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Transport and Telecommunication Institute, Lomonosova 1, LV-1019, Riga, Latvia*

SPECIAL FEATURES OF MARKETING IN THE CONTEMPORARY SPHERE OF TRANSPORT LOGISTICS

Egor Zherebov

*St. Petersburg State University of Service and Economy
Kavalergardskaya street 7, Saint-Petersburg, 191015, Russia
Ph.: +7 812 5684364. E-mail: egor_z@bk.ru*

Application of a logistic-based approach to the transportation market, with considering the transport complex as a structured system and the transportation process as such as a logistic chain of operators and infrastructure objects that interact through logistic relations makes it possible to optimise the process of transportation services production and to ensure satisfying the needs of customers belonging to various categories on the basis of rational use of the available economic resources. By way of processing received information on demand parameters, logistic units ensure coordination of demand with logistic supply capabilities and limitations (that is, throughput capacity and transportation capacity) and effect actual conversion of demand into transportation.

It is obvious that market segmentation forms the basis for making well-substantiated decisions by logistic units. On the basis of market research, logistic strategies are elaborated, transportation schedule is generated, and rolling stock is optimised. Ideally, the marketing information flow is to meet the logistic information flow in a combined process of transportation planning and development of an integrated end-to-end transport-and-logistic chain, accompanied at the input end with the flows of marketing information and at the output end with the target parameters of the logistic services.

Keywords: transport logistics, marketing mix in logistics, transportation process

Transport logistics means management of cargo and passenger flows transportation at the lowest transportation costs on the basis of transportation infrastructure development, establishment of optimal logical patterns and optimisation of the use of available resources and delivery periods by way of creating a single controlled pattern and logistic chain for delivery by one or several carriers (kinds of transport), calculation and incurring the transportation expenses and consultation upon the entire transportation process from its starting to its ending operations.

Transportation facilities resolve diverse multidimensional tasks that may be classified by their respective lines, namely, as belonging to the organizational, economic, transportation or service line.

The organizational line includes rational placement of transportation facilities and location of transportation vehicles; elaboration of the regulatory framework (calculation of the load-carrying capacity of transportation vehicles, differentiation by loading / carrying capacity between cargo transportation and passenger transportation); operational (dispatching) control over a number of principal operations (inspection of transportation vehicles, cargo commercial inspection, cargo re-addressing, etc.); implementation of preparatory arrangements (preparation of the required transportation documents, passage tickets, cargo marking, combining cargo into an appropriate transportation package, railway sorting, elaboration of transportation plans for various kinds of transport and selected routes, elaboration of transportation routing flow charts and train schedule).

The economic line includes analysis and assessment of using transportation in inter-city and suburban traffic at the level of transport hubs and stations; analysis, comparison and assessment of variable costs related to cargo and passenger transportation (fuel and lubricants, electric power, maintenance, running repairs); examination and evaluation of fixed costs related to transportation, ensuring reduction in the transportation costs and transportation vehicles operation costs; organization of cross-shipments using the return path of transportation vehicles; determining the logistic components of costs (identification of the logistic component and attempt to separate it from the overall cost structure) assessment of the ratio of the transportation cost to the monies spent for rolling stock improvement and determining the amount of working capital released in case of facilitating cargo/passenger delivery; determination of the transportation service basic level, optimisation of transport operation expenses with maintaining the service level; determination of the priority lines of investment policy by transportation facilities and transportation infrastructure development lines; satisfying to the maximum possible extent the demand for

transportation hubs and repair capacity; optimal choice of time between repairs and preventive repairs; improvement of communication means and traffic safety arrangements; using up-to-date technologies for environmental damage prevention and avoidance.

The transportation line includes selection of optimal cargo/passenger transportation options with due account for throughput of the network, intensity of cargo and passenger flows on certain routes and also taking into consideration seasonal features; selection of participants in the transportation process and optimal combination thereof; making up rational routes (computation and detailing of transportation schedules on various routes with due account for the planned organizational arrangements, elaboration of flexible routing patterns); rational use of transportation vehicles in terms of their load-carrying capacity, speed and cost effectiveness; transportation of cargo and passengers (delivery, including delivery of small-batch cargo to the destination points).

The service line comprises the following components: rendering integrated services in the course of passenger transportation, aimed at enhancement of comfort and safety of transportation conditions with due account for the price-to-quality ratio; continuous extension of the range of additional services; provision of informational support to clients (current information on the transportation schedule and mode, train running, availability of tickets in the ticket office network, provision of additional services, etc.); selection of logistic intermediaries from the viewpoint of optimisation of the criteria established by the customer (costs, cargo delivery reliability and time, cargo safety); cargo monitoring and escorting in transit, insurance services; customs processing of export and import operations; cargo storage, warehousing, sorting, assembling and other services.

The principal tasks to be resolved by transport logistics in transport-and-logistic chains (TLC) are not limited with the issues of transportation as such (see Table 1). Transport enterprises may act as system integrators with respect to the entire logistic flow. If transport services are rendered in the sphere of railway transportation and a macro logistic system is in place, the scope of logistic optimisation may comprise in addition to the transportation process the in-house infrastructure complex, intra-entity turnover, etc.

Table 1. Principal tasks of transport logistics [1]

Functional sphere of transport enterprise's logistics, logistic function	Logistic optimisation tasks
1. Order management	Selection of quality parameters of the services related to acceptance, processing and completing the order Document flow organization at passing of an order; electronic document flow introduction Minimization of logistic transaction costs
2. Transport network structure selection	Building-up the organizational structure of logistic delivery channels and transport network as a whole; location of transportation hubs Analysis of the criteria for selecting partners for TLC Selecting the structure of procurement logistic channels, with exclusion of transitory warehousing where possible Selection of the types and the quantity of logistic intermediaries Rationalization of the processes of cargo and passenger flows consolidation and deconsolidation Optimisation of cargo delivery from suppliers, with shipping as large batches as possible, utilizing to the maximum possible extent the load-carrying capacity of transportation vehicles, and applying economically reasonable rates Optimisation of rolling stock standard series and transportation vehicles load-carrying capacity, selection of containers and packing in the process of transportation Minimization of product loss in transit
3. Management of the intra-entity production arm / infrastructure (“production support”)	Optimisation of the intra-entity transport-and-warehouse and repair complex performance For railway entities – optimisation of the infrastructure (track facilities, locomotive, carriage and repair facilities, etc.) performance Selection of the intra-entity information and control system for resources optimisation

The continuation of Table 1

Functional sphere of transport enterprise's logistics, logistic function	Logistic optimisation tasks
4. Transportation	Selection of a rational mode of cargo and passengers transportation (transportation methods, delivery systems) Selection of the kind (kinds) of transport Selection of transportation vehicles (in terms of load-carrying capacity, loading space, etc.) Coordination with other carriers and logistic partners (freight forwarders, agents, brokers, terminals, logistic centres (LC)) Optimisation of transportation process parameters Optimisation of the vehicle fleet structure Transportation routing optimisation Rolling stock allocation among the routes Optimisation of dispatcher control over transportation Transportation costs planning and calculation of rates Allocation of rewards, risks and responsibilities among the participants in the transportation process Planning the need for rolling stock and transport infrastructure repair and maintenance Planning production program for repair capacity and rolling stock repair Planning investment into the transport production and technical facilities Selection of a rational system of physical escorting of transportation vehicles and cargo and control over location thereof Selection of transaction units in transportation, in particular, spacious modules, packing, containers, and selection of transportation vehicles in terms of their loading space Selection of the system for informational and computer support to transportation
5. Logistic service quality management	Optimisation of logistic service quality indicators (parameters) specification Optimisation of the corporate system for logistic service quality management Selection of logistic techniques, technical means, systems and procedures ensuring high quality level Selection of methods and models of assessing the logistic service quality parameters Selection of logistic intermediaries ensuring required quality level Domestic and international certification of the company's quality management system in accordance with ISO 9000 procedures Optimisation of integrated models for service quality assessment at LC
6. Logistic administration	Planning (strategic, tactical, operational) Regulation (making decisions) Coordination Analysis, audit and controlling

Research and assessment of the transportation services market includes analysis of its structure and segments, capacity, development lines and rate, level of monopolization or competition, and relevant qualitative and quantitative parameters.

Principal demand and supply factors that are to be taken into consideration when determining the transportation market parameters are described in Table 2.

Table 2. Principal demand factors and supply parameters in the transportation services market

Potential demand	Services supply
Economic and geographic description of the area	Sufficient availability of transport lines and their density per square meter
Activity nature and scope	Equipment status of transport enterprises, quantity of vehicles in the rolling stock fleet
Availability of large cities and territorial industrial complexes Population density in the area Location of the facilities in terms of their remoteness from a) suppliers' markets and target markets and b) from major megalopolises	Actual volume and structure of cargo and passenger transportation by kinds of transport and types of transportation

The continuation of Table 2

Potential demand	Services supply
Prevailing nature of transportation – transit, cargo-receiving, cargo-dispatching	Description of the transportation market in terms of influence on inter-industry competition
Demand for labour resources and servicing the manpower in the areas neighbouring industrial zones; migration processes, seasonal travelling (visiting “dacha”-type country houses and resorts)	Organization of additional seasonal routes and point-to-point routes to mitigate the peak loads in cargo and passenger flows
Description of the effective demand in the area	Financial parameters of the transportation services market by the kinds of transport and types of transportation

Transport logistics is a branch of applied logistics, with its tangible aspect manifesting itself as rendering inventory-related and transport services. Inventory-related services comprise such activities that do not involve transformation of the forms of matter, and their product consists in special value in use, manifesting itself in public utility of labour as such. Inventory-related services comprise any activities that result in increase in the value of previously created values, such as storage, transportation, packing, etc.

Transportation services are a special kind of transport activity, which requires appropriate technological, financial, informational, legal and resource support. Transportation services also include accompanying operations related to preparation and effecting of the transportation process, such as handling operations, cargo packing, informational support (monitoring the service), etc.

The activity of an operator company as a participant in the market relations depends to a considerable extent on the processes going on in the external environment. For such companies, their customers and the railroad transport infrastructure remain principal actors of the external environment. The requirements imposed by the market on transportation products are not limited to demand for transportation services. Consumers dictate their conditions as regards the composition and the quality of the services rendered thereto in the course of cargo delivery of passenger transportation. Stable functioning of a transport enterprise largely depends on stability of relations among consignors, consignees, railway transport infrastructure, enterprises of other kinds of transport, financial organizations, customs services, etc.

Each party is seeking to improve its position in the course of interaction; or, in other words, the i^{th} operator seeks to enlarge its payoff described with the criterion S_i . The mode of action followed by the actor represents its strategy and consists in selection of certain parameters x .

Interaction of two transportation market operators may be described on the basis of the market competition model:

$$S_i = \begin{cases} (C - V)x, & C < G \\ \min[Q - Gy, Cx] - Vx, & C = G \end{cases} \quad (1)$$

$$S_i = \begin{cases} (C - W)x, & G < C \\ \min[Q - Gx, Cy] - yW, & G = C \end{cases} \quad (2)$$

where C – is the price of the first operator’s services;
 V – is the cost of the first operator’s services;
 x – is the volume of the first operator’s services;
 G – is the price of the second operator’s services;
 W – is the cost of the second operator’s services;
 y – is the volume of the second operator’s services;
 Q – is the volume of the effective demand of consumers of transportation services.

The following limitations are applied in the model:

$$\begin{aligned} 0 < x < N, \\ 0 < y < M, \\ 0 < C < T, \\ 0 < G < T, \end{aligned}$$

where N and M – are transportation capacities of the first and the second operator, respectively;
 T – is the limiting maximum value of the service rates.

As a sub-system of strategic management, marketing is like the eyes and the nervous system of a corporate “body”, performing sensory and analysis functions, and logistics relates to the functions of the locomotive apparatus of the system, forming the frame (skeleton) of the goods distribution network. Within the marketing mix described by the “4P” formula (Product, Price, Place, Promotion) logistics is “responsible” only for the “Place” (that is, distribution) component, which, in fact, has formed the subject specialization area for logistics upon withdrawal thereof from the sphere dealt with by marketing.

It is this process that serves as a logistic-based indicator of effectiveness of a system in terms of utility of time and place of each product. However, logistics is responsible within the transportation process not only for distribution but also for formation of supply, namely, a transportation service (product).

The logistic transportation management system functions in line with the goals and objectives of optimal management of inventory flows and the flows accompanying them, with such objectives united both by the business entity’s internal goals and with its external goals as well, and the logistics system parameters are the entity’s marketing objectives. Consequently, rendering services to consumers is a result of coordinated actions in the fields of logistics and marketing (see Fig. 1).

At the early stages of designing the logistic transportation management system, the inputs of strategic marketing are prevailing, providing target figures for subsequent logistic planning, including strategic and operational logistic targets.

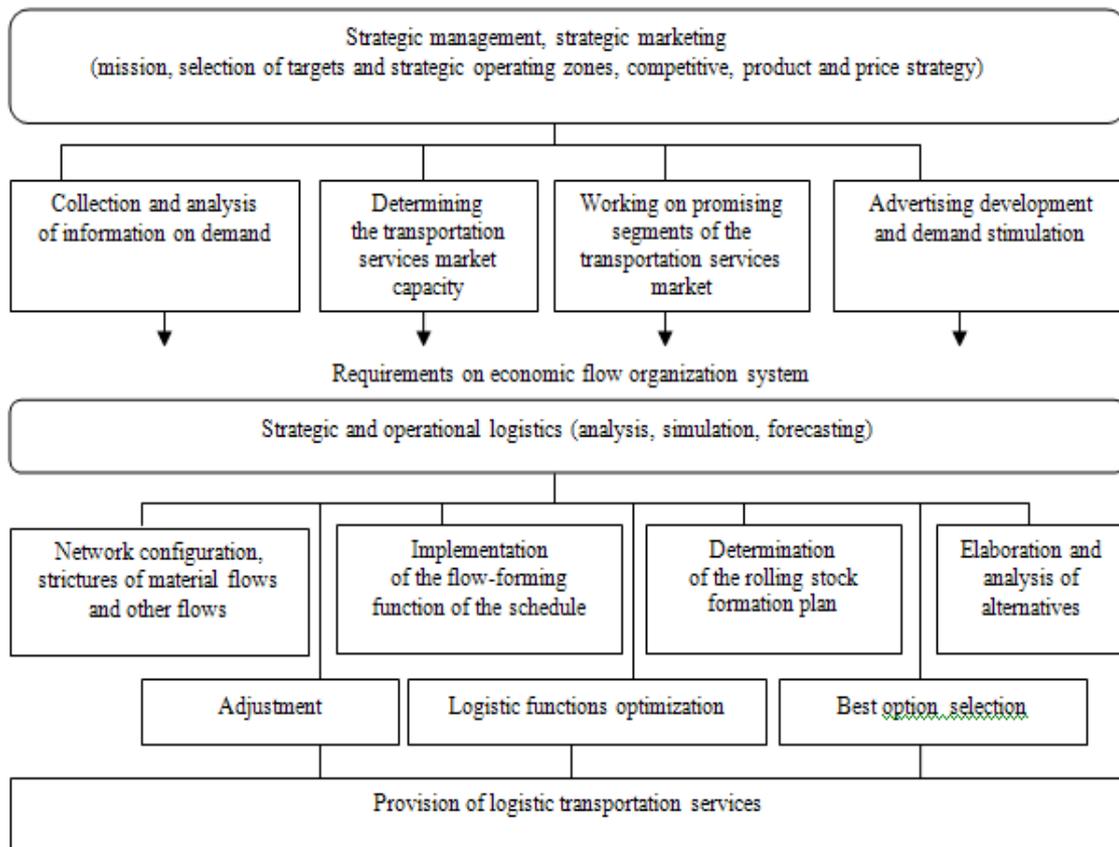


Figure 1. Interrelation of logistic and marketing objectives of the transportation process

Assessment of the initial situation is represented with the help of the SWAT analysis and, generally, reminds the algorithm for a project marketing research (see Fig.2). To make logistic management effective, marketing information bodies are to be build up on the status of transportation services in the region, demand structure, client base composition and the role of competing kinds of transport.

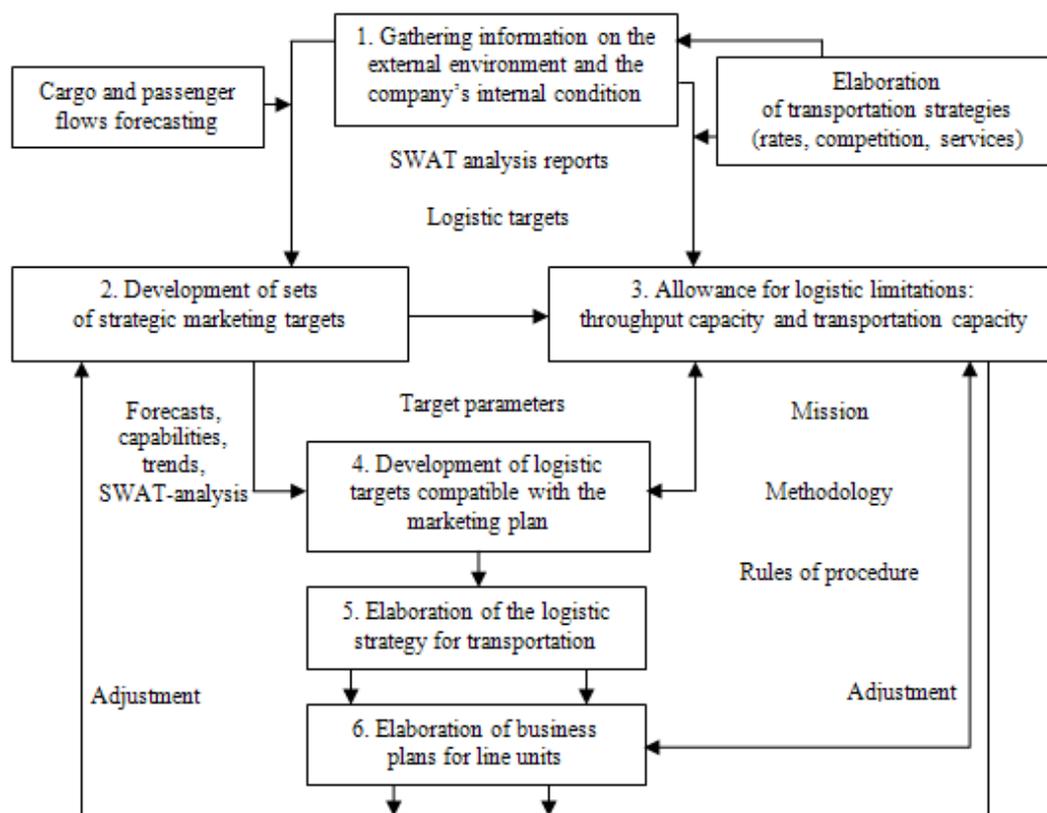


Figure 2. Strategic planning chart on the basis of marketing-logistics interaction

As an example, let us consider the contents of a transportation service of carrying passengers by railroad transport.

The pattern for transformation of the traditional marketing mix with due account for importance of the logistic functions within the passenger transportation process is presented in Table 3.

Table 3. Interrelation of the marketing mix and logistic elements within the transportation process

Marketing element	Functional sphere	Objectives adapted to passenger transportation complex
DEMAND ANALYSIS	marketing	Passenger flow analysis, determination of the market share, segmentation, identification of the procedure for making the decision on selection of the transportation vehicle
PRODUCT	logistics	Identification of objective and subjective properties of the transportation service and determination of the standards for logistic services Determination of the (services) supply volume with the application of the technique of assessing the effectiveness if the schedule and optimisation of structure of suburban trains. Schedule management, satisfying the general public's needs as regards the quantity of trains and carriages, convenience of the schedule Delivery of passengers "just-in-time" on the basis of intermodal transportation systems (ITS)
PRICE	marketing logistics	Formation of the correlation between the price and the value of the transportation service Identification of the special features of behavioural patterns of various group of passengers; determination of profitability of consumer segments Substantiation of the pricing policy in accordance with the population's paying capacity Logistic costs calculation

The continuation of Table 3

Marketing element	Functional sphere	Objectives adapted to passenger transportation complex
DISTRIBUTION CHANNELS	logistics	Management of network, tracking facilities, locomotive and carriage facilities development Coordinated development of the transportation infrastructure on the basis of simulation models Development of regional logistic centres
PRODSUCT PROMOTION, including	marketing	Demand management Determination of the quantity of additionally dispatched passengers on the basis of flexible rates application Identification of reserves for increasing the railroad transportation market share
advertising		Demand management, work with potential consumers Organization of railroads activity in the sphere of advertising on the basis of a media planning system
sales promotion		Product promotion in the place of sale Identification of active consumer segments with the application of the sociological survey methodology Organization and holding of promotional events (contests, special offers, discounts) Organization of operation of ticket offices and travelling ticket sellers Consumer information support systems
PR		Building up and strengthening the transport enterprise image
PERSONNEL	marketing personnel management	Training of the specialists effecting principal kinds of communication with consumers. Inclusion of psychology, conflict management, sales techniques, etc. courses into the training programs for ticket sellers, guards, travelling ticket sellers

Management of the “product (service)” element implies using such tools as identification of the features of the transportation service and the optimal volume of the supply (service).

The optimal volume of the service may be determined by analysis of compliance of the carriage fleet structure with the preferences of the consumer groups, satisfying the population’s needs as regards the quantity of trains and carriages, and convenience to passengers of the trains departure time and arrival time.

The required transportation service parameters are determined through the description of the target audience of the route and the fixed value representing the additional quantity of the passengers dispatched.

To develop the pricing policy in accordance with the consumers’ paying capacity, a body of information is required, including the data on the paying capacity of the population, passengers’ preferences, etc.

As the “product” and “distribution” elements are close to each other in terms of their meanings within the transportation process, product solutions may be understood as optimisation of the transportation process as such, and arrangements related to distribution channels establishment may be reasonably assessed against the long-term strategy of network infrastructure development.

Demand management in the passenger complex is a multi-functional tool of achieving breakeven operation of the selected sections. Arrangements developed on the basis of marketing data may be aimed either at introduction of new services or at enhancement of effectiveness of the existing ones.

The influence of the travel cost factor on the demand for transportation may be expressed with the help of a standard price elasticity ratio, showing the percentage of a change in the transportation services volume upon a 1% change in the ticket price. The passenger transportation demand elasticity level with respect to price may be determined to the following formula [2]:

$$Ed = \frac{\Delta P/P}{\Delta T/T'} \quad (3)$$

where ΔP – is the change in the quantity of the dispatched passengers upon a change in the rates;
 P – is the average quantity of the passengers dispatched by railroad transport;
 ΔT – is the rate change;
 T – is the average rate.

Thus, if the value of the price elasticity of the demand is in the interval from 0 to 1, the demand is deemed not elastic; if the price elasticity value lies in the range from 1 to - , the demand is elastic, and the value equal to -1 shows unitary elasticity of the demand.

In addition to the travel cost factor, the demand for passenger transportation is strongly influenced by the level of the population’s real income and the ticket prices at competing kinds of transport. The extent of that influence may be assessed using such parameters as Ei – income elasticity of the demand and Ec – cross-elasticity.

$$Ei = \frac{\Delta P/P}{\Delta I/I'}, \quad (4)$$

where ΔI – is a change in the population’s income;
 I – is the population’s average income.

$$Ec = \frac{\Delta P/P}{\Delta A/A'}, \quad (5)$$

where ΔA – is a change in the rate at an alternative kind of transport;
 A – is the average value of the rate at an alternative kind of transport.

The calculated value of the required increase in the quantity of additionally dispatched passengers is to be compared with the forecast change in the demand for passenger transportation. If the expected changes in the volume of the transportation services correspond to the required values, the pricing policy is economically reasonable. [2].

On the basis of market research, integrated study may be carried out of the nomenclature of the cargo transported by the company, the structure of the cargo flows and passenger flows, transportation schemes and applied transportation process techniques. That facilitates the enterprise’s adaptation to varying external conditions and ultimately ensures steady work of the enterprise and achievement of relatively stable final result. [3]

For a transport operator, the standard marketing mix may be described as follows:

- a transportation service (variations depending on the range of goods and consumer properties);
- the transportation rate (establishment/recommendation of prices that are optimal in terms of the balance of the company’s and the client’s benefits; discount systems for various groups of clients);
- the service rendering method (distribution channels choice, regional network development, interaction with other transport companies);
- attracting customers, holding of promotional events, and establishing public relations with due account for special features of activity of a railroad company. [3]

At doing that, it is important for a transport company to form key competences, that is, certain internal environment parameters that are difficult for competitors to imitate, relying on successful interaction of human and organizational potential elements and ensuring growth of the market capitalization on the basis of developing stable competitive advantages of the enterprise.

The key competences are the higher-level competences involved in generating the largest portion of the added value.

The competences, which may be divided into internal and external ones, together with the company’s dynamic capabilities (ability to adapt in a short time to changes in the market and to manage expertise), are sources of competitive advantage and fundamental factors of long-term success.

The following may be considered internal competences of a transport company:

- unique transportation technologies;
- ability to create a competitive transportation service;

- ability to produce well-worked-out and effective business process in individual fields of functioning: transportation process management, commercial work, marketing, planning, budgeting, transportation services quality management;

- efficient use of production factors, intellectual and creative potential, organizational expertise, and application of low-cost technologies;

- application of advanced logistic information technologies, new software products adapted to the railroad company's needs;

- sufficient availability of informational resources, availability of structured databases, tools and techniques for corporate informational system;

- availability of highly-qualified personnel, which is not widely available in the labour market and training of which takes considerable time;

- personnel's commitment for general corporate values and employees' motivation for achievement of the set objectives. [4]

The following may be considered the company's external competences:

- availability of stable relations with suppliers, consumers and partners;

- ability to ensure corporate projects financing in the required volume, within the shortest possible time and at an acceptable price (availability of well-established relations with financial institutions and investors);

- ability to protect its own interests as regards establishment of non-discriminating conditions of business (availability of relations with government authorities). [4]

Thus, application of a logistic-based approach to the transportation market, with considering the transport complex as a structured system and the transportation process as such as a logistic chain of operators and infrastructure objects that interact through logistic relations makes it possible to optimise the process of transportation services production and to ensure satisfying the needs of customers belonging to various categories on the basis of rational use of the available economic resources.

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It is obvious that market segmentation forms the basis for making well-substantiated decisions by logistic units. On the basis of market research, logistic strategies are elaborated, transportation schedule is generated, and rolling stock is optimised. Ideally, the marketing information flow is to meet the logistic information flow in a combined process of transportation planning and development of an integrated end-to-end transport-and-logistic chain, accompanied at the input end with the flows of marketing information and at the output end with the target parameters of the logistic services.

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