

Quality Issue in Shipping and Maritime Education

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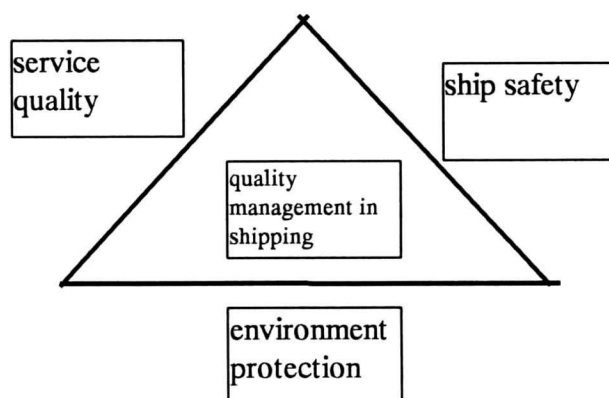
1. Introduction

This article explores both what quality of service is and what the quality of maritime education can be improved or guaranteed. The shipping industry is a service industry, based on a derived demand, which is particularly derived from manufacturing industries. The world manufacturing industry has been becoming sophisticated in terms of time(JIT manufacturing) as well as geography(global sourcing and manufacturing). The sophisticated manufacturing industry has been developing quality management, resulting in TQM(total quality management).

Shipping industry is not immune to the sophistication such as JIT and TQM. Shipping industry itself needs to be equipped with quality service, which means cost-effectiveness, efficiency and reliability. In addition to it shipping industry is asked to satisfy the requirements of international community to secure the safety of ships and hence the cargo and ocean environment.

The dimensions of service quality in shipping, thus, may be identified as following three factors-customer satisfaction, ship safety, and environment protection. 'service quality' in figure 1 means a service provided to shippers, freight forwarders that use shipping as a transportation means. 'Ship safety' means the safety of cargo as well as ship itself, which should be afloat and can navigate to the destination with seaworthiness. 'Environment protection' means the pollution control against sea caused by ship operation(like ship's crew sewage) or accident(like oil pollution) and polluted air emitted by ship's engine.

Figure 1. Three dimensions of quality management in shipping



Source: The author

Three factors of quality management in shipping is further explained in table 1. Table 1 shows that service quality is achieved by company-built measures; safety, by ISM code or ISO 9000; environment, by ISO14002. The service quality is mainly pursued by shore-based office; safety, by ship; and environment, by ship. Principal benefactors are shippers, cargo and ship, and general public. Service quality can be monitored by measuring gaps; safety, by audit; and environment, by audit.

Table 1 the elements of shipping service quality

	Service quality	Safety	Environment
Means to achieve	<ul style="list-style-type: none"> • Company-built measures such as timeliness, responsiveness • ISO 9000 	<ul style="list-style-type: none"> • ISM code • ISMA code • SOLAS IX • ISO 9000 	<ul style="list-style-type: none"> • ISO 14002
Principal actor	<ul style="list-style-type: none"> • Shore-based office 	<ul style="list-style-type: none"> • Ship 	<ul style="list-style-type: none"> • Ship
Principal benefactor	<ul style="list-style-type: none"> • Shipper 	<ul style="list-style-type: none"> • Cargo and ship 	<ul style="list-style-type: none"> • General public
How to monitor	<ul style="list-style-type: none"> • Gap(expectations-perceptions) measurement 	<ul style="list-style-type: none"> • Audit 	<ul style="list-style-type: none"> • Audit

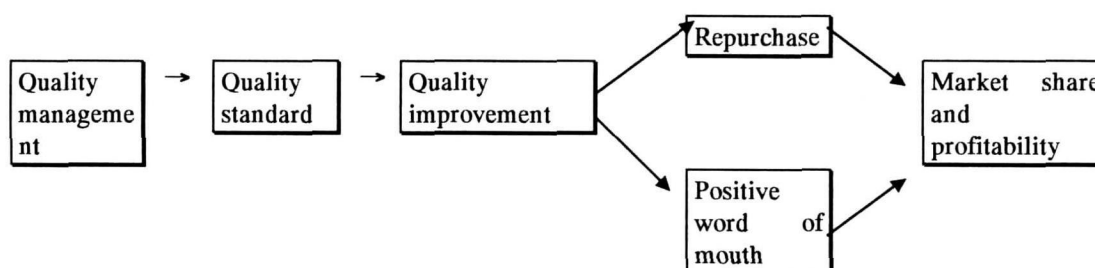
Source: The author

2. Why quality management in shipping?

It were Deming, Juran and Fiegenbaum who laid the foundation of quality control not in service but in manufacturing sectors. They suggested a set of steps or points- Deming’s fourteen points, Juran’s quality planning road map and Fiegenbaum’s ten benchmarks.

Quality management has a positive effect on a company’s market share and profitability. Quality management creates more employee sensitivity to the issue of quality. This generates a higher level of quality, which impacts on both increased repurchase and increased sales from positive word of mouth.

Figure 1 Benefits of quality management



Source: The author

The expectations towards market share and profitability make many shipowners and operators be committed to quality shipping. Ship management companies also developed the ISMA(International Ship Managers’ Association) code. The ISM(International Safety Management) code has finally come into force internationally. High quality service itself is not an end but results in benefits for the organisation. The drive to quality in shipping sector has had three significant features: positive company image, lower costs and higher market share, and decreased liability.

- Positive company image

A reputation for high-quality service creates a positive image for shipping lines. Positive image helps a shipping company increase sales, obtain funds from various lending agencies, and recruit better personnel.

- Lower costs and higher market share

Quality enhancement increases productivity and lowers rework time, scrap costs, and warranty costs, leading to increased profits. Improved performance enables the company to increase its market share and gain competitive advantage through economies of scale.

- Decreased liability

Shipping companies have been facing complaints caused during the transportation or because of ship accidents. Successful launch of quality assurance system such as ISO and ism shall typically result in improved service

performance and lower liability costs.

3. 'SERVQUAL' dimensions applied to shipping/logistics

In order to provide good service to shippers the dimensions which constitute quality should be identified. The model provided by Parasuraman et al is a good base to continue the discussion toward the quality dimension of shipping and logistics.

Parasuraman et al ¹ has developed ten different determinants within the service quality after series of qualitative and quantitative studies; access, communication, competence, courtesy, credibility, reliability, responsiveness, security, tangibles and customer knowledge. Definition and examples of the determinants within the shipping services can be seen in table 2. The right-hand side column of the following table shows the dimension of service quality in shipping and logistics, composed by the author, who arbitrarily placed the quality dimension according to the SERVQUAL dimensions. For example, 'reliability' in SERVQUAL dimensions means delivery time, issuing bill of lading on time and correctly, and delivering the cargo at the promised time.

Table 2. Shipping services: customers' view of service quality

Dimension	Shippers' view
Reliability	<ul style="list-style-type: none"> • Delivery time • Issuing bill of lading on time and correctly • Delivering the cargo at the promised time
Tangibles	<ul style="list-style-type: none"> • Clean and undamaged containers • Modern looking equipments • Appearance of the invoice • Appearance of the communication materials
Access	<ul style="list-style-type: none"> • Convenient working hours • Accessibility by telephone easily
Communication	<ul style="list-style-type: none"> • Informing the shippers about the technical details
Understanding the customer	<ul style="list-style-type: none"> • Knowing the specific objectives of the shipper in terms of logistics
Security	<ul style="list-style-type: none"> • Confidentiality not giving the information about the customer to third parties
Credibility	<ul style="list-style-type: none"> • Reputation of the firm • Giving clear and right information about the logistics cost
Responsiveness	<ul style="list-style-type: none"> • Dependability in handling the problems • Responding the inquiry quickly
Competence	<ul style="list-style-type: none"> • Working with the personnel having expertise and knowledge
Courtesy	<ul style="list-style-type: none"> • Treating the shippers respectively and politely

Table 3 shows what sort of factors are regarded as the dimensions of quality in shipping and logistics. The

¹ Parasuraman, A., Zeithaml, V.A. and Berry, L.L. (1985), "The Conceptual Model of Service Quality and its Implications for Future Research", *Journal of Marketing*, Vol.49, Fall, p.41.

most common factors stipulated as the dimensions of quality concept are listed as reliability, transit time etc.

Table 3 quality dimensions of shipping and logistics quality

Researchers	The dimensions of service quality
Pearson ²	Flexibility, frequency of service, transit time, reliability, regularity,
Bardi ³	Transit time, reliability, willingness to negotiate, financial stability
McGinnis ⁴	Reliability, transit time
Matear and Gray ⁵	Fast response to problems, avoidance of loss or damage, on-time collection and delivery
John and Stephen ⁶	Reliability, equipment availability, service frequency
Subbash and Srinivas ⁷	Reliability, responsiveness
Bienstock ⁸	Timeliness items, availability items, condition items

The expectations of customers may vary from company to company. A shipping company listed the expectations of its customers arising from six areas;⁹

- The negotiation and agreement of terms and conditions
- Purchase order tracking
- Transportation from customers' premises to port
- Seaborne leg of the cargo movement
- Transportation from port to customer's premises
- The handling of cargo documentation

4. ISM(International Safety Management) Triangle

International shipping industry produced its Code of Good Management practice in Safe Ship Operation around 1985 to give guidance towards safe transportation by sea. Some countries including the UK and Nordic countries put forward proposals which at last was developed to 'The Guidelines on Management for the Safe Operation of Ships and for Pollution Prevention.' After further revision of the guidelines International Safety Management code has been given a birth.

² Pearson Roy (1981), *Containerline Performance and Service Quality*, Marine Transport Centre, University of Liverpool, pp. 120-121.

³ Bardi Edward J., Bagchi Prabir K. and Raghunathan T.S. (1987), "Motor Carrier Selection in a Deregulated Environment", *The Logistics and Transportation Review*, Vol.23, No.4, p.5.

⁴ McGinnis Michael A. (1989), a Comparative Evaluation of Freight Transportation Choice Models, *Transportation Journal*, Winter, p. 43.

⁵ Matear Sheelagh and Gray Richard (1993), "Factors Influencing Freight Service Choice for Shippers and Freight Suppliers", *International Journal of Physical Distribution and Logistics Management*, p. 28.

⁶ Kent John L. and Parker R. Stephen (1999), "International Containership Carrier Selection Criteria: Shippers/Carriers Differences", *International Journal of Physical Distribution and Management*, Vol.29., No.6, p.40.

⁷ Mehta C. Subbash and Durvasula Srinivas (1998), "Relationship Between SERVQUAL Dimensions and Organisational Performance in the Case of a Business-to Business Service", *Journal of Business and Industrial Marketing*, Vol. 13., No. 1, pp. 44-45.

⁸ Bienstock, Carol C., John T. Mentzer and Monroe Murphy Bird (1997), "Measuring Physical Distribution Service Quality", *Journal of the Academy of Marketing Science*, 25(1), p. 31.

⁹ *Containerisation International* (1998), Keeping Customer Satisfied", October, p.39.

This management code entered into force in 1998(1st July) for passenger ships, tankers, bulk carriers and high-speed craft, and in 2002(1st July) for other cargo ships and mobile offshore drilling units.

ISM code , after some revisions, was made mandatory through a new chapter IX to SOLAS. Under the regulations of the new Chapter IX of SOLAS, administrations are responsible for ensuring that, on the prescribed dates, each new or existing ship flying its flag holds a Safety Management Certificate(SMC) and that the operating company holds a document of Compliance(DOC) for that type of a ship. The administration may request another contracting government or recognised organisation to issue such certificates and periodically verify the proper functioning of the SMS.

The structure of the ISM code can be described as following diagram, which has been named as 'ISM Triangle' by the author.

Figure 2. ISM triangle

Who?	ISM triangle	main objective
Top management		The objectives of the code are to ensure safety at sea, prevention of human injury or loss of life, and avoidance of damage to the environment, in particular to the marine environment, and to property
Shore personnel		Safety management objectives of the Company should, <i>inter alia</i> : 1. provide for safe practices in ship operation and a safe working environment; 2. establish safeguards against all identified risks; and 3. continuously improve safety management skills of personnel ashore and aboard ships, including preparing for emergencies related both to safety and environmental protection
Ship personnel		The ISM code requires that the SMS should ensure: 1. compliance with mandatory rules and regulations; and 2. that applicable codes, guidelines and standards recommended by the organisation, administrations, classification societies and maritime industry organisations are taken into account.

Source: The author

The nature of the mandatory code has changed, from the initial proposal based on ISO9000 quality assurance principles to 'mundane' safety management code.

5. Quality Assurance in Maritime Education

Quality assurance has now become the issue of the 1990s as far as the shipping industry is concerned. The principle of quality assurance is a self-examination process that is designed to lead to continuous improvement in operation, in this case, in education. When shipowners are keen to establish quality assurance program, maritime college should train students to be qualified in entering that system of quality assurance. The graduates of maritime institutions will be exposed to TQM as soon as they are entering the Q.A. shipping company.

If a maritime college is to train people for employment by quality assured shipowners whether under the national or foreign flags, it should incorporate TQM.

5.1 Three Components

TQM consists of three components, which should be integrated: (1) the students(the clients), (2) the course(processor-1), the whole college(processor-2), and (3) the employers(the customers). We concentrate only on the processors.

5.2 A Quality Manual

Total quality management finally must produce a quality manual which explains and interprets the quality policy and which clearly states the procedures to be followed in following matters:

- Course design
- Teaching
- Assessment methods
- Staff development
- Course management
- Hardware procurement
- Maintenance

5.3 Miscellaneous establishments

After the setting up of quality manual, the following should be established

- A documented quality management system
- Statistical process control
- Quality manager: ensure consistency in quality levels, continuous improvements, and the elimination of waste across various departments or sections.

5.4 The Quality Management of Maritime Education

The quality management of maritime education can be listed as the following(very briefly):

- A defined organisational structure with
 - (1) the responsibility, authority of personnel,
 - (2) the personnel to perform inspection and verification for compliance with the quality requirements.
- Selection and recruitment of college staff-the qualifications and experience qualifications
- Staff development-encouraging and enabling staff to upgrade their qualifications
- Course design and course development
 - (1) involving employers and students as well in course design
 - (2) ensuring that up-to-date information on developments in the global shipping industry are received and disseminated throughout the college.
- Records- indexing, filing, storage, maintenance and disposition of quality records.
- Document control-procedures to control all documents(obsolete documents and changes to documents) and data that relate to the requirements of the Quality Manual.
- Quality system
 - (1) establish and maintain a documented quality system.
 - (2) the documented quality system, procedures and instructions should be effectively implemented.
 - (3) planned periodic reviews of the quality system
- Internal quality audits-to verify whether quality activities comply with planned arrangements and to determine the effectiveness of the quality system
- External quality audits-TQM can be claimed to be established when it is audited and certified by an independent body.

5.5. The Subjects To Be Taught

The subjects to be taught at maritime institutions should comprise three systems: technical system, operational system and human system.

5.5.1 Technical System

This system consists of following sub-systems

- Hull
- Engine Room
 - Electrical installations
 - Propulsion
 - Services
 - Steering
 - Pollution prevention
- Navigation
 - Navigation
 - Moorings
 - Pollution prevention
 - Steering
- Cargo
- Safety
 - Fire protection and fighting
 - Life saving systems
 - Communications
 - Medical
 - Others such as Air conditioning, accommodation and food preparation

5.5.2 Operational system

This system consists of following sub-systems

- Navigation
- Propulsion
- CIQ and administration
- Emergency procedure

5.5.3 Human system.

This system consists of following sub-systems

- Organisational behaviour
- Human relationships

6. Conclusion

This article has explained what quality of service is and how the quality of maritime education can be improved or guaranteed. The common characteristics of shipping industry and maritime education is that they are service industries that require quality assurance system.

Quality assurance has now become the issue of the current decade as far as the shipping industry is concerned. This article has applied the principle of quality assurance of shipping companies to maritime education.

Maritime college should train students to be qualified in entering quality assurance program which shipowners have established because the graduates of maritime institutions will be exposed to TQM as soon as they enter the shipping company of quality assurance system. This article finally demonstrated how the quality assurance system in maritime education can be set up.