MÁRIA M. WITTINGER

FEATURES OF SUPPLIER MANAGEMENT AND ITS MECHANISMS –
INSIGHTS IN HUNGARIAN PRACTICE: HOW TO ENHANCE THE EFFECTIVENESS OF PROCUREMENT PROCEDURES?

A SZÁLLÍTÓ MENEDZSMENT JELLEMZŐI ÉS MECHANIZMUSAI –
BETEKINTÉS A MAGYAR GYAKORLATBA
HOGYAN LEHET JAVÍTANI A BESZERZÉSI ELJÁRÁSOK HATÉKONYSÁGÁT?

Considering the risk how serious consequences could occur in case of supply problems, the increasing importance of suppliers in supply chains is indisputable; therefore, management of relationships and selection and evaluation of suppliers are seen as crucial strategic issues (Araz & Ozkarahan, 2007). The practice/activity – and theory – how to handle the suppliers is the so-called Supplier Management (SM).

The article presents the findings of research investigating the actual practice of SM in the inquired procurement organizations. The theoretical contribution of the paper is to compare the practice of these particular organizations with the literature in order to state the coincidences with it or the discrepancies between them, in other words, to reveal the status of purchasing work. The managerial implication – on this basis – is to be a compass for practitioners where to find the deficiencies (if any) and how to strengthen the effectiveness of procurement by a better understanding of the problems; also, the paper formulates suggestions for a more efficient SM practice. The author argue that the procurement processes in terms of SM have deficiencies which can be originated from its component parts: i) supplier evaluation; ii) cooperation; and iii) IT platforms.

She applied survey research while the answers of the survey were analyzed applying comparison to the literature and using Cross-table analysis to reveal the connection among the stated SM factors.

Keywords: Supplier Management, supplier evaluation, supplier selection, cooperation, IT platforms

Figyelembe véve annak kockázatát, hogy milyen súlyos következmények léphetnek fel ellátási problémák esetén, a szállítók növekvő fontossága az ellátási láncokban vitathatatlan; ezért a szállítói kapcsolatok kezelése, a szállítók kiválasztása és értékelése stratégiai kulcskérdéseknek tekintendők (Araz & Ozkarahan, 2007). A tevékenység/eljárás – és elmélet – , amellyel a szállítókat kezeljük az úgynevezett szállító menedzsment (SM).

Jelen cikk annak a kutatásnak az eredményeit mutatja be, amellyel megvizsgáltuk az SM tényleges gyakorlatát a megkérdezett beszerzési szervezetekben. A tanulmány elméleti hozzájárulása az, hogy összehasonlítja a kiválasztott szervezeteknek a konkrét gyakorlatát az irodalommal, hogy megállapíthatók legyenek a közöttük lévő egybeesések vagy éppen különbözőségek, annak érdekében, hogy felfedjük a beszerzési tevékenység valós állapotát. Előbbiek alapján a tanulmány gyakorlati vonatkozása, hogy iránymutatásként szolgáljon a szakemberek számára, a hiányosságok (ha vannak ilyenek) hol találhatók és hogyan lehet a beszerzés hatékonyságát növelni a problémák jobb megértése által, illetve a cikk javaslatokat is megfogalmaz egy hatékonyabb SM-gyakorlatra vonatkozóan. A mellett érvelünk, hogy a beszerzési folyamatoknak vannak hiányosságai az SM szempontjából, amelyek ennek alkotóelemeiből származtathatók: i) szállítók értékelése, ii) együttműködés és iii) informatikai platformok.

A felmérés kérdőíves kutatással készült, amelynek eredményeit egyrészt összehasonlítva a szakirodalommal, másrészt kereszttáblás analízist használva elemeztük, annak érdekében, hogy lehetőség adódjon a meghatározott SM-tényezők közötti kapcsolatok feltárására.

Kulcsszavak: szállító menedzsment, szállítók értékelése, szállítók kiválasztása, együttműködés, IT-platformok

Author/Szerző:
Wittinger Magdolna Mária, PhD candidate, Corvinus University of Budapest (mariamagdolna.wittinger@uni-corvinus.hu)

In today's turbulent environment, the necessity to sustain and to further enhance the competitive ability of a company is unquestionable (Trkman & McCormack, 2004). Therefore, there is a continuous competition among companies to gather benefits from this race in order to increase competitiveness as much as possible; in Hungary – the same as elsewhere – the companies should choose how to do this: on their own possibilities/assets, in alliances with other companies (as corporations, joint ventures or subsidiaries), or even by becoming a destination of the foreign direct investments in Central and Eastern European region (Lőrincz, 2018).

The work of the procurement organization affects strongly the competitiveness since the purchasing area has the role to manage corporate costs efficiently, to perform these purchases in a cost- and time-effective manner. Also, procurement managers cannot disregard the continuously and rapidly changing environment and the phenomenon that the supply patterns can fall overnight (Kraljic, 1983), therefore the most complex and maybe the most critical part of the purchasing work is the management of supplier relationships (Handfield et al., 2009).

Due to the market changes *"in organizations of the future, world-class operations will require world-class supply management and suppliers"* (Carter et al., 2000, p. 22). Therefore, *"without a foundation of effective supply chain organizational relationships, any effort to manage the flow of information or materials across the supply chain is likely to be unsuccessful"* (Croom et al., 2000, p. 73). As a consequence, the role of the purchasing function in the business has significantly increased in importance due to the emphasis on building and maintaining long-term relationships with external partners (Cousins, 2002; Bendixen & Abratt, 2007; Handfield et al., 2009).

Considering the depicted responsibilities of procurement, the paper seeks to compare the actual practice – in terms of SM – of purchasing professionals to the recommended features of literature, in order to confirm the coincidences or to depict the discrepancies; the endeavor of this article is to be a support both for practitioners and for scholars; for practitioners in that sense how to avoid the improper routines or how to follow the suggested behaviours; for scholars to see the actual processes in practice.

To enlist the undertaken tasks, the article is organized as follows: the first chapter is to give a general description about the topic and its importance, while Chapter II. introduces the concept and the notions of Supplier Management in the literature. In Chapter III. we depict shortly the characteristics of the survey and the research methodology, then, in Chapter IV. we draw up the research hypotheses, and the fifth chapter depicts the findings of the survey. In Chapter VI. we summarize the research findings and we offer some concluding remarks, while the last one shows insights in terms of theoretical contribution and practical implications, furthermore to the limitation of the research.

Concept and literature of Supplier Management

Purchasing decisions will affect core activities of the company such as production planning and control, inventory management and logistics (Govindan et al., 2010), therefore will have a significant influence on the whole competitiveness of the company.

The main goals of supplier relationship management processes are to reduce purchase/supply risk, to maximize value to customer, to give importance to strategic sourcing, to build long-term strategic relationships between buyers and suppliers and to improve delivery, quality and cost performance of the product (Kraljic, 1983; Ganesan, 1994; Snehota & Håkansson, 1995; Dyer & Singh, 1998; Bensaou, 1999).

To achieve all the above goals, we argue that in terms of Supplier Management – as the essential and main part of the purchasing work – we can distinguish different activities and/or aptness as follows:

1. Supplier selection and evaluation: as the crucial parts of Supplier Management strategies (Lee et al., 2001; Choi & Kim, 2008) means the internal activities of purchasing organization to properly handle suppliers;
2. Cooperation: as the other main part of Supplier Management strategies (Bensaou, 1999; Chen et al., 2006) means the external activity of the organization in connection with suppliers;
3. IT platform: is the aptness of the company in terms of IT systems and applications, on which basis the internal and external processes and workflows take place.

Supplier selection and evaluation

Since suppliers are parts of the supply chain, the relationship between supplier and customer company will have a determinative effect on the whole supply chain, so on the competitiveness of company as well, therefore, the supplier selection problem becomes one of the most crucial issues to implement a successful and effective supply chain system (Chen et al., 2006; Araz & Ozkarahan, 2007; Amindoust et al., 2012). Thus, we can treat supplier selection and evaluation as an optimization opportunity of the processes; in this case, this problem-solving (i.e. selection and evaluation of suppliers) requires the formulation of an objective measurement (Huang & Keskar, 2007).

To possess that objective measurement a proper Supplier Management system has to be set up; its role will be to monitor suppliers' performance, to identify strengths and weaknesses of suppliers and to provide relevant information about them to procurement (and to other divisions), to state distinctions in performance among supplies, also to give feedback to suppliers about their performance or even to support suppliers by providing knowledge, skills and experience via various supplier development programs (Araz & Ozkarahan, 2007).

The decisions of supplier selection and evaluation are based on multiple criteria. The number of decision makers, the nature and number of criteria and the degree of uncertainty, all have to be taken into consideration while solving them. Therefore, one of the crucial challenges confronted by procurement managers is the selection and evaluation of suppliers by the usage of a properly configurated method, built on right kinds of attributes/factors/criteria by a system compatible to company's other decision-making platforms (Chen et al., 2006).

The techniques used in supplier selection vary widely. Researches carried out in this field apply several models which can be grouped (almost all of them) into four main conglomerates: MP (mathematical programming), MA (mathematical analytical), AI (Artificial Intelligence) and other models (e.g. combined methods or industrial/ company's specific ones). Even if there is a large body of literature on different methodologies, most of them are basically variations of MA methods (e.g. DEA-Data Envelopment Analysis: Liang et al., 2006; Chen, 2011 and AHP-Analytic Hierarchy Process: Bruno et al., 2012; Rouyendegh & Erkan, 2012; De Felice et al., 2015 and MCDM-Multi-criteria Decision-Making: Araz & Ozkarahan, 2007; Chen et al., 2006).

Also, we often find AI methods (e.g. Fuzzy logic: Chen et al., 2006; Amindoust et al., 2012), hybrid methods or other methods such as SCOR-Supply Chain Operations Reference (Lima-Junior & Carpinetti, 2016) or ISM-Interpretive Structural Modeling (Huang & Keskar, 2007; Mohd et al., 2006).

As described above, in the literature various decision-making techniques are proposed to deal with the process of supplier selection and evaluation. But supplier selection differs significantly from supplier evaluation. The main goal of supplier evaluation is to classify each supplier based on the gaps existing between their real performance and desired one. Also, supplier evaluation includes determination of the evaluation criteria to be used and the weights of each criterion; therefore supplier evaluation seeks to categorize suppliers (along the predefined criteria), while supplier selection aims to define an order of preference among evaluated suppliers (Keskin et al., 2010; Omurca, 2013); in other words, we can evaluate all suppliers, but it could happen that we will select only a part of them (to conclude a contract or to continue an already started cooperation).

The most of studies and papers found in the literature propose techniques for supplier evaluation which are more appropriate just for ranking suppliers based on comparison among them (e.g. Olsen & Ellram, 1997; Chen et al., 2006; Sarkar & Mohapatra; 2006; Araz & Ozkarahan, 2007; Lee et al., 2009; Park et al., 2010; Chen, 2011; Zeydan et al., 2011; Rezaei & Ortt, 2013).

Also, numerous decision models consider only quantity criteria for supplier selection (Chen et al., 2006). In addition, several researchers have concerns regarding the existing methods: about mathematical rigor of AHP (Dyer, 1998); while Liang et al. (in spite of application of DEA) consider that *"it cannot be employed directly to measure the performance of supply chain and its members, because of the existence of the intermediate measures connecting the supply chain members"* (Liang et al., 2006, p. 35); also while applying fuzzy system in case of large number of suppliers and criteria *"this method is quite time consuming and the final results of ranking are very close to each other, therefore, the ranking results from this method may not be accurate"* (Amindoust et al., 2012, p. 1665).

However, even scholars emphasize the need of quantitative researches, they do not apply them or overlook the importance of integration with business strategic thinking and apply them *"without a clear rationale for choosing an appropriate objective function to be optimized"* (Huang & Keskar, 2007, p. 522).

In practice, there are also several ways and methods on how to evaluate the performance and efficiency of suppliers and how to select them. Therefore, the methodologies and the complexity of evaluations/selections cannot be discussed that easy; or – because of business confidentiality – the indeed applied methods cannot be disclosed at all. Furthermore, the mode of evaluation and its relevant aspects – we mean the aspects and items of a particular model – cannot be generalized, as we could see in this chapter as well. Therefore, there was no purpose to put questions in the survey regarding the applied methodologies for supplier selection. Instead, we inquired respondents about the supplier selection schemes during the bidding phase and their popularity.

In terms of proposed criteria, based on literature their number and types also vary significantly. Several models propose to evaluate/segment suppliers based on the evaluation of factors such as cost/price and delivery issues, product quality and technical aspects (e.g. Olsen & Ellram, 1997; Sarkar & Mohapatra, 2006; Araz & Ozkarahan, 2007; Omurca, 2013; Rezaei & Ortt, 2013).

Undisputable, cost and quality, furthermore on-time delivery and flexibility are the most dominant factors. In the late 1970s' and early 1980s' literature, there was a heavy emphasis on cost; in the early 1990s, cycle time and delivery aspects emerge, while in the late 1990s, researchers realized the importance of flexibility. Later, environmental and safety issues became the key criteria (Huang & Keskar, 2007; Dobos & Vörösmarty, 2014).

Recently, evaluation of supplier follows methodologies which identify factors such as supplier financial (still prominent criterion) and operational performance, human resource quality and compliance with processes and IT systems, as the main supplier characteristics which affect the likelihood of a supplier-connected disruption or a decrease in its performance; a supplier with a good evaluation in these categories is less likely to underperform in the chain (Trkman & McCormack, 2009). In addition, a significant part of the cited articles groups further the evaluation criteria into two (sometimes one) dimensions of supplier classification/evaluation.

Rezaei and Ortt (2013) propose a two-dimensional model to evaluate and classify suppliers based on the dimensions of capability and willingness. They consider the dimension of capability including price, quality, delivery, etc., while the dimension of willingness contains – among others – criteria such as relationship, communication openness, commitment to quality, etc.

Sarkar and Mohapatra (2006) also propose a two-dimensional model in which suppliers are segmented into motivated and de-motivated categories based on evaluating long-term capability and short-term performance.

Criteria of the long-term capability are – among others – financial capability, technological capability, quality system, production facilities, management and organization, and reputation; while short-term performance criteria are price, quality, delivery, lead time and attitude.

Olsen and Ellram (1997) propose a two-dimensional model as well: strength (intensity) of a relationship and supplier attractiveness. They argue that strength of relationship depends on economic factors, characteristics of the exchange relationship cooperation and proximity, while supplier attractiveness depends on financial, technological and organizational factors, production performance, culture, and strategy.

Omurca (2013) and Araz and Ozkarahan (2007) both propose a uni-dimensional model to group suppliers; Omurca organizes them in clusters based on 11 criteria (such as cost reduction, quality, price, delivery, quality management practices and systems, development capabilities, etc.), while Araz and Ozkarahan propose in their model – based on a set of 10 criteria (such as technology level, quality, cost reduction, delivery, ease of communication, etc.) – to evaluate and classify suppliers according to their ability and performance.

As we can see, apart from the evaluation and selection methods applied, the first step is to state the criteria to be used for evaluation, segmentation, and selection. To have a general view about of the set of criteria, we compared the ones found in the literature to the criteria we used in our survey. Based on the comparison (Figure 1), even if there is a variety of quantitative and qualitative criteria used to evaluate supplier performance, criteria such as financial terms (cost/price/payment), quality and delivery still are the most commonly used. High technological capabilities and long-term partnership, participation in common product development and supplier evaluation belong to the second group of the most commonly used criteria. It is interesting to see cost reduction (as endeavor and action) is not anymore among the most frequently used criteria.

We seek to emphasize again, indifferent from the methods along which the evaluations are made, the first and general step is to identify and select criteria for evaluation – as measurements factors – which will be applied equally to all suppliers.

Cooperation

Nowadays there is no mode to avoid supply risks and to enhance competitiveness without an efficient supply chain system. The purchased materials generally form a considerable part of the manufactured products, since *"the typical industrial firm spends more than one half of every sales dollar on purchased products"* (Dyer et al., 1998, p. 57); thus, building stable and long-term relationships between buyers and suppliers is a critical success factor of such a system (Chen et al., 2006).

Good cooperation among Procurement and Supplier can contribute significantly to produce value. Procurement should purchase goods and services using the most efficient supply chains of suppliers who can provide them the purchased materials not only at the lowest cost, best quality, and highest flexibility but also in a socially and environmentally responsible manner (Seuring & Müller, 2008; Zimmer, 2015).

Therefore, the cooperation within a given supply chain must start with the identification of supplier relationship types; all the suppliers and their "value" must be measured. Hence, companies need to optimize the classification of suppliers, to apply as effective systems as possible. The company's ability to strategically segment suppliers in such a way as to realize the benefits of the cooperation model secures the key to future competitive advantage in supply chain management (Dyer et al., 1998).

Several supplier- and supplier relationship classifications can be found in the literature; we show a few of them to give an insight into the wealth of cases:

The traditional view of suppliers is to keep them at "arm's-length" and to avoid any form of commitment, to minimize dependence on suppliers and to maximize bargaining power. Formerly this arm's-length model was widely accepted as the most effective way to manage supplier relationships. Later, based on the success of Japanese companies, the partner-type model emerged, and there was a need to consider this new type of cooperation, the partner-type model as well. However, while Japanese-style partnerships have economic benefits, some researches found that these types of relationships are costly to set them up and to maintain that cooperation since they could result in a reduced customer ability to switch away from a less efficient supplier to another one (Dyer et al., 1998).

Kraljic's (1983) in the frame of his portfolio matrix categorized the products/goods/services as non-critical, leverage, bottleneck and strategic items. Following this way of thought, we can extend these four item categories even to supplier categories, to broaden items to supply sources, consequently, to measure each supplier on the weight of supplied items.

Das and Teng (2000) group alliances (the cooperation/relationship types) into four major categories as follows: equity joint ventures, minority equity alliances, bilateral contract-based alliances, and unilateral contract-based alliances.

Baker et al. (2002) argue that relationships depend on the integration degree (e.g. vertical integration) between companies since it affects parties and determines their behavior. They distinguish two groups of relationships: transaction integrated (when the downstream party owns the asset) and transaction non-integrated (when the upstream party is an independent contractor, working with its own asset).

Araz and Ozkarahan (2007) suggest selecting and sorting suppliers based on their relations to the customer company as follows: strategic partners (''perfect'' suppliers), candidates for supplier development programs (''good'' suppliers), competitive suppliers (''moderate'' suppliers) and pruning suppliers (''bad'' suppliers).

Bensaou (1999) applies also four types of relationships: strategic partnership and market exchange, captive supplier and captive buyer. According to him, the level of investment made by either party in every type of relationship correlates significantly with the practices commonly associated with strategic partnerships and notions such as long-term relationship, cooperation, and mutual trust.

Figure 1. Frequency of used evaluation criteria (*Author's construction*)

APPEARANCE IN LITERATURE OF THE SET OF EVALUATION CRITERIA SELECTED FOR THIS PARTICULAR SURVEY		Good company reputation	Favourable payment terms	Reasonable price	Low shipping cost	Stability of the supply	Precise delivery	Short delivery time	Flexibility in schedule changes	High technological level	High product/service quality	Favourable connected services	Geographical proximity of the Supplier	Quality management system (e.g. ISO)	Participation in product development	Cost reduction	Finding the right Suppliers	Long-term partnership with Suppliers	Reducing the number of Suppliers	Evaluation of Suppliers	Management of Suppliers' relationship
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Amindoust et al. (2012)	1		■	■			■		■	■	■			■							
Araz-Ozkarahan (2007)	2		■				■							■						■	
Bensaou (1999)	3		■	■			■							■				■			
Chen (2011)	4			■					■		■				■						
Chen et al. (2006)	5						■				■										
Chin et al. (2006)	6														■					■	
Day et al. (2010)	7																■	■			■
Dyer et al. (1998)	8			■		■				■	■	■	■		■	■		■			■
García et al. (2013)	9		■				■			■	■										
Govindan et al. (2010)	10						■		■						■					■	
Huang-Keskar (2007)	11		■	■		■	■				■						■				
Jain et al. (2004)	12			■			■														
Keskin et al. (2010)	13		■											■							
Kraljic (1983)	14						■			■											
Lee et al. (2009)	15		■				■			■	■										
Lee-Drake (2010)	16		■				■														
Liang et al. (2006)	17				■															■	
Luzzini et al. (2012)	18			■			■								■						
Mohd et al. (2006)	19																	■			■
Ohdar-Ray (2004)	20																				
Olsen-Ellram (1997)	21	■	■						■												
Omurca (2013)	22	■					■				■										
Pagell et al. (2010)	23																				
Park et al. (2010)	24										■		■								
Prajogo et al. (2012)	25								■						■			■		■	
Rezaei-Ortt (2013)	26																				
Sarkar-Mohapatra (2006)	27		■									■									
Shih et al. (2009)	28						■		■												
Toni-Nassimbeni (2001)	29									■					■						
Zeydan et al. (2011)	30																			■	
No. of references		**3**	**12**	**20**	**1**	**5**	**23**	**1**	**9**	**11**	**23**	**7**	**5**	**2**	**10**	**8**	**3**	**11**	**1**	**10**	**9**

Although Cousins is on the opinion that *"partnership relationships do not exist"* (Cousins, 2002, p. 71), it is worth to consider the force of close and strategic cooperation among companies because cooperation delivers superior value (Contractor & Lorange, 2002). Cousins also acknowledged that collaborative relationships (instead of partnership relationships) exist, but these are still competitive because the parties do not trust each other. They will judge the risk on the basis of the particular business case and will decide the appropriate relationship based on the outcome (Cousins, 2002, p. 71).

Ganesan suggests that a successful long-term relationship between a buyer and supplier is the condition of mutual dependence (Ganesan, 1994).

At one point all perceptions are the same: companies should think more strategically about Supplier Management; should avoid both under-designing and over-designing of supplier relationships (Bensaou, 1999).

But a "one-size-fits-all" strategy for supplier relationship management will not be feasible; instead, each supplier should be analyzed strategically to have opportunity to determine the extent to which its product contributes to the core competence and competitive advantage of the company (Dyer et al., 1998).

Further concordant opinions in the literature are the power of (strategic) cooperation and of the governance mechanism such as trust, fairness, commitment, and reliability.

The importance of cooperation and building mutual trust still remains utmost in the digitized world, since *"trust ... lead to improved satisfaction and performance"* (Nyaga et al., 2010, p. 101). Trust means the dimension to which extent parties of the given relationship perceive one another to be credible and benevolent partner (Ganesan, 1994). Therefore, trust is undoubtedly an important variable in governing the interactional dynamics (Andersen & Kumar, 2006; Gelei & Dobos, 2016).

Literature confirms the idea that one part of a cooperation can use knowledge about another one (as levels of the same organization or in case of supplier-customer relation), to improve its own performance or the mutual performance of the members (Snehota & Håkansson, 1995; Dyer & Singh, 1998; Liang et al., 2006). The supply risks can be managed in an effective manner if all partners of that supply chain share information frequently with each other through a collaborative relationship and the members trust each other (Mohd et al., 2006).

The success of Japanese-style partnerships can be originated from the above phenomenon as well since they apply a close supplier relationship and follow a partner model behavior. They result in superior performance because partner companies i) share more information with each other, ii) invest in dedicated or relation-specific assets which lower costs, improve quality and speed product development, and iii) rely on trust to govern the relationship, a highly efficient governance mechanism that minimizes transaction costs (Dyer & Singh, 1998).

As we can see in the above parts of this chapter, there is no agreement on how to segment the suppliers; but there is a consensus on the importance of suppliers and on the necessity to classify them for a better cooperation and lower risk level; consequently, the segmentation of supplier relationships and how to name these segmentations are required activities.

Due to the fact that in practice these activities will also vary significantly from company to company, therefore, we did not aim in our survey to classify/catalog these relationships probably segmented in as many types as companies exist; nor the questionnaire and its questions were built in this sense. But we inquired our respondents about how they handle their partners, and also about the effectiveness of cooperation and its features such as trust, fairness and so on.

IT platform

Given the globalization of markets and sourcing processes, the necessity to focus on core business and the need to exchange information inside and outside companies made IT vital for companies and the entire global economy (Chae et al., 2005; Ronchi et al., 2010); therefore, information technology becomes one of the key drivers in the formation of cooperation and alliances in supply chains (Contractor & Lorange, 2002). No one, nor the professionals and managers can disregard that the EDP (Electronic Data Processing) is a must for decades in business processes (Krajlic, 1983); especially in such an area as procurement, where everything is data, information consists of figures and databases.

IT platforms as various digitized systems, applications, and tools are to provide relevant information to management to help decision making, including performance evaluation of a given activity (Szukits, 2017). Therefore, several digital solutions are available for procurement as well: transaction on the network, different platforms or cloud solutions, mobile applications, Big Data analysis and so on (Centobelli, 2013). Even Artificial Intelligence (AI), which – for instance – would be able to pull out the necessary content from thousands of contracts; in addition, by monitoring economic and/or social background, companies will be able to make forecasts, to predict whether those events could affect the relationship and cooperation with the strategic suppliers. Because all these factors finally will have an impact (positive or negative) on suppliers' performance.

Application of other technological solutions such as EDI (Electronic Data Interchange: capabilities and infrastructure regarding electronic data transfer in the supply chain for effective communication) initiates changes both in organizational architecture and processes (Centobelli, 2013), by a necessity to partly/totally reorganize them. But based on these IT investments, they will launch an undeniable positive effect on the procurement function and processes and as a consequence, e-procurement will allow increased efficiency in the organizational structure as well (Rodriguez-Escobar, 2015; Ronchi et al., 2010). Thus, Procurement should run its activity by digitized workflows (by digitized applications/tools on digitized platforms) to operate procedures at the most effective level, with secured outputs in the most transparent way.

As we can see in the literature, and since several times it happens that there is an urgent need of data (figures which can be obtained or extracted from the digitized systems and applications only), the digitized workflows and processes are must; without them it is not possible to make the purchasing procedures faster and well-monitored, to have reporting possibilities, where the status, lead times and spending can be viewed accurately and instantly.

Considering the importance of the IT platform, in order to have the opportunity to see the status and the degree of digitized systems and solutions applied by the companies, we also put concerning questions in our survey.

General thoughts about the literature

In the literature there is no clear connection between the theory of Supplier Management and its applicability in the practice; especial regarding the procurement area as a segment only of the supply chain. We argue that the presented literature is – generally – too scientific (in their original form) to be applicable/viable in the practice; on the other side, the practice will be much more complex than to discuss it – for instance – on the evaluation criteria basis only.

Furthermore, we did not find in the literature researches which process the practice (analyze and show the results), especial in comparison with the theory.

Research methodology and characteristics of survey

We decided to apply the survey research and as its tool for data collection the survey; we consider the survey to be an appropriate method for the present research since it is a means for gathering information about the characteristics, actions or opinions of people (Pinsonneault & Kraemer, 1993). The survey research has the features which we were looking for: it is used to quantitatively describe specific aspects, several variables can be originated from it, which allow examining the relationships among these variables.

The research was carried out between 2017 Q4 and 2018 Q1-Q2 time interval. The mode of inquiry was an online survey, where the questionnaire was available on Hungarian online platforms of professionals and via direct emails. Some parts of the questionnaire (partial questions) were adapted from International Purchasing Survey (IPS - Rotterdam School of Management, Erasmus University, The Netherlands) and others from Competitiveness Survey of Corvinus University (Competitiveness Research Centre, Institute of Business Economics, Corvinus University of Budapest).

The number of respondents was 57, 80% of them procurement directors or managers. Regarding the corporate structure, the respondents' companies in more than 60% of cases belonged to the manufacturing industry and in more than 70% they were multinational and large companies.

The mode of examination of the answers was on one hand, the comparison of our examination factors (i.e. evaluation criteria) to the literature to see whether there is overlap among them, on the other hand we apply Cross-table Analysis – by SPSS – to analyse whether relationships exist among variables (answers and/or criteria) and if so, to reveal the strength of connections.

Research hypothesis and questions

Despite the increasing importance of SM, our hypothesis is that there are several deficiencies in the procurement processes.

We argue that the factors which improper handling could weaken and jeopardize – or contrarily strengthen – the procurement processes can be originated from the segments of Supplier Management:

i) supplier evaluation and selection: application of improper evaluation criteria and/or tools in practice, ii) cooperation: there are deficiencies in relationships, iii) IT platforms: there are lack of proper IT systems.

Therefore, we aimed to examine – through the questionnaire – the status of procurement practice in terms of the three discussed areas to see whether the features of the literature could be identified in the practice.

Nevertheless, we extended the survey from the simple inquiry about the evaluation criteria, cooperation type with the suppliers and mode of application of the IT systems (i.e. from the theoretically reviewed parts), to a broader pool of questions, putting more (others) of them in connection with the various aspects of practice; following this approach we had the opportunity to interpret widely the professional status of organizations.

We seek answers – among others – of the following questions:
1. Supplier selection and evaluation:
   Whether the applied evaluation criteria are in line with the ones recommended by literature?
   How serious accent do the companies put on supplier evaluation?
   What kind of supplier selection schemes do they apply?

It was expected that supplier evaluation and selection are not in line with the literature and the applied criteria still have too much emphasis on financial aspects.

2. Cooperation:
   How do the companies handle their suppliers?
   How effective do they consider the cooperation to be?

Our hypothesis was there are several deficiencies in terms of cooperation, on one hand in the mode of how to handle the suppliers, on the other hand in the effectiveness of cooperation.

3. IT platform:
   What is the degree of digitized solutions?
   Whether the applied IT platforms are in line with the actual requirements?

We supposed that the penetration of digitized applications and systems is too poor and too many processes still are conducted without IT support.

Findings of research

In this chapter we enlist the findings of research in that manner to follow the stated segments of Supplier Management.

Supplier selection and evaluation

Instead to put questions in the survey regarding the applied methodologies for supplier selection (because it cannot be disclosed and/or generalized at all, as we see in Chapter II), we inquired, and Figure 2. shows some selection schemes during the bidding phase and their popularity.

Figure 2. Popularity of supplier selection schemes during bidding (*Author's construction*)
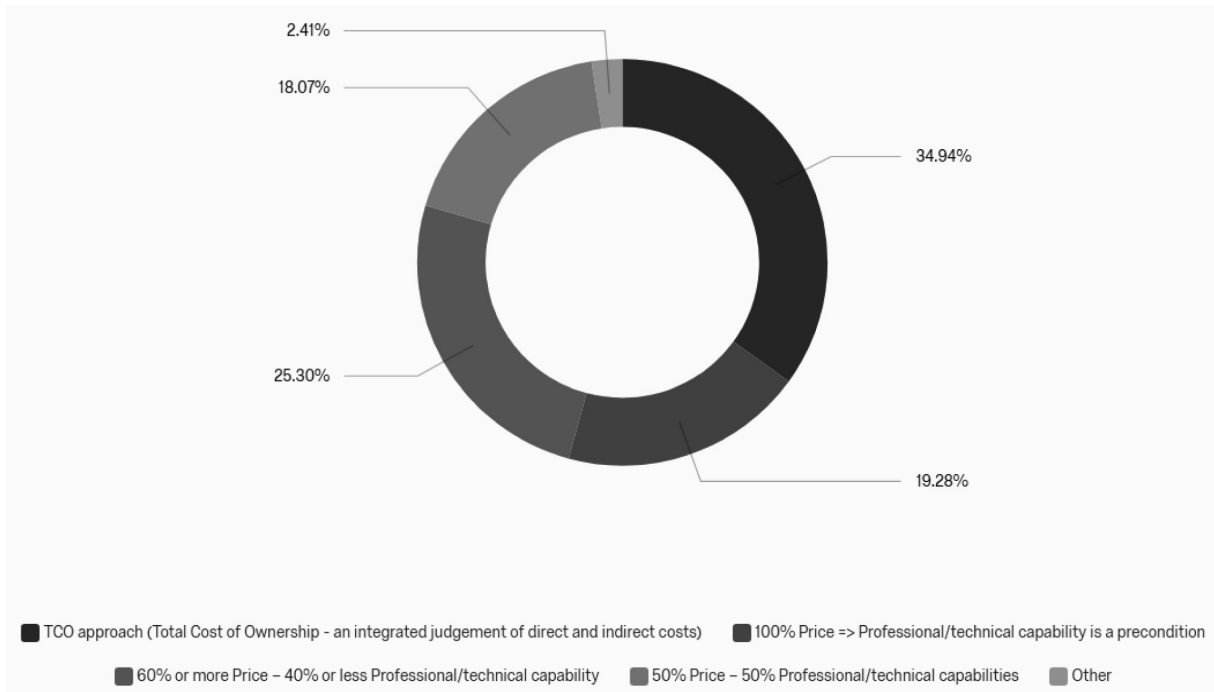
As the results depict, a heavy emphasis still is on the price aspects; nevertheless, fortunately – and as a step towards systems thinking – the TCO (Total Cost of Ownership) is the most popular (34,94%) selection scheme.

Figure 3. describes the results of the survey in connection with the evaluation tools used in practice by the respondents; besides their types, we can see their popularity/frequency in the application. There is a possibility to

Figure 3. Supplier evaluation tools (*Author's construction*)
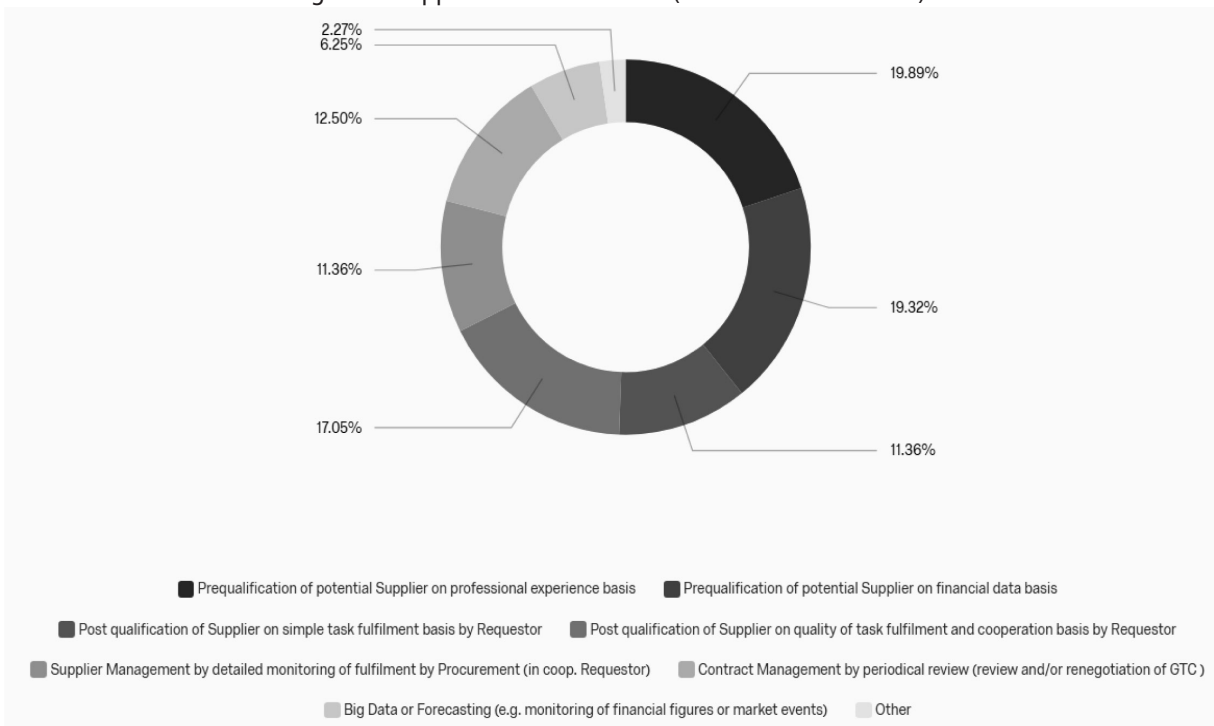
state some ascending order among the tools based on their complexity from the simplest prequalification to a more complex tool such as Big Data.

As we can see there is a quite equal spread of tools among the most popular/used ones, it seems that none of them precede the others significantly.

In Figure 4. we show how important respondents consider evaluation criteria in their Supplier Management practice. Based on respondents' answers criteria with the highest importance level (above 50%) are price, delivery, the stability of supply and high quality. The findings are in line with the frequency/popularity of criteria experienced in the literature and depicted in Chapter II.

Figure 4. Importance of evaluation criteria in Supplier Management (*Author's construction*)

IMPORTANCE OF EVALUATION CRITERIA IN SUPPLIER MANAGEMENT		Not at all		Slightly important		Neutral		Very important		Completely	
Good company reputation	1	3.51%	2	3.51%	2	28.07%	16	54.39%	31	10.53%	6
Favourable payment terms	2	5.26%	3	1.75%	1	14.04%	8	49.12%	28	29.82%	17
Reasonable price	3	0.00%	0	0.00%	0	5.26%	3	36.84%	21	57.89%	33
Low shipping cost	4	0.00%	0	5.26%	3	31.58%	18	38.60%	22	24.56%	14
Stability of the supply	5	1.75%	1	0.00%	0	7.02%	4	29.82%	17	61.40%	35
Precise delivery	6	0.00%	0	1.75%	1	7.02%	4	29.82%	17	61.40%	35
Short delivery time	7	0.00%	0	3.51%	2	24.56%	14	50.88%	29	21.05%	12
Flexibility in schedule changes	8	1.75%	1	3.51%	2	15.79%	9	45.61%	26	33.33%	19
High technological level	9	0.00%	0	3.51%	2	21.05%	12	47.37%	27	28.07%	16
High product/service quality	10	0.00%	0	0.00%	0	7.14%	4	39.29%	22	53.57%	30
Favourable connected services	11	7.27%	4	9.09%	5	40.00%	22	32.73%	18	10.91%	6
Geographical proximity of the Supplier	12	3.51%	2	15.79%	9	45.61%	26	29.82%	17	5.26%	3
Quality management system (e.g. ISO)	13	0.00%	0	5.26%	3	31.58%	18	33.33%	19	29.82%	17
Participation in product development	14	10.53%	6	8.77%	5	40.35%	23	35.09%	20	5.26%	3
Cost reduction	15	1.75%	1	8.77%	5	10.53%	6	36.84%	21	42.11%	24
Finding the right Suppliers	16	0.00%	0	1.79%	1	8.93%	5	42.86%	24	46.43%	26
Long-term partnership with Suppliers	17	5.26%	3	3.51%	2	15.79%	9	45.61%	26	29.82%	17
Reducing the number of Suppliers	18	8.93%	5	10.71%	6	42.86%	24	35.71%	20	1.79%	1
Evaluation of Suppliers	19	5.26%	3	1.75%	1	19.30%	11	47.37%	27	26.32%	15
Management of Suppliers' relationship	20	5.36%	3	3.57%	2	23.21%	13	48.21%	27	19.64%	11

Due to the continuously changing environment, respondents evaluated both the importance of stability in supply (61,40%) and the precise delivery (61,40%) at the highest ('completely') level, while the reasonable price is also ranked (still considered) at one of the most important criteria (57,89%). The next one best-ranked criterion is high quality (53,57%).

The short delivery time is considered very important (50,88%), while the geographical proximity of the Supplier is placed to a lower position with a distinctive neutral (45,61%) or slightly important (15,79%) ranking.

The reputation of the company ('good company reputation') is becoming increasingly important (54,39%) which phenomenon also confirms the importance of the relational capital.

Conversely, there is not enough emphasis – despite the relevant literature and expertise – on the common product development in Hungary, since the participation in product development is positioned at neutral (40,35%) or 'Not at all' (10,53%) importance level.

The criterion reduction the number of suppliers seems to be the least important, since it was selected neutral (42,86%), or slightly important (10,71%) or not at all (8,93%). This judgment of this criterion is also in line with the literature.

As we have already had the set of criteria, in addition, we strived to reveal whether there are relevant connections among them, and if so, to see their strength; therefore, Figure 5. is to show the results of the Cross-table analysis on a 5% significance level, where the pairwise relationship-significance is stated on p-value basis.

Figure 5. Strength of connections of evaluation criteria (*Author's construction*)

STRENGTH OF CONNECTIONS: SUPPLIER EVALUATION CRITERIA IN SUPPLIER MANAGEMENT by Chi-Square tests results on a 5% significance level (> 0,05 / ≤ 0,05 / ≤ 0,01)		Good company reputation	Favourable payment terms	Reasonable price	Low shipping cost	Stability of the supply	Precise delivery	Short delivery time	Flexibility in schedule changes	High technological level	High product/service quality	Favourable connected services	Geographical proximity of the Supplier	Quality management system (e.g. ISO)	Participation in product development	Cost reduction	Finding the right Suppliers	Long-term partnership with Suppliers	Reducing the number of Suppliers	Evaluation of Suppliers	Management of Suppliers' relationship
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Good company reputation	1	■	0,000	0,673	0,000	0,000	0,000	0,001	0,000	0,000	0,159	0,003	0,001	0,513	0,005	0,003	0,000	0,000	0,004	0,153	0,000
Favourable payment terms	2	0,000	■	0,381	0,012	0,956	0,939	0,406	0,459	0,376	0,849	0,338	0,190	0,384	0,343	0,001	0,929	0,140	0,674	0,264	0,014
Reasonable price	3	0,673	0,381	■	0,091	0,100	0,677	0,025	0,279	0,803	0,121	0,427	0,465	0,176	0,934	0,003	0,650	0,560	0,699	0,592	0,468
Low shipping cost	4	0,000	0,012	0,091	■	0,000	0,005	0,082	0,000	0,000	0,151	0,005	0,108	0,224	0,002	0,003	0,933	0,150	0,147	0,726	0,004
Stability of the supply	5	0,000	0,956	0,100	0,000	■	0,000	0,000	0,000	0,000	0,000	0,000	0,775	0,316	0,280	0,695	0,049	0,000	0,002	0,013	0,000
Precise delivery	6	0,000	0,939	0,677	0,005	0,000	■	0,000	0,000	0,000	0,000	0,000	0,870	0,221	0,206	0,945	0,259	0,000	0,001	0,022	0,000
Short delivery time	7	0,001	0,406	0,025	0,082	0,000	0,000	■	0,000	0,001	0,179	0,038	0,050	0,295	0,557	0,314	0,088	0,080	0,079	0,854	0,042
Flexibility in schedule changes	8	0,000	0,459	0,279	0,000	0,000	0,000	0,000	■	0,000	0,000	0,000	0,028	0,632	0,002	0,002	0,244	0,000	0,001	0,325	0,000
High technological level	9	0,000	0,376	0,803	0,000	0,000	0,000	0,001	0,000	■	0,000	0,074	0,062	0,162	0,001	0,001	0,768	0,000	0,004	0,243	0,000
High product/service quality	10	0,159	0,849	0,121	0,151	0,000	0,000	0,179	0,000	0,000	■	0,000	0,247	0,007	0,158	0,818	0,366	0,001	0,022	0,003	0,001
Favourable connected services	11	0,003	0,338	0,427	0,005	0,000	0,000	0,038	0,000	0,074	0,000	■	0,075	0,389	0,100	0,201	0,058	0,000	0,032	0,080	0,011
Geographical proximity of the Supplier	12	0,001	0,190	0,465	0,108	0,775	0,870	0,050	0,028	0,062	0,247	0,075	■	0,255	0,342	0,003	0,265	0,208	0,578	0,923	0,314
Quality management system (e.g. ISO)	13	0,513	0,384	0,176	0,224	0,316	0,221	0,295	0,632	0,162	0,007	0,389	0,255	■	0,024	0,124	0,107	0,703	0,628	0,215	0,383
Participation in product development	14	0,005	0,343	0,934	0,002	0,280	0,206	0,557	0,002	0,001	0,158	0,100	0,342	0,024	■	0,254	0,165	0,011	0,087	0,116	0,000
Cost reduction	15	0,003	0,001	0,003	0,003	0,695	0,945	0,314	0,002	0,001	0,818	0,201	0,003	0,124	0,254	■	0,196	0,000	0,081	0,299	0,019
Finding the right Suppliers	16	0,000	0,929	0,650	0,933	0,049	0,259	0,088	0,244	0,768	0,366	0,058	0,265	0,107	0,165	0,196	■	0,000	0,067	0,239	0,020
Long-term partnership with Suppliers	17	0,000	0,140	0,560	0,150	0,000	0,000	0,080	0,000	0,000	0,001	0,000	0,208	0,703	0,011	0,000	0,000	■	0,020	0,193	0,000
Reducing the number of Suppliers	18	0,004	0,674	0,699	0,147	0,002	0,001	0,079	0,001	0,004	0,022	0,032	0,578	0,628	0,087	0,081	0,067	0,020	■	0,116	0,001
Evaluation of Suppliers	19	0,153	0,264	0,592	0,726	0,013	0,022	0,854	0,325	0,243	0,003	0,080	0,923	0,215	0,116	0,299	0,239	0,193	0,116	■	0,003
Management of Suppliers' relationship	20	0,000	0,014	0,468	0,004	0,000	0,000	0,042	0,000	0,000	0,001	0,011	0,314	0,383	0,000	0,019	0,020	0,000	0,001	0,003	■

- There is a "nodule point" which consists of a group of factors – from 4 to 11 – where we can see significant connections; these factors have a quite strong connection to each other, and they are connected (mainly) to supply, delivery and technological level. This phenomenon is in line with the importance of the factors decided by respondents, and also in line with the popularity suggested by literature.
- There are no significant connections among factor 2 (Favourable payment terms) and factor 3 (Reasonable price) and other factors; except for the factor 15 (Cost reduction).
- Factor 1 (Good company reputation) has the biggest number of significant connections to other factors which confirms the emerging importance of this criterion.
- Factor 20 (Management of Suppliers' relationship) has the second rank in the number of significant connections to other factors, such as price, delivery, technological and quality level; this also emphasizes the importance of Supplier Management.

- There are also significant connections among factor 20 (Management of Suppliers' relationship) and other factors (such as Long-term partnership with Suppliers and Evaluation of Suppliers), also related to a conscious Supplier Management.

Cooperation

Considering that our intention was to avoid the classification of suppliers in a not uniform manner (by different approaches of companies), thus we applied three simple categories to group them (Figure 6): partners, competitors and sources of materials/goods/services.

To the question "How do you consider and handle your Supplier?" we got answers as follows: no one considers its supplier to be a competitor of the company, while almost 80% of respondents consider and handle their suppliers as partners; a considerable percentage of respondents (more than 20%) still classify their suppliers as a simple material source. The question is – and further research should confirm – whether this category is equal to "arm's-length" category and viewpoint, in order to keep suppliers at that distance where it is possible for the buyer to preserve its independence from any commitment.

Figure 6. Classification of suppliers (*Author's construction*)
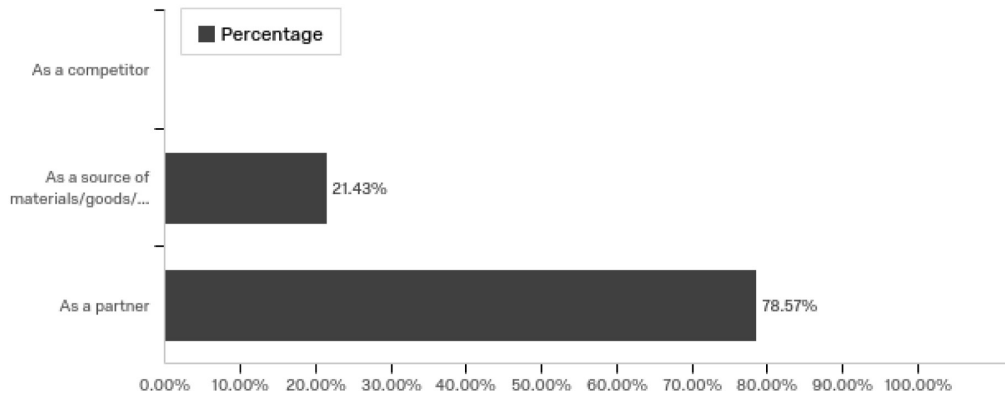
We also analyzed the relation between criteria Supplier Management effectiveness (as an existing system) and importance of management of Suppliers' relationship (as an activity), in other words as a part of procurement work. We find a connection between variables because the result of the analysis showed that if the company consider more important the suppliers' relationship management, also the effectiveness of SM will be better. The relationship (on a 5% significance level) between variables was significant (Pearson Chi-Square: 23,621, p-value: 0,023 and Exact sig: 0,024).

Due to IT solutions and according to the professional practice, the proportion of personal contacts decreases day by day. Even though there is an increasing emphasis on digital solutions, these, however, do not always replace personal connections. Also, in practice there is not enough emphasis on on-the-spot audits, although this would be one of the simplest methods for assessing supplier's proper conditions or the possible risks. Since today we must be more conscious in the evaluation and selection of Suppliers, the onsite audit could help more in this sense: as it is said *"go and see for yourself to thoroughly understand the situation"* ("Genchi Genbutsu" i.e. "Go and See" from TPS – Toyota Production System).

Figure 7 shows, on one hand, the percentage of meetings in person between buyer-supplier, while on the other hand the percentage of audits at suppliers' side; both are at the same level and extremely low (21%), however, the personal contacts ensure much smoother cooperation and an increased trust level between parties, it seems that in practice there is not enough accent on these personal connections.

Considering the above findings, there is a crucial need to increase the proportion of the face-to-face meetings in some cases, because it could strengthen the trust and the relational capital between parties better than anything else; one personal meeting could count more than hundreds of impersonal letters (emails).

We also tried to reveal whether there are significant connections between governance mechanisms (GM, such as trust, fairness, reliability, punctuality, and cooperation itself, as requirements on both Supplier and Procurement side) and other criteria, such as effectiveness of Supplier Management, the nature of cooperation (in terms of common goals) and the supplier segmentation; we tried to see which conditions and to what extent do ensure a good cooperation between Procurement and Suppliers and an effective Supplier Management.

Figure 8 is to show the results of the Cross-table analysis, where the pairwise relationship-significance is also stated on the p-value basis.

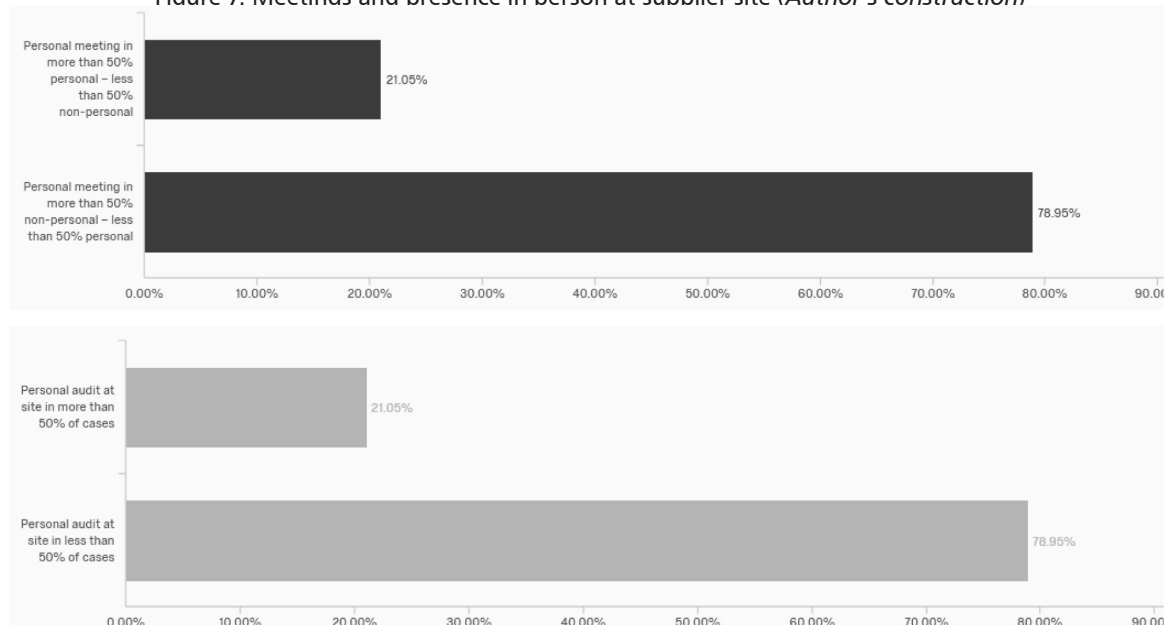Figure 7. Meetings and presence in person at supplier site (*Author's construction*)

Figure 8. Strength of connections of GM factors and other aspects (*Author's construction*)

STRENGTH OF CONNECTIONS: GOVERNANCE MECHANISM FACTORS AND OTHER ASPECTS by Chi-Square tests results on a 5% significance level $\leq$ 0,05		PROCUREMENT – Fairness	PROCUREMENT – Trust	PROCUREMENT – Reliability	PROCUREMENT – Punctuality	PROCUREMENT – Cooperation	SUPPLIER – Fairness	SUPPLIER – Trust	SUPPLIER – Reliability	SUPPLIER – Punctuality	SUPPLIER – Cooperation
		1	2	3	4	5	6	7	8	9	10
Effectiveness of SM	1	0,139	0,684	0,083	0,250	0,434	0,077	0,948	0,164	0,037	0,056
Cooperation with Suppliers	2	0,727	0,040	0,704	0,413	0,321	0,319	0,779	0,454	0,659	0,892
Treatment of Suppliers	3	0,122	0,588	0,480	0,792	0,025	0,779	0,315	0,763	0,748	0,363

We find a connection between variables at those pairs where the intersection of variable shows to be significance between criteria on a 5% significance level. There are significant relationships among criteria if:

- effective Supplier Management is accompanied from the supplier side by punctuality and cooperative attitude,
- there will be good cooperation with suppliers if procurement trust supplier,
- treatment of supplier is appropriate in such a case when a cooperative attitude of procurement exists towards the supplier.

Based on the findings of the survey, the lesson to be drawn is the better cooperative behavior and trust exist between parties of the supply chain (buyers-suppliers), the more effective Supplier Management and smoother cooperation will be in that particular relationship, so, the more unlikely risks will be.

IT platform

This chapter is to depict the degree of digitization, more exactly to give information about the penetration (percentage) and type of applied IT systems/solutions/applications.

Figure 9. shows the result of the survey in respect of the degree of digitized workflows: as a positive result, almost 70% of respondents responded that i) there is 80-20% the proportion of electronic-paper-based processes (60,34%) or there are not at all paper-based processes at their company (8,62%).

However, more than 30% belongs to workflows which are digitized in the proportion of 50-50% only (22,41%) or the workflows are mostly or totally paper-based (altogether 8,62%).

In Figure 10. we collected the spread and types of the digitized IT-platforms (systems/solutions/ applications) applied which can support the purchasing operations, procedures and workflows.

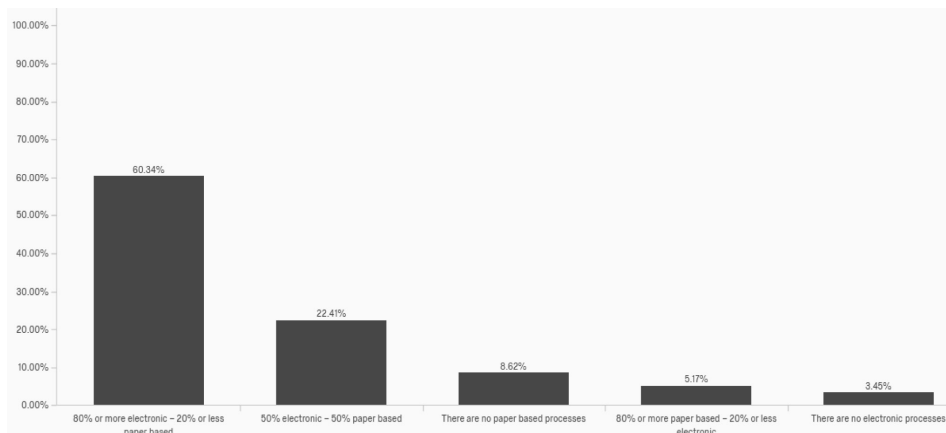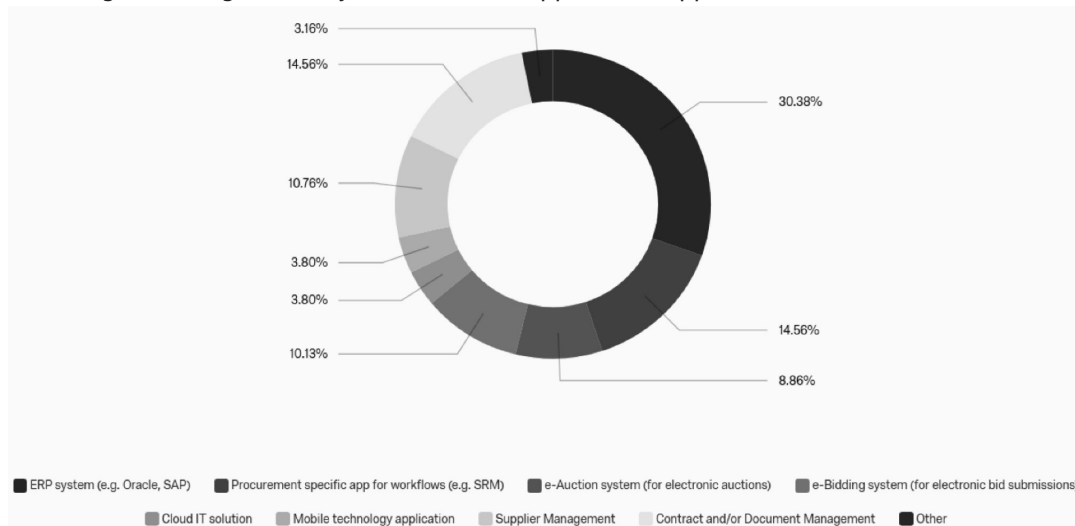Figure 9. Proportion of digitized workflows (A*uthor's construction*)

Figure 10. Digitized IT systems/solutions/applications applied (*Author's construction*)

Most of the companies own some digitized IT systems/solutions/applications, however, their proportion is not yet satisfactory enough; especial considering that majority of companies are manufacturer ones, therefore the lack of ERP system – only 30% of them have such a system – is an alarming phenomenon.

Discussion of findings and concluding remarks

We strive to summarize in this chapter the research findings in comparison to the literature and to our hypothesis and questions.

Supplier selection and evaluation

Considering that in the nowadays global economy and open innovativeness when it is must developing products', services' and suppliers' performance simultaneously, strategic supplier evaluation and selection decisions cannot be based on traditional selection criteria only, such as cost, quality, and delivery (Araz & Ozkarahan, 2007).

In the past, procurement managers focused (mainly) on cost reduction (Kraljic, 1983); recently, they should give importance to stability and continuity of supply, to flexibility and good relationship between partners, because all of them will ensure competitive advantages to the company; many other criteria should be also considered such as to acquire supplier management practices and skills, to develop long-term supplier relationships, to enhance quality management, to strengthen financial results, to increase technology and innovativeness level and so on (Snehota & Håkansson, 1995; Dyer & Singh, 1998).

There is a consensus on that viewpoint that in order to build durable and supporting relationships the increasing importance of well-established and prudent evaluation models and tools is indisputable. Leaders strongly believe that the above objectives can be achieved through an effective Supplier Management system. Therefore, companies need proper tools to monitor and evaluate supplier's performance, to select key suppliers or develop promising suppliers for strategic partnership, to support suppliers in common engineering activities, even to provide feedback to suppliers about their weaknesses and how to enhance them (Araz & Ozkarahan, 2007).

To have a real opinion about suppliers and their capabilities, the main rule is that all suppliers should be evaluated several times. Generally, in case of a potential supplier (to become a new partner) the prequalification will be a strong requirement to see clearly the strength and weakness of the future partner, so to reduce the supply risk. As minimum requirement (and – for instance – during the bidding procedure and supplier selection), the supplier will be evaluated before to conclude a contract. Also, during the cooperation supplier will (should) be periodically evaluated based on tasks fulfillment.

Those companies which have some quality assurance system (e.g. possess an ISO certification) the supplier evaluation must be done regularly, at least once a year in order to control the supplier's performance, whether it still is in line with the original (first) evaluation and requirements set by assurance system standards and/or with the contract in force.

As we can see in the figures of the survey regarding the evaluation tools, we can state that all the evaluation means (several types of pre- and post-qualifications) are applied by companies.

Also, the evaluation criteria used in practice generally are in line with the literature; the most popular criteria are the stability of the supply and precise delivery, reasonable price and high product/service quality. The hypothesis that the companies apply improper evaluation criteria and/or tools in practice is not confirmed.

In terms of selection schemes, however, there is still a quite big accent on prices as well, but the TCO approach is becoming more popular; the financial aspects (more exactly a part of them) have to be replaced by other evaluation criteria which are in line with the today's requirements.

Cooperation

The literature recommends applying a well-balanced relationship network, where the weight and value of suppliers and of relationships with them are measured based on the real risk of each cooperation. Researchers also suggest managing suppliers in that way to make them committed to the company forming a well-functioning business network, because the network is more effective than a single firm, due to the generation, transfer, and recombination of knowledge at several levels; also the cooperative participants of a supply chain can incorporate in

their own strategies the aptitudes, capabilities, and performance of their partners (Dyer & Nobeoka, 2000; Gereffi et al., 2005; Håkansson & Snehota, 1995; Håkansson & Snehota, 2006).

Based on the findings of research the proportion of companies who treat their supplier as partners is almost 80%; nevertheless, the remaining part is too large if companies intend to develop well-established networks. A single exception could be, if the endeavor of them is to keep supplier at "arm's-length" distance; but even in this case such an evaluation of partners ("simple source") cannot be a generalized concept, it could be applied after a prudent segmentation of suppliers.

Good relationships and well-working governance mechanism of these relationships can be best achieved through reliable business cooperation and enhanced by personal meetings to increase the relational capital which exists between buyers and suppliers (Dyer & Singh, 1998; Cousins et al., 2006). But as we can see, nowadays there is not anymore enough accent on personal relationships, however, they will result in a smoother bilateral and barrier-free cooperation and will strengthen the relational capital. This will also make more attractive both buyers and suppliers to each other and the projection of such a relationship on cooperation would generate governance mechanisms such as trust, fairness, and commitment (Ganesan, 1994; Baker et al., 2002; Andersen & Kumar, 2006).

Based on results, it seems that the companies have realized the importance of relationships and the function of governance mechanisms, and they consider the cooperation to be effective enough. Despite this feeling, the phenomenon of rare personal connections confirms that there still are deficiencies in terms of cooperation.

IT platform

The opportunity offered by digital technologies to make deep rationalization in the purchase of goods and materials is becoming indispensable in competition among enterprises, taking into consideration the positive effects in reducing costs and process lead-time of the companies which adopted e-procurement solutions (Centobelli, 2013). Digitization and digital solutions can help procurement to achieve an outstanding level of how to handle the enablers (inputs/information): to improve a comprehensive procurement intelligence, to deal with faster procurement processes and solutions, to accelerate the decisions by a better access to information, to boost flexibility in working, and finally to reduce costs. The companies who still use paper-based and labor-intensive processes for procurement freeze a large scale of inefficiencies in their processes (Puschmann & Rainer, 2005).

Therefore, within a short time, the proportion of digitized processes and applications – in order to maintain competitiveness – will be acceptable ones at a 100% level only.

As we see, despite the importance of IT platform and apart from the recommendation of literature, the degree of digitization in inquired companies in not yet satisfactory; more than 30% of companies still apply paper-based workflows in more than half of processes.

Also, the proportion of applied systems, especial in case of ERP systems, is alarming, since only 30% of companies own such a system, but the ERP system is one of the crucial supporting means in case of production. In this case, the hypothesis is definitely confirmed, serious deficiencies exist in the IT architecture.

Besides the findings of the research discussed above, in order to emphasize the most important parts of SM, we have some pieces of advice:

1. We recommend increasing the performance of Supplier Management in terms of tools applied for evaluation and selection schemes used.
2. We propose to focus more on inter-organizational cooperation and strategic sourcing to follow an adequate treatment of suppliers – as partners for a continuous and stable supply – furthermore, to ensure proper importance to personal cooperation as well, to enhance further the relational capital and governance mechanisms such as trust.
3. We suggest to introduce and use as many digitized solutions as possible to secure a continuous monitoring and instant reporting.

If procurement conducts a proper Supplier Management which has a key role in risk mitigation and the discussed factors are treated at their proper importance, this approach will assure to the company an effective and rationalized way of operations and will lead to optimized functions and outstanding business results.

Theoretical contribution and practical implications, limitation of research

This article was written to project attention on the (past) routines and/or on existing ones, and to reveal the deficiencies and/or strengths to have opportunity to align them to the new challenges. The revealed features and the practices of procurement professionals could serve as inspiration for other companies or could shed light on the problems.

The theoretical contribution of the paper is to investigate the relation between Supplier Management theory and practice in Hungary to state whether gaps exist between them. From the managerial implication point of view, the novelty of the article is the endeavor to analyze the applicability of relevant literature in SM practice.

Since the paper shows concrete results of a research and also, formulates suggestions for a more efficient SM practice, the paper seeks to be a guide for practitioners how to strengthen the effectiveness of procurement organizations, where to find the deficiencies. Therefore, we believe it has a considerable contribution to the stream of the relevant researches.

This article depicts aspects and status of – mainly – Hungarian procurement organizations and their Supplier Management. Also, the practices have been studied from the procurement perspective, therefore, the paper does not try to evaluate these issues from the suppliers' point of view. Therefore, the findings cannot be generalized at all.

Furthermore, the result of research – considering the number of respondents (no. of participating companies) cannot be considered representative; that is why it remains an open question whether the answers really reflect the present situation. If not, there is another question whether the quite small sample or a possible euphemism attitude (that maybe was used in the answers) distorted the results in comparison to the existing situation and applied practice, and if so, to what extent?

References

Amindoust, A., Ahmed, S., Saghafinia, A., & Bahreini-nejad, A. (2012). Sustainable supplier selection: a ranking model based on fuzzy inference system. *Applied Soft Computing, 12*(6), 1668-1677.

Andersen, P.H. & Kumar, R. (2006). Emotions, trust and relationship development in business relationships: A conceptual model for buyer–seller dyads. *Industrial Marketing Management, 35*(4), 522-535.

Araz, C. & Ozkarahan, I. (2007). Supplier evaluation and management system for strategic sourcing based on a new multicriteria sorting procedure. *International Journal of Production Economics, 106*(2), 585-606.

Baker, G., Gibbons, R., & Murphy, K.J. (2002). Relational Contracts and the Theory of the Firm. *The Quarterly Journal of Economics, 117*(1), 39-84.

Bendixen, M. & Abratt, R. (2007). Corporate Identity, Ethics and Reputation in Supplier-Buyer Relationships. *Journal of Business Ethics, 76*(1), 69-82.

Bensaou, M. (1999). Portfolios of buyer-supplier relationships. *MIT Sloan Management Review, 40*(4), 35-44.

Bruno, G., Esposito, E., Genovese, A., & Passaro, R. (2012). AHP-based approaches for supplier evaluation: Problems and perspectives. *Journal of Purchasing and Supply Management,* 18, 159-172.

Carter, P.L., Carter, J.R., Monczka, R.M., Slaight, T.H., & Swan, A.J. (2000). The Future of Purchasing and Supply: A Ten-Year Forecast. *Journal of Supply Chain Management, 36*(4), 14-26.

Centobelli, P., Cerchione, R., Converso, G., & Murino, T. (2014). E-procurement and E-supply Chain: Features and Development of E-collaboration. *IERI Procedia,* 6, 8-14.

Chen, Y.J. (2011). Structured methodology for supplier selection and evaluation in a supply chain. *Information Sciences, 181*(9), 1651-1670

Chen, C.T., Lin, C.T., & Huang, S.F. (2006). A fuzzy approach for supplier evaluation and selection in supply chain management. *International Journal of Production Economics,* 102, 289–301.

Chin, K.S., Yeung, I.K., & Pun, K.F. (2006). Development of an assessment system for supplier quality management. *International Journal of Quality and Reliability Management, 23*(7), 743-765.

Choi, T.Y. & Kim, Y. (2008). Structural embeddedness and supplier management: A network perspective. *Journal of Supply Chain Management, 44*(4), 5-13.

Contractor, F.J. & Lorange, P. (2002). The growth of alliances in the knowledge-based economy. *International Business Review, 11*(4), 485–502.

Cousins, P.D. (2002). A conceptual model for managing long-term inter-organisational relationships. *European Journal of Purchasing and Supply Management, 8*(2), 71-82.

Cousins, P.D., Handfield, R.B., Lawson, B., & Petersen, K.J. (2006). Creating Supply Chain Relational Capital: The Impact of Formal and Informal Socialization Processes. *Journal of Operations Management, 24*(6), 851-863.

Croom, S., Romano, P., & Giannakis, M. (2000). Supply chain management: an analytical framework for critical literature review. *European Journal of Purchasing and Supply Management, 6*(1), 67-83.

Day, M., Magnan, G.M., & Moeller, M.M. (2010). Evaluating the bases of supplier segmentation: A review and taxonomy. *Industrial Marketing Management, 39*(4), 625-639.

Das, T.K. & Teng, B.S. (2000). A resource-based theory of strategic alliances. *Journal of Management, 26*(1), 31-61.

De Felice, F., Deldoost, M.H., Faizollahi, M., & Petrillo, A. (2015). Performance Measurement Model for the Supplier Selection Based on AHP. *International Journal of Engineering Business Management, 7*(17), 1-13.

Dobos, I. & Vörösmarty, Gy. (2014). Green supplier selection and evaluation using DEA-type composite indicators. *International Journal of Production Economics,* 157, 273-278.

Dyer, J.H., Cho, D.S., & Chu, W. (1998). Strategic supplier segmentation: the next "best practice" in supply chain management. California Management Review, 40(2), 57-77.

Dyer, J.H. & Nobeoka, K. (2000). Creating and managing a high-performance knowledge-sharing network: the Toyota case. *Strategic Management Journal,* 21, 345-367.

Dyer, J.H. & Singh, H. (1998). The relational view: cooperative strategy and sources of interorganizational competitive advantage. *Academy of Management Review, 23*(4), 660-679.

Ganesan, S. (1994). Determinants of long-term orientation in buyer–seller relationships. *Journal of Marketing, 58*(2), 1-19.

García, N., Puente, J., Fernández, I., & Priore, P. (2013). Supplier selection model for commodities procurement. Optimised assessment using a fuzzy decision support system. *Applied Soft Computing, 13*(4), 1939-1951.

Gelei, A. & Dobos, I. (2016). Mutual trustworthiness as a governance mechanism in business relationships: A dyadic data analysis. *Acta Oeconomica, 66*(4), 661-684.

Gereffi, G., Humphrey, J., & Sturgeon, T. (2005). The governance of global value chains. *Review of International Political Economy, 12*(1), 78-104.

Govindan, K., Kannan, D., & Haq, A.N. (2010). Analyzing supplier development criteria for an automobile industry. *Industrial Management and Data Systems, 110*(1), 43-62.

Handfield, R., Petersen, K., Cousins, P., & Lawson, B. (2009). An organizational entrepreneurship model of supply management integration and performance outcomes. *International Journal of Operations and Production Management, 29*(2), 100-126.

Huang, S.H. & Keskar, H. (2007). Comprehensive and configurable metrics for supplier selection. *International Journal of Production Economics, 105*, 510–523.

Jain, V., Tiwari, M.K., & Chan, F.T.S. (2004). Evaluation of the supplier performance using an evolutionary fuzzy-based approach. *Journal of Manufacturing Technology Management, 15*(8), 735-744.

Keskin, G.A., Ilhan, S., & Özkan, C. (2010). The Fuzzy ART algorithm: a categorization method for supplier evaluation and selection. *Expert Systems with Applications, 37*(2), 1235-1240.

Kraljic, P. (1983). Purchasing must become supply management. *Harvard Business Review, 61*(5), 109-117.

Lee, E.K., Ha, S., & Kim, S.K. (2001). Supplier selection and management system considering relationships in supply chain management. *IEEE Transactions on Engineering Management, 48*(3), 307-318.

Lee, A.H.I, Chan, H.J., & Huang, C.Y. (2009). An evaluation model of buyer–supplier relationships in high-tech industry – the case of an electronic components manufacturer in *Taiwan. Computers and Industrial Engineering, 5*7(4), 1417-1430.

Lee, D.M. & Drake, P. (2010). A portfolio model for component purchasing strategy and the case study of two South Korean elevator manufacturers. *International Journal of Production Research, 48*(22), 6651-6682.

Liang, L., Yang, F., Cook, W.D., & Zhu, J. (2006). DEA models for supply chain efficiency evaluation. *Annals of Operations Research, 145*, 35-49.

Lima-Junior, F.R. & Carpinetti, L.C.R. (2016). Combining SCOR model and fuzzy TOPSIS for supplier evaluation and management. *International Journal of Production Economics, 174*, April, 128-141.

Lőrincz, N. (2018). Being an investment target in CEE - Country attractiveness and near-shoring. Vezetéstudomány/Budapest Management Review, XLIX (5), 47-54.

Luzzini, D., Caniato, F., Ronchi, S., & Spina, G. (2012). A transaction costs approach to purchasing portfolio management. *International Journal of Operations and Production Management, 3*2(9), 1015-1042.

Mohd, N.F., Banwet, D.K., & Shankar R. (2006). Supply chain risk mitigation: modelling the enablers. *Business Process Management Journal, 12*(4), 535-552.

Nyaga, G.N., Whipple, J.M., & Lynch, D.F. (2010). Examining supply chain relationships: Do buyer and supplier perspectives on collaborative relationships differ? *Journal of Operations Management, 28*(2), 101-114.

Ohdar, R. & Ray, P.K. (2004). Performance measurement and evaluation of suppliers in supply chain: an evolutionary fuzzy-based approach. *Journal of Manufacturing Technology Management, 15*(8), 723-734.

Olsen, R.F. & Ellram, L.M. (1997). A portfolio approach to supplier relationships. *Industrial Marketing Management, 26*(2), 101-113.

Omurca, S.I. (2013). An intelligent supplier evaluation, selection and development system. *Applied Soft Computing, 13*(1), 690-697.

Pagell, M., Wu, Z., & Wasserman, M.E. (2010). Thinking differently about purchasing portfolios: an assessment of sustainable sourcing. Journal of Supply Chain Management, 46(1), 57-73.

Park, J., Shin, D., Chang, T.W., & Park, J. (2010). An integrative framework for supplier relationship management. Industrial Management and Data Systems, 110(4), 495-515.

Pinsonneault, A. & Kraemer, K.L. (1993). Survey Research Methodology in Management Information Systems: An Assessment. *Journal of Management Information Systems,10*(2), 75-105.

Prajogo, D., Chowdhury, M., Yeung, A.C. L., & Cheng, T.C.E. (2012). The relationship between supplier management and firm's operational performance: a multidimensional perspective. *International Journal of Production Economics, 136*(1), 123-130.

Puschmann, T. & Rainer, A. (2005). Successful use of e-procurement in supply chains. *Supply Chain Management: An International Journal, 10*(2), 122-133.

Quesada, G., González, M.E., Mueller, J., & Mueller, R. (2010). Impact of e-procurement on procurement practices and performance. *Benchmarking: An International Journal, 1*7(4), 516-538.

Rezaei, J. & Ortt, R. (2013). Multi-criteria supplier segmentation using a fuzzy preference relations based AHP. *European Journal of Operational Research, 225*(1), 75-84.

Rezaei, J. & Ortt, R. (2013). Supplier segmentation using fuzzy logic. *Industrial Marketing Management, 42*(4), 507-517.

Rodríguez-Escobar, J.A. & González-Benito, J. (2015). The role of information technology in purchasing function. *Journal of Business and Industrial Marketing, 30*(5), 498-510.

Ronchi, S., Brun, A., Golini, R., & Fan, X. (2010). What is the value of an IT e-procurement system? *Journal of Purchasing and Supply Management, 16*, 131-140.

Rouyendegh, B.D. & Erkan, T.E. (2012). Selecting the best supplier using analytic hierarchy process (AHP) method. *African Journal of Business Management, (4)*, 1455-1462.

Sarkar, A. & Mohapatra, P.K.J. (2006). Evaluation of supplier capability and performance: a method for supply base reduction. Journal of Purchasing and Supply Management, 12(3), 148-163.

Seuring, S. & Müller, M. (2008). From a literature review to a conceptual framework for sustainable supply chain management. *Journal of Cleaner Production, 16*(15), 1699-1710.

Shih, K.H., Hung, H.F., & Lin, B. (2009). Supplier evaluation model for computer auditing and decision-making analysis. *Kybernetes, 38*(9), 1439-1460.

Snehota, I. & Håkansson, H. (1995). *Developing Relationships in Business Networks.* London: Routledge.

Szukits, A. (2017). Management Control System design: The effect of tools in use on the information provided. *Vezetéstudomány/Budapest Management Review, 48*(5), 2-13.

Toni, A. & Nassimbeni, G. (2001). A method for the evaluation of suppliers' co-design effort. *International Journal of Production Economics, 72*(2), 169-180.

Trkman, P. & McCormack, K. (2009). Supply chain risk in turbulent environments: A conceptual model for managing supply chain network risk. *International Journal of Production Economics, 119*(2), 247-258.

Zeydan, M., Çolpan, C., & Çobanoğlu, C. (2011). A combined methodology for supplier selection and performance evaluation. *Expert Systems with Applications, 38*(3), 2741-2751.

Zimmer, K., Fröhling, M., & Schultmann, F. (2016). Sustainable supplier management – a review of models supporting sustainable supplier selection, monitoring and development. *International Journal of Production Research, 54*(5), 1412-1442.