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Quality Management in the Logistics Industry: an Examination and a Ten-Step Approach for Quality Implementation

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ABSTRACT *We examine the factors that encourage firms in Hong Kong's logistics industry to implement quality management systems (QMSs) to ensure quality in their work processes. Based on a case study, we introduce a generic ten-step approach for QMS implementation, and discuss the cost and service advantages achieved in the case firm. The approach offers procedural guidelines for firms in the industry contemplating the implementation of QMS.*

KEY WORDS: Quality management, logistics industry, implementation, case study,

Introduction

The enduring repercussions of the Asian financial crisis in 1997, the worsening global economy following the burst of the dotcom bubble in 2001, and the incessant rise in customer demands for better services have all contributed to shrinking profit margins for all business firms in the world. In addition to having to cope with these tough challenges, firms in Hong Kong will also need to face severe competition from a growing crop of low-cost, labour-intensive competitors on the Chinese mainland and from a formidable army of high value-added competitors from Singapore and Taiwan. In order to face up to these challenges, many Hong Kong firms, including those in the logistics industry, have begun to realize that their survival and prosperity lie in placing a great emphasis on attaining superior product/service quality.

To preserve competitive strengths, business firms are increasingly capitalizing on their core competencies and outsourcing their non-core businesses, such as logistics activities, to outside parties. The logistics industry exists to help business firms perform all or part of their materials management and product distribution functions. Firms in the logistics industry are generally regarded as logistics

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service providers (LSPs). An LSP can be defined as an external supplier that performs all or part of a firm's logistics function (Coyle *et al*., 1996), or any firm providing a good or service that is not owned by the purchasers of the good or service (Stank & Maltz, 1996). Economically, the use of an LSP's service is justifiable on grounds of reduced logistics costs and enhanced service responsiveness to customers (Daugherty *et al*., 1996). As an increase in logistics capabilities might bring competitive advantages in cost and service differentiations (Mentzer & Williams, 2001), the use of LSPs to handle part or all logistics activities has become a popular practice among business firms.

Meanwhile, competitive pressure has prompted many business firms to deliver better value in their product/service offerings. Accordingly, the importance of quality improvement has received increasing attention among business firms in Hong Kong (Lai *et al*., 2002). Similar to their counterparts in other business sectors, many LSPs in Hong Kong have implemented various quality improvement programs with a view to gaining a competitive position in the logistics industry (Fung & Wong 1998). Some of them even view quality in the form of a certified quality system like the ISO 9000 quality management series, as a competitive advantage or as a minimum qualification for survival in the marketplace.

A number of factors are seen to account for the increase in the adoption of quality management systems (QMSs) among LSPs in Hong Kong. These factors include a rise in quality awareness, an increase in customer pressure, and a need to install a mechanism to improve work processes. While there are numerous studies on the implementation of quality management in manufacturing and other service sectors (e.g. Victor *et al*., 2000; Dean & Terziovski, 2001), studies on quality management practices in the logistics industry are few in number. To fill this gap in the research, we set out to investigate quality management initiatives in Hong Kong's logistics industry, examining a ten-step approach for QMS implementation in an LSP and discussing how this firm achieves cost and service advantages through quality improvement. Finally, we attempt to draw some lessons from this case study to share with other logistics firms.

Quality Management Initiatives

Quality Awareness

In the past two decades, quality management has been widely recognized as a potent means for achieving a competitive edge from differentiation across a broad spectrum of business sectors (Lai & Cheng, 2003). Improving product and service quality has been extensively discussed in the literature as an effective strategy for gaining sustainable competitive advantages (Morgan & Piercy, 1996). Empirical evidence suggests that quality management leads to improvements in organizational performance in terms of increased productivity and profits (Hendricks & Singhal 1997; Douglas & Judge, 2001). Recognizing the potential benefits that improved quality is likely to bring, firms are increasingly according it a high priority in their management agenda.

Quality management is a holistic management approach that strives for

continuous improvement in all functions of an organization. Oakland (1993) defined it as an approach to improving the effectiveness and flexibility of business as a whole. According to him, quality management is essentially a way of organizing and improving the whole organization, every department, every activity, and every single person at every level. The aim is continuously to improve process performance by placing the customers at the focal point of operations in order to satisfy them fully. It is a continuous quest for excellence that has to reach every individual within an organization in order to make prevention of defects possible and satisfy customers totally at all times. There is a multiplicity of frameworks in the literature for implementing quality management (e.g. Ahire *et al*., 1996). Nevertheless, the principles of quality management, to a greater or lesser extent, incorporate the following (Sitkin *et al*., 1994):

(1) the generating of objective data ('facts') for the systematic improvement of work processes and products as a prerequisite for taking action;
(2) a focus on key problem areas and customer satisfaction;
(3) the involvement and empowerment of employees.

Although quality management originates in the manufacturing sector, its widespread adoption has gradually been extended to the service sector, including the logistics industry (Millen & Maggard, 1997). The management approach is intended to empower employees to promote continuous, sustained, and long-term improvement in quality and productivity to accomplish such corporate goals as increased customer satisfaction and reduced costs (Hackman & Wageman, 1995; Powell, 1995). The principles of quality management are applicable and useful for LSPs to create customer value at a low cost in many aspects of their services. These include warehouse management, shipment consolidation, logistics information management, order fulfilment and processing, carrier selection, and production assembly. Similar to firms in the manufacturing sector, quality management can help LSPs achieve dual cost and service objectives by the continuous improvement of work processes through procedure design, policy deployment, human resources management, and a set of quality management toolkits (c.f. Anderson *et al*. 1994). As quality awareness in Hong Kong's logistics industry is becoming a commonplace, many LSPs have started to implement QMSs. Nowadays, a quality logistics service is fast becoming a pre-requisite for survival and long-term success in the logistics industry (Menzter *et al*., 2001).

Customer Pressure

In recent years, customer pressure in the logistics industry has increased dramatically due to escalating customer demands for better logistics services to achieve cost and service improvements in the customer firms. As a result, the creation of time and place utility in the seven rights (Rs), i.e. the ability to deliver the right amount of right product at the right place at the right time in the right condition at the right price with the right information (Coyle *et al*., 1996), may not be sufficient fully to satisfy customers. Because of this, many LSPs have employed QMSs to improve the quality of the seven Rs in their services. They have also broadened the scope of their services to include value-added logistics tasks such

as packaging, labelling, bar coding, and information systems management (Menzter & Firman, 1994).

On the other hand, the pressure from the customer groups is characterized by their increased emphasis on speed to market with high quality. The shortening product life cycles and the proliferating product choices have forced business firms to compete on quality products, consistent product availability, and faster product delivery to meet customer demand (Fliedner & Vokurka, 1997). Accordingly, business firms are increasingly looking to the logistics service capability of LSPs to meet their own challenges with respect to time and quality-based competition. The challenge for LSPs is to develop a continuously improving logistics service system to handle the physical product flows of the customer firms and to ensure that the added-value in the seven Rs is worth the price paid by the customer firms. Otherwise, the customer firms might take their businesses to other LSPs or undertake the logistics activities themselves. In the increasing trend to create LSP–client partnerships for cost and service improvements, LSPs are increasingly compelled to implement an operational QMS to assure quality, i.e. to attain the seven Rs in different aspects of their services.

Need for an Improvement Mechanism

To deliver customer value, it is essential that LSPs thoroughly understand and effectively manage different aspects of their services ultimately to conform to customer and market requirements in a cost-effective manner (McGinnis *et al.*, 1995). Quality improvement is meaningless without an understanding of the competitive implications of quality (Porter, 1987). For instance, customers tend to view quality primarily in terms of the level of service provided and the associated logistics costs, whereas LSPs tend to view quality from a broader perspective embracing such areas as customer service, administration, maintenance, storage, and information. A clear conception of quality and a concerted effort to attain superior quality are important for LSPs to meet the requirements desired by all parties concerned. Divergent interpretations of quality and work process requirements will obscure organizational directions and compromise efforts to improve quality (Garvin, 1987).

To reach a common quality goal by invoking company-wide efforts for quality improvement, there is an increasing need for LSPs to install a mechanism, e.g. QMS, devised and deployed to support all quality improvement work (Waldman & Gopalakrishnan, 1996). Otherwise, the quality implementation effort might eventually end up being futile, as a 'discrete phenomenon' without continuity (Westphal *et al.*, 1997).

In the next section, we examine the quality management practices in an LSP and the ten-step approach adopted for implementing QMS in response to the above challenges. Accomplishments from this implementation, as well as the managerial implications, are discussed.

Case Study: Oriental Logistics

Oriental Logistics provides professional logistics services to multinational businesses and corporate clients; for example, handling the supply, storage and

distribution of promotional materials for the Hong Kong Tourism Board. The company is one of the major LSPs in Hong Kong with an establishment of 184 permanent staff. It generated around HK$90 million in sales revenue in 2001, a 20% increase compared with 2000. In 2002, the company was awarded the Outstanding Enterprises in IE 2002 Award by the Institute of Industrial Engineering. The service scope of the company ranges from public warehousing for general cargoes and dangerous cargoes as well as physical cargo distribution, to high value-added services such as e-commerce logistics services, third-party warehousing services, product repacking and relabelling, order processing and invoicing, inventory management and freight forwarding.

The company is fully equipped with a modern transportation fleet, two distribution centres with direct access to delivery vehicles, and various temperature-controlled zones for air-conditioned, chilled, and frozen storage. Furthermore, the company operates an extensive sea and air freight-forwarding network, covering major cities on the Chinese mainland and in the Far East, and reaching all major ports in Europe and the USA. The company's competitiveness rests with its deep expertise and rich experience in handling and moving different kinds of cargoes, and with its ability to connect these different stages on a global scale.

The increase in awareness of quality, rising customer expectations and the need for an improvement mechanism have all spurred the company into installing a QMS as a means to enhance its ability to compete. The need for quality improvement in Oriental Logistics is reflected in its vision 'to become the best LSP of the decade which pledges to provide quality services' and its mission 'to provide zero-defect quality logistics with advanced computer technology, in an efficient and customer-driven manner, resulting in total satisfaction of customers'. To embark on this quality management implementation initiative, Oriental Logistics embraced a ten-step approach in implementing QMS. An overview of the ten-step approach is shown in Figure 1. Each of the implementation steps is discussed in the following section.

The QMS helps the company avoid errors arising in the work processes in different functional departments. Table 1 shows the potential errors that might occur in the work processes in different functional disciplines of Oriental Logistics. With the support of top management, a QMS grounded on the principle of doing all things right the first time every time, was set up as the first step towards the goal of attaining continuous improvement in all logistics work processes.

The Ten-Step Approach

Step One—Management Commitment

The first step in implementing QMS was to solicit and capture the commitment and support of management so as to make the quality improvement efforts sustainable. The lack of senior management commitment, awareness and vision in an organization is often diagnosed as the main cause for the failure of QMS. The importance of top management in providing a clear and strong message

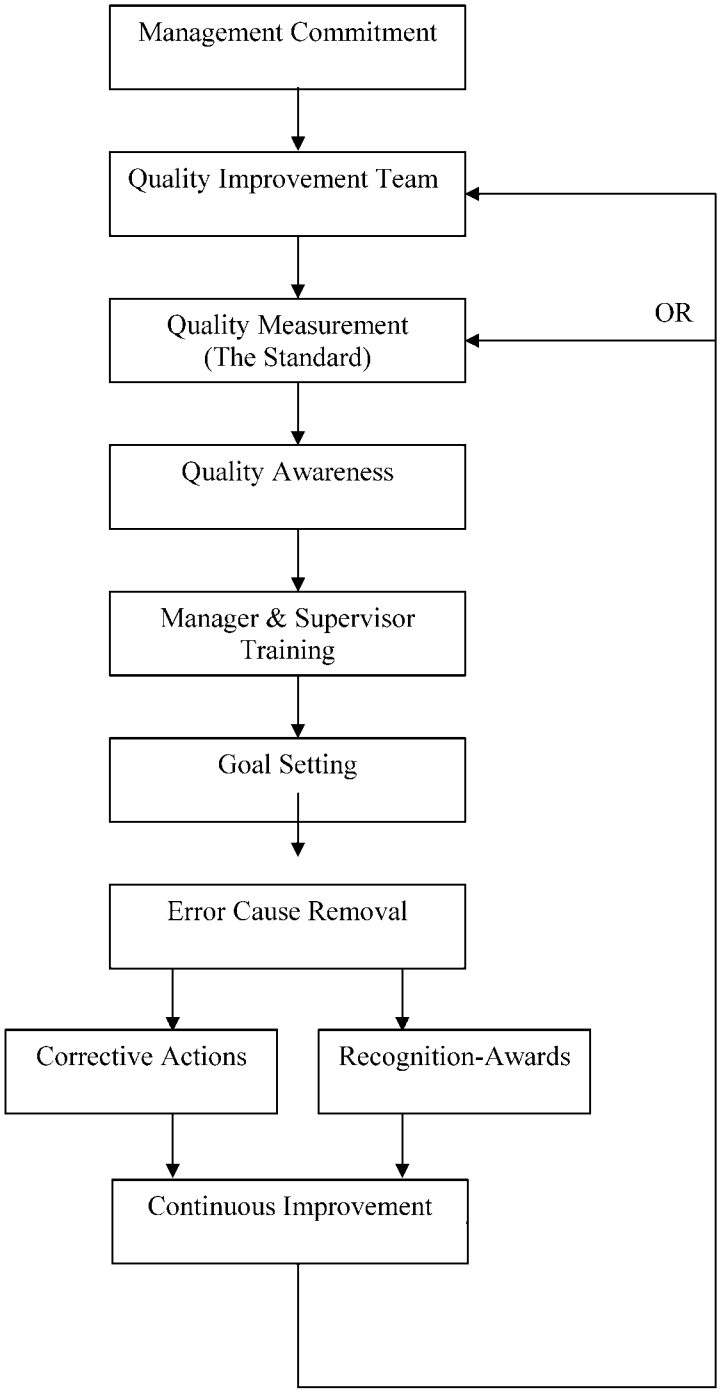

Figure 1. Ten-step approach for QMS implementation.

Table 1. Potential errors in work processes

Potential Errors	Sales & Marketing	Operations	Accounting	Technical
1	Lease/quotation errors	High accident rate	Percentage of late warrants/invoices	Time lost in forklift/container hoist/mechanical equipment failure
2	Late rate sheet	Low efficiency in receipt/delivery of cargoes	Incorrect computer inputting	Slow response to property technical advice
3	Punctuality to work/ appointment	Slow response to requests	Errors in specific reports as audited	
4	Sales budget achievement (achievable %)	Politeness to customers	Billing errors	
5		Wrong computer inventory inputs	Accounts payable/ receivable deductions issued	

about its vision for quality improvement cannot be over-emphasized and must be articulated at all levels of the company. The purpose of this step was to make it clear where the top management stands on quality, pronouncing it throughout the company. To start with, the need to implement QMS was extensively debated and discussed by the top management team, including the Chairman and the CEO. The vision for the QMS implementation was defined, which is to provide 'zero-defect' logistics services with maximum efficiency through the continuous improvement of every aspect of work processes in the company, which ultimately contributes to customer satisfaction. This first step helped top management recognize that they must be committed to, and be the champion of, the initiative, by personally participating in the implementation of QMS to achieve the declared vision.

Step Two—Quality Improvement Team

After defining the vision, top management defined a set of measurable quality and performance objectives and formulated the corresponding strategies to guide the company towards achieving those objectives. To this end, the company conducts customer surveys on a regular basis to understand customer needs and identify quality and performance objectives. The survey covers different aspects of workflow in its logistics services including storage, receiving cargo procedures, delivery cargo procedures, export procedures, import procedures, local distribution, inventory management, documentation, and the overall perception of its staff. In the survey, the customers of Oriental Logistics are requested to rate the importance of the workflow to them, as well as the performance of the company in meeting their requirements. The importance–performance analysis provides

directions for the company to set performance objectives and strive for continuous performance improvement. On the other hand, a quality improvement team (QIT) was assembled to carry out the strategies laid down by top management. The team was composed of representatives who could speak for their departments and steer their departmental activities towards actions for improvement. The QIT was responsible for the detailed design of the QMS, defining the team's scope of work, developing operations standards and assessment methods, and estimating and gathering the resources required for a successful QMS implementation.

Step Three—Quality Measurement (Setting Quality Standards)

This step was to develop a quality improvement model with appropriate measures to gauge outcomes and performance. The QIT identified the most significant outputs being produced in the company that would determine customer satisfaction and figured out the critical performance characteristics of each of these. These quality improvement requirements were incorporated into the quality policy of the company, which requires its staff to ensure:

(1) priority in safety, health and environment;
(2) reliable inventory records;
(3) flawless inventory;
(4) services that satisfy both customers' requirements and related regulatory and legal requirements; and
(5) continuous improvements for its services.

On the other hand, the company has set a number of quality objectives. These objectives include:

(1) decrease the number of accidents by 10%, compared with the figure in the previous year, or less than three cases;
(2) decrease the number of incidents regarding incorrect inventory records by 10%, compared with the figure in the previous year, or less than three cases;
(3) 100% stock-take accuracy as per agreed service standard (number of discrepancy quantity/handled quantity);
(4) zero customers lost due to sub-standard service quality;
(5) increase overall customer survey rating by 5% against last survey, or above 5 on a 7-point scale.

The purpose of quality measurement was to reveal problems so that evaluative and corrective action could be taken, as follows: a quality review was conducted in each department, i.e. sales and marketing, operations, accounting, and technical, to reveal where improvement was possible, where corrections were necessary, and to record actual improvements for assessment in subsequent stages.

After the quality review, the QIT established written standards and procedures to govern the various aspects of the work processes in each department affecting customer satisfaction. The standards and procedures provided clear guidelines and instructions to staff members on the requirements of each work process and

their roles and responsibilities in meeting the requirements and the following performance pledges of the company:

(1) all staff are to serve with sincerity and quality, without defective performance;
(2) all staff have the highest level of professionalism and follow any safety requirements;
(3) science management is integrated into all commercial and logistics management activities;
(4) provide customers with quality service by making use of advanced information technology;
(5) business is operated in the most ethical way.

Step Four—Quality Awareness

This step was to create quality awareness and communicate top management's vision about quality improvement to all employees. The purpose was to raise the personal concern and commitment of staff members to achieving quality improvement in the company. Managerial and supervisory staff were imbued with the basic knowledge of quality management for transmission to their subordinates. It involved a clear explanation of the objectives of QMS and educated employees on the concepts of quality, thus eliminating their fear of the QMS implementation and motivating them to participate.

Step Five—Manager and Supervisor Training

A series of training seminars on quality management were conducted for managerial and supervisory staff in the company. The purpose was to provide the necessary training for managers and supervisors to carry out their functions as required by the QMS. It is essential that all the managers and supervisors have a thorough understanding of the concepts and objectives of the QMS implementation so that they can explain them to their subordinate staff. The experiences gained from successful and failed QMS implementations in other organizations were shared. For instance, the cases of the HKMA's quality management award winners and finalists (the Hong Kong version of the Malcolm Baldrige National Quality Award, whose criteria are widely accepted as the blueprint of excellence in quality management implementation) and the associated benefits from QMS implementation were discussed among the management and supervisory staff. After the training seminars, meetings were organized between management and staff at different organizational levels to ensure their support.

Step Six—Goal Setting

This step was to turn commitment into action by encouraging individual departments, by themselves, to set improvement plans and goals towards the organizational goal of achieving 'zero defects' with maximum efficiency in the work processes. Ultimately, the quality improvement efforts should result in

increased customer satisfaction. All departments incorporated customer satisfaction as a key objective in their work and established goals that were specific and capable of being measured. The set goals were to be realized through concerted efforts to understand the requirements of customers, followed by effective use of company resources to meet those requirements. Examples of these initiatives are customizing services to meet specific customer needs, enhancing value for customers by offering convenient storage and distribution options, reducing order processing and delivery times, and being responsive in handling customer complaints. This stage helped staff learn to think in terms of meeting goals, and to work in teams to accomplish specific tasks for improving quality.

Step Seven—Error Cause Removal

This step was to motivate individual staff to improve their work quality by giving them a way to communicate to management the difficulties they encountered in actually implementing QMS. Listening to feedback from employees and initiating positive changes were important because QMS implementation might cause an increase in the daily workload of the staff. The increased workload might cause some employees to become disgruntled while the lack of staff support is likely to undermine efforts to implement QMS.

In this step, each individual staff member was invited to describe in a simple, one-page form any problems that hindered him/her in carrying out error-free work. Examples of staff inputs are (1) the sales and marketing department made too many errors in the rate sheet or quotations (a comment from a member of the accounting staff), (2) the requests from customers for the delivery of cargoes were not clear enough (a comment from a member of the operations staff). This step helped the staff realize that channels exist to make their grievances known and to help them deal with problems arising from their efforts to pursue quality improvement in their work.

Step Eight—Corrective Actions

Error-free logistics services require periodic preventive maintenance of work processes. Simply setting goals and identifying root causes for quality problems will not automatically lead to continuous improvement of the services. Accordingly, there is a need to assess frequently the required level of performance from the work processes and to improve them as necessary to remain competitive. This step was to provide a systematic method for resolving once and for all the problems that were identified in the previous steps. To this end, the QIT organized meetings or formed task forces to hunt for the specific problems in a proactive manner (e.g. late delivery of cargoes by more than one hour), and to formulate solutions for problems uncovered (e.g. advanced planning of delivery schedules).

Step Nine—Recognition and Reward

Employee empowerment and staff satisfaction based on motivation, both intrinsic and extrinsic, are crucial to achieving quality goals. It is therefore important to

reward staff participation and celebrate achievements in quality improvement. This can help to make the QMS implementation journey more relaxed and enjoyable. In this stage, award programmes were established to recognize staff who met their goals or performed outstanding acts, in order to motivate their continuous commitment and support for quality improvement. As a result, the company fostered a culture of quality in its staff by cultivating mutually supportive relations between the company and staff, motivating and empowering staff to make decisions that prevented problems, and encouraging teamwork through such means as the formation of quality circles and rewarding performance equitably.

Step Ten—Continuous Improvement

The last step was to repeat the cycle of continuous quality improvement. The emphasis was on making quality improvement enduring as a never-ending action in the company. This is important because a typical QMS implementation cycle spans 12 to 18 months. During the cycle, staff turnover and market changes might adversely affect the company's efforts to improve quality. To sustain the momentum for continuous improvement, the QIT met periodically to review the design of the QMS and made adjustments to suit evolving market conditions. This step was important in preparing for a new quality improvement cycle in order to carry on with the QMS. The renewal effort helped propel the quality improvement movement to spiral upwards in a never-ending fashion, for quality knows no upper limits.

Discussion

Oriental Logistics believes that every one of its customers has an absolute right to have the correct quality of product in the correct quantity at the agreed time, every time. By using a QMS in the form of written standards and procedures mutually agreed upon by the firm and by different departments at all levels, Oriental Logistics can effectively periodically evaluate work processes to improve performance. Bearing in mind that what gets measured has a better chance of getting done, the preventive QMS helps the company ensure that every aspect of its work processes conforms to customer/standard requirements, and consequently meets the expectations of customers without discrepancies.

The ten-step approach for implementing QMS is characterized by employee empowerment, collaboration among functional areas, an emphasis on prevention rather than on detection, and measuring performance based on goals. To Oriental Logistics, there have been many benefits from implementing the QMS. The first is the common quality standards agreed upon and understood by staff at different levels and departments within the company. When staff talk about quality improvement, they refer to the common standards and criteria for planning, implementing and evaluating their work processes, ensuring consistency in their quality management efforts and quality in the services delivered. The standards and procedures provide a common understanding among staff members within the company, and define the job responsibilities and requirements of individual staff to achieve the

overall corporate vision for improving quality. As a result, the ability of Oriental Logistics to consistently meet or surpass customer requirements in its various logistics services is assured and continuously enhanced.

Furthermore, the QMS instils confidence in the customers of Oriental Logistics, particularly the major international customers, who have stringent service requirements. The company sees that quality management has become a potent and formidable means for LSPs to deliver quality services in the logistics industry. QMS will increasingly be a must in the future to create new business opportunities or expand market share, to demonstrate the ability of an LSP to satisfy customer needs, and to stand as proof of the firm's commitment to quality.

In terms of performance outcomes, the company achieves cost and service advantages with its QMS. The costs resulting from customer dissatisfaction, demurrage charges, contaminated storage, or wasted human resources are reduced through the preventive QMS. The cost of getting things wrong, e.g. reworks and returns, are minimized. As many LSPs in Hong Kong, including Oriental Logistics, are increasingly switching to a customer-centred approach in their business operations to gain competitive advantages, the QMS will not only contribute to an enhanced ability to satisfy customer requirements, but also help to differentiate the company from other LSPs as a leader of quality in the industry.

Conclusions

Rising customer expectations and intensified competition have put pressure on LSPs to improve the quality of their services. This has led many LSPs in Hong Kong to implement QMSs for quality improvement. It is evident in the case of Oriental Logistics that a successful QMS implementation, resulting in cost and service improvements, is key to the survival and long-term prosperity of the company. The ten-step approach to implementing QMS, where measures to achieve quality are taken in each step of the implementation, provides procedural guidelines towards this end. As a concluding remark, the ten-step approach introduced in this study should serve as a useful reference to LSPs on implementing QMS. It should provide them with valuable lessons on how to cultivate a firm-wide culture of continuous improvement and to attain the desired performance results in their journey to quality improvement.

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References

Ahire, S. L., Golhar, D. Y. & Waller, M. A. (1996) Development and validation of TQM implementation constructs, *Decision Sciences*, 27(1), pp. 23–56.

Anderson, J., Rungtusanatham, M. & Schroeder, R. (1994) A theory of quality management underlying the Deming management method, *Academy of Management Review*, 19(3), pp. 472–509.

Coyle, J. J., Bardi, E. J. & Langley, C. J. Jr. (1996) *The Management of Business Logistics*, 6th edn (St. Paul, MN: West Publishing Company).

Daugherty, P. J., Stank, T. P. & Rogers, D. S. (1996) Third-party logistics services providers: purchasers' perception, *International Purchasing & Materials Management*, 32(2), pp. 23–29.

Dean, A. & Terziovski, M. (2001) Quality practices and customer/supplier management in Australian service organizations, *Total Quality Management*, 12 (5), pp. 611–621.

Douglas, T. J. & Judge, W. M. (2001) Total quality management implementation and competitive advantage: the role of structural control and exploration, *Academy of Management Journal*, 44(1), pp. 158–169.

Fliedner, G. & Vokurka, R. J. (1997) Agility: competitive weapon of the 1990s and beyond? *Production and Inventory Management Journal*, 38(3), pp. 19–24.

Fung, P. & Wong, A. (1998) Case study: managing for total quality of logistics services in the supply chain, *Logistics Information Management*, 11(5), pp. 324–329.

Garvin, D. A. (1987) Competing on the eight dimensions of quality, *Harvard Business Review*, 65(6), pp. 101–109.

Hackman, J. R. & Wageman, R. (1995) Total quality management: empirical, conceptual, and practical issues, *Administrative Science Quarterly*, 40(2), pp. 309–342

Hendricks, K. B. & Singhal, V. R. (1997) Does implementing an effective TQM program actually improve operating performance? Empirical evidence from firms that have won quality awards, *Management Science*, 43(9), pp. 1258–1274.

Lai, K. H. & Cheng, T. C. E. (2003) Initiatives and outcomes of quality management implementation across industries, *Omega—The International Journal of Management Science*, 31(2), pp. 141–154.

Lai, K. H., Weerakoon, T. S. & Cheng, T. C. E. (2002) The state of quality management implementation: a cross-sectional study of quality-oriented companies in Hong Kong, *Total Quality Management*, 13(1), pp. 29–38.

McGinnis, M. A. Kochunny, C. M. & Ackerman, K. B. (1995) Third party logistics choice, *The International Journal of Logistics Management*, 6(2), pp. 93–102.

Menzter, J. T. & Firman, J. (1994) Logistics control systems in the 21st century, *Journal of Business Logistics*, 14(1), pp. 27–42.

Menzter, J. T. & Williams, L. R. (2001) The role of logistics leverage in marketing strategy, *Journal of Marketing Channels*, 8(3 & 4), pp. 29–47.

Mentzer, J. T., Flint, D. J. & Hult, G. T. M (2001) Logistics service quality as a segment-customized process, *Journal of Marketing*, 65(4), pp. 82–105.

Millen, R. A. & Maggard, M. (1997) The change in quality practices in logistics: 1995 versus 1991, *Total Quality Management*, 8(4), pp. 173–179.

Morgan, N. A. & Piercy, N. F. (1996) Competitive advantages, quality strategy and the role of marketing, *British Journal of Management*, 7(3), pp. 231–246.

Oakland, J. S. (1993) *Total Quality Management: The Route to Improving Performance*, 2nd edn (New Jersey: Nichols Publishing Company).

Porter, M. E. (1987) From competitive advantage to corporate strategy, *Harvard Business Review*, 74(6), pp. 61–78.

Powell, T. C. (1995) Total quality management as competitive advantage: a review and empirical study, *Strategic Management Journal*, 16(1), pp. 15–37.

Sitkin, S. B., Sutcliffe, K. M., and Schroeder, R. G. (1994) Distinguishing control from learning in total quality management, *Academy of Management Review*, 19(3), pp. 537–564.

Stank, T. P. & Maltz, A. B. (1996) Some propositions on third-party choice: domestic vs. international logistics providers, *Journal of Marketing Theory and Practice*, 4(2), pp. 45–54.

Victor, B., Boynton, A. & Stephens-Jahng, T. (2000) The effective design of work under total quality management, *Organization Science*, 11(1), pp. 102–117.

Waldman, D. & Gopalakrishnan, M. (1996) Operational, organizational, and human resources factors predictive of customer perceptions of service quality, *Journal of Quality Management*, 1(1), pp. 91–107.

Westphal, J., Gulati, R. & Shortell, S. (1997) Customization or conformity? An institutional and network perspective on the context and consequences of TQM adoption, *Administrative Science Quarterly*, 42(2), pp. 366–394.