

Quality Management In Logistics Sector: Principles And Practice

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Abstract:

As it is the case for production and service sectors, one of the key ways for a logistics company to create sustainable competitive advantage is to differentiate itself from the rest with the quality that it offers. Researchers and practitioners have developed various quality improvement policies for logistics service providers and each of the policies addresses certain aspects of the business. This study individually evaluates the major quality approaches involved in an attempt to explore prospects of combining them in a way to maximize the benefit of their implementation. To promote applicability the quality approaches are analyzed from the perspective of customers as well as that of implementers of quality programmes.

Key Words : *Logistics, Quality Management, JIT Logistics, Green logistics, Value-added logistics*

1. Introduction

Although originated from military efforts, logistics has now become a life-line for almost all sorts of activities in the world; from industrial and agricultural production, to service industry, from medicinal operations to humanitarian campaigns etc. Before 1960s it used to be considered merely as a “supporting” operation for the “main” job under consideration and, consequently, improvements recorded were bound to remain occasional only. In time, however, practitioners and academicians have started treating logistics as a separate discipline in its own right after experiencing its complexity and also discovering many opportunities in it. Discrete improvements recorded through practice have been transformed into principles, serving the industry systematically as bettering tools that are applicable to all other cases.

While Groover (Groover, 2007) names production, service, logistics and information as the four broad type of occupations, many treats logistics as a subset of service sector (Saura et al, 2008) and (Huang et al 2009). Regardless of their relative position, the three sectors, namely production, service and logistics, share many common concepts, approaches and tools of quality management. When developments in production and logistics are analyzed together, they seem to have followed somewhat parallel, even if not simultaneous, patterns. For example, in the case of production the overriding concern for the sector in earlier times was productivity and only subsequently quality has become an issue for the sector. Similar to the case of production, in logistics sector cost-cutting efforts were dominant first and importance of quality was appreciated in coming years (Table 1).

In addition to the parallelity between logistics and production with reference to quality, logistics sector also deploys quality concepts developed for service industry, which will be discussed in detail in the coming sections.

To stay competitive in the global market, Logistics Service Provider (LSP) companies have been substantially investing on the quality front and adopting any quality improvement available, regardless of the sector of origin, since there has been very little room for improvement in the cost-cutting front in these days due to globalization, which tends to equate all LSP in their access to energy and HR markets. This study compiles these approaches and analyzes particular contributions of each approach to the logistics sector.

2. Approaches Adopted For Logistics Quality Management

Main goals of logistics are commonly and concisely expressed as 7Rs of logistics, denoting moving the right materials/products in the right quantity in the right condition at the right time to the right place at the right cost to the right customer. To achieve these goals various quality management approaches are adopted by the sector. It should be pointed out that since these approaches are not mutually exclusive alternatives, a given logistics company can adopt more than one of them at the same time, creating augmented improvements.

2.1. Service Quality Approach

As pointed out earlier, it is common to consider logistics as a subset of service industry and, therefore, utilizing service

quality approach for quality managements in logistics is also common. Service quality approach is based on the concept of customer-driven quality. As the name implies, some companies use service quality concept to assess their performance as perceived by the customer, because, after all, customer is at the receiving end of the service provided and the ultimate corporate goal is to satisfy the customer. The followings list is a selection of elements that are import to customers, regardless of them being an individual or a corporate customer (Filho and Souki, 2007), (Lambert and Burduroglu, 2000) and (Fugate et al, 2010):

- Time between order receipt and delivery
- Punctuality in the delivery (delivery in the agreed period of time)
- Absence of damage
- Resolution of complains
- Reliability of the information given by the personnel
- Information about the order's status
- Ease of placing order
- Flexibility
- Time in repairing faults
- Efficient communication
- Return policy
- Supplier absorbs cost of freight and handling on returns due to shipping damages or product shipped in error
- Quality/durability of packaging
- Product according to specification
- Delivery of the correct product
- The shipments rarely contains wrong items
- The shipment rarely contains incorrect quantities
- The shipments rarely contains substituted items
- Correct invoice
- The products are constantly in stock
- Advanced warning about delays
- Physical appearance of the employees, trucks and equipments
- Employees' capacity to solve problems
- Employees' cordiality
- Urgent and special services
- Availability of technical information

The above elements are what the customers take into consideration in evaluating quality and, consequently, they are the ultimate targets of logistics companies. To reach these ultimate targets, the management sets internal and interim operational targets for itself to reach, which are constantly monitored to evaluate company's performance. In other words, the list above tells what customers want, but the job of how to deliver them is another matter and it requires a set of performance metrics similar to the ones in Table 2. (Wojciechowska, 2011):

It should be noted that the metrics in the table are basically a kind of interim indications that give an idea about the performance of the company, rather than the data of standards related to what are being delivered to the customer. Consequently they can only be used internally as a feedback to figure out how to reach the ultimate target, which is customer satisfaction.

2.2. Benchmarking

Benchmarking is one of the common concepts that has been utilized in any quality management programme. It essentially involves determining the leading firm in a particular field as the reference against which the given company compares itself. The comparison leads to question performance of the company and then to identify the areas for improvement and finally conduct the improvement work. The following list is a selection of factors that are used for benchmarking (Rushton, 2010):

- lead time
- stock availability
- minimum delivery/order size policy
- order and delivery frequency
- full loads delivered on time

2.3. Just-In-Time (Jit) Logistics

Although defined differently by many, JIT is basically a management philosophy with some tools that focuses on waste reduction, where the word "waste" not only refers to scraps or lost time but also to any non-value-adding-activites/inventory/space/skills. It was originally developed for improving production sector, but later deployed by service industries although relatively slowly (Lai and Cheng, 2009). As stated by Lai and Cheng, "While JIT is a process-orientated waste elimination management approach, the principles are relevant and applicable to both production and service firms processes and systems to perform the tasks of production and delivery of products or services." (Lai and Cheng, 2009) .

The followings are some areas where JIT philosophy can record progress:

- Minimize idle capacity for transport through more efficient scheduling
- Maximize carriage capacity through more efficient routing
- Eliminate unnecessary inventory unless there is a considerable price discount to gain or a possibility of stock-out loss
- Streamlined information flow by integration between all parties involved

2.4. Value Added Logistics

Another opportunity that a logistics firm can explore for differentiating itself with its quality is to offer value added logistics to its customers. Moving pre-sales production functions and after-sales services to an LSP transforms logistics function to value-added activities that increase customer satisfaction, among other benefits (Li, 2011). The followings are examples of value-adding activities that can be encountered in logistics (UNESCAP), (Zeybek and Kaynak, 2008) and (Gudehuss and Kotzab, 2012):

- Labelling, for example for customizing purposes
- (Re)Packaging
- Assembling
- Adding manuals
- Breaking bulk/
- Palletizing/unitizing

- Stretch-shrink-wrapping
- Final assembly
- Repairment
- Blending/mixing
- Cleaning
- Quality control
- Reverse logistics

2.5. Green Logistics

The EU identified five areas of economic activity that may affect the environment, as follows (Rushton, 2010):

- Tourism
- Energy
- Transport
- Agriculture
- Industry

While the above list signifies gravity of logistics on the environment on the one hand, it also indicates opportunities of making logistics activities more environmentally friendly. Since more and more customers have concerns about the environment and perceive greener companies as more quality ones, even if they receive the same level of service, one of the key ways for a logistics provider to differentiate itself qualitywise is to opt for operations with less damage to the environment. Table 3 gives a summary of ecological objectives for logistics sector, along with the means to achieve them:

In order to evaluate their own performance, companies should monitor and keep records of the following data of their activities:

- Fuel consumption (lt/km)
- Used oil (lt/km)
- Percentage of empty kilometers run by vehicles
- Percentage of utilization of vehicle load space
- Targets for reducing waste packaging

Although corporate customer may be less sensitive to impact of logistics activities on the environment, individual customers take this issue into account in great deal in making their decisions. Especially in urban logistics and courier service businesses it is a must for businesses to provide environmentally friendly logistics services. Use of bicycle couriers is an obvious solution not only for a more environmentally friendly logistics but also for a faster service (Maes and Vanelslander, 2011).

2.6. Standards, Quality Certificates And Awards

Similar to the early phases of quality movement in production, where quality concept was perceived simply a matter of detecting and discarding the products that do not comply with certain standards, logistics sector has also established certain standards that are used as criteria for assessing logistics quality. This approach, however, is not as straight forward as

production as there are many intangible factors that determine logistics quality, setting definite standards. Nevertheless standards, such as family of ISO 9000s, ISO 14000s are available for quality improvement efforts, the latter governing ecological side of logistics operations.

Research on ISO 9000 implementation in 288 Spanish companies reveals (Casadesus and Gimenez, 2000) that 80 percent of the companies say that customer satisfaction has increased and 63 percent say that customer complaints have decreased.

Quality awards delivered by various national and international institutions can also be useful and important indications that should be taken into consideration since they, in a way, reflect voice of the customer.

2.7. Relationship-Based Logistics

It is a well established fact that “maintaining existing customers and extending business with them is significantly less expensive than acquiring new customers” (Cahill, 2007). Since logistics sector typically offers services that a customer needs more frequently than many other necessities, such as buying a fridge, relationship-based logistics naturally attracts considerable amount of attention. Relationship-based logistics, needless to say, requires customer satisfaction and as Cahill stated “..quality is an antecedent of satisfaction”. Offering such a long-term relation is also statement of self-confidence, reinforcing the perception of being a company of quality. Cahill further states that “According to social exchange theory, the benefit and consequently the satisfaction perceived by the customer depend both on cost and on performance aspects, the latter being represented by service quality” (Cahill, 2007)

Many companies seek to establish relationship-based interactions as opposed to transactional ones and this can only be achieved through high quality service delivered consistently.

3. Conclusions

As with production and service industries, logistics sector is also focusing on customer satisfaction in its quality undertaking and to achieve that it is, too, using regular quality management concepts such as JIT, benchmarking etc. However quality improvement efforts of logistics companies have far gone beyond meeting customers’ demand, which can be extremely changeable and not always easy to describe. Companies are well aware of the fact that they must not only satisfy their customers’ expectations but also create such quality that the customers have not asked for yet at their transactions. In this context, the concepts of value-added logistics and relationship-based logistics are all those efforts of offering quality that the customer has not experienced and, as a result not demanded yet. These concepts are being widely practised by many companies as a part of their quality management programmes, distinguishing themselves from their rivals. In addition to these concepts of value-added logistics and relationship-based logistics, the concept of green logistics also inherently lends high quality logistics opportunities.

4. Tables

Table 1 - Overriding Concerns in Production and Logistics, Illustrating Their Parallel Evolution

	PAST	PRESENT
PRODUCTION	Productivity	Quality
LOGISTICS	Low-cost	Quality

Table 2. Some Internal Logistics Metrics Used to Evaluate Performance of an Logistics Company

METRIC'S NAME	METRIC'S FORMULA	UNIT
Orders delivery timeliness	Number of fulfilled orders / Number of orders to be fulfilled	[%]
Number of lost deliveries	Number of all lost deliveries for which company is responsible	[unit]
Number of transportation damages	Number of all transportation damages for which company is re-sponsible	[unit]
Employees being on call	Number of picking up phone (during 30 seconds) / All phone calls	[%]
Completeness of deliveries fulfilment process	Number of deliveries fulfilled completely /number of all deliveries fulfilled during a chosen time interval	[%]
Number of complaints per 1000 bill of ladings	Number of complaints raised in the chosen division / 1000 bill of ladings	[unit./1000 bill of ladings]

Table 3 : Ecological objectives for logistics and the means of attaining them

OBJECTIVES	MEANS
Minimum fuel and energy consumption	* vehicles with more efficient motors * vehicles with hybrid motor in urban logistics * well-maintained vehicles (tyres, brakes, clutches etc) * aerodynamic loading * bikes for courier service
Minimum emission of harmful gases	* vehicles with catalitic convertor
Waste reduction	* re-usable containers/packages * recycle packaging * recycle used oil * adopt predictive maintenance for optimum oil-change timing

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