

MODEL OF PLANNING OF THE TRANSPORT COMPANY'S BUSINESS

Daiva Novikovienė

*Vilnius Gediminas Technical University,
Department of Transport Management
Plytinės Str.27, LT-2016, Vilnius, Lithuania
Ph: (+370) 52744781. E-mail: daiva.novikoviene@post.5ci.lt*

INTRODUCTION

In developing economy the role of transport and other production infrastructures becomes more important as development of these areas creates the necessary conditions for more efficient production concentration and specialisation, labour distribution and cooperation, quantity of the products created and maintaining of the consumer qualities, reducing of losses in all stages of the “product-consumption” process.

At the moment, changes in the market, like in the whole surrounding world, are significant and dynamic. The changes of business environment, changing consumers' needs and requirements make the problems of competitiveness for companies even more important. Any change in the company's activity is not possible without modern information technologies. Web technologies are rapidly spreading by creating possibilities for carrying out many of the business processes in a distance.

Many companies are facing the need to restructure their business processes in order to shorten the time of work, to reduce the price, and to better satisfy the consumers' needs. This can be achieved by implementing computerised information systems (IS). At the moment better methods for describing the problematic area and reflecting of the business processes of organisations are being searched for. A lot of modelling methods have been created, however each of them has certain advantages and disadvantages.

The analysis of transport relations with other sectors of economy and improving of the transport strategy are the necessary conditions for improving of transport efficiency.

IMPORTANCE OF PLANNING AND MODELLING

Seeking to successfully solve transport problems it takes a lot of various economic measures and actions in improving technical vehicles (rolling-stock, stationary equipment, etc.), uniform planning and controlling of the transport system as well as the economic mechanism of transport. All these issues must be solved by applying a systemic analysis so that the resources allotted to functionality and development of transport are used in the most effective way.

The economy mechanism in transport is understood as a mechanism controlling the plans implementation process. According to some scientists, when dividing the economy mechanism, its integrity is “divided”, the formation principles of the most important elements are detuned as well as the use of the sphere and the economy mechanism, and it is more correct to define the essence of the economic mechanism of transport as the completeness of “interrelations ensuring the uniform implementation of the economic interests of all subjects by coordinating separate needs of each of them”.

Of all possible ways to use the resources and the respective transport development alternatives we must chose those that guarantee maximum efficiency. The alternatives must be selected for the systems' class so that the cargo and passenger carryings fulfilled in time and qualitatively are guaranteed with the lowest total economic costs. Therefore, the task of a transport company is to use the vehicles as efficiently as possible, to increase the work efficiency of the employees, and to improve the company's operation by using new information technologies.

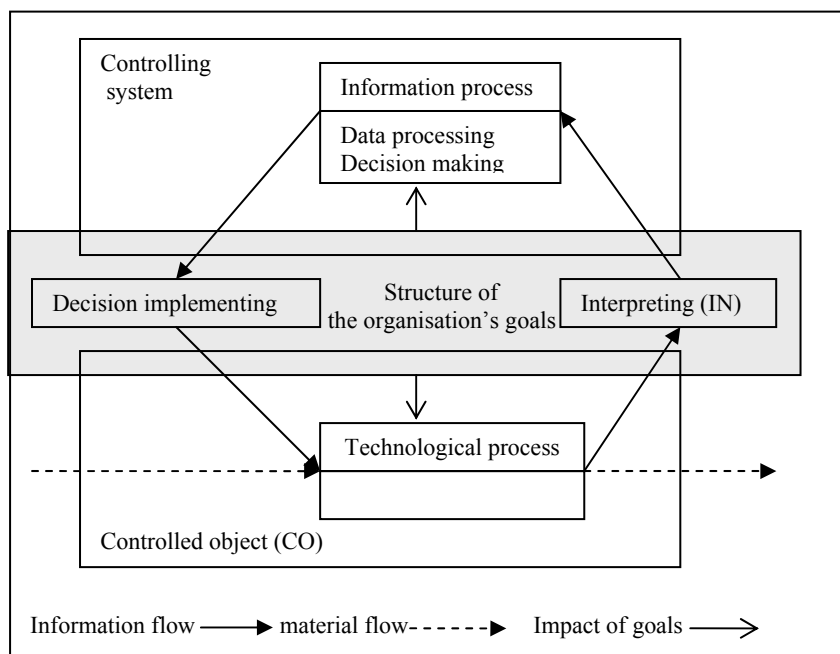
Attention must be paid to improving of the transport services, satisfying of the consumers' needs, and increasing of profit.

METHOD OF THE CONTROLLED PROCESSES

One of the latest methods of modelling the business processes is based on the statement that every business process in the organization must be controlled [4]. The basic feature of the company’s managing process is the closed feedback round connecting all components of the business process. The feedback makes the information exchange cycle between the business components, which are parts of the controlled object and the controlling system.

Each of the controlled business process has its structure and causal order, and its basis is the feedback round connecting the following components into a closed chain (cycle) (Picture 1)

- Technological process – the material output of the business of the organization - operations of forming of the business product;
- Interpretation process – the process of forming and transmitting of information on the technological process required by the controlling system;
- Information process – data processing made by the controlling system and the controlling decision-making;
- Decision implementation process – transmitting and implementing of the controlling decision in the technological process, i.e. the process of turning the decision into a physical impact.



Picture 1. The controlled process structure

The controlled business process is described by the formal structure called the elementary controlling cycle (ECC) [4].

MODEL OF TRANSPORT BUSINESS PLANNING

The classical task of cargo carrying programming is the following: let us say that we have m of cargo senders A_1, A_2, \dots, A_m , who have a_1, a_2, \dots, a_m units of cargo of one kind. The cargo must be carried to n destination points B_1, B_2, \dots, B_n , cargos b_1, b_2, \dots, b_n for each consignee. The price for carrying one cargo unit from the sender A_i to the consignee B_j amounts to C_{ij} . We must create the cargo-carrying plan to satisfy all orders and to have the minimal price of all carrying.

Then the function of purpose – total price for carrying will be:

$$\sum \sum c_{ij} x_{ij} \rightarrow \min \tag{1}$$

with the restrictions

$$\sum x_{ij} = a_i, i=1, 2, \dots, m; \tag{2}$$

$$\sum x_{ij} = b_j, j=1, 2, \dots, n. \tag{3}$$

In solving of the task, the cargo-carrying plan is more satisfying the customers' needs but not the aims of the transport company.

The business aim of each business company, including transport company, is to get more profit, therefore the business model of the transport company can be formulated with the company's profit increasing as the main factor. The task where the main factor is the company's profit increasing can be formulated as follows: set the volumes of k kind of cargo carrying by f vehicle kind from the sender i to the consignee j to receive maximum profit for the company.

Let us select the following notation:

a_{ijkf} – price, LTL, for carrying 1 tone of cargo by vehicle of f kind from the sender i to the consignee j ;

X_{ijkf} – volume, t, for carrying 1 tone of cargo by vehicle of f kind from the sender i to the consignee j ;

b_{ijkf} – costs, LTL, of carrying 1 tone of cargo by vehicle of f kind from the sender i to the consignee j .

In this case the function of purpose is as follows:

$$\sum_{i=1}^m \sum_{j=1}^n \sum_{k=1}^p \sum_{f=1}^r (a_{ijkf} - b_{ijkf}) \times X_{ijkf} \rightarrow \max \tag{4}$$

i – senders of the cargo, $i=1, 2, \dots, m$;

j – consignees of the cargo, $j=1, 2, \dots, n$;

k – kind of the cargo, $k=1, 2, \dots, p$;

f – kind of vehicle, $f=1, 2, \dots, r$.

In modelling it must also be considered and evaluated that each function must have restrictions, which are created by separate factors characterizing the activity of the transport company. In such case, the function of maximum profit will be restricted by the following factors:

$$\sum_{j=1}^n X_{ijkf} = a_i, (i=1, 2, \dots, m); \tag{5}$$

$$\sum_{i=1}^m X_{ijkf} = b_j, (j=1, 2, \dots, n) \tag{6}$$

where a_i – quantity, t, of cargo in i sender's point,

b_j – quantity, t, of cargo delivered to the consignee j ,

$X_{ijkf} > 0$.

WHO IS GOING TO WIN IN THE ELECTRONIC LOGISTICS MARKET?

The European transport industry has been in crisis for a long time: companies are going bankrupt one after another, cargo consigners are not able to survive in the competitive fight, the carrying business has been in danger of being competed by the Eastern European companies. Successful companies in this area are becoming an exception rather than a rule. In this situation, the search for new methods and attitudes helping to stop this going down process is becoming of crucial importance. One of the possible ways is using of possibilities offered by the electronic marketing.

During the recent 36 months, applying of new technologies in logistics has probably made more progress than during the past 36 years. Although this industry is usually late in implementing new technologies, judging by the plenty electronic advertisements, electronic brokers, carrying exchange

services and markets appearing in the recent years, huge changes can be projected in this area. Originally, electronic market included only transportation, but recently it has significantly expanded to warehousing after starting to offer reservation of warehouses by Internet.

Who can benefit from the electronic logistics market? It depends on the selected business development model.

Three basic business models exist in logistics:

- 1) Escalating of the demand interests, when we have a cargo and the sender wants to have it carried. This attitude makes the “periodic fight” between the cargo senders and carriers even harder and it ignores the structural and systemic problem of the industry, like insufficient “visibility” of the demand and supply, which conditions the terribly low assets profitability and finally leads to high carrying prices and low profit, which has become the main problem in this business.
- 2) Escalating of the supply interests when vehicles are available and the point is how much the customers can pay for the service. Like in the first case, this attitude is a step back in solving the structural and systematic problems, therefore it is unlikely that it could become dominating, except possibly air transport.
- 3) Neutral cooperation when everybody is working in accord in this transport business and the main issue for both the sender and the consignee is how to optimise the transportation process, i.e. make it profitable for both sides.

It is obvious that only this, third, attitude offers the scenario without losers. The senders of cargos get lower prices for carrying as carrying of empty transport is reduced (at the moment 30% of all trailers are travelling unloaded on the European roads). The carriers receive what they need most – higher fund return and profit.

The electronic market operator basing on the neutral cooperation can implement this scenario. He must invest in technologies and create the business platform of the electronic market ensuring the “visibility” of the demand and supply offering the algorithms of solutions and assistance of analysts, which would help convince the market participants that this market will take care of everybody’s interests equally. The current lack of “visibility” and, unfortunately, confidence is one of the main reasons of structural and systemic problems in the transport industry.

What must be this market like? What does it seek? What does it offer?

First of all, electronic market must be easily accessible to all participants, it must be flexible and ensure “visibility” of the supply and demand. Modern technologies, like Internet, make this task much easier. The data, which is required by the cargo senders and carriers, is usually in the customer’s database and most frequently it gets there much earlier than received by the logistic specialists seeking to optimise the process of transportation. One of the main tasks of the electronic market is to encourage mutually beneficial interactive cooperation between the cargo senders and carriers.

Basically, cargo carriers are interested in using the benefits offered by the electronic market (lower prices, bigger choice of vehicles lower transportation costs, and better “visibility” of supply), however, they certainly do not want to lose the advantages of the conventional market: service quality, information, financial security, insurance, etc. They would be happy to buy the services of the same or higher quality for a lower price.

Therefore, the operator of electronic market must create a system, which would allow automating the current processes, be easily accessible, include all carrying process from the point of departure to the point of destination, be totally transparent, and give access to the wide database of carriers. By joining this “business plan”, the carriers would ensure better use of vehicles and would get higher profit.

“Visibility” of supply and demand, reliability, and possibility to project the carrying time more precisely would allow achieving two goals at the same time: on the one hand, the carrying costs would be significantly reduced, on the other – the carriers would increase the profitability. This would encourage the carriers to invest more in technologies and production instruments, which would also ensure higher assets, return. The electronic market created on the basis of neutral equal cooperation makes that realistic. Open discussion of all interested market participants on the issue must be initiated. In case the principle of equity is implemented, the electronic market could become an important step to transforming of the whole transport industry.

INFLUENCE OF THE INTERNET ON TRANSPORT COMPANY'S BUSINESS

At the moment, most of attention is focused on using of technologies in order to improve the company's market position. In spite of that, most companies have a good opportunity to improve their basic internal operations by using the information technologies and, first of all, using of the electronic commerce to gain competitive advantages. The information technologies sector is one of the fastest developing sectors in the world's economy. This sector is also rapidly developing in Lithuania. Developing of the service sector of information technologies is a very important aspect of the information technologies market. The importance of these services has especially increased with the increasing need to use the latest electronic data transmission and processing methods in business, to increase the work efficiency, improve customer servicing, and have efficient access to financial and other commercial information. All these factors condition business competitiveness on the global scale.

The Internet is now a powerful instrument for business and communication. New markets appear on the Internet. The Internet should be used more. Therefore, cheaper and faster Internet connection is needed. This can be achieved only due to more severe competition inside the market. In 2005, Lithuania is planning to achieve the main task and to provide all public services to Lithuanian individuals and business entities by using digital technologies. The government of the Republic of Lithuania is going to take measures to provide more possibilities to the Lithuanian residents to use the Internet. It is intended to speed up the computerization of schools, libraries, to establish Internet shops in the region. Electronic power will be created in stages – from information providing by the Internet to the possibility to make settlements, communicate with the governmental institution in filling various questionnaires. It has been provided that the electronic power projects may be financed from the State budget by using the funds of the European Union programs, internal resources of the institution, and by attracting business investments.

Having made the research, it was established that the influence of the Internet on transport companies is also a very important factor that has impact on many of the logistics links. The characteristic features of using Internet in the transport business are the following:

- Fast, cheap and reliable communication with customers;
- Faster reaction to the changing needs;
- Advertising expenses are much lower when using the Internet;
- Faster service since information is received faster;
- Internet is used as the collection of instruments of qualification improvement and hiring new personnel;
- The company's information system is improved by the help of Internet;
- Internet provides new cooperation advantages, better and stronger connection with the world in exchanging of information and software, this is the technology development;
- Internet provides the possibility to adapt information for each user;
- Internet provides interaction, i.e. helps fully understand the needs of service buyers;
- Internet can fulfil the entire marketing function as a deal can be done in one action;
- The company provides information on the Internet in time and can update and publish it any time;

The Internet provides possibilities to fill the niches in the market – a transport service may be offered to a very specific group of users;

The Internet provides new business opportunities.

Having researched and surveyed 271 respondents of the Republic of Lithuania (Lithuanian transport companies engaged in cargo and passenger carrying by local and international routes) it came out that after starting to use Internet in their business, the transport companies observed the following:

- 33.3 % of the respondents indicated that the average number of customers of the transport companies increased by 21.5%;
- 83.3 % of the respondents indicated that the average data transmission speed increased by about 947%;
- 70.8 % of the respondents indicated that connection with the customers improved by about 331%;

- 79.2 % of the respondents indicated that communication with the customers improved by about 121%;
- 33.3 % of the respondents indicated that the average transactions speed increased by 472%;
- 45.8 % of the respondents indicated that the average information transferring costs decreased by 139%;
- 25.2 % of the respondents indicated that the average income increased by 0,023%.

It must be stated that using of the Internet in the transport company business has a positive impact on the customer's expenses, too, since he can also benefit from the Internet. Therefore, in formulating the business model of the transport company with the company's profit increasing as the main factor, it would be purposeful to consider the factor of using Internet in the company's business. Therefore, it is suggested to enter the element into the function of purpose (4) in order to evaluate the impact of the Internet use in the transport company's business on the profit of the company:

$$\sum_{i=1}^m \sum_{j=1}^n \sum_{k=1}^p \sum_{f=1}^r (a_{ijkf} - b_{ijkf}) \times X_{ijkf} \times S \rightarrow \max \quad (7)$$

where S – coefficient evaluating the impact of the Internet use in the transport company's business on the profit of the company.

Having analysed the information of the survey, it came out that the main factor in using Internet in the transport company's business is saving of the working time; reducing of idling time of the vehicles, which, according to the analysis of the survey, would allow increasing the average income of the transport company by 0.023% or 1.023 (in this case $S=1.023$).

The integrated coefficient S , evaluating the impact of the Internet use in the transport company's business on the profit of the company, can be calculated as follows:

$$S = T_1 \times T_2 \times \dots \times T_d \quad (8)$$

where T_1, T_2, \dots, T_d – coefficients evaluating the impact of the aforementioned factors of the profit of the transport company. These coefficients are established by a separate analysis.

CONCLUSIONS

The importance of transport is increasing with the intensifying economy. The transport system together with its functioning mechanism and interaction with the production sectors and non-production sphere are becoming more complicated and united. All this conditions the importance of the systematic analysis and modelling of the transport economic processes. The areas of modelling have especially expanded with appearing of computers. With the increasing possibilities of the latter, it became possible to analyse various even most complicated processes.

The results of the research showed that nowadays transport companies are using Internet as an element for achieving of the competitive advantage. Therefore, in formulating the business model of a transport company with the main factor being the company's profit increasing, the factor of using Internet in the transport company's business was considered.

The Internet offers new possibilities for marketing and advertising. New technologies may be used for developing of new forms of products and services by considering the market possibilities in the global communication infrastructure.

The following results can be expected when using Internet in the transport company's business: higher profit, lower costs, creating of image, increasing of the market share, and expanding of business. The question "is Internet a competitive instrument in business?" remains important to many of the company managers. For many years technical experts have been interested whether the computer systems of the company correspond to its needs. Unfortunately, these experts did not realize the business needs in respect of competition and they did not realize that the electronic commerce based on the Internet and information technologies is part of the competitive business. Despite of the lack of this strategic line, many sectors, including transport companies, are using Internet and all possibilities provided by it to achieve the competitive advantage.

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