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Some Aspects of Purchasing Process in Suppliers' Selection

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ABSTRACT

In a dynamic business environment, it is important for companies to permanently maintain their competitiveness and achieve the highest possible efficiency in all areas of business activities. This includes not only the production and sale of products but also purchasing. The purchasing process is one of the important tools for understanding its strategic importance and the success of the company. The contribution orientates to the importance of the efficiency of the purchasing process in the selected company belonging to the IT sector, dealing with procurement of the advertising items. The authors performed the analysis of the purchasing process using the DMAIC method, enabling an effective and systematic approach to the monitored problem, and providing a consistent framework for the design of processes effectiveness increasing. In addition to the analysis of possible suppliers also their comparison and selection for the most advantageous supplier for the purchase of advertising items in the selected company results from the research. Changes in procurement cannot eliminate in full the human factor and its possible failure, therefore the authors suggest artificial intelligence use, e.g. in historical data processing, consumer trends analysis or prediction of good and services demand.

INTRODUCTION

Globalization and rapidly advancing technologies create a challenging business environment. In a highly competitive environment and due to market dynamics, effective purchasing becomes a key aspect of business success. Thus, purchasing presents no longer just an administrative obligation, but also a strategically important activity that has a direct impact on achieving the goals of the company and creating value for customers.

The understanding of the purchasing and its position changes over time and gradually develops. In the past, purchasing presented an executive function, when the main task was to secure product sales in the shortest possible time and at the lowest possible price. Currently, many authors characterize purchasing as a set of management and physical functions to ensure the necessary material inputs and services for the production and business activities of the company in the required time, quantity and quality, at the right place. Fulfillment of the needs and satisfaction of customers with reasonable costs depends on the fulfillment of the mentioned goal (Gros et al., 2016).

The purchasing process is of strategic importance for the company; therefore, it is important to address it with due attention. This contribution focuses on the efficiency of the purchasing process in a selected company belonging to the IT sector when procuring advertising items.

1. LITERATURE REVIEW

Purchasing is a process, providing suitable business resources and serving for further use. It presents of finding and providing goods, services and raw materials for the business from external entities (Synek et al., 2011). This includes all activities associated with the selection of goods and services, supported by business processes (Dolzhenko, 2023). These help the purchasing team to provide each purchase and thus control the costs of the company.

Is of strategic importance for the company, as it can achieve the goals and objectives of the business through effective purchasing. It presents an organizational function, which presents the process of obtaining supplies and inputs. For a business to grow, purchasing without a clear strategy can have some disadvantages. Lack of control, ambiguous purchasing rules, no or minimal relationships with suppliers and inaccurate evaluation metrics mean a business can be at risk of fraud. On the contrary, a proper and well-set procurement process helps the company minimize costs and at the same time increase the overall quality of supplies (Muheesi, 2022).

One of the tools for analyzing and illustration of the value creation is also the "value chain" proposed by Porter in 1985 (Porter, 1985; Antosova, 2012; Chai, 2024; etc.). Due to the value chain, the company can identify primary and secondary activities, evaluate their effectiveness and orientate to the possible process improvements to increase its competitiveness.

From an economic point of view, it is necessary to perform all activities in the company in such a way that the complex generated value is higher than the sum of the costs. In the context of the value chain, the term procurement presents rather than purchasing, considered as a supporting activity of various business activities. In the frame of the primary activities, it means mainly ensuring the material requirements related to input and output logistics and requirements related to the operations of the company (Kennedy, 2023). Depending on the industry, in which the company operates, individual procurement activities may differ.

Purchasing presents, a holistic view of the business that can lead to removing the internal barriers and reducing duplicity in the whole company. In addition to the value added, which can be created by the effective purchasing process, belong except for classic cost reduction and a positive impact on income, also improving cash flows, return on investment (ROI), risk mitigating, avoiding unnecessary expenses, strategic partnerships, and supply chain management. The mentioned benefits of the purchasing process present a proof of its important role in the company and bring a deeper insight into its significance (Loges, 2018).

Marketing presented for several decades an equally important concept in the creation of value delivered for all interested. Simply said, we can state that individuals get what they need in exchange for another value (Hanulakova et al., 2021). Bielik et al. (2020) define the current century as the century of

marketing. It is not possible to characterize marketing by only one sentence or definition. However, all definitions agree that the customer and satisfaction of his needs presents a common indicator.

Even marketing has been developing and changing since the 1950s due to changing market conditions (Kotler, 2007). Marketing significantly contributes to the prosperity of the company, thus becoming one of its basic functions. Business success lies in the understanding of the importance and essence of marketing. While classic sales marketing is customer-oriented, purchase marketing is supplier-oriented.

Purchasing marketing presents according to Kita (2017) process of purchase behavior of the business. The purchasing process lacks a clearly defined procedure. Several factors influence the specific steps of the purchasing process. Therefore, the individual steps in the literature differ. The purchasing process is influenced by the size of the company, the industry in which the company operates and the organizational structure, as well as the purchasing department in the company, the nature of the purchased goods or services, the amount of financial resources for the purchase, etc. Most often, authors describe the purchasing process in eight steps as follows: Identification of the problem; The needs analysis; Search for potential suppliers; Solicitation and analysis of offers; Negotiation with suppliers; Supplier selection; Order; Purchase evaluation and control (Grandia & Volker, 2023; Gu, 2023; Codeless Platform, 2019).

For example, Kita (2017) divides the marketing approach to the purchasing process into two parts, which also represent the individual stages of the purchase and the steps that the company takes on the market.

Similarly, trends in the measurement of company performance are developing and changing, with a particular focus on supporting corporate strategy, tracking financial and non-financial indicators, or the system for measuring the performance of individual levels of management. The EFQM Excellence Model, Six Sigma and the Balanced Scorecard present so far the most successful systems in the practice, based on the above principles (Janoskova et al., 2018; Ottou et al., 2020; Manova et al., 2021).

2. METHODOLOGY

The object of the investigation is a company operating in the information technology (hereinafter IT) sector, belonging to the Deutsche Telekom AG Group (hereinafter DT), which operates in several countries worldwide. The company is a modern provider of information and communication technologies with the aim of constant innovation and improvement. The attention of the research focuses to the analysis of the process of purchasing advertising items belonging to marketing costs.

We implemented the description and analysis of the purchasing process using the DMAIC method. This method represents a structured process within Six Sigma. The goal of the method is to improve processes and solve problems (DMAIC = Define, Measure, Analyze, Improve and Control). Applying the method enables an effective and systematic approach to the monitored problem, providing a consistent framework for possibly increasing the process´s effectiveness.

3. RESULTS OF RESEARCH

The entire purchasing process at Deutsche Telekom IT Solutions Slovakia consists of the so-called operational procurement process (internal guidelines "Global Procurement Policy and One Procurement Processes"). The purchasing department procures goods and services according to the company's needs, including supply chain management and contract management. We analyzed operational purchasing, namely all activities from entering the request to sending the invoice. These purchasing processes must be processed and documented in such a way that a third party can access them at any time and gain insight.

3.1 Defining

The entire purchasing process demands several tools, by which individual consumers or suppliers work. Such tools are following:

- MyStore / SRM: purchasing system and electronic purchases for DT company, connected to SAP system;
- SAP OFI: backend system, through which the orders and all other connected operations are registered;
- OneSource: internal system for managing the suppliers and contracts;
- HowToBuy: internal web side, where mentioned processes of the company are mentioned, together with all necessary steps;
- ServisPortal: portal for creating the requests (RFQ);
- DocuSign: portal for electronic signing the contract.

The assumed price and characteristics of the procured items influence the purchasing process as well. Internal purchases create three groups according to the possibility of how to make a purchase. The groups are as follows:

A. Order OnePortal: serving for small expenses to the value 500 EUR. The consumer creates a request (RFQ), where he mentions what and by which value he wants to make a purchase. After approval by the purchasing department, he buys a necessary good or service at his costs and consequently, he gives a cash receipt or invoice to the accounting department to be overpaid.
B. Catalogue order: The catalogue contains a list of items from various suppliers that the company regularly purchases. Suppliers has contracts with DT and the offered prices are determined according to the auctions, when regarding a number of factors, such as price, quality, and reliability of supplier and delivery time.
C. Order Free – text: when the consumer did not manage to find necessary material or service in the catalogue, or in case of any specific item, which is necessary to evaluate individually by the supplier.

We used the RASCI Matrix for the identification of the position and tasks of the individual participants in the purchasing process. Table 1 illustrates all activities.

Table 1. RACI matrix

Activities / participants	*Requestor*	*Procurement specialist*	*Account Specialist*	*Controlling*	*Budget approver*
Request for quotation – RFQ	R	A			
Supplier and contract management	R	A			
Creating Shopping Cart	C	R		C / I	
Approving Shopping Cart		A	A	A	A
Releasing Purchase order	I	R			
Confirmation of delivery – GR	R	I	I		
Invoice receiving and verification	R	C	R		R
Invoice payment			R		
Monitoring and Archiving of documents		R			

Source: created by authors

Legend:

R / responsible: the responsible person for the activity;
A / accountable: the responsible person for the activity approval before taking the effect;
C / consulted: the responsible person for the questions or council;
I / informed: the responsible person, informing about the results.

3.2 Measurement

Measurable outputs from the purchasing process are orders, providing detailed review of DT, its volume and value. The period of the analyzed data is 2023. The data of orders are in Table 2.

Table 2. Orders from the analyzed period

	All orders	*Orders for advertising items*
Analyzed period	2023	2023
Number of orders	3,328	237
Number of purchased items	9,104	306
Total value of orders / EUR	58,899,019.50	438,423.26
Average sum of orders / EUR	17,698.02	841.50
Number of catalogue orders	1,015	198
Number of free-text orders	2,313	39

Source: created by authors

3.3 Analysis

When analyzing the purchasing process, we compared the current prices on the market from several suppliers. We have selected a list of 12 items that are purchased most often and price offers from five suppliers (A, B, C, D, E). Supplier B is very important for DT, providing a wide portfolio of products and services in the field of advertising. Its prices are higher, but the quality and speed of delivery of goods and services compensate for the higher price. Suppliers A and C are protected workrooms, and cooperated with DT for a long time because large companies have a legal obligation to allocate a certain part of their costs to such type of business. The company cooperated with supplier D for a long time in the past, but supplier D did not offer favorable conditions for the purchase at the last auction. The last supplier E is new one, DT has no experience with supplier D. The new supplier presents well known in the region, so we consider it as interesting to request him and consider his prices and offer. Table 3 shows the prices that suppliers offer for selected, most frequently purchased products. The prices are without VAT, during the purchase of 10 and 100 pieces.

Table 3. Comparing of prices of advertising items

Item / Supplier	*Number / pieces*	*A*	*B*	*C*	*D*	*E*
T-shirt basic	10	6.66	7.50	14.40	7.16	7.00
	100	4.75	5.75	5.80	7.16	5.00
Printed sweatshirt	10	20.92	19.00	28.00	18.23	19.70
	100	16.26	17.00	21.80	18.23	18.00
Poster A4	10	0.60	0.70	0.40	0.32	0.50
	100	0.18	0.35	0.34	0.32	0.40
Poster A3	10	1.00	1.00	0.80	0.64	0.90
	100	0.25	0.50	0.67	0.64	0.70
Mug	10	8.00	6.00	5.70	7.07	8.00
	100	4.20	3.00	2.70	3.42	4.80
Coffee mug	10	11.01	9.00	6.70	6.76	10.20
	100	5.95	7.50	3.38	4.47	7.00
Sticker	10	1.00	1.00	0.80	0.90	1.00
	100	0.20	0.15	0.18	0.50	0.30
Pen	10	3.25	3.00	3.64	2.90	3.20
	100	0.58	0.75	0.70	0.80	0.80
USB 32 GB	10	9.00	8.50	9.25	9.00	9.50
	100	4.50	7.00	5.95	6.60	7.60
Neck cord	10	2.00	3.00	4.48	1.26	3.50
	100	1.16	2.50	1.20	1.26	2.10

Booklet	10	5.80	5.00	5.85	4.46	6.00
	100	2.55	3.50	2.90	4.46	4.50
Linen bag	10	3.35	3.50	5.95	4.20	6.00
	100	1.83	2.75	1.75	4.00	4.00

Source: created by authors

We have chosen three ways, in which we will analyze the price offers from suppliers, namely: average price, price indexes and the importance of quantity or weight. The analysis results serve for comparison and decision of the supplier selection.

3.4 Calculation of average price

The average price of products presents an important factor, offering the consumers an overview of price competition and the market situation. From the calculations, we can find out, which of the suppliers offers the best prices for different products and different order volumes. We calculated the average prices for quantities of 10 and 100 items and consequently, we calculated the total average price. We present a sample calculation for a T-shirt from supplier A in detail, other calculations are shown in table 4.

$$Average\ price\ of\ T-shir\ from\ A\ supplier\ for\ 10\ pieces\ \frac{6.66+7.50+14.40+7.16+7.00}{5}=8.54$$

Table 4. Calculation of average price of advertising items

Item	*Price for 10 pieces*	*Price for 100 pieces*	*Average price*
T-shirt basic	8.54	5.69	7.118
Printed sweatshirt	21.17	18.25	19.71
Poster A4	0.50	0.32	0.41
Poster A3	0.87	0.55	0.71
Mug	6.95	3.62	5.29
Coffee mug	8.73	5.66	7.20
Sticker	0.94	0.27	0.60
Pen A	3.19	0.73	1.96
USB 32 GB	9.05	6.33	7.69
Neck cord	2.85	1.64	2.25
Booklet	5.42	3.58	4.50
Linen bag	4.60	2.867	3.733

Source: created by authors

The calculations show that out of 24 average prices, supplier A has 15 items under the average value, similarly to supplier D. In comparison, the highest prices have supplier E, which has the better prices in only 6 cases. Suppliers B and C have the better prices in 13 cases.

3.5 Calculation of price indexes

Price index analysis is a key tool for comparing prices from different suppliers with average market prices. It helps to understand how the current prices offered by suppliers differ from each other. The price index quantifies the percentage change in price compared to the average price. As a reference point, we chose the average prices of individual products obtained from previous calculations. The resulting values are given in percentage, expressing by what percent the price from the supplier is higher (or lower) than the average prices of other suppliers. We present a sample calculation for a T-shirt from supplier A. Table 5 shows the following calculations.

$$T-shirt\ from\ A\ supplier\ for\ 10\ pieces = \frac{6.66}{8.54} * 100 = 77.95\ \%$$

Table 5. Calculation of price indexes

Item / Supplier	*Number of pieces*	*A*	*B*	*C*	*D*	*E*
T-shirt basic	10	77.95	87.78	168.54	83.80	81.93
	100	83.45	101.02	101.90	125.79	87.84
Printed sweatshirt	10	98.82	89.75	132.26	86.11	93.06
	100	89.06	93.11	119.40	99.85	98.59
Poster A4	10	119.05	138.89	79.37	63.49	99.21
	100	56.60	110.06	106.92	100.63	125.79
Poster A3	10	115.21	115.21	92.17	73.73	103.69
	100	45.29	90.58	121.38	115.94	126.81
Mug	10	115.04	86.28	81.97	101.67	115.04
	100	115.89	82.78	74.50	94.37	132.45
Coffee mug	10	126.06	103.05	76.71	77.40	116.78
	100	105.12	132.51	59.72	78.98	123.67
Sticker	10	106.38	106.38	85.11	95.74	106.38
	100	75.19	56.39	67.67	187.97	112.78
Peen	10	101.63	93.81	113.82	90.68	100.06
	100	79.89	103.31	96.42	110.19	110.19
USB 32 GB	10	99.45	93.92	102.21	99.45	104.97
	100	71.09	110.58	94.00	104.27	120.06
Neck cord	10	70.22	105.34	157.30	44.24	122.89
	100	70.56	152.07	72.99	76.64	127.74
Booklet	10	106.97	92.22	107.89	82.26	110.66
	100	71.19	97.71	80.96	124.51	125.63
Linen bag	10	72.83	76.09	129.35	91.30	130.43
	100	63.85	95.95	61.06	139.57	139.57

Source: created by authors

Through the analysis of price indexes, we found that supplier A is the most advantageous, followed by supplier D, supplier C, and supplier B. Supplier E provides the least favorable prices in relation to average prices.

3.6 Weight analysis

When analyzing price offers from different suppliers, in addition to the price, we will consider the importance, or the weight of the various quantities DT purchases. Since the most of the analyzed orders were in small quantities, we assign a weight of 80% to the number of 10 pieces and 20% to the number of 100 pieces. The resulting amount will provide information about the average price at which the company would purchase the items in the current state of the purchasing process. In the next part, we will change the ratio and analyze the opposite case, to compare the current purchase process with the recommended one. The process of the weighted average calculation is as follows:

$$Weight\ avetage\ for\ T-shirt\ from\ A\ supplier\ (0.80 * 6.66) + (0.20 * 4.75) = 6.28$$

Table 6. Weight analysis 80/20

Item / Supplier	*A*	*B*	*C*	*D*	*E*
T-shirt basic	**6.28**	7.15	12.68	7.16	6.60
Printed sweatshirt	19.99	18.60	26.76	**18.23**	19.36
Poster A4	0.52	0.63	0.39	**0.32**	0.48
Poster A3	0.85	0.90	0.77	**0.64**	0.86
Mug	7.24	5.40	**5.0**	6.34	7.36
Coffee mug	10.00	8.70	**6.04**	6.30	9.56
Sticker	0.84	0.83	**0.68**	0.82	0.86
Pen	2.72	2.55	3.05	**2.48**	2.72
USB 32 GB	**8.10**	8.20	8.59	8.52	9.12
Neck cord	1.83	2.90	3.82	**1.26**	3.22
Booklet	5.15	4.70	5.26	**4.46**	5.70
Linen bag	**3.05**	3.35	5.11	4.16	5.60

Source: created by authors

As for this indicator, the lowest price values after considering the determined weights are important. The supplier with the lowest weight price is the most advantageous for DT, as it offers the lowest prices with regard to the weight of the quantities of ordered items. The best prices are in Table 6 highlighted in color. Supplier D is the most advantageous, offering the lowest price for only seven items, followed by supplier A and supplier C. Supplier B and E are not advantageous. Based on previous comparisons using different methods, we listed the order in which the suppliers ranked within the three presented analyses in Table 7. The ranking also represents the number of points.

Table 7. Comparing of the analysis results

Analysis method / Supplier	*A*	*B*	*C*	*D*	*E*
Average prices	1	3	3	1	5
Price indexes	1	4	3	2	5
Weight analysis	3	5	3	1	5
SUM	5	12	9	4	15

Source: created by authors

The results of the above analysis are important for the observed problem in DT Company, according to which we determine the comparison of suppliers:

- Supplier D is the best choice for the company, achieving the best results and ranking. Within the framework of average prices and weight analysis, the supplier proved to be the most advantageous; the price indices were also favorable. It is a suitable alternative as a future supplier.
- The second rank belongs to supplier A. The ordered quantity most significantly affects his prices; it is most convenient to buy products from supplier A in larger volumes. It also offers the best prices compared to the average prices for the given products. In the weight analysis supplier, A has a third rank, which still means that it represents one of the more advantageous partners for the company.
- Supplier C has stable and competitive results and prices in the frame of all analyses. The prices are optimal, for some specific products even the most advantageous among the analyzed competition.
- Supplier B is currently the largest supplier of advertising items for DT, but the analysis results show that it currently does not represent the best possible solution.
- Supplier E is a new one, with whom DT has no previous experience. Considering the results of the analyses, it does not achieve better or comparable results than other suppliers, which means that supplier E presents the least suitable supplier. However, this does not mean that it cannot offer suitable marketing solutions in other areas in the future.

3.8 Improvement

The disposal data reveals several problem areas that accompany the purchase process. These are mostly recurring deficiencies that the company can eliminate in a few steps, making the purchase process more efficient. We pointed out the current prices of twelve selected advertising items that DT buys most often. The difference in prices among the selected suppliers is significant and points to the fact that it is more profitable for the company to purchase such items in larger quantities and in sufficient advance.

The aim is to select from among possible suppliers the one that can provide the best prices. The company can also conclude a contract with the price list of the most frequently purchased advertising items so that buyers can provide favorable prices in the long term.

In the purchasing process, we have currently identified an uncertain process for purchasing advertising items. A suitable solution would be imitating the purchasing process of hardware and software; which competent employees oversee. In the first step, the company needs to contact them; they will collect the demand and only then enter a purchase request where several items are in larger quantities. In this way, the company can have an accurate overview of purchases and volumes, so that it can ensure the purchase of only necessary and high-quality products and services. Similarly, it is advisable to adjust the purchase of advertising items, when the authorized employee would oversee such an agenda. He would also collect the requirements of the employees and assess the necessity and suitability of the given items, the location of the logo and the suitability of the selected print. Only then would he enter a request for the purchase of a larger quantity. In this way, the company would be able to use the so-called quantity rebate that suppliers offer during purchasing of more products.

3.9 Control

Ensuring the effectiveness of changes and their maintenance is very important for achieving long-term favorable results of DT. Control of the purchasing process should include monitoring of performance indicators, control, or auditing processes and, last but not least, feedback from interested parties.

The proposed solution for increasing the effectiveness of the purchasing process of advertising items is grouping the requests for such purchases and subsequently ordering them in larger quantities. This means to realize the least purchases as possible in a small volume. The goal is to create orders where company purchases larger quantities, but still under the assumption of procuring only those volumes that are necessary for the specified purposes. For comparison, we will follow up on the weight analysis from the previous section, but in this case, we will adjust the weights for individual purchase volumes so that 10 pieces will represent 20% and 100 pieces will represent 80%. This means that 80% of purchases will be for 100 or more units, and only 20% of purchases will be orders of small quantities of products. We carry out the calculation as follows:

$$Weight\ average\ for\ T-shirt\ from\ A\ supplier\ (6.66 * 0.20) + (4.75 * 0.80) = 5.13$$

Weight average for other advertising items and from other suppliers are in Table 8.

Table 8. Weight analysis 20/80

Item / Supplier	*A*	*B*	*C*	*D*	*E*
T-shirt basic	5.13	6.10	7.52	7.16	5.40
Printed sweatshirt	17.19	17.40	23.04	18.23	18.34
Poster A4	0.26	0.42	0.35	0.32	0.42
Poster A3	0.40	0.60	0.70	0.64	0.74
Mug	4.96	3.60	3.30	4.15	5.44
Coffee mug	6.96	7.80	4.04	4.93	7.64
Sticker	0.36	0.32	0.30	0.58	0.44
Pen	1.11	1.20	1.29	1.22	1.28

USB 32 GB	5.40	7.30	6.61	7.08	7.98
Neck cord	1.33	2.60	1.86	1.26	2.38
Booklet	3.20	3.80	3.49	4.46	4.80
Linen bag	2.13	2.90	2.59	4.04	4.40

Source: created by authors

Through weight analysis, we demonstrated changes in the average prices at which the company purchased the products if approximately 80% of orders were in volume of more than 100 items from one product Supplier A is the most advantageous since he could provide up to eight items at the cheapest price.

We can do the check simply by comparing the fictitious purchase and costs under the current and proposed purchasing process. For this purpose, we will use data from internal sources, based on which we have calculated the average prices of purchased items for the year 2023 (Note: some prices have changed depending on the supplier and the ordered quantity. For calculation purposes, we have identified their averages).

Table 9. Comparing of present and recommended purchasing process

	Average purchase price	*Actual process*		*Suggestion*	
		A	*D*	*A*	*D*
T-shirt basic	12.95	6.28	7.16	5.13	7.16
Printed sweatshirt	21.85	19.99	18.23	17.19	18.23
Poster A4	0.80	0.52	0.32	0.26	0.32
Poster A3	1.00	0.85	0.64	0.40	0.64
Mug	6.50	7.24	6.34	4.96	4.15
Coffee mug	10.50	10.00	6,3	6.96	4.93
Sticker	0.80	0.84	0.82	0.36	0.58
Pen	2.80	2.72	2.48	1.11	1.22
USB 32 GB	9.75	8.10	8.52	5.40	7.08
Neck cord	1.95	1.83	1.26	1.33	1.26
Booklet	5.48	5.15	4.46	3.20	4.46
Linen bag	3.1	3.05	4.16	2.13	4.04
SUM	77.48	66.57	60.69	48.43	54.07

Source: own processing

Table 9 shows the sum of the prices, for which DT purchased in 2023. In case the purchasing process would not change, the purchase is for following sums of prices in the same proportion, i.e. 20% of purchases would be large purchases - over 100 pcs and 80% would be small purchases of 10 pcs. The change would only occur when selecting a supplier. According to the previous analysis, supplier A and supplier D appear to be the best selection. Calculation of the sum of the prices when we adjusted the purchasing process and the ratio is 80% for large purchases and 20% for small purchases is below. The current price gives a value of 77.48 EUR. If DT concluded a contract with only supplier A or D, while not modifying the purchasing process, it could record savings. We calculate their amount using the following formulas:

$$Saving: supplier\ A\ = \left(1 - \frac{66.57}{77.48}\right) x\ 100 = \ 14.08\ \%$$

$$Saving: supplier\ D = \left(1 - \frac{60.69}{77.48}\right) x\ 100 = 21.67\%$$

The result is a saving in the case of supplier A in the average amount of 14.08%; the savings with supplier D would reach up to 21.67%.

If the company decided to modify the purchasing process, mainly to collect demand, only then create larger orders, and thus obtain savings from scale, the percentage savings would be even higher.

$$Saving: supplier\ A = \left(1 - \frac{48.43}{77.48}\right) x\ 100 = 37.\ 49\ \%$$

$$Saving: supplier\ D = \left(1 - \frac{54.07}{77.48}\right) x\ 100 = 30.21\%$$

In this case, the savings would be up to 37.49% for supplier A and 30.21% for supplier D. Such a high percentage of savings means great potential for DT Company and an opportunity to reduce the costs spent on the purchase of marketing items.

Based on the analysis of price offers, we selected two suppliers for the company that provide the most favorable prices for different purchase quantities of advertising items. The current supplier with whom the company cooperates is reliable and friendly, but currently no longer providing the best prices. Therefore, we propose to expand cooperation with another supplier and consider the possibility of negotiations and concluding a possible contract. At the same time, after concluding the contract with the price list, it would be appropriate to include these new products in the internal catalogue, so that employees can also independently purchase items and printed materials at advantageous, contractually agreed prices.

The marketing department should have an overview of all purchases to promote the company in any way. The department must assess whether the company's logo is used and presented by the marketing policy, whether the color scale is respected - whether there are objects that can be suppressed by the company's logo, etc. The solution could also be to designate the marketing department as the only one competent to act in this matter and to be the only entity with the authority to purchase advertising items.

CONCLUSION AND DISCUSION

Purchasing is one of the necessary processes in every business; in addition to financial factors, it also affects overall competitiveness and efficiency. The purchasing process of a large company such as Deutsche Telekom IT Solutions Slovakia is not simple, several guidelines at the local level, take into account the processes of the entire global DT group. The company has extensively developed various internal systems; one of them is the portal, where each department has its own space for the agenda, news and processes.

However, any changes in the procurement of advertising items cannot eliminate the human factor and possible failure. There may still be purchases without sufficient time reserve in case of purchases, made in the shortest possible time (Moretto et al., 2017). In such a case, when selecting a supplier, its production and delivery capabilities are important, not the price. Shopping in a time of distress may continue to be costlier for the company. Therefore, we recommend setting a price range with the most suitable supplier, within which it can vary even if the goods need to be produced and delivered within a very short time. However, the price should still be more favorable than the current market prices.

The paper authors present the identification and comparison of the most advantageous suppliers for the purchase of advertising items in the selected company of the IT industry. The analysis showed suppliers D and A offer the best prices compared to other suppliers, when supplier D achieved the best results under various evaluation methods, including average price, price indexes and weight analysis. Optimizing the purchasing process could lead to a cost reduction up to 37.49% in case of supplier A and 30.21% in case of supplier D. Such result could be recorded if bulk purchases would be realized in larger volumes. This result demonstrates the potential for significant cost savings through better planning and management of the purchasing process.

The paper is a comprehensive analysis of the purchasing process in an IT company, which provides practical solutions for improving efficiency. Offers knowledges of the DMAIC method use in the field of procurement, which enables a systematic approach to problem solving and improving performance. The

findings point to the possibilities of optimizing cooperation with suppliers, identifying the most advantageous supplier and cost reduction through more effective management of purchases of the advertising items.

It is also important to mention the possibilities of using modern technologies, including artificial intelligence (AI). Its contribution could be used mainly in the processing of historical data and its use to predict future needs and purchases and provide recommendations, which would make it easier for buyers to make their decisions (Kehayov et al., 2022). The company could also use artificial intelligence to evaluate the performance of suppliers. In this way, it is possible to ensure the monitoring of key performance indicators and to analyze the behavior of suppliers, thereby increasing transparency, reducing possible human errors and increasing the efficiency of relations with suppliers. In recent years, AI has become a key tool for optimizing various business processes, including procurement. AI algorithms are able to analyze consumer trends, predict demand for goods and services, and provide recommendations to optimize orders.

Another significant benefit of AI is the automation of repetitive tasks, such as evaluating price offers and selecting suppliers. This expedites procurement process, as well as reduces manual errors, and improves the accuracy of decision-making (Sakyoud et al., 2024). AI also allows for continuous monitoring of supplier performance through key performance indicators (KPIs), such as reliability, delivery times, and product quality. This allows companies to manage supplier relationships more effectively and make better-informed decisions.

Moreover, AI can enhance process transparency by analyzing large amounts of data in real time and providing recommendations for increasing efficiency. This technology not only reduces costs but also boosts the overall competitiveness of the company. However, the implementation of AI should be gradual, with appropriate employee training and expert support to ensure effective use of this technology.

These recommendations represent only a part of the potential that artificial intelligence has in relation to the efficiency of any processes in the company, not only the purchasing. However, the implementation of such measures must be gradual, with a focus on specific characteristics and goals. The analyzed company should consider also the need for professional advice and training of stakeholders and employees.

The research presented of the paper is limited to the IT sector, dealing with procurement of advertising items by DMAIC method. Future research will be oriented to the other sectors and comparison of the common characteristics of the procurement and purchase process.

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