. To serve this need, the China Association of Quality has provided a unified examination on the basic knowledge of quality management and provided the relevant training services with the cooperation of many professional organizations and industries.

To further the quality management efforts in China, advanced training in quality management and strategy should be delivered to quality managers and professionals. Any information exchange among international organizations concerning quality management methods and techniques is also beneficial for raising the knowledge of quality in China. Chinese firms should take every opportunity to participate in professional and academic activities that promote contemporary quality management concepts and practices. Just like the MBNQA program in the USA, Chinese firms should use their own quality award program as a communication channel for sharing successful strategies and for benchmarking purposes.

Conclusion

This study reports a recent survey of the current state of quality management implementation and practices in China using the MBNQA criteria as the reference. Comparisons were made between firms in three different stages of development of quality practices, firms that focus on inspection, statistical quality control, and total quality management. The results support the common wisdom that firms practicing total quality management have superior performance in leadership, strategic planning, customer and market focus, information and analysis, human resource focus, process management, and business results.

Our survey findings also indicate that, due to the gradual deregulation and intensified global competition of recent years, both product performance and service quality have been improving among Chinese firms. Many firms in our survey have also obtained ISO 9000 certification and/or implemented total quality management. In fact, many Chinese firms today are the contract manufacturers of the products of some famous global brands, which are recognized for the high level of their quality. Although there are some positive aspects to the current quality movement in China, we find that the present level of understanding of quality management in most Chinese firms must be raised, and they need to implement more effective and efficient ways to further improve on their quality performances.

Given the high percentage (56 per cent) of firms that are ISO 9000 certified, but which still lack an understanding of quality management, our findings may seem paradoxical at first. However, other studies, such as Chin *et al.* (2002) and Quazi *et al.* (2002), also find that holding ISO 9000 certification does not have any significant relationship with the improvement of business results nor other quality practices. As a result, our findings are actually consistent with other independent studies of Chinese firms. Future studies are necessary to better understand this phenomenon.

Publicizing the use of the MBNQA criteria or other prominent business practices is one way of raising awareness of quality management in China and it would help identify areas for improvement. These criteria and standards can also provide references to Chinese firms when pursuing customer-focused and market-driven quality strategies. Finally, all levels of staff in a firm need to take the initiative to fulfill their different needs for education and training in quality management. To further the quality movement in China, quality managers and professionals should take a leading role in promoting contemporary, strategic quality management concepts and practices. Likewise, quality management researchers should play an active role in China's efforts to improve quality. Future research should evaluate the effectiveness of alternative approaches to implementing TQM, and how implementation of TQM helps companies enhance their performance. Furthermore, the effect of contextual factors, such as the competitive environment, firm size, and characteristics of the industry, on TQM implementation and the effectiveness of different quality management practices should also be investigated.

References

- Carmines, E.G. and Zeller, R.A. (1979), *Reliability and Validity Assessment*, Sage Publications, Beverly Hills, CA.
- Child, J. and Tse, D.K. (2001), "China's transition and its implications for international business", *Journal of International Business Studies*, Vol. 32 No. 1, pp. 5-21.

-
- Chin, K.S. and Pun, K.F. (2002), "A proposed framework for implementing TQM in Chinese organizations", *International Journal of Quality & Reliability Management*, Vol. 19 No. 3, pp. 272-94.
- Chin, K.S., Pun, K.F. and Hua, H.M. (2001), "Consolidation of China's quality transformation efforts: a review", *International Journal of Quality & Reliability Management*, Vol. 18 No. 8, pp. 836-53.
- Chin, K.S., Sun, H., Xu, Y. and Hua, H. (2002), "A comparative study of quality management practices in Hong Kong and Shanghai manufacturing industries", *International Journal of Management*, Vol. 19 No. 4, pp. 576-81.
- Dunn, S.C., Seaker, R.F. and Waller, M.A. (1994), "Latent variables in business logistics research: scale development and validation", *Journal of Business Logistics*, Vol. 15 No. 2, pp. 145-72.
- Evans, J.R. and Jack, E.P. (2003), "Validating key results linkages in the Baldrige performance excellence model", *Quality Management Journal*, Vol. 10 No. 2, pp. 7-24.
- Garvin, D.A. (1988), *Managing Quality: The Strategic and Competitive Edge*, The Free Press, New York, NY.
- Ho, S.C. (2001), "Growing consumer power in China: some lessons for managers", *Journal of International Marketing*, Vol. 9 No. 1, pp. 64-83.
- Hughes, M.A., Price, R.L. and Marrs, D.W. (1986), "Linking theory construction and theory testing: models with multiple indicators of latent variables", *Academy of Management Review*, Vol. 11 No. 1, pp. 128-44.
- Lee, C.C., Lee, T.S. and Chang, C. (2001), "Quality/productivity practices and company performance in China", *International Journal of Quality & Reliability Management*, Vol. 18 No. 6, pp. 604-25.
- Lee, C.Y. and Zhou, X. (2000), "Quality management and manufacturing strategies in China", *International Journal of Quality & Reliability Management*, Vol. 17 No. 8, pp. 876-98.
- Liu, Y.Z. (1994), "TQM in the socialist market of China", *Asia Pacific Journal of Quality Management*, Vol. 3 No. 3, pp. 36-44.
- Nunnally, J. (1978), *Psychometric Theory*, McGraw-Hill, New York, NY.
- Pun, K.F. (2001), "Cultural influences on total quality management adoption in Chinese enterprises: an empirical study", *Total Quality Management*, Vol. 12 No. 3, pp. 323-42.
- Quazi, H.A., Hong, C.W. and Meng, C.T. (2002), "Impact of ISO 9000 certification on quality management practices: a comparative study", *Total Quality Management*, Vol. 13 No. 1, pp. 53-67.
- Solis, L.E., Rao, S.S. and Ragu-Nathan, T.S. (2001), "The best quality management practices in small and medium enterprises: an international study", *International Journal of Manufacturing Technology and Management*, Vol. 3 No. 4-5, pp. 416-43.
- Wilson, D.D. and Collier, D.A. (2000), "An empirical investigation of the Malcolm Baldrige National Quality Award causal model", *Decision Sciences*, Vol. 31 No. 2, pp. 361-90.
- Yeung, A.C.L., Chan, L.Y. and Lee, T.S. (2003), "An empirical taxonomy for a quality management system: a study of the Hong Kong electronics industry", *Journal of Operations Management*, Vol. 21 No. 1, pp. 45-62.