PERFORMANCE INDICATORS OF THE LOGISTIC PROCESSES AND ITS CONSISTENT DEFINITION IN THE SELECTED MANUFACTURING COMPANY

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Abstract

The main purpose of this paper is to analyze the consistency of performance indicators related to logistics processes in the selected manufacturing company. Research explores two basic areas: 1) which performance indicators are applied in measuring and assessing logistics processes and 2) how are defined attributes of performance indicators, which should create a consistent system for measuring and evaluating performance. The consistency in this case is based on the homogenous definition of attributes relating to the performance indicator as a basic element of performance management system (PMS). Based on the results of previous research, we defined four groups of attributes relating to the performance indicator: formal attributes, attributes of target value, informational attributes and attributes of evaluation. The whole set contains 21 attributes. The research results have an implication for business practice in assuring logistic processes. If manufacturing companies applied the homogenous set of attributes of performance indicator it would increase the effectiveness of their management systems. Consistency of the management system including performance management system is one of the main best practice principles.

Keywords: Performance indicators, logistic processes, management system

1. INTRODUCTION AND LITERATURE REVIEW

An important aspect of the management system is its orientation. Orientation of the management system is determined by defining its structure, which included control processes (planning, organization, leading, controlling) and realization processes (value creating processes). We consider three basic orientations of management systems [30]: (1) functional, where the dominance of organizational units as the base for enterprise management prevails, (2) process, where the basis for management is a cyclical process with repeating outputs and (3) the project one, where it is a non-cyclical project with usually non-repeating output for a customer.

The first is functional orientation, where the basic structure of management is the line managers and organizational units entrusted to them. The second type is a process orientation, which forms the basic structure of the process owner and entrusted to a business process. The third type of process emanating from a project-management system, which forms the management structure for the project manager and entrusted to a unique project. Regardless of the orientation control system there is always a managing subsystem (line managers, process owner, and project manager) and the managed subsystem (employees). The difference is that in which the structure of the management and realization processes take place. All kinds of orientation management system have their advantages and disadvantages and the choice is mainly the size of the company, complexity of realization processes and their degree of automation.

Logistic processes are one of the main value creating business processes. Some authors [12 - 14] define them as support processes. Otherwise, they belong to the process-based management system which comes from process approach. The process approach presents an enterprise process-based management system. Declarative or real application of any management systems depends on managers. The real application of a process approach enables organizations especially to [3, 25, 27]: (1) focus on goals and process outputs

regardless of different organizational units, (2) define the intra-organizational market of internal suppliers and customers (in many organizations based on a service-oriented architecture), whose basis are intra-business service-level agreements between the process owners (managers responsible for individual business processes), (3) identify critical places of value creation for customers faster, as in the case of hierarchical functional structures, (4) optimize cost structures concerning products and services.

Answering the question "why the process orientation management system is more preferable than other", it is quite simple. As shown in **Fig. 1**, the three basic mechanisms of secondary adaptability - identification and optimization of bottlenecks, measuring and evaluating of the enterprise performance by a set of performance indicators and innovation activities of stakeholders can be more effectively implemented if there is process-oriented management system. Finding bottlenecks as the imbalances are usually carried out by analyzing processes using specific methods of analysis and modeling of business processes. A detailed analysis of selected business process can also detect hidden bottlenecks that are in functional orientation management system difficult to identify.

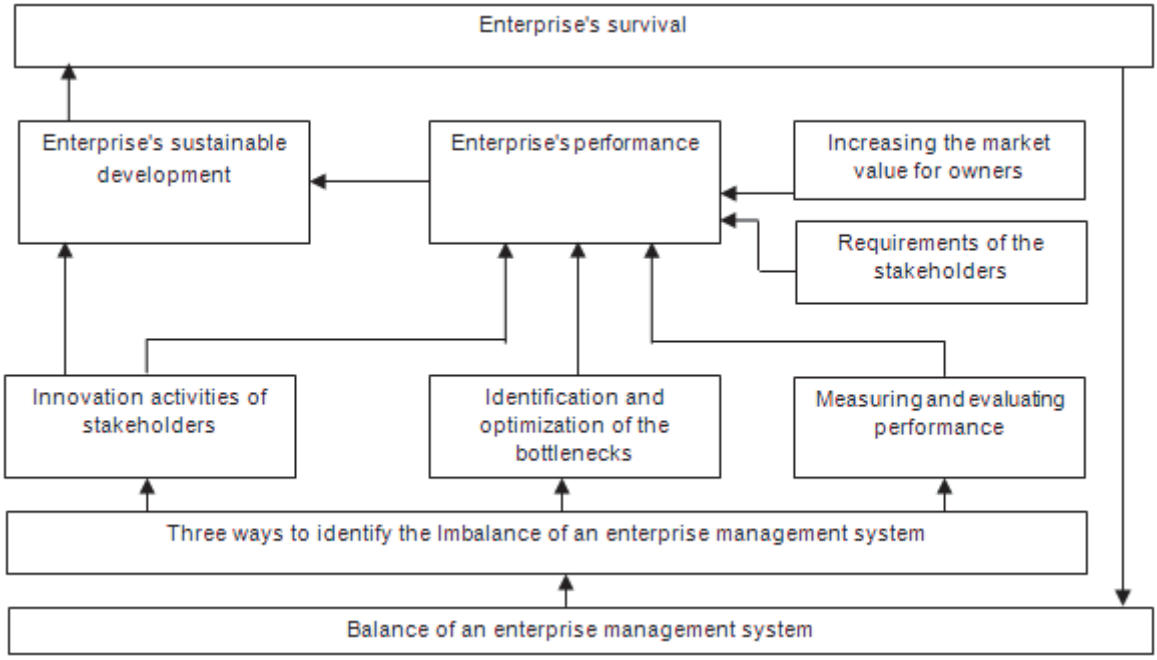

Fig. 1 Enterprise target orientation

Measurement and performance evaluation is a single event described by several authors that define the different systems for measuring and evaluating performance such as the Balanced Scorecard [15, 16, 17 18, 22, 10], Corporate Performance Management or Performance Management [19]. In the process-oriented management systems, defines three performance levels - strategic performance system of strategic goals, operational performance of the system of operational objectives, business processes and employee performance system of personal goals. We can easily identify the relationships between levels of performance by defining business processes. A prerequisite is knowing business processes at the level of individual actions, identifying indicators to measure and assess the performance of business processes, determine the relation between the process performance indicators (operational performance), strategic goals (strategic performance) and personal goals of employees, if they are defined.

Process performance is a level of reaching the required process results. The size of the level is determined by the difference between the real and target result. Process performance is an inseparable part of an overall company's performance. The basic element for measuring performance is an activity of any type of process. Process performance can be measured directly or indirectly. Direct measurement means monitoring process

performance through chosen process attributes. When measuring process performance indirectly, the chosen information about process development is compiled into a specifically defined file with a chosen criterion filter. When using these filters, one can have complete access to organized groups of information in each file; thus, giving a profile of the company's different departments. Accounting is a good example. Every managerial discipline represents its own view on performance evaluation. The difference between approaches on how to evaluate process performance is at the basis of measurement and evaluation, and in the internal system structure of measurement and evaluation. Even if all the approaches use different starting points to measure performance their combination can create a much more effective managerial decision-making system. The Balanced Scorecard is an example that contains different approaches. It uses information and indicators from other methods, but it does not directly apply methodology of other concepts—all the concepts complement each other like the pieces of a puzzle. If a company uses the Balanced Scorecard, it can also use Economic Value-Added or Activity-Based Costing in order to boost its decision-making system. Process Performance Management is a part of a process-based management system. Process Performance Management begins with its internal structure definition, which comprises identification of processes, determination of their importance, selection of process attributes and performance indicators (PIs) on an operational and strategic level.

This paper shows mainly a consistency of management system coming from the consistency of performance management system. Flapper, Fortuin & Stook [8] present a systematic method for designing a consistent performance management system to be used in practice where explicit attention is paid to the relations between the PIs. With a consistent performance management system (PMS) they intended a system that covers all aspects of performance that are relevant for the existence of an organization as a whole. Such a system should offer management quick insight into how well the organization is performing its tasks and to what extent the organizational objectives are being obtained. The method consists of three main steps: (1) defining performance indicators, (2) defining relations between performance indicators, and (3) setting target values or ranges of values for performance indicators. Ferreira & Otley [9] are describing the structure and operation of performance management systems (PMSs) in a more holistic manner. Berry, Coad, Harris, Otley & Stringer [1] made a wider literature review in management control. Performance management system can be defined in many different ways. Závadský & Závadská [32] describe it as a part of business process models. It could be also defined as a management control system [2, 4, 5, 23, 26]. Another point of view on PMS is a strategic view, in literature mostly described by Kaplan & Norton [15, 16, 17, 18, 11]. A critical view to their publications was presented by Otley [24]. Chenhall [5] also refers to the Integrative strategic performance measurement system. In literature we are confronted with three important terms: (1) management control system, (2) performance measurement system (PMeS) and (3) performance management system. From our point of view the type of that system is not important because we can find the performance indicator in each one. Performance indicator is a subject of our research, especially its attributes that need to be defined. An interesting work is presented by [7]. Their study deals with the moderating role of leadership in the relationship between management control as part of total quality management (TQM) and business excellence in terms of purposive change. Their results also indicate that transformational leadership is the most influential factor in the relationship between the management control construct and purposive change. It is concluded that organizations are strengthened by a management control system which is applied in combination with an intensive management communication approach in a context of transformational leadership. There are several views on performance. We remind that the starting point of our research is neither view on a PMS. We are dealing with the homogeneity of any of these performance systems which basic element is the PI.

2. ATTRIBUTES OF PERFORMANCE INDICATORS AS A BASELINE FOR CONSISTENT PMS

Indicator attributes for measuring and evaluating performance of the logistic processes as well as another business processes form a clear system of particular indicators. Indicator attributes do not replace the Balanced Scorecard, and neither do Activity Based Costing, but they are their internal structure. Each PI has

a clearly defined name that indicates the area of performance, which is being monitored by the indicator. It would be ideal if the name of the particular indicator contains a measuring unit; for example a percentage of faulty pieces. When deciding on the appropriate indicator name, it is advisable to ask the following question: How can we find out if the performance or the strategic goal has been reached? The PI can relate to either an operational or strategic level. This fact can be determined by the manner in which the Balanced Scorecard is used in the company. When the Balanced Scorecard is implemented in the company, it is evident which indicators correspond with the strategic level, which relate to the operational level and what connection there is between them. If the company does not use this concept, it is advisable to create a primary relation between a strategic goal and an indicator. This means linking all strategic goals with the relevant indicators that signalize extension of the goal fulfillment. If the indicator does not measure a strategic goal, it represents operational process performance. In both cases, the indicator is related with process attribute. If the indicator represents operational process performance, a process owner, a line manager, or lower management can define it. In case the indicator monitors strategic goals and their fulfillment, the top management is responsible for defining the indicator. It is important to specify responsibility for defining the indicator [29]. It is equally essential to specify responsibility for the indicator target value. For example, in Alcatel, the same person defines the indicator and its target value. This rule does not have to apply in all companies, because selection and definition of the indicator can be a result of teamwork. The indicator has to be specifically quantified in measuring units [28]. The measuring unit depends on the indicator type. When using absolute indicators, it is fairly easy to quantify them. It gets more complicated with relative indicators. There are situations when exact measurement is impossible, e.g. intangible assets such as improvement of organizational culture. The time frame of the target value sets a period, for which a goal is being defined, for example one year. In order to continuously monitor the performance, the target value is divided into equal time intervals, which correspond with the frequency of indicator evaluation. This means that if we set an indicator e.g.: process cost for a year and we want to monitor it throughout the year, the year target value will be divided into monthly goals. Each indicator has to have a target value otherwise we cannot measure it. Setting a target value is an activity that takes into consideration real expectations and conditions. It usually means to use a retrospective analysis and prognosis. There are various analytical, comparable and planning methods, which are used for target value specification. The first information attribute of the indicator is responsibility for recording concurrent values. Concurrent results can be collected automatically or manually. In the case of the latter, it is necessary to choose a responsible employee who will record concurrent values periodically in the specified place. Record periodicity is next information attribute. If an automatic data collection is used, record periodicity is defined in the program as well. Value record place specifies where the data will be recorded. It is important to use such an information system that would integrate monitoring of all indicators. Many companies have implemented various information systems with isolated orientation in marketing, finance, logistics, production planning, and management. Indicators localized in various information systems have to have a unified description defined in a centralized place, which can be easily accessed. This centralized registry also lists a place, where concurrent values are being recorded. Furthermore, the database defines the sources of information about performance. In the case that it is impossible to clearly assign a value to a certain indicator, it is however necessary to specify entry data, from which the target value will be attained. This is especially typical for synthetic, relative, and differential indicators. When a calculation is needed, it must be evident, which partial sub-indicators make up the final value.

Responsibility for indicator evaluation is usually connected with responsibility for the target value definition. This practically means that one manager directs his own indicators. Process evaluation means monitoring the process development. When the required performance is not being attained, the manager makes a decision on relevant measures or reports the discrepancy to his superior manager. The employee who is responsible for indicator evaluation has to know the frequency of performance evaluation. If the measurement and evaluation is automated, the system will automatically notify the employee and report a positive or negative discrepancy. Every situation that causes insufficient process performance can have specific causes with

specific solutions. Systematic measures need to be specified for each indicator in the case of insufficient performance. A series of methods can be used for evaluating different areas. These methods are stated in evaluation method attribute.

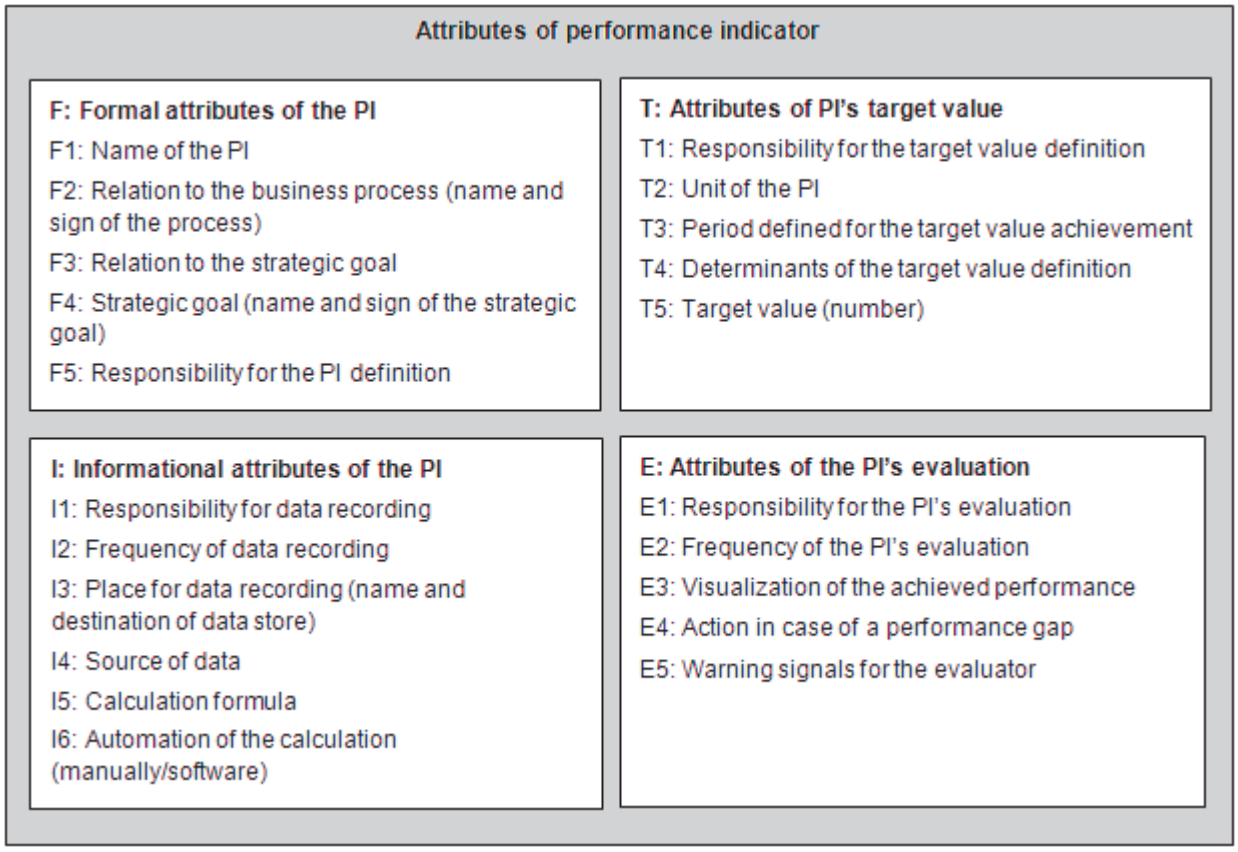

Fig. 2 The four groups of the PI`s attributes

At the end of this paper`s part we can define final groups of attributes of the PI: (1) formal attributes of the PI, (2) attributes of the PI's target value, (3) informational attributes of the PI and (4) attributes of the PI's evaluation. Each group consists of various attributes. Each set of attributes consists of 21 attributes of PIs. In **Fig. 2** are shown the groups and the attributes of the PI.

2.1. Formal attributes of the PI

Name of the PI - Each indicator should have a specific name which implies an area of the performance that is measured by this indicator. To make the indicator able to describe the context it is good to answer to the following question: How could we find out if the performance or strategic goal has been reached?

Relation to the business process (name and sign of the process) - This formal attribute refers to the connection of indicator to the specific business process.

Relation to the strategic goal - There is a possibility that an indicator is related to operational or strategic level in a PMS. If the indicator is used for the measurement of strategic goals it refers to measurement and evaluation of strategic performance. The fact if the indicator belongs to first (strategic) or second (operational) level depends also on the utilization of the Balanced scorecard system. If this system was implemented in a company, it is obvious which indicators are part of the strategic set and which are part of the operational level of performance and what are the connections between them. If this approach is not used by company it is good to create a primary connection between strategic goals and indicators.

Strategic goal (name and sign of the strategic goal) - If there is a connection to strategic goal it is also necessary to name the strategic goal that is measured by the given PI.

Responsibility for the PI definition - If it is an operational level of performance and the indicator do not measure the strategic goal, the indicator can be defined by the process owner or by the line managers. If the indicator monitors the achievement of strategic goals, it is very important to follow specific principles of its definition. It means that the responsibility for the indicator definition usually lies with the top managers.

2.2. Attributes of the PI's target value

Responsibility for the target value definition - It is very important to define the responsibility for the indicator definition but on the other hand from this definition it should be obvious where the responsibility for its target values definition lie. The target value is critical from the performance evaluation point of view and that is why its specification should be addressed to a specific employee.

Unit of the PI - After creating a suitable indicator and defining the target value, the indicator should be clearly quantified in exact measurement units.

The Period defined for the target value achievement -This characteristic determines the period on which the goal is set.

The Determinants of the target value definition - Each target value should be based on real expectations and the existence of the assumption of its determination. It usually comes from retrospective analyses and future state forecasting. There exists a row of analytical, comparative and planning methods of determining the target value.

Target value (number) - One of the indicator attributes is a goal and without target value the existence and monitoring of performance would hardly be realized.

2.3. Informational attributes of the PI

Responsibility for data recording - The next responsibility is a determination for the employee who records the data necessary for measurement and evaluation of the performance. It is the third responsibility as an attribute of the performance indicator.

Frequency of data recording - The next informational attribute that deals with the creation and distribution of information in connection to the business performance is a frequency of data recording. A dependable employee should clearly identify his responsibilities and frequencies of data recording to make the performance measurement realistic. If the collecting of data is automated, the frequency of data recording is defined by software.

Place for data recording (name and destination of data store)

Source of data - If there is no definite value assignment of an indicator, it is important to determine the input data from which the final values are achieved. It is characteristic especially to synthetic indicators and relative indicators. If the calculation is necessary, it should always be clear what the partial sub indicators that are used for final value calculation are.

Calculation formula - If the value of the PI is gained from various input values, the mechanism of final values calculation should be defined (if the calculation is not automated). In case of complex PI it is good to use automated calculation, because the evaluation of achieved performance is easier.

Automation of the calculation (manually/software) - In this case it is important to determine which parts are necessary to be automated and which parts need to be calculated manually.

2.4. Attributes of PI`s evaluation

Responsibility for the PI`s evaluation - Responsibility for the evaluation is usually connected with the responsibility for defining the target values. It means that one of the managers is managing "his" indicators.

Frequency of PI`s evaluation - Employee who is responsible for the performance evaluation should know the frequency in which the performance of the selected process is evaluated by each indicator. If PMS is automated, it can automatically warn a responsible employee to evaluation need, or system is reporting a deviation.

Visualization of the achieved performance - An important attribute of the PI that should be determined is a visualization of the performance results. It represents the selection of the method or the way of visualization of the results to the evaluator.

Action in case of the performance gap - Situations that caused an insufficient performance can have specific causes with specific ways of solving them. For each PI there should be a defined procedure in the case that the performance is in either the "exceed" or "failure" interval.

Warning signal for evaluator - The warning signal represents an alert to the person who is evaluating the achieved level of performance.

3. EXPLORING THE CONSISTENCY OF PIs ATTRIBUTE DEFINITION FOR MEASURING AND EVALUATING LOGISTIC PROCESSES IN THE SELECTED MANUFACTURING COMPANY

The aim of our research was to identify the extent of consistency of performance indicators related to logistics processes. Research was conducted in the selected manufacturing company which provides components for Whirlpool located in Poprad Matejovce. As we already state the consistency of defined indicators is an important premise for increasing the efficiency of company´s management. Defining especially the responsibilities in performance management system ensures its stability.

3.1. MESOT framework

In order to evaluate consistency we use the MESOT framework (Measuring and Evaluating Strategic and Operational Targets). This frameworks in Table 1 shows all attributes of performance indicator (21) in first column of the framework and more than two real indicators in the first raw. In the MESOT framework must always be more than two indicators for correct identification of the performance management system consistency.

The consistency of performance management system (PMS) is clearly described by MESOT framework application in the specific business conditions and in accordance with the analysis of performance indicators. In our paper we focus on performance indicators of logistic processes in the selected company.

The rows of MESOT framework provide information about all attributes of performance indicator A_j. In total there are 21 of them. Therefore j = 21. Data in the columns describe specific performance indicators PI_i, where i = 1, 2 ... n. In order to evaluate total consistency of PMS all indicators used in company should be involved, especially those used in strategic performance evaluation.

We can assess whether PMS is partially consistent according to sum the sum of values in the corresponding lines. Framework consists of values 1 or 0 depending on the fact whether indicator PI_i in corresponding column has defined attribute A_j or not, while $A_i \in \{F1, F5; T1, T5; I1, I6; E1, E5\}$. If the attribute is defined, the value 1 is written and if the attribute is not defined, value 0 is entered.

If the attribute has reached a value equal to the number of indicators, we consider it a positive partial consistent definition of all the indicators included in the analysis using MESOT framework. If the attribute has reached a

value of 0, there is also a partial consistent definition, but negative. All values between 0 and 21 speak of inconsistent definitions of characteristics. Mathematically, we can describe partial consistency as following:

$$\text{If } \sum_{i=1}^{n} A_i = 0;\ A_i \in \{F1, F5; T1, T5; I1, I6; E1, E5\} \text{ than negative partial consistency} \quad (1)$$

$$\text{If } \sum_{i=1}^{n} A_i = n;\ A_i \in \{F1, F5; T1, T5; I1, I6; E1, E5\} \text{than positive partial consistency} \quad (2)$$

$$\text{If } \sum_{i=1}^{n} A_i = (0, n);\ A_i \in \{F1, F5; T1, T5; I1, I6; E1, E5\} \text{than partial inconsistency} \quad (3)$$

Inconsistencies in MESOT framework are featured in the last column in red, negative partial consistency is characterized by yellow and partial positive consistency is characterized by green color. In regards of total consistency of PMS, then all the attributes in all of the rows have values equal to the number of analyzed parameters n, whichever is:

$$\text{If } \sum_{i=1,i=1}^{n,21} A_{i,j} = n \wedge j = \langle 1,21 \rangle \text{ than whole PMS consistence} \quad (4)$$

The sum of the individual columns can have a value from the interval 0 to 21. More attributes defined for performance indicators, the measurement is a more systematic evaluation of performance, and we can talk about systemic approach.

Table 1 MESOT framework

		1	...	i	...	n	
		Performance Indicator PI_1	...	Performance Indicator PI_i	...	Performance Indicator PI_n	**ΣA_i**
F1	Name of the PI	1 ∨ 0	...	1 ∨ 0	...	1 ∨ 0	<0,n>
F2	Relation to the business process	1 ∨ 0	...	1 ∨ 0	...	1 ∨ 0	<0,n>
F3	Relation to the strategic goal	1 ∨ 0	...	1 ∨ 0	...	1 ∨ 0	<0,n>
F4	Strategic goal (name and sign of the strategic goal)	1 ∨ 0	...	1 ∨ 0	...	1 ∨ 0	<0,n>
F5	Responsibility for the PI`s definition	1 ∨ 0	...	1 ∨ 0	...	1 ∨ 0	<0,n>
T1	Responsibility for the target value definition	1 ∨ 0	...	1 ∨ 0	...	1 ∨ 0	<0,n>
T2	Unit of the PI	1 ∨ 0	...	1 ∨ 0	...	1 ∨ 0	<0,n>
T3	Period defined for the target value achievement	1 ∨ 0	...	1 ∨ 0	...	1 ∨ 0	<0,n>
T4	Determinants of the target value definition	1 ∨ 0	...	1 ∨ 0	...	1 ∨ 0	<0,n>
T5	Target value (number)	1 ∨ 0	...	1 ∨ 0	...	1 ∨ 0	<0,n>
I1	Responsibility for the data recording	1 ∨ 0	...	1 ∨ 0	...	1 ∨ 0	<0,n>
I2	Frequency of data recording	1 ∨ 0	...	1 ∨ 0	...	1 ∨ 0	<0,n>

I3	Place for data recording	1 ∨ 0	...	1 ∨ 0	...	1 ∨ 0	<0,n>
I4	Source of data	1 ∨ 0	...	1 ∨ 0	...	1 ∨ 0	<0,n>
I5	Calculation formula	1 ∨ 0	...	1 ∨ 0	...	1 ∨ 0	<0,n>
I6	Automation of the calculation (manually/software)	1 ∨ 0	...	1 ∨ 0	...	1 ∨ 0	<0,n>
E1	Responsibility for the PI`s evaluation	1 ∨ 0	...	1 ∨ 0	...	1 ∨ 0	<0,n>
E2	Frequency of the PI`s evaluation	1 ∨ 0	...	1 ∨ 0	...	1 ∨ 0	<0,n>
E3	Visualisation of the achieved performance	1 ∨ 0	...	1 ∨ 0	...	1 ∨ 0	<0,n>
E4	Action in case of a performance gap	1 ∨ 0	...	1 ∨ 0	...	1 ∨ 0	<0,n>
E5	Warning signal for the evaluator	1 ∨ 0	...	1 ∨ 0	...	1 ∨ 0	<0,n>
	ΣA_j	<0,21>		<0,21>		<0,21>	

3.2. PMS consistency of the logistic processes

The subject of the research is the logistics processes in the company include the supply, production and distribution logistics, defined in the following areas: order capture, inventory management, purchasing and supplier management, production / manufacturing, warehousing and transportation. We included into our analysis the following indicators:

1. DIF - Delivery in Full,
2. DOT - Delivery on Time,
3. DIFOT - Delivery In Full on Time,
4. TSMC - Total Supply Management Costs,
5. CCCT - Cash to Cash Cycle Time,
6. ISTD - Inventory stock turns in Days,
7. % of failed orders,
8. % of realized km out of planned km,
9. TLC - Total loading capacity (for trucks),
10. Average fuel use per km,
11. NCC - Number of customer complains,
12. OSCR - % of orders scheduled to customer request.

In this article we are not dealing with the contents of indicators for evaluation of logistics processes as some authors [20, 21]. We analyze the consistency of their definitions using MESOT framework. Based on the analysis in selected company, we enter values 1 or 0 into the framework matrix depending on whether the attribute has been defined for that variable. We conducted an analysis of controlling system, reviewed reports and conducted structured interviews with managers of logistics. **Table 2** shows the results of the analysis achieved by the MESOT framework. The company uses 12 indicators to evaluate logistics processes. In this case i = 12. The number of attributes performance indicator is unchanged, i.e. j = 21.

Firstly, we was investigated an existence of partial positive or negative consistency. As shown in Table 2, the positive consistent partial definition applies to all variables in the following attributes: F1, F2, T2, T3, T5, I4, I5 and I6. This means that all performance indicators used to evaluate company's logistics processes are defined. If any of the indicators would not have defined any other attributes, we could talk about complete consistency PMS. Our analysis, however, discovered that some indicators have also defined other attributes and vice versa, several do not. Thus, the sum of the last column shall be neither 0, nor 12.

In the case of analyzed company so we can talk about an inconsistent PMS. A solution would be to either define attributes, F1, F2, T2, T3, T5, I4, I5, and I6 for the other indicators or omit the attributes which are defined only for certain parameters, thus the last column of this attribute acquiring the sum 0. The set of all attribute reaches a value of 21. In the last line we can see the degree of systemic approach in measuring and assessing

performance of logistics processes. A systematic approach is applied when the last line in each field is equal to the value 21, representing a definition of all attributes for all indicators.

Table 2 Application of the MESOT framework in the selected manufacturing company

		1	2	3	4	5	6	7	8	9	10	11	12	
		DIF	DOT	DIFOT	TSMC	CCCT	ISTD	% of failed orders	% of realized km out of planned km	TLC	Average fuel use per km	NCC	OSCR	Σ
F1	Name of the PI	1	1	1	1	1	1	1	1	1	1	1	1	12
F2	Relation to the business process	1	1	1	1	1	1	1	1	1	1	1	1	12
F3	Relation to the strategic goal	1	1	1	1	1	1	0	0	0	0	0	0	**6**
F4	Strategic goal (name and sign of the strategic goal)	0	0	0	0	0	0	0	0	0	0	0	0	0
F5	Responsibility for the PI`s definition	1	0	0	1	1	0	0	1	1	1	1	0	**7**
T1	Responsibility for the target value definition	1	1	1	1	1	1	0	0	0	0	0	1	**7**
T2	Unit of the PI	1	1	1	1	1	1	1	1	1	1	1	1	12
T3	Period defined for the target value achievement	1	1	1	1	1	1	1	1	1	1	1	1	12
T4	Determinants of the target value definition	0	0	0	0	0	1	1	0	0	0	0	0	**2**
T5	Target value (number)	1	1	1	1	1	1	1	1	1	1	1	1	12
I1	Responsibility for the data recording	1	1	1	1	1	0	0	0	0	1	1	1	**8**
I2	Frequency of data recording	1	1	1	1	0	0	0	1	1	0	0	1	**7**
I3	Place for data recording	1	1	1	1	1	1	0	0	0	1	1	0	**8**
I4	Source of data	1	1	1	1	1	1	1	1	1	1	1	1	12
I5	Calculation formula	1	1	1	1	1	1	1	1	1	1	1	1	12
I6	Automation of the calculation (manually/software)	1	1	1	1	1	1	1	1	1	1	1	1	12
E1	Responsibility for the PI`s evaluation	1	1	1	0	0	0	0	1	1	1	0	0	**6**
E2	Frequency of the PI`s evaluation	1	1	1	0	1	0	0	0	0	0	0	0	**4**
E3	Visualization of the achieved performance	1	1	1	1	1	1	0	0	0	0	0	0	**6**
E4	Action in case of a performance gap	1	1	1	1	0	0	0	0	0	0	0	0	**4**
E5	Warning signal for the evaluator	1	1	1	1	0	0	0	0	0	0	0	0	**4**
	Σ	**19**	**18**	**18**	**17**	**15**	**13**	**9**	**11**	**11**	**12**	**11**	**11**	

4. CONCLUSION

The main aim of this paper was to analyze the consistency of performance indicators related to logistics processes in the selected manufacturing company. Firstly we looked into various types of management system

orientation. Furthermore we provided arguments why the process orientation management system is more preferable than others. Our main focus was on consistency of management system coming from the consistency of performance management system. We provided the list of attributes which every indicator should have defined. These attributes can be divided into four main categories: formal attributes, attributes of PI's target value, informational attributes and attributes of the PI's evaluation. It total there are 21 attributes. A short description was provided for each category.

The main value of this paper lies in its third part where we explored the consistency of PIs attribute definition for measuring and evaluating logistic processes in the selected manufacturing company. We used the MESOT framework as the main tool in this evaluation. This case study provides an example of an analysis of such type can be performed in a company. The results of this analysis provide a clear image of how well are the indicators defined in real business environment.

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