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THE PRACTICE OF HRM IN LOGISTICS CHAIN MANAGEMENT

The main aim of this report is to point and describe particular areas of changes in the field of human resource management, conditioned by the specificity of logistic chains. Furthermore, the report contains a division of strategies and models of human resources, particularly emphasizing empirical research concerning models and strategies which are favorable to guidelines of the conception of integrated logistic chains.

Keywords: human resource management, logistics chain management, individual-oriented model, bureauctic model, social model, group model

INTRODUCTION

In order to obtain improved management of product flow and a high level of effectiveness of both a logistic system in a single company and a group of such systems forming a logistic chain, one should become more aware that business activity should be shifted from severe and ruthless competition to partner relations among recipients, suppliers and other institutions which support logistic processes. This does not only involve strategy integration and coordination among members of a logistic chain, but also changes of attitude towards human resource management.

The principle objective of this report is to assess the following research hypothesis:

Logistics staff and its management determine the execution of the concept of logistic chains. (The author sees logistics staff as management staff responsible for logistic processes and executive staff participating in physical product flow from sources of raw materials to ready-made product distribution. According to the author, logistics staff also include people involved in generating, processing and sending information which accompanies physical flow).

To support the hypothesis, we should verify the following theses:

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1. The model of human resources management assumed in a company influences relations with suppliers, recipients and other institutions which support logistic processes.
2. The social model of human resources management facilitates partner relations which are typical of integrated logistic chains.
3. The strategy which is based on the model of contracting of human resources and the strategy which uses the alliance creation model concerning human resources facilitate the integration of logistic chains.
4. Self-managing teams are instruments of growth in the process of accomplishment of strategies for logistic chains.

Wawrzyniak, based on reports of Lepak and Snell (Lepak et al. 1999), divided human resource management strategies into four types:

- a strategy based on the model of human resource development,
- a strategy based on the model of acquiring human resources,
- a strategy based on the model of contracting human resource,
- a strategy based on the model of alliance creation concerning human resource.

A starting point for those strategies are two variables: human resource value in a strategic perspective (human resource value is measured by its usefulness for an organization in connection with competitive advantages and/or limiting dangers) and the uniqueness of human resource in strategic perspective (uniqueness of human resource is seen as a set of specific skills of workers with the so-called personalized knowledge, that is based on personal experience, skills, value system and individual motivation system and intuition). At the same time, we bear in mind the division into strategic human resources (that provide long-term competition advantages) and operational human resources which are needed for current tasks (see Table 1).

The four strategies based on various human resource models shown in Fig.1 show different strategic assumptions.

The human resource strategies which facilitate integration of links in logistic chains can be either strategies based on the alliance creation model concerning human resources or the strategy based on contracting human resource.

The strategy which uses the alliance creation model can facilitate integration of a logistic chain because it assumes a possibility for development of human resource and its simultaneous acquirement through

strategic alliances. The concept of employment focuses on "strength integration" of two or more organizations cooperating in order to accomplish a project or activity within a logistic chain. Such an approach can lead to a synergic effect and value added that is impossible to achieve individually, without cooperation from one of the partners.

Integration of links can also be, in its pure form, facilitated by the contracting model which is based on the assumption that the company's mission and strategies do not have to be achieved with the exclusive use of its own workers. Such a strategy can be used in a situation of the highest level of integration of chain links, when we deal with network management and competence in logistic functions. In such cases, analyses concerning activities of current and/or potential customers and their advantages in the market are very crucial. The customer's task is to make sure their human resource management strategies make them attractive partners (See Ludwiczyński et al. 2001, pp. 61–62).

An appropriate solution could be using the all four models at the same time. One must only remember that when the surrounding environment of a logistic chain is more and more changeable, the way of building and conducting human resource strategies must facilitate flexible activities which can quickly react to changes. That must guarantee human resource management which will not hold back adjustment changes of the whole logistic system.

As Strużyna (Strużyna 1996, p. 216) points out, each company can be defined in terms of a given model which specifies relations between objectives, individual interests and reinforcement supplied by the company and the reverse capability. That implies four different model types of human resource management (see Table 2).

Considering theoretically the division of logistic strategies in relation to the growing level of logistic management in a company, the role model, considering the more and more popular concept of integrated logistic chains, seems to be the social model. Its assumptions are very close to the Scandinavian management model which focuses on the balance between a company's objectives and workers' satisfaction and development. The model stresses friendly interpersonal relations. It facilitates mutual identification of workers and the organization, as well as the identification of separate systems forming links and the chain as a whole.

Table 1

Strategies of human resource management based on four models

Value of human resource in strategic perspective / Uniqueness of human resource in strategic perspective	Operational	Strategic
Unique	**Human resource strategy based on alliance creation** Strategy model: aimed at maintaining own resources with acquiring external resources at the same time Employment conception: emphasizing partnership Strategy configuration: hybrid in relation to strategy instruments, emphasizing cooperation and learning processes based on personal interaction Expectations: synergic effects	**Strategy based on human resource development** Strategy model: aimed at internal development of human resources Employment conception: workers integration Strategy configuration: aimed at workers involvement through e.g. sponsoring career paths, training, payment according to skills, long-term employment Expectations: high productivity
Standard	**Strategy based on contracting human resources** Strategy model: aimed at acquiring external resources - in various forms Employment conception: cooperation treated as transaction Strategy configuration: determined by contracts, emphasizing outsourcing, adjusting workers to company's requirements, focusing on economic aspects of labor Expectations: execution of contracts	**Strategy based on acquiring human resources** Strategy model: aimed at acquiring skilled workers from labor market Employment conception: cooperation based on mutual benefits Strategy configuration: aimed at employing and dismissing workers according to needs, emphasizing selection and assessment, limiting formal training Expectations: showing skills that conform to company's current strategy

Source: author's own concept based on Ludwiczyński, Stobińska, 2001, p. 60

Table 2

Models of human resource management

Model type of human resource management	Model characteristics
Bureaucratic model	An individual is seen as a component of a whole, and functions to accomplish objectives of the whole.
Individual-oriented model	Individual autonomy is respected and the organization is an instrument to individual career. The organized whole consists of individual interests which are limited by conditions of the company's activity.
Group model	There is a tendency to create teams which cooperate on the basis of mutual benefits and obligations. Objectives of the whole result from actability of employees' groups.
Social model	There is a balance between objectives of individuals, groups and the whole organization. As a result of a conscious process, individuals are supported by the organization, and the whole becomes the supreme individual objective.

Source: author's concept based on: Gruszczyńska-Malec, Strużyna 1998, p. 11

1. METHODOLOGY

Being especially interested in the role of the contracting model, the alliance creation model in personal terms and the social model of staff management in terms of establishing and managing an integrated logistic chain, the author attempted to assess the impact of the employed model of human resource management on relations with suppliers, recipients and other institutions which support logistic processes. As human resource management models and strategies define the methods of approach towards staff management, the aim is interrelated with the initial research hypothesis.

That aim was a starting point of formulating questions where research issues were translated into techniques used in surveys.

The necessity of using data from original sources resulted from the lack of derivative data, that is transformed data coming from previous research and analyses conducted by other subjects. All the information contained here comes from a survey conducted between September 2001 and February 2002.

The survey was diversified in terms of quantity and in terms of the wide range of branches and locations throughout Poland. In the initial

assumption 180 units were meant to be included. Eventually, the survey covered data from 105 units representing a wide variety of business branches including the following types of industry: pulp and paper, chemical, glass-making, paint and varnish, pharmaceutical, furniture, food, clothing, tobacco, automotive, electronic, iron and steel, and heavy industry. Additional data came from representatives of fruit and vegetable processing, building industry and power industry.

As data from 26 units were not complete, they were not included in the analysis. In 49 cases questionnaire sheets were not returned, thus the report does not include information coming from those 49 units.

The survey can only be treated as a pilot research and it cannot be treated as representative because of:

- too few, in comparison with the total number of companies that were analyzed; (according to the data of the National Statistical Office on 31 Dec 2001 the number of registered companies was 57,917),
- random number distribution (29 companies were classified as big, 43 as medium-sized and 33 as small - The division into small, medium-sized and big companies was based on the number of employees. Therefore, small companies are those with fewer than 50 employees, medium-sized with 51-250 employees and big with over 250 employees. This criterion is considered standard; see: Business activity act issued on 19 Nov 1999 – Dz. U. No 101, position 1179, art. 54.1, 55.1);
- random industry distribution (16 production, trade and service companies, 39 production companies, 16 trade companies, 5 production and service companies, 3 service companies, 14 production and trade companies, 4 trade and service companies, 8 transport companies).

The objects were described with 106 variables. The 105 companies were divided into internally uniform object types (on the basis of characteristic features, that is similar responses).

The method that was used was the complete link, or the furthest neighbour method, one of the hierarchical methods of classification, programmed in SPSS for Windows.

The degree of similarity of objects was measured by the coefficient of Sokal & Michener which is used in multidimensional statistical analysis. The coefficient was chosen because it can measure similarities between objects described by twostate (binary) nominal variables. The preliminary stage of constructing such a measure is shown in Table 3.

Table 3

Encoding for binary nominal variables

Variable X_j		a_j	b_j	c_j	d_j
Object A_i	Object A_k				
+	+	1	0	0	0
+	-	0	1	0	0
-	+	0	0	1	0
-	-	0	0	0	1

Note: (+) means "existent"; (-) means "non-existent"

Source: Walesiak, 2003, p. 262

$$\sum_{j=1}^{m} a_j = a \; ; \sum_{j=1}^{m} b_j = b \; ; \sum_{j=1}^{m} c_j = c \; ; \sum_{j=1}^{m} d_j = d$$

where: a (d) is the number of variables for which objects A_i, A_k have compatible occurrence (or non-occurrence) values of the appropriate variant of the variable, (+,+) and (-,-), respectively; b (c) is the number of variables for which objects A_i, A_k have incompatible variable values, (+,-) and (-,+), respectively.

The coefficient of Sokal & Michener, used to measure similarities between objects described by binary nominal variables, gives information which tells us:

a) the participation of variables for which objects A_i, A_k (i, k = 1, ..., n) have incompatible variable values, (1,0) and (0,1), respectively, in the total number of variables;

b) the participation of variables for which objects A_i, Ak (i, k = 1, ..., n) have compatible occurrence (or non-occurrence) values of the appropriate variant of the variable, (1,1) and (0,0), respectively (Walesiak 1993, pp. 43-44; Walesiak 200, p. 262).

Hence:

$$d_{ik} = \frac{b+c}{a+b+c+d} = 1 - \frac{a+d}{a+b+c+d}$$

2. RESEARCH FINDINGS

Using the complete connection method, the total of 105 objects was divided into 10 relatively uniform classes (see Table 4). The division into so many classes is well-grounded at the computer processing stage, where it turns out that 10 classes allow us to precisely categorize objects (companies) according to their characteristic features (similarity of responses concerning models of human resource management employed in a company and relationships in a logistic chain).

Table 4
The division of the sample into 10 classes with the use of the complete connection method

Explained variable	Explaining variable *	Class (number of objects in class)									
		I (2)	II (15	III (15)	IV (15)	V (7)	VI (5)	VII (2)	VIII (4)	IX (9)	X (8)
		Number of objects in class that pointed at given variables as characteristic of them **									
Main principle concerning employment security	Conformity to appropriate procedures	25	0	15	15	7	5	2	0	0	0
	Loyalty to employee's interests	9	2	2	4	2	2	2	4	0	0
	Loyalty to group's interests	7	15	0	4	1	2	1	0	3	0
	Loyalty to social values and company's interests	0	0	0	0	0	4	1	0	9	8
Company's directions of fostering appropriate behaviour	Personal security and compliance with law	25	0	15	15	7	5	2	0	0	0
	Facing difficulties and challenges	3	0	6	1	0	3	1	4	0	0
	Serving leader	1	0	0	5	1	0	2	1	1	0
	Supporting other group members	1	15	0	1	0	5	1	0	6	0
	Readiness for sacrifice, limitation of needs for the good of the whole	0	0	1	1	0	5	1	0	9	8
Company's objectives of human resource management	Discipline and obedience	25	0	15	15	7	5	2	0	0	0
	Development through conflict and career creation	1	0	3	3	2	3	1	4	0	0
	Stimulating personal competition	1	0	3	0	0	4	1	4	0	0
	Creating groups and task teams	5	15	1	0	0	4	1	0	0	0
	Stimulating group competition	0	15	1	3	1	4	2	0	0	0
	Creating values, identifying and preserving role models and patterns	2	0	0	1	0	3	1	0	6	8
	Stability, sense of justice and equality	0	0	0	0	0	3	1	0	8	8
Grounds for identification with company	Awareness of role played in company's overall activities	25	0	15	15	7	4	2	0	0	0
	Hope to receive support for own interests	1	0	1	2	2	3	0	4	0	0
	Relationship with partners	3	15	0	1	0	3	0	0	0	2
	Awareness of position and social role and expectations of others	0	0	0	1	0	4	0	0	9	6

Company's basic instrument used in management	Rewards for compliance with procedures, penalties for non-compliance	25	0	15	15	7	5	2	0	0	0
	High universal rewards (money)	1	0	2	0	0	3	2	4	0	0
	Group's support, acceptance from colleagues	1	15	0	1	0	4	1	0	0	3
	Striving for perfection; pointing out weakness; help; understanding	2	0	0	3	0	4	1	0	9	6
Company's basic human resource management strategy	Aimed at maintaining own human resource, simultaneously acquiring external human resource	1	10	1	1	0	0	0	0	7	8
	Aimed at acquiring external workers in different forms	3	0	1	1	1	1	1	4	1	0
	Aimed at internal development of human resource	3	5	0	0	0	1	1	0	2	0
	Aimed at acquiring high-skilled workers from job market	18	0	5	6	3	0	1	0	0	0
Type of employment concept dominant in company	Emphasizing partnership	1	10	1	1	0	0	0	0	7	8
	Cooperation seen as transaction	3	0	1	1	1	1	1	4	1	0
	Workers' integration	3	5	0	0	0	1	1	0	2	0
	Cooperation based on mutual benefits	18	0	5	5	3	0	1	0	0	0
Company's criteria for choosing suppliers	Product quality	25	15	15	15	7	5	2	0	9	8
	Price	2	0	15	15	0	5	2	4	8	0
	Readiness for cooperation	23	15	0	0	7	0	0	0	0	8
	Delivery on time	25	15	15	15	7	5	2	0	8	8
	Degree of solvency	0	0	9	0	0	3	2	4	5	0
	Data concerning expenses, growth of sale and income	0	0	0	0	0	0	0	0	0	0
	Financial results	0	0	0	0	0	0	0	4	0	0
	Management structure	0	0	0	0	0	0	0	0	0	0
	Candidate's number and quality of salespersons	0	3	0	0	7	0	0	0	0	0
	Candidate's number and quality of other product lines	0	3	0	0	7	0	0	0	0	0
	Location of distribution points	0	3	0	15	0	0	0	4	0	0
	Reputation	3	15	0	0	7	0	0	0	0	8
	Candidate's ability to establish new distribution points	0	0	0	1	0	0	0	0	0	0
Assessment of ability to acquire new high-skilled agents	Very good	19	12	1	0	7	0	0	0	9	6
	Average	6	3	13	15	0	2	2	4	0	2
	Unsatisfactory	0	0	1	0	0	3	0	0	0	0

Table 4 continued on the next page

Table 4 continued

Explained variable	Explaning variable *	Class (number of objects in class)									
		I (2)	II (15	III (15)	IV (15)	V (7)	VI (5)	VII (2)	VIII (4)	IX (9)	X (8)
		Number of objects in class that pointed at given variables as characteristic of them **									
Source of authority used by company in contacts with agents	Authority resulting from enforcement	0	0	1	15	0	0	0	0	0	0
	Authority resulting from rewards	0	12	0	0	0	1	0	4	9	2
	Authority resulting from legal grounds	25	0	14	0	0	4	2	0	0	0
	Authority resulting from expert position	0	3	0	0	7	0	0	0	0	6
	Authority resulting from respect	0	0	0	0	0	0	0	0	0	0
Company's methods to motivate associates and agents	Margin	25	15	15	15	7	5	2	0	5	8
	Rewards	0	15	1	0	7	0	0	4	9	8
	Means for mutual advertising	0	0	0	0	7	0	0	0	0	0
	Contests of highest sales	0	15	9	0	0	0	1	4	9	8
	Training courses	0	15	0	0	7	0	0	0	0	8
	Professional advisory and assistance	0	15	0	0	7	0	0	0	0	8
Does company invest in suppliers?	Yes	0	15	0	0	7	0	0	0	9	8
	No	25	0	15	15	0	5	2	4	0	0
Assessment of relationships between suppliers, recipients and other agents	Opponents	25	0	13	15	0	5	2	4	0	0
	Partners	0	15	2	0	7	0	0	0	9	8
Chain link responsible for quality control	Supplier	25	0	13	15	0	4	0	0	0	0
	Producer	0	0	2	15	0	4	0	4	0	0
	Receiving and shipping agency	0	1	1	0	0	0	2	0	0	0
	Whole logistic chain	0	14	0	0	7	0	0	0	9	8
Chain link bearing costs connected with maintaining warehouses and storing materials	Supplier	24	0	5	15	0	3	0	0	0	0
	Producer	1	0	9	15	0	2	0	4	7	0
	Agency	0	0	1	0	0	0	2	0	0	0
	Whole logistic chain	0	15	0	0	7	0	0	0	2	8
Range of contacts among links in delivery chains	Specific contact for one transaction	25	0	15	15	0	5	2	4	0	0
	Continuous contact	0	15	0	0	7	0	0	0	9	8

Distribution of risks and opportunities among participants in delivery chain	Taking advantage of opportunities and taking risks by logistic chains of each company independently	25	0	15	15	0	5	2	4	7	0
	Long-term distribution of risks and opportunities among co-operating parties	0	15	0	0	7	0	0	0	2	8
Company's instruments to improve effectiveness of logistic chains	Reengineering	0	3	0	10	4	0	0	4	0	0
	Rationalization and department allocation	0	12	0	0	1	0	0	0	0	8
	Development of computer systems	25	15	15	15	7	2	0	4	9	8
	Bar codes	25	15	8	15	7	5	2	4	5	8
	Self-managed teams	0	12	0	0	0	0	0	0	0	8
	Benchmarking	0	12	0	0	2	0	0	0	0	8
	Outsourcing	0	1	2	3	2	0	0	1	0	0
Company's period of business activity	Less than 10 years	2	0	15	0	0	5	2	0	9	0
	11-20 years	23	15	0	9	4	0	0	3	0	8
	More than 20 years	0	0	0	6	3	0	0	1	0	0
Form of ownership	Private	12	10	9	8	5	0	1	2	4	5
	Foreign	13	5	6	0	0	5	1	0	5	3
	State-owned	0	0	0	7	2	0	0	2	0	0
Number of employees	Less than 50 people	2	0	15	0	0	5	2	0	9	0
	51-250 people	23	12	0	0	0	0	0	0	0	8
	251-1000 people	0	3	0	10	7	0	0	4	0	0
	More than 1,000 people	0	0	0	5	0	0	0	0	0	0
Annual turnover	Less than PLN 5,000,000	2	0	15	0	0	5	2	0	9	0
	PLN 5,000,000-100,000,000	23	15	0	8	6	0	0	0	0	8
	More than PLN 100,000,000	0	0	0	7	1	0	0	4	0	0

Note: * The table does not contain explaining variables that the survey classified as "Others (please indicate...)". That is because none of the 105 companies chose that answer.

** The number of objects assigned to given variables is not always equal to the number of elements in a given class (it can be higher). That is because the respondents could choose more than one answer.

Source: author's own research

On the basis of compatible values of occurrence of the appropriate variant of variables (compatible answers concerning the basic principles of human resource models), the coefficient of Sokal & Michener allowed us to join classes whose objects have incompatible values of occurrence of variants of other variables (incompatible answers concerning relationship among suppliers, recipients and other institutions supporting logistic processes).

Table 5 presents the key variables for which objects of different classes have compatible occurrence (or non-occurrence) values of the appropriate variant of the variable.

Table 5

Common features of object classes determined with the use of the complete connection method

Models	Features \ Classes	Principle deciding on employment security	Directions of fostering behaviour	Objectives of human resource management	Basis of identification with organization	Basic management instrument
Bureau-cratic	I	Conformity to appropriate procedures	Personal security and compliance with law	Discipline	Awareness of role played in company's overall activities	Rewards for compliance with procedures, penalties for non-compliance
	III					
	IV					
	V					
Social	X	Loyalty to social values and company's interests	Readiness for sacrifice, limitation of needs for the good of the whole	Creating values, stability, sense of equality	Awareness of position and social role, and expectations of others	Striving for perfection; pointing out weakness; help; understanding
Group	II	Loyalty to group's interests	Supporting other group members	Creating groups and task teams and stimulating group competition	Relationships with partners	Group's support, acceptance from colleagues
Individual -oriented	VIII	Loyalty to employee's interests	Acceptance of new challenges	Development through conflict, stimulation of personal competition	Hope to receive support for individual interests	High universal rewards (money)
Social-group	IX	Characteristic features of a social-group model (see above).				
Mixed	VI	Characteristic features of a bureaucratic, social, group and individual-oriented model (see above).				
	VII					

Source: author's own research

Class I (25 elements), class III (15 elements), class IV (15 elements) and class V (7 elements) include objects which diagnose the mixed model of human resource management, although the dominating characteristics indicate the bureaucratic model.

All 25 companies of class I are private and foreign companies which have been functioning in the market for less than 10 years, but also organizations which have been in the market for more than 11 years and less than 20. They employ less than 50 workers (2 companies) or from 51 to 250 workers (23 companies). Their annual turnover does not exceed PLN 5,000,000, which indicates that the main criteria of the choice of suppliers are product quality and timely delivery. In this class, 23 companies declare that their priority is readiness for cooperation, 2 – the price and 3 of them – reputation.

Nineteen companies see their abilities to find highly skilled agents as very good, while six companies – as average.

The source of authority used by the entities of class I is authority resulting from legal grounds, guaranteed by hierarchical relations, contracts.

As for methods which motivate associates and agents, all companies in class I mention margin. There are no training courses, nor professional advisory and assistance. No organization invests in suppliers, nor do they assess the relationships among suppliers, recipients and other agents which support logistic processes as being a partner.

The range of contacts among individual co-operators is sporadic (only while executing a particular transaction), nor is there long-term distribution of risk or taking advantage of opportunities. Companies' basic methods of facilitating integration include: integration of computer systems and reduction of the number of suppliers and (strangely enough, considering other responses that do not indicate partnership) creating an agreed partnership with suppliers, and even their certificates.

The link that is responsible for quality control is the supplier. Twenty four companies burden the producer with the expenses connected with warehouse maintenance. Instruments used to improve logistic processes include bar codes and improved computer systems.

In choosing their suppliers, companies in class III, like in class I, favour product quality and timely delivery. Unlike class I, though, they also consider the price (15 companies) and the degree of solvency. They do not, however, take reputation into account.

Thirteen companies see their ability to acquire new high-skilled agents as average, one – as unsatisfactory and one – as very good.

In this class, like in the previous one, the dominant source of authority is one resulting from legal grounds (14 companies). One company of class III uses authority which comes from enforcement, that is threats to withdraw means or break cooperation with partners that do not comply with the company's requirements.

The most common methods of motivating co-operators and agents is margin (15 companies) and contests of the highest sales, which were not declared by the companies in class I. There are no investments in suppliers and the range of contacts is sporadic.

Furthermore, there is no distribution of costs connected with storing resources, nor is there any responsibility for quality control in the whole chain. The situation in class III, however, is better than in the previous class, because the costs and the responsibility belong to producers and suppliers. It is possible to diagnose a germ of logistic chains integration, although class III companies still take the risk and take advantage of opportunities on their own.

Among methods of facilitating integration within the system of producer-supplier-recipient-supporting institutions there is an integration of computer systems and a reduction of the number of suppliers. There is also (which is not typical in class I) a reduction in the number of shipping companies. This could result from the fact that two out of fifteen companies in the class declare outsourcing to be one of the instruments used in order to facilitate logistic processes. According to class III respondents, other methods of improving logistic processes include upgrading computer systems and bar codes, just like in class I.

The companies of class III are private and foreign companies, which have been functioning in the market for less than 10 years. They employ less than 50 workers. Their annual turnover does not exceed PLN 5,000,000.

All entities in class IV (like the two previously discussed) diagnose the mixed model of human resource management, although the dominating characteristics indicate the bureaucratic model. Their criteria of choosing suppliers include product quality, price, punctual delivery, but also location of distribution sites, which was not indicated by companies in class I and III. One company in class IV pointed to the ability to establish new distribution sites.

All companies in class IV see their abilities to find high-skilled agents as average.

The source of authority used by the entities of class IV is the authority resulting from enforcement, which is especially unlike class I. As for methods which motivate associates and agents, the margin is also the issue here. The companies do not invest in their suppliers, nor do they see their relations with agents and co-operators as based on partnership. The range of contacts is limited to individual transactions. What is also typical in this class, is taking advantage of opportunities and taking risk independently. It is possible to say that there is a germ of logistic chains integration (or at least going in that direction) thanks to the distribution of costs connected with storing resources and the responsibility for quality control between producers and suppliers.

Among methods of facilitating integration within the system of producer-supplier-recipient-supporting institutions, the respondents declared (as in the previous classes) an integration of computer systems and a reduction of the number of suppliers, but also: long-term contracts (12 companies), strategic alliances with providers of logistic services (3), suppliers certificate (11), identification of needs and offering new services to suppliers (5), knowledge of co-operators' demands through fairs and commercial exhibitions (15). Most of these methods might indicate that the companies should see their relations with agents as based on partnership. It is not so, however. Perhaps the companies in this class, having declared their ability of acquiring new agents to be average, decided to change their strategies towards co-operators through decreasing the number of co-operators, creating alliances with them, knowing their needs and offering new services which would guarantee mutual loyalty and cooperation. The author believes that in a few years' time the companies might base their activities on integrated logistic chain management.

In class IV instruments improving the quality of logistic processes include (like in class I and III) bar codes and upgrading computer systems, but also reengineering (10 companies), which could support my previous speculations. Companies of class IV are private and state-owned companies which have been functioning in the market for more than 11 years and those older than 20 years. They employ from 251 to 1,000 workers. Their annual turnover is from PLN 5,000,000 to 100,000,000, or more.

The bureaucratic model of human resource management dominates entities in class V. Their criteria of choosing suppliers include product quality, timely delivery, but also (like in class I but unlike class III or IV) readiness for cooperation. Entities of class V (unlike class I, III or IV) do not

pay attention to prices. They do, however, pay attention to candidates' new product lines, quality and number of sales staff and reputation.

All companies in class V see their abilities to find high-skilled agents as very good, and, which is not typical for class I, III or IV, their authority comes from an expert position. Therefore, seeking new cooperation, they use professional knowledge and experience valued by their co-operators. Methods of motivating their co-operators include margin, but also rewards, resources for advertising, training courses, professional counselling. These should be more typical for the social and group model of human resource management. It must be noted, though, that it is a class consisting of only seven elements and its respondents indicated numerous characteristics of the individual-oriented model whose elements can influence relations among producers, suppliers, recipients, or possibly other institutions supporting logistic processes. Companies of class V invest in their suppliers and see relations between themselves and their suppliers as based on partnership. The range of contacts among chain links is permanent. The responsibility for quality and storage costs is placed evenly throughout the whole chain. The distribution of risk and opportunities is described as long-term.

Among methods of facilitating integration within the system of producer-supplier-recipient-supporting institutions, the respondents declared (as in class I, III and IV) an integration of computer systems, a reduction in the number of suppliers, but also creating contracted relations with suppliers, long-term contracts, strategic alliances with providers of logistic services, suppliers certificate, identification of needs and offering new services to suppliers, and knowing co-operators' demands through fairs and commercial exhibitions (all like in class IV).

Instruments improving the quality of logistic processes include reengineering (4 companies), which is similar to class IV. Such a situation might be explained by the fact that both classes consist of big companies that try to make themselves less bureaucratic and 'flatten' their structures. In a further perspective, they may base their activities on the group or social model. They may base their logistic chain management on strategic and 'friendly' relationships with suppliers, rationalization and department allocation (unlike class I, III or IV), improvement of computer systems, bar codes (like class I, III and IV). There are companies which use benchmarking and outsourcing (2 companies).

The class encompasses big, private and state-owned companies which have been functioning in the market for more than 11 or even 20 years. They

employ from 251 to 1,000 workers. Their annual turnover is from PLN 5,000,000 to 100,000,000, or even more.

It is worth noting that the features which distinguish class V from companies of class I, II or IV, make it similar to classes II, IX and X, which represent the group and social models of human resource management. Beside this, 38 out of 63 companies which diagnosed the bureaucratic model use a model based on acquiring experts from outside. However, 30% of big companies which employ over 251 staff, despite the dominating bureaucratic model, base their strategies on a model of human resource contracting which facilitates integration.

Class II (15 elements), class IX (9 elements) and class X (8 elements) include companies whose responses diagnose the mixed model of human resource management, dominated by elements indicating the group model (class II), the group-social model (class IX) and the social model (class X).

In class II the criteria of choosing suppliers include product quality, punctual delivery, readiness for cooperation (like class I, III, IV and V) and reputation. Besides, 3 out of the 15 mentioned candidates' new product lines, quality and number of sales staff, which is similar to class V. Twelve companies see their ability to acquire high-skilled agents as very good, only three as average, none as unsatisfactory.

Twelve out of fifteen organizations use their authority which comes from rewarding agents and offering them additional advantages for the execution of particular tasks. The other three base themselves on their expert positions. The indicated types of authority and the assumptions of the group model are reflected in the management of the whole logistic chain.

Relations among producers, suppliers, recipients and supporting institutions are assessed as based on partnership. There is a permanent contact among chain links and the responsibility for quality and storage costs is placed evenly throughout the whole chain. Typical is the distribution of risk and opportunities which is described as long-term.

Methods of motivating their co-operators include margin, rewards, highest sales contests, training courses, professional counselling and assistance. All companies invest in their suppliers.

Among the methods of facilitating integration, they mentioned integration of computer systems, reduction of the number of suppliers, long-term contracts, certificates, identification of needs and offering new services to suppliers, and knowing co-operators' demands through fairs and commercial exhibitions.

Instruments improving the quality of logistic processes include reengineering (3 companies), rationalization and department allocation (12 companies), improvement of computer systems and bar codes (3 companies), self-managed teams (12 companies) benchmarking (12 companies) and outsourcing (1 company).

The class includes private and foreign companies which have been functioning in the market for between 11 and 20 years. They employ from 51 to 250 workers. Their annual turnover is from PLN 5,000,000 to 100,000,000.

Very similar to class II is class IX, where responses indicate a model intermediate between the group and social models, and also class X where the social model of human resource management was clearly diagnosed.

As for the supplier's selection criteria, entities in class X mention product quality, readiness for cooperation, timely deliveries and reputation. Companies in class IX add prices and solvency, but do not mention reputation and readiness for cooperation.

All class IX entities view their ability to acquire high-skilled agents as very good. In class X, six out of eight companies see this ability as very good, two companies – as average.

Class IX entities use authority coming from rewards, the same as two out of eight entities in class X. The remaining six use authority coming from their expert positions. Methods of motivating their co-operators include margin, rewards, highest sales contests. Companies in class X also mention training courses and professional assistance. According to the author, this is because the assumptions of the social model of human resource management are exactly converted into social management of links within a logistic chain.

Companies of classes IX and X, like class II, invest in their suppliers and see their cooperation as strategic and based on partnership. Therefore, there is a long-term distribution of opportunities and risks. The responsibility for quality and storage costs in both classes is placed evenly throughout the whole chain. There is permanent contact among chain links.

Among methods of facilitating integration they mentioned integration of computer systems, reduction of the number of suppliers, identification of needs and offering new services to suppliers, and also knowing co-operators' demands through fairs and commercial exhibitions. Entities in class IX also indicate contracted partnership with suppliers and long-term contracts. They do not, however, declare participation in fairs and exhibitions in order to know their suppliers' demands.

In class X instruments improving the quality of logistic processes include rationalization and department allocation, improvement of computer systems,

bar codes, self-managed teams and benchmarking. Class IX entities favour bar codes and upgrading of computer systems. In classes II, IX and X the dominating model of human resource management is one based on building personal alliances. Class IX includes private and foreign companies which have been functioning in the market for less than 10 years. They employ less than 50 workers. Their annual turnover is less than PLN 5,000,000. Class X includes private and foreign companies which employ from 51 to 250 workers. Their annual turnover is from PLN 5,000,000 to 100,000,000.

Responses from companies in class VIII indicate the domination of the individual-oriented model of human resource management. Because the basic instrument of management are is rewards of universal importance (money), companies which declared this model as typical for them concentrate on financial indicators (price, solvency, financial terms, financial results, location of distribution points). The same applies to the criteria of supplier's selection. Companies in class VIII see their abilities to find high-skilled agents as average. Authority comes from rewards. Methods of motivating their co-operators include rewards and highest sales contests. This may be a result of the basic aims of the individual-oriented model (development through conflict, career creation, stimulation of personal competition). Class VIII companies do not invest in their suppliers, nor do they see their agents and cooperating parties as partners.

The range of contacts among individual co-operators is restricted to particular transactions. There is no long-term distribution of risks or taking advantage of opportunities. Costs and responsibilities connected with quality control are laid either on producers or suppliers.

Among methods of improving relations among producers, suppliers, recipients, or possibly other institutions supporting logistic processes, they mention integration of computer systems, reduction of the number of suppliers, contracts, certificates and identification of co-operators' needs.

Instruments improving the quality of logistic processes include reengineering (four companies), improvement of computer systems (four companies), bar codes (four companies) and outsourcing (one company). All class VIII companies base their activities on personnel management strategies that are built on a human resource acquisition model.

The class includes private and state-owned companies which have been functioning in the market for more than 11 but less than 20 years. They employ from 251 to 1,000 workers. Their annual turnover exceeds PLN 100,000,000.

Class VI (5 elements) and class VII (2 elements) are similar in relation to the total model mix. According to the responses, there is no distinct dominating

model of human resource management. As for the supplier's selection criteria, entities in both classes mention the price, product quality, punctual deliveries and solvency. Companies see their abilities to find high-skilled agents as average. In class VI, three out of five companies even indicate unsatisfactory abilities.

In class VI, authority comes from rewards (one company) and legal grounds (four companies). In class VII, companies only use authority resulting from legal grounds. Methods of motivating their co-operators and agents include margin. Entities in class VI also mention highest sales contests. Companies do not invest in suppliers and mutual relations are not seen as based on partnership.

There is no long-term distribution of risks and opportunities. In class VI, the responsibility for quality control belongs to producers (four companies), suppliers (four companies). In class VII it is also shipping agencies (two companies).The costs of storage in class VI belong to producers (three companies) and suppliers (two companies). In class VII it is shipping agencies again.

Among methods of facilitating integration companies mention direct relations with suppliers (one company), suppliers certificates (three companies), knowing co-operators' demands through fairs and commercial exhibitions (one company). In class VII, companies mention direct relations with suppliers and a decreased number of suppliers. Instruments improving the quality of logistic processes are bar codes. In class VI it is also upgrading computer systems.

Class VI includes foreign companies which have been functioning in the market for less than 10 years. They employ less than 50 workers. Their annual turnover does not exceed PLN 5,000,000. Class VII includes private and foreign companies which have been functioning in the market for less than 10 years. They employ less than 50 workers. Their annual turnover is between PLN 5,000,000 and PLN 1,000,000.

3. DISCUSSION

The research can be summarized as follows:

1) None of the 105 analyzed companies manages their human resource on the basis of a model in its strict form.

2) Nevertheless, in each company there are determinants which indicate that one of the models prevails.

3) The responses showed that the dominant model of human resource management (at least among the 105 companies) is the bureaucratic model. This

is the basic model for 39% of big companies, 63% of small companies and 57% of medium-sized companies. In the light of the theoretical assumption where the role model is the social model, the survey results are somewhat alarming.

4) The social model was rarely used by the 105 companies. It was dominant in 27% of small companies and 14% of medium-sized companies. In the case of big companies, none of them considered the model to be dominant. Big companies do not see the need for implementing the social model. That confirms the thesis that the size of company determines the choice of a model for human resource management. The bigger the company, the lower the percentage of companies which use the social model.

5) 29% of medium-sized companies chose the group model as the dominant one. The model is aimed at team activities which may contribute to the final success in medium-sized companies. It is not surprising that 43% of medium-sized companies mentioned self-governing teams as an instrument of improving the effectiveness of logistic processes and strategies for integrated logistic chains. Supporting teamwork is important in human resource management of medium-sized companies. In spite of this, the bureaucratic model is still dominant in that group. That undermines the hypothesis that self-governing teams are an instrument facilitating the effectiveness of logistic systems and strategies for logistic chains.

6) The survey does not permit us to reject the hypothesis that the model of human resource management implemented by a company influences its relationship with suppliers, recipients and other institutions which support logistic processes:

a) Among companies which assumed the bureaucratic model of human resource management, the dominant source of authority over their agents is authority resulting from legal grounds guaranteed by hierarchical relations, contracts. Besides, it is also the case of enforced authority which is based on threats concerning withdrawal of means or breaking off cooperation in case agents do not comply with requirements. Among the ways of motivating co-operators the most common are: margin, prizes, contests of highest sales. Companies in this group usually limit their co-operation with agents to specific transactions and independently take either advantage or risks. There is no long-term division between risks and opportunities. Most companies which are based on the bureaucratic model asses their ability to win new high skilled agents as average. Numerous impersonal formal procedures, technocratic mechanisms of decision making concerning personnel and procedures aimed at discipline and obedience are characteristic of the bureaucratic model of human resource

management. The model then influences the relationship with suppliers, recipients and other institutions which support logistic processes.

b) Companies whose responses pointed to either a social or a group model of human resource management mentioned some sources of authority used to assure cooperation from agents. The major sources, according to the respondents, are firstly offering additional benefit and secondly, authority resulting from professional knowledge and experience respected by agents. Among the ways of motivating cooperators the most common are: margin, prizes, contests of highest sales. They also point to: training courses, professional counseling and assistance. Such companies invest in their workers as a team, but also in their suppliers. Small companies are an exception and despite their 27% share in the social model of human resource management, they do not invest in their suppliers. Such a situation can be caused by different restrictions, mostly financial. Companies which implemented the social, group or mixed social and group models see their relations with suppliers, recipients and other institutions which support logistic processes as a partnership. They also have permanent contacts with the logistic systems of their cooperators. In comparison with companies based on different models, there are definitely more companies which assess their ability to win new high skilled agents as very good. The principles of the social or group model of human resource management seem to influence relationship with business partners. The companies considered the number of suppliers and long-term contracts the major factors which smooth the process of integration of systems.

c) A special case is the group of big companies, either private or state-owned, which have been in the market for more than 10 or even 20 years. They employ over 250 workers and their annual turnover is from 5 to 100 million zlotys, or more. Responses coming from 93% of such companies indicated the bureaucratic model of human resource management, however 30% of the companies declare that they provide training courses, professional assistance and counseling. That would mean that they invest in the development of their suppliers, they view their relations as partnership and see the long-term risk and opportunity division among cooperators. Big companies are also special because only in this group were companies (less than 7%) whose responses indicated the individual-oriented model of human resource management. One would rather

believe that such a model is more suitable for small or medium-sized companies. None of those, however, declared this model as the dominant one. We must notice, though, that in case of the 7% of companies, the theory of the individual-oriented model is shifted onto relations with suppliers, recipients and other institutions, which support logistic processes. There are companies for which the main objective of human resource management is development through conflict, career building and stimulation of personal competition. Moreover, the base for identification with an organization according to them is the hope of supporting one's own interests and identification with a person. Their basic instrument used in management is money rewards. Those companies do not see their relations with cooperators as partnership. As for relationships, their main criteria for choosing suppliers lie in finance (price, financial conditions, ability to pay). Independent use of risks and opportunities by the logistic system of each company correlates with sporadic contracts (closed for a given transaction). The companies declared that the main instrument of motivating suppliers is the stimulation of competition among them. It can be therefore concluded that the main goals of human resource management in the company (development through conflict, individual competition, career building) are shifted onto relationship management among suppliers, recipients and other institutions which support logistic processes.

The survey results seem to support the thesis that the social model of human resource management makes it easier to create partner relations among logistic systems of cooperating companies. The group model favours such relations as well. It just stands one rung lower on the ladder of evolution of models of human resource management.

It turns out that both the social and the group models are typical models for medium-sized companies, either with national or foreign capital. Therefore, as regards the 105 surveyed companies, it is medium-sized companies, which are the closest to the concept of building integrated logistic chains based on partner relations among cooperating links.

7) Of all the companies based on the social model, over 50% of those in favour of the group model as dominant, and 50% of those who implemented the mixed social and group model (that is models with long-term partner relations typical of integrated logistic chains) pointed to the

strategy based on maintaining their own human resource management and winning workers from outside at the same time. These are typical qualities of the alliance creation model of human resource management. It also supports the thesis that strategies based on staff alliances facilitate integration of logistic chains.

8) The survey results show that the strategy of winning human resources is typical of companies, which are based on the individual-oriented and bureaucratic models and do not generally facilitate integration with a logistic chain. Over 50% of companies based on the bureaucratic model and 100% of those based on the individual-oriented model are based on winning experts from outside if their skills fit in with the company's current strategy. Such a company employs and dismisses workers according to its needs. It focuses on selection and assessment and neglects training courses or investments in suppliers. It faces opportunities and risks on its own.

9) Strategies based on contracting human resources were only identified in the case of a few big companies. They employ over 250 people and are based on the bureaucratic model. Despite that they act with a logistic chain. They constitute only 30% of the number of big companies. That does not mean, however, that we can dismiss the idea that the strategy based on contracting human resources facilitates the integration of chain links. The limited number of such companies can confirm the theoretical assumptions that the contracting model is mainly used at the highest level of integration within a chain (e.g. integration within virtual corporations). We know that in practice there are still very few companies with such a level of advanced cooperation.

The research, by diagnosing models of human resource management and analysing companies' relations with customers, helped to show the models and strategies which facilitate the execution of the concept of supply chains. The empirical studies helped to define the models and strategies which do not foster cooperation and strategic partnership, thus being useless in integrating metalogistic chain links. The author's research hypothesis that logistic personnel and staff management determine the execution of the concept of logistic chains was therefore confirmed.

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