

## **TQM implementation in 3PL organisations vs. organisations with in-house logistics department. A literature review.**

### **Abstract**

**Purpose-** This paper presents the results of an exploratory literature review investigating the similarities and differences in TQM implementation between 3PL organisations and organisations with an in-house Logistics function.

**Design/methodology/approach-** The authors collected all relevant papers covering both types of organisations implementing TQM worldwide in a time period from 1991 until today. The aim was to identify key papers and analyse its contents based on the quality of services provided by these two types of organisations.

**Findings-** The survey contains information about the forces that encourage managers to implement quality practices in the logistics function, the reasons that impeded the implementation of such a quality programme, the quality methods being used and also the level of their satisfaction with the current quality management in logistics.

**Research limitations/implications-** The main limitation of this paper is the timeframe used to analyse the relationship between TQM implementation in 3PL organisations vs. organisations with in house logistics department (papers that have been published globally from 1991 until today).

**Originality/value-** The present study is one of the few that reviewed literature for the years 1991-2010 in order to provide a comparison of quality management implementation between 3PLs and in-house Logistics organisations. The paper provides the basis for further investigation of the subject under study for both practitioners and academics.

**Keywords:** TQM implementation, logistics quality, 3PL, Logistics Function

**Paper type:** Literature review.

## **Introduction**

The importance of the logistics function has increased dramatically over the past twenty years. It has taken a further seventy years or so for the basic principles of logistics management to be clearly defined (Christopher, 1998). In the general area of management research, the interest in logistics as a function or, more broadly, as a strategic activity, first emerged in the 1980s. Business interest in the subject of logistics has developed progressively, in stages, as the logistics function has been integrated into organisational structures (Halley and Guilhon, 1997). In the 1960s-1970s, customer service emerged and the "technical era of distribution logistics" began, where logistics were limited to warehousing, transportation, conditioning and order processing functions, supported by the development of micro-computing and the need to calculate customer service costs. Logistics performance was measured mainly through monitoring the cost of distribution activities. In the 1970s-1980s logistics became a function in the organisation, incorporated within the marketing and production functions. Logistics performance was measured by cost control, quality and deadlines. In the third phase, environmental pressures led to the emergence of logistics as a strategic means for firms (McGinnis et al., 1995). In our days, it is widely accepted that logistics is one of the main functions of organisations and plays a major strategic role in achieving a competitive advantage. On the other hand, Third Party Logistics (3PL) is becoming a reality for many organisations trying to reduce costs, improve efficiency, delivery performance and satisfy their customers. Terms such as "Third party logistics" or "logistics outsourcing" have been used to describe the organisational practice of contracting-out part of or all logistics activities that were previously performed in-house (Bowersox, 1990; Lieb, 1992; Aertsen, 1993; Sink et al., 1996). 3PL firms may perform any logistics activity at any point in the supply chain. Logistics activities performed by 3PL firms include: transporting, warehousing, managing inventory, packaging, materials handling and managing logistics information (LaLonde and Maltz, 1992; McGinnis et al., 1995; Lieb and Peluso, 1999). Logistics activities that are most frequently outsourced by manufacturers and merchandisers include outbound and inbound transportation, freight bill auditing/payment and warehousing (Lieb and Peluso, 1999). 3PL is usually associated with the offering of multiple, bundled services, rather than just isolated transport or warehousing functions (Leahy et al., 1995). From

the early 80s, a lot of transport and warehousing companies developed into Third Party Logistics Providers (3PL) (i.e Exel Logistics, Frans Maas) (Bergund et al., 1999; Hertz and Alfredsson, 2003). This can be partly explained by the growing trend of outsourcing logistics activities in a wide variety of industrial sectors (Transport Intelligence, 2004). Since then, there have been two types of companies. Those that are 3PL companies and specialise in providing all the activities connected with the supply chain and those companies that are commercials or industrials and have an in-house logistics department in order to carry out all the activities that are related to the supply chain. The continuing wave of consolidation within the 3PL industry has also resulted in the emergence of large companies that have the capabilities to offer sophisticated logistics solutions on a continental or even global scale. Such logistics service providers (LSPs) strive to assume a more strategic role within the supply chain of clients, expanding their scale and scope of operations (Selviaridis and Spring, 2007). On the other hand, there are companies that make all or most part of logistics activities in-house. According to Wilding and Juriado (2004) it is usual for shippers to employ a mixed strategy regarding logistics and retain important logistics activities (e.g order management) in-house. The “do or buy” decision is also affected by the evaluation of cost/service trade-offs (Selviaridis and Spring, 2007). One important determinant of the decision is the cost comparison between alternative options. Costs associated with performing logistics activities in-house and investment in capital assets is traded-off against service provider fees. The lowest cost solution should then be selected (van Damme and Ploos van Amstel, 1996). However, cost is not the single most important decision variable and logistics service issues are also considered. (La Londe and Maltz, 1992; Sarel and Zinn, 1992; McGinnis et al., 1995). Aertsen (1993) argued that high asset specificity coupled with difficulties in performance measurement should lead to in-house distribution (Selviaridis and Spring, 2007). Maltz (1994a) found that high asset specificity is associated with in-house warehousing, whereas high transaction frequency leads to outsourcing (Selviaridis and Spring, 2007). Another important determinant of the decision is quality. Quality is a dominant concept that creates value in logistics (Bowersox et al., 1993). A higher quality management performance is expected to result in higher quality logistics services and thus higher satisfaction of the final customer (Gotzamani et al., 2010).

## **Research Methodology**

The aim of this exploratory study is to identify and analyse principal papers that have been published globally in order to provide a comparison of the quality of management practices implemented between the two types of companies mentioned above. The papers that have been analysed were published from 1991 until today and covered only eight countries, in Europe (Greece and Finland), North America (USA), Asia (Hong Kong, Korea, Singapore, Malaysia), and Australia. It seems that these twenty years were very crucial not only for papers that investigated the quality in logistics but also for papers in logistics generally. These major papers consist of edited volumes and journal articles only. Databases were used where a keyword search using some important keywords such as “service quality”, “logistics quality”, “3pl”, “customer satisfaction”, “supply chain management”, “quality measures”, and “Total Quality Management” was conducted. In order to limit the number of publications, the papers that have been taken into account were only those that have analysed the application of quality practices in the logistics function. All other papers were excluded from the research. The papers included in this study are seventeen. Eight of them investigated the application of quality practices in companies that are 3PL and the remaining investigated the application of quality practices in companies that have a logistics department in-house.

### **Literature review**

There is a sufficient number of studies that investigated the application of quality practices in the logistics activities, with the aim of gaining insight into the extent to which quality initiatives were practised, how such programmes were structured and their main results. Some of the studies investigated the application of quality practices in companies that are 3PL and some other studies investigated the application of quality practices in companies that have a logistics department in-house. In the first part of the literature review papers related to 3PL will be presented and the second part will present papers related to companies with a logistics department in-house.

#### *3PL Organisations and Quality Management implementation*

There have been a lot of studies investigating the application of quality practices in 3PL organisations worldwide. The concept of service quality goes beyond the technical aspects of providing the service. It includes customers’ perception of what the service

should be and how the service is to be conveyed (Tsaur et al., 2002). Therefore, 3PL service providers should understand how customers perceive and evaluate service quality, because service quality is related to customer satisfaction, which in turn influences the performance of their organisations (So et al., 2006). In their study, So et al. attempted to use the five dimensional structure of SERVQUAL, which is an instrument suggested by Parasuraman et al., (1988, 1991) in order to measure the quality of service provided by 3PL service providers. Parasuraman et al. (1985) followed a general procedure of qualitative research (interviews and focus groups) to develop the initial scale and then performed quantitative surveys to refine and empirically test the scale, in order to develop SERVQUAL (Mentzer et al., 2001). The five service quality dimensions that have been identified in the study of So et al. (2006) were tangibles, reliability, responsiveness, assurance and empathy. More specifically, tangibles are the physical facilities, appearance of personnel and tools or equipment used to provide service, reliability is the ability to perform the promised service dependably and accurately, responsiveness is the willingness to help customers and provide prompt service, responds immediately to customer request and site problems. Assurance is the skill, knowledge and courtesy of service providers and the level of confidence that they convey to customers. Finally, empathy is the care and personalized attention the firms provide for their customers (So et al., 2006). Although the conceptualization and dimensionality of SERVQUAL have been subjected to some severe criticism (Buttle, 1996), there is a general agreement that the five dimensions are reasonably accurate predictors of perceived service quality (Sureshchandar et al., 2002). Juda et al. (2010) identified the central dimensions of service quality in third-party logistics and determined their impact on a service buyer's satisfaction and loyalty towards the service provider in an outsourcing relationship. A theoretical model is developed and tested using structural equation modelling with survey data from industrial companies in Finland. The survey was conducted in spring 2008 and offered a broad coverage of the various logistics user industries that buy logistics services in Finland. This study builds on the satisfaction-loyalty paradigm in service management research, and notably the "performance-only" (SERVPERF) model advocated by Cronin and Taylor (1992) (Juda et al., 2010). As mentioned above, the objective of the study is to identify the central dimensions of service quality in third-party logistics and empirically determine their impact on the service buyer's satisfaction and loyalty in an

outsourcing relationship (Juda et al., 2010). Perceived service quality in third party logistics is formed of three central quality dimensions: operational service quality, personal service quality and technical service quality (Juda et al., 2010). Service quality is positively associated with the service buyer's overall satisfaction, which again positively influences the buyer's loyalty to the 3PL service provider in the outsourcing relationship (Juda et al., 2010). The results of this study showed that the importance of the technical service dimension appears to be less significant compared to operational and personal dimensions (Juda et al., 2010). From the above study, it can be concluded that service quality is an important antecedent to customer satisfaction and loyalty (Juda et al., 2010).

In another study, Rahman (2006) investigated the application of quality practices in logistics function in Australia. The sample was 350 Australian companies. The survey instrument in this study was developed by Millen and Maggard (1997) and used with only minor modifications (Rahman, 2006). At this point, from this study the results only from the logistics firms would be isolated. Managers were asked how they define logistics quality by identifying the most important components that describe quality in logistics. The top two components that identified quality for logistics firms were 'on-time delivery' and 'total support of customer needs'. After that was the 'error-free transactions', 'no goods damaged in handling or delivery', 'consistency of order cycle', 'defined procedures and work instructions', 'reliable suppliers' and finally 'accurate inventory information'. No manager of the logistics firms believed 'out-of-stocks' to be an important component of logistics quality (Rahman, 2006). The factors that impeded the implementation of the quality management programme were, firstly, 'changing the corporate culture' and at the same rank 'training and educating employees' followed by 'establishing employee ownership of the quality process', 'establishing a common vision through the organisation' and finally, 'lack of data availability', 'gaining senior executive commitment' and 'considering quality in long-term planning' (Rahman, 2006). Also this study showed the practices that used to measure the quality performance. The most important practices in the logistics firms were the 'quality audit by internal resources' and 'competitive benchmarking' which both took the first place and then follows the 'survey of customer expectations', 'the process-specific measures' and the 'quality audit by customers' respectively (Rahman, 2006). The main reasons for not implementing a quality programme were 'lack of human resources', firstly, and then

‘lack of financial resources’, ‘no pressure to initiate’, ‘lack of training’ and finally a 18,2% of the respondents answered that ‘there is no need’ (Rahman, 2006).

Brah and Lim (2006) conducted a study of 325 Singaporean logistics companies from a list of certified logistics companies obtained from three main sources namely, Singapore trade development board 2001/2002 and two online directories. This study showed that the 49,4% of the logistics companies were companies that apply TQM practices and 50,6% of them were non-TQM companies. In this study indicated that there have been three performance constructs that are operational performance, quality performance and technology performance. More specifically, operational performance includes the cost, as compared to main competitors, and the delivery quality and flexibility. Quality performance includes employees’ quality, inter-organisational and external and technology performance includes all the IT systems used by the company (Brah and Lim, 2006). Brah and Lim (2006) proved that the implementation of TQM in Singaporean logistics companies enable them to achieve superior operational performance than their competitors (Gotzamani et al., 2010). The results from the study showed that the reasons for not implementing TQM practices were mainly the ‘lack of financial support’, ‘no pressure to initiate’ and ‘lack of management support’ (Brah and Lim, 2006).

[Table 1 here]

Gotzamani et al. (2010) studied a sample of 193 manufacturing and 107 3PL companies, in order to evaluate the logistics services outsourcing dilemma and the decision to select a 3PL provider via a quality management and a financial performance viewpoint. The data for this study were collected through a structured questionnaire that was built upon the initial instrument prepared by Read and Miller (1991) and its modified version by Millen et al. (1999) (Gotzamani et al., 2010). The results of their study showed that the most important quality strategy components of the logistics services were, firstly, the ‘total support to customer needs’ and then ‘on-time delivery’, ‘error-free transactions’, ‘consistency of order cycle’ and ‘no goods damaged in handling or delivery’ respectively. While ‘no stock outs’, ‘defined procedures and logistics service instructions’, ‘accurate inventory information’ and ‘reliable suppliers’ were less important factors (Gotzamani et al., 2010). On the other hand, there have been

a lot of impediments to the implementation of a quality management system which were firstly, 'lack of data availability', 'considering quality in long term planning' and 'changing the corporate culture' and followed by 'establishing a common vision', 'establishing employee ownership of quality', 'fund availability' and last 'training and educating employees' and 'gaining senior executive commitment' (Gotzamani et al., 2010). The study also showed the major drivers to quality management which were 'top management initiative', 'customers' complaint/dissatisfaction', 'revision of overall strategy', 'internal pressures' and follows the 'competitors' quality initiatives', the 'decrease in sales', the 'loss of customers' and finally the 'benchmarking results' (Gotzamani et al., 2010). The methods used by the companies, in order to measure the quality performance in logistics services were 'quality inspection by internal inspectors', 'survey of customers expectations', 'quality inspection by customers' and 'quality inspection by external inspectors' and followed by the 'competitive benchmarking' and the 'process specific measures' (Gotzamani et al., 2010).

Other studies that have investigated the quality practices in 3PL companies are those of Fung and Wong (1998) in which they studied a logistics service provider from Hong Kong, which had implemented TQM practices in its operations and found that customer satisfaction, flexibility and continuous improvements were the main outcomes of logistics quality practices implementation (Fung and Wong, 1998). Another study, that of Lai et al. (2004) investigated a Hong Kong logistics service provider and found that a successful implementation of a quality management system is the key to survival and long-term prosperity for a logistics company (Gotzamani et al., 2010). Also, Anderson et al. (1998) examined causal relationships between quality management components and logistics performance, in shippers from the American Society of Transportation and Logistics, and identified a causal model that supported this relationship (Gotzamani et al., 2010).

By analysing chronologically the research papers from table 1, many similarities but also differences can be found in terms of content and context. For example, the results in the research of Fung and Wong (1998) as well as those of Anderson's (1998) showed that the implementation of quality practices in the logistics function led to customer satisfaction. Similarly, the researches of Brah and Lim (2006) and Rahman (2006) also showed some very close results but not exactly the same. In the first research there were three performance constructs and three impediments to the implementation of quality

practices. In the second research there were two top components that identified quality and also five impediments to the implementation and five tools to measure the quality performance. On the other hand, Gotzamani et al., (2010) research showed that the quality components are five, the impediments to the implementation are eight, the tools that measure the quality performance are six and the factors that lead to the implementation of TQM practices are nine. All the above lead to the assumption that the variables that have been considered in each research tend to increase in numbers over the years. Additionally, those variables are common among the countries that have been investigated.

[figure 1 here]

#### *Quality Management implementation in the Logistics Function*

On the other hand, there have been a lot of studies investigating the application of quality practices in companies that are not 3PL. One of these studies is the study by Read and Miller (1991), which was conducted by the Cleveland Consulting Group, who surveyed 2200 American and European managers. This paper conducted an exploratory study of quality in logistics. Read and Miller (1991) showed that the most important factors that define quality were the 'total customer satisfaction', 'on-time delivery', 'zero defects', 'employee awareness of quality importance' and then follows the 'reduction of the cost of quality', 'the best-in-class practices' and the 'human resource excellence'. One of their critical findings is that logistics quality programmes are not driven by overall business success factors, as was previously believed (Rahman, 2006). They also indicated that quality management practices are often more fully implemented in purchasing than in other logistics areas (Read and Miller, 1991). They found that 'lack of pressure to initiate' and 'lack of managerial support' were the major obstacles to implement a logistics quality programme. Their study also showed the most important logistics quality measures, which were 'on-time delivery', 'order cycle time', 'order fill rate', 'accuracy of order' and 'customer satisfaction' (Read and Miller, 1991). Another important finding of their study is "a clear gap between the importance given to the components of logistics quality, and the measures being used" (Chow et al. 1994).

Another important study is that of Millen and Maggard (1997). They conducted a follow-up study to the Read and Miller (1991) and provided a comparison of quality management practices between the two studies (Rahman, 2006). In this study were examined quality logistics practices in the largest 500 US companies. The findings of the study showed that the two most important elements that define logistics strategy were: 'total support of customer needs' firstly, and then 'on time delivery'. Elements such as 'reliable suppliers' and 'accurate inventory information' ranked last in this study (Millen and Maggard, 1997). Also, the study showed that in the 64% of the US firms all employees have some quality project responsibilities. However, 60% of them reported that specific employees have been dedicated to quality projects. Some further results from this study are the three areas where quality programmes have been implemented the most extensively. These areas were identified as customer service, purchasing and transport (Millen and Maggard, 1997). On the other hand, this study also showed some of the greatest obstructions to a quality programme in logistics. 'Changing the corporate culture' was ranked as the greatest obstruction, while 'lack of data availability' was ranked second and 'establishing a common vision throughout the organisation' and 'training and educating employees' ranked third and fourth respectively by US firms (Millen and Maggard, 1997).

Similar to the study of Millen and Maggard (1997) is the study of Millen et al., (1999) which examines the application of quality management practices in the logistics function based on a field study of 165 Australian companies. There are several studies that have investigated the implementation of quality management practices in Australian organisations. However, none of these has specifically focussed on the logistics function (Millen et al., 1999). In this study in order to address the status of quality practices in Australian companies they employed a questionnaire that was based on a survey instrument originally prepared by Read and Miller (1991). The resulting questionnaire addressed three main areas regarding logistics practices in the firms. The first area was quality practices implemented by the firm. Specific issues included whether the firm had such a programme, what motivated the firm to have such a programme, how the firm defined quality and how well integrated into the logistics function the quality management programme was (Millen et al., 1999). The second area examined how the quality programme was organised and implemented. Issues considered were how the programme was administered, the extent of implementation in

different logistics areas, and impediments to implementation. The third area was improvement measurement. The processes for measuring performance, performance versus customer expectations, the tools employed and the firm's satisfaction with the results achieved to date, were examined in this area (Millen et al., 1999). The results showed that the major drivers for implementing a quality programme in logistics were 'top management' and the 'overall logistics strategy'. 'Customer dissatisfaction' and 'benchmarking' were also factors, which influenced the implementation of quality practices in logistics. The results also showed that the three most frequently selected reasons for not implementing a quality programme were a 'lack of management support', 'no pressure to initiate' and a 'lack of financial resources' (Millen et al., 1999). Additionally, respondents named the aspects that define logistics quality management. The most vital aspects were 'total support of customer needs', 'on-time delivery', 'reliable suppliers', 'accurate inventory information', 'error-free transaction', 'defined procedures and instructions', 'no out of stocks', 'no goods damaged in handling and shipping' and finally 'consistency of order cycle' (Millen et al., 1999). On the other hand, the greatest factors that impeded the logistics programme were identified as 'changing the corporate culture', 'establishing employee ownership of the quality process', 'establishing a common vision throughout the organisation', 'training and educating employees', 'lack of data availability', 'considering quality in long term planning', 'gaining senior executive commitment' and finally 'funding availability' (Millen et al., 1999). This study also investigated the processes that used by the firms in order to measure quality performance. These processes were 'quality audit by internal group', 'survey of customer expectations', 'process specific measures', 'quality audit by external resources other than customer', 'competitive benchmarking' and 'quality audit by customer' (Millen et al., 1999). Finally, the study indicated the different levels of improvements from the total quality management programme in logistics. These levels were 'customer satisfaction', 'information accuracy', 'communication', 'delivery', 'productivity', 'logistics costs', 'order cycle time' and finally 'transaction costs' (Millen et al., 1999).

Another important study that has been mentioned before, is that of Rahman (2006). This study examined 350 Australian companies, consisting of 120 logistics, 103 manufacturing and 127 retail/service companies. At this point of view, the results only from the 103 manufacturing and 127 retail/service companies would be isolated. The

results from this study showed that the top two components that identified quality for manufacturing and retail companies were 'on-time delivery' and 'consistency of order cycle'. This is consistent with the findings of other studies (McMullan, 1996; Millen and Maggard, 1997). 'On-time delivery' and 'order cycle' are frequently cited in literature as critical measures of logistics performance (Beamon, 1999; Gunasekaran *et al.*, 2001). In this study were also investigated the factors that impeded the implementation of the quality management programme in logistics. The three most important obstacles for manufacturing and retail companies were 'establishing employee ownership of the quality process', 'changing the corporate culture' and 'establishing a common vision through the organisation' respectively (Rahman, 2006). This study also showed that organisations use a variety of procedures to learn about the effectiveness of their quality efforts and to set targets. The most frequently cited method by managers was 'quality audit by internal resources'. This finding is consistent with the findings of the previous studies (Read and Miller, 1991; Millen and Maggard, 1997; Sohal *et al.*, 1999). Also the use of 'third-party audits' (i.e. external quality audits) was common among the manufacturing and retail companies. The managers of those companies indicated a greater usage of all procedures except 'competitive benchmarking' (Rahman, 2006). The same study also showed the extent to which various methods were used by companies to benchmark performance against customer expectations. The three most frequently applied techniques were 'line management visits to customer sites', 'customer surveys' and 'internal measurements of repeat business'. These results suggest that the participating organisations are customer-focused and utilize a variety of methods to assess customer needs and expectations. The manufacturing companies employ more "customer survey" techniques to ascertain customers' expectations. Managers were also asked to indicate the tools they used to identify and track improvements in processes. The most commonly used tools were 'flow charts', 'statistical process control', 'check sheets' and 'histograms' (Rahman, 2006). These results are similar to the findings of Millen and Maggard (1997). This study also showed that the reasons given by managers for not implementing a quality management programme in logistics functions are 'lack of human resources' and 'lack of financial resources' (Rahman, 2006). Millen and Maggard (1997) came to similar conclusions in their research in the context of American companies.

[Table 2 here]

Gotzamani et al. (2009) studied 450 Greek companies. The sample consisted of 43 logistics firms, 223 manufacturing firms, 115 trade firms and 69 service firms. Because the logistics firms equal to 9.5% of the sample, that is the reason why the results from this study would be presented from the scope of the companies that are not 3PL. The results of this study showed that the three most important components that outline quality in logistics were 'total support of customer needs', 'on-time delivery' and 'error-free transactions'. This proved that companies' view of logistics quality is mainly customer-oriented since the most popular indicators are directly related to customer satisfaction and not internal operational performance (Gotzamani et al., 2009). These results are consistent with the findings of previous studies (Read and Miller, 1991; Millen and Maggard, 1997; Millen et al., 1999; Sohail et al., 2004; Rahman, 2006). On the other hand, the impediments to the implementation of a quality management system were firstly, that 'they do not believe they need it', secondly the 'lack of human resources' and then 'no pressure to initiate'. The results showed that the companies are not interested in the implementation of an official quality management programme simply because they do not believe that they need it and not because there is 'lack of training' or because there is 'lack of management support' (Gotzamani et al., 2009). The study also showed the methods used to evaluate quality performance. First was 'quality inspection by internal inspectors', second 'quality inspection by external inspectors other than customers' and third 'process-specific measures'. The methods used more to measure and assess quality improvements were 'check sheets', 'statistical process control' and 'flowcharts' respectively (Gotzamani et al., 2009).

Except for the above studies, there have been some others that investigated the implementation of quality management practices in developing nations like Malaysia or any other Southeast Asian nation. One of these studies is the study by Sohail et al. (2004). In this study, in order to determine the status of quality practices in Malaysian companies they conducted a mail survey using a questionnaire that was originally prepared by Read and Miller (1991) and Millen et al. (1999) (Sohail et al., 2004). The main areas that the study focussed on were the existence of quality management programme in the logistics function, the barriers, if any, in the reasons for not implementing quality initiatives in logistics, the important constructs in the definition of

logistics quality management, the major drivers of logistics quality management programme, the major impediments in its implementation and the performance measures used to assess effectiveness (Sohail et al., 2004). The results from this study showed that the major drivers for implementing a quality programme in logistics were initiated from 'top management', 'declining sales' and 'competitor's quality initiatives'. Comparisons with 'industry benchmarks' and 'customer dissatisfaction or complains' were also factors that influenced the implementation of quality practices in logistics (Sohail et al., 2004). The factors that prevented these firms from implementing a quality programme in logistics were 'lack of financial resources', 'no pressure to initiate' and 'lack of management support' (Sohail et al., 2004). These results are similar to those found in the Australian and US studies (Millen and Magard, 1997; Millen et al., 1999). In this study, the respondents named the three most important measures in their definition of logistics quality management. The findings were 'total support of customer needs', 'on-time delivery' and 'error free transactions'. About the procedures utilised to measure quality performance, the respondents of the study named firstly a 'quality audit by internal auditors' and secondly 'surveys of customer expectations'. 'Competitive benchmarking', 'quality audit by customers' and 'process-specific measures' were the other procedures used to measure quality performances (Sohail et al., 2004). Finally, the study indicated the different levels of improvements from the total quality management programme in logistics. These levels were 'customer satisfaction', 'internal communication/co-ordination', 'productivity', 'delivery quality and reliability' and also 'information accuracy' (Sohail et al., 2004). Other studies that investigated the implementation of quality management practices in Malaysian organisations in an overall context are the studies of Poh and Hamid (2001) and Hazman (2000) with similar findings.

A.T. Kearney for the CLM conducted a comprehensive study of the logistics improvement process in 1991. The research team surveyed more than 400 U.S. based companies and conducted 57 interviews with leading companies in quality and productivity improvement. The objective of the study report was to provide guidance on how to begin and sustain a quality and productivity-improvement process (Byrne and Markham, 1991). Methods and characteristics of firms perceived to be successful in the area of logistics customer value and satisfaction were identified and used as the foundation for recommendations and suggestions on quality improvement (Anderson et

al., 1998). The A.T. Kearney study report was organised around four major categories of characteristics shared by successful companies in the creation of customer value. Along with business strategy (i.e. competitive positioning, leadership, mission and goals), these categories comprised what the authors referred to as “The Process of Creating Customer Value”. The four categories were: ‘customer-driven service strategy’ (e.g. needs/requirements, expectations, service strategy), ‘senior management commitment’ (e.g. corporate attitudes and culture, process orientation, cross-functional coordination, supplier/customer relationships), ‘formal process for continuous improvement’ (e.g. analysis tools, benchmarking, measurement), and ‘employee ownership of improvement’ (e.g. training, team approaches, reward and recognition) (Anderson et al., 1998). The A.T. Kearney study made no attempt, however, to determine causal relationships between the methods and characteristics and customer outcomes (Anderson et al., 1998). Service quality and customer satisfaction are related concepts that are sometimes understood to be synonymous, especially by practitioners, but theoretical and empirical research mostly support the view that they are distinct concepts and that quality performance leads to satisfaction (e.g. Rosen and Surprenant, 1998; Olsen, 2002). The previous study, however, did not mention the reasons that impeded the application of quality programmes and also the tools for measuring quality performance and quality improvements.

From the above analysis, someone could observe that the findings from the latter research are similar to those of the former. For example, the findings of the research of Sohail et al. (2004) are similar to those of Millen et al. (1999) and Millen and Maggard (1997). The results of the Rahman’s research are similar to those of Millen and Maggard (1997) and Read and Miller (1991). And also the results of Gotzamani’s research are similar to those of Rahman (2006), Millen et al. (1999), Millen and Maggard (1997) and Read and Miller (1991). It is obvious that the factors that have been considered in each investigation have been confirmed and remained the same with minor differences over the years. Additionally, these factors are common among the countries that have been investigated.

[Figure 2 here]

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## **Discussion and Conclusions**

In the literature there have been many papers about the quality practices implemented by 3PL companies as well as the quality practices implemented by companies with an in-house logistics department. This paper tried to investigate the quality practices from the principal studies and to evaluate if there have been similarities and differences between these two types of companies. From the analysis of the literature review it is evident that there are a lot of similarities in the way that 3PL companies and companies with an in-house logistics department implement quality practices in their logistics functions but also there are a lot of differences too. More specifically, the three most important components identified for both types of organisations regarding TQM implementation were 'total support to customer needs', 'on-time delivery', and 'error-free transactions'. The main factors that impeded the implementation of the quality management programme in 3PL companies were similar to those of companies that are not 3PL. These factors were 'lack of management support', 'no pressure to initiate', 'lack of financial resources', 'lack of data availability', 'considering quality in long term planning', 'changing the corporate culture', 'establishing a common vision', 'establishing employee ownership of quality', 'training and educating employees' and finally 'gaining senior executive commitment'. But in total, the evidence showed that 3PL organisations seem to face fewer problems in TQM implementation compared to organisations having an in-house logistics function mainly due to resources availability, human resources expertise and better and sophisticated technology.

Furthermore, the results of this study showed that both types of firms have applied the same quality tools to monitor and measure improvements in various areas of logistics functions, such as 'quality audit by internal group', 'survey of customer expectations', 'process specific measures', 'quality audit by external resources other than customer', 'competitive benchmarking' and 'quality audit by customer'. However, 3PL companies showed a significantly higher use of all possible methods that help measure quality performance, identify customers' perceptions and evaluate quality improvements in logistics services than the companies that are not 3PL. These results are in contrast to the results of some other studies. There are studies which showed that both groups of companies have applied simple quality tools to monitor and measure improvements in various areas of logistics functions. However, the managers of manufacturing and retail

companies used these tools more frequently than the managers of the logistics companies. Finally, the study indicated the different levels of improvements from the total quality management programme in logistics companies and in companies with a logistics department in-house. The results showed some differences between the two types of companies. In the 3PL companies the levels of improvements were the 'top management initiative', 'customers' complaint/dissatisfaction', 'revision of overall strategy', 'internal pressures' and follows the 'competitors' quality initiatives', 'the decrease in sales', the 'loss of customers' and finally the 'benchmarking results'. On the other hand, in organisations with in-house logistics function these levels of improvements were 'customer satisfaction', 'information accuracy', 'communication', 'delivery', and 'productivity'. Finally, the comparison of the two types of companies showed that 3PL providers implement quality programmes in more logistics' related areas compared to companies that operate their own logistics departments and this is a result of the experience and the ability that 3PL companies have in every aspect of the logistics functions more than the companies that are not 3PL. This study contradicts other studies, which showed that manufacturing companies with an in-house logistics department are ahead of logistics firms in the application of quality management practices in the logistics functions.

The results obtained from the analysis of key papers proved that in many aspects 3PL companies and those that are not 3PL implement quality practices in the same way. Also, the results offer a better understanding of what are the forces that encourage managers to implement quality practices in the logistics function, the quality methods being used and also the level of their satisfaction with the current quality management in logistics. Another issue that came up from the analysis was the changes in time in relation to the implementation of TQM in companies that are 3PL and those that have a logistics department in-house. Organisations with an in-house logistics department seem to experience fewer changes in time, in relation to the implementation of TQM in comparison to the 3PL companies. But, the biggest change is in the organisational culture and more specifically in the way they define quality and in the approach used to implement quality principles and tools in their logistic functions. Additionally, the way that companies define quality, implement quality practices, the obstacles they face and the tools used to measure quality performance are common among the countries that have been considered in this study. It is obvious that in the past twenty years

organisations have changed their philosophy entirely in order to become more customer-oriented. Furthermore, the authors believe that if there were sufficient financial resources and top management initiative from the side of the in-house logistics as well as the most qualified personnel in the logistics department then the differences between the two types of companies would be eliminated.

This research paves the way for other, in-depth studies to further examine the 3PL vs. in house logistics department TQM implementation both using a meta-analysis approach or designing a quantitative study using a sample of 3PL companies and a sample of companies that have an in-house logistics department in order to assume more reliable results about their similarities and differences in the way they implement quality practices in their logistics functions and also to analyze the motives, reasons and approaches used by both types of organisations in their effort to improve quality and thus to satisfy their customers.

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Table 1. Key papers – 3PL and TQM Implementation

Author	Title	Journal	Year	Country
Fung, P. & Wong, A.	Case study: managing for total quality of logistics services in the supply chain	Logistics Information Management	1998	Hong-Kong
Anderson, R.D., Jerman, R.E. & Crum, M.R.	Quality management influences on logistics performance	Transportation Research Part E, Logistics and Transportation Review, Transportation Research	1998	USA
Lai, K.H., Lau, G. & Cheng, T.C.E.	Quality management in the logistics industry: an examination and a ten-step approach for quality implementation	Total Quality Management	2004	Hong-Kong
Brah, S.A. & Lim, H.Y.	The effects of technology and TQM on the performance of logistics companies	International Journal of Physical Distribution and Logistics Management	2006	Singapore
Rahman, S.	Quality management in logistics: an examination of industry practices	Supply Chain Management: An International Journal	2006	Australia
So, S., Kim, J., Cheong, K., & Cho, G.	Evaluating the Service Quality of Third-Party Logistics Service Providers using the Analytic Hierarchy Process	Journal of Information Systems and Technology Management	2006	Korea
Gotzamani, K., Longinidis, P. & Vouzas, F.	The logistics services outsourcing dilemma: quality management and financial performance perspectives	Supply Chain Management: An International Journal	2010	Greece
Juda, J., Juntunen, J. & Grant, D.B.	Service quality and its relation to satisfaction and loyalty in logistics outsourcing relationships	Managing Service Quality	2010	Finland

Table 2. Key papers – TQM Implementation in the Logistics Function

Author	Title	Journal	Year	Country
Read, W.F. & Miller, M.S.	The state of quality in logistics Achieving Customer	International Journal of Physical Distribution & Logistics Management	1991	America and Europe
Kearney, A.T.	Satisfaction through Logistics Excellence	Managing Service Quality: An International Journal	1994	Europe
Millen, R. & Maggard, M.	The change in Quality practices in logistics: 1995 versus 1991	Total Quality Management	1997	USA
Millen, R., Sohal, A. & Moss, S.	Quality management in the logistics function: an empirical study	International Journal of Quality & Reliability Management	1999	Australia
Hazman, S.A.	Quality assurance and ISO 9000 in higher education institutions in Malaysia: some observations	Malaysian Management Review	2000	Malaysia
Poh, J.P. & Hamid, A.Z.	Total quality management (TQM) in Malaysia: a comparative study on employees' perceptions of management practices in TQM and non-TQM companies	The 4th Asian Academy of Management (AAM) Conference Proceedings	2001	Malaysia
Sohail. M.S., Sohal, A.S & Millen, R.	The state of quality in logistics: evidence from an emerging South East Asian nation	International Journal of Quality & Reliability Management	2004	Malaysia
Rahman, S.	Quality management in logistics: an examination of industry practices	Supply Chain Management: An International Journal	2006	Australia
Gotzamani, K., Vouzas, F. & Longinidis, P.	Quality management in the logistics function: a study of the Greek industry	Supply Chain Management: An International Journal	2009	Greece

Figure 1. Timeline of factors in 3PL

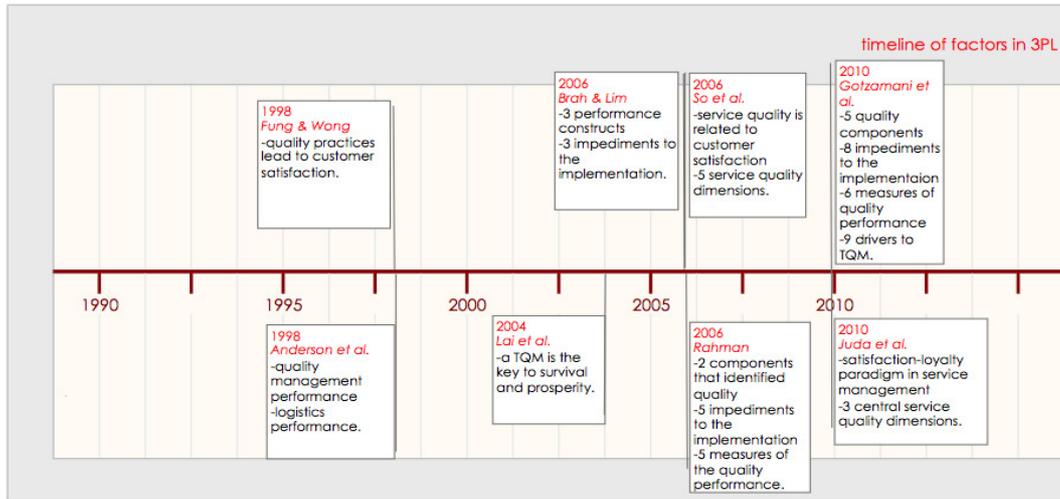


Figure 2. Timeline of factors in in-house Logistics

