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# **Strategie i logistyka w sektorze usług. Strategie na rynku TSL**



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## NEGOTIATION EFFICIENCY AND EFFECTIVITY IN SUPPLY CHAIN MANAGEMENT

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**Summary:** The object of research is negotiation efficiency and effectivity in Supply Chain Management (SCM). The elements of negotiation effectivity are identified by literature research. A method to measure and affect negotiation efficiency is identified which could be a significant contribution to current negotiation research. In a lab test 107 negotiation simulations in different complexity levels were conducted and analyzed afterwards, comparing performance before and after a training which aimed to improve the participant's negotiation skills. The research findings identify the key elements to influence negotiation effectivity and support the assumption that negotiation efficiency can be measured and influenced. The results delivered trigger points to affect the negotiation skills – certainly knowledge about negotiations, but mainly the appropriate structure and preparation of the negotiation are the key factors influencing negotiation efficiency improvement.

**Keywords:** negotiations, effectivity, efficiency.

## 1. Introduction

### 1.1. Object of research

The object of research is negotiation efficiency and effectivity in Supply Chain Management (SCM). The elements of negotiation effectivity are identified by literature research. A method to measure and affect negotiation efficiency is identified which could be a significant contribution to current negotiation research.

Following Drucker's statements that efficiency is the ability to do things right vs. effectivity being the ability to get the right things done<sup>1</sup>, it is obvious that effectivity cannot really be measured as "the right things" cannot be quantified and can totally differ from person to person, but can still lead to comparable results. Therefore one key aspect of negotiation effectivity – Total Cost of Ownership – will be discussed based on literature research. Regarding negotiation efficiency this

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<sup>1</sup> P. Drucker, *The Effective Executive*, London 1967, p. 1.



research will describe the results of a negotiation simulation which allows to measure and influence the negotiation efficiency – which is the consumed time and energy to reach at a minimum the same results as before.

From the negotiation effectivity perspective, the Total Cost of Ownership (TCO) elements “Price”, “Management” and “Quality” according to Ellram and Siferd<sup>2</sup> are in many cases not all followed consistently, which leads to missed potentials in a negotiation. Conducting negotiations as efficient as possible but maintaining a healthy relationship emphasizes the TCO concept.

Several authors highlighted and tested the importance of performance measurement<sup>3</sup>. Quayle says for example that “we are well aware of the impact Supply Chain Management has on business performance and cost control. How can we expect professional performance if we do not measure capability and provide the help to obtain it?”<sup>4</sup> This outlines that applying this concept from SCM environment to negotiation training is a promising approach to drive negotiation skills.

## 1.2. Scientific goal

The main goal is to identify a method to measure and affect negotiation efficiency. The main hypothesis to research the described field will test the influence of the improved negotiation skills to the utilized time and the success rate of the simulation case.

H<sub>1</sub>: Dependency of utilized time from round

H<sub>2</sub>: Dependency of success rate from round

The round is an equivalent of an Ex Ante/Ex Post measurement, where an impulse is given between the two data collection points to influence the tested group and measure the change.

A critical question every customer and supplier of negotiation training faces is how to measure the impact of the training to negotiation efficiency. Without valid data and proofs, the term “negotiation efficiency” would more be seen as a sales argument than a scientific approach to collect and analyze data so that negotiation efficiency develops from a soft factor to a measurable metric.

## 1.3. Methodology and methods

The foundation of a measurable metric is a clearly defined and structured framework which collects data which can be compared and analyzed. This was realized in a laboratory test, where simulation cases were designed on different complexity

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<sup>2</sup> L. Ellram, S. Siferd, *Purchasing the cornerstone of the total cost of ownership concept*, “Journal of Business Logistics” 1993, Vol. 14, No. 1, p. 163-166.

<sup>3</sup> E. Oztemel, E. Tekez, *Interactions of agents in performance based on Supply Chain Management*, “Journal of Intelligent Manufacturing”, London 2009, Vol. 20, No. 2, p. 159-167.

<sup>4</sup> M. Quayle, *Purchasing and Supply Chain Management: Strategies and Realities (Dissertation)*, Hershey 2006, p. 19-23.

levels, allowing a standardized timeframe of 15 minutes for the completion of the case and then measuring the defined criteria. Those criteria were time consumption in total and especially for the negotiation (trading) as well as success rate. While conducting the different negotiation courses the role plays were analyzed to gain the data needed for a comparison. Between the two negotiation simulations an impulse was set to the groups, to influence their negotiation behavior. This represents laboratory research as the simulation was done by test persons in a separated environment, not in a real life negotiation. The research was done during one negotiation course to keep the group of participants identical from the first case to the second one. The first case was a very easy negotiation simulation with only one item to negotiate, the second round included 4 items to negotiate.

In total 107 datasets were collected to measure negotiation efficiency. As this is a limited number of data, but the possibilities for analysis were split in several sub groups, other classifications needed to be grouped. The “time utilized” and “starting time” had been collected in minutes, but were grouped into “fast” for 0-8 minutes, “medium” for 9-12 minutes and “slow” for 13-15 minutes. The reason for the distribution of the timing is that there is a very low likelihood that the case would be closed in less than 5 minutes. Most of the data were scaled nominally. Therefore a cross table analysis with a Chi<sup>2</sup> test for validation of the hypothesis was chosen.

## 2. Literature review

Supply Chain Management is a perfect field to research negotiations, because all transactions within the supply chain are related to negotiations in some respect. Especially the contacts to suppliers and customers are in many cases negotiations, but also internally many processes and discussions carry elements of a negotiation. On one hand only limited amount of literature and research on negotiations within Supply Chain Management (SCM) is available, but on the other hand SCM concepts inherit various potentials which can be applied also to negotiation training. First it is paramount to understand the supplier relationship concept of SCM to find the most successful and sustainable negotiation process. While several authors outlined and tested<sup>5,6</sup> in studies that key SCM prerequisites are cross-company processes and partnership<sup>7</sup>, Win-Lose negotiations do not seem to be the proper “standard operating mode” for modern companies. Moreover in some areas (e.g. hierarchic Supply Chains) and situations (like monopolies) Win-Lose can still deliver – at least short-term – successes. In some areas (e.g. symmetric supply chains) a cooperative approach is needed. Croxton, Garcia-

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<sup>5</sup> S. Ganesan, *Determinants of long-term orientation in buyer-seller relationships*, “Journal of Marketing” 1994, Vol. 58, No. 2, p. 1-20.

<sup>6</sup> D. Miocevic, *Organizational buying effectiveness in supply chain environment: A conceptual framework*, “Journal of Business Market Management” 2008, Vol. 2, No. 4, p. 171-185.

<sup>7</sup> D. Power, *Supply Chain Management integration and implementation: a literature review*, “Supply Chain Management” 2005, Vol. 3 No. 4, p. 252.

Dastugue, Lambert and Rogers highlight the role of a supplier relationship management<sup>8</sup> and negotiations need to support that direction instead of contradicting it. This starts at the sourcing strategies, continues with the initial negotiations for a contract, but basically the negotiation process never ends. During cooperation several minor or major issues between customer and supplier have to be negotiated, but also internally many negotiations have to be conducted.

Negotiations are often directly – and uniquely – connected to purchasing, because a negotiation between a buyer and a supplier is the most obvious stereotype. However, purchasing and procurement are not the only SCM function where negotiations are conducted; basically they are driving the entire Supply Chain Management in all areas and processes. SCM as an integration of all corporate functions means that also internally all departments are interacting closer than ever before, which indicates that negotiations are different from the past. Silo thinking and focusing on “best for the own department” is increasingly replaced by internal negotiations to reach the best result for the corporation. Lambert, García-Dastugue and Croxton say that a total replacement of functional silos with processes as suggested by Hammer<sup>9</sup> is not realistic because of the expertise which is in those functions. Key is to organize the function in cross-functional teams.<sup>10</sup>

Negotiations appear in a majority of the SCM processes, internally as well as externally. As a negotiation is basically solving a conflict and aligning different perspectives to find a solution, every contact between the internal functions as well as every contact to the external partners is in fact a negotiation. Croxton, García-Dastugue, Lambert and Rogers state that SCM is “being recognized as the management of key business processes across the network of organizations that comprise supply chain.”<sup>11</sup> Following that approach, negotiations can be defined as one of those processes, which is implemented in all interactions throughout the supply chain. This can be best visualized by using the SCOR model, one of the most recognized Supply Chain Management models, because it provides a standard format and supports design or reconfiguration of supply chains.<sup>12</sup> The SCOR model “provides a common supply chain framework, standard terminology, common metrics with associated benchmarks and best practices; and can be used as a common model...”<sup>13</sup>

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<sup>8</sup> K. Croxton, S. Garcia-Dastugue, D. Lambert, D. Rogers, *The Supply Chain Management processes*, “International Journal of Logistics Management” 2001, Vol. 12, No. 2, p. 13.

<sup>9</sup> M. Hammer, *The superefficient company*, “Harvard Business Review”, Vol. 79, No. 8, p. 82-91.

<sup>10</sup> D. Lambert, S. García-Dastugue, K. Croxton, *The role of logistics managers in the cross-functional implementation of Supply Chain Management*, “Journal of Business Logistics” 2008, Vol. 29, No. 1, p. 114.

<sup>11</sup> K. Croxton, S. Garcia-Dastugue, D. Lambert, D. Rogers, op. cit., p. 13.

<sup>12</sup> S. Huan, S. Sheoran, G. Wang, G., *A review and analysis of Supply Chain Operations Reference (SCOR) model*, „Supply Chain Management – An International Journal” 2004, Vol. 9, No. 1, p. 25.

<sup>13</sup> S. Huan, S. Sheoran, H. Keskar, *Computer-assisted supply chain configuration based on supply chain operations reference (SCOR) model*, „Computers & Industrial Engineerin” 2005, Vol. 48, p. 393-394.

The following table explains the various implications of negotiations to the SCM process.

**Table 1.** Potential implications of negotiations to the SCM process (acc. to SCOR)

Process 1	Process 2	Examples for negotiations	Can impact
Source	Make	Product has quality issues, departments discuss if sourcing was done incorrectly or if internal production process is instable.	Own company: plan, if part design & specification was incorrect. Deliver: if no sufficient number and quality of parts can be produced. Return if defective parts were already sent to customers. Supplier and customer. Source, Make and Deliver function, e.g. charge backs*.
Deliver	Source	Demand is higher than purchased/contracted volume.	Supplier Source, Make and Deliver function to increase output and fulfill customer's increased demand.
Deliver	Make	If internal capacity is not sufficient to fulfill demand.	Own company: plan: to improve capacity. Source: to source external capacity, capacity increase or additional volumes from suppliers. Supplier and customer. Source, Make and Deliver.
Plan	Make	If too many defective parts are returned.	Also impacts Return function.

\* A. Field, *Making it right*, "Journal of Commerce" 2005, p. 1.

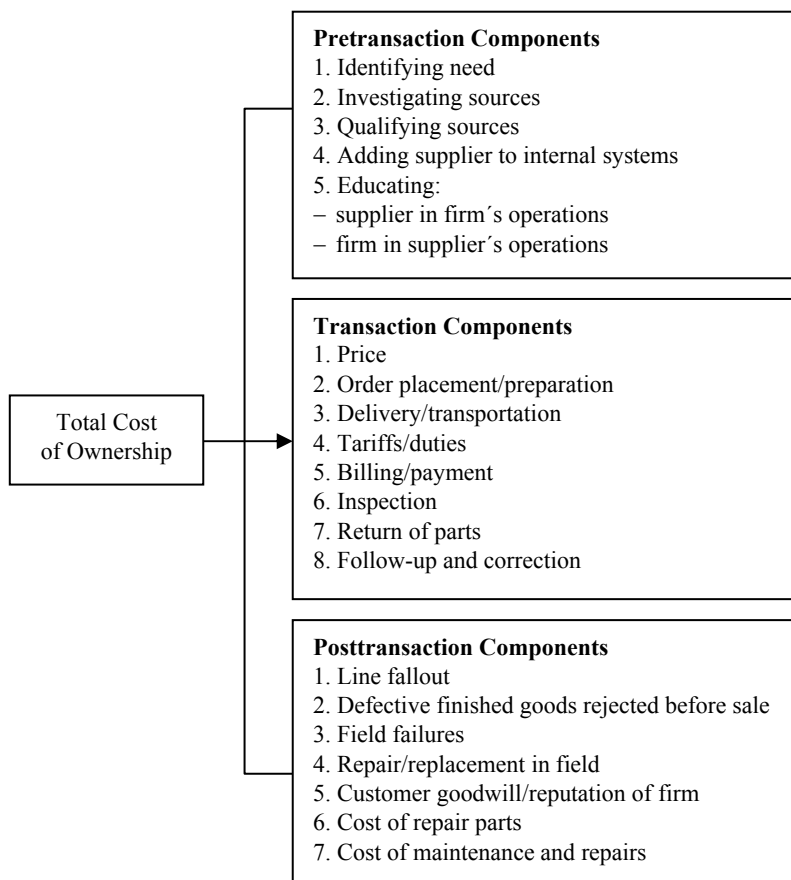
Source: own study.

In Supply Chain Management very often the goals of single departments are running to different directions, e.g. full ability to deliver parts might increase stocks or supplier's service level which would drive the cost up. That narrow view of "cost of ownership" only focuses on cost the individual managers are responsible for<sup>14</sup>. A common observation is that many negotiators only focus on just a few metrics like price, timing, etc. But "price does not equal cost; cost includes much more than purchase price"<sup>15</sup>. TCO driven goals add to the direct cost like piece price, transport cost, customs and duties the indirect cost like e.g. downtimes. Indirect cost can also be described as reducing the involved persons' ability to use the

<sup>14</sup> J. Cavinato, *Identifying interfirm total cost advantages for supply chain competitiveness*, "International Journal of Purchasing and Materials Management" 1991, Vol. 27, No. 4, p. 11.

<sup>15</sup> D. Merrill, *Storage Economics – Four Principles for Reducing Total Cost of Ownership (White Paper)*, Santa Clara 2009, p. 9.

resources or perform their tasks<sup>16</sup>. TCO is a rather complex approach to understand all elements which drive the cost of a purchase. Those are the cost of acquisition (also called pretransaction components), using the product (or transaction components) and of maintaining the purchased good or service (post transaction components)<sup>17</sup>. If the goals do not consider all of those three elements, potentials might remain unused. Ellram's chart of major TCO categories (Figure 1) provides a good overview for the consideration of the various components.



**Fig. 1.** Major Categories for the Components of TCO

Source: L. Ellram, *Total cost of ownership: elements and implementation*, "Journal of Supply Chain Management" 1993, Vol. 29, No. 4, p. 7.

<sup>16</sup> H. Werner, *Supply Chain Management – Grundlagen, Strategien, Instrumente und Controlling*, Gabler Wirtschaftsverlag, Wiesbaden 2010, p. 29-30.

<sup>17</sup> L. Ellram, *Total cost of ownership: elements and implementation*, "Journal of Supply Chain Management", Hoboken (NJ) 1993, Vol. 29, No. 4, p. 3-4.

Negotiation effectivity is, simply said, a consideration of all TCO elements in a negotiation. In many negotiations the focus is just on very few factors (mainly the transaction components) which leads to incomplete business case calculations and in final consequence often to wrong decisions. As an example, in many industries the first businesses with new partners do not result in the expected results, because the posttransaction costs were either not considered at all or too positive. With that the customer does not grant a sufficient learning curve to the supplier and has to pay increased posttransaction cost, e.g. for defective goods, repairs or field failures. If the negotiators do not follow a win-win negotiation approach, missing consideration of TCO elements can be easily misused. As an example, a supplier offers the most competitive piece price for a component. But with high prototype costs – which are often not in the main focus of the customer, the supplier's business case is significantly improved and they get the oncost before the actual serial production starts. A solid business case should be calculated and negotiated with defined pretransaction, transaction and posttransaction cost to ensure all potential cost factors are considered.

### **3. Measuring change in negotiation efficiency**

As stated in the description of methods and methodology, the negotiation simulations were measured and analyzed for the impact of the change. In a wide majority of the first round simulation cases the negotiations were not conducted efficiently, meaning that too much time was used for general discussions and interchanging arguments. The negotiators could not separate relations from problem solving and consequently focused more on blaming each other and defending their own position. In addition many negotiators used an improper approach (e.g. threatening, fingerpointing, etc.) and a majority only followed the goal to “win” the negotiation, but did not define factual, problem solving oriented goals. Mainly distributive strategies and corresponding tools were chosen. From a process perspective the lack of structure led to inefficient use of time. In summary the majority of the negotiators improvement potentials in various areas resulting in an average total time consumption of 12.61 minutes in the initial case and a success rate of only 52.5%. In the second round, the complexity was even increased, as four or more items had to be negotiated within the same timeframe of 15 minutes. The better structure, preparation and use of tools during the negotiation significantly improved the negotiation efficiency. On average more complicated cases were closed with higher success rates and less time consumption than the initial cases. The average time utilized for the negotiation improved from 12.61 to 9.96 minutes. The cross-table comparison of time utilized in different rounds describes the change in the speed from the beginning compared to the end of the negotiation training. The count of “slow time utilized” drops significantly, while medium and fast time utilization increases.

			Round		Total
			Ex Ante	Ex Post	
Time utilized (categorized)	Fast	Count	12	25	37
		%	21.8%	48.1%	34.6%
	Medium	Count	7	13	20
		%	12.7%	25.0%	18.7%
	Slow	Count	36	14	50
		%	65.5%	26.9%	46.7%
Total	Count	55	52	107	
	%	100.0%	100.0%	100.0%	

Fig. 2. Cross-table: dependency of utilized time from the round

Source: own study.

The Chi<sup>2</sup> test shows a value of 15.976 at a degree of freedom of 2 and an asymptotic significance of zero.

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15,976 <sup>a</sup>	2	.000
Likelihood Ratio	16.430	2	.000
Linear-by-Linear Association	13.923	1	.000
N of Valid Cases	107		

a. 0 cells (.0%) have expected the count less than 5. The minimum expected count is 9.72.

Fig. 3. Chi<sup>2</sup>: dependency of utilized time from the round

Source: own study.

Given that data, a relationship between the time utilized and the training delivered to the participants is confirmed. The success rate of the negotiation cases improved from 52.5% in the first case to 82.2% in the final negotiation case. This is an additional indication that the negotiation efficiency was improved significantly. Also the cross table confirms the significantly increased success rate in round 2 compared to round 1.

			Round		Total
			Ex Ante	Ex Post	
Closed deal	No	Count	27	11	38
		%	49.1%	21.2%	35.5%
	Yes	Count	28	41	69
		%	50.9%	78.8%	64.5%
Total	Count	55	52	107	
	%	100.0%	100.0%	100.0%	

Fig. 4. Cross-table: dependency of “success rate” from the round.

Source: own study.

The Chi<sup>2</sup> test shows a value of 9109 at a degree of freedom of 1 and an asymptotic significance of below 5%, which is within the parameters to confirm a relationship between the success rate and the performed training between simulation 1 and 2.

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	9,109 <sup>a</sup>	1	.003		
Continuity Correction <sup>b</sup>	7.930	1	.005		
Likelihood Ratio	9.331	1	.002		
Fisher's Exact Test				.004	.002
Linear-by-Linear Association	9.024	1	.003		
N of Valid Cases	107				

<sup>a</sup>. 0 cells (.0%) have expected the count less than 5. The minimum expected count is 18.47.

<sup>b</sup>. Computed only for a 2x2 table.

**Fig. 5.** Chi<sup>2</sup>: Dependency of “success rate” from the round.

Source: own study.

## 4. Conclusions

The previous analyses support the main hypothesis, i.e. that negotiation efficiency be measured and influenced. This is an important step to measure a return-on-investment effect of negotiation training as well as the sustainability. Moreover it is a bridge between the SCM concept of measuring metrics and the providers of negotiation training who often have issues to justify the impact of their services. Additional findings (not specifically documented in this paper) were that neither nationality nor experience nor the number of participants influence the time consumption and the success rate in the negotiation. This supports also the assumption that structure and knowledge are the main drivers for negotiation efficiency. Negotiation efficiency aims for reaching minimum the same results with less time consumption and efforts taken. This does not specifically consider the sustainability of the results, i.e. if the negotiations impacted the relationship positively and negatively. As a subjective observation during the negotiation simulations it can be stated that at a minimum the relationships were not impacted negatively. But this was not included into the measurements, which is a potential for future research.

The negotiation effectivity was not specifically measured in this research but the considerations to improve also effectivity were analyzed by literature research, indicating the factors to consider in a negotiation in line with the philosophy of TCO.



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## SKUTECZNOŚĆ I EFEKTYWNOŚĆ NEGOCJACJI W ZARZĄDZANIU ŁAŃCUCHEM DOSTAW

**Streszczenie:** Przedmiotem badania jest skuteczność i efektywność negocjacyjna w zarządzaniu łańcuchem dostaw. Elementy skuteczności negocjacyjnej zostały określone w literaturze badawczej. Została określona metoda pomiaru i wpływu skuteczności negocjacyjnej, co może stanowić znaczący wkład we współczesne badania negocjacyjne. W teście laboratoryjnym przeprowadzono, a następnie przeanalizowano 107 negocjacji symulacyjnych na różnych poziomach złożoności, porównując wykonanie przed szkoleniem i po szkoleniu, co miało na celu poprawę umiejętności negocjacyjnych uczestnika. Wyniki badań określają kluczowe elementy, które wpływają na skuteczność negocjacyjną i wspierają hipotezę, że istnieje możliwość mierzenia i wpływania na skuteczność negocjacyjną. Osiągnięte wyniki mają wpływ na umiejętności negocjacyjne, oczywiście na wiedzę dotyczącą negocjacji. Jednak przede wszystkim to właściwa struktura i przygotowanie negocjacji są kluczowymi czynnikami wpływającymi na poprawę skuteczności negocjacyjnej.

**Słowa kluczowe:** negocjacje, efektywność, skuteczność.