

CLASSIFICATION OF SERVICE LOGISTIC IN TERMS OF BRANCHES

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Abstract: The contribution continues the previous section entitled "Concept of logistics service", where the logistics of services is characterized as a special part of the logistics and defined the essence of the services and especially logistics of services. The contribution deals with the classification and description of logistics of services in various fields. The problem, which the article is devoted to, is the identification and classification of logistics of services in various fields of industry and non-manufacturing sector. The aim is to identify and describe logistics of services in various fields ranging from industry over health care to transportation. Individual fields can be further characterized and specially study, on the logistic side as well as on the logistics of services side. The main orientation for the analysis of the areas is in the logistics of services. Services are an inseparable aspect of human life and the more advanced company, the bigger interest for services. The same is true for the companies from various fields. The richer and more advanced companies, the bigger interest in ensuring their faultless service and professional operation and logistics of services not excluding.

1 Introduction

The variety of services considerably complicates their general definition. Due to the heterogeneity of services it is appropriate to categorize their essential characteristics into several categories. Services may be classified according to whether they are dependent on humans or on devices [1]. Services that depend on the devices can be further classified on those which are provided by fully automated devices and those which are provided by devices monitored by the low qualified or highly qualified personnel. Services that depend on the people may be classified into those that are provided by workers with high or low qualification or by top experts. Some services require the immediate presence of the customer [2].

2 Logistics of services in petrochemistry

Petrochemistry can be characterized as a branch of chemistry that mostly deals with the oil and natural gas and with the methods of their transformation into utility materials and goods. The system of petrochemistry, from extraction through production to consumption we can understand from logistic point of view as flow (Figure 1).

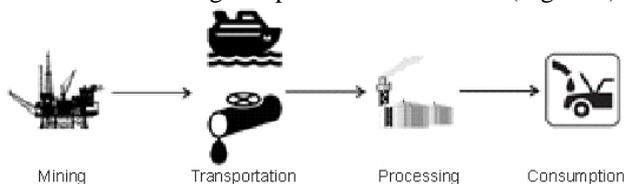


Figure 1 Process of oil production [1]

Principles of logistics in petrochemistry can be described as:

- The right way – the use of adequate means for the smooth distribution of oil and oil products to the place of consumption.
- The right service – the use of the right methods for execution and implementation of services in the field of

petrochemistry, while respecting the principles and provisions of the law.

- The right quantity – to distribute a sufficient amount of oil and oil products to the places of consumption to ensure the smooth running.
- The right quality – use of modern technologies and continuous improvement of processes of oil production.
- The right place – the place of finding of oil reserves, its adequate extraction and minimization of environmental pollution.
- The right time – ensuring the supply of oil and oil products in time and without incurring of downtime.
- The right customer – all natural persons that shows a feeling of insufficiency, resp. market demands.
- The right price – total price of oil products is based also on the economy of the state itself.

3 Logistics of services in construction industry

Construction industry is characterized as a sector of the economy that realizes construction of objects and implementing of construction and business activities. In most of the cases, construction industry has the task to procure the building materials.

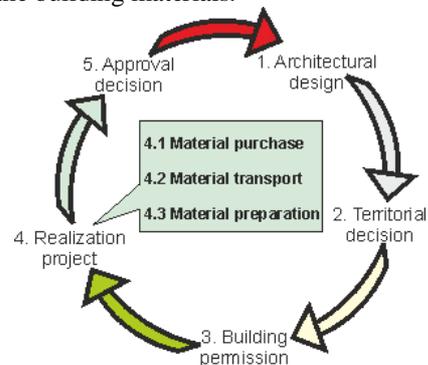


Figure 2 Processes in construction industry [1]

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It is necessary, from the logistical point of view, to define eight “right activities” of logistics since the construction industry is understood as a service, thus activity, which is provided by one party to another:

- The right way – compliance with administrative procedures and construction law in the implementation of constructions.

- The right service - service providers in the construction industry offers not only the construction of buildings intended for housing, but this also applies to the entire national economy. It is also about the construction of various industrial buildings, logistical centers, but also about the reconstruction itself, demolition of unused or unnecessary buildings.

- The right quantity – all that could be offered by service provider during the realization of construction. It may not include only the material supply needed for construction, but also the realization of construction itself, the design of project documentation and after the and after the completion of construction the possibility of occupancy permit of management (Figure 2).

- The right quality – quality is evaluated based on the type of given building. Whether it is the private sector (construction of apartments, basements, garages), industrial sector (the construction of shopping centers, companies) or the public sector (construction of schools, libraries, offices) the quality itself is evaluated based on the used material and technologies.

- The right place – allocation is mostly based on the general city plane of the borough, region. It also depends on the demand and the character of the building and the height of the needs of the given services that will be offered by this property.

- The right time - a matter of time when to realize the construction, seasonal affair. Building construction is done during the spring to autumn months, i.e. march – september, and depending on the actual weather.

- The right customer – the customer can be any natural or legal person who, for its personal or business aim, needs creation of the building for living or for business development.

- The right price – price belongs to the most important factors during the choosing of service provider. The price does not depend only on the type of used building material and building components, but also on the high of the quality, deadline for completion of construction and, last but not least, a guarantee from the provider.

4 Logistics in banks and in financial area

Financial services can be characterized as services that are connected with transfer of money from the sender to the receiver, resp. between economic subjects (Figure 3). When providing the services, it is necessary to realise who is the provider and who is the user of the provided service. Provider is a financial institution (bank, insurance company, leasing companies...), which provides maintenance and services within the financial area, are of

bank transfers or area of a concluded contract. User is either a physical or a legal person, who needs and uses the services for some compensation.

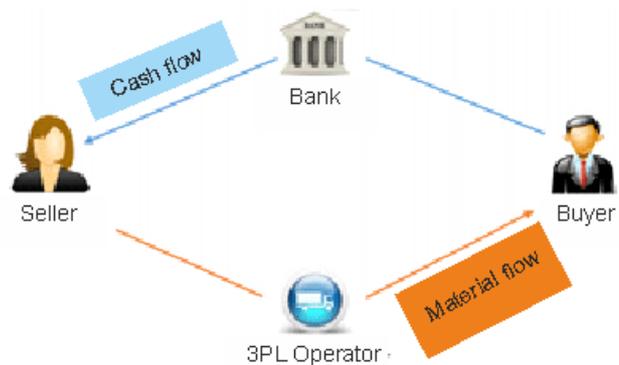


Figure 3 Supply chain of financials [1]

Logistic features of the financial services can be characterised as follow:

- The right way – meeting the correct legislative and norms while performing the considered duties

- The right service – providing the service to the customers actually, completely and correctly in such range as that is expected from the financial.

- The right quantity – according to the finances, this only means that the financial institution has to provide the amount of finances that the customer demands.

- The right quality – providing of the financial services professionally and correctly. According to the customer, the quality can also be judged by the well-educated staff, willingness to help and give advice.

- The right place – the key factor when selling the financial services is the way they are presented. It is important that the distribution channels are well-defined and their progress has to be monitored.

- The right time – considers the timing of the financial services providing, mainly when the demand is big. It is necessary to monitor the economic development on the market and change the services accordingly. Another important thing is to adjust the opening hours according to the customers’ demand.

- The right customer – is every physical and legal person who needs the funds for personal or entrepreneurial intention.

- The right price – The price is the defining factor, mainly according to the financial institution, in order to profit and to be competitive on the market.

5 Logistics in the public utilities

The logistics occur also in the area of public utilities. All the services included are important for the society and a lot of people do not realise that their every-day routine cannot work without logistics. Every action represents a system, which cannot work and be sufficient for the society without correct settings of parameters, connections and flows [3], [4]. What one group of people considers a matter

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of course, means every-day struggle with the market's demands for the others [5], [6].

Logistics of water supply: The aim of the logistics of water supply is the correct connection of water supplies and sewerages on the area of Slovak republic. In the past, there were not so many water suppliers in Slovakia. With the growth of population, there also grow the problems of supplying of water and planning of sewerages for everyone.

Logistics of waste disposal: Collecting of the communal waste and its separation according to the environment belong to basic services to not only population, but also to basic principles of a logistics of a company. The question of waste economics becomes a bigger problem nowadays. The reasons are the growth of the world population on one hand and the willingness of people to help and create a better environment. The logistics of waste economics is characterised as a reversed logistics. The provider of the waste disposal service is the community. In Slovakia, the communities obey the law No. 223/2001 from the collection of laws about waste management. The user of the service is characterised as every creator of waste, or everyone who treats the waste in a matter of mixing, separating or other, if the result is the change of the waste composition and nature [7].

One of the main goals of the reverse logistics is the reuse of the waste that was created during production and everyday life (Figure 4). There are a lot of companies that produce tons of waste which cannot be used from the technological point of view of that do not even care about the question of waste management.

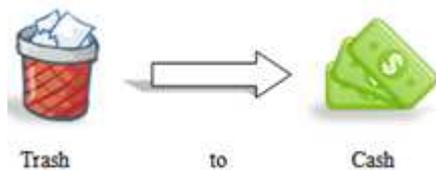


Figure 4 The „From trash to Cash“ide [1]

Logistics of the energy supply services: Energetics is one of the biggest areas of the national economics in Slovak republic. It represents an important and substantial area not only for the households but also for all kinds of companies and producers. It concerns providing important services, without which the recent life cannot be imagined. The energetic area mainly consists of:

- electricity,
- thermal energy delivery,
- gas delivery,

The supplying of the energy to the residents can be characterised as a complicated logistic process. Each supply of a certain energy consists of several smaller activities and has to have a secured distribution from the producer the customers (Figure 5). Usually it consists of static distribution networks. Their shape and direction does not change at all.

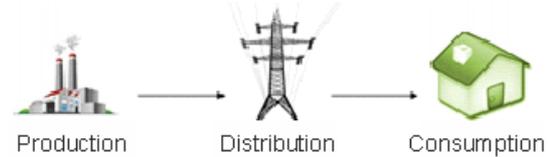


Figure 5 Logistic energy flow [1]

Logistics of the health services: The area of health services can be understood as a complete system (Figure 6), which consists of the following operations:

- Medical services – services provided to the patient in order to cure some health difficulty.
- Medical production- production of different products, medicals, which help to cure medical difficulties or prevent another to occur. This can mean medical aids, like medical mattresses, shoe wear, doctor's assortment, but also all kinds of drugs.
- Supplying of medical centres with medical aids – regular income of supplies in the form of drugs, aids, blood transport...
- Science and research in the medical area – continuous improvement and searching of new methods and pharmaceuticals in order to prevent and cure deadly and dangerous diseases.

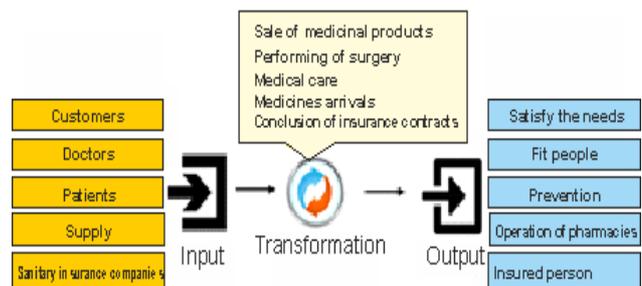


Figure 6 Scheme of logistic flows within health services [1]

6 Logistics of telecommunications, information and postal services

This group of services is an inevitable part of our everyday life. Telecommunication services are characterised as all the services that provide us with information in various forms (audio, video, text) on a specified area within a state. Postal services include all the services, which are connected to choice, separation, transport and delivery of packages by a specific post office or courier company. Courier companies are individual part within the area of package delivery. They are private companies, which deliver packages to the recipients for financial retaliation. There exist the courier companies within the area of industry and traffic, whose main purpose is to deliver bigger packages for bigger production companies all around the world. These include mainly logistic companies that offer the delivery of material, supplies and components.

7 Logistics among the military forces services

The main purpose of the military forces is a complete security of the country's safety from potential threats and dangers. This requires a rational use of all the available information to eliminate the threats and this is where the logistics of the military forces is hidden. Logistics fulfils all the functions that are related to army supplying, full support to the aviation military components and securing of the medical services, transfer and communication among bases. There is a big interest within military forces directly in the transfer and traffic logistics.

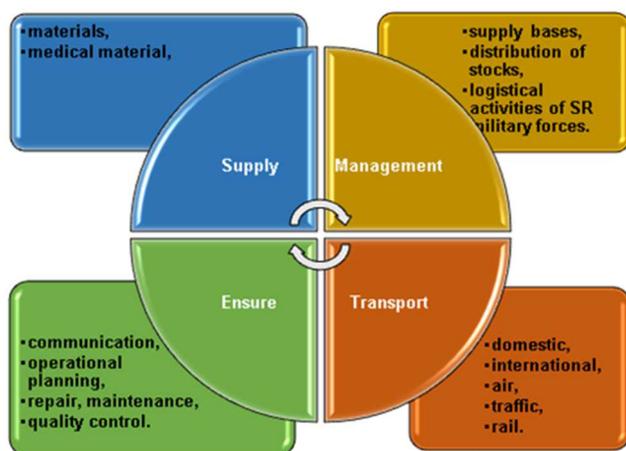


Figure 7 Main logistic aims of the military forces of SR [1]

8 Logistics in traffic and transport services

The transport area is the most important part of the logistics. Even the best product on the market will not make it to the customer without a sufficient and fast transport. The transport of the desired goods from the production place to the consumption place is a dominant issue in modern business. No matter what the product is, everything is located in various places all around the world and directly import and export are responsible for the transport flow and supply flow in the world.

The road transport is the one mostly used recently and not only in logistics but also in everyday life. It is divided into:

- personal,
- freight.

The main difference between those two is the subject that is transported. While the freight mainly transports materials and components or supplies, the personal transport is focused on transporting persons and deals with personal flows. Ultimately, these flows can be considered logistic and therefore it is possible to ensure that the transported persons are brought to the right place in the right time for appropriate quality and costs. In the personal transport it is necessary to consider the transport's reason, whether it is to get to school or work or just for the causes of tourism.

Conclusions

It is possible to consider logistics from several points of view within the area of production and industry. In the area of industry, there occur other parts that relate to each other and do not have to concern the production itself. Here we can consider petrochemistry, building or the process of companies supplying. Classification and identification of the services logistics allows us to understand its basic purpose, which says that the defined activities belong to the services and the logistics at the same time. This state allows further progress of the particular area with a detailed interest in the individual parts of the service's logistics.

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Review process

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IDENTIFICATION OF THE DISTRIBUTION FLOW OF INFORMATION ABOUT ORGANIC PRODUCTS AND INNOVATIONS TO THE FINAL CUSTOMER

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IDENTIFICATION OF THE DISTRIBUTION FLOW OF INFORMATION ABOUT ORGANIC PRODUCTS AND INNOVATIONS TO THE FINAL CUSTOMER**Erika Loučanová**

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Keywords: organic products, innovation, information, distribution flow**Abstract:** Nowadays innovation as an important part of business management concerns not only the product itself, but also increasing customer's interest. In order to increase customer's interest in products it is essential to identify the distribution flow of product information within the distribution logistics of products and innovations. Therefore, this paper deals with identifying the distribution flow of information on a specific group of products to final customer, namely organic products and their innovations, for the effective increase of customer's interest in these products and innovation.**1 Literature review**

The current market is characterized by customer orientation, rapid product innovation and broad range of offered products and services [1]. The only one who innovates, whether technology, products, services, processes, organization or other activities, can be successful under condition of strong competition in the market.

Distribution logistics and marketing in synergy with the innovation process of the company are certain tools with which such a competitive advantage can be achieved and kept for a longer period.

Distribution logistics as a part of the commercial logistics provides physical, organizational and information link between the source (business input stock) and consumers. The function of distribution logistics is to ensure the most appropriate way, selection and analysis of transportation that is most effective for the transfer of manufactured products to achieve no-failure operation of the market [2]. Commercial logistics is a part of marketing, that according to Kotler is a „social and management process in which individuals and groups obtain through creating and exchanging products and value what they need and want“ [3].

Recently, the trend within the resource connection is to implement eco-innovations in the meaning of corporate social responsibility and apply the principles of sustainable development. The term "eco-innovation" refers to innovative products, processes or organizational innovations that reduce environmental costs increase the acceptance of society and contribute to sustainable development. The concept is often used in conjunction with "eco-efficiency" and "eco-design" and also covers related ideas to environmentally-friendly technological advances and socially acceptable innovative concepts towards sustainability [4].

Business innovation management implements sustainability strategy through innovation leading to sustainable use of resources and materials from the environment, including the growing importance of socio-economic approach as part of a commercial logistics. In addition to sustainable use of resources, companies engage to the solution of environmental problems in the pursuit of development and improvement of social conditions and the environment itself, which should be a manner to ensure environmental sustainability and socio-economic development [5].

Linking product innovation management and corporate social responsibility in the application of environmental protection in the course of commercial logistics constitutes an environmental management system based on three pillars - environmental product performance, quality of innovation and customer value added product.

All these innovative activities are a prerequisite for the commercial success of a business unit for the sustainable development of its business in the conditions of market, which are connected with commercial - distribution logistics and marketing. Innovations present an important dynamising factor of each business, while it constitutes an important connecting link between the present and the future of any company [6].

Product innovation management is then focused on more far-reaching commercialization of the product for the future direction of the company. It integrates the products into the overall "green" marketing strategy compatible with the policy of environmental protection. They are the drivers of environmentally oriented business strategy based on the principle of sustainable development in conjunction with commercial logistics. Green marketing strategy promotes product features with really positive impact on the environment. It provides information to create customers' opinion on the innovative "green" products and explains the benefits of innovation [7].

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According to [6] and [8] understanding of innovation by the customer in the context of the innovation management issues in conjunction with the distribution logistics and marketing is based on the globalization trends representing modern philosophy of distribution. That is based on the following factors:

- stable supply and demand in the transport market – term structure,
- development of transport infrastructure, networking – spatial structure,
- creation of new impulse structures – boom of transport market,
- a formation of traffic waves unresponsive to each other – the emergence of clusters,
- creation of spirals and hyper cycles – creation of the transport chain, logistics from the perspective of progressive development,
- rise of deterministic chaos – system failure, management breakdown.

For orientation in these factors arising from globalization trends affecting the innovation in the market, it is necessary to know the information chaining within the distribution logistics of innovations and products. This refers to the time and factual aspect of commercial distribution, marketing and innovation contributing to the business competitive advantage. Therefore, the aim of this paper is to identify the distribution flow of information about organic products and innovations to the final customer.

2 The methodology

The paper methodology is based on questioning. It is a method by which we can get a wide range of information about purchasing consumer’s behavior necessary for marketing research. According to [9] questioning is a detection method by which we obtain information through questions, written or printed. We obtained information about the distribution flow of organic products by selected target groups of respondents, where the sample of 175 Slovak and Swiss respondents was queried.

The questionnaire in both language versions was in electronic form. It consists of two parts – the identification data obtaining and the main part identifying the distribution flow of information about organic products and their innovations to final customers. The obtained data were processed in a database and then evaluated by statistical indicators and cluster analysis in the program STATISTICA. Cluster analysis for the evaluation was used with respect to the stated objective of the survey to monitor the clusters of information distribution flow about organic products and their innovations to final customers. Since as stated [10] cluster analysis determines how the statistical units should be grouped to ensure the greatest possible similarity within the groups and the largest differences between groups.

3 The results and discussion

To reach the objective – to identify the information distribution flows about organic products and innovations to customers – data from 84 Slovak and 91 Swiss respondents were processed. The respondents were queried on ways of obtaining information on organic products and innovations by the six selected communication channels informing and supporting these products sale (Table 1).

Table 1 Basic statistical indicators on the selected incentives within the distribution flows of information about organic products and innovations

	Slovakia		
	Absolute frequency	Relative frequency	Variance
Television and radio (Prom 1)	19	22,62	0,17503
Magazines and press (Prom 2)	15	17,86	0,14668
Internet (Prom 3)	24	28,57	0,20408
Leaflets and promotional materials (Prom 4)	9	10,71	0,09566
Friends and relatives (Prom 5)	13	15,48	0,13081
Other sources (Prom 6)	4	4,76	0,04535
	Switzerland		
	Absolute frequency	Relative frequency	Variance
Television and radio (Prom 1)	22	24,18	0,18135
Magazines and press (Prom 2)	11	12,09	0,10627
Internet (Prom 3)	34	37,36	0,14367
Leaflets and promotional materials (Prom 4)	4	4,40	0,04202
Friends and relatives (Prom 5)	20	21,98	0,17148
Other sources (Prom 6)	0	0,00	0,00000

Basic statistical indicators indicate that the distribution flow of information about organic products and their innovation to customers in the analyzed countries is very similar. The differences are more in terms of quantitative representation of individual incentives in the distribution of information on organic products and their innovation to customers. More significant differences can be seen according to the relative frequencies in obtaining information from other information sources, internet, family and relatives, magazines and press, leaflets and promotional materials. The minimum difference between the research subjects can be seen about television and radio. Validity of data is guaranteed due to the low statistical deviation from the average of analyzed data within the investigated objects by variance.

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We used cluster analysis with Ward’s method to identify the distribution flow of information about organic products and innovation to final customer that is presented in Figure 1.

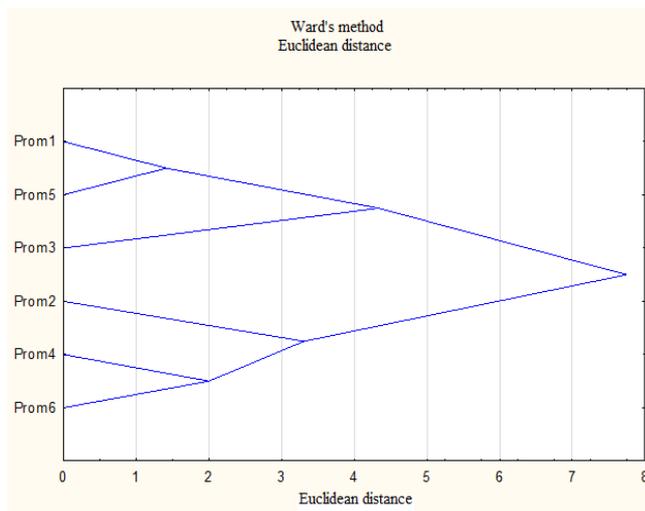


Figure 1 Distribution flows of information about organic products and their innovation to the final customer in Switzerland

We have identified two clusters based on a significant diversity of clusters that occurred at a level of 7, where the increase of values at the Euclidean distance between the monitored object has occurred.

Based on the above, we can conclude that the distribution flow of information about organic products and their innovation to the final consumer is connected within a cluster 1 - television, radio, internet, friends and relatives - and within a cluster 2 - magazines, press, leaflets and promotional materials and other information sources (none identified by the Swiss respondents).

The distribution flow of information about organic products and innovation to final customer in Slovakia is presented in Figure 2. More significant diversity of clusters occurred at the level of 3.5 of Euclidean distance and on what basis we have identified three clusters: cluster 1 - television, radio and internet, cluster 2 - magazines, press, friends and relatives and cluster 3 - leaflets, promotional materials and other sources of information about organic products and innovation (Slovak respondents identified as a doctors and personal sales).

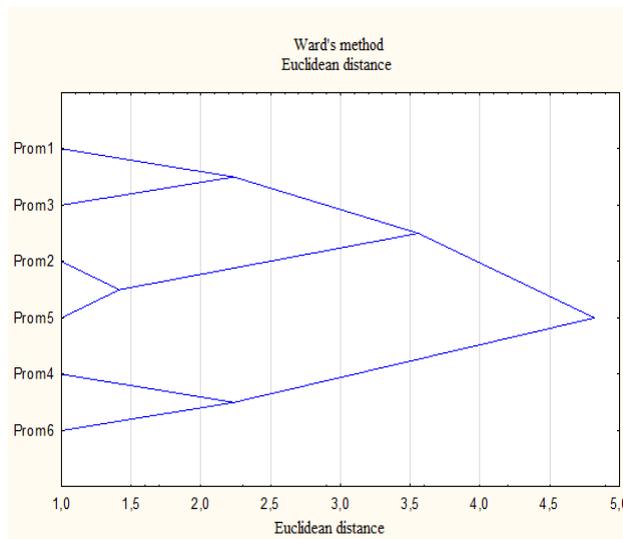


Figure 2 Distribution flows of information about organic products and their innovation to the final customer in Slovakia

In conclusion, we can summarize that the main identified distribution flows of information about organic products and their innovations to final customers differs in Slovakia and Switzerland, see Table 2.

Table 2 Clusters of distribution flows of information about organic products and their innovation in Slovakia and Switzerland

	Switzerland	Slovakia
Cluster 1	Television and radio, internet, family and relatives	Television and radio, internet
Cluster 2	Magazines and press, leaflets and promotional materials, other sources	Magazines and press, family and relatives
Cluster 3		Leaflets and promotional materials, other sources

Identified distribution flows of information about organic products and innovations to the final customers create a combination of external impulses and responses in both clusters. In contrary, the Slovak identified information distribution flow is differentiated into three clusters, which for organic products and innovation in Slovakia is disadvantageous condition in terms of the flow of information about them. Because as stated [3] differentiated perception, which was also identified in the information flow for organic products and their innovations in Slovakia, distorts the information, the interpretation of the subject and represents a distortion of certain information on the perceptions of individuals.

In order to generate such an offer of organic products and their innovations that meets the needs of consumers, marketing incentives in the information distribution flows of organic products and innovations should be associated

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with its needs, not demand. Because as stated [11] the demand is that part of the needs that motivates the subject to obtain a specific products or services, and which is also recognized as necessary for the company at a given developmental stage and a certain time period. Demand is therefore the form of needs expression, but the needs are not the same as demand, but they form its content.

4 Conclusions

Innovations are an important part of the market and nowadays eco-innovations and products are at the centre of interest. To increase customer interest in this kind of innovation and products, they need to be associated with marketing tools that provide necessary information on knowledge to the customers. Therefore, the paper deals with the identification of the distribution flow of information about this particular group of products - organic products and to innovate to ultimate customers in Slovakia and Switzerland. Based on the obtained data comparison, we concluded that in Slovakia the information distribution flow is more differentiated than in Switzerland and we recommend streamlining it to avoid the distortion of information about organic products and their innovation.

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SYSTEM OF THE WATER DISTRIBUTION IN THE CONCRETE REGION**Silvia Leczova**

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Keywords: logistics, distribution, system, manufacturing, efficiency, competitiveness**Abstract:** This article aims to review the current representation of distribution systems and distribution strategies, describe possible ways of product flows from the producer to the final customer and to describe individual distribution strategies used in today's systems. The main aim is to analyse, give advice and streamline the activity of a distribution system of a specified company, which distributes mineral water. After performing the above-mentioned activities, there will be proposed a way to streamline the system of logistic distribution. After analysing the customer's portfolio and segmentation of the customers, it is possible to point out one of the main problems of the company and according to the analysis of the current state, it is possible to point out the bottle-neck. The proposed changes can be evaluated from the savings point of view and also from the raise of the additional value.**1 Introduction**

The product only gains its value when it is on the place, where it can fulfil the desire of the customer. Up to this moment, the product is only a commodity, which ties up the funds, deprives the owner of the interest and uses other tools for its maintenance and storage. Those costs cannot be refund by raising the price, because of the competition on the market. It is therefore obvious, that they consume a large part of the profit. One of the possibilities of minimizing these costs is the streamlining of the distribution system's structure. The structure of the distribution system is the result of strategic decisions. Therefore the costs are the result of different decisions at different levels of the distribution systems, considering uncertain information about the future economical state of the market. This is the reason why the distribution strategy of a company has to have a model, which allows it to use existing tools to improve the decisions.

Distribution consists of all the activities, which allow the movement of product's physical and disposal law from one subject to another. Distribution system has to bring the products from the producers to the users and then to the final customers. Distribution also includes several distribution subjects, that are a strict part of it and that cannot be omitted from the realisation of the distribution functions [1].

Currently, the pressure of streamlining of activities among distribution grows continually. The main problem among the distribution is the correct distribution of the storage units, semistorages and distribution and operating centres. The search for the optimal topology of the distribution network on a known operational place and optimizing of the transport represent a very important task. [1].

In order to be able to realise the distribution, the existence of the distribution subjects is necessary. The basic subjects of the distribution are producer and consumer. We can call them obligatory subjects [2].

Except for them, there occur also the facultative objects; distribution mediator and distribution assistant. We can ask why the producer moves a certain part of his seller's tasks to the distribution mediator. It obviously represents a loss of control over the product selling. On the other hand, this also raises some advantages. By using of the mediators, the producer obtains bigger efficiency – the product will be available on the target markets. The mediators team with contacts, experience and range of the activity, providing the producer with much more than he could do by himself.

The distribution mediators are individual companies, whose activities consist of transfer of economical competence over the products and they do it for a financial compensation [2].

2 Design of distribution channel and its strategy

Distribution channel is organized collection of institutions with the main purpose of securing the availability of the products and services to the users, doing it under appropriate economic and ecologic requirements. The distribution channel connects time, spatial and possessive differences that separate the products and services from the users. Individual distribution subject each take over the functions, which they are able to perform for their own purpose in the best way, but also to reach the effect of the whole channel [3].

The creation of the distribution channel consists of two main parts; segmentation and configuration. The design of the distribution channel deals with the organising of the distribution channels in order to obtain effectiveness and no problems. Segmentation means dividing the market into groups of final customers. Configuration is made according to the segmentation

By defining the segment, the company decides about the segments that should be considered and omits those that can be ignored. In this case there can occur some blank

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spaces, for example among households, where the company could also profit.

3 How to start the distribution?

At the first sight, the business with selling of mineral water seems simple. The producer rents the source of the mineral water (source of some mineral stream) from the country, builds the filling machine and counts the money. This business is, however, not so simple. From all the mineral water sources, only 20 are actively used for filling the bottles. The reason is that to acknowledge the source one has to invest a lot of time and money. The source has to be examined for several years, in order to prove the constancy of its composition. Then one can ask for the acknowledgement and the approval for the intended use. After these procedures, the prospect can prepare for the investments to the filling machine, establishing the brand and getting the support on the market. [4].

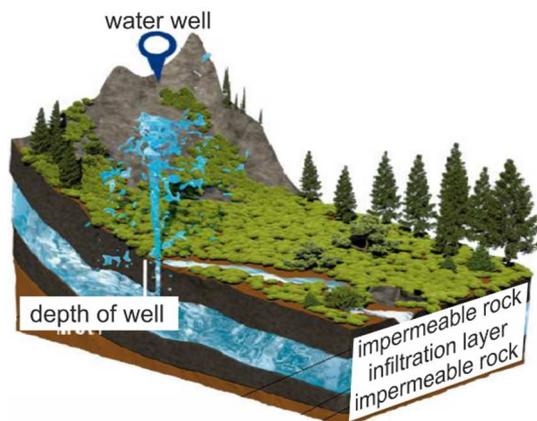


Figure 1 Position of the mineral water

The mineral water is microbiologically clean water with the origin under the ground with the original composition. It comes out of the ground through one or several natural holes. The source has to be acknowledged according to a special regulation. The mineral water in its original state is approved to be used by children and adults. It is not chemically treated and its quality is examined the most from all types of beverages for human use. That is why it is the best beverage for the correct drinking regime. [4].

The whole mineralisation is 1000mg/l of solid or gas substances, the concentration of sulphates is 1mg/l and the temperature at the source is minimally 20°C. According to the high number of minerals, its consumption should be watched [4].

The water supply water underground or ground water used for collective supplying of water to the population. The water supply has to be chemically treated. The quality of drinking water is different in every part of SR, depending on the source and the quality of water pipes. The quality of drinking water is not examined as strictly as the mineral water [4].

4 System of the distribution of the mineral water

The whole process of ensuring the mineral water on the market starts in the filling machine. The process of filling of the mineral water into 18.9 l polycarbonate bottles takes place automatically in the filling line. The mineral water is brought here directly from the source without any other treatment [5]. The filling process is divided into following activities:

- input of the empty bottles into the system, washing of the bottles with detergent and hot water from the inside and outside at the same time, sanitation of the bottles by water containing ozone,
- filling of the bottles with the mineral water, closing of the bottles and moving of the bottles to the rolling conveyors,
- labelling the expiration date and code of the production line on the bottles during their conveyor transport,
- storing of the bottles in the transport system by the pneumatic manipulator, which makes them ready for the expedition.



Figure 2 Process of the filling, cleaning, labelling and preparation of the water for the distribution

4.1 Reversed logistics – polycarbonate bottles

Polycarbonate (PC) is a material, which has a high impact resistance, is firm and flexible. It can absorb the impact energy. It is resistant to wind abrasion and tolerates movement without its damaging. Its low weight and unbreakability allow simple and safe manipulation during transport and storing. Properties: good light transparency (depending on the width - up to 82% of light spectrum), heat isolation (saving compared to glass: 50%), UV filter, Thermal stability (-40°C – +120°C), impact resistance (practically unbreakable).



Figure 3 Polycarbonate bottles of the company

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The main purpose of the reversed logistics is the supporting of the alternative usage of products that have already been used before. Generally, it is possible to define the reversed logistics as a process of re-gaining of the recycled and reused materials, waste and re-produced items from a certain point of production. These items can be used for maintenance, re-producing or elimination or storing. Reversed logistics consists of activities that support material recycling and that aim to minimize the production waste. From another point of view, it has the closest connection to the waste management of the company and it fulfils the legislative demands of the country through the ecological aims.

The company also aims to preserve the environment and therefore this chapter mainly deals with the reversed logistics of the company. From the above-mentioned it follows, that although the polycarbonate is impact resistant, it can be damaged. The main damage is caused during the manipulation of returned bottles.

4.2 Logistics and distribution of the mineral water

The distribution system of the company AQUA PRO evolved thanks to many years of experiences. The company was founded in 1998 and developed continually in the current state. Now it owns a filling machine, three distribution centres and a car park.

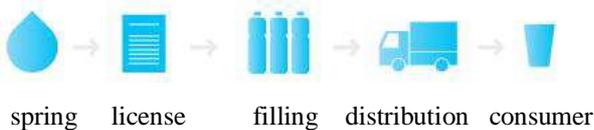


Figure 4 Elements of the company's distribution system

Every day, fresh mineral water is shipped to individual regional logistic-distribution centres of the company. From there, it is distributed directly to the customer. This short logistic cycle ensures that the water is not stored and will be fresh once it arrives to the customer. The aim is that the water should not be stored for more than two days.

The transport of the bottles into the distribution centres and to the customer is performed by the company itself. The car park of the company has a daily capacity of 430 tons. This avoids the need of external distributors

Truck transport with the capacity of 1040 bottles continuously refills the supplies of the mineral water in areas of Košice, Žilina and Bratislava.

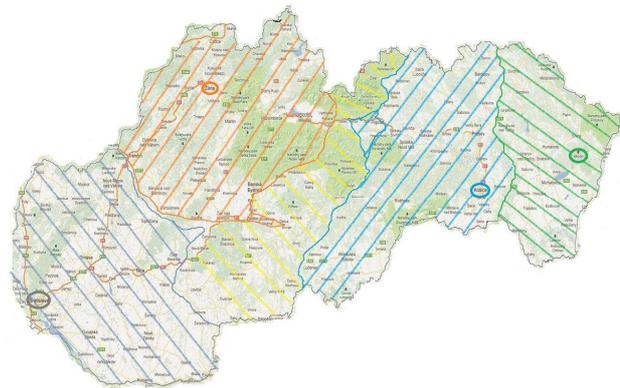


Figure 5 Distribution scheme according to the individual depots



Figure 6 Routes of the mineral water distribution I.

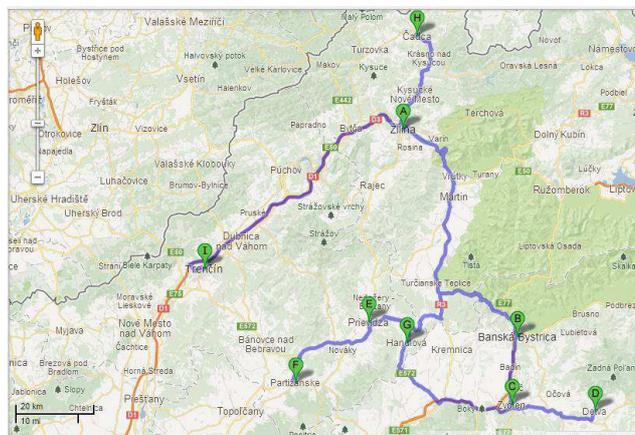


Figure 7 Routes of the mineral water distribution II.

Positive discoveries according to the analysis:

- Long-time influence on the market,
- Own production and storage area,
- Own transport/car park,
- Flexibility and speed of delivery,
- Flexibility of the production process,
- Flexibility of the distribution plan,
- Modern information system,
- Free-of-charge hotline,
- Qualified and trained staff,
- Complex care of the hygiene of the fillers,
- Recycling of the plastic packing.

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Negative discoveries according to the analysis:

- Rising of the distribution prices because of higher inputs,
- Uncovered areas of SR without distribution,
- Continuous fight with the competing companies,
- Improper location of the filling machine according to the location of west and east depot,
- Small number of domestic customers,
High transport costs.

5 Conclusions

The system approach was used within the solving of the current task. After the solving, the company gained significant savings related to truck delivery costs. The main reasons behind that are changes and suggestions of new distribution routes, aiming not only to lower the fuel costs, but also to lower the weight of the distributing vehicle, which can now be used for other distribution activities. The above-mentioned also predetermines the company to extend its influence on the market, to ensure the drinking regime for new domestic customers and partially to extend the production abroad. Overall, it is possible to say that the solution requires the finding of the new source of mineral water and to build a new filling machine located in the middle Slovakia.

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ANALYSIS OF THE POSSIBILITIES OF BUILDING A TOLL SYSTEM IN KOŠICE

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Keywords: analysis, toll system, transport, Kosice

Abstract: Of course, transport has also the adverse effects that cause the costs to society and the economy. Therefore, charging for transport must better reflect the actual cost of shipping. The external costs associated with the use of infrastructure vary depending on time and place e.g. traffic congestion, air pollution, noise and accidents. Applying differentiated fees is a way to take these changes into account. Public acceptance will probably be one of the biggest problems in implementing the Košice tolling system. It will depend on how the system will be presented, whether as a separate measure without a system specification and without explanation, where will the incomes go or what other measures will be related to the system. However, most of the people probably would oppose its introduction. Probably the most appropriate strategy of introduction of the toll system in Košice will be the strategy of improving overall traffic situation in the city. If this system will be fair, beneficial and transparent for all participants, the chance of acceptance is much higher.

1 Introduction

The enormous increase in passenger car traffic, an increase in the number of major traffic accidents, significant air pollution for road transport, the growth of congestion in urban agglomerations, a decline in mass passenger transport performance, these are just some of the transport impacts on society. The costs for maintenance and reconstruction of the road network in the extravilan and intravilan are enormously rising. The city of Košice has not escaped the expansion of road transport and the demand for private use of vehicles, as well as the growth of transport performance on the road network. Transport is a major employer in transport-related economic sectors (services, equipment, infrastructure) and increasing the competitiveness of transport operators is a guarantee of maintaining employment in the transport sector. The transport system has been subject to major changes due to further market opening and innovation. Transport services are essential for economic activity and have an impact on quality of life. Well-organized transport contributes to effective action and strengthens cohesion by allowing economic operators, including peripheral regions, to have better access and gain more benefits from the European Union's (EU) internal market.

The aim is to analyze the key ways of implementation of the city's toll system in the city and to indicate the potential direction that the city of Košice could take to solve the complicated traffic situation in the city.

Even standard procedures for the direct provision of parking facilities require new approaches with financial and implementation involvement of the private sector as well as of the future users. With limited area and financial options, the city can involve private service providers – construction and operation of car parks and parking garages in select locations. The selection of sites and conditions is based on the transport concept of the city of

Košice, in terms of bearing carrying-capacity of the area as well as the transport structure [1].

The article focuses on analyzing different forms of dealing with the negative impacts of transport as well as analyzing the potential implementation and introduction of toll system. From the analysis of traffic problems follow the conclusions, in what direction the transport problems could be tackled, which could be a major priority for the city of Košice, which could help improve the transport system.

2 Goals and direction of transport policy

The basic documents of the European transport policy are a White Book and a Itinerary Transport 2050. These documents outline the basic strategic vision that should be fulfilled in the coming period in the transport sector. The goal of a comprehensive strategy is to introduce a competitive transport system in Europe that would increase mobility, eliminate the biggest bottlenecks in key areas and promote growth and employment. [2] The White Book, after the completion of the internal market in 1985, included a recommendation for the freedom to provide services and set the main directions of the common transport policy.

In November 1985, the Council adopted three main objectives [2]:

- creation of a free market (without quantitative restrictions) no later than 1992,
- reduce bilateral restrictions,
- increase community quotas and eliminate unequal conditions of economic competition.

The Council also adopted a "framework plan" containing these objectives:

- development of infrastructure in the interest of the Company,
- simplification of border controls and formalities,

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- improve safety.

On 2nd of December 1992 the Commission adopted the White Book on the future development of the Common Transport Policy. The most important measure was the opening of transport markets.

The Green Book of Commission from the 20th of December 1995 called "For fairer and more efficient transport prices" focused on the external costs of transport. Discussed were particularly fiscal measures in this field. In the following White Book of 22nd of July 1998 entitled "Fair payment for the use of infrastructure", The Commission drew attention to the wide variation in charging fees in traffic between Member States. [3]

In the White Book "European transport policy for 2010: time to decide" The Commission first explored the problems and the roles of European transport policy, especially considering the planning of the enlargement of the EU towards the East of the Europe. The White Book predicted a significant increase in traffic, which will be accompanied by congestion and traffic overloading, particularly for road and air transport. Thus, the Commission presented a set of 60 measures, which were intended to resolve problems resulting from the economic growth and prevent uneven growth of certain types of traffic:

- to make rail transport more efficient,
- support for maritime and inland waterway transport,
- strengthen the link between individual transport modes. [2]

Itinerary transport 2050

The main objectives to be achieved by 2050 are as follows:

- no vehicles with conventional fuels in cities,
- 40% use of sustainable low carbon fuels in air transport,
- 50% movement of roads to medium distances in intercity passenger and freight transport from road to rail and waterborne transport.

These measures will contribute to a 60% reduction in transport emissions by 2050 [2].

3 Objectives of the Transport Policy of the Slovak Republic

Transport is one of the key sectors of the economy not only of the European Union but also of the Slovak Republic. Demand for transport of persons and goods is increasing and the role of the state is to create legal and economic conditions for the provision of public transport services but also for transport business and the corresponding transport infrastructure related to transport needs. Another important measure is to set traffic systems so that they would prefer those types of transport which are environmentally friendly and can be covered by the public budgets of the Slovak Republic. This chapter discusses the current state of the problem that is addressed in the final work. These are the different starting states, input values,

current output values, operating conditions, data model, current calculations, carrier formulas, and value and variable calculations. The transport policy of the Slovak Republic after the accession of the country to the European Union is linked to the objectives and the length of the European Union's transport policy period. The key documents relating to the transport policy of the Slovak Republic is a material called "Transport Policy of the Slovak Republic" [4]:

- Creating transparent and harmonized conditions for competition in the transport market.
- Ensuring the modernization and development of transport infrastructure.
- Ensuring adequate funding in the transport sector.
- Reducing negative impacts of transport on the environment.
- Improving the quality and development of transport services.
- Increasing transport safety and security.
- Promoting research and development in transport.
- Addressing the effects of transport globalization.
- Continue with activities in the area of possible extension of the performance fee to other roads in state and regional administration, possibly in municipalities, and the possibility of extension for other categories of vehicles
- Installing intelligent transport systems on major highways.
- Ensuring road network development with respect to international commitments.
- To consistently require and control statutory driving times and rest periods for truck drivers, to consistently control legally prescribed truck driving regulations during weekends, holidays and overloading of automobiles.
- Monitoring compliance with regulations for road transport of dangerous goods.
- To create legal conditions and gradually introduce measures for the possibility of effective regulation of individual car traffic by, for example, charging parking and entry into selected areas.
- Introduce new rules for training of applicants for driving license, including the tightening of rules on the testing of professional competence for driving a motor vehicle.

4 Traffic congestion in the cities and suburban areas of the Košice city

The trend in recent decades is urbanization and it is expected that it will continue. Urban expansion is a major problem for urban transport, as it increases the need for individual types of transport which causes the overloading transport, infrastructure and environmental problems. Urban transport is responsible for 40% of CO₂ emissions and 70% of other pollutant emissions. Traffic congestion, which occurs mainly in agglomerations and in their access

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the same time, the graph below shows that the largest percentage representation of transport in the city of Košice

(Figure 3). have vehicles in the group others with a vehicle registration number outside the eastern Slovak region.

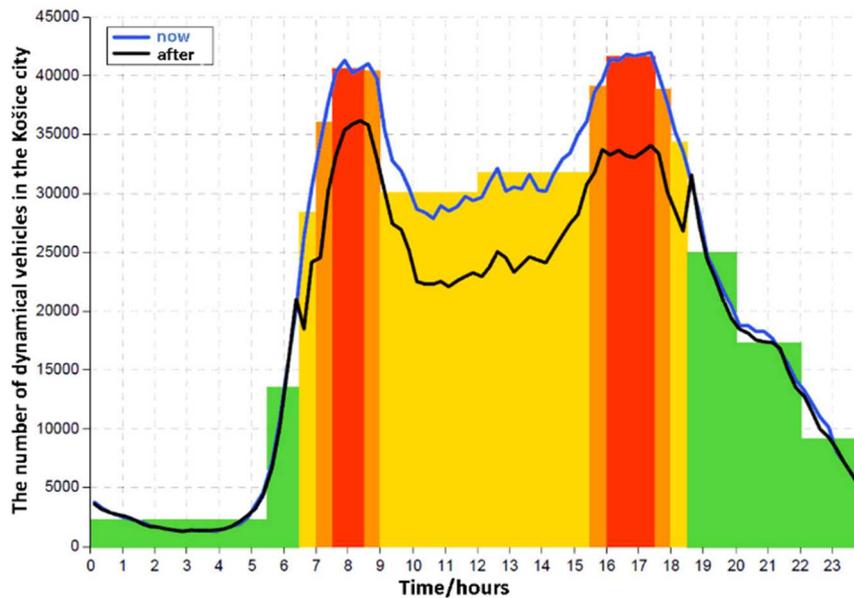


Figure 2 Estimated number of dynamic vehicles in Kosice

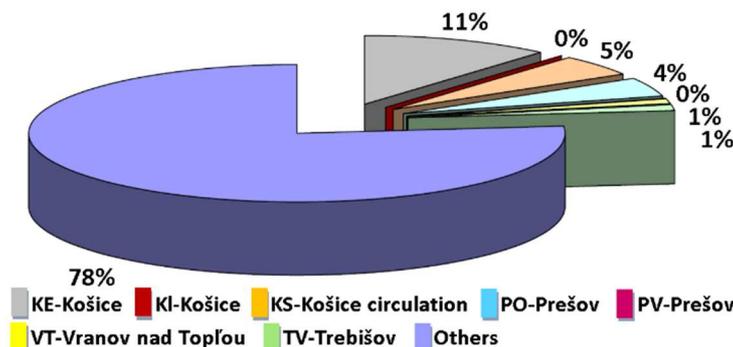


Figure 3 Percentage representation of external transport according to EČV
Source: <http://www.ssc.sk/files/documents/prieskum/kosice.pdf>

6 Analysis of the road network

The road network (Figure 4) hierarchically links to the internationally advanced routes and functionally forms the basis of an intraregional (inter-circuit, inter-district) street network. It is, so-called, basic communication system (ZÁKOS) that is stabilized in a more detailed solution of ÚPD and General of city transport. On the whole-district scale, the basic communication network is created of I. and II. class roads as a road strains ensuring the interregional and inter-district road strains, also international (cross-border) flow with planned sections of speed roads. [8]

The main super-regional road network of speed character (D1, R2, R4) tangles the territory of Košice district from the southern and eastern side in the form of the so-called external traffic circuit. Inner-radial radial-circular network based on internal circuits continues in the radial direction to this traffic bypass (circuit). This is based on the concept of preference of speed higher-quality

standard of city deferment (given by the proposal of ÚPN-HSA Košice and by the supplement of the General Transport Plan) on the D1 highway. Its route is determined by communications: north highway feeder – Prešovská cesta – Južné nábrežie – Nižné Kapustníky – junction with crossing “Červený rak” with a connection to the road I/50 (Moldavská cesta). The given axial transport artery of the city is considered as intermediate step of building ZÁKOS of the city, which is completed by completing the transport hub intersection Prešovská/Sečovská – Južné nábrežie – Palackého street.

In addition to the overhead network investment, the city's basic communication network (ZÁKOS) needs to implement other important transport investment projects:

- Shifting of road II/552 south of the village of Krásna Hornádom and increase the capacity of roads section Slanecká.
- Reconstruction of Štúrova street, Liberators square, Palackého street with grade-separated

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ANALYSIS OF SERVICE LOGISTICS IN THE CITY OF KOŠICE

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Keywords: services, logistics, analysis, region

Abstract: Services, as one of the main means of meeting human needs, were already created in early stages of development of human society. The more advanced society, the higher demands on the quality of their provision. The problem addressed by the article lies in the insufficient resp. uneven distribution of services within a particular region, city Košice. Services are an indispensable part of the everyday existence of man and society itself, therefore they should be provided at least at a standard level. The article deals with the analysis of whether the level of services is at the required level due to the wide range of services provided within the city of Košice.

1 Introduction

Services as one of the main means of meeting human needs emerged early in the development of human society. The more advanced society, the higher demands on the quality of their provision. The problem addressed by the article lies in the insufficient resp. uneven distribution of services within Košice. Services nowadays represent inseparable needs of everyday life because they ensure its everyday existence. This necessity was not always considered as positive, as in the past, the term service was understood as “slavery”.

Since the service sector is very diverse, it is very difficult to define a general definition of this term. There exists quantum of service definitions from different authors who come from defining them from different perspectives. These definitions can be found further described in the book Theory of services [1], [3].

As an example of the most commonly cited service definition can be used the definition whose authors are Armstrong and Kotler, according those [2], [3]:

“Service is any activity or advantage that can be offered by one party to another. It is basically intangible and its result is no property. Service production may or may not be associated with a tangible product.”

Based on this, we will understand the service as a result of the activities and performances provided in the city of Košice, which aims to meet the needs of the residents of the Košice city. Among the basic characteristics of services belongs features such as intangibility, inseparability, variability, inability to store. In addition to these basic characteristics there are also other typical features such as e.g. the inability to own services or indestructibility [1], [3].

Other factors by which the services can be divided are e.g. the criterion whether the services are charged or free of charge or based on what is the aim of the services [1], [3]. Services are divided according to Footem and Hattem into “tertiary, among which we include e.g. restaurants, hairdressers, solarium, etc., quaternary, there belongs shops, transport, etc., quinary, to this group we assign services focused on education, recreation, etc.” [2].

As mentioned, services are inseparable part of everyday life, so they should be provided at least at a standard level. The article deals with the analysis whether the services level is or is not provided at the required level. Divisions, based on the sectoral principle due to the wide spectrum of provided services within the Košice city, were used for the analysis.

2 Analysis of services within the specific region

System of services of the Košice city is created of several subsystems, specifically of subsystem of the services, population, infrastructure, engineering networks and finally territorial-administrative division (Figure 1).

Services as a subsystem consist of a set of elements of the provided services such as e.g. grocery store, hairdresser, etc. This subsystem is influenced by other subsystems, elements of the system. The service subsystem is significantly affected by the infrastructure subsystem, since this subsystem is composed of the elements such as e.g. roads, buildings. It would be impossible to use the services without them. It would be also impossible to use the services without elements such as electricity, water, eventually gas. These elements are a part of the engineering network subsystem.

Another subsystem, which affects the services, is population subsystem. It is created of all the residents of Košice. They represent the set of potential customers. As the last defined subsystem of the services system of Košice is territorial-administrative division. This subsystem consists of the set of city parts such as e.g. Barca, Šaca, Vyšné Opátske, etc.

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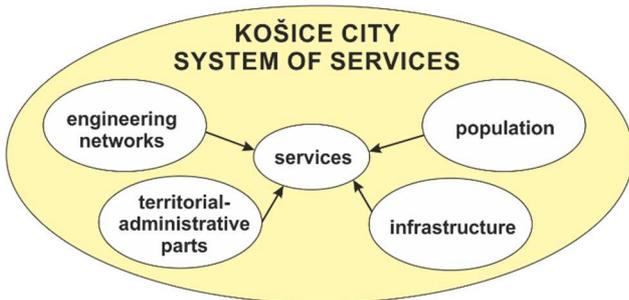


Figure 1 Service system of the city of Košice

63 319 companies that offers services were filed in the statistic register during the realization of current state analysis of the Košice city. Based on this it is possible to conclude that every fourth resident of the Košice city is provider of certain service. For the analysis there were chosen only certain types of the services. The number of chosen economical subjects providing services that are physically situated in Košice is 1138 (Figure 2).

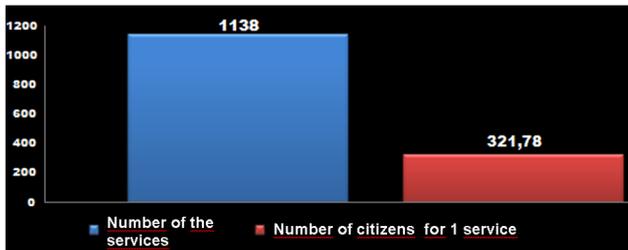


Figure 2 Graph of comparison of the number of services to the number of services per one resident

Košice offers wide spectrum of providing services (Figure 3). Individual estates of the services are relatively evenly delegated in each part of Košice city parts, as well as in the city center itself (Figure 4). Individual estates of the services create clusters not only in the area of the residential zones of the city parts but also in their suburb.

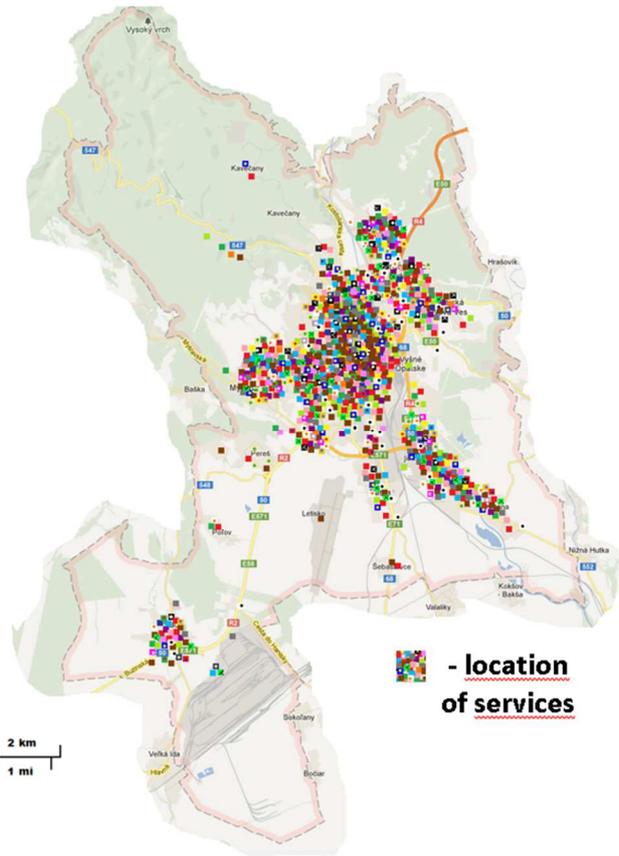


Figure 3 Map of the layout of the provided services in Košice

For better imagination of the representation of individual service estates provided in the Košice city is shown on the picture no.4. Mentioned graph on which it is possible to see ascending arrangement of single service estates resp. from the most numerous the least numerous. To the most numerous services it is possible to assign restaurants, grocery stores or ATMs and to the least numerous services it is possible to assign cinemas, swimming pool or shoes repair, etc.

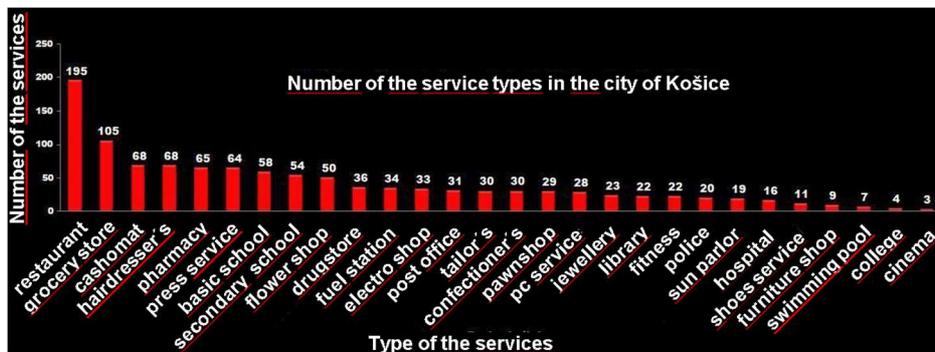


Figure 4 Graph of the number of the service types in the city of Košice

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3 Analysis of the public opinion on service satisfaction within the researched region

Analysis of the public opinion was performed within the region of the Košice city in the form of a questionnaire. Internet was used as a form of communication. The questionnaire was offered to wide sample of respondents, from teenagers through adults to seniors. The questionnaire was oriented to the service problematics within the Košice city and it was offered to 6 797 residents. It is possible to conclude from the results of the survey (Figure 5) that 67,74 of all the responding respondents is satisfied with the level of providing services within the Košice city. There is 29.03% of respondents who are not satisfied with the level of providing services and 3,23% of respondents had not even known whether they are satisfied or not.

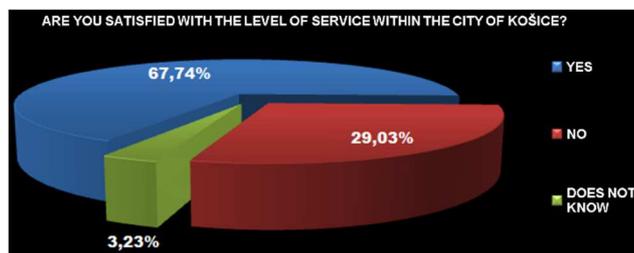


Figure 5 Graph of public opinion oriented to the service problematics within Košice

Another fact is that respondents placed between the most important stores not only the grocery stores, ATMs, drugstores, post offices but also PNS stores, pump stations and bet offices. Next fact shows the will of the respondents to travel certain distance for the quality of services. 71% of respondents is willing to travel for better quality services.

Figure number 6 shows the rating of the level of the providing services within the arrangement and frequency of respondents. 67,74% of respondents assigned average satisfaction with the providing services within the arrangement and frequency. 3.23% of respondents is

highly satisfied and 0% of respondents think that the level of services is insufficient. The number of respondents who have not responded to this question is as big as the number of satisfied respondent and so 3,23%.

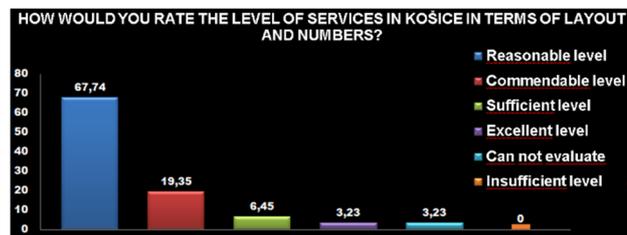


Figure 6 Graph of public opinion oriented to service problematics within Košice

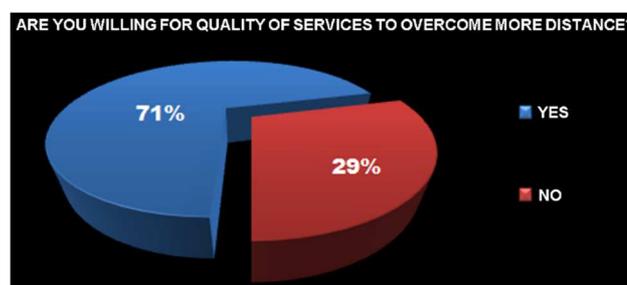


Figure 7 Graph of public opinion no.3 oriented to service problematics within Košice

Figure number 7 shows the fact that 71% of respondents is willing to overcome greater distances for the better quality services and only 29% of respondents is not willing to overcome greater distances for the better quality services.

From the figure number 8 results that to the most frequently used services, that are used by the respondents, belong e.g. grocery stores that are used by the 93,55% of adepts. To the less the most frequently used services belong ATMs. Those are used by 70,97% of respondents. On the other hand, only 3.23% of respondents marked florist's, bet offices and pawn shops as the most frequently used services.

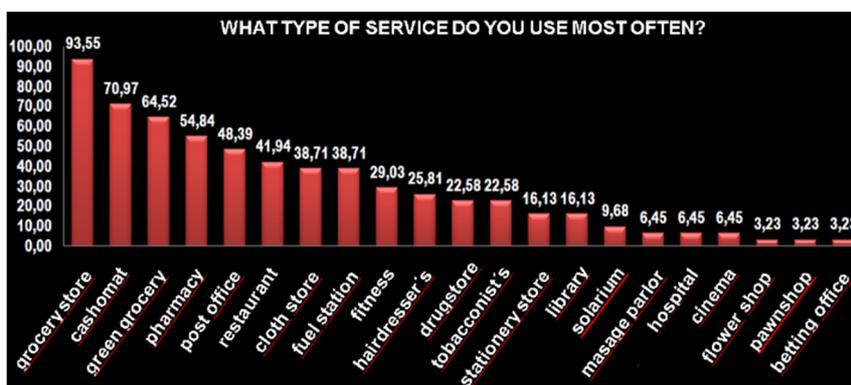


Figure 8 Graph of public opinion no.4 oriented to service problematics within Košice

4 Conclusions

Nowadays, services represent essential need of every human life because they ensure its everyday existence.

Their insufficiency within the certain region negatively shows off within the quality of life.

ANALYSIS OF SERVICE LOGISTICS IN THE CITY OF KOŠICEMaroš Žigala

Since the main problem of ensuring the services lies in the uneven resp. insufficient arrangement of the services within the region Košice. This is the reason why is the bigger part oriented to system analysis of current state of arrangement of given services within Košice. Analysis of public opinion was used in this problematics in the form of questionnaire.

According to the individual analysis resp. their results it is possible to sum up that some of the service estates within the Košice city are arranged more evenly and some are arranged less evenly. To the main deficiencies resulting from the analysis belong allocation of the stores hairdresser, allocation of policlinic, swimming pool and allocation of cinema.

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