

## QUALITY OF TRANSPORT SERVICE PROVISION, LOGISTICS OF DELIVERY TRANSPORT SERVICES DURING A PANDEMIC

Darina MATISKOVÁ<sup>1</sup>, Michal BALOG<sup>2</sup>, Kateryna KOVBASIUK<sup>3</sup>

<sup>1</sup>Technical University of Košice, Faculty of Manufacturing Technologies with a seat in Prešov, Prešov, Slovakia, EU, [darina.matiskova@tuke.sk](mailto:darina.matiskova@tuke.sk), [michal.balog@tuke.sk](mailto:michal.balog@tuke.sk), [kateryna.kovbasiuk@tuke.sk](mailto:kateryna.kovbasiuk@tuke.sk)

<https://doi.org/10.37904/clc.2022.4571>

### Abstract

The paper deals with the quality and logistics of transport services provided during a two-year pandemic period. It sets out key evaluation indicators when choosing delivery transport services. Part of the paper deals with theories about the logical evaluation of criteria for transport services due to the occurrence of many negative phenomena caused by the global pandemic situation, which is still receiving relatively much attention. This issue is analyzed in several ways in the paper and illustrated on the model situation of a particular delivery service company. The method of outsourcing is used in the paper.

**Keywords:** Transport, services, logistics, pandemic, outsourcing

### INTRODUCTION

The diversity of resource flows in the delivery transport services in conditions of constant enhancement of information flow, complexity of accounting and financial transactions, complexity of logistics channels for service flow and development of universal quality management concept requires development of unified systematic approach to manage flow processes and logistics functions in the company.

Over the centuries, the whole world has had to deal with many catastrophes that have not only significantly affected human health, but also had a devastating impact on countries' economies. There were natural disasters, epidemics, chemical explosions and the latest one was COVID-19 pandemic. The year 2022 is again marked by the war in Ukraine. We have been fighting the COVID-19 pandemic for two years now, which is and will be here, as scientists are discovering more and more viruses related to this pandemic. According to research, the COVID-19 pandemic, which began in the Chinese city of WU-chan, is one of the largest global health epidemics that humanity is still facing. (Deloitte et al. 2020)[11]

In order to stop the pandemic, various countries have taken measures such as business closures, travel bans between countries, hard lockdowns, curfews, etc. [1,3] This situation has affected the lives and lifestyles of many people: new work habits, working from home, distance learning in all types of schools, job losses, etc. In this life situation, a lot of people used delivery services to buy goods, and not only food, but also various other kinds of goods were delivered to all of us.

The aim of this paper is to analyse flexibility, agility and also the sustainability of the delivery services provided in the period before and during the COVID-19 pandemic. One of the issues can be variable agility, which mediates the relationship between flexibility and the ability to respond on time during the COVID-19 pandemic, from the perspective of dynamic capability and contingency theory.

### 1. METHODOLOGY SUITABLE FOR SOLVING THE GIVEN ISSUE

To address the aforementioned issue of providing delivery services, a number of methods that could be applied to such an analysis were found based on the literature [7-10]. As an example, there are included the key

performance indicator method, the logistics performance evaluation method, etc. For the selected methodology of logistic evaluation of the choice of service provider in transport, the concept of evaluating functional performance in the transportation process can be used. This therefore means selecting a suitable delivery transport service provider so that the delivery service meets the consumer's expectations [1,5,6]. However, the aim is to assess the quality and logistics of the delivery services provided at a time when people were using it the most, i.e., at the time of the COVID-19 pandemic.

## **2. CRITERIA FOR EVALUATING THE SELECTION OF DELIVERY TRANSPORT SERVICE PROVIDERS**

The criteria for evaluation and selection of delivery service providers or suppliers of material resources depend mainly on the requirements of consumers of the logistics system and may differ from each other. There are usually three or four of them, in some cases there may be more. Regardless of the specifics of the industry, the size of the company and the characteristics of production, the most important criteria in the evaluation and selection process according to the requirements of procurement logistics are the following:[6],[3]

- 1) Reliability of delivery.
- 2) Quality of delivered products.
- 3) Price and speed of order delivery.
- 4) Distance of the material flow generator from the consumer logistics system.
- 5) Deadlines for execution of current and emergency orders.
- 6) Ability to ensure regular supply of spare parts throughout the life of the equipment supplied.
- 7) Psychological climate in the contractor's workforce.
- 8) Organization of product quality management at the supplier.
- 9) Creditworthiness and financial situation of the supplier.
- 10) Product design and packaging
- 11) Availability of reserve capacities at the source of supply.

Another set of criteria has been proposed by Michael R. Linders and Harold E. Fearon and is used by most foreign manufacturing companies in the pre-selection of material suppliers. These criteria are arranged in order of priority:

- 1) The quality of the service or product provided.
- 2) Price - this is a comparison of the actual price with the required or minimum price different from other providers or suppliers.
- 3) Quality of technical assistance and service.
- 4) Repeated suggestions for product or service development to reduce price.
- 5) Technical, engineering and manufacturing capabilities.
- 6) Evaluation of distribution opportunities.
- 7) Detailed assessment of finance and management.
- 8) Timely delivery of products that have a short warranty period.

Therefore, if we generalize these criteria by logical reasoning, we can identify the main criteria on the basis of which we can assess the quality of services provided in the field of delivery services at DHL in Slovakia.

## **3. QUALITY ASSESSMENT OF DELIVERY TRANSPORT SERVICES PROVIDED**

DHL was one of the first companies to provide international express delivery transport services in the former Czechoslovakia in 1986, through the partner company Čechofracht, which changed in 1993, when a new legal

entity was established and DHL began operating under its own brand. Two years later, the company opened its own delivery center at the Bratislava Airport and 5 years later launched an air connection between Bratislava and Vienna.[3,4] Thanks to the strategic integration of leading freight forwarder Danzas and logistics chain specialist Exel, DHL's portfolio of services within Slovakia has expanded significantly and the company has grown from an express specialist to a company that today offers a comprehensive portfolio of logistics and transport services through five specialized divisions – from road, rail, sea and air freight, to warehousing and supply chain management.

**Figure 1** shows the number of DHL employees in Slovakia.



**Figure 1** DHL delivery company in Slovakia, number of employees

Based on the short history of the DHL company in Slovakia, we will proceed to the analysis of the company, for which we used the SWOT analysis, i.e. the analysis of strengths, weaknesses, opportunities and threats.

The individual items of the SWOT analysis are evaluated on the basis of attractiveness to the enterprise and likelihood of success. As well as strengths and weaknesses, opportunities and threats have been rated on a scale of 1 to 5.

**Table 1** Strengths

Strengths	Performance	Importance	Rate
Globalisation	5	0.14	0,7
First-mover advantage	5	0.16	0,8
Product range	5	0.14	0,7
Trademark and patents	4	0.11	0,44
Customer confidence	5	0.15	0,75
Worldwide service	4	0.15	0,6
Quality certificate	4	0.15	0,6
<b>TOTAL</b>		1	4,59

**Table 2** Weaknesses

Weaknesses	Performance	Importance	Rate
Limited number of employees	5	0,24	1,2
Inefficient use of capacity	4	0,26	1,04
Relatively high distribution costs	3	0,27	0,81
Insufficient marketing communication	3	0,23	0,69
<b>TOTAL</b>		1	3,75

**Table 3 Opportunities**

Opportunities	Performance	Importance	Rate
Entering new global markets	5	0,7	3,5
Weak competition and the acquisition of new customers	5	0,6	3
Motivating employees at a high level	5	0,6	3
Favorable distribution prices	4	0,8	3,2
The right investment	4	0,6	2,4
<b>TOTAL</b>		-	15,1

**Table 4 Threats (Threats are assessed on the basis of severity and likelihood of occurrence)**

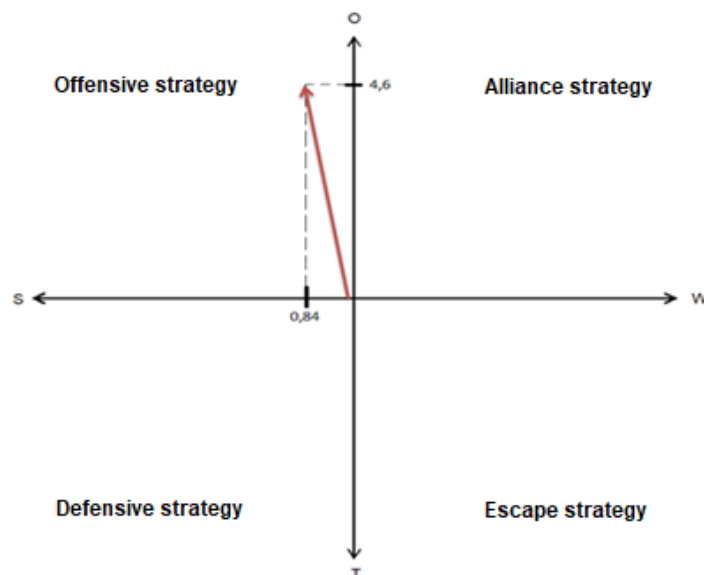
Threats	Performance	Importance	Rate
Cyber attacks in the supply chain	4	0,5	2
Climate change	3	0,5	1,5
Cargo congestion	4	0,4	1,6
High fuel prices	3	0,6	1,8
Cargo theft	3	0,4	1,2
Small local courier companies	4	0,6	2,4
<b>TOTAL</b>		-	10,5

Resources in tables: tables are authors' own work.

Based on the evaluation of the strengths, weaknesses, opportunities and threats of the company, the resulting SWOT analysis was graphically depicted.

$$\Sigma S - \Sigma W = 4,59 - 3,75 = + 0,84$$

$$\Sigma O - \Sigma T = 15,1 - 10,5 = + 4,6$$


**Figure 2** Graphic representation of DHL's strategic market positions

The graphical representation of the SWOT analysis shows that the distribution company is very well positioned in the market and is in an offensive strategic position.

The quality of services is also related to the quality of transportation, and this term means a measure of the quality of transportation performance, which measures the ability of a means of transport or logistics system to ensure certain quality parameters on a given route during transportation performance. [11]

- Factors of a traffic-organizational nature – factors that can be significantly affected only by traffic (safety, reliability, speed, offer of travel opportunities, average occupancy, means of transport).
- Factors of hygienic-transport nature - factors perceived by the passenger as travel comfort, which include the effects of the design, the healthiness of the environment, physical and psychological influences (microclimate – air temperature, air humidity, air flow, dustiness, the presence of toxic impurities, radiation from the surrounding walls; space in the means of transport, lighting, quality of driving, noise, fatigue time).[10]
- Factors of a transport-operational nature – include additional services that are affected by the transport operation.

#### 4. COMPARISON OF PROFITS OF TWO COURIER COMPANIES OPERATING IN SLOVAKIA

From the known statistical data, data on the profits of two courier companies operating in Slovakia and abroad were compared, namely:

- **DHL Express (Slovakia), Ltd.** – a large logistics company that specializes in international delivery, courier and postal services, package delivery and express mail service. Globally, it has over 400,000 employees and operates in 220 countries. DHL invests structurally in researching trends and developing solutions. It also invests in green solutions. It wants to reduce all logistics-related emissions to zero by 2050. In 2020, DHL Express (Slovakia) increased its profit by 66% to € 1.629 million and its sales increased by 11% to € 73.49 million. Statistics for 2021 are not yet available. [14]
- **Direct Parcel Distribution SK, Ltd.** – The company is better known as DPD and is a member of the DPD group. It focuses on parcel transportation in Slovakia and worldwide. It has a European network with more than 900 branches. It has products and solutions for e-shops (e.g. DPD Home), which help to make e-commerce more attractive and simplify the transportation of parcels. It can integrate shipping services into the e-shop software and ensure an efficient workflow from order to delivery. In January 2020, DPD took over the parcel companies Geis Parcel in Slovakia and the Czech Republic. In 2020, it increased its profit in Slovakia by 57% to €2.695m and grew revenue by 58% to €49.43m. Statistical figures for 2021 are not yet available [14].

#### CONCLUSION

The desire of every organisation is to differentiate itself and be exceptional. However, in the current era of increasing demands and growing competition, achieving excellence is not easy for many. To be successful and sustainably able to maintain the highest levels of performance, regardless of size or industry, organisations often need to use an appropriate management framework [12]. The well-established EFQM Excellence Model, which is an initiative of representatives of European organisations and is used throughout Europe, can provide such a framework for organisations in both the private and public sectors. Efforts to institutionalise the model were completed in 1988, when the then presidents of major companies such as Bosch, Electrolux, Fiat, Philips, Nestlé and Volkswagen, with the support of the European Commission, decided to set up the European Foundation for Quality Management (EFQM). The impetus for the creation of this model was the fact that frameworks for quality improvement already existed in the USA (Malcolm Baldrige Model) and Japan (Deming

Prize). Therefore, the creation of the EFQM Excellence Model was a necessary step on the European quality journey [13].

## ACKNOWLEDGEMENTS

**„This publication was supported by the Operational Program Integrated Infrastructure within the project: Enhancements to support the efficient exploitation of outputs from H2020 projects solved at TUKE (code ITMS: 313011W554), co-financed by the European Regional Development Fund.“**

**“This work was supported by the Slovak Research and Development Agency under the contract No. APVV-19-0590, by the projects KEGA 055TUKE-4/2020 granted by the Ministry of Education, Science, Research and Sport of the Slovak Republic.”**

## REFERENCES

- [1] MAJERČÁK, J. Časopis: *Kvalita v praxi*. 2011. ISSN 1335–9231.
- [2] MAJERČÁK, J., PLEVKO, J. Entropia dopravného procesu v podmienkach multimediálnej prepravy. 2011, pp. 90-96.
- [3] MAJERČÁK, J. KRÁLOVENSKÝ, J. *Postavenie dopravy v logistike*. Edis: Žilina, 2001. ISBN 80-7100-88-5.
- [4] GNAP, J., JELENEK, P., KRÁLOVENSKÝ, J., MAJERČÁK, J., ŠULGAN, M. *Logistika a nové úlohy pre zaslalateľov*. Žilina: EDIS – vydavateľstvo Žilinskej univerzity, Žilinská univerzita v Žiline, 2004. ISBN 80-8070-306-X.
- [5] SIXTA, J., MAČÁT, V. *Logistika, teórie a praxe*. Vydavateľstvo CP Books, 2005. ISBN 80-251-0573-3.
- [6] GNAP, J. *Kalkulácia vlastných nákladov a tvorba ceny v cestnej doprave*. 2. prepracované vydanie. Žilina: EDIS – vydavateľstvo Žilinskej univerzity, Žilinská univerzita v Žiline, 2002. ISBN 807100-958-X.
- [7] STRAKA, M., MALINDŽAK, D. a kol. *Distribučná logistika*. Košice: Košice TU, 2005, pp. 12-17. ISBN 80-8073-296-5.
- [8] BALOG, M., STRAKA, M. *Logistické informačné systémy*. Vydavateľ EPOS, 2005. ISBN: 80-8057-660-2
- [10] BALOG, M., MATISKOVÁ, D. *Procesné a strategické riadenie firiem*. Vydavateľ TRIBUN CZ, 2015. ISBN 978-80-553-2213-1.
- [11] DELLOITTE at all. 2020 *COVID-19 Riadenie rizika a narušenia dodávateľského reťazca*. Autori správy; Kilpatrick, J. & Barter, L. Prispievatelia; Alexander, C, Brown, J., Calderon, R., Carruthers, R., Joyce, P. & Xu, L, Kanada: Deloitte Development LLC. Deloitte Design Studio, 2020, 20-6536T.
- [12] ŠESTÁK, Milan. Použitie modelu výnimočnosti EFQM v praxi. *Kvalita: odborný časopis Slovenskej spoločnosti pre kvalitu*. Žilina: MASM, 2003, vol. 11, no. 2, pp. 33-36. ISSN 1335-9231.
- [13] ĎURIÁN, J. *Model výnimočnosti EFQM v systéme personálneho kontroingu*. [Online]. 2012. Available from: <https://www.mktraining.sk/model-vynimocnosti-efqm-v-systeme-personalneho-kontroingu>.
- [14] TURYO, J. Aké kuriérske spoločnosti posobia na Slovensku? *Retail magazin.sk*. [Online]. 2021. Available from: <https://www.retailmagazin.sk/logistika/preprava/5797-ake-kurieske-spolocnosti-posobia-na-slovensku>