

# Interreg



EUROPEAN UNION

## Austria-Czech Republic

European Regional Development Fund



# LOGISTICS AND TRANSPORT

## Logistics of services



UNIVERSITY  
OF APPLIED SCIENCES  
UPPER AUSTRIA



EUROPEAN UNION

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# I. THE CONCEPTION OF SERVICES

## I.1. Services in the European Union:

At present, the principle of services is explained by, for example, American authors Kotler and Armstrong (Vašítková, 2008) as follows: The service is any activity or benefit which can be offered by one party to another party; it is basically **immaterial** (intangible) and the result cannot result in **ownership**. Service production may or may not be associated with a **tangible product**.

**Services** are an indispensable and dynamically developing sector of the economy of all countries, and since the beginnings of European integration, their free provision and freedom of establishment have been among the fundamental principles of the internal market.

The **service sector** accounts for almost 70% of GDP and employment in most Member States, and from this perspective, it can be described as the engine of economic growth.

### Services in general

In the past, the importance of services to the national economy has been greatly underestimated. This approach to services was deeply rooted, coming from Adam Smith, who in 1776 described services as goods of no value.

**Karel Marx**, who divided economic sectors into productive and unproductive, had a similar attitude towards the service sector. This conception was taken over by the centrally planned economy and the result was an underestimation of the entire sector and its lagging behind developments common in advanced economies by several decades.

## 2. THE SPECIFICS OF SERVICES

### 2.1. Services specifics:

**The most important features of services include:**

- immateriality,
- inseparability,
- heterogeneity,
- degradability,
- impossibility of ownership.

**Immateriality is the most typical feature of services and the other characteristics derive from it.**

Pure service cannot be assessed by any physical sense - it cannot be inspected before the purchase and in a few cases only it can be tried. Many of the qualities which are referred to by advertisements during promoting sales of goods and which the customer can verify by sight remain hidden when selling services.

**Inseparability** – The production and consumption of goods can be separated. Swimwear is sewn in the winter, delivered to the wholesale, retail and then purchased by the customer before the summer season. The customer who takes the swimsuit with him to go to the sea with a travel agency gets a service consisting essentially of providing transport to the place, accommodation services and meals. The service is produced in the customer's presence, that is, the customer is involved in the provision of the service, and is therefore an integral part of its production. It is another characteristic feature of the service, its inseparability from its production tools. The service producer and customer must meet in place and time so that the benefit that the customer receives from the service can be implemented. As a rule, the customer does not have to be present for the entire duration of the service - the hotel's food is cooked without his personal presence.

**Heterogeneity** – The variability of services is mainly related to the service quality standard. People, customers and service providers are present in the service delivery process. Their behaviour is not always predictable. In the case of customers, it is even difficult to set certain standards of behaviour. (Nevertheless, for many types of services, these standards are set, for example, rules for the behaviour of public transport passengers). It is not possible to perform output quality checks before delivering the service as is the case with goods. Therefore, it is possible that the way one and the same service is provided varies, even within one company (each hairdresser can offer a different quality of service, and the final result - the quality of the hairstyle - can vary). It may also be the case that one and the same person may provide a different quality of service offered on the same day. A fresh and relaxed lecturer gives a lively and interesting lecture in the morning, while in

the evening he is tired and does not spend too much time explaining difficult subject matters and examples from practice.

The immateriality and heterogeneity of services also make it difficult to **patent** services. Sometimes

franchising may occur, such as the provision of fast food (Kentucky Fried Chickens), hotel services, counselling services, etc. where the way, i.e. process of the service delivery is protected. The heterogeneity of services and the greater participation of people in the service delivery process result in an easier entry to the service market and the presence of more competitors. This is a consequence of the lesser possibility of patent protection of outputs and the lower need for input capital.

**Degradability** - Service immateriality means that services cannot be stored, resold or returned. If a seat in a theatre, a vacancy on a tour, the skills of a marketing consultant or knowledge of a language lecturer are not used, that is, sold at the time when they are offered, they cannot be stored and sold later. For that moment they are lost, destroyed.

**Impossibility of ownership** - The impossibility to own a service is related to its immateriality and destructibility. When purchasing goods, the customer is entitled to own the goods. During the provision of a service, the customer does not receive any ownership in exchange for his money. He only buys the right to be provided a service, such as the time of a private doctor along with the time-limited use of their equipment, or the right to use public transport, or to park in a designated place. In the case of public services, the right to use the services produced by the state is offered to the customer in exchange for paid taxes or social and health insurance.

**Functional differences are based on service characteristics and give reasons for the distinctive different service factors:**

- services cannot be stored,
- if there are distribution channels, they are short,
- there is no patent protection,
- there is no mass production in the service sector, so it is difficult to standardize them,
- services cannot be packed,
- samples cannot be provided,
- in view of the intangible nature of services, it is difficult to make use of economic theory of supply, demand and cost in the field of services,
- the sector of services offers only limited concentration possibilities,
- monetary value is also expressed in terms other than prices (quality, willingness, guarantee),
- in the case of services, symbolism results from their provision rather than from ownership.

# 3. CLASSIFICATION OF SERVICES

## 3.1. Services classification

The simplest way of defining the term services is represented by the exclusion method - "services are that part of the economy that remains after deduction of agriculture, production and mining".

### Economic activity:

- **Primary sector** - primary production
- **Secondary sector** - manufacturing industry
- **Tertiary sector** - services
  - **Branches division**
  - **Division according to expediency criterion** → market, non-market
  - **Division according to recipient** → services for consumers, services for organizations

## 3.2. Market and non-market services:

This breakdown (categorization) distinguishes services that can be exchanged on the market for money and services, which, by virtue of a certain social and economic environment, represent **advantages that need to be distributed through non-market mechanisms. These include public services, i.e. services produced by the public administration or non-profit organizations.** No fees are charged for these services, or users of these services pay prices that are subsidized from public sources (state budget, municipal and regional budget). The important feature of public services is the inability to exclude persons or groups of persons from the possibility of using the service, and their consumption is indivisible. At the national level, indivisible services include state administration, security, defence, judicial services, etc.

- Management consulting services,
- Advertisement,
- Sales representative services,
- Legal or tax advice,
- Real estate services, such as real estate agencies,
- Construction, including services of architects,
- Organization of trade fairs,
- Car rental,
- Travel agencies,

- Amusement parks,
- and others.

As for other services, the EU has not liberalized the services market yet. These include mainly national provided (non-liberalized) services, as follows:

- Childcare, social housing or services for families,
- Financial services,
- Electronic communications services and networks,
- Services in the field of transport,
- Health services,
- Audio-visual services,
- Gambling,
- Social Services, and others.

The amount of some services is not changed by their consumption, but their quality decreases as the number of consumers increases. In this case, there is a phenomenon called congestion and then some types of charges are introduced to limit this congestion. Examples include highway tolls, museum and gallery entry fees, as well as drug charges



# 4. THE CLASSIFICATION OF LOGISTICS PROCESSES

## 4.I. Logistics processes

The flow of material, information, finance, planning, and management is never considered independently; these are **logistics processes**. These concurrent logistics processes have to meet and promote each other at exactly given specific points in order to act synergistically and lead to the most effective achievement of the enterprises' business goals.

**Relevant logistics processes include:**

- **Purchase**
- **Stocks (inventory)**

We recognize the functions of each type of stocks (inventory) that affect inventory management:

- Disconnecting inventory,
- Inventory on the logistics route,
- Technological inventory,
- Strategic inventory,
- Speculation inventory,

Stocks (inventory) are further divided into **usable and unusable**.

- **Storage**
- **Transport**

## 4.2. Purchase

Purchasing was previously seen as a support function. This also resulted in responsibility for the fulfilling production functions. But the duty was no longer to examine whether the purchasing needs were justified or to build long-term relationships with suppliers. They focused on a narrow range of activities according to marketing requirements and operating units that needed to procure something from outside sources. Purchasing played a key role in ensuring the smooth running of production and other operations, but the lowest total costs were not achieved. Purchasing processes are still evolving, with businesses spending more on external purchases, while resources on labour are reducing.

**Purchasing logistics provides the following activities:**

- determining contracting needs
- order and delivery tracking
- monitoring material flows from supplier to destination
- goods receipt
- packaging material circulation
- material storage

## 4.3. Stocks (inventory)

Stocks are a **significant financial item** in any company. The issue of correct stock decisions is one of the riskiest areas of logistics. Stocks have both positive and negative value for the company. Stocks address timing, space, capacity, and product mismatches between production and consumption, ensuring the smoothness of the production process and covering unpredictable fluctuations. The negative value is that they weigh capital, consume labour and resources, and carry the risk of depreciation, uselessness, and unsalability.

**Establishing the necessary level** of stocks in the right quantity, quality and structure is a key prerequisite for the smooth running of the business. The ideal situation would be if the purchased inventory was used directly for production. Unfortunately, this is unrealistic in a normal business. It is generally believed that stocks tend to grow. The reason is the expansion of the product range because each type of product requires its own stock of material. This problem could be solved if production allowed material standardization.

## 4.4. Storage

Storage is an integral part of any logistics system that serves as a link between supplier, manufacturer and customer. Storage ensures product storage at all stages of logistics. Mostly, the company needs to store raw materials, components, finished products, goods in production, and stocks of materials for disposal and recycling.

The storage functions include balancing, security, completion, speculation and refinement.

## 4.5. Transport (shipping)

Transport (shipping) provides the physical relocation of products from where they are produced to where they are needed. This move in space adds value to the product. It also affects the speed and reliability with which the move takes place. Therefore, timely and quality delivery increases added value for both customer and customer service. The costs of shipping are one of the largest in logistics and often contribute significantly to the price of the product. The impact of shipping on customer service is one of the most important. Transport service must be reliable, an important part is played by transport time and market coverage.

**According to the type of transport route and means of transport it is divided into:**

- road transport
- rail transport
- air transport
- water transport (inland and maritime)
- multimodal (combined) transport
- unconventional (belt and pipeline) transport

# 5. SERVICES IN THE INTERNAL MARKET

Building the European Union's internal market is a long-time process that began in 1951 with signing the Treaties of Rome and is also reflected in documents, namely the White Paper on Completing the Internal Market (COM, 1985), the Cecchini report (Cecchini, 1988), a Single European Act (1986), and others.

## Directive on Services in the Internal Market (2006/123/EC).

The aim of the Directive is to achieve the **easy providing services between Member States** by establishing a general legal framework for the given services, while the way to achieve this is left to each member state. The presumption of a successful liberalization of services in the EU is seen in the **freedom of settling and the free movement of services**, which are related to the activities open to free competition.

## 5.1. Basic terms according to the Directive:

### Service

- performances provided for remuneration (for a fee), unless they are governed by the provisions on the free movement of goods, capital and persons.

### Services of General Interest:

- The term "service of general interest" covers both market and non-market services classified by public authorities as **services of general interest subject to specific public service obligations**. Thus, the term concerns a wide range of activities of general interest, both **economic and non-economic**.

### Services of general interest of economic nature

- services with a certain public interest and are provided for remuneration (e.g. postal services, electricity supply, telecommunications, etc.).

## 5.2. Services subject to the Directive

- Management consulting services,
- Certification and testing,
- Advertisement,
- Sales representative services,
- Legal or tax advice,
- Real estate services, such as real estate agencies,
- Construction, including services of architects,
- Organization of trade fairs,
- Car rental,
- Travel agencies,
- Amusement parks,
- and others.

## 5.3. Services not subject to the Directive

- Services of general interest of non-economic nature,
- Childcare, social housing or services for families,
- Financial services,
- Electronic communications services and networks,
- Services in the field of transport,
- Health services,
- Audio-visual services,
- Gambling,
- Social Services,
- Private security services,
- Services provided by notaries and bailiffs appointed by an official act of the Government,
- Tax services, and others.

## 5.4. Free movement of services

EU Member States are obliged to respect the right of providers to provide services in a Member State other than the one in which they are established. In addition, Member States must ensure free access to the service activities and the free operation of such activity in their territory.

### Service Provider

This is a natural person who is a national of a Member State or a legal person established in a Member State or offering or providing a service.

## 5.5. Single points of contact

Establishing single points of contact is one of the requirements determined by the **Directive on Services in the Internal Market 2006/123/EC**, which aims to contribute to the simplification of business conditions in the countries of the European Union.

**A single point of contact (SPC)** represents a place where an entrepreneur entering the market with services of a given state can handle all the procedures and formalities required by this state. **SPC** helps service providers to get easy access to the markets of other Member States by the possibility to be able to complete all the procedures and formalities needed to access their activities in the field of services providing.

# 6. POSTAL AND TELECOMMUNICATION SERVICES

## 6.1. Act No. 29/2000 Coll., On postal services

In the Czech Republic, this Act regulates, in accordance with European Community laws, the conditions for the provision and operation of postal services, the rights and obligations arising from the provision and operation of postal services as well as the special rights and special obligations of those postal operators who are required to provide basic services.

The postal service is an activity performed on the basis of a postal contract and under the conditions stipulated by this Act, the purpose of which is to deliver a postal item or the specific amount of money.

### Basic terms:

- postal item is a thing that has been taken by the operator as a single entity to provide postal services,
- postal voucher is a postal service, the purpose of which is to deliver a specific amount of money,
- operator is the person providing the postal services,
- consignor is the person who is identified as a consignor on a postal item or in a postal voucher; if the consignor is not identified, he is represented by the person who concluded the postal contract,
- addressee is the person who is identified by the sender on the postal item or the postal voucher as being the addressee,
- recipient (consignee) is the addressee or another person whom, according to the postal contract, should or may be issued a postal item or paid a specific amount of money.

### Terms and conditions for the postal services operation:

- The condition for the operation of postal services is to get a trade license under Act No. 455/1991 Coll., On Trades Licensing, as amended.
- The condition for the postal service operation, the purpose of which is to deliver a document, is furthermore a postal license or a special postal license under this Act.

## State administration in the field of postal services:

The **Czech Telecommunications Office** performs a state administration in the field of electronic communications and postal services, including market regulation and setting conditions for doing business. The Office also ensures the protection of certain services in the field of television broadcasting and information society services.

## 6.2. Telecommunication services

Telecommunication service can be understood as a service for the **transmission of information by telecommunication networks for payment** to third parties.

### Telephone services:

- **Division 1:**
  - Standard telephone services (caller-paid)
  - Telephone services paid by the called
  
- **Division 2:**
  - **Shared-cost telephone services**  
Blue line 844, White line 840/841.
  - **Telephone services with a special tariff**  
Yellow line 900, Rainbow line 906, Line 909.

### Broadband internet access in the Czech Republic

### Data transmission services



# 7. EDUCATIONAL SERVICES

## 7.1. Interpretation

Every citizen has the right to education. School attendance is mandatory for the time period stipulated by the act.

Citizens have the right to free education at elementary and secondary schools, according to the capabilities of the citizen and the possibilities of the society at universities as well.

### Education and Training 2010

In 2002, the work program Education and Training 2010 was launched to create, in the years 2002 – 2010, the world's most advanced knowledge-based economy from the EU. This program sets out three main strategic goals:

- improving the quality and efficiency of education and training systems in the EU
- ensuring access to education and training for all
- opening up education and training systems to the outside world

### Lifelong Learning Program 2007 – 2013

The program has four main fields:

- **Comenius,**
- **Erasmus,**
- **Leonardo da Vinci,**
- **Grundtvig.**

## 7.2. Management and organization

The educational system of the Czech Republic has two degrees and is divided according to the level and nature of the provided education and services related to education to:

- **schools** that carry out education under the Framework Educational Programs, they provide a socially recognized level of education,
- **school facilities** that complement or support school education, they do not provide a degree of education.

School founders can be various entities - **the ministry, the region, municipalities, churches and religious communities, or private entities**. If the founder is a municipality, region or ministry, the schools operate as contributory organizations or school legal entities, they have legal personality, but they manage the property of the founder.

### 7.3. Economy

Educational resort, i.e. schools and school facilities, is **one of the most financially demanding areas but the effectiveness of the money spent here is hardly measurable**. The Ministry of Education, Youth and Sports provides funding for individual school sections from Chapter 333 of the State Budget. The greatest volume of this chapter funds is directed to the area of regional education, where the basis of future education is actually created, and the second most important item is expenditure on subsidies for higher education.

In the field of education, the public and private sectors are closely interconnected, inter-related and economically linked. Thus, education is becoming a product of a mixed economy and, in this area, it is currently possible to meet practically all the basic types of goods:

- purely public
- mixed
- private

### 7.4. Legislation:

**In the Czech Republic, the field of education is treated in the following legislations:**

- Act No. 561/2004 Coll., On pre-school, elementary, secondary, higher and other education (Education Act),
- Act No. 562/2004 Coll., Amending certain acts related to the adoption of the Education Act,
- Act No. 563/2004 Coll., On Teaching Staff,
- Act No. 306/1999 Coll., On granting subsidies to private schools, pre-schools and school facilities,
- Act No. 109/2002 Coll., On the performance of institutional education or protective education in school facilities and on preventive educational care.
- Act No. 111/1998 Coll., On universities.

# 8.CULTURAL SERVICES

## 8.1. Cultural services:

**Public cultural services** are services consisting in making the artistic creation and cultural heritage available to the public and in the acquisition, processing, protection, preservation and disclosure of information that serves the cultural, cultural-upbringing or cultural-educational needs to the public.

Three experimental programs were created by the European Commission for cultural cooperation between Member States:

- Kaleidoscope,
- Raphael,
- Ariane.

**The main objectives of European cultural cooperation policy are:**

- to contribute to the flowering of culture in the Member States, while respecting their national and regional differences,
- to share, preserve and protect the common cultural heritage,
- to promote non-commercial cultural exchanges,
- to encourage contemporary cultural production,
- to foster cooperation between Member States and with third world countries and international organizations.

## 8.2. Cultural policy instruments:

- Legislative,
- Economic,
- Institutional,
- Managing,
- Methodical.

**Legislative** - The state public service in the field of culture must be defined in the legal order, the rights and obligations of the state in the provision of cultural service as a public benefit service must be defined,

**Economic** – state economic support for culture is implemented:

- indirectly - by tax relief, by supporting the economic self-sufficiency of non-profit entities,
- directly - by subsidies from the state budget, it is desirable to strengthen the funding of cultural activities from funds and to provide funds for subsidies from public budgets,

**Institutional** - the system of state cultural institutions is an important source of information in the cultural heritage care system,

**Managing** - a consistent attitude of public authorities as a prerequisite for maintaining equal access to cultural wealth for citizens,

**Methodical** - to motivate the behaviour of entities independent of the state administration (regions, municipalities, churches and religious societies, non-profit organizations) by methodical action

## 8.3. Management and organization

### State administration

- State administration at the central level is carried out by the **Ministry of Culture of the Czech Republic**, which includes the following fields:
  - art,
  - cultural and educational activities and monuments,
  - churches and religious societies,
  - printing,
  - implementing the Copyright Act,
  - and other.

### Self-government

The funds of territorial budgets mainly finance public cultural services - the operation of theatres, libraries, museums and galleries and cinemas. Territorial budgets thus focus mainly on presenting art among citizens. The creation and publication of literary, visual and audio-visual works and the field of research and development in the field of culture are not funded from the territorial budgets almost at all. These areas are in particular financed from the support of the state budget.

## Private-legal sector

The establishment of cultural and artistic civic associations. This new professional organizations were created, replacing the existing creative associations, where mandatory membership was a condition for the inclusion of artists in the professional sphere. Brand new professional organizations or organizations that, with their renewed activity, built on their pre-war continuity came into existence. On the market principle and virtually with no support, a number of art galleries or small, essentially non-commercial music publishers have also been established.

## 9. HEALTH SERVICES

In the Czech Republic, health services are regulated by **Act No. 372/2011 Coll. On health services** and the conditions for their providing.

### 9.1. Health services are understood as:

- providing the health care by healthcare professionals,
- consultation services to assess the individual treatment process,
- handling the deceased's body, including transferring the deceased's body to a pathological-anatomical autopsy,
- medical rescue service,
- medical transport service,
- transportation of emergency care patients.

### 9.2. Health care is understood as:

- a set of activities and measures carried out for natural persons for the purpose of
- prevention, detection and elimination of illness, defect or medical condition,
- maintaining, restoring or improving health and functional status,
- sustaining and prolonging life and alleviating suffering,
- help with reproduction and childbirth,
- health assessment

prevention, diagnosis, treatment, medical rehabilitation, nursing or other health care performed by healthcare professionals.

## 9.3. Health care provision:

The Provider may only provide the health services listed in the Health Service Authorization.

### **Without health services authorization it is possible to provide:**

- Professional first aid,
- health services in social service facilities under the Social Services Act,
- to ensure the transport of a person whose state of health requires it from abroad to the Czech Republic or from the Czech Republic abroad by a person authorized to do so under the legislation of another state from whose territory the transfer takes place and if that is a temporary activity in the territory of the Czech Republic.
  
- Health services may only be provided by persons qualified to practice the health profession or to perform activities related to the provision of health services.

# 10. QUALITY OF SERVICES

## 10.1. Customer service:

Customer service is defined as a **measure of how well the logistics system works in terms of generating the utility values through time and space with a focus on external customers.**

In order to fulfil the set quality and scope of services, special units are created in companies, and their task is in particular:

- obtaining information
- introducing information into the system
- communication with customers.

### **Creation of customer service:**

The long-term survival of the company is based on competitiveness. This can be achieved by creating a strategy that applies to all internal and external business processes. In practice, different ways of approaching this area can be found. Some of the strategies go beyond the national framework and are applied internationally.

### **Customer service components:**

Customer service components are divided into **3 basic groups:**

- Pre-sale,
- Sale,
- After-sale.

### **Customer services**

Services are an essential factor in developing a strategic concept of supply system management. Their conception and closer specification can be included in four areas:

- The philosophy of business organizations representing their identification with customer requirements,
- A means of increasing the utility value of goods for the customer as a source of added value and a significant competitive factor for the supply system.
- A set of activities that need to be planned and whose implementation needs to be managed and for which an organizational framework needs to be set up in the system and powers to implement them need to be delegated.
- A set of indicators needed to quantify logistics performance in the supply system.



## 10.2. Quality

**Quality** is an essential determinant that distinguishes objects or phenomena from other objects or phenomena, expressing the sum of properties (attributes) that cannot be separated from the object or phenomenon.

**The quality of goods or services**, as this term is used for market-based business relations, is a far narrower term than quality. It is, to a certain extent, the absolute term, inherent in a given good or service. It expresses the status of the goods or service concerned and not its relationship with other goods or services. This status indicates whether the value of the good or service complies with:

- binding terms and conditions required by the company to express them in binding regulations, measures or obligations generally imposed on all suppliers of similar goods or services, or in particular the relevant supplier (general and individual obligations),
- terms and conditions that have been expressed as contractual obligations between the supplier or product provider and the customer,
- terms and conditions that are generally recognized and considered customary in a conscientious supplier of goods or service providers (Code of Conduct).

Quality in this concept is linked to market relations and accompanies the acts of sale-purchase of goods and services. They are also mostly enforceable commitments, and the recovery of these commitments is more or less complex, time-consuming and costly.

# II. THE QUALITY OF TRANSPORT AND LOGISTICS SERVICES

## II.1. Provided services quality:

**The quality extent of each process**, even transportation of goods by road freight transport or transportation of passengers by public passenger transport, is a sum of its features (attributes), which are demonstrated by its functionality in real time. These features include **reliability, accuracy, flexibility, safety, minimization of environmental impact and others**.

**Demand for transportation is a demand derived from demand for products, substrates, products of general and specific consumption.**

- **Factors influencing the quality of transportation process** can be divided into two groups:
  - **Subjective factors** - they can be influenced (affected),
  - **Objective factors** - they cannot be influenced.

## II.2. Services quality evaluation methods:

The person authorized to evaluate the carrier or forwarder in terms of an extent to which he fulfils or fails to meet his own requirements for the quality of consignment carriage (transportation). Emphasis is placed especially on compliance with the agreed delivery time, not damaging the consignment and its packaging.

**Evaluation methods** can be developed (processed) by the organization itself, it can be completely taken over, or taken methods can be modified to their own conditions.

**General procedure to implement the measurement and evaluation of transportation quality:**

- Defining the quality characters
- Allocation of points, or point span to individual quality characters
- Determining the weight of importance of quality characters
- Ideal scoring of quality characters
- Specifying the ideal score of quality characters
- Determining the ideal value of transportation quality
- Scoring the quality characteristics of particular transportation in terms of their

- Determining the actual score of quality characters for particular transportation
- Determining the transportation quality value
- Comparing the ideal value of transportation quality and the quality of particular transportation
- Conclusions
- Graphical representation of quality values of realized transportations

### **A. Methods of determining the weighting criteria:**

First of all, most methods of the multi-criteria evaluation of variants require to specify the weightings of individual evaluation criteria that express the importance of these criteria.

#### **These methods include:**

- the Pairwise comparison method
- 100-point allocation method
- the Method of determining the preferential order of the criteria
- Saaty's method
- the Progressive weighting method
- other methods (especially multi-criteria analysis methods)

### **B. Methods of comprehensive evaluation of services quality (transportation):**

Comprehensive quality evaluation, alternatives evaluation, and alternatives ranking represent the final and main phase of the solution (decision-making).

#### **These methods include:**

- Indexing methods,
- Method of complex utility function,
- Methods of determining the value (utility) of alternatives,
- other methods (multi-criteria analysis methods - AHP, WSA, PRIAM, TOPSIS, ELECTRE).

# 12. THE EFFICIENCY OF LOGISTICS SERVICES

## 12.1. Evaluation of logistics variables:

Application of logistics integrated supply chains to achieve defined logistics goals means necessarily **to evaluate their logistics variables**.

**Learning the values of logistics indicators is used:**

- for assessing the capabilities and their comparing with customer requirements and capabilities of competitors,
- for **identifying the problem processes**, their bearers and **causes**,
- for **identifying threats and opportunities** for improvement,
- for **determining logistics goals** and measuring the achieved improvement.

## 12.2. Basic characteristics of logistics indicators, requirements for a set of logistics indicators

**Basic characteristics of logistics indicators:**

- Representing the material and information flow properties and associated logistics processes,
- Interconnecting to enterprise logistics goals,
- Simplicity and clarity,
- Enable to compare,
- Ensuring connections in the logistics chain,
- Ensuring connections to a specific variant of requirement and a specific customer or market segment.

## 12.3. Structure of logistics system - effectiveness of logistics services:

When fulfilling the logistics goals, an effective **overcoming of space and time is being monitored (tracked) to ensure the satisfaction of customer requirements for goods and services** (logistics efficiency - effectiveness of the logistics services).

**Logistics efficiency (effectiveness) consists of two components:**

- Logistics **performances**,
- Logistics **costs**.

**The set of logistics indicators** includes the following groups of indicators:

- Level of logistics (quality) services,
- Logistics productivity,
- Logistics costs,
- Structure of the logistics system,
- Potential of logistics.

**Logistics productivity** is actually the **permeability of the logistics system** per unit of time and per unit of spent (consumed) resources.

## 12.4. Matrix model for the logistics services effectiveness evaluation:

A comprehensive approach (procedure) to evaluate the effectiveness of a logistics system (services) using logistics indicators is expressed by the **Matrix model**.

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