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Full Length Research Paper

The impact of understanding duties at the level of internal integration between logistics and marketing functions: Case of Slovene retailers

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Duplication of tasks or activities in companies is a frequent occurrence. On one hand, this results in time lost, on the other hand it may cause disharmony between work results. Logisticians often define integration within the framework of the supply chain, yet they neglect the internal integration or the integration between individual departments or functions in a company. Defining internal integration and its level as well as the connection with the level of the right understanding of the duties is the basis of this research. Quantitative research focuses on the way the level of the right understanding of duties of logistics employees influences the level of internal integration between logistics and marketing function.

Key words: Logistics**,** marketing, functions, internal integration, duties.

INTRODUCTION

One of the most distinct paradigms of modern business management is that individual business systems can no longer be competitive as independent entities but only as the entire system of the supply chain (Stevens, 1989). It is no longer about the system type-of-merchandise versus type-of-merchandise or retail-store versus retail-store. Now, the only competitive system is supplier-type of merchandise-retail-store versus supplier-type of merchandise-retail-store or supply-chain versus supply-chain. In this established competitive environment the essential success of one business system depends on management capability for the integration of business relations of the complicated network of this system.

Marketing focus is on creation of demand or needs. This can be implemented through a product, a price and through business relations with end users (buyers) and by managing purchase channels, whereas logistics is typically operationally directed towards meeting the demand. The functional interdependence between logistics and marketing can be seen in all components of the marketing network (Murphy and Poist, 1994; Rinehart et al., 1989). The typical meeting point of logistics and marketing functions in a company presents the areas of support to consumers and logistics quality (Morash et al., 1997).

Therefore, the integration of logistics and marketing functions is especially critical for achieving maximum consumer satisfaction, incurring minimal business costs or maximising company's revenues. However, this depends on the effect of more than one individual or one individual function. Therefore, the integration of logistics and marketing functions is necessary for each company that strive to be locally and globally competitive.

Objectives and assumptions

The main aim is to study inter-functional integration of logistics and marketing functions in a company. Moreover, the research will investigate the link between the way the level of understanding the duties influences the level of internal integration of logistics and marketing functions. To this end, we will explore the understanding of duties of logistics employees from the viewpoint of marketing employees. Based on the data on relationships between employees in a logistics and marketing function,

that were acquired using questionnaires which were completed by the employees of these functions in selected Slovene B2C (business to consumer) companies, we will learn about the relationships between employees. We will endeavour to confirm the hypothesis regarding the link between the level of understanding the duties with the level of integration of logistics and marketing functions. The set hypothesis is as follows: "If the employees from the marketing function understand the duties or tasks of employees from logistics function, then the level of integration in these functions is higher."

The hypothesis will then be confirmed or rejected using statistics data analysis that is a bivariance correlation between both variables that present the level of collaborative behaviour and the level of internal integration. The correlation will inform us whether the variables are in fact connected or not.

Characteristics of internal integration

Theorists, exploring the structure of organizations suggest that the interdependence is catalyst for inter-functional integration (Brown, 1983; Pfefer and Salancik, 1978). Interdependence theory suggests that the relations between the two operating units are described as individual or collective and behaviour of individuals or groups (Ellinger, 1997). Internal integration occurs when specialized functions or departments in a company are interdependent and when operations and procedures occur which allow and call for co-operation. Internal integration thus researches within a company. It aims to eliminate traditional silo functions and emphasizes better coordination between function areas. Internal integration reflects the fact that at least two (or more) complementary functions of a company act as a unity although they are not integrated into a single entity. Two departments (two functional areas) in a company are complementary when they complete each other and have a certain array of inter-connected functions which need to be complemented with another function of a complementary department.

Certain literature characterizes inter-functional integration as interaction or as communication activity (Rinehart et al., 1989; Griffin and Hauser, 1996), which states that more frequent meetings and information flows between function departments contribute to a more effective integration. Interaction philosophy for managing inter-functional relationships probably stems from a holistically designed philosophy, which is based on many business theories and managerial procedures (Sheth and Parvatiyar, 1993). Managers strictly define interactional philosophy as a system of contacts with other functions and departments in form of transactions. The transactional viewpoint of integration deals with departments as interdependent entities which compete against all resources in a company; contacts between departments are understood as temporary and present financial loss. Due to such competitiveness and costs, managers view this process of meetings and the flow of information as a negotiation system, whereby each department or a function strives to benefit as much as possible from a meeting or data exchange. The interactional aspect of inter-functional integration thus presents a behaviour which includes exchange of information.

Similar assumptions were also made by Bonoma et al. (1977), who assert that integration between functions or departments exists when an unimpeded data interchange occurs. The way, in which data interchange has an impact on the success of company's co-operation, is not always agreed upon by the researches. Monaert et al. (1994) identified a positive link between the integration aspect of data interchange and success of the company, whereas Gupta et al. (1985), Ruekart and Walker (1987) identified a lack of inter-functional contacts or integration as one of the more important reasons for company's bad performance. Kahn (1996) conducted an empirical research, in which he found out that within the framework of interactional aspect of integration data exchange and formal meetings clear behavioural patterns exist.

In situations, where there is no direct communication, there may only be one-sided or one-way flow of information. This means that information flow only occurs from logistics to marketing function but not vice versa. Other literature characterizes integration as collaboration (Lawrence and Lorsch, 1986; Lorsch, 1965), which facilitates team-work, sharing of resources and achieving mutual goals between complementary functions in that they all contribute to a more effective integration. The third group of literature, however, characterizes integration as an element of interaction and collaboration (Gupta et al., 1985; Gupta et al., 1986; Song and Parry, 1992; Song and Parry, 1991). Such an aspect is in a way a very attractive philosophy, as inter-functional or inter-departmental integration is viewed as a multi-dimensional approach.

Souder and Sherman (1993) defined integration as a state of dispersed high-level values, common goals, and collaborative behaviour. Lorsch (1965) defined it as a process of unified investment of efforts between different subsystems when reaching completed tasks of a company. O'Leary-Kelly and Flores (2002) stated, integration refers to the level at which separated functions cooperate and thus achieve goals. Based on this definition, the integration is a puzzle, which depends on the level of co-operation, co-ordination, interaction and collaboration.

METHODOLOGY

Methodology is based on the basic definition of the existing level of internal integration, which is further based on interaction and the collaborative aspect (Figure 1: Research model). The basic independent variables of the existing level of internal integration in

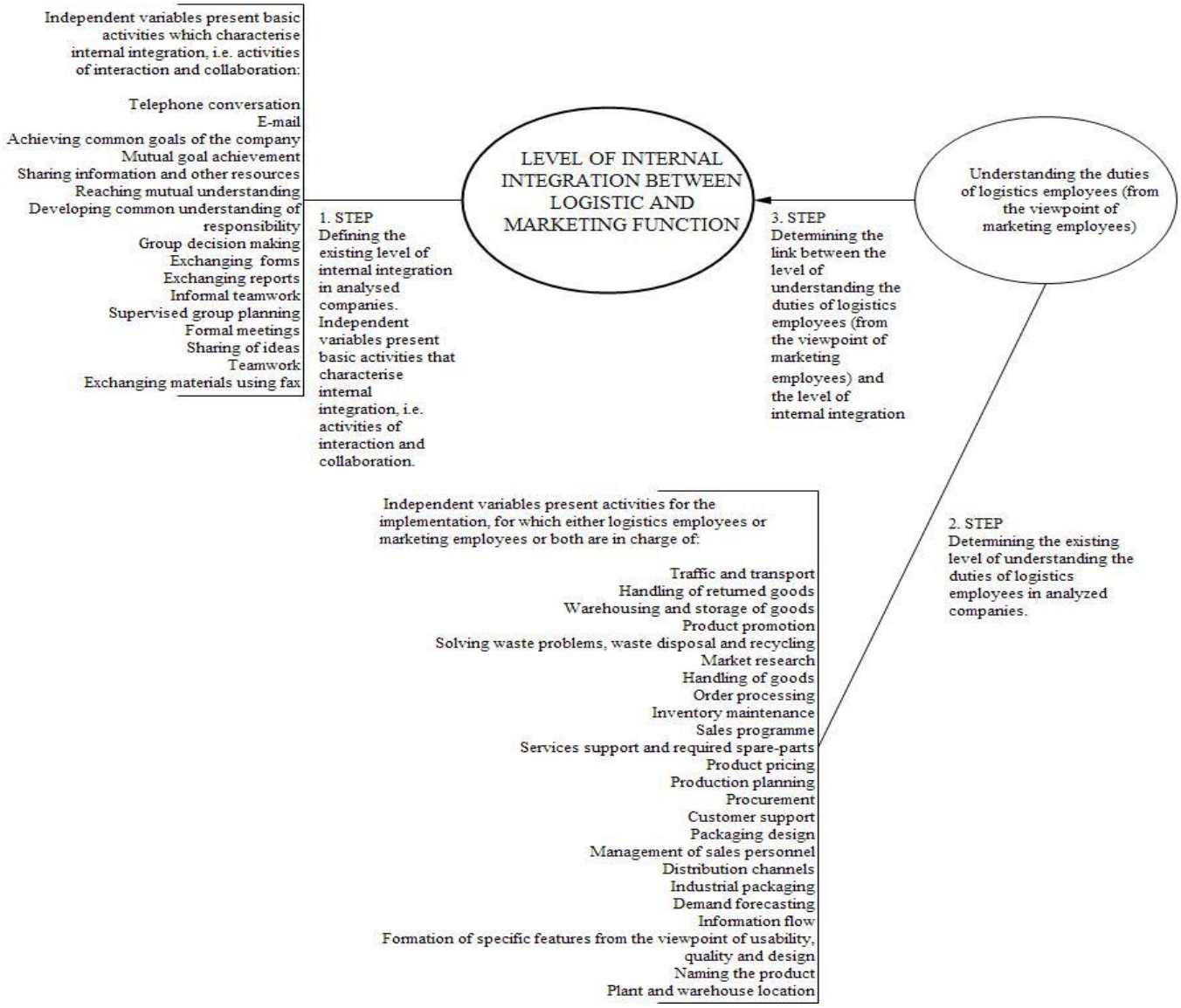

Figure 1. Research model

analysed companies are also based on some recent studies. Defining the arithmetic mean of questionnaire findings, which defines the existing level of internal integration, will present the basis for further research.

Research will then be undertaken by analysing the findings and independent variables, which refer to the search for the existing level of collaborative behaviour in companies in question. Means will form the basis for investigating the existence of a link between the level of collaborative behaviour and the level of internal integration. The process of finding such a link presents a basis for confirming the hypothesis. The study will be pursued using analysis of findings and independent variables which refer to the search for the existing level of collaborative behaviour in analysed companies. These results will help us confirm the hypothesis.

Sampling of selected companies

The sample of companies was based on previously defined area, which the companies represent, that were classified as retail companies excluding motor vehicle retailers. This area was defined as such by the Chamber of Commerce of Slovenia and presents the primary source of information on companies included in the research. The entire population of large[1] companies whose activities were in retail excluding motor vehicle retailers was included. The data on these companies were acquired the Slovene Chamber of Commerce. On 2 April, 2009, there were 33 registered large companies in Slovenia, whose activities were in retail, excluding motor vehicle retailers.

[1] According to the Companies Act companies are: micro, small, medium and large sized companies, taking into account the set measures on a balance sheet day of the annual balance sheet: the average number of employees in a business year, net sales, and the value of assets. A large company is a company which meets two or more measures: the average number of employees in a business year is over 250, net sales amount to more than 29.200.000 Euro, and the value of assets exceeds 14.600.000 Euro.

Table 1. Degree of mutual activities with the compared sector; level of internal integration (N=26).

Activity	Logistic sector (%)	Marketing Sector (%)	Total (%)
Telephone conversation	100	100	100
E-mail	100	100	100
Achieving common goals of the company	93	100	96
Mutual goal achievement	86	100	92
Sharing information and other resources	79	100	88
Reaching mutual understanding	71	100	85
Developing common understanding of responsibility	71	100	85
Group decision making	71	100	85
Exchanging forms	64	100	81
Exchanging reports	64	100	81
Informal teamwork	71	92	81
Supervised group planning	64	100	81
Formal meetings	64	92	77
Sharing of ideas	64	83	73
Teamwork	50	82	64
Exchanging materials using fax	57	60	58
Arithmetic mean of all activities	73	95	83
Level index of internal integration [0..100]	73	95	83

The scale from 0 to 100 or from 0 to 100 %, whereby 100 % or 100 means that all interviewees believe that a particular activity is implemented at least once a year and whereby 0 or 0 % means that all interviewees believe that a particular activity is not implemented at all.

Developing the questionnaire

Prior to developing the questionnaire, relevant opinions and facts had to be defined. For research purposes, a partially structured questionnaire was chosen, which includes closed-type questions, followed by open questions, to which the interviewees provide descriptive answers.

Methodology of implementing the questionnaire

On 5 June, 2009 questionnaires were sent out via snail mail to all 33 large Slovene companies, which are defined as “retail companies, excluding motor vehicle retailers”. Each company was sent 5 questionnaires including 5 envelopes with post stamps. This way a complete anonymity of the company was assured, as well as the anonymity of the people who filled out the questionnaires. In the letter of correspondence managers and some other employees, such as representatives, heads of projects, clerks, consultants etc. of both sectors were asked to fill out the questionnaires. By 3 August 2009, 26 filled out questionnaires were returned, 14 from the logistics sector and 12 from the marketing sector.

RESULTS

In the following analysis the operationalization and the results of each of the terms or concepts was presented that are referred to in the hypothesis. Then, the hypothesis entitled: “If logistics employees understand the duties or tasks of marketing employees then the level of integration of both functions is higher” was tested.

Level of internal integration

To be able to establish a link between the level of internal integration and the level of understanding the duties, we first had to determine the existing level of internal integration in companies in question. The level of internal integration was operationalized using a set of questions in which various activities (Figure 1 and Table 1: Degree of mutual activities with the compared sector; level of internal integration (N=26)) were set out, whereby the interviewees rated the degree of frequency of mutual cooperation with the compared sector, which means that the interviewees from the marketing sector rated the cooperation of their sector with the logistics sector and vice versa – the interviewees from the logistics sector rated the co-operation of their sector with the marketing sector. The said set of questions featured 16 different activities such as formal meetings, telephone conversations, e-mails etc. (Table 1), in which the interviewees rated the frequency of operations or implementation by choosing one of the following answers: daily, weekly, monthly, yearly or never.

Based on the bivariance analysis, which tests the influence of one or more independent variables on the dependent variables, of this set of statements compared to other questions, we found out that the interpretation of results is most plausible, if all possible answers are dichotomised or that they are consolidated into two categories such as: never (0) or at least once a year or

more (1). Parts of dichotomised answers are shown in Table 1, whereby the results are shown separately for the interviewees from the logistic sector and the interviewees from the marketing sector.

Activities from Table 1 directly measure the level of internal integration. For the majority of activities, shares are relatively large, as they present a share of the category "at least once a year" or "frequently", what is a relatively wide period of time. The interviewees from the marketing sector rated for 11 out of 16 activities that everyone from this sector (100%) conducted the aforementioned activities at least once a year or more. The interviewees from logistics sector, on the other hand, rated in only 2 out of 16 activities that everyone from logistics sector (100%) conducted the aforementioned activities at least once a year or more. These activities include most widespread communication activities such as telephone conversations and emails. However, least implemented activities featured the use of fax machines (58%) and teamwork (64%) if we compare the shares based on the sector.

The index of internal integration level is more interesting than the implementation of each activity as such. The latter notion is operationalized as a common relative sum of dichotomy variables or activities presented in the previous table (Table 1) and amounts to 83. The bottom row in Table 1 clearly shows that the level of internal integration for employees from the marketing sector is somewhat higher (95) compared to employees from the logistics sector (73).

The level of understanding the duties or tasks of employees in logistics function from the viewpoint of marketing employees

In order to be able to establish a link between the level of understanding the duties and the level of internal integration, the questionnaire also encompasses questions, which help us confirm or reject the following hypothesis "If marketing employees understand the duties or tasks of logistics employees then the level of integration of both functions is higher." First of all, we will determine the indicator of the right understanding the duties or tasks, which will present the arithmetic mean of all activities. Due to its comparison with the indicator of the level of internal integration, we will transfer the scale from 1 to 5 onto 0 to 100.

There are 24 different activities, such as traffic and transport, warehousing and stocking, industrial packaging, goods management etc. which were rated on a scale from 1 to 5 according to their existing state, followed by the expected state. Five different grading levels were available whereby "1" means "not in charge of", and "5" means that the logistics sector was "in charge of" a particular activity. Of the aforementioned 24 activities, the logistics sector is in charge of the majority of them (hereinafter referred to as L); both sectors are in charge of some of them (hereinafter referred to as LM), and the marketing sector is in charge of the rest of them (hereinafter referred to as M).

Table 2 (Understanding the duties or tasks of logistic sector from the viewpoint of marketing employees and the presentation of their arithmetic mean (N = 12)) presents arithmetic means of ratings based on 24 activities, as provided by marketing employees. It should be mentioned, that activities from the said category M have been rotated so as to present the right understanding of duties. To this end, all activities from Table 2 are rated so that the higher the grade, the higher the correct understanding of duties. The statements were "mapped" in the following way: the new value = 6, the old value (for example grade 1 is mapped into 5, grade 2 into 4, 3 stays 3, and grade 4 was mapped into 2 and grade 5 into 1). This way, statements marked with M do not measure opinion on how the interviewees rated the duties, but they present the degree to which the duties or the "power" was rightly rated (because, for the statements, rated with M, the logistics sector is not in charge of). Apart from the arithmetic grades, also the standard deviations from arithmetic means (from the average) are presented, whereby the higher the standard deviation for a certain activity, the higher the degree to which the rates of marketing employees differ from each other, or their grades are dispersed. The outer right column also features p. value (sig.) of t-test. Where the said value is lower than 0.05, the differences between the existing and the actual state are statistically significant or based on the patters one can assume that the differences are also present in the population (not just the sample).

Based on the findings from Table 2 we can determine which activities were (close to) best understood from the viewpoint of marketing employees (these are activities or tasks with the highest average rate) and which activities or tasks were (more or less) wrongly interpreted. Table 2 further presents the difference between the existing situation (Table 2) and the hypothetical proposed situation (last column). The aim of such a questionnaire is to investigate their perception regarding the duties. As already mentioned, some statements have been rotated. To this end, all activities were analyzed in such a way that the higher the rating, the better the right understanding of duties. Due to the fact that the last column from Table 2 to a large extend refers to activities or tasks of higher hypothetical value compared to the actual value we can assert that considering all activities, marketing employees theoretically have a somewhat better understanding of duties of logistics employees, than this could be interpreted from their rating of the existing situation (third column). An exception is the activity "production planning", where the difference is negative (-0.2). Here, we may conclude that the marketing employees do not correctly understand the duties or tasks of logistics employees. As this statement was not rotated we may

Table 2. Understanding the duties or tasks of logistic sector from the viewpoint of marketing employees and the presentation of their arithmetic mean (N = 12).

Activities or tasks	Existing situation	Std. deviation existing situation	Difference towards the proposed duties	t-test (p. value) existing/proposed difference
(M*) Product promotion (not part of logistic tasks)	4.8	0.4	+ 0.1	0.103
(M*) Sales programme (not part of logistic tasks)	4.8	0.4	+ 0.2	0.043**
(L) Warehousing and storage of goods	4.8	0.5	+ 0.2	0.134
(L) Traffic and transport	4.7	0.5	+ 0.2	0.103
(M*) Market research (not part of logistic tasks)	4.6	0.5	+ 0.2	0.110
(M*) Management of sales personnel (not part of logistic tasks)	4.5	0.7	+ 0.0	0.713
(L) Handling of goods	4.0	0.9	+ 0.4	0.032*
(L) industrial packaging	3.7	1.3	+ 0.3	0.327
(LM) Plant and warehouse location	3.7	1.2	+ 0.8	0.003**
(L) Inventory management	3.6	1.1	+ 0.4	0.006**
(L) Distribution channels	3.4	1.2	+ 0.7	0.001**
(L) Solving waste problems, disposing of and recycling of waste	3.3	1.4	+ 0.3	0.013**
(L) Order processing	3.2	1.6	+ 0.5	0.025**
(L) Service support and required spare parts	3.1	1.0	+ 0.8	0.001**
(L) Handling of returned goods	3.0	1.1	+ 1.2	0.013**
(L) Information flow	2.8	0.9	+ 0.9	0.000**
(LM) Packaging design	2.4	1.5	+ 0.4	0.013**
(L) Production planning	2.2	1.5	- 0.2	0.283
(L) Procurement	1.9	1.2	+ 0.2	0.013**
(LM) Customer support	1.8	1.1	+ 0.5	0.002**
(L) Formation of specific features from the viewpoint of usability, quality and design	1.7	1.2	+ 0.0	0.207
(L) Demand forecasting	1.6	0.9	+ 0.3	0.022**
(L) Naming of product	1.3	0.5	+ 0.3	0.327
(LM) Product pricing	1.3	0.5	+ 0.0	0.086
Arithmetic mean of all activities	2.7	/	/	/
Indicator of the right understanding of duties or tasks [0..100]	54	/	/	/

The scale is from 1 to 5, whereby 1 means "not in charge of" and 5 means that the logistics sector is in charge of a specific activity. The indicator of the right understanding of existing implementation of activities or tasks maps the scale from 1 to 5 onto the scale 0 to 100. The difference to the proposed duties were determined as a difference in the interviewees' rating (difference between the rate, as to which activities are the responsibility of the logistics sector and for which should the sector be responsible according the marketing employees).

** The difference between the average in logistics and marketing sector is statistically significant.

*The said statements are mapped (as already mentioned)

argue, that marketing employees to a large extent believe that the logistics sector is responsible for this activity. At the bottom of Table 2 the indicator of the right understanding of duties or tasks is presented. The indicator was calculated as "mapped" arithmetic mean from the scale 1 - 5 to a scale 0 - 100. Such an indicator is necessary for a comparison with the indicator of the level of internal integration which is defined on the same scale. The higher the indicator, the higher is the level of understanding the existing duties regarding the implementation of activities or tasks. Moreover, from Table 2 we can see that the average value of indicator for marketing employees is 54 (on a scale from 0 to 100), which shows a middle level of understanding the duties of the logistics sector.

From the viewpoint of the content or the viewpoint of the hypothesis, the link of this indicator with the level of integration between logistics and marketing functions (Figure 2: The link between the indicator of understanding the duties of logistics employees (from the viewpoint of marketing employees) and the level of internal integration) is more important than the average value of the indicator of the right understanding of existing duties and tasks. Namely, the hypothesis of this research is called: "if marketing employees understand the duties or tasks of logistics employees than the level of

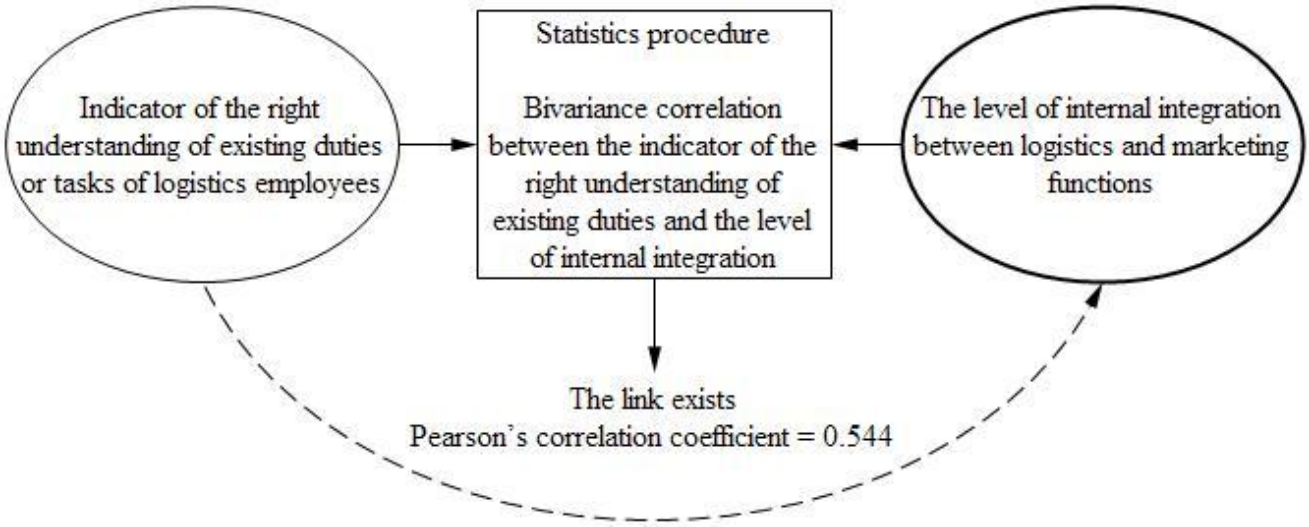

Figure 2. The link between the indicator of understanding the duties of logistics employees (from the viewpoint of marketing employees) and the level of internal integration.

integration of both functions is higher". Based on Pearson's correlation coefficient, the aforementioned hypothesis may be confirmed, as the correlation between the indicator of the right understanding of existing duties and the indicator of the level of internal integration is higher than the limit value 0.3, or Pearson's correlation coefficient of 0.544 which refers to a weak correlation. The said correlation is still statistically significant (sig.) 0.050 or is somewhat over the limit as it is (sig.) 0.065.

Based on regression analyses, which presupposes linear connectivity, an equation of connectivity between the indicator of the right understanding of existing duties and the indicator of the level of internal integration may be determined. Statistical significance of the regression model as a whole is (sig.) 0.068. The explained variance of this model is relatively small and amounts to just 22.5% which further refers to the fact that the link is not linear, but square. Namely, if the data are processed using square transformation the adjustment is much higher or the explained variance increases to 40.9%. The square transformation means that internal integration does not increase in a linear way based on understanding the duties from the viewpoint of marketing employees but initially increases more rapidly and then more slowly. The constant of the model is 64.931 and presents the value of the indicator of the level of internal integration, provided the value of the indicator of the right understanding of existing duties is 0. Directional coefficient B is 0.55, thus referring to a positive connectivity between the variables, its value tells us for how many units the value of dependent variable of the indicator of internal integration changes on average, if the value of the indicator of the right understanding of existing duties increases by one unit. Regression model of linear connectivity is thus:

Internal integration indicator = 64.931 + 0.55 × indicator of the right understanding of existing duties

The process of data analyses can be seen on a module (Figure 3: Regression model of connectivity of the indicator of the right understanding of existing duties of implementing activities by logistics employees and the indicator of internal integration), which usually presents the analyses procedure. Based on the findings we may confirm the following hypothesis: "if marketing employees understand the duties or tasks of logistics employees than the level of integration of both functions is higher".

Conclusion

Based on the set problem and the objectives, the introduction dealt with the hypothesis: "if marketing employees understand the duties or tasks of logistics employees than the level of integration of both functions is higher". Using the hypothesis we endeavoured to confirm the link between the level of internal integration and the level of the right understanding of existing duties of a logistics function. We tried to confirm the hypothesis using Pearson's correlation coefficient. As both variables, the level of internal integration and the level of the right understanding of duties were normally distributed, the test was first conducted using Pearson's correlation coefficient, which confirmed the link between the variables, as its value was 0.544, i.e. statistically significant. Therefore, the hypothesis may be confirmed.

However, we were further interested in the type of connection between variables. To this end, using regression analysis a close square connection was confirmed. Based on the findings we may conclude that the level

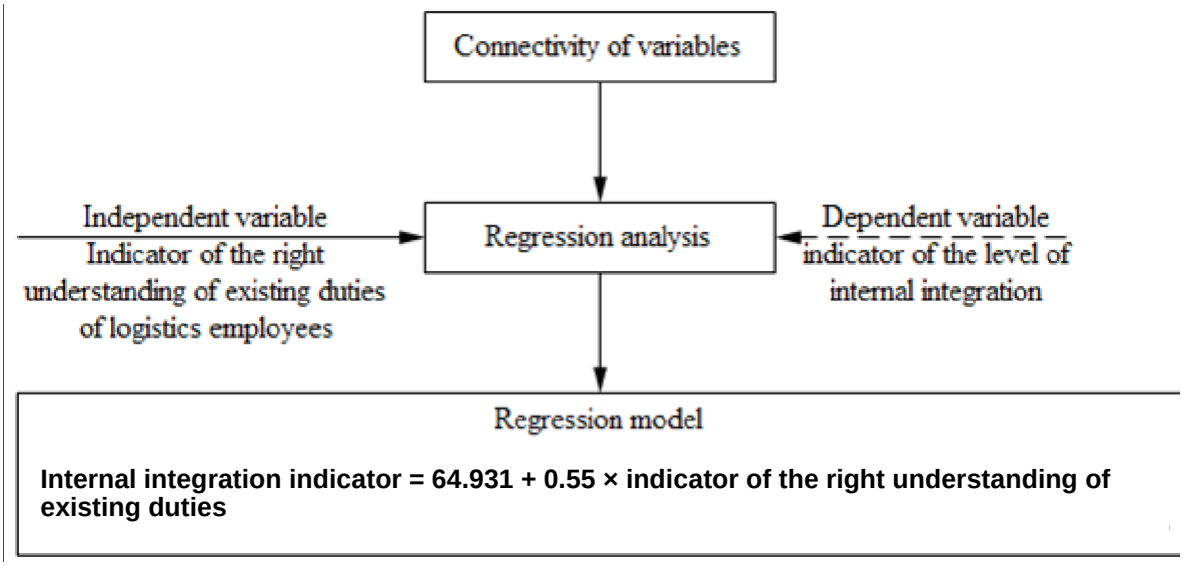

Figure 3. Regression model of connectivity of the indicator of the right understanding of existing duties of implementing activities by logistics employees and the indicator of internal integration.

of internal integration of logistics and marketing functions in a company depends on the level of the right understanding of duties of logistics employees, if the answers are provided by marketing employees.

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