

MANAGEMENT-CONCEPT AND QUALITY-STRATEGIC ELEMENTS OF TRANSPORT-LOGISTIC SERVICES

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Abstract

In this paper, it is indicated how important the development and implementation of quality systems are for the transport-logistic service providers. It can be stated that ISO 9002 system standard is the right solution, however, it requires significant professional efforts to adapt this standard because of the special characteristics of transport-logistic services. This paper tries to explore the methodological background of the implementation with practical examples.

Keywords: transport, logistics, services, quality system, ISO 9000, railway, customer satisfaction

1. Introduction

The Hungarian logistic and transport service providers have to face the challenge of the accession of Hungary. The liberalisation of transport and logistic market is one of the areas of the EU's integrated market liberalisation.

At the same time, quality and customer orientation getting widespread all over the world becomes a key factor of the market success and even condition of survival in the area of transport service providers, too.

Therefore the Hungarian logistic-transport companies have to establish and implement the quality strategy of their services rapidly. Establishment, maintenance and continual improvement of quality services have two primary preconditions: definition of the right quality of transport services, and establishment of quality system assuring the quality of services. Regarding the latter condition, ISO 9000 Standard is available, however, its definition and adoption require significant professional efforts. The definition and implementation of a quality system in transport services are much more specific tasks, without any existing and appropriate standard. This paper attempts to discover the methodological grounds of these primary conditions.

2. Framework, the Necessity of Quality Strategy

After the turn of the millennium, the dominant elements of Hungary's image are: sustainable economic development, civil society, and the EU membership. Transport-logistic services have a significant influence on all the three elements.

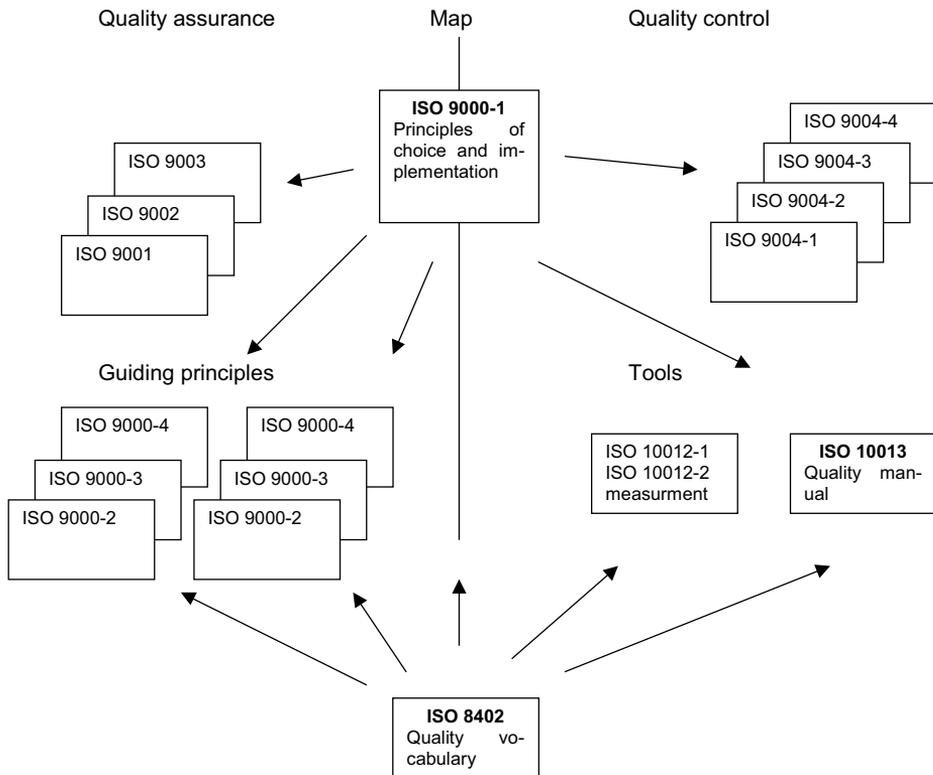


Fig. 1. The ISO 9000 series of quality management standards

One of the conditions of sustainable economic growth is the sustainable mobility of people and goods, the key factor of which is the environment and quality of life-friendly and customer-oriented transport and logistics. High level transport-logistic services are a part of the civil society's quality-culture, in form of cooperative, intermodal, and interoperable transport-logistic services meeting social and economic mobility demand.

At the same time, the transport-logistic system has to meet special expectations in the enlarged European Union. Logistics is required to connect urban areas, towns, regions, and countries as well as industrial, commercial and economic centres at a regional and Pan-European level conforming to a certain level of quality.

The Common Transport Policy published in 1982 – and periodically reviewed,

modified and implemented – has three major priorities still valid, from which one is the improvement of the quality. Within this, three priorities are set: safety, environment and consumer protection, and improvement of the quality of transport services.

Consequently, the quality of transport-logistic services is an important condition and element of the European civil society's quality-culture.

Therefore quality and customer orientation increasingly becomes a key factor of the market success in the area of transport services.

For that reason the domestic transport and logistic companies have to establish their quality strategy – following the practice of the European transport-logistic companies – aiming at the establishment, maintenance and continuous improvement of transport-logistic services.

3. The Standard Basis of Establishment of Transport-Logistic Quality Strategy

The principles and basic elements of the development of transport-logistic quality assurance and management systems (referred to as: quality systems) are regulated by ISO 9000 series of quality management standards shown in *Fig. 1*, accepted by EU (EN: EuroNorm), in Hungary too as Hungarian Standard (MSZ).

The classic five-phase model of the establishment of quality management system consists of decision support, quality system design, development of documentation, implementation, and independent qualification. One of the basic decisions during the preparation for the audited quality management system is the selection of the quality system-model, which can be done according to ISO 9000-1 standard.

Regarding the core activities of transport and logistic service providers it can be stated that ISO 9002 system standard is usually the right choice, based on the ISO 9000-1 map. ISO 9002 is the most common member of the ISO 9000 series and is identical to ISO 9001, but it does not contain the design and development requirements, however, it is more complex and encompassing than ISO 9003 designed for organisations that only require final inspection and testing of their products and services.

In compliance with it, the implementation of the quality system should be realized following the 19 standard elements of ISO 9002. These standard elements should be documented in the quality manual, the basic documentation of the implemented system, according to ISO 10013 standard.

Besides the selection of the system-model, the implementation assumes the adaptation and specification of the applied quality terms regarding transport and logistic services based on ISO 8402 standard, the vocabulary comprising the terms and definitions in general.

It is obvious that the definitions of ISO 8402 in the field of logistics and transport should be adopted and elaborated requiring great time and work input, in spite of the apparently detailed definitions of ISO 8402.

After the selection of the system model, the structure and elements of the quality system should be selected so that the system conforms to the concrete activity of the enterprise or adapts to it the best possible. In this, ISO 9000-1 helps in three respects:

- It gives the quality principles, which are practically the principles of the enterprise's quality system;
- It contains the principles how to choose and implement quality system standards for the own internal quality objects of the organisation,
- and for external quality objects.

On this basis, *Table 1* summarises the principles of the implementation of the quality system in the field of transport-logistic services.

Fundamentally, it is given by the system-model chosen what kind of elements should contain the quality system, however, ISO 9004-1 supplies the principles how to introduce these elements.

Besides the foregoing, the characteristics of services should be taken into consideration, namely the service, service delivery and quality control, which are detailed in ISO 9004-2 regarding management, resources, documentation and operational subsystems.

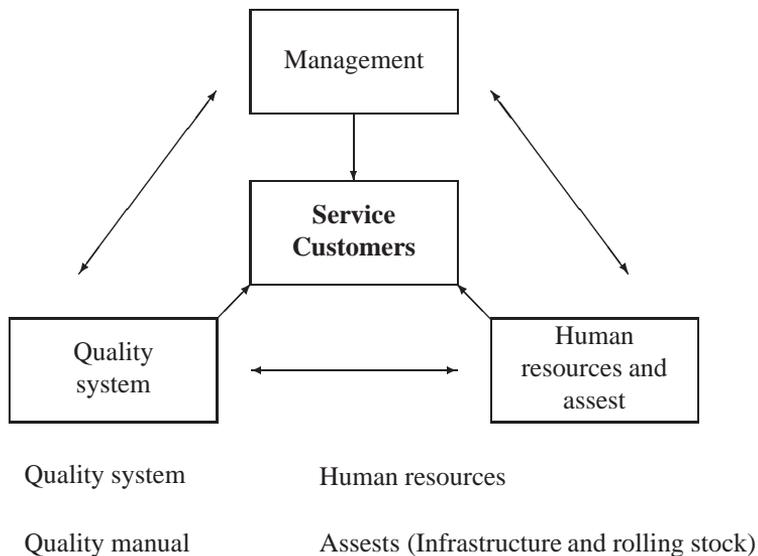


Fig. 2. The magic triangle of transport-logistic services

In the end, the regulation of the inspection and auditing of quality systems are detailed in ISO 10011-1.

The above mentioned standards are illustrated in *Fig. 1*.

Table 1. The principles of the development of transport-logistic quality assurance system by ISO 9000-1

| |
|---|
| <ul style="list-style-type: none"> • Determination and regulation of main objects and responsibilities regarding quality |
| <ul style="list-style-type: none"> • Exploration and satisfaction of expectations and demands of the organisation |
| <ul style="list-style-type: none"> • Taking the four general product groups (hardware, software, processed materials, services) and their characteristics into consideration |
| <ul style="list-style-type: none"> • Definition of the four elements of quality (marketing, planning, production, usage) |
| <ul style="list-style-type: none"> • Recognition of the process orientation, the quality management system itself should be approached as a process, the essence of the process orientation is that every process has inputs, transformation, and outputs |
| <ul style="list-style-type: none"> • Principle of networks: the processes create network |
| <ul style="list-style-type: none"> • Recognition of the fact that quality system itself is a network, so it should be harmonised |
| <ul style="list-style-type: none"> • The quality system should be evaluated and inspected continuously. |
| <ul style="list-style-type: none"> • The value of the product includes both quality and price, hence the price is not an element of quality. |
| <ul style="list-style-type: none"> • The consumer takes into consideration the value-added factors besides the quality characteristics <ul style="list-style-type: none"> – The market situation and strategy of the supplier – The financial situation and strategy of the supplier – The human resource situation and strategy of the supplier |
| <ul style="list-style-type: none"> • The stress is laid on <ul style="list-style-type: none"> – Meeting all of customer's expectations – Determination of scope of duties regarding quality – Evaluation of possible risks and advantages |

4. Concept Basis for Quality Strategy of Transport-Logistic Services

In respect of transport-logistic services, the magic triangle of quality assurance (*Fig. 2*) is essential. In the centre of it, the customers and final consumers of services and service providers can be seen.

The second point of this triangle is that three elements must be balanced. The total efficiency of the quality system could be depreciated if the assets raise a problem (which is quite general in most Hungarian transport companies), while the

management is committed and quality system is well implemented.

As the third important factor, this figure shows that the condition of the commitment of the management is the company policy (image, objectives, strategy), and within it the quality policy, determining the future success and quality position of the organisation starting from the present situation.

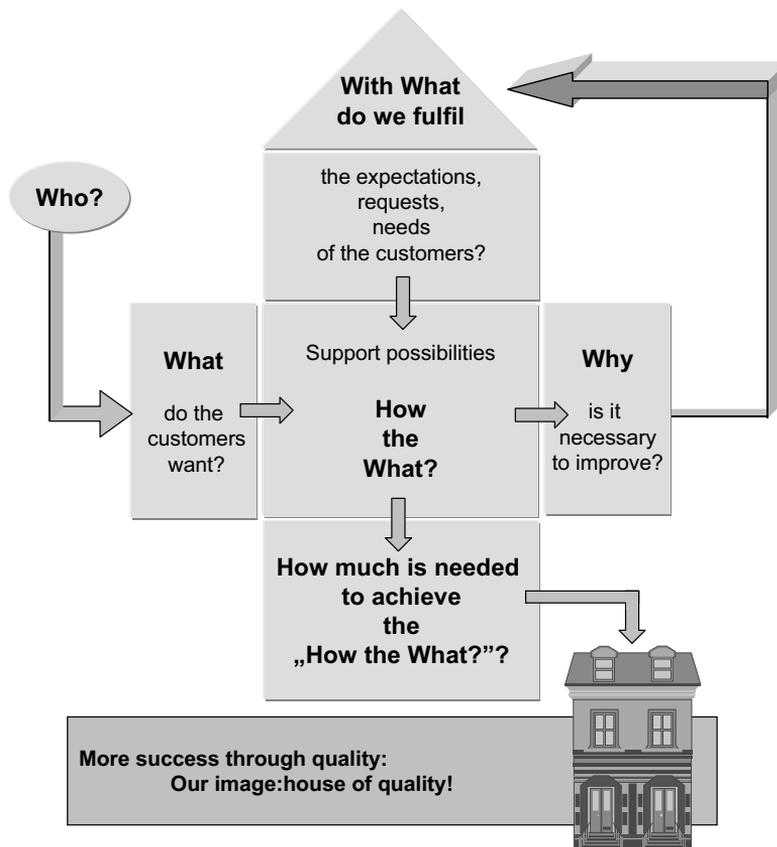


Fig. 3. House of quality: image of the rail passenger transport services (Source: [2] Figure on page 8)

The company image includes the quality image described by the house of quality model (Fig. 3). According to this model, the enterprise determines their customers, surveys their needs, decides about the assets and the way of performance and resource-requirements, and systematically checks quality and performance for the continuous improvement.

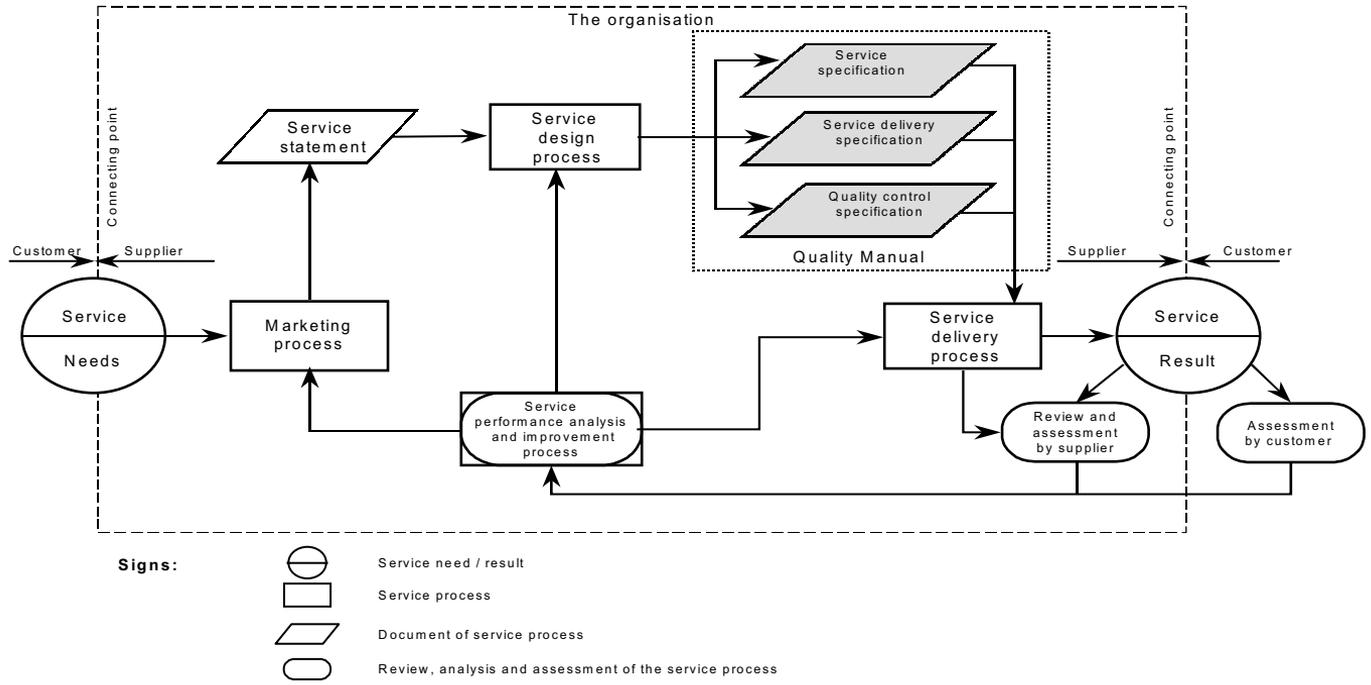


Fig. 4. Quality loop of service

Further element of quality image is the quality loop. Within it marketing determines the customers' needs (Fig. 4), on their basis the service statement follows, which describes the service, the needs that it must fulfil, and the obligations and requirements that must be met. After that service, service delivery and quality control specifications, and the improvement process must be designed and documented.

Table 2. Value model elements of transport-logistic services

| Value of product/service |
|---|
| <ul style="list-style-type: none"> • Demand satisfaction (basic and additional) function / performance + technical requirements (norms) |
| <ul style="list-style-type: none"> • Contract conditions + <ul style="list-style-type: none"> Price Quantity Time limit Other (parity, place) |
| <ul style="list-style-type: none"> • Safety + <ul style="list-style-type: none"> Safety requirements |
| <ul style="list-style-type: none"> • Health effects + <ul style="list-style-type: none"> Sanitary regulations |
| <ul style="list-style-type: none"> • Environmental impacts + <ul style="list-style-type: none"> Environmental requirements (norms) |
| <ul style="list-style-type: none"> • Quality (basic and additional function / performance)+ <ul style="list-style-type: none"> Quality requirements |

5. The Basic Elements of the Quality Model of Transport-Logistic Services

The quality model of transport-logistic services can be established in the following steps, involving essentially the specification of products and services meeting customers' expectations and market demand.

- The value, quality and excellence levels of products and services and their dimensions should be defined;
- Services and products should be defined;
- Process chains of service and production should be determined;
- The suitable quality model of products and services should be selected or elaborated;

Table 3. Success factors and value model of transport-logistic services

| |
|---|
| Service price <ul style="list-style-type: none"> • Transport charges • Additional costs • Reduced prices |
| Service content and selection <ul style="list-style-type: none"> • Basic services • Additional services • Service limits (weight and dimension limits) |
| Quality of service <ul style="list-style-type: none"> • Availability (space, time) • Reliability • Safety • Flexibility • Other |
| Environmental conditions/frame of service <ul style="list-style-type: none"> • External effects • Legal environment <ul style="list-style-type: none"> Company law Tax regulations Regulation on road (border crossing, road limits) Transport, social, labour law Regulations on combined transport • Transport policy |

- Quality characteristics should be determined.

The general value model of transport-logistic services is given in *Table 2*. Hence it is evident that no products conform to quality at all, which are:

- dangerous to environment
- or health,
- not safe,
- non conforming to the conditions of the contract.

These and the quality requirements can be defined as the value of the service. If all requirements are met at the promised level, it is an excellent product. At the same time if all quality requirements are met at the promised level, it defines the quality of the service.

Table 3 shows how the general value model can be applied to the transport-logistic services, it is the specific value model, which is the collection of the success factors simultaneously.

Quality of service could be divided into transport, service and logistic criterions, which can be seen in *Table 4*.

Table 4. Quality criterions of freight transport in detail

| |
|---|
| <p>Performance criterions of transport:</p> <ul style="list-style-type: none"> • Reliability • Meeting the time limit • Punctuality • Flexibility • Prevention of accidents • Tracking, information on transport • Prevention of damages • Availability of transport capacity |
| <p>After sales service criterions</p> <ul style="list-style-type: none"> • Qualification • Motivation • Sensitivity • Helpfulness • Qualification to carry on negotiations • Reliability • Impression • Responsibility • Market knowledge • Marketing tools • Speed of supply • Easy to survey • Presence in sale |
| <p>Logistic performance criterions</p> <ul style="list-style-type: none"> • Supply from one hand • Make or buy ability • Transport chain • Custom clearance • Cargo insurance • Tracking • Consultation |

It is expedient to design and provide the quality and performance content of services by the Kano-model (*Table 5*). Basic needs should be met in case of every service, the different need options can distinguish the service, and extras can meet special needs (EuroCity trains in international, InterCity in inland and InterPici in regional traffic are the examples for the latter).

Table 5. Need and performance levels of products and services, the pyramid model

| |
|--|
| Basic expectations/needs |
| <ul style="list-style-type: none"> • Minimal performance level • The performance of them are assured both by supplier and customer, non-performance causes dissatisfaction, or failing the business • They are fundamentally the same, and are the basic functional characteristics of the product or service • Factors of the presence in the market • The performance of them ensures minimal market price |
| Concrete needs/value added specifications and options |
| <ul style="list-style-type: none"> • Raised performance level forming the basis of buying • Product and service options, which can be selected as a whole or a part or reaching a compromise by the customer • Their composition and weight vary with supplier and customer • Could determine the choice between suppliers and products or services • Factors distinguishing an organisation from its competition • The performance of them ensures average market price |
| Latent needs/extra value specifications and options |
| <ul style="list-style-type: none"> • The maximal performance level ensuring enthusiasm of customers, and excellence of the product • Factors resulting market leader position • The performance of them ensures maximal market price |

In the course of establishing the quality model, the product principle should be applied according to ISO 9000-1. *Table 6* illustrates this principle in rail transport practice (train products).

In accordance with the other basic principle of ISO 9000-1, i.e. the process orientation, *Fig. 5* illustrates the door-to-door logistic chain in case of rail passenger transport.

On this basis process elements include:

- the relating objects (e.g. seats, ticket offices, trains, terminals);
- staff (e.g. booking clerk, guard, stock clerk);
- service (e.g. ticket selling, information desk, transfer);

Table 6. Division of MÁV Rt's passenger transport activities

| Basic activity | Market segments | | Train products |
|----------------|-------------------------|----------------------|-------------------------------------|
| Passenger | International Trains | | EuroCity (EC) trains |
| | | | International InterCity (IC) trains |
| | | | International express trains |
| | | | Other international trains |
| transport | Inland trains | Long-Distance trains | Inland InterCity (IC) trains |
| | | | Express trains |
| | | | Fast trains |
| | | | Other fast trains |
| | trains | Regional Trains | Suburban trains |
| | | | InterPici trains |
| | | | Other local trains |
| | | | Special trains |
| | | | Nostalgia trains |

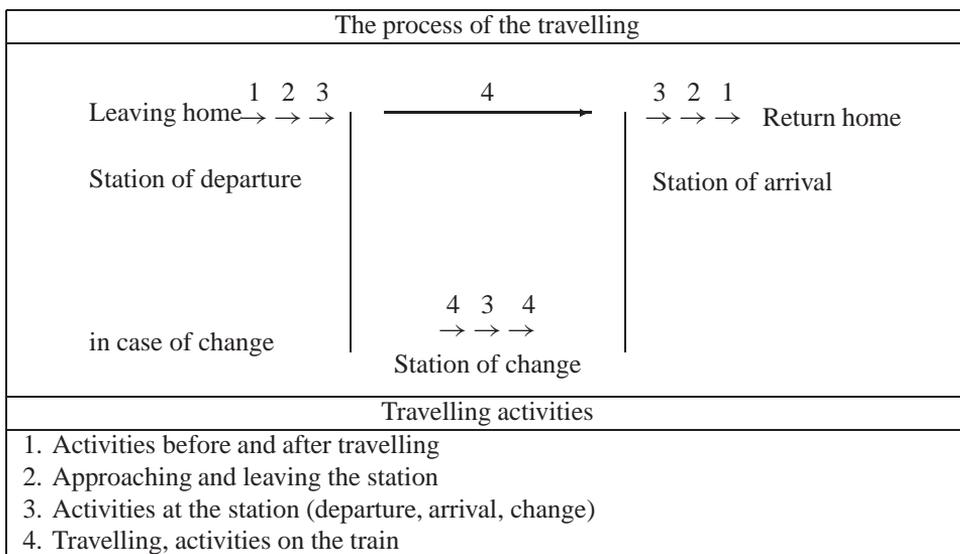


Fig. 5. Door-to-door logistic process of rail services

- and their quality characteristics.

The next step of establishing the quality model is the identification of the quality characteristics of the object, service and staff elements.

Several general quality and value models of products and services are available in literature. The comparison of them is illustrated in *Table 7*. This table shows the significant differences.

The general models should be adapted to transport-logistic enterprises and their service, thus specific models can be elaborated. The special quality model regarding the railway stations introduced at MÁV Rt. in 1997 can be seen in *Table 8*.

The next and final step of establishing the quality model is the specification of the quality characteristics of the object, service and staff elements regarding service (quality condition brochure), performance of service (quality engagement brochure), and quality inspection (quality inspection brochure).

6. Summary, Conclusion

In the framework of EU accession process the Hungarian logistic-transport companies have to establish and implement the quality strategy and quality system of their services. ISO 9000 series of standards seem to be a suitable base, however, it requires significant professional efforts defining and adapting this standard. The planning and implementation of value, performance and quality model of transport-logistic services are much more specific tasks, without any existing standard base.

The most important elements of quality strategic planning and management systems are the following:

- Quality policy and strategy fitting to company's strategy;
- Principles and service elements of ISO 9000 series;
- Specific quality loop and magic triangle of service quality;
- Value, performance and quality model of services;
- Process schemes, objects and value chains of services;
- Quality characteristics of service;
- Quality condition, engagement, inspection brochures.

The main trends of the improvement of the quality system after the implementation:

- Improvement toward to Total Quality Management;
- Tracking, monitoring market trends and changes of customers' needs;
- More detailed quality model, and specifications;
- Continuous improvement of quality spiral regarding quality contracts (*Fig.6*);
- Implementation and maintenance of customer communication management system.

Table 7. Comparison of general value and quality models of product/service

| Quality categories | Category systems | | | | | | |
|--|------------------|---|---|----|---|----|---|
| | A | B | C | D | E | F | G |
| Speed | 1 | | | | | | |
| Goodness | 2 | | | | | | |
| Cheapness/ Price | 3 | | | | | 10 | |
| Behaviour | | 1 | | | | | |
| Politeness | | 2 | | 5 | | | |
| Co-operation | | 3 | | | | | |
| Thoughtfulness | | 4 | | | | | |
| Reputation | | 5 | | | | | |
| Reliability | | 6 | 3 | 1 | 1 | 5 | 3 |
| Friendship | | 7 | | | | | |
| Performance | | | 1 | | | 3 | |
| Specialities/ Extra characteristics | | | 2 | | | 4 | |
| Conformity | | | 4 | | | | |
| Durability | | | 5 | | | | |
| Serviceability | | | 6 | | | 7 | |
| Aesthetics/ Aesthetic appearance | | | 7 | | | 8 | |
| Perceive of quality/ Perceived quality 9 | | | 8 | | | 9 | |
| Palpable factors | | | | 10 | | | |
| Adaptability | | | | 2 | | | |
| Expertise | | | | 3 | | | 5 |
| Availability/ Accessibility/ Approachability | | | | 4 | | 1 | 2 |
| Communication | | | | 6 | | | 8 |
| Authenticity | | | | 7 | | | 6 |
| Safety | | | | 7 | | | 4 |
| Understanding/ Empathy | | | | 9 | 4 | | 7 |
| Trust | | | | | 2 | | |
| Comfort | | | | | | 2 | |
| Standardisation | | | | | | 6 | |
| Flexibility | | | | | | | 1 |
| Style | | | | | | | 9 |

A: Tenner-DeToro, 1997, p. 65 (Value dimensions)

B: Tenner-DeToro, 1997, p. 71 (Quality characteristics of services, examples)

C: Garvin, 1987, (Quality dimensions)

D: Berry-Zeithaml – Parasuraman, 1985; Tenner-DeToro, 1997, p. 68 (Quality elements of services)

E: Berry-Zeithaml – Parasuraman, 1990; Tenner-DeToro, 1997, p. 69 (Quality categories of services)

F: Tenner-DeToro, 1997, p. 69 (Quality characteristics, delivered things)

G: Tenner-DeToro, 1997, p. 69 (Quality characteristics, interaction)

1,2,... : order of quality categories within the category system

Table 8. Examined quality factors of railway stations in the quality control system of MÁV Rt.

| Quality factors of railway stations |
|--|
| • Condition and picture of places of passenger traffic |
| Condition of the floor, wall, ceiling, cover |
| • Tidiness and cleanness |
| Undisturbed traffic |
| Cleaning up in the daytime |
| • Passenger information |
| Through telephone |
| Loudspeakers in the railway station |
| Timetables |
| Pictograms |
| Electronic visual information |
| • Ticket/booking office |
| Opening hours |
| Waiting time |
| Politeness of service |
| • Other services |
| Baggage room |
| Baggage trolley |
| Bicycle storage |
| Telephone cells |
| • Catering |
| Restaurant, buffet |
| Shopping facilities |
| Other services |
| • Approach and leaving the railway station |
| Connecting urban transport facilities |

The adaptation of quality loop and levels according to ISO 9000-1 to the relation of customer organisation is given in *Fig. 6*. Marketing has to define the design, production and usage quality levels in quality statements relating to quality loop. On the other hand, measurement techniques and the system of performance-quality bonus/malus contracts should be improved in the connection points of quality levels and customer.

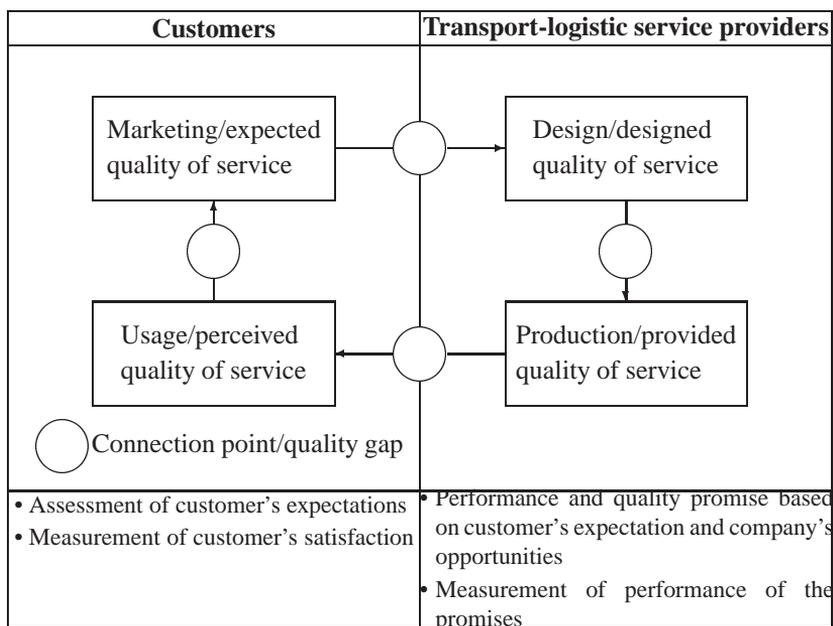


Fig. 6. Quality elements and the quality loop of the transport-logistic service providers

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