

THE IMPORTANCE OF SUPPLIER EVALUATION IN SHORT SUPPLY CHAINS

GÁBORNÉ SZÚCS BEÁTA PATÓ*

University of Pannonia, Hungary

FANNI KISS

University of Pannonia, Hungary

Abstract

The consideration of supply chains can foster the viability and maintainability of local producers. The formation and retention of the market may be complicated for local producers; therefore it is advisable to take the creation of supply chains into consideration. Constant feedback and evaluation is highly important to maintain successfully operating short supply chains and supplier evaluation forms could act as the starting point of these chains. These forms reflect the strengths and weaknesses of suppliers, based on which the correction of mistakes can be done and the performance of suppliers may be enhanced. The aim of this study is to examine the role of supplier evaluation form and relationships between customers and suppliers in short supply chains, from a local producer's point of view through a case study. The scientific relevance of this study is to draw particular attention to short supply chains which are and will be of high importance considering local economies. As the case study reveals, it is recommended for the members of short supply chains to use supplier evaluation forms.

JEL classification: Q31;

Keywords: short supply chain, supplier evaluation form, supplier, case study.

1. Introduction

The aim of supply chain management is the satisfaction of consumer needs and the integration of all parties and processes involved in a given supply chain into a unified system. Both the internal and external relationships of organizations are of high importance (Szegedi- Prezenszki 2012, pp.367-368). Creating and acting in short supply chains can foster viability and maintainability in case of local producers as well. In order to maintain a beneficial supply chain, it is crucial to manage the relationship between customers and suppliers continuously. Constant evaluation and effective communication is one of the basis of well-operating supply chains, therefore the use of supplier evaluation form should be

* Corresponding author. Address: Pannon University, 8200 Veszprém, Egyetem u. 10, Hungary, Telephone: +36 88 624645, E-mail: patog@vnet.hu

taken into consideration. These forms provide beneficial information to customers and producers, furthermore it fosters the appropriate communication and collaboration between the parties.

The objective of this research is to examine local products' short supply chains with particular regard to the application of supplier evaluation forms and customer-supplier relationships between the members. In this study the importance of supplier evaluation is discussed from a local producer's point of view acting in a short supply chain. The main contribution is to draw attention to the application of supplier evaluation forms and to the importance of beneficial customer-supplier relationships in short supply chains.

Firstly, the literature on the two main factors of this research is summarized based on some articles: short supply chains and supplier evaluation forms. In the second part, the case study of a local producer is presented.

2. Short supply chains

A supply chain involves at least two or more legally separated organizations, connected by material, financial and information flows. The three most decisive participants are: manufacturers, suppliers and consumers (Jarzebowski et. al, 2017, p.197). There exist several different definitions of short supply chains, but they share a common characteristic: reduced number of intermediaries between the producer and the consumer.

2.1. Definition of short supply chains

According to Peters (2012), the criteria for short supply chains are the number of intermediaries and physical distance: 'short supply chains are not only focused on the distance between production and sale of product, but also the number of links in the food supply chain, with the goal being to reduce this as much as possible'. The European Rural Development Regulation (1305/2013) defines the short supply chain as: 'a supply chain involving limited number of economic operators, committed to cooperation, local economic development, and close geographical and social relations between producers, processors and consumers'. This definition highlights the social relations and economic development as well. Ilbery and Maye (2005) state that: ' the direct relationship between the producer and the consumer involves construction of knowledge, value and meaning about the product and its provenance, production and consumption, the producer and the consumer themselves, rather than solely an exchange of a product. These two authors focus on knowledge exchange besides social relations.

Summarizing the definitions the most important criteria of short supply chains are: reduced number of intermediaries, physical proximity, importance of social relations and cooperation, and rural economic development.

2.2. Classification of short supply chains

There are several classifications for short supply chains, but the most widespread is the classification by Renting and his co-authors. Renting et. al

(2003) differentiate three main types of short supply chains based on the number of intermediaries and physical distance. The first type is the *Face-to-face short supply chain* meaning that the local producer sells the product directly to the final consumer without any intermediaries. The second category is the *Proximate short supply chain* the sale of products is made locally, in a specific region. In this context one intermediary appears in the short supply chain (e.g. local shops, service providers, public institutions). The last type is the *Spatially extended short supply chain* – products are sold not only locally but in different regions as well. In this case consumers may have no experience with origin of the region.

3. Supplier evaluation form

The purchase decisions of organizations highly influence the economic performance of corporations. The prime cost represents a large part of total cost, therefore the evaluation of the most appropriate suppliers should be based on this issue and with respect to good quality. Organizations which are able to manage suppliers efficiently can be successful on the long-term.

3.1. The aim of supplier evaluation form

The basic requirement of procurement is to meet the expectations of organizational strategy. Suppliers can contribute to the competitiveness of companies. The main element of supplier relationships is the accurate and purposeful evaluation of suppliers. Two major factors should be considered with regard to the evaluation: aims and weight points (Körmendi-Pucsek, 2008, p.61).

Three different aims of the supplier evaluation form can be stated: (Vörösmarty-Tátrai, 2010, in Pató-Kopácsi-Kreiner, 2015, pp.60-61): the evaluation of the best supplier possible; the enhancement of the suppliers' performance; controlling the relationship with suppliers.

The evaluation of the best supplier possible

Organizations aim to have the most competent suppliers possible, in order to operate effectively in the market, in which the communication plays very important role (Szabó-Szentgróti-Gelencsér-Szabó-Szentgróti -Berke, 2019). In addition to this, the engagement and the high level of proficiency are must-have characteristics considering suppliers (Jin-Vidyaranya, 2016, p.169). If the company determines to procure a new product/service or to dismiss a supplier, it has to seek for other suppliers. If there is an opportunity to elect from many suppliers, the goal is to find the best supplier possible. This can not be decided easily, therefore many aspects have to be determined during the evaluation. The organization has to define the most crucial criteria, which have to be weighted. These aspects are detailed later in this study (Vörösmarty-Tátrai, 2010, in Pató-Kopácsi-Kreiner, 2015, pp.60-61).

The enhancement of the suppliers' performance

Supplier evaluation forms enable the analysis of the strenghts and weaknesses of suppliers. The success of organizations depends on the performance of suppliers, thus it is beneficial to companies to help suppliers. Aims and expectations

of organizations could boost the performance of suppliers (Vörösmarty-Tátrai, 2010, in Pató-Kopácsi-Kreiner, 2015, pp.60-61).

Controlling the relationship with suppliers

Mapping of the suppliers is necessary in order to predict the future of partnership. Acquired information may be favorable in case of bargaining or when making suppliers compete each other (Vörösmarty-Tátrai, 2010, in Pató-Kopácsi-Kreiner, 2015, pp.60-61).

3.2. Customer-supplier relationship

Deciding how to manage suppliers is a key-question concerning customer-supplier relationships. In order to operate a business successfully and efficiently, managing customer-supplier relationship is of high importance. There are two main models representing customer-supplier relationships:

- Opponent/competition model by conventional approach:

Customers elect suppliers based on price, therefore they make suppliers compete against each other to reach the price suitable for the customers. This approach treats suppliers as opponents (Chikán-Demeter, 1999, p.443).

- A collaborative model according to the state-of-the-art approach:

This model puts emphasis on collaboration between partners. It is advisable to maintain the number of suppliers at the lowest level possible and to develop a partnership based on collaboration with these suppliers. This can enhance the competitiveness of the organization (Chikán-Demeter, 1999, p.443). Salam and Khan state that, many customer-supplier relationships follow the partnership approach. This means closer contracts, shared strategies, long-term perspective and shared information resulting in a higher level of integration. It is important to enhance the engagement of suppliers in order to maintain a mutually beneficial long-term relationship (Salam-Khan, 2018 p.4088).

In case of the competition model, trust is not evolved between the partners. However trust is the basis of the other model, partners aim to maintain a mutually beneficial relationship by solving problems arising. Organizations can enquire other companies about the reliability of a given supplier. Supplier evaluation forms could also help organizations if they had been working with the supplier before (Pató-Kopácsi-Kreiner, 2017, pp. 499, 503, 507).

Fehr and Rocha (2018) state based on their and previous researches, that the main elements of a mutually beneficial and economically successful customer-supplier relationship are trust and continuous information sharing (Fehr-Rocha, 2018, p.598). This statement enhances the application of supplier evaluation forms and communication which is very important in sale of local food (Dajnoki – Szabados – Kulcsár – Bácsné Bába, 2018).

3.3. Criteria of the supplier evaluation form

One or more criteria of the supplier evaluation form are needed to be determined, because these aspects can act as a basis when making decisions about suppliers. These criteria can differ from an organization to another. In 1966 Dickson publicized a study (Dickson, 1966 in Esse, 2012, p.8), in which 273

purchasing agent and manager defined the most important criteria about suppliers. Based on the results, 23 criteria were ranked by Dickson. His study also points out the importance of taking more criteria into consideration (Esse, 2012, p. 8). A recent research shows that the most important evaluation factors are quality, supplier certification, facilities, continuous improvement, physical distribution and channel relationship (Hwang et. al, 2016).

Table 1. Ranking of the 23 criteria

Ordinal	Criteria	Mark	Evaluation
1	Quality	3,508	Highly important
2	Transport	3,417	Essential
3	Former performance	2,998	
4	Guarantee	2,849	
5	Production facility and capacity	2,775	
6	Price	2,758	
7	Technological ability	2,545	
8	Financial status (Csiszárík, 2017. pp.75-87.)	2,514	
9	Consistent procedures	2,488	
10	Communication system	2,426	
11	Repute and position in industry	2,412	
12	Desire to sign contracts	2,256	
13	Management and organization	2,216	
14	Operational control	2,212	
15	Repair service	2,187	
16	Attitude, behaviour	2,120	
17	Impression	2,054	
18	Packaging ability	2,009	
19	Labour	2,003	
20	Location	1,872	
21	Number of businesses so far	1,597	
22	Help in training	1,537	
23	Mutual settlement, agreement	0,610	Trivial

(Source: Esse, 2012, p.8)

3.4. Types of supplier evaluation forms

Supplier evaluation is an important feature of procurement. In scientific literature, several different types are defined. Szegedi-Prezenszki (Szegedi-Prezenszki, 2005, p. 92) differentiated 3 distinct categories:

- **Simple, categorical method:** The buying department determines the criteria to which the values are assigned. In general, 3-7 value categories are used in practice, in order to make the model manageable. This method is advantageous due to the low costs and simplicity. On the other hand, there are no numerical data involved supporting the details, therefore categories should be regularly supervised (Szegedi-Prezenszki, 2005, p. 92). In case of short supply chains this method can be useful.

The supplier evaluation form represented in Figure 1 is based on this method.

Figure 1. Sample for simple supplier evaluation form

Supplier Evaluation Form			
Name of supplier:			
Address of supplier:			
Code of supplier:			
Phone number:			
Date of supply:			
Name of supplied product:			
Number of products:			
Characteristics	Qualification		
	Low	Adequate	Excellent
Price		X	
Number of defective products			X
Number of damaged products due to transportation		X	
Accuracy of transportation			X
Payment terms	X		
Safety of packaging		X	

(Source: Szegedi-Prezenszki, 2005, p.93)

- **Cost-based supplier performance evaluation:** Costs are represented and examined in the ratio of prime costs. Ratios are defined based on different cost categories and the performance of suppliers is compared on the basis of these ratios. The advantage of this method is the simple comparison of suppliers. However it is disadvantageous, because it requires a huge amount of information and time (Szegedi-Prezenszki, 2005, p.93).
- **Complex evaluation/assessment procedures:** Several methods belong to this category, but the common characteristic is the application of numerical data. Weighted factors are ordered to the most important factors of procurement. On the basis of the calculated results, suppliers are classified into 4 groups:
 - **'Category A' Supplier:** delivery can be done without any restrictions
 - **'Category B' Supplier:** delivery can be done without any restrictions, but periodical supervision of incoming products are advised
 - **'Category C' Supplier:** delivery can be done with restrictions, but supervision of incoming products is done by regular sampling
 - **'Category D' Supplier:** delivery should only be done in the last resort with the permission of the general manager. Quality of incoming products is not guaranteed; therefore all products should be supervised.

This method is relatively easy to understand, but it is quite time-consuming and some of the data are not numerical. (Szegedi-Prezenszki, 2005, p.94-96) Defining the accurate expectations, gathering and analysing data are of high importance when creating a supplier evaluation form. If this work is not done with a sufficient degree of accuracy, suppliers probably lack the needed information in order to meet the desired requirements. Lack of information can also prevent suppliers from enhancing their performance. Supplier evaluation forms may represent problems, which are overlooked by suppliers, thus supporting the development of performance (Vörösmarty-Tátrai, 2010, in Pató-Kopácsi-Kreiner, 2016, p.256).

4. Case study of CSIKOS jam family

In this section, the aim and the method of this study, the description of the CSIKOS jam family and the answers to the research questions can be read.

4.1. The description and the method of this research

The aim of this case study detailed below is to represent the role of supplier evaluation form and the relationships between partners in short supply chains from the aspect of a local producer through a case study.

This study is an exploratory research, therefore there is no hypothesis.

The research questions are the following:

- Which is the role of the supplier evaluation forms in short supply chains?
- What are the characteristics of customer-supplier relationships in short supply chains?

The scientific relevance of this study is to draw attention to short supply chains, which significantly define the livelihood of local producers and customers as well. Thinking and operating in short supply chains means an economic philosophy based on outstanding quality and mutual trust. The aim is to represent the importance of effective short supply chains in local economies.

The local producer of the case study is well-known in his local region. It is significant to represent a best practice from which other local producers can collect ideas and develop their activities.

4.2. The CSIKOS jam family and the supplier evaluation form

The owner of this jam family manufactures his trademarked products by his own hands. Today the jams are present in more than 30 shops in the country, including some restaurants as well. These jams are produced in several different flavours, there are jams created specifically to women and some expressly to men. The favourites of women are for example the jam which tastes like the gerbeauds cake and the one made with basil, green tea and raspberry. On the other hand lots of men appreciate the marmalade flavoured with Belgian chocolate and sour cherry.

In short supply chains there are no or only a few intermediate actors between suppliers and final customers, this is true for this case as well. The owner of the jam family sells approximately half of his products directly to end customers. The other half of the products are sold by approximately 30 different intermediate actors (e.g. shops and restaurants). In the second case, it is highly important to cooperate and communicate well with partners in order to maintain a mutually beneficial relationship.

As a supplier, the owner of the jam family, has not received any formal supplier evaluation form from its customers. However, verbal evaluation of the supplier is common between the partners. Most of the customers highlight the unique taste of the jams, the size of the jar and the modern design of the labels. The owner considers formal supplier evaluation highly important, therefore he looked for a solution. At least one special supplier evaluation form per year, composed by him, is sent to customers. According to his experiences, 2-3 evaluations per year are considered to be optimal. He claims: The more feedback is made, the more successful the relationship is between partners. His supplier evaluation form contains some major

questions and some questions are based on the S+S+C (Start+Stop+Continue method). This method reveals which of his activities connected to his products should be continued (Continue), removed (Stop) or developed (Start) (based on www.retrium.com/resources/techniques/start-stop-continue). This kind of evaluation contributes to the development of partnerships, by revealing problems. Furthermore it can be seen, if anything new should be introduced. The owner of the jam family states that the use of the written supplier evaluation form contributes to the maintenance of mutually beneficial relationships with the customers. The filled supplier evaluation forms represent the strengths and weaknesses of the supplier, based on which the supplier can find solutions to appearing deficiency. The supplier can totalize the strengths and weaknesses, for example some customers suggested to change the size of the jams, which results that these forms can also contribute to product development. Besides that, suppliers can recognize the needs of customers and decide if they can or would like to satisfy them or not. The use of this supplier evaluation form is beneficial to customers as well, because all their expectations and recommendations can be easily stated, and it is communicated to them, that their opinions matter to the supplier. The owner claims that the use of written supplier evaluation form is the basis of developing and maintaining proper cooperation and communication with the partners. As a supplier his relationship with the customers became much better after the use of his written evaluation form. This proves the fact that constant communication and evaluation is needed to develop and maintain a successfully operating short supply chain.

The comparison of a 'regular' supplier evaluation form and the CSIKOS supplier evaluation form is made in order to represent these two possibilities to the member of short supply chains who may plan to use written supplier evaluation form. When comparing the supplier evaluation form shown in Figure 1 with the CSIKOS supplier evaluation form, several similarities and differences can be determined. Both forms contain the most important general criteria such as price, quality, packaging and logistical questions. The supplier evaluation in Figure 1 is shorter and is based on a simple, categorical method. The company has to decide which criteria are of high importance, then the evaluation of the supplier according to these criteria is made. The CSIKOS supplier evaluation form is more detailed and it also consists of sentencial evaluation. The S+S+C method is used in case of questions about the products and logistics. In this form a special section is about marketing. The owner asks the the customers if they need any help in marketing (e.g. leaflet, molino), or are they satisfied with the frequency and form of communication (e.g. newsletter, Facebook).

Table 2. Comparison of supplier evaluation forms

Supplier evaluation form (Figure 1)	CSIKOS supplier evaluation form
- the most important general criteria (pl. price, quality etc.)	- the most important general criteria (pl. price, quality etc.)
- short	- more detailed
- simple, categorical method	- sentencial evaluation
	- S+S+C method
	- highlight of marketing

(Source: Own construction)

4.3. Supplier-customer collaboration in case of the CSIKOS jam family

According to the owner, trust is the basis of any appropriate partnerships. Communication between the partners and constant feedback are both of high importance. These can contribute to finding solutions to arising problems.

Not only customers can evaluate suppliers, but suppliers may rate customers as well based on the quality of collaboration. In our case, the owner has already made some evaluation of customers, in which he rated partners based on how successful the collaboration and the communication is. The aim of this process is to eliminate partnerships which are not beneficial for the supplier. There are some customers with whom many conflicts arise and some has too high expectations. Suppliers have to consider if a partnership is profitable or not. On the other hand, he devotes more time and attention to those customers who has good ranking after the evaluation.

The owner of the CSIKOS jam family puts emphasis on his marketing activity, according to him it is highly important in order to be a successful local producer. To those customers who accept it, he sends tasting packages so that consumers can get to know his products better. A product guide is attached to each package including a detailed explanation of all jams, supporting the work of the shop assistants. Joint marketing activity could increase the number of sold products and it can also deepen the collaboration between the partners.

5. Conclusions

Short supply chains are more and more determinative considering local economies. The fulfilment of high quality expectations enables the sale of local products. Suppliers have to cooperate with other members of the short supply chain in order to react proactively to changing consumer demand. The use of supplier evaluation form - such as the example mentioned previously - can be the basic element of communication. In the short supply chains of local products, the application of written supplier evaluation is not typical. However verbal feedback is common between customers and suppliers. As the case study proves, constant written evaluation besides verbal communication contributes to maintaining a mutually beneficial partnership between suppliers and customers. Therefore the application of written supplier evaluation forms in short supply chains is highly advised. Based on supplier evaluation, suppliers can recognize their strengths and weaknesses, furthermore arising problems can be easilier solved. The evaluation can support product development and logistical aspects (e.g. size of the product, package) as well. In a given short supply chain, it is highly recommended to create and apply an integrated, 360 degrees evaluation framework. This unified framework ensures a convenient platform to the members of the given short supply chain based on which the evaluation of partners and determination of development can be done.

Considering customer-supplier relationships in short supply chains, trust and constant communication is the basis of a mutually beneficial relationship. Arising problems can be solved easilier together, meaning that customers have to communicate any occurring problems to suppliers, so that suppliers can react to them. In case of local products joint activities (such as joint marketing activity

detailed above) may enhance customer-supplier relationships and economical profit for both sides.

With respect to scientific literature and this study, it is advisable for local producers to consider acting in short supply chains, where customer-supplier relationships and the application of some kind of written supplier evaluation forms are of high importance.

The findings are based on scientific literature and the case study examined, therefore further research is recommended to broaden the knowledge on this topic. The future development of the topic could consider conducting a research in this theme with local producers, in order to get not only qualitative, but quantitative results as well. In addition to this, another aim is to test two supplier evaluation frameworks made by the authors based on this and previous researches. One of these frameworks is the Double Evaluation Platform, in which the evaluation of the supplier is made by the central organization and the consumers as well. The other framework is the PaTeNt®- SESC (**Pató Tetrahedrons of interNational Theory (Pató, 2015, 2017) - Supplier Evaluation of Supply Chain**), which is a visualized 3D model, presenting the members and relationships in short supply chains.

Acknowledgements

This publication/research has been supported by the European Union and Hungary and co-financed by the European Social Fund through the project EFOP-3.6.2-16-2017-00017, titled "Sustainable, intelligent and inclusive regional and city models".

References

- Chikán, A.- Demeter K. (1999) Az értékteremtő folyamatok menedzsmentre; Termelés, szolgáltatás, logisztika, Aula Kiadó, Bp., 443.
- Csiszárík-Kocsir Ágnes (2017): Etikus pénzügyek, avagy a pénzügyek etikája: Vélemények egy kutatás eredményei alapján *Polgári szemle* 12. évf. 4-6. szám pp. 75-87., 2017.
- Dajnoki K. – Szabados Gy. – Kulcsár G. – Bácsné Bába É. (2018) Visszatérni vidékre” – A vidéki élet kvantitatív és kvalitatív megközelítésben. *International Journal of Engineering and Management Sciences (IJEMS)*, 3(5) DOI: 10.21791/IJEMS.2018.5.22.
- European Parliament (2016) Short food supply chains and local food systems in the EU. Briefing, 2016 September
- Esse, B. (2012) A beszállító-kiválasztási folyamat szerepe és stratégiái. Budapesti Corvinus Egyetem, TM 36. sz. műhelytanulmány, p.8.
- Hwang, B.N., Chen, T.T., Lin, J.T. (2016) 3PL selection criteria in integrated circuit manufacturing industry in Taiwan, *Supply Chain Management: An International Journal*, 21(1), 103-124.
- Fehr, A., F., C., L., Rocha, W. (2018) Open-book accounting and trust: influence on buyer-supplier relationship, *RAUSP Management Journal*, 53(4), Sao Paulo, p.598.

- Ilbery, B., Maye, D. (2005) Alternative (shorter) food supply chains and specialist livestock products in the Scottish-English borders, *Environment and Planning*, 37, pp. 823-844.
- Jarzebowski, S., Pietrzyck, K. (2017) The concept of short supply chains in the food economy, *The Common Agricultural Policy of the European Union- the present and the future*, Institute of Agricultural and Food Economics National Research Institute, p.197-198.
- Jin, S., Vidyaranya, B.G. (2016) Supplier selection in small- and medium-sized firms, *American Journal of Business*, 31(4), p. 169.
- Pató, G. Sz. B., Kopácsi, E., Kreiner, B. (2015) Beszállító értékelés folyamatának elemző kutatása, *Vállalkozásfejlesztés a XXI. században tanulmánykötet*, Óbudai Egyetem, Keleti Károly Gazdasági Kar, pp. 60-61.
- Pató, G. Sz. B., Kopácsi, E., Kreiner, B. (2016) Beszállító értékelés vizsgálata SWOT analízis segítségével, *Vállalkozásfejlesztés a XXI. században VI. tanulmánykötet*, Óbudai Egyetem, Keleti Károly Gazdasági Kar, p.253.
- Pató, G., Sz., B., Kopácsi, E., Kreiner, B. (2017) Gondolatok a bizalom szerepéről a beszállítói kapcsolatokban, *Vállalkozásfejlesztés a XXI. században, VII. Tanulmánykötet*, Óbudai Egyetem, Keleti Károly Gazdasági Kar, pp.499, 503, 507
- Pató, Sz. G. Beáta (2017) Formal Options for Job Descriptions – theory meets practice, *Journal of Management Development*, 36(8), 1008-1028.
- Pató, Sz. G. Beáta (2015): The 3D Job Description, *Journal of Management Development*, 34(4), 406 – 420.
- Peters, R. (2012) Local Food and Short Supply Chains, *EU Rural Review*, N 12
- Renting, H., Marsden, T.K., Banks, J. (2003) Understanding of alternative food networks, exploring the role of short food supply chains in rural development, *Environment and Planning*, 35(3), 431-436.
- Salam, A., M., Khan, A., S. (2018): Achieving supply chain excellence through supplier management, *Benchmarking: An International Journal*, p. 4088
- Szabó-Szentgróti G., Gelencsér M., Szabó-Szentgróti E., Berke, Sz. (2019) Generációs hatás a munkahelyi konfliktusokban. *Vezetéstudomány - Budapest Management Review*, 50 (4), 77-88.
- Szász, L., Demeter, K. (2017) *Ellátásilánc-menedzsment*, Akadémiai Kiadó, Budapest, pp. 13-22.
- Szegedi, Z., Prezenszki, J. (2005) *Logisztika menedzsment*, Kossuth Kiadó, Budapest pp. 92-96.
- Szegedi, Z., Prezenszki, J. (2012) *Logisztika menedzsment*, Kossuth Kiadó, Budapest, pp. 367-368.