

Configuring Quality Management and Marketing Implementation and the Performance Implications for Industrial Marketers

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Abstract

This study empirically examines if different configurations of quality management and marketing (Q&M) implementation exist in various industrial organizations and explores their implications for firm performance. We survey 304 organizations that have operational quality management systems and conduct in-depth interviews with selected groups of respondent organizations to understand their market-oriented behaviours. We perform cluster analysis of the survey data to empirically construct taxonomic configurations of Q&M implementation that may exist in these organizations. The results show three distinct configurations with each configuration displaying specific implementation characteristics. We label the corresponding organizations as *reactive firms*, *progressive firms*, and *proactive firms*, respectively. In other words, each configuration represents a different extent of implementing Q&M in organizations. We also find that the empirically-derived configurations, corroborated with in-depth interview data, are associated with various firm performance measures. The analysis reveals that proactive firms in which Q&M are implemented at a high level attain the best firm performance. Despite the exploratory nature of this study, the taxonomy developed yields valid and reliable findings that have significant theoretical and practical implications for industrial marketers.

Keywords: Quality; Marketing; Performance; Survey; Case Study

1.0 Introduction

The competitive pressure of today's business environment has prompted many organizations to shift their operational emphasis from a production-oriented approach to a market-oriented approach, which accords customer satisfaction the highest priority. At the same time, many businesses respond to competition by embracing the concepts of quality improvement and total quality management (TQM), which espouses that firms link organizational visions, missions, and operating principles with satisfying customer wants, and that companies exploit quality as a means to this end (Lai & Cheng, 2003).

This quality management approach emphasizes organizational ability to continuously satisfy customer needs at a profit with the involvement of all of the organizational members. Implementation of quality management is consistent with the marketing management approach where the latter requires organization-wide generation of market intelligence pertaining to current and future customer needs, dissemination of the intelligence across departments, and organization-wide responsiveness to it for execution (Kohli and Jaworski 1990). Although quality management and marketing (Q&M) have been well defined and both are anchored in the concept of customer satisfaction, their management implications in relation to each other have not been adequately covered in the literature (Lai, 2003).

A number of studies have examined the impact of quality management, particularly TQM (e.g., Yeung, Cheng, & Lai, 2006), and the impact of marketing (e.g., Song & Parry, 2009) on business performance. In general, these studies tend to support the notion that Q&M are significant contributors to company success. Some studies, however, have questioned the value of quality management (e.g., Benner & Veloso, 2008) and of marketing (e.g., Merlo & Auh, 2009) to firm performance. Furthermore, the literature is short of empirical studies that examine different Q&M implementation configurations in organizations, although Q&M have been considered complementary management approaches for performance improvement (Lai & Cheng, 2005).

It has been suggested that the lack of successful joint implementation of Q&M is the missing link between these two management approaches (e.g., Kordupleski, Rust, & Zahorik, 1993). Therefore, it is desirable to establish a framework that considers the Q&M interface, identify different Q&M implementation configurations, develop a taxonomy of Q&M implementation configurations, and explore the performance implications of different Q&M implementation configurations. This will raise the confidence of organizations in implementing these two management approaches. In fact, the literature is unclear as to the following issues: Does the performance of firms vary with different configurations of Q&M implementation and, if so, which configuration will bring the best performance outcomes? Do organizations with a more desirable configuration with Q&M implemented at a higher level perform better, and vice versa? If different Q&M implementation configurations do exist in practice, then it will be useful to understand what characteristics each configuration possesses and specifically how they are associated with firm performance.

While a considerable number of studies have investigated either the quality management-performance relationship or the marketing-performance relationship, there is a serious lack of studies examining the two management approaches collectively focusing on Q&M implementation configurations and their associated performance implications. Today's business environment is characterized by diverse customer needs and rapid market changes, which present huge challenges to many businesses in managing their operations. Research linking internal operating processes and market needs is emerging in industrial marketing (Nath, Nachiappan, & Ramanathan, 2010) and operations management (Chintagunta & Desai, 2009). There is an urgent need for more studies to address the new challenges of quality management, particularly when firms are striving to meet rapidly changing market requirements (Schroeder, Linderman, & Zhang, 2005) and industrial relationships. We conduct this study with a view to shedding light on the questions of whether different Q&M implementation configurations exist in organizations and how different

configurations are related to firm performance. We also seek to explore the managerial implications of our research findings for industrial marketers.

2.0 Theoretical Framework

2.1 Quality Management

Quality is an abstract concept that is related to the desire of individuals involved in a transaction. Quality management in organizations emphasizes satisfaction of customer needs and wants. One important point to note about the meaning of quality is the multidimensional nature of the concept (Flynn, Schroeder, & Sakaibara, 1994). Reeves and Bednar (1994) point out that no one definition of quality is best in every situation with respect to measurement, generalizability, usefulness to management, and relevance to customers. The multidimensional nature of quality is also evident in the works of Garvin (1984, 1987), in which he proposes five bases and eight dimensions of quality, respectively. Indeed, a consensus of the concept of quality is important to drive performance, without which organizational directions might be obscured and efforts to improve quality compromised (Tatikonda & Montoya-Weiss, 2001). To direct employees' efforts towards the goal of customer satisfaction, a common understanding of the term "quality" is required (Lai, Cheng, & Yeung, 2005). Viewed from this perspective, quality has become a critical strategic issue rather than an operational one. Many organizations have employed quality management systems such as ISO 9000 and some have even taken a step forward by using such systems to link quality improvement and satisfaction of customer needs within a quality management framework (Yeung, Cheng, & Lai, 2005). In essence, what a quality management system emphasizes is organizational ability to satisfy customer needs precisely and profitably that involves all of the members of the organization. The desire to excel in the competitive marketplace that requires organizational flexibility and responsiveness to satisfy customer needs gives rise to the popular approach of quality management.

2.2 Marketing

Today's customers expect an increasingly higher level of product/service quality than ever before because they have more choices and possess better knowledge about product/service offerings. The challenge for any business to remain competitive is to determine what customers want and whether they are satisfied with the business' products/services (Almquist & Lee, 2009), which is the underlying philosophy of marketing. The marketing concept centers on the management of the market "exchange" between the customer and the organization. For decades, the marketing concept has been the core of practicing marketing (Uslay, Morgan, & Sheth, 2009). The marketing concept suggests that the long-term purpose of a firm is to satisfy customer needs for the purpose of maximizing corporate profits (Homburg, Wieseke & Bomemann, 2009). It requires firms to take a proactive attitude in doing business and to be responsive to customer needs and market changes. It helps organizations achieve exchange-determined goals more effectively (Houston, 1986). In contrast to the sales concept, which is short-term with a focus on the selling process, the marketing concept is strategically oriented towards long-term customer satisfaction, rather than sales volume, as the key to profitability (Homburg, Jensen, & Krohmer, 2008). A general belief that firms that are better equipped to respond to market requirements and to anticipate changing conditions are expected to enjoy sustainable competitive advantage and superior profitability. This view on the value of marketing capabilities to firm performance has been consistently substantiated with empirical evidence (Morgan, Vorhies, & Mason, 2009). As the development of marketing capabilities requires organization-wide generation of market intelligence, dissemination of the intelligence across functional units as well as responsiveness to it, this study defines marketing implementation as market orientation following the conception of marketing implementation by Kohli and Jaworski (1990).

2.3 Configuring Q&M Implementation and Industrial Marketing

Configuration theorists have long maintained that operational strategy is central to organizational outcomes (Chandler, 1962). Configuration of the organizational characteristics of a

business can be viewed as a desirable state leading to superior performance (Schulte, Ostroff, Shmulyian, & Kinicki, 2009). It has been argued that, in firms, certain elements of strategy, structure, and process tend to cluster together to form configurations, which are critical organizational characteristics that commonly occur together and which support firms in pursuit of their strategic goals (Doty, Glick, & Huber, 1993). In the marketing literature, researchers are paying increasing attention to the configurations of marketing activities in practice (Homburg, Jensen, & Krohmer, 2008; Vorhies and Morgan 2003). We have seen increasing numbers of industrial marketing researchers using the configuration approach to explain organizational configurations for marketing management. For instance, Gebauer (2008) identifies four service strategies, namely after-sales service providers, customer support providers, outsourcing partners, and development partners, in product manufacturing companies by exploring environment-strategy configurations using cluster analysis. To understand how subcontractors in the steel and metalworking industry can effectively upgrade their customer value offerings, Matthysens, Vandenbempt & Weyns (2009) identify the “ideal” value-added market positions and relate these to specific competence configurations with respect to processes and systems, assets, knowledge and capabilities, as well as culture and organizations. Using qualitative methodology and interview data, Biemans, Brencic, & Malshe, (2010) develop a dynamic, evolutionary spectrum of four B2B marketing-sales interface configurations, namely hidden marketing, sales-driven marketing, living apart together, and marketing-sales integration.

Their studies seem to suggest an increasing trend towards using the configuration approach to understand marketing’s interface with other functions of a firm such as quality management. This development illuminates the importance of empirically uncovering and showing the existence of certain theory-driven organizational configurations such as Q&M implementation and establishing their relationships with performance in industrial marketing research. Indeed, design of organizational configurations for implementing management practices has long been a popular research topic (e.g., Short, Panye, & Ketchen, 2008; Wong, Lai, & Cheng, 2009). From the

contingency perspective, Burton, Lauridsen, & Obel (2002) develop and empirically test a multicontingency model for strategic organizational design. Their study results highlight the importance of the configuration issue to performance success. Considering supplier integration as a bundle of practices, Das, Narasimhan, & Talluri (2006) examine if these practices in specific configurations can lead to superior performance and find an optimal set of supplier integration practices.

Using the configuration-theoretic approach, some studies have sought to explore if certain organizational configurations are more or less appropriate for certain competitive business strategies (e.g., Kabadayi, Eyuboglu, & Thomas, 2007). Furthermore, Aksin and Masini (2008) identify four configurations of shared service organizations and their relationships with performance. The general conclusion is that proper organizational configurations are conducive to achieving superior performance outcomes. This configuration-theoretic approach suggests that firms implementing Q&M with appropriate configurations (e.g., both Q&M implemented at high level) make greater contributions to their performance than do the implementation with misalignment or both implemented at low level. In industrial marketing research, information technology applications are configured as digitized logistics bundles where firms possess more extensive bundles and utilize them more intensively are found to achieve better logistics performance (Lai, Wong, & Cheng, 2010). Configuration issue on coalignment of environmental-quality management across different industrial contexts and the performance implications also receives research attention by industrial marketing scholars recently (Fuentes-Fuentes, Llorens-Montes, Molina-Fernandez, & Albacete-Saez, 2011). Along this line of configuration studies, marketing scholars have also found interest in examining the Q&M interface and exploring its performance implications. In a study on industrial firms, Calantone and Knight (2000) find that Q&M play important roles in their international performance. In examining the causes and performance outcomes of product quality alignment, Morgan and Vorhies (2001) suggest that effective cross-functional interactions between Q&M functions is essential to satisfying customer

quality requirements and that the resultant product quality alignment affects the business unit performance. Krasnikov and Jayachandran (2008) conclude that marketing capability has a stronger impact on firm performance than research-and-development and operations capabilities. Recently, Nath, Nachiappan, & Ramanathan (2010) find that a market-driven firm is likely to bring better business performance than a firm focusing solely on operational capabilities such as quality improvements. The insights from these studies are that firms should develop a holistic view to better coordinate industrial activities (e.g., distribution, transportation, warehousing) involving different parties in the supply chain. The design and implementation of market-oriented processes is essential for industrial marketers to deliver the required quality standards and improve supply chain-wide performance (Mason, Doyle, & Wong, 2006).

2.4 Q&M Implementation and their Configurations

Comparing the characteristics of Q&M, it is not difficult to discern the similarities of their basic orientations, which are obvious in their conceptual emphases on meeting and satisfying customer demands (Lai & Cheng, 2005). Quality as perceived by customers is inseparable from the usage context and the value of the product/service. The marketing concern is to analyze, plan, implement, and control the delivery processes to ensure conformance to the required quality for a beneficial exchange with customers. While quality management focuses on managing and controlling processes to satisfy customer needs with a full range of products and services, marketing is related to quality management via the standpoint of business process improvement to attain total customer satisfaction. Quality management, particularly when it is practised at a high level such as TQM, is congruent with the marketing concept, which prescribes satisfying customer needs (Yeung, 2008).

Despite its adherence to customer satisfaction, there are criticisms of marketing for being practised as a set of functional activities rather than organization-wide implementation that compromises the expected performance benefits (Baker and Hart 2008). Indeed, marketing personnel need to interact with other non-marketing specialists such as design, manufacturing,

finance, quality control, engineering, and R&D to reach for the common goal of customer satisfaction. The holistic nature of quality management can resolve the functional focus problem with the use of such integrative consensual decision-making mechanisms as quality circles, quality function deployment, and quality improvement teams for continuous process improvement to achieve customer satisfaction. On the other hand, there are chances for quality management efforts to develop an inward focus that lacks the voice of customers in the performance improvement process. The marketing role helps to assure that the design of quality products and services for customer satisfaction is based on market-driven quality rather than the management perception of quality requirements or internal procedures. The above discussion highlights that Q&M are complementary management approaches in implementation. They can gain by recognizing their common theoretical basis on customer satisfaction and their respective focuses, i.e., marketing on determining and translating customer requirements into market-led quality by soliciting, collecting, and analyzing marketing needs while quality management on continuous process improvements and team work allowing an organization to be more sensitive and responsive to the changing marketing environment.

According to configuration theory (Meyer, Tsui, & Hinings, 1993), ideal sets of organizational characteristics (i.e., configurations) of firms' strategic initiatives should exist that enable them to attain their strategic goals. From this perspective, a proper Q&M implementation configuration is expected to be a desirable state that will lead to superior firm performance (Lai, 2003). It is therefore an important topic to explore if there exist different Q&M implementation configurations and whether certain configurations are associated with superior performance. This configuration-theoretic perspective provides insights on the Q&M implementation-performance relationship and on the development of an ideal configuration for implementing Q&M as an organizational resource for firms to strive for performance advantages. From the resource-based view (RBV) of the firm, competitive advantage originates at the firm. In particular, competitive advantage for industrial marketing is derived from the resources and capabilities of the firm in the

marketing channel (Auh & Menguc, 2009). Q&M implementation configurations may also exhibit the inimitability and non-substitutability characteristics essential for the firm to achieve competitive advantage. For instance, if a firm's superior performance results from a Q&M implementation configuration, it will be difficult for competitors to imitate and there may be no substitute to replicate the success. Following configuration theory, it is logical to predict that a proper Q&M implementation configuration is essential for superior firm performance. The above argument is consistent with the notion of strategic choice (Child, 1972). Based on this notion, Chakravarthy (1982) develops a framework of organizational adaptive states that has specific implications for structure and strategy. Firms have different adaptive orientations based on their patterns of choices with respect to strategy and structure and, as a consequence, they adopt different operational procedures and activities (Conant, Mokwa, & Varadarajan, 1990).

2.5 Q&M Implementation Configurations and Firm Performance

In this study we consider quality management as an internal operations capability, with which firms embark on continuous improvement initiatives to enhance their operational efficiency through process improvements (Yeung, Cheng, & Lai, 2005), which lower costs by way of higher efficiency. In contrast, marketing is an external operations capability, with which firms proactively and aggressively satisfy market requirements (Kohli & Jaworski, 1990) through integration of all the marketing related activities using superior market knowledge from customers and competitors. According to RBV, coordinated efforts should be made for developing these two capabilities as an inimitable resource to bring cost and service advantages. Hence, a suitable Q&M implementation configuration will be conducive to a firm's strategic choice of a better overall capability to compete in the marketplace.

The existence of Q&M implementation configurations is congruent with the concept of fit as a gestalt in strategy research (Venkatraman 1989). The fit as a gestalt perspective suggests searching for archetypes such as Q&M activities and determining organizational adaptation for

performance improvement actions. Without proper configuration of the external quality desired by customers and the internal quality delivered by organizational processes, the innovativeness and the new product success of the firm can be compromised (Molina-Castillo & Munuera-Aleman, 2009). This underlies the need for configuring the two management approaches in their implementation. In line with this view, a high-high configuration of Q&M implementation should yield performance outcomes superior to other configurations (Lai & Cheng, 2005).

Nevertheless, it is possible that organizations may implement quality management in an environment that totally lacks a market focus and that is driven by the sake for production. Equally, it is possible for organizations to be highly market-oriented, but stuck in the primitive stage of quality improvement (Yeung, 2003). To illustrate, TQM, quality assurance, and inspection represent different extents of implementing quality management with TQM at the highest level and inspection at the lowest level. For marketing implementation, a production orientation focuses on operational efficiency, cost minimization, and mass distribution to serve customers at an attractive price. Functional marketing is more advanced that treats marketing as a selling-oriented function under the belief that customers will purchase more goods and services if aggressive sales and advertising methods are used. To progress further requires an awareness of competitors' offerings and capabilities, as well as how they are viewed by customers, with a full understanding of the organization's own capabilities relative to the competition in satisfying market needs. An organization-wide implementation of the marketing concept beyond the marketing function (i.e., market orientation) is needed for such a high level of marketing implementation. The creation of sustainable competitive advantage requires a close partnership between Q&M. A firm must therefore recognize the Q&M interface and the complementary nature of Q&M in formulating business strategies for superior performance (Lai & Cheng, 2005). This is consistent with Piercy's (2009) call for alignment between boundary-spanning functions whereby internal operations are commensurate with external relationships with customers, suppliers, and partners for superior innovation capabilities and business agility to develop.

It is expected that merely implementing quality management systems in organizations without considering integrating them with marketing activities and customer requirements would dilute the competitive power that quality management could deliver. On the other hand, a high level of market orientation without paying due attention to important quality issues would not achieve superior business performance due to the high cost of quality. Therefore, we posit that different Q&M implementation configurations in organizations exist and that better performance is expected for those implementing Q&M at a high level. Based on the discussions above, we develop the following proposition:

Proposition: *Firms with different configurations of Q&M implementation have different firm performance outcomes. Specifically, firms implementing Q&M at an overall higher level attain superior firm performance.*

3.0 Research Methodology

Our investigation of Q&M implementation configurations is exploratory in nature with little prior knowledge of the subject. Following Homburg, Jensen, & Krohmer (2008), we empirically group organizations by cluster analyses, followed by company interviews with qualitative findings to supplement the survey findings and to enrich the conceptual development of Q&M implementation configurations.¹ The population of our study consists of all the firms in Hong Kong that practise quality management and we examine the Q&M implementation configurations of firms sampled from this population.

We choose the study respondents based on the key-informant methodology.² For each sample organization, the target respondent is the quality manager or the personnel responsible for

¹To ensure the validity of the sample selection, the sampled organizations need to demonstrate certain levels of sophistication in quality management implementation before we examine their marketing implementation in terms of market-oriented behaviours. In doing so, we sampled Hong Kong Management Association's (HKMA) quality award winners and finalists and all the companies in Hong Kong certified to the ISO 9000 series.

² We acknowledge that bias in data collection may stem from the use of a single respondent in our study. However, a key-informant may provide a more reliable source of information and help to ensure that the respondent has the

quality management in the organization.³ To enrich the survey research findings, we conduct a *post hoc* study involving a cross-case investigation of selected firms that display different Q&M implementation configurations.⁴ The research procedures involve the use of an interview questionnaire (developed based on the survey research items and focusing on the “how” and “why” questions), a replicable field guide, the development of a database of the evidence collected from the case studies, triangulation of multiple sources of evidence to test for convergence, and reviews of the draft case studies reports by the key informants (Yin, 2009).

3.1 Study One

We drew a sample of 1,092 organizations from the buyer’s guide of the Hong Kong Quality Assurance Agency (HKQAA), the *ISO 9000 Directory* published by the Hong Kong Trade Development Council (HKTDC), and the list of winners and finalists of the Hong Kong Management Association’s (HKMA) quality management award.⁵ The two mailings of the survey questionnaire yielded 342 returns with 304 of them valid for data analysis, representing a usable response rate of 28.6%. The sample consisted of 69 manufacturing firms, 107 service firms, 114 construction firms, and 14 public utilities.⁶ The organizational characteristics of the sample firms are summarized in Table 1.

< Insert Table 1 about here >

One way of measuring organizational implementation of management approaches is by gauging the resource allocations deployed to support the activities concerned. Perceptual measures

necessary knowledge to respond (Lai, Bao, & Li, 2008). We target a single well-informed respondent from each sampled organization.

³ Because a quality management system requires an organization-wide focus, it is natural to assume that these informants have a good understanding of quality management and an appreciation of how such systems are related to market intelligence generation, market intelligence dissemination, and responsiveness to market intelligence in their organizations, as well as the resultant performance impact.

⁴ In the *post hoc* study, the research design adopts several techniques to ensure the quality of the case studies and confirm the empirical survey findings.

⁵ We solicited only one response from each sample organization. Measures were taken to cross-check the sample to avoid double mailing. We sent out the questionnaire twice.

⁶ We conducted a test of non-response bias using the *t*-test, with the respondents in the first and the second mailings being used as the proxy “respondents” and “non-respondents”, respectively, to determine if there are significant differences in the mean scores of Q&M and firm performance constructs between the two groups. The results show no differences between the two groups at the $p > 0.05$ significance level, suggesting that non-response was not a problem in this study.

are used in this study due to several reasons.⁷ We review the Q&M literature to define the meaning and domain specifications for the constructs of quality management, marketing, and firm performance.⁸ The list of all the theoretical constructs and their measurement items is summarized in the Appendix.

We adopt Black and Porter's (1996) 10-dimension, 32-item instrument to measure quality management implementation. The ten dimensions are: people and customer management (Q-PCM), supplier partnerships (Q-SUP), communication of improvement information (Q-CII), customer satisfaction orientation (Q-CSO), external interface management (Q-EIM), strategic quality management (Q-SQM), teamwork structures for improvement (Q-TSI), operational quality planning (Q-OQP), quality improvement measurement systems (Q-QIM), and corporate quality culture (Q-CQC)⁹.

We adopt Kohli and Jaworski's (1990) conceptual definition of marketing implementation because of its wide acceptance in the marketing literature. We use the 20-item MARKOR instrument developed by Kohli, Jaworski, & Kumar (1993), which covers three aspects of market orientation, namely market intelligence generation (M-MIG), market intelligence dissemination (M-MID), and responsiveness to market intelligence (M-RMI).¹⁰ While both Q&M emphasize the satisfaction of different stakeholders, many past studies about their performance impacts are

⁷ First, there is no secondary source that provides detailed data on the theoretical constructs of Q&M implementation. Second, Zahra and Covin (1993) note that few secondary sources provide details that allow one to measure accurately constructs pertaining to management practices in firms. Third, prior research has provided well-developed, valid, and reliable scales for the constructs examined in this study (Black & Porter, 1996; Kohli & Jaworski, 1990). Fourth, several studies have concluded that perceptual measures are valid and reliable for evaluating Q&M implementation and using such measures facilitates comparisons among firms in different industries (Lai, Bao, & Li, 2008; Yeung, 2008).

⁸ We develop and refine the three constructs on the basis of: 1) the original instruments used in other studies, 2) panel interviews with practitioners and academicians, and 3) questionnaire pretest with managers in a social setting organized by The Hong Kong Total Quality Forum. We use perceptual measures on a five-point Likert scale (ranging from 1 = strongly disagree to 5 = strongly agree).

⁹ This scale is modeled after the Malcolm Baldrige National Quality Award (MBNQA) which is used in the United States to recognize national leader in quality management efforts. Unlike other scales such as Yeung et al (2006) with a manufacturing focus, the scale by Black and Porter (1996) is more generic for evaluating quality management implementation across a wide variety of industries which was required in this study.

¹⁰ We make minor modifications and add illustrative examples to some items in the original MARKOR scale to adjust the semantic meanings to suit the Asian culture in Hong Kong and to enhance the content validity of the instrument measuring market orientation.

confined to financial-related indices only (e.g., Morgan, Vorhies, & Mason, 2009).¹¹ The quality of marketed-oriented behaviours should be considered to improve performance measurement by examining multiple dimensions of performance (Cadogan, Souchon, & Procter, 2008). Considering these issues, we measure firm performance on different dimensions, addressing the interests of various stakeholders rather than those of stockholders only (Lai, 2003).¹² We assess the validity and reliability of the three constructs using coefficient alphas (Cronbach, 1951) and item-total correlation analysis. We perform confirmatory factor analysis (CFA) to evaluate the three constructs at both first-order and second-order levels.¹³ Table 2 summarizes the construct measurement results. We perform appropriate statistical tests to examine the convergent, discriminant, and nomological validity of all the theoretical constructs.

< Insert Table 2 about here >

We use Cronbach's alphas to assess the reliability of the measures¹⁴ and assess convergent validity based on construct items loadings and achieved satisfactory results.¹⁵ Having determined that the latent constructs and their observed indicators possess acceptable measurement properties, we proceed to develop the empirical taxonomy (details of the measurement results are available upon request).

Common method bias commonly exists in self-reported surveys in organizational research. To determine the seriousness of common method bias, we apply Harman's one factor test between

¹¹ It is unlikely that any single performance measure such as traditional financial measures can appropriately serve the purpose of evaluating firm performance in an industrial setting, particularly for management approaches such as Q&M, which consider the benefits of multiple stakeholders (Gonzalez-Benito & Gonzalez-Benito, 2005).

¹² The measurement considers a broader perspective of performance beyond financial measures and captures the performance levels of organizations in the past three years in terms of employee motivation, market performance, productivity, and impact on society.

¹³ We give primary attention to CFA and estimation of higher order constructs (i.e., quality management implementation, marketing implementation, and firm performance) in the model using composite scores.

¹⁴ All the alpha values of all the first-order factors of the three constructs exceeded the 0.70 threshold level, except two (Teamwork structures for improvement with $\alpha = 0.67$ and Corporate quality culture with $\alpha = 0.69$), that were just a shade below the threshold.

¹⁵ We further examine and establish discriminant validity with phi estimates (i.e., inter-correlations among first-order constructs) and by comparing a model with the correlation constrained to one with the unconstrained model (Fornell & Larcker, 1981). Nomological validity is established by the positive, significant inter-correlations among the constructs.

quality management implementation (39 indicators) and firm performance (15 indicators), and between marketing implementation (20 indicators) and firm performance.¹⁶ The predictor variables (i.e., quality management) and criterion variables (i.e., firm performance) are clearly distinguished from one another to form distinct and different factors, suggesting any potential influence of common method bias is very limited.¹⁷

4.0 Taxonomy Development and Exploration of Clusters

Cluster analysis is very sensitive to outliers. A careful examination of the data confirmed that there was no abnormal case, so we included all the sampled firms in performing a cluster analysis. We use both hierarchical and non-hierarchical cluster procedures in this study.¹⁸ To begin with, we used hierarchical procedures to determine the number of clusters that should be formed and applied the non-hierarchical method to produce clusters. For hierarchical procedures, we analyzed the agglomeration coefficients.¹⁹

< Insert Table 3 about here >

4.1 Number of Clusters

There are two basic approaches to determine the number of clusters that have evolved. They include analysis of agglomeration coefficients and the use of dendrograms. The statistical results

¹⁶ In this procedure, we enter all of the variables of interest into a factor analysis. Following this, we examine the results of the un-rotated factor solution to determine the number of factors that are necessary to account for the variance in the variables. The basic assumption of this technique is that if a substantial amount of common method variance is present, either (a) a single factor will emerge from the factor analysis or (b) one “general” factor will account for the majority of the covariance in the independent and criterion variables (Greene & Organ, 1973). This method has been widely deployed in organizational research (e.g., Lai, 2009).

¹⁷ This also indicates that the relationships between dependent and independent variables are not common method variances. In addition, we use a marker variable - employee number, which is not theoretically related to any of the theoretical variables in this study, to assess the threat of common method bias (Lindell & Whitney, 2001). The results indicate that the marker variable was not significantly related to any of our theoretical variables, providing further support that common method bias was not a serious issue in our study.

¹⁸ Hair, Black, Babin & Anderson (2010) suggest that researchers use both hierarchical and non-hierarchical methods to eschew their potential problems.

¹⁹ Analysis of agglomeration coefficients is a very objective way for determining the number of clusters as it is based on changes in agglomeration coefficient to a next level of clusters. A large change in the coefficient implies that very different clusters are combined, suggesting that further agglomeration of clusters is inappropriate. Our analysis of agglomeration coefficients clearly indicates that clusters could be combined up to three major clusters. These three clusters are very distinctive such that further combination of clusters (from 3 to 2) would greatly increase the agglomeration coefficient, resulting in very different clusters being combined. Please refer to Table 3. In addition, our analysis of many randomly divided sub-samples dendrograms further confirms that three clusters can be clearly distinguished.

based on agglomeration coefficients suggest that a classification of the respondent firms into two or three clusters provides a valid solution.²⁰

4.2 Final Centroids of Clusters

Given that three cluster solutions were specified, we used a non-hierarchical cluster analysis to generate the results. Figure 1 plots the final centroids of the clusters of the different constructs.²¹

< Insert Figure 1 about here >

4.3 Validation of Clusters

If a cluster solution is repeatedly discovered across a few sub-samples of a large sample, the researcher may conclude that the solution is internally consistent (Sharma, 1996).²² The results of a one-way Analysis of Variance (ANOVA) suggest that all of the underlying factors of Q&M implementation in the three clusters of firms are significantly different ($p = 0.000$). In order to test the significance of the differences of quality management implementation across individual groups, we conduct Scheffe multiple comparison tests.²³ We use four areas of firm performance as external criteria and the results confirm that the measures of firm performance are significantly different ($p < 0.01$) in these four groups, providing evidence of external validity of the taxonomy. Figure 2 presents the firm performance of the three clusters of Q&M implementation configurations.

< Insert Figure 2 about here >

²⁰ A classification of two, however, results in two groups of clusters, representing normal Q&M implementation and a few special cases of implementing Q&M at a low level. With a more detailed classification that is theoretically interesting, a taxonomy of three clusters represents a better solution. A dendrogram is a visual representation of the steps in a hierarchical cluster analysis. It identifies the clusters being combined and the values of the coefficients in each step. Random sampling of dendrograms confirms that a classification of three clusters gives the best solution.

²¹ The centroids of clusters are the mean values of each variable in a cluster. The centroid values represent the general characteristics of a cluster. We provided the abbreviations in the previous section.

²² The replicability of a cluster solution provides some evidence of generalizability of the sample. We divided the sample randomly into approximate halves by a computer. We obtained a similar pattern of cluster centroids of the sub-samples to the original solution, providing evidence of internal consistency of the cluster solution (Ketchen & Shook 1996).

²³ Although the Scheffe test is a very conservative procedure in terms of protesting against type I error (Stevens, 2009), all the 39 possible combinations in the 13 constructs are highly significant ($p < 0.01$). Aldenderfer and Blashfield (1984) point out that significant tests of external variables are one of the best ways to test a clustering solution for external validity.

4.4 Interpretations of Clusters

Through the cluster analysis, we identify three clusters of firms characterized by their Q&M implementation configurations with evidence of both internal and external validity. However, these clusters must be interpreted with reference to theories germane to our study. The interpretation stage of a taxonomy involves examining the cluster variate and assigning a label that accurately describes the nature or characteristics of each cluster (Hair, Black, Babin & Anderson, 2010)

Cluster 1 (Reactive) firms score very low on various dimensions of quality management implementation, in particular communication of improvement information, customer satisfaction orientation, teamwork structure for improvement, and corporate quality culture. The magnitudes of the three aspects of marketing implementation in this cluster of firms are relatively high compared with many dimensions of their quality management implementation. However, their marketing implementation is low in comparison with other clusters in the taxonomy. It seems that this cluster of firms is particularly passive in generating and disseminating market intelligence to aid decision making in their business operations. Although they are rather responsive to market intelligence, they lack integrating the voice of customers in their business processes. One of the major reasons could be the lack of a teamwork-orientated quality culture to improve communication, including the sharing of information or intelligence of customer satisfaction. Most of the scores are below 3, which implies that this cluster of firms practice quite limited quality principles and there is a low level of marketing intelligence generation and dissemination. These firms' quality management practices are driven by "response to customers" or "response to problems". We label this cluster of firms as reactive firms.²⁴

Cluster 2 (Progressive) firms score much higher on quality management implementation, especially on dimensions relating to customer satisfaction orientation, external interface management, and corporate quality culture. Most of the scores are between 3 (neutral) and 4 (agree), implying that they follow the principles of quality management to a good extent. The development

²⁴ There are 49 firms in this cluster, making up 16.1% of the sample.

of quality management ideas progresses in a few major stages and “quality assurance” represents an intermediate stage of development. According to Juran and Gryna (1993), quality assurance refers to “all those planned or systematic actions necessary to provide adequate confidence that a production or service will satisfy given requirements”. In this Q&M implementation configuration, marketing implementation is concerned with product evaluation, captive service activities, and special survey and competitive evaluations. Organizations with this configuration only have a medium level or a standard function of market intelligence generation and dissemination, with the marketing implementation being confined to the responsibility of the marketing department only. We label this cluster as progressive firms.²⁵

Cluster 3 (Proactive) firms achieve consistently higher scores on all the dimensions of Q&M implementation. All the scores are above 4 (agree or strongly agree), implying that their practices are very close to the norms of total quality and market-oriented management. Compared with progressive firms, they score much higher on some soft quality management dimensions such as teamwork structures and corporate quality culture. Similarly, their scores on market intelligence generation, dissemination, and responsiveness to the intelligence are also higher, despite to a lesser extent. Since this cluster of firms achieve consistently high scores on all the aspects of their Q&M implementation, they seem to be practising a high level of quality management with a high degree of integrating the voice of the market. We label them as proactive firms. When the quality movement of an organization proceeds to an advanced configuration and the organization enters the TQM paradigm, it experiences market-driven quality where all the employees think and act to improve organizational systems to provide superior customer value (Yee, Yeung, Cheng, & Lai, 2009). It achieves internal integration, where employees cohere as a group centering on customer needs.²⁶

²⁵ Over half of the firms (52.6%) belong to this cluster.

²⁶ There are 95 firms belonging to this cluster, making up 31.3% of the study sample. Public utilities and service firms take up a higher percentage in this cluster.

4.5 Determining performance of Q&M Implementation Configurations

To determine if the three clusters of firms characterized by their Q&M implementation configurations vary in firm performance, we compare their organizational outcomes in four performance aspects.²⁷ Subsequently, we apply the General Linear Model in the analysis (Monahan, 2008) and the results, as shown in Table 4, indicate that all four aspects of firm performance significantly improve when organizations move from being reactive to progressive, and from being progressive to proactive. Such results imply that firm performance is significantly enhanced when an organization reaches a higher level of implementing Q&M. Our proposition is generally supported.²⁸

< Insert Table 4 about here >

Figure 3 shows the overall relationships between average Q&M implementation configurations (the mean of the average scores of the quality management and marketing constructs) and firm performance. Statistical analyses suggest that the strength of the relationships between the two management approaches varies among the different Q&M implementation configurations. For reactive firms, the strength of the relationship between Q&M implementation configuration and firm performance is strong ($r = 0.622$). However, the significance and strength of the relationship drops for progressive firms ($r = 0.440$). For proactive firms, the effect of Q&M implementation configuration on firm performance is highest ($r = 0.700$). These differences in relationships (r) are statistically significant, providing further support for our proposition.

< Insert Figure 3 about here >

4.6 Comparing Performance of Q&M Implementation Configurations

²⁷ Previous research has suggested that business size is likely to interact with marketing and operational practices, leading to a different effect on firm performance (Kinney & Wempe, 2002). In this regard, we consider sales turnover as an objective measure of “business size”.

²⁸ As a control factor, business size significantly influences firm performance in terms of market performance, productivity performance, and societal performance in earlier stages of implementing Q&M (from reactive firms to progressive firms). However, in later stages of implementing Q&M (from progressive firms to proactive firms), business size yields no advantages - only Q&M implementation configurations are important factors. There is little interaction effect between Q&M implementation and business size on firm performance. Nevertheless, regarding the effects on societal performance, business size interacts with the transformation from progressive firms to proactive firms (i.e., larger proactive firms attain significantly better societal performance).

Table 4 summarizes the average scores of the four aspects of firm performance attained by the three clusters of firms characterized by their Q&M implementation configurations. The results show that if Q&M implementation is configured in a positive direction, all four aspects of firm performance are enhanced. However, the effect is nonlinear. As mentioned above, the strength of the relationship between Q&M implementation configuration and firm performance varies between the three firm clusters. Specifically, this relationship is weaker for progressive firms, but stronger for reactive and proactive firms as shown in Figure 3.

Our results suggest that reactive firms are normally production-oriented. They emphasize short-term sales activities and tend not to have strong and well-planned organization-wide marketing implementation. While progressive firms demonstrate some operational forms of marketing implementation, they restrict these activities to a functional focus (e.g., confined to a marketing department). In other words, marketing planning, customer services, and client management are solely the responsibility of a few people in a functional marketing department. Quality management implementation is limited to some problem-prevention and -solving activities. The progressive firms are very unlikely to render themselves to either a production-oriented or market-oriented focus. On the other hand, organizations in the more advanced stage as proactive firms with TQM for quality improvement have company-wide marketing implementation in their organizational systems. Our empirical taxonomy provides important insights on Q&M implementation in organizations. It is seldom for firms to focus on quality management or marketing alone and the cluster analytic results show a positive association between Q&M in their implementation. Figure 4 summarizes the three clusters of firms characterized by their configurations at different levels of Q&M implementation. The three types of firms clustering according to their Q&M implementation configurations suggest that superior performance requires partnership of the two management approaches. Our results suggest that proactive firms implementing Q&M at higher levels outperform their progressive and reactive counterparts with Q&M implemented at lower levels. A firm must therefore recognize the Q&M interface and their

complementary nature in the formation of business strategies for improved performance. Another important insight is that quality management lacking the voices of customers would compromise improvement efforts. Similarly, market orientation requires appropriate attention to quality issues to avoid the high costs of quality improvements. To find support for these insights, we carried out case studies in the next research step in study two.

< Insert Figure 4 about here >

4.7 Study Two

4.7.1 Case Analyses Comparing Reactive Firms and Proactive Firms

To supplement the survey findings and to have a better understanding of the practical differences among Q&M implementation configurations, we conducted case studies with selected respondent firms to enhance our survey research with rich and in-depth qualitative data²⁹. Following the recommendations of Yin (2009), we collect from the case studies evidence that involves multiple sources including company documents, archival data, and personal interviews³⁰. We conducted an initial interview at each site with the quality manager and subsequently with all the other people identified to have an involvement in the Q&M interface (e.g., human resources, marketing, supervisors, and shop-floor employees).³¹ As the firms wish to remain anonymous, we conceal their identities and refer to them as Firms A and B and Firms C and D, representing organizations that are high and low, respectively, in both levels of Q&M implementation. Following Yin (2009), we use the pattern-matching and explanation-building techniques to analyze the case data. The discussion below summarizes the key findings from the case studies.

²⁹ The objective of this case-based research is to provide further evidence of the validity of the survey results and to triangulate the survey findings with multiple sources of evidence from the case analysis. This multiple research method has been found useful to enhance the validity of empirical findings by using different data collection sources (Jick 1979).

³⁰ We performed a combination of within- and cross-case analyses. We selected four firms, where two are high (composite mean score > 3.50) and two are low (composite mean score < 2.50) in both levels of Q&M implementation. We chose the four cases for literal replications under each of the above two theoretical replication conditions.

³¹ The use of multiple respondents makes it possible to develop converging lines of inquiry. We conducted a total of 20 one-to-one interviews for the four case studies. The length of the interview time ranged between 30 to 90 minutes. We tape-recorded all the interviews and later transcribed the contents for the compilation of the case studies in English.

Both Firms A (a public utility) and B (a hotel) are dedicated to quality improvement to ensure high quality offerings to their customers. Top management in the two firms is committed to providing top quality services, and prioritize quality issues in their long-term planning. They have favourable perceptions of their strategies for quality improvement, of which their employees are aware. The two firms set goals and policies (e.g., in performance pledges) geared towards customer satisfaction, both internally and externally, and continuous improvement of their operations. Thus, they manage to translate their company goals into operational objectives. Their employees are empowered and provided with training opportunities to acquire the knowledge and skills needed to accomplish their company's goals. Teamwork structures in both organizations are flexible enough (e.g., process owners are appointed for process improvement across functions) to enable employee participation in quality improvement that helps to maintain a high level of quality management implementation in both firms

Marketing implementation in the two firms is high. They take a broad approach to generate market intelligence, encompassing nearly all the aspects of their business operations, including information on customers, competitors, and the broader business environments such as government regulations and technology levels in their industrial sectors. The two firms employ some form of customer survey on a continuing basis to integrate the voice of customers in the products and services they offer, and to track their performance with regard to customer satisfaction. As the two firms are highly dependent upon their daily interactions with customers, they rely on the efficiency and speed of their communication systems to ensure a timely response to customer needs and requirements of the marketplace. The emphasis on the multi-directionality of information flow is apparent in both firms. There is a stress on facilitating channels of communication between various functions, and market intelligence is not confined to the upper management level or distributed vertically in an ad hoc manner in the two firms. Rather, formal and systematic methods are employed for the dissemination of market intelligence to all the levels within the organizations (e.g., regular meetings and use of newsletters). The two firms continuously monitor their business

outcomes and assess the effectiveness of, and adjust their strategies, if necessary, in response to market changes.

In both cases, the firms are convinced that quality improvement and market orientation are key to business success. They are proactive and ready to respond effectively to customer needs and market changes. Both firms achieve a reasonably high level of firm performance in terms of customer and employee satisfaction.³² Firms C and D are construction firms, which only recently obtained ISO 9002 certification. Both of them have implemented an ISO-based quality management system. Although their ISO management systems guide them on the application of quality management, their work plans are not focused on customers and are not based on continuous improvement either. Customer feedback is not regularly monitored and work results are not audited effectively. The quality management systems implemented in the two firms, to a great extent, are due to customer pressure (i.e., stipulation of the Hong Kong Housing Authority for ISO-certified status for the tendering of public construction work). The quality management activities of the two firms tend to be confined to “specification matching” rather than “customer satisfaction striving”. However, they recognize that quality management plays a positive role in standardizing work procedures and enhancing customer confidence in their offerings.

Employees in both firms appear not to be too keen on quality improvement because of a lack of management support, motivation, and empowerment. Although the employees are provided with training in quality management, they are not eager to pursue quality improvement due to a lack of motivation from management. Commitment and involvement of both middle and top management to quality management are not evident. The majority of the quality efforts observed in

³² In Firm A, there is a 4% growth rate in customer headcounts and the employee turnover rate is 7.3%, which compares favourably with the average employee turnover rate of 20.4% in Hong Kong. In Firm B, customer satisfaction and market share are on an upward trend. This is evidenced by the many awards won by the firm for its excellent services and the votes by various independent bodies as one of the best hotels in Hong Kong. In terms of employee retention rate, it has improved from 80% to 85%, the highest among hotels in Hong Kong. Both firms' productivity and market performance are also impressive. The revenue generated from operations in Firm A has been on an upward trend and has recorded a 12% rate of growth in the return on average net fixed asset from 11% two years ago. The firm also reports a 3% decline in real operating cost per customer. Similarly, a productivity index compiled by Firm B that covers different ratios including staff/guest ratio, room/night ratio, and laundry coverage ratio indicates that the index is up 5.7% compared with the previous year's index.

these two firms mostly centre on developing existing operations in a marginal way to meet customer needs and, to a larger extent, to maintain their ISO-certified status.

Both firms exhibit a low degree of marketing implementation. The scope of market intelligence generations in the two firms is narrow and confined only to existing customers. They do not employ any proactive means such as customer surveys to determine the needs of customers but rather wait for customers to award new contracts to them. Market intelligence in both firms appear to be disseminated in a restricted way (i.e., only shared within functions and mostly at the discretion of management). Very often, market intelligence in the two firms is disseminated through informal channels such as personal dialogues among engineers because they are the few in the two firms that are actively involved in matching customer specifications. However, the engineers are not keen to keep members of the other functions in their organizations (e.g., marketing, human resources, and finance) informed of the progress and quality standards of the project work, even though they are themselves highly reliant upon these functional areas for advice, resources, and information. Although top and middle managers regularly hold meetings to formulate policies and solve problems, the results are not always made known to shop floor workers. Customer and market related information and performance results are not effectively disseminated to all the working units.

Both firms display low responsiveness to market intelligence and tend to focus their responses on their current customers only. In short, they are often reacting to changes taking place in the markets, without sufficient market knowledge to consistently design and implement strategies that are proactive. Both firms lack a real market orientation and focus. They do not adopt any performance indices for performance evaluation either. We could not assess their productivity performance based on real figures. As observed, performance improvement in these two firms is not evident in terms of market performance, employee satisfaction, and productivity. Their quality management practices seem to adopt the “quick fix” approach to meet the requirements of the ISO-

certified status for public work tenders. However, they recognize the benefits of a quality management system including clear work procedures and an increase in customer confidence.

4.7.2 Summary

In Firms A and B, quality management provide them with a unifying focus and integrated the efforts of all the employees, from top management to front-line staff, to continuously improve their business operations for customer satisfaction. Quality management in the two firms helps assure customer focus, give employees a clear role in quality management, and facilitate continuous improvement. All these quality management practices are reflected in their resulting firm performance - increased customer and employee satisfaction, and improved market performance and productivity.

Although Firms C and D do not practise quality management well, they recognize the benefits of quality management. It gives them a well-defined and formulated quality policy that contributes to standardized work procedures and reduces job variations. The quality management practices in the two firms appear to be inward-focused and concerned with internal documentation and work procedures. They run the risk of losing sight of market needs and the voice of customers in their quality improvement journeys. Because of a lack of a common language for quality management (e.g., customer satisfaction), collaboration among functional areas and coordination of organizational activities is not obvious.

The cross-case findings provide support for the findings in the survey research that Q&M are complementary management approaches in organizations. Quality management acts as an integrating mechanism to drive organization-wide efforts to satisfy customers efficiently, while marketing imbues organizational members with the importance of customer satisfaction and assures a market focus on quality management efforts.

5.0 Discussion and Implications

This research seeks to advance the theoretical understanding of the Q&M interface from the configuration theory perspective. The findings of our research extend those of prior studies, which mostly concentrate only on cross-functional integration (Swink & Song, 2007) but do not explore Q&M implementation configurations and their performance implications. The results of our two studies suggest that the achievement of superior performance requires organization-wide efforts. Not only should the Q&M interface in the organization be understood, but it should constantly be reinforced in the workplace in view of the fact that customer satisfaction is the responsibility of every organization member instead of being left to some specialized departments. The philosophical elements of Q&M need to be communicated to both quality and marketing specialists, and other organizational members, to discourage a “departmental focus” in order to widen the appreciation for Q&M in business operations.

In view of Schroeder, Linderman, & Zhang’s (2005) call for research on quality with a market focus, we contribute knowledge to this under-explored research area. While the Q&M interface has long been neglected in the literature, recently there is an increasing call for attention to this and related topics (e.g., Chintagunta & Desai, 2009). To the best of our knowledge, this study represents one of the most comprehensive studies on the Q&M interface with survey data collected from over 300 organizations in various industries. Our study results indicate that Q&M implementation configuration is important to firm performance. Consistent with configuration theory, the results suggest that simply implementing a quality management system such as the ISO 9000 series alone without the voice of customers and the marketing link (e.g., a procedural-based quality management system putting the interests of customers at a lower priority as in the case of reactive firms) does not appear to be comprehensive enough to gain competitive advantage. In a similar vein, formulating a quality strategy with the participation of the whole organization in continuous improvement, with the interests of customers being put at the very heart of the business operations as in the case of proactive firms, should provide a more coherent and comprehensive

road map for Q&M implementation configurations. From the configuration-theoretic perspective, firms with a high level of Q&M implementation configuration can engender better performance outcomes than those with an unbalanced implementation configuration. Q&M implementation configurations can be developed as a valuable resource unique to organizations that is not imitable and replaceable, providing a basis for firms to attain cost and service advantages.

In addition, we identify three clusters of firms characterized by their Q&M implementation configurations in the empirical taxonomy. This makes a contribution to understanding the Q&M interface characteristics and their implementation symbiosis among the firm clusters. The empirical taxonomy, supplemented with the case study findings, supports the complementary nature of Q&M configurations and their collective implementation. It should be noted that we identify no cluster of firms characterized by divergent Q&M implementation configuration. The taxonomy confirms that Q&M are reinforcing each other in their implementation. In exploring the outcomes of Q&M implementation configurations, the results suggest that the configuration in proactive firms is more successful than those in the other two clusters. The proactive firms are characterized by implementing both Q&M at a high level. Practical and strategic methods to implement Q&M must be developed and introduced to both Q&M disciplines. This calls for further empirical research, as well as conceptual development, on the essence of the Q&M interface.

For industrial marketing management, congruent beliefs and expectations are imperative to motivate the exchange parties towards developing a committed buyer-supplier relationship in the supply chain (Andersen, Christensen, & Damgaard, 2009; Lai, 2009). Divergent relationship expectations pertaining to quality requirements, role specification, coordination, and planning efforts may lead to increased costs, as well as decreasing trust and willingness to cooperate in the future. Quality assessment in industrial marketing involves not just the physical attributes of products, but also the subjective supply and demand conditions (Korneliusson, Pedersen, & Gronhaug, 2007). Industrial marketers can benefit from developing knowledge of the Q&M interface, which highlights the need to establish closer relationships with upstream and downstream

partners and satisfy evolving requirements of the marketplace with quality at low costs. Practically, the taxonomy helps managers understand the specificities of Q&M implementation configurations and the complementary nature of Q&M. We find that the cluster of proactive firms with a high level of Q&M implementation perform better than the other two clusters, suggesting a target configuration for which managers should strive. In contrast, the weak performance of the cluster of reactive firms indicates an undesirable configuration that should be avoided. The superior cluster suggests that market orientation should be fostered in the quality improvement efforts of firms. Managers should ensure a high level of market intelligence generation and dissemination, as well as a high level of responsiveness to changing market requirements. This goal can be enhanced with communication of improvement information, teamwork structure for improvement, operational quality planning, and quality improvement measurement planning, all of which are essential elements for quality management implementation. This research provides managers with a systematic way to understand the Q&M interface. Although Q&M are important management approaches for contemporary businesses, they are often considered separately and their interface has long been neglected in the literature. However, it is nice to see increasing research on quality management issues and market orientation in industrial marketing. Managers are advised to convert their Q&M implementation plans into action. Not only marketing and quality personnel but also channel members in the industrial networks of the firm should recognize the complementary nature of Q&M to ensure their alignment in implementation for better performance outcomes

6.0 Future Research

This study has some shortcomings that limit the interpretation of the results and we leave them for further investigation. The survey results are limited to the perspective of quality managers. Examining the views of marketing managers and using a dyadic research design with data collected from both sides will contribute further insights on the Q&M interface. A promising avenue for further research is to extend this study to different situational contexts. It is also useful to extend beyond using the MARKOR scale as a proxy on market-oriented behaviours for evaluating

marketing implementation. Future research can consider using other more comprehensive scales to capture the marketing implementation process as organizational change and operational level actions. Only respondents from one culture (i.e., Hong Kong) are included in this study, which may limit the generalizability of the results to other cultures. Study of Q&M implementation in different cultural and social contexts will not only help generalize the findings, but also contribute to understanding how differences in cultural and social contexts influence the effectiveness of various systems and practices, and to what extent Q&M implementation configurations should be standardized or tailored to local conditions by multinational corporations. As the pace of globalization of markets has accelerated, the cross-cultural management problem is regarded as one of the most important issues for multinational firms. Replication of this study in other cultural and social settings is recommended. This research provides insights on the theoretical development and empirical findings on the Q&M interface for industrial marketers. Future research can build on this work to explore the implications of Q&M implementation configurations for developing industrial relations in a supply chain-wide environment and in specific business-to-business contexts such as logistics services and container port terminal operations (Lun, Lai, Wong, Ng & Cheng 2011; Wong, Lai, Lun & Cheng 2012). As the focus of this research is on the taxonomic configurations of Q&M implementation, we only test one proposition with detailed methodological explanations. It is worthwhile for future studies to investigate the antecedents of different Q&M implementation configurations to extend this line of research. On the other hand, sampling progressive firms for in-depth case analyses is promising for further research to analyze the evolution and change of Q&M implementation configurations on a longitudinal basis. Doing this will help enhance our understanding on how firms evolve from being reactive to progressive and proactive in their Q&M implementation configurations and the performance attainments over time.

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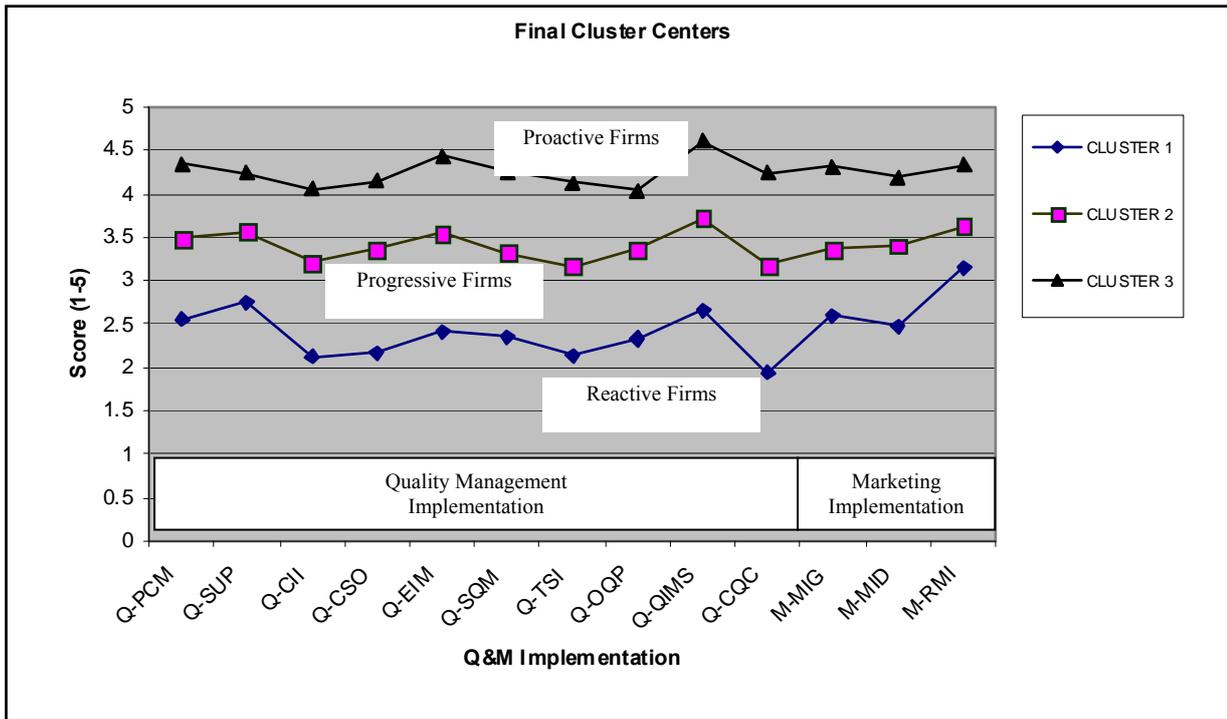


Figure 1: Relative scores in quality management and marketing implementations for the three clusters

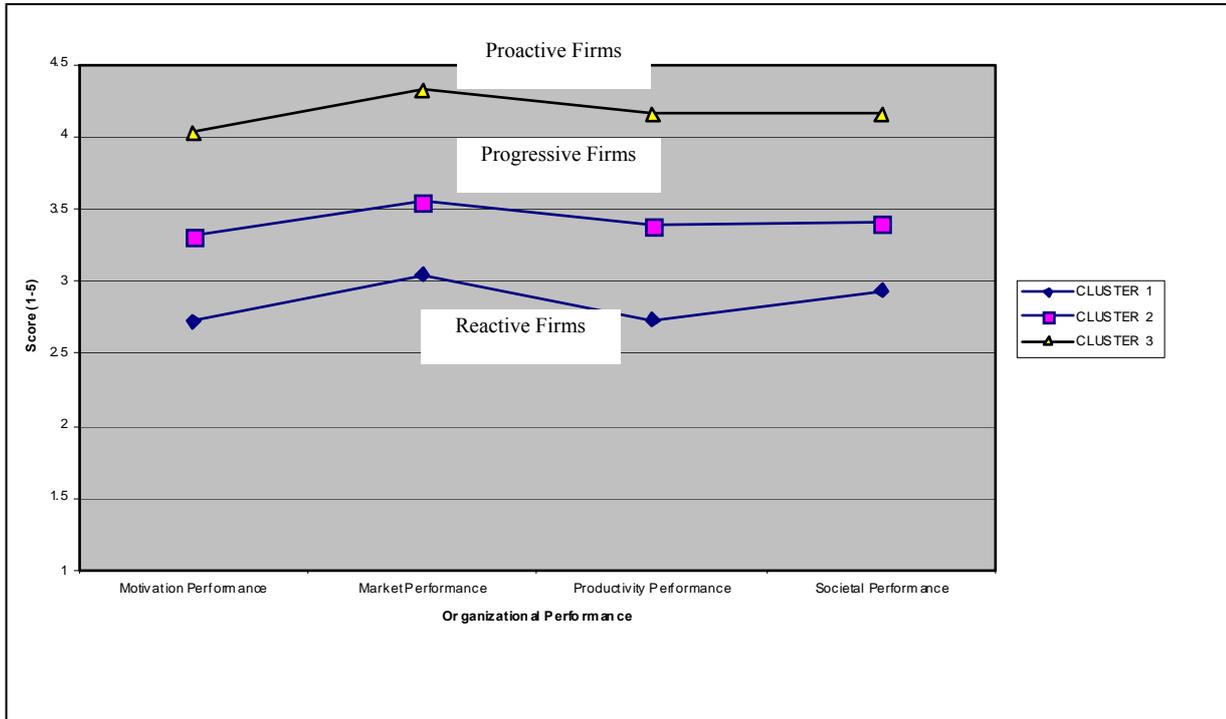


Figure 2: Relative scores in the four dimensions of performance measures for the three clusters

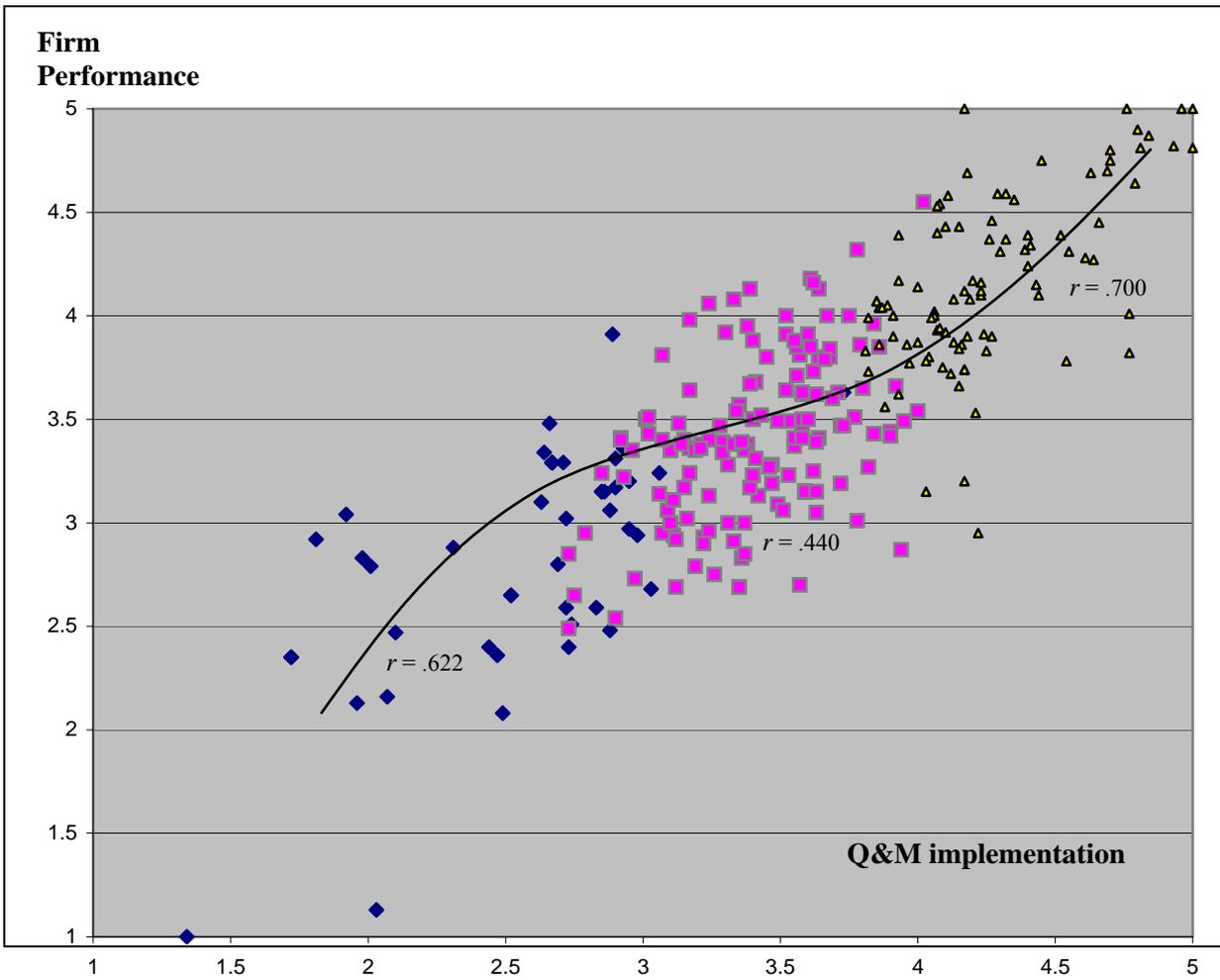


Figure 3: Q&M implementation and firm performance

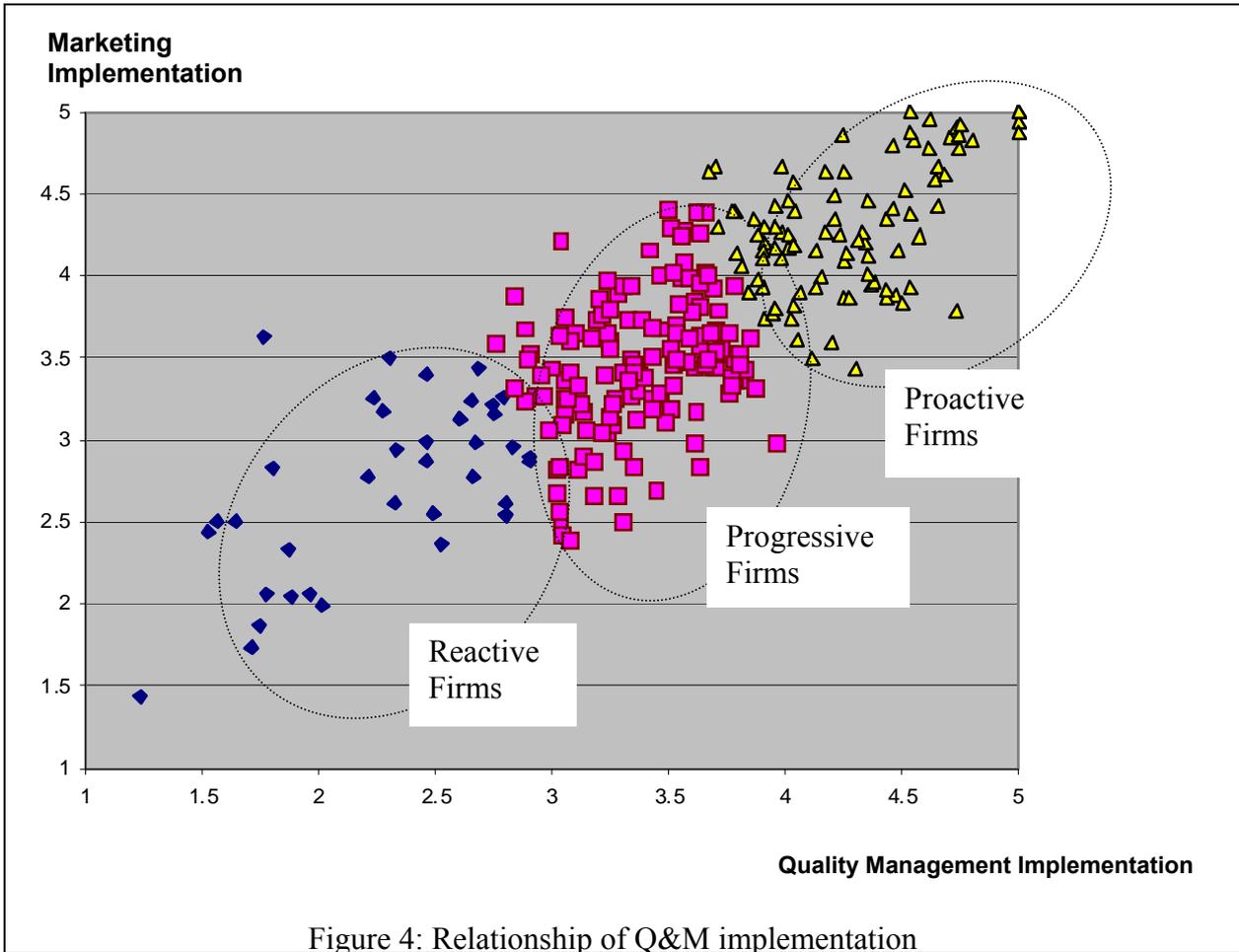


Figure 4: Relationship of Q&M implementation

Table 1: Organizational characteristics of the sample firms

Frequencies (Percentage)	Manufacturing	Service	Construction	Public utilities	Total
No. of employees					
Below 100	10 (14.5%)	52 (48.6%)	38 (33.3%)	1 (7.1%)	101 (33.2%)
100 – 999	28 (40.6%)	35 (32.7%)	54 (47.4%)	3 (21.4%)	120 (39.5%)
1,000 - 4,999	24 (34.8%)	8 (7.5%)	18 (15.8%)	7 (50%)	57 (18.8%)
5,000 or above	6 (8.7%)	10 (9.3%)	3 (2.6%)	3 (21.4%)	22 (7.2%)
Unknown	1 (1.4%)	2 (1.9%)	1 (0.9%)	--	4 (1.3%)
Level of turnover (HKD)					
Below 1 million	1 (1.4%)	6 (5.6%)	--	--	7 (2.3%)
1-10 million	10 (14.5%)	20 (18.7%)	13 (11.4%)	--	43 (14.1%)
10-100 million	19 (27.5%)	27 (25.2%)	35 (30.7%)	3 (21.4%)	84 (27.6%)
Over 100 million	33 (47.8%)	34 (31.8%)	58 (50.9%)	9 (64.3%)	134 (44.1%)
Unknown	6 (8.7%)	20 (18.7%)	8 (7%)	2 (14.3%)	36 (11.8%)
Length of quality management program					
1 - 2 years	7 (10.1%)	38 (35.4%)	33 (29%)	2 (14.3%)	80 (26.3%)
3 - 4 years	22 (31.9%)	35 (32.7%)	41 (35.9%)	3 (21.4%)	101 (33.2%)
5 - 6 years	17 (24.6%)	17 (15.9%)	21 (18.4%)	6 (42.9%)	61 (20.1%)
7 - 8 years	11 (15.9%)	7 (6.5%)	14 (12.3%)	2 (14.3%)	34 (11.2%)
9 years or above	7 (10%)	6 (5.5%)	2 (1.8%)	1 (7.1%)	16 (5.3%)
Unknown	5 (7.2%)	4 (3.7%)	3 (2.6%)	--	12 (3.9%)
Total no. of firms	69 (22.7%)	107 (35.2%)	114 (37.5%)	14 (4.6%)	304 (100%)

Table 2: Construct measurement results

Constructs	Standardized loading	t-value
Quality management implementation $\alpha = 0.95$; $CR = 0.97$; $AVE = 0.87$		
People and customer management*	0.84	--
Supplier partnerships	0.65	12.7
Communications of improvement information	0.85	19.1
Customer satisfaction orientation	0.84	18.5
External interface management	0.83	18.3
Strategic quality management	0.91	21.5
Teamwork structures for improvement	0.75	15.6
Operational quality planning	0.69	14.0
Quality improvement measurement systems	0.86	19.5
Corporate quality culture	0.85	19.0
Marketing implementation $\alpha = 0.86$; $CR = 0.76$; $AVE = 0.52$		
Market intelligence generation*	0.67	--
Market intelligence dissemination	0.69	15.2
Responsiveness to market intelligence	0.52	8.5
Firm performance $\alpha = 0.89$; $CR = 0.77$; $AVE = 0.46$		
Motivation performance*	0.58	--
Market performance	0.59	16.5
Productivity performance	0.60	14.4
Societal performance	0.59	16.1

* The corresponding parameter was set to 1.00 (unstandardized) to fix the scale of measurement.

Note: Construct reliability (CR) is calculated using the following formula: $CR_{\eta} = (\sum \lambda y_i)^2 / [(\sum \lambda y_i)^2 + (\sum \varepsilon_i)]$, where λy_i is the standardized loading for scale item y_i , and ε_i is the measurement error for the scale item y_i (Fornell and Larcker 1981); whereas the average variance extracted (AVE) for each construct is calculated using the following formula: $V_{\eta} = \sum \lambda y_i^2 / (\sum \lambda y_i^2 + \sum \varepsilon_i)$ (Anderson and Gerbing 1988). Results for confirmatory factor analysis at the first order level are available upon request to the authors.

Table 3: Analysis of agglomeration coefficient for hierarchical cluster analysis

Combining Clusters to the Next Level	Agglomeration Coefficient	Percentage Change of Coefficients by Combining Clusters
From 10 to 9	354.10	1.80%
From 9 to 8	361.12	1.98%
From 8 to 7	368.53	2.05%
From 7 to 6	376.86	2.26%
From 6 to 5	386.80	2.64%
From 5 to 4	407.17	5.25%
From 5 to 3	430.52	5.73%
From 3 to 2 (Stopped here)	485.16	12.69%

Table 4: Main and interactive effects on firm performance

Firm Performance	Effects	Cluster centroids and significance of effects				
		Reactive firms	Sign.	Progressive firms	Sign.	Proactive firms
Motivation performance	Between groups effect	2.72	.000*	3.31	.000*	4.03
	Business size		.132		.688	
	Interactive effect		.342		.690	
Market performance	Between groups effect	3.04	.000*	3.55	.000*	4.32
	Business size		.050*		.902	
	Interactive effect		.058		.812	
Productivity performance	Between groups effect	2.74	.000*	3.38	.000*	4.16
	Business size		.009*		.974	
	Interactive effect		.122		.128	
Societal performance	Between groups effect	2.93	.000*	3.40	.000*	4.16
	Business size		.002*		.527	
	Interactive effect		.179		.026*	

* $p < 0.05$

Appendix: List of measurement constructs and items

Quality management implementation

People and customer management
Strategic human resources management (e.g., education, training, and employee involvement schemes) is a key performance objective of our company.
Our company monitors the effectiveness of the quality education and training which support the company's quality and performance objectives.
Our company uses employee recognition and performance measurement schemes (e.g., frequent evaluation of employee participation in quality improvement) which support the company's quality and performance objectives.
Our company employs proactive customer relations (e.g., market research, follow-up with customers, and use of customer service standards) i.e., frequent use of customer information to improve customer satisfaction.
Supplier partnerships
Our company audits suppliers' quality (e.g., by first party audits, management reviews, inspection, and accreditation to ISO series).
Our company takes action (e.g., providing rapid information and data exchange) to assist and improve the quality and responsiveness of our suppliers.
Our company considers suppliers as associates rather than as adversaries (e.g., by reliance on few dependable suppliers, development of long-term relations, involvement in the design/development process).
Communication of improvement information
Our company employs quality costs (e.g., appraisal, prevention, and failure) to facilitate the continuous improvement processes.
Our company assesses the need for quality education and training (e.g., on-the-job performance improvement, employee growth) and its subsequent delivery and review.
Benchmarking of processes in non-competing organizations for process improvement is practiced in our company (e.g., learn best practice outside the company's industry).
Our company interacts with outside groups (e.g., education, business, trade, professional groups) for mutual benefits of quality improvement.
Customer satisfaction orientation
Our company promotes trust and confidence in our products/services (e.g., by quality policy, third party assurance, guarantees, and warranties).
Our company evaluates competitors with respect to the level of customer satisfaction (e.g., by company-based competitive studies, evaluations made by independent organizations including customers).
Our company evaluates customer satisfaction with internal performance objectives (e.g., by comparisons with past customer satisfaction index or standard set).
Our company determines and improves customer satisfaction (e.g., by identifying market segments, benefits sought by customer groups, and the target quality requirements of each segment or group).
Benchmarking of direct competitors' products/services for improvement of own products/services is practiced in our company (e.g., learn best practice within the company's industry).
Benchmarking of direct competitors' processes for improvement of own processes is practiced in our company (e.g., learn best practice within the company's industry).
External interface management
Our company recognizes its social responsibilities such as public health and safety, environmental protection, and waste management (e.g., by including its public responsibilities in its quality policy and practice).
Our company determines customers' future requirements and the relative importance of product/service features (e.g., by survey, focus group, dialogue with customers).
Our company's new product/service development process is designed to ensure satisfaction of customer needs (e.g., by tools such as quality function deployment, venture team, new product development committee).
Strategic quality management
Our company uses process capability studies to ensure that product/service design requirements are delivered by the processes.
Our managers take active leadership in coaching, encouraging, communicating and promoting quality issues (e.g., frequent reinforcement of the company's quality value).
Satisfaction of intrinsic rewards (e.g., employee job satisfaction, sense of achievement) for employees is considered as a critical factor for attaining our company's quality objectives.
Satisfaction of extrinsic rewards (e.g., pleasant working conditions, job security, fair salary and promotion) for employees is considered as critical factor for attaining our company's quality objectives.
Our top management commits to quality improvement through involvement and visibility in quality activities and communication of quality values (e.g., frequent involvement and reinforcement of quality values within and outside the company).
Our company implements long-term plans (3 years or more) which are based on customer needs.
Our company implements long-term plans (3 years or more) which are based on company capabilities.
A continuous improvement program of processes based on objective analysis of operational performance (e.g., improved cycle time, productivity, and waste reduction) is carried out in our company.
Teamwork structures for improvement
Our company uses non-hierarchical organizational structures (e.g., councils, quality circles, steering committees, and quality improvement

teams) to support quality improvement.
Work is organized in our company according to key business processes which reflect customer needs, rather than on traditional specialization of functions.
Operational quality planning
Our company implements short-term plans (1 to 2 years) which are based on customer needs.
Our company implements short-term plans (1 to 2 years) which are based on company capabilities.
Quality goals, measurable and time-based (e.g., reduction of failure costs by 10% within the next six months) are included in the development of our short-term plans (1 to 2 years).
Quality improvement measurement systems
Our company evaluates and improves its products/services.
Our company evaluates and improves its business processes.
Our company manages data/information (e.g., data/information on quality improvement, customer and employee relations, supplier relations) to support quality improvement efforts.
Our company employs procedures (e.g., regular reviews and time updates) to ensure reliability, consistency, and rapid access to data and information throughout the company.*
Corporate quality culture
Quality goals, measurable and time-based (e.g., increase in customer satisfaction by 20% within the next three years) are included in the development of our long-term plans (3 years or more).
The quality culture (e.g., common value, belief, and behaviors) in our company is company-wide.

Marketing implementation

Market intelligence generation
Our company meets customers at least once a year to find out what products/services they will need in the future.
Our company conducts all related market research (e.g., needs analysis of customer groups, market segments) necessary for effective customer satisfaction.
Our company is <i>slow</i> to detect changes in our customers' product/service preference.
Our company polls customers at least once a year to assess the quality of our products/services.
Our company is <i>slow</i> to detect fundamental shifts in our industry (e.g., competition, technology, regulation).
Our company periodically reviews the likely effect of changes in our business environment on customers (e.g., regulation, competition, technology).
Market intelligence dissemination
Our company holds interdepartmental meetings at least once a quarter to discuss market trends and developments.
Our company's marketing personnel spends time discussing customers' future needs with the other functional departments.
When something important happens to a major customer in our market, the whole company knows about it within a short period.
Our company disseminates data on customer satisfaction at all levels in the company on a regular basis.
When one department finds out something important about the market (e.g., customers, competitors), it is <i>slow</i> to alert the other departments.
Responsiveness to market intelligence
It takes our company a <i>long</i> time to decide how to respond to our competitors' price changes.
For one reason or another, our company tends to <i>ignore</i> changes in our customer's product/service needs (e.g., make <i>no</i> response to the changes).
Our company periodically reviews our product/service development efforts to ensure that they are in line with what customers want.
Several departments get together periodically to plan a response to changes taking place in our business environment.
If a major competitor of our company was to launch an intensive campaign targeted at our customers, our company would implement a response immediately.
The activities of the different departments in our company are well coordinated.*
Our company takes <i>no</i> action on customer's complaints.
Even if our company came up with a good marketing plan, our company probably would <i>not</i> be able to implement it in a timely fashion.
When our company finds that customers would like us to modify a product/service, the departments involved make concerted efforts to do so.

Firm performance

Motivation performance
The equity of our company (e.g., wage, promotions, fringe benefits) to employees has been continuously improving in the past three years.
The training function provided to employees for the acquisition of necessary job skills and knowledge has been continuously improving in the past three years.
The extent of employee job satisfaction has been continuously improving in the past three years.
The extent of employee job security has been continuously improving in the past three years.
The environmental factors affecting the job (e.g., safety of the job environment) have been continuously improving in the past three years.
Market performance
The success rate of our company in introducing new or modified products/services to satisfy customer needs has been continuously improving in the past three years.

The price of the products/services of our company has remained relatively competitive to the price trend of the competitors in the past three years.*
The ability of our company to satisfy customer needs has been continuously improving in the past three years (e.g., decrease in customer complaints, product returns).
Productivity performance
The efficiency of materials usage of our company (e.g., ratio of total output to material input) has been continuously improving in the past three years.
The efficiency of labor of our company (e.g., ratio of total output to labor input) has been continuously improving in the past three years.
The efficiency of capital utilization of our company (e.g., ratio of total output to capital input) has been continuously improving in the past three years.
Societal performance
The level of consumer rights of our company has been continuously increasing in the past three years.
The level of recognition of the need to protect the environment in our company has been continuously increasing in the past three years.
The expansion of the product/market of our company has been continuously increasing in the past three years.
The provision of employment opportunities by our company has been continuously increasing in the past three years.