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WORK HUMANISM

Teamwork Dysfunctions at Large – Scale Enterprises: Comparative Research Based on Norm-Referenced Testing

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The paper deals with the data obtained in the research which lasted for a period of 5 years and was carried out by a joint team of researchers. The test „Team Puls" developed in Germany for the assessment of teamwork efficiency was adapted for Lithuanian production enterprises and served as the basis for the research. The test consists of 66 questions which reflect different aspects of teamwork. By the method of factor analysis primary questions were summarised into 6 scales (dimensions): 1) Orientation to goals and achievements; 2) Work dedication and responsibility; 3) Communication in the team; 4) Team management; 5) Team organisation; 6) The role and the status of the team in the organisation.

The paper consists of two parts: Introduction, in which scientific topicality of the study is proved and theoretical assumptions are reviewed; and Research methods and results. Theoretical and empirical studies on teamwork carried out by Lithuanian and foreign researchers are reviewed in the theoretical part (Introduction) of the paper. Theoretically postulated 6 dimensions of the adapted test are shown, proved to be reasonably universal and acknowledged by other authors. In the second part, Research methods and results, the structure of the test is substantiated and described and psychometric measurements and formulations of the test phases are provided. Norm and target samples, 4 large-scale production companies, where 403 employees representing 35 different working teams were tested, are also described in this part. Brief anonymous company profiles are provided.

Keywords: *teamwork, norm test, factor analysis, rating*

Introduction

Teamwork in organization is especially urgent in problem solving and decision – making and in striving for total quality management. Results of teamwork leave behind the results of people, who work in individual manner. Evident are qualities of teamwork: higher quality work, results with achieved higher standards, more possibilities to open the great abilities of people, flexibility and ability to adapt to changes (Jezerskytė & Žydžiūnaitė, 2005).

Researchers[1] analyze differences between team and group, team dynamics and roles in a team, features of effective team. Researchers very seldom accentuate the teamwork limits, which obstruct the striving for high standards results and effective achievements. There are very few studies or empirical evidence about teamworking peculiarities and especially – dysfunctions that are related to enterprise production and engineering, too. The **novelty** of the study presented in this paper is revealed in the presentation of various types of enterprises with focus on teamwork and those are empirically compared and illuminated teamwork peculiarities and dysfunctions of teams in various types of large – sized enterprises. **Research question:** What are the peculiarities, positive qualities and dysfunctions of teamwork in various types of large – scale enterprises? **Research aim:** To compare, analyze and generalize the teamwork peculiarities, positive qualities and limits in various types of enterprises.

Background

The focus is on six main peculiarities of teamwork (see Table 1).

[1] *Teamwork concept* has been analyzed and investigated by various Lithuanian and foreign researchers, e.g. Stephen (2003); Hendrix (2002); Kasiulis, Barvydienė (2001); Gordon (2001); Kneafsey *et al* (2001); Levi (2001); Stewart (2001); Vijeikienė, Vijeikis (2000); Nowaczyk, R. (1997); Nowaczyk, Levi (1996); Nowaczyk, Perlow, Palazzo (1996); Appelbaum *et al* (1999); Tamosiunas (1999); Cole (1998); Davis, Perry, Delmont (1998); Heimer, Vince (1998); Regenstein *et al* (1998); Fisher, Fisher (1997); Greenewood (1997); Johnson, Johnson (1997); Lipnack, Stamps (1997, 1995); Nolan *et al* (1997); Parker (1997, 1996); Dubrin (1995); Smith (1995); Barlow (1994); Brewer *et al* (1994); Harrington (1994); Katzenback, Smith (1994); Belbin (1993); Hirschorn (1991); Margerison, McCann (1990) and etc.

Table 1

Teamwork dimensions according to various studies

Teamwork peculiarity	Researchers who investigated the teamwork peculiarity	Content of teamwork peculiarity
Orientation to aim/ task and achievements	Zydziunaite (2005a); Hendrix, 2002; Kasiulis, Barvydienė (2001); Stoner *et al* (1999); Tamošiūnas (1999); Regenstein *et al* (1998); Nowaczyk (1997); Harrington (1994); Katzenback, Smith (1994).	• The aim of a team should be related to purposive activity, reflect aims of organization, where the team works, be clear, detailed and motivate people to work[2]. • Members of engineering teams treat the team aim or task – definition as the most important 'factor' and the organization should explicitly define the task presented to the team. Along with that statement the team members feel that the team sponsor should be one who can evaluate the technical merits of the resulting product.
Devotion to work and responsibility	Zydziunaite (2005a,b); Appelbaum (1999); Nowaczyk (1997); Nowaczyk, Levi (1996); Nowaczyk, Perlow, Palazzo (1996); Richardson (1995).	• The team[3] takes the managerial responsibility, and requires from team members to be responsible for activity content; the basis of collaboration in a team is interpersonal reliance and devotion to work. • In engineering teams devotion and responsibility is stipulated by cooperation and shared vision: 'deposit' of every team member is useful and influences efficient establishment of aims and decision – making; team members understand that other people have the other standpoints that helps 'to leave' the 'tunnel' of personal vision and the synergic decisions form the unity, cohesion and ability to conform to complex reality; team members share with leadership, aims, vision, 'network of minds', responsibility, awards, skills, information and enthusiasm; the team establishes the vision on the basis of dialogue between team members who strive for responsibility, autonomy and equality.
Communication in a team	Zydziunaite (2005, 2003); Cole (1998)	• Structures in a context of a team are understood as communication network[4] between team members and describe the relatively constant role of every team member in interaction between team members. This structure reflects type of communication between team members who realize the different roles.
Team management	Stephen (2003); Hendrix (2002); Gordon (2001); Kneafsey *et al* (2001); Levi (2001); Stewart (2001); Nowaczyk (1997); Nowaczyk, Levi (1996); Nowaczyk, Perlow, Palazzo (1996)	• Equality and participation[5], leadership[6], decision – making[7] • The members of an engineering team will share some level of expertise (i.e. technical knowledge) among themselves that may not always be found on a management team where individuals come from very different disciplines and this shared expertise can account for the emphasis on conflict resolution.
Team organization	Zydziunaite (2005a, b); Nowaczyk (1997); Regenstein *et al* (1998); Fisher, Fisher (1997); Greenewood (1997); Johnson, Johnson (1997); Lipnack, Stamps (1997); Nowaczyk, Levi (1996)	• Success of a team depends on team members and their supervisors having a clear understanding of the level of effort and time that an individual should devote to the team. When a team is created, explicit attention to the composition of the team in terms of not only technical expertise but also an individual's available effort and time to the team will increase the likelihood of team success. • In engineering teams is important debate, which involves all team. The debate about the problem, potential solutions and methods to achieving the solutions should occur early during the team's life.
Team role and status in organization	Davis, Perry, Delmont (1998); Heimer, Vince (1998); Regenstein *et al* (1998); Fisher, Fisher (1997); Greenewood (1997); Johnson, Johnson (1997)	• The team behavior and status in organization is dependent on time deadlines that are ambitious and challenging to a team, changes in team membership that are externally imposed during the life of the team. • It is important that the organization trusts the team and empowers it: for the team is possible to realize the self - government model with the focus on self – management and continuous development; head of organization does not poke into teamwork except the cases when the short consultation is needed; the team takes responsibility for everything that influences its activity, outcomes and interaction. • The team status and role in organization is dependent also on team members' competence and continuous learning and development.

[2] Ignorance of the aim in a team stipulates managerial (e.g., non – efficient / non – effective activity) and psychological (e.g., anxiety, fear) problems. The team members, who treat themselves as a team, should form and accept the general aim / task (related to organizational aims) and identify themselves with it.

[3] Team is a system: the team means a 'derivate', which consists of the aim and serves the aim, activity and actions, and that excepts the team in environment as a compact and relatively autonomous unit.

[4] Types of information interchange includes those aspects (Cole, 1998): a) *speed of information diffusion*, where an important question is how it is possible to compare the structure of communication networks, according to speed characteristic; b) *precision of information rendering* with the question – in which type of network is the best precision; c) *absorption of information* – this aspect is related to information volume and raises the question – in which network the absorption is the highest and lowest.

[5] Communication, collaboration and cooperation processes in the team should be based on interpersonal equality principle; power includes listening, trust and sharing; in the team the differences between members are not acceptable thus they should be eliminated after regular diagnostics / evaluations o teamwork and team management.

[6] In teams there always exists a non-formal leader, and the functions of the leader are performed by some team members or all the team; the leadership style determines the processuality of teamwork; autocratic leadership style limits the leader's identification with the team and the democratic style stipulates the effective teamwork, when responsibilities of the team leader are delegated to team members.

[7] The team takes responsibility for decision - making; there does not exist the only way for the team to take decisions and this is dependent on the nature of the decision and on outcomes that will influence the team members.

Table 2

Dimensions of teamwork test, their explanation and example of test items

Dimensions (scales)	Explanation of dimensions (scales)	Examples of test items
1. Orientation to tasks and achievements Cronbach α =0.83	Dimension shows how, in what way aims of team's work are raised and how their reliability is tested. It shows the ways of incentives, that are employed to achieve aim, and team members' orientation to achievements	All team members work to attain a joint aim Aims set for the whole team are realistic and attainable Results attained by team are excellent Team regularly gets feedback on how (well or badly) is assessed its performance
2. Devotion to work and responsibility Cronbach α =0.8	Dimension characterizes the strength of links between an employee, team and task. Support for each other, personal responsibility of an employee, his/her initiative, and possibility for employee's development are attributed here.	I gladly work in this team because the work attracts and satisfies me. All team is seriously interested in success and each individual does his/her best Sometimes, individual team members elude personal responsibility Team members recognize each other's achievements and see their own mistakes.
3.Communication within a team Cronbach α =0.89	Dimension shows the intensiveness and openness of communication processes in a ream. In addition, it is treated as an indicator of interpersonal relations.. Peculiarities of employees social behavior during work meetings, peculiarities of conflict resolution are also attributed to this dimension	Team meetings are efficient Everyone in the team shares important information It is possible to express one's opinion within the team, even if it differs from majority If any of team members has problems or troubles, they are noticed by the team and appropriately react to these problems
4. Team leadership Cronbach α =0.89	Dimension shows aimed leader's psychosocial impact on the team as a group. Key moment here is management style and how the leader is perceived and evaluated by the team. How a leader represents the team outside it is also attributed to this dimension.	Team leader constantly regards efforts and abilities of each employee Team leader regularly informs employees on all issues concerning the team. Team leader usually makes decisions after consulting with other team members Team leader tries to shift his/her mistakes or lapses onto employees when there is an opportunity
5. Organizing a team Cronbach α =0.87	Dimension characterizes how the team, itself organizes its work: task distribution, work agreements and deadlines It involves both ways of work-related decision making, organizing meetings, and the rules for preparing completed work report documents (bills, handling and presenting timecards and other important documents)	A thorough preparation for team's meetings Aims, content and course of the meeting are clear Every team member's tasks are precisely explained Everybody knows what he/she has to do Before taking final decisions, all team discuss different versions and alternatives Joint work in the team is not always properly planned or it is weakly coordinated
6. Role and status of team in an organization Cronbach α =0.81	Dimension shows team's localization and its importance in the joint organization. Key feature here is outside impact on the team: if there were enough resources provided, what the degree of team's independence is, how the team is treated (evaluated) by leaders of organization, how efficient are contacts with leaders of the organization and other teams of the organization. The dimension treats team as a working division, which is a part of a bigger organization	Present means and resources (staff, technical equipment, finance) correspond to the tasks raised to the team If there is a need, the team gets enough support from other divisions Management of the organization positively evaluates and supports the team The team has enough freedom and decision-making rights, necessary to carry out set tasks

Research methods and results

Research instrument: dimensions, validity and reliability

The theoretic concept of Team Puls test is based on a combination of modern Western theories of management, and the test itself has passed the tests of scientific research both in Germany (the country of its origin) and in Lithuania (Žydžiūnaitė, 2005a,b; 2003; Merkys, Dromantas, 2004; Wiedemann, Watzdorf, Richter, 2000).

After the linguistic adaptation of the test, more than 2000 employees from 350 teams of various organization types have been tested (see Table 4). The testing was conducted anonymously. Typical five-point Likert scale questions were used. The test provides a possibility to precisely diagnose and assess the efficiency (or a lack of it) of most diverse teams. The number of pre-testing items is 66. The German authors of the test employed a factor analysis to group them into six qualitative teamwork dimensions (subscales): 1) leading a team, communication within a team, employee dedication to work, employee responsibility, etc. (Wiedemann, Watzdorf, Richter, 2000).

The authors of this paper adopted the German dimensionalization and tested it empirically. Both German and Lithuanian samples produced similar dimensionalization of the test. It is worth mentioning that a secondary factorization of six test dimensions in the Lithuanian sample produces one statistically consolidated and fit factor (Cronbach α = 0.94). This is important because it allows on the basis of Lithuanian data to calculate a total test score on all 6 dimensions (i.e., on all 66 primary items). The test subscale indicators of Internal consistence ob-

tained from Lithuanian labor organizations are rather high. The Internal consistence of the test, dimension characteristics and examples of items are presented in a table (see Table2).

High indicators of the test Inter-Factor consistence were obtained not only in the great target sample (N=2047), but also in the sample of large-sized manufacturing organizations (N=403). According to the scales, values of the following consistency coefficients were obtained (Cronbach α_1 =0.75; α_2 =0.77; α_3 =0.84; α_4 =0.89; α_5 =0.8; α_6 =0.74). Notably, the German test adapted in Lithuania demonstrates particularly high characteristics of reliability by applying test – retest method both with complete and reduced test versions. Every test dimension of the reduced test included only those items, which met at least two requirements: 1) they were logically valid in the context of Lithuanian labor organizations 2) were characterized by the highest factorial weight and Inter-Factor consistence. Thus, two reduced test versions were produced from the 66- item teamwork test – a) "Medium test version"(27 items) and b) "Reduced version"(15 items). Retests, depending on the sample clusters, were carried out during the interval of four to eight weeks. Table 3 reflects repeated measurements correlation results of the joint sample.

Table 3

Matrix of repeated teamwork tests intercorrelations. Joint test

	1	2	3	4
1. Complete version (1)	1	0.85	0.82	0.82
	N = 793	***	***	***
2. Complete version (2)		1		
	N = 265	N = 270		
3. Medium version			1	0.95
	N = 515		N = 543	***
4. Reduced version				1
	N = 259		N = 258	N = 259

*Note: *** significance 0.01. Two empty cells in the table mean the absence of corresponding retest formation.*

The adapted teamwork test is highly stable and reliable. While reducing the test two or four times, the test stability remains, correlation coefficients range from 0.82 to 0.95 and can be defined as very high. The volume of sample clusters, in which correlations were calculated, was high enough as well - from 259 to 793.

Next to control inner consistency, factor validation and tests – retest methods, the test in Lithuania was tested by correlating it with outside criterion, and by applying qualitative methods (Merkys, Kalinauskaitė, Beniušienė, Weinhardt, Dromantas, 2005; Dromantas, 2002). It was found out that there is a systematic and significant correlation of the teamwork test with 18 subscales of the organization climate test. The explained variance of both tests in a 810 N sample reached about 20% on the average.

For quantitative study, several small and medium - sized business enterprises (teams) were selected. Teamwork scores of these enterprises extremely deviated from the average towards positive and negative scores. Researchers' visits and interviews during the test in the best-performing team revealed exceptional and objective economic indicators of this enterprise and a special competitive success.[8] A visit to the worst performing company in terms of teamwork[9], did not reveal the crisis of economic achievements, but revealed a deep crisis of staff management, job dissatisfaction and a permanent staff turnover (Dromantas, 2002). Valid indicators and tests ability to forecast econometric indicators of an enterprise were described by the authors of Team Puls test (Wiedemann, Watzdorf, Richter, 2000).

Norm-referenced test sample and target sample of manufacturing enterprises

Test norming

During the five years of testing and verification in a Lithuanian organization, a significant norm-referenced test sample was formed. Sample size is 2047 respondents. In the norm-referenced sample a total test score is according to normal distribution. Norm-referenced sample clusters represent 363 teams from 50 different size „mother" organizations. The sample includes acceptable proportions of both public and private sector. Within state organizations, a particular organization type is represented – statutory organizations (see Table 4).

Rather large normative-referenced sample determined a very short confidential interval, which on the standard z-scale of normal distribution is 0.12, when α=0.01. The accumulated norm-referenced database enables us to construct "specialized" test norms for individual organization types, e.g. for statutory organizations, education and health organizations, banks, municipality department, etc.

However, the paper focuses on the analysis of larger manufacturing enterprises teamwork. The term "rather large manufacturing enterprise" in terms of Lithuania acquires a specific meaning. According to Statistics of Lithuania[10], as much as 89% of Lithuanian enterprises employ a staff of about 19. The accumulated rate interval of 99 employees covers 98.11% of all country's enterprises. The interval from 500 to 999 employees covers only 0.12% of all enterprises. Thus, a larger enterprise in Lithuania is a statistical exclusion.

[8] This was a business incubator enterprise founded by a student of radio electronics and his friends. The enterprise designed and installed nonstandard security systems in enterprises. The fact, that it started its activities in the business incubator, indirectly indicated that at the beginning it had no working capital event to keep a small office. After two years, the turnover of the company reached a 2-million Litas turnover. This small enterprise in an open tender won a huge order from a large local monopolist company.

[9] This enterprise also represented the SME sector and business incubator. The enterprise had acquired good equipment to immediately deal with small oil product- related emergencies (e.g. in petrol stations, workshops, etc.) The visit allowed to raise a hypothesis the reason for a deep human resources crisis lies in impossible disposition of the owner and manager, or even most likely a psychic disorder. For a few years in a row, nobody of hired staff stayed for longer than 1-3 months.

[10] See: http://www.std.lt/lt/pages/view/?id=1247

An enterprise employing a staff of 100 or more people, in terms of Lithuania, can be regarded as relatively large, when using as a basis not organizational science or international enterprises classification[11], but empirically-based statistical trend. According to Statistics of Lithuania, such enterprises comprise 1.9% of all 61035 enterprises registered in Lithuania.

Table 4

Types of organizations tested on teamwork

Organizations	# of tested organizations	# of tested persons
Largest banks of the country (regional branches)	2	124
Different business organizations	2	112
Statutory organizations	5	238
Educational organizations	10	570
Health care organizations	6	167
State central governing institution (X)	1	57
County governors 'administrations and municipalities	7	247
Manufacturing enterprises	4	403
Boroughs	9	74
Rural regional business organizations	3	14
Insurance organizations	1	41
Total:	50	2047

As a research subject three large-size enterprises were selected from normative-referenced sample. On Lithuanian scale, these were large-sized manufacturing enterprises and which had independent manufacturing facilities. Short profiles of these enterprises are presented below. They are presented in general features without mentioning their real names; code names (anonyms) were used. The researchers undertook to keep the test anonymous and not to publish concrete data about the enterprises, which could damage their image.

A brief profile of Manufacturing Enterprise (X)

The manufacturing enterprise under the code name X is a private – capital limited liability company (Ltd.). The enterprise produces food stuffs and the export share makes about 80%. High technologies prevail in the enterprise, and reorganization and reforms are in full swing. The organization employs about 600 men and 800 women. The diversity of tested teams (or departments) was sought on purpose in order to get indirect information about the organization as a whole. Eight teams took part in testing. The total number of tested employees is 62.

A brief profile of Manufacturing Enterprise (Y)

Another large light industry manufacturing enterprise under the code name (Y) is a stock company, the activities of which go back to the 1920s. In 1992 it was privatized and reorganized into stock company. At present, local (Lithuanian) capital is prevailing, and export share comprises 97%. The organization employs about 500 men and 300 women, a narrow specialization predominates. Reorganization and reforms are only being planned. The changes were limited to replacing managers. Nine teams took part in testing. The total number of tested employees is 102.

A brief profile of Manufacturing Enterprise (Q)

Another large light industry manufacturing enterprise under the code name (Q) is a stock company. It manufactures X-type products and processes raw materials Z. Although the company is classified as a local capital company, its export share is quite large – about 90%. Traditional technologies prevail in the enterprise. Organizational reforms have been started, but not completed: the director general was replaced twice, as well as the managers of commercial services; the inner structure of the organization has undergone changes. The number of staff is about 200. All employees have written job descriptions. No staff management system is introduced in the company; no staff studies are done; no seminars, staff trainings on the issues of human resource management are carried out. 11 teams took part in testing. The total number of tested employees is 115.

A brief profile of Trade-Production Enterprise (Z)

Next to manufacturing enterprises, one was included into the target sample. The establishment of this network is linked to the coming of foreign capital to the Lithuanian market. At present the enterprise is owned by a 100% foreign capital. In this paper, the trade company with a network of outlets all over Lithuania is presented under a code name Trade-Production Enterprise (Z). Employees of trade and marketing areas and manufacturing departments (gastronomy, bakery, and confectionary) form the foundation of the enterprise. The presence of large production departments in particular led to the decision of the authors to include this enterprise into the target sample. Seven teams (departments) took part in testing. The total number of tested employees is 124.

Results

As one can see, the selected enterprises are rather large, their status and origin of capital are diverse, and some of them are working for the local, others – for the foreign markets. In all four enterprises a total of 403 employees from 35 different teams (departments) were tested. The distribution of both the general work experience and work experience in that particular enterprise was rather „realistic". General work

[11] The meaning of terms "small-sized enterprise", "medium-sized enterprise or "large-sized enterprise" is not clearly defined neither in international nor in national management science. This was well revealed in S. Vaitkevičius PhD dissertation (Vaitkevičius 2005). The definition is most often based on the number of staff and turnover, but it is differently treated in terms of geography and branch.

experience (GWE) ranged from one to 42 years, and the standard deviation was 10 years (BDSmin=1; GWEmax=42; GWEMean=16; GWESD=10.4).

Equivalent parameters of work experience in present organization (SO) of the sample are the following: (EPO_{min}=1; EPO_{max}=35; EPO_{Mean}=6; EPO_{SD}=6.4). As one can see from the data, the research sample represents both very young (beginners) and mature (experienced) employees, also represented are those working for the organizations for a very long time and newcomers, who hardly settled down. What is favourable for the sampling is that there are 12% (N=47) team leaders, who allow us to treat this subset as a separate statistical cluster, and to compare the attitudes of managers and members towards the functionality of teamwork. Gender-wise division is also realistic – women make up 57%. The fact that women outnumber men in the staff structure reflects the trends prevailing in light industry.

Table 5 presents ratings of all types of studied organizations in terms of teamwork efficiency. The same information is presented in Figure 1. The dotted lines mark the limits of confidence interval, when α =0.01. At the top of ratings is the organization (or organizations) that have the most effective teamwork performance. The rating was constructed on the basis of standard normal distribution z-values, when the scale mean is =0, and a standard deviation is =1; z value is obtained calculating a mean of all six-test dimensions values, i.e. by calculating a mean of all 66 values of the primary test items. It is important to regard not only the mean, which equalizes the statistical exclusion, but also variance. In the table, next to z-value, a minimal and maximal feature value found in relevant sample cluster, as well as the variation scope. Next, two homogeneity indexes of attitudes on teamwork in a particular organization are derived. They are expressed in percent. The first homogeneity index was calculated from the highest precedent of present variation scope. The highest variation scope was found in individual university departments (6.25 points on the z-scale) and this value was equivalent to 100%. Another homogeneity index was calculated from 6 standard deviations, based on a three-sigma rule, which obtains in case of regular distribution. Here we have in mind the fact that interval Mean±3SD gets about 99% of all possible observations. As one can see, the most scattered (or least homogeneous) is the attitude towards teamwork in an organization like university. Although university is at the top of the rating, there was one faculty whose values dropped below norm-referenced mean by 4 (3.87) standard deviations, which shows statistical exclusion. The least scattered attitude on teamwork was found in fire department; in addition, this organization takes the first and the highest place of the rating. Such have evaluations probably result from the work specifics in this organization. Extreme work conditions of firefighters determine that those who are unable to adjust to high requirements and accordant, joint work in a team are soon identified and eliminated. It is symptomatic that the fire department values significantly deviate from the value of statutory organizations branch. As the values of other statutory organizations such as police precinct, territorial customs and prisons department are less impressive. Thus, it is not always correct to speak about the organizational branch effect.

Table 5

Organizational rating

Organizations	z-score	Min	Max	Variance score	From max	From 6 SD
Fire department	0.69	-0.06	1.68	1.74	28%	29%
Local department of education	0.45	-2.95	2.49	5.44	87%	91%
Schools	0.3	-2.05	2.28	4.33	69%	72%
Rural business organizations	0.28	-2.12	1.72	3.84	61%	64%
University	0.24	-3.87	2.38	6.25	100%	104%
Boroughs	0.21	-2.12	1.75	3.87	62%	65%
Insurance company X	0.18	-1.67	1.88	3.55	57%	59%
State central governing institution X	0.19	-1.74	2.3	4.04	65%	67%
Business organizations	0.1	-2.84	2.39	5.23	84%	87%
Health care institutions	0.07	-1.58	2.04	3.62	58%	60%
Police precinct	0.00	-2.59	2.25	4.84	77%	81%
Territorial customs X	-0.11	-2.16	2.12	4.28	68%	71%
County governor‘s administration X	-0.2	-2.39	1.95	4.34	69%	72%
Municipalities	-0.21	-2.57	1.64	4.21	67%	70%
Banks X and Y	-0.19	-2.16	2.15	4.31	69%	72%
Divisions of prisons departments	-0.27	-1.86	2.08	3.94	63%	66%
Trade – production organization Z	-0.03	-2.61	2.44	5.05	81%	84%
Manufacturing organization X	-0.41	-3.4	1.59	4.99	80%	83%
Manufacturing organization Y	-0.44	-2.7	2.14	4.84	77%	81%
Manufacturing organization Q	-0.5	-2.94	1.87	4.81	77%	80%

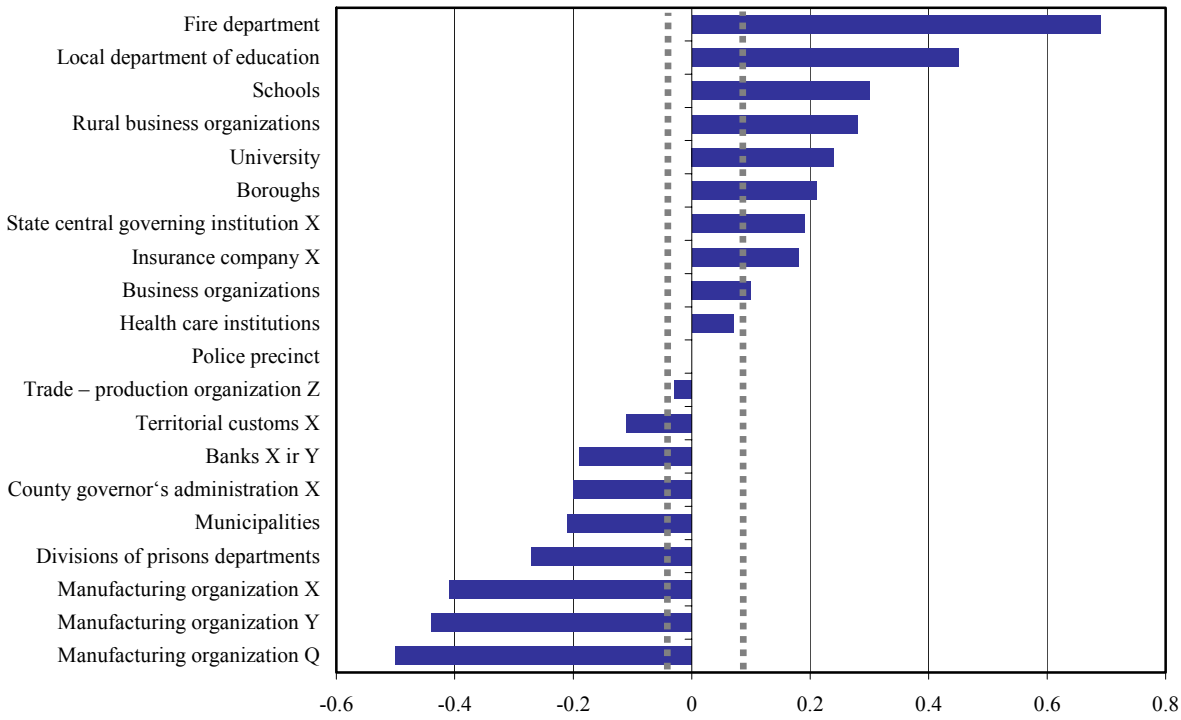

Figure 1. Organizational ratings according to teamwork efficiency

Teamwork may be significantly different within the department of a single organization. Thus, the approach taken by the authors that, while interpreting the values of teamwork test, to rely not only on the mean but also on the parameters of feature dispersion, was justified.

However, it is very symptomatic, that in the whole normative sample, the last positions were unanimously taken by three large-sized manufacturing organizations, mentioned before. Their values significantly go beyond the limits of reliable range and drop below normative sample mean by approximately a half of standard deviation. The values of manufacturing organizations differ from those of the leading one, fire department, by more than one standard deviation. The norm-referenced scale also included large-sized organizations of other type. E.g., large regional branches of the two biggest banks, or a regional department of a large insurance company. It has to be noted, that the rest of other business enterprises in the normative sample cannot be considered as large-sized ones. These are rural tourism business organizations and SME-type organizations, including the business incubator ones. The range of their activities is very wide: services, small trade and manufacturing. In any case, we are speaking here about very small enterprises, the larger part of which is working for the local market and have a status of a sole entrepreneur, or Ltd. It is symptomatic the values of large-sized non-production business organizations and SMEs are more favorable, and they are above the normative mean and go beyond the upper limit of the reliable range. It is worth mentioning that, the values of shopping centre network, mentioned above, are closer to the mean of norm-referenced sample. Table 6 presents a generalized rating of teamwork according to organization types (branches, areas of activity). Educational organizations and an insurance company are in the leading positions.

Table 6

Teamwork ratings according to organization types

Organizations	Organizations group	z-score	Variance score
Fire department	Educational organizations	0.33	6.36
Local department of education			
Schools			
Rural business organizations		0.18	3.55
University	Statutory organizations	0.08	4.84
Boroughs			
Insurance company X			
State central governing institution X			
Business organizations		0.07	3.62
Health care institutions	Other business organizations	0.06	5.23
Police precinct			
Territorial customs X			
County governor‘s administration X	Administrative and governance organizations	-0.003	4.87
Municipalities			
Banks X and Y			
Divisions of prisons departments			
Trade – production organization Z		-0.03	5.05
Manufacturing organization X	Manufacturing organizations	-0.45	5.54
Manufacturing organization Y			
Manufacturing organization Q			

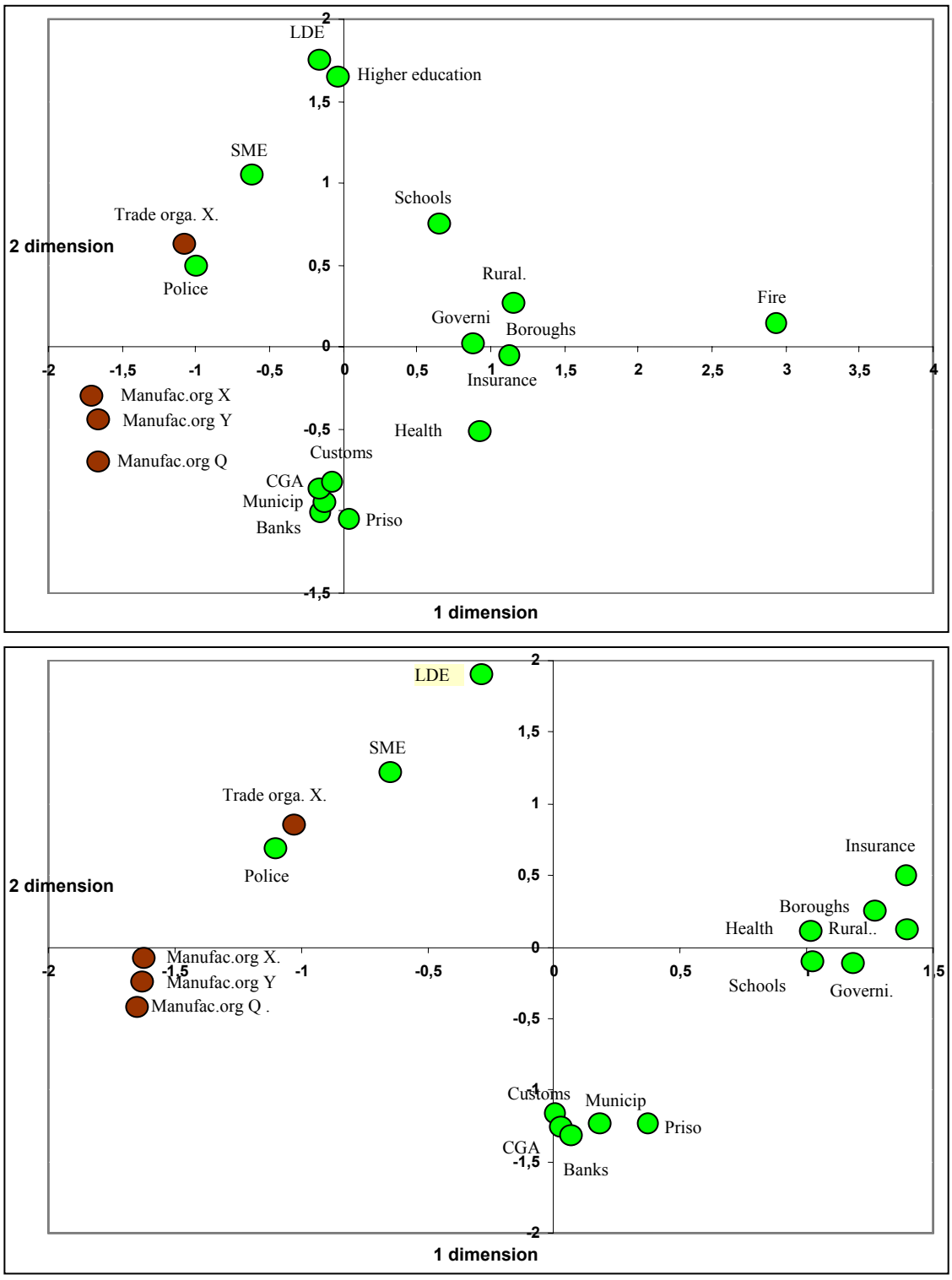

Figure 2. MDS models, A (above) and B (below) versions with complete and reduced structure of features. (Abbreviations are explained in Table 7)

Into the middle position fall statutory, health care, administration and governance organizations, trade network and SME organizations. The cluster of large-sized manufacturing enterprises takes the lowest rating position of all.

It was decided not to limit the study to the measures of descriptive statistics only, and to conduct a study employing a multidimensional method, MDS (Multidimensional scaling) model in particular. The model included two dimensions – z-value and variation scope. Thus, the model regarded two things: 1) efficiency of teamwork and 2) homogeneity of attitude on the before mentioned parameter in the organization.

Distances were calculated from the data matrix, the selected unit of measure – Euclides distance. The result was calculated in two versions: A) by including into the model all types of organizations; B) by eliminating from the model those types of organizations, which tend to be

statistical exclusions. Specifically, fire department and university were excluded from the model. The MDS-modeling results are presented in Figure 2.

In both cases, a very similar "map" of organizations was obtained, the difference is only in the scale, on axis X (first dimension). It is common knowledge, that MDS model is an exploratory method, and the result of it is acceptable when it can be meaningfully interpreted. The first dimension (axis X) may be relatively defined as a dimension of teamwork success, where on the left-hand side of the map accumulate organizations and their types that are characterized by poor teamwork. The right-hand side is taken by organizations characterized by excellent teamwork. The upper part of the map concentrates organizations and their types that are characterized by heterogeneous evaluation of teamwork, and the bottom part concentrates organizations whose evaluation of teamwork efficiency is relatively less scattered and is homogeneous. Therefore, the second dimension (axis Y) signifies the homogeneity of attitudes on teamwork. It is symptomatic, that in both SMS-modeling cases large-sized manufacturing organizations form a single cluster of organizations that failed in teamwork efficiency. Point values of these organizations concur, they get into one cluster that take marginal positions on the left-hand side of the map (according to success-failure dimension) and middle position on axis Y (dimension of attitudes homogeneity).

Table 7

Abbreviations used in MDS models

Manufacturing org Q	Manufacturing organization Q
Manufacturing org Y	Manufacturing organization Y
Manufacturing org X	Manufacturing organization X
Police	Police precinct
Trade org X	Trade – production organization Z
SME	Small and medium enterprises
LDE	Local department of education
CGA	County governor's administration X
Banks	Banks X and Y
Customs	Territorial customs X
Municip.	Municipalities
Prison	Prison department divisions
Insurances	Insurance company X
Health	Health care institutions
Rural	Rural business
Boroughs	Boroughs
Governing	State central governing institution X
Schools	Schools

Summing up and discussion

The study highlighted that large-sized manufacturing enterprises take the last position among different organizations in the rating of such important human resources dimension like teamwork. This allows concluding (at least on grounded hypothesis) that teamwork in larger manufacturing enterprises is relatively in a state of neglect and of little efficiency. Certainly, this conclusion should be strengthened in the future by additional research, by including into the norm-referenced database more large-sized enterprises, their number should not be limited to three or four, but expanded to a minimal statistical cluster of 25 enterprises. It is important, because when diagnosing the functionality of human resources in an organization, the unit of statistical observation is not the only single score of tested persons, but the organization itself, to be precise – aggregated values of organization which are calculated by summing up the values of single individuals. When the sample of organizations is small, generalizations in terms of branch are partly risky, even when the sample of individuals is relatively large. Thus, the authors admit that the consistent pattern identified in the study is a scientific hypothesis that demands further grounding and additional arguments for proof.

However, one should consider other circumstances, which strengthen the validity of the raised hypothesis. Firstly, the gauged scientific fact and obtained by a reliable and valid test. In terms of contents, the test is complex and universal – 66 primary items are summed up in six dimensions.

Next, while interpreting data, it worthwhile to consider a rather large testing data rating base. Here, it is meaningful to highlight two aspects: a) a large sample which enables us to test very precisely; b) typological variety of compared and rated organizations.

Joint teamwork is a very important indicator of efficient human resources management in an organization. It systemically correlates with other essential parameters, such as organization climate, work motivation, work stress, etc. It is meaningful in the context of this fact to pose a research question, that probably other human resources parameters in the large-sized organizations of this country are relatively neglected. The relevant hypothesis is supported by the fact that in a study conducted on organization climate; large-sized organizations were also positioned at the bottom of the rating (Merkys, Kalinauskaitė, Beniušienė, Weinhardt, Dromantas, 2005).

While interpreting the research data, one has to admit that the employed test is rather eloquent, and in the future it is useful to expand some of the obtained data by qualitative research. The employed test allows to: a) accurately identify and evaluate general teamwork efficiency (or its deficiency); b) determine, on which dimensions and single features teamwork is efficient or less efficient. However, the employed test tells us little in terms of an attitude when we speak about the main reasons of efficient (or poor) teamwork. An unexploited possibility for further research (the qualitative one in particular) lies here. The productivity of such research is revealed by other studies, in which Team Puls test was combined with qualitative methods. In this respect, it is worth mentioning studies carried out with the population of Lithuanian nurses (Žydžiūnaitė, 2005a, b; 2004; 2003).

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Komandinio darbo disfunkcijos stambiose gamybos įmonėse: tyrimo, paremto norminiu testavimu, duomenys

Santrauka

Straipsnyje atspindėti tyrimo, kurį per 5 pastaruosius metus atliko jungtinė tyrėjų komanda, duomenys. Tyrimo esmė ta, kad Lietuvos darbo organizacijų kultūros sąlygomis buvo adaptuotas Vokietijoje sukur-

tas komandinio darbo testas „Team Puls“. Jis testas susideda iš 66 pavienių klausimų, kurie atspindi labai įvairius komandinio darbo raiškos aspektus. Faktorinės analizės būdu pirminiai klausimai apibendrinti į šešias skales (dimensijas): 1) „Orientacija į tikslą ir pasiekimus“; 2) „Atsidavimas darbui ir atsakomybė“; 3) „Komunikacija komandoje“; 4) „Vadovavimas komandai“; 5) „Komandos organizavimas“; 6) „Komandos vaidmuo ir statusas organizacijoje“. Testo adaptacija Lietuvoje pavyko. Pirma, analogiškai atsikartojo visos šešios dimensijos. Antra, sudarytų skalių psichometrinė kokybė labai aukšta ir yra ne prastesnė už analogiškas charakteristikas Vokietijoje. Sudarytų 6 skalių vidinės darnos koeficientas Cronbach-alfa Lietuvos imtyje svyravo nuo 0,80 iki 0,89. Trečia, Lietuvos imtyje testas demonstruoja labai gerą matavimų patikimumą, kuris buvo patikrintas retesto (pakartotinių matavimų) metodu. Atitinkamas koeficientas svyravo nuo 0,85 iki 0,95. Sutrumpinus testą 2 – 4 kartus, jo patikimumas nesumažėja.

Per 5 testo išbandymo metus sukaupta didelė ir įvairi testo normavimo bazė. Joje apibendrinti 2047 darbuotojų įverčiai. Testuotų darbo organizacijų pobūdis labai įvairus. Tai 1) viešojo sektoriaus organizacijos (švietimo, sveikatos, vietos savivaldos ir centrinio valdymo organizacijos); 2) statutinės organizacijos (policija, muitinė, kalėjimų departamentas, priešgaisrinė ir gelbėjimo tarnyba); 3) verslo organizacijos: draudimo kompanijos, bankai, stambios gamybinės įmonės, SVV įmonės. Didelė normavimo imtis lėmė gerą matavimų tikslumą. Apie tai liudija palyginti nedidelis normavimo vidurkio pasikliaujamojo intervalo ilgis, kuris standartizuoto normaliojo skirstinio z-skalėje tesiekia 0,12 punkto, netgi tuo atveju, kai pasirinktas gana griežtas statistinio reikšmingumo lygmuo α=0,01. Antrinė visų šešių testo skalių faktorizacija Lietuvos imtyje sudaro vieną faktorių, ir tai parodo, jog tikslinga skaičiuoti ir interpretuoti jungtinį testo balą, agreguojamą iš 66 pavienių įverčių. Tai atveria galimybę komandinio darbo raišką vertinti apibendrintai ir visybiškai.

Straipsnis susideda iš dviejų dalių, „Įvado“, dalies, kurioje pagrįstas tyrimo mokslinis problemiškumas ir apžvelgti tyrimo teoriniai pagrindai, ir „Tyrimo metodikos ir rezultatų“ dalies. Straipsnio teorinėje dalyje (įvade) apžvelgtos šalies ir užsienio autorių atliktos teorinės ir empirinės studijos apie komandinį darbą. Parodoma ir pabrėžiama, kad adaptuojamo testo teoriškai postuluojamos šešios dimensijos yra ganėtinai universalios ir pripažintos kitų autorių. Tyrimo metodikos ir rezultatų dalyje pagrįsta ir aprašyta testo struktūra, pateikti jo psichometriniai matai, testo žingsnių formuluočių pavyzdžiai. Šioje dalyje apibūdinta ir testo normavimo imtis, ir tikslinė tyrimo imtis – keturios stambios gamybinės įmonės, – kuriose buvo testuoti 403 darbuotojai, atstovaujantys 35 skirtingoms darbinėms komandoms. Išsaugant organizacijos anonimiškumą, pateikta trumpa atitinkamų įmonių charakteristika.

„Gamybos įmonės (X)“ trumpa charakteristika. Gamybos įmonėje, kuri straipsnyje koduojama indeksu X ir turi uždaros akcinės bendrovės (UAB) statusą, vyrauja privatus kapitalas. Įmonė gamina maisto produktus, o jos eksporto dalis sudaro apie 80 proc. Organizacijoje vyrauja aukšto lygio technologijos, o reorganizacijos ir reformos jau įsibėgėjusios. Organizacijoje dirba apie 600 vyrų ir 800 moterų. Testuojamų komandų (arba padalinių) tipų įvairovės buvo siekiama sąmoningai, kad būtų galima netiesiogiai spręsti apie organizaciją kaip apie visumą. Testavimo tyrime dalyvavo 8 komandos. Bendras testuotų darbuotojų skaičius yra 62.

„Gamybos įmonės (Y)“ trumpa charakteristika. Kita stambi lengvosios pramonės gamybos įmonė, kuri straipsnyje koduojama (Y) ir pagal tipą priskiriama prie akcinių bendrovių (AB), savo veiklą vykdo nuo tarpukario laikų. 1992 metais buvo privatizuota ir reorganizuota į AB. Dabartiniu metu įmonėje vyrauja vietinis (lietuviškas) kapitalas, o eksporto dalis sudaro apie 97 proc. Organizacijoje dirba apie 500 vyrų ir per 300 moterų, vyrauja siaura specializacija. Reorganizacija ir reformos kol kas dar tik planuojamos. Kol kas apsiribota tik tokiais pokyčiais kaip vadovų keitimas. Šioje įmonėje buvo testuotos 9 darbinės komandos. Iš viso testuotų darbuotojų yra 102.

„Gamybos įmonės (Q)“ trumpa charakteristika. Dar viena stambi gamybos įmonė, kuri straipsnyje koduojama slapyvardžiu (Q), turi akcinės bendrovės (AB) statusą, o joje gaminami X tipo lengvosios pramonės dirbiniai bei apdirbama Z pirminė žaliava. Nors įmonė priskiriama prie vietinio kapitalo organizacijų, jos eksporto dalis gana didelė – apie 90 proc. Įmonėje vyrauja tradicinės technologijos. Organizacinės reformos jau pradėtos, bet nebaigtos: net du kartus keitėsi gen. direktorius, komercinių tarnybų vadovai, buvo keičiama vidinė organizacijos struktūra. Įmonėje dirba apie 200 darbuotojų. Visi jie turi rašytinius pareigybės aprašymus. Pažymėtina, kad organizacijoje nėra įdiegta personalo valdymo sistema; neatliekami personalo tyrimai; seminarai, personalo mokymai žmogiškųjų išteklių valdymo klausimais taip pat nevykdomi. Aptariamoje įmonėje testuota 11 darbinių komandų (padalinių), o iš viso testuotų darbuotojų yra 115.

„Prekybos-gamybos įmonės (Z)“ trumpa charakteristika. Greta minėtų gamybos įmonių, į tyrimo tikslinę imtį buvo įtrauktas ir vienas prekybos tinklas. Tinklo įkūrimas sietinas su užsieninio kapitalo atėjimu į lietuvišką rinką, ir dabar visas įmonės kapitalas priklauso užsienio investuotojams. Straipsnio kontekste prekybos tinklas, turintis savo taškus visoje šalies teritorijoje, sąlygiškai pavadinamas „Prekybos-gamybos įmone (Z)“. Įmonės pagrindą sudaro prekybos ir marketingo sferos darbuotojai bei gamybos cechai (kulinarija, kepykla, konditerija). Būtent nemaži gamybiniai cechai organizacijos struktūroje ir lėmė autorių apsisprendimą ir šią įmonę įtraukti į tikslinę tyrimo imtį. Aptariamoje įmonėje buvo testuotos 7 darbinės komandos (padaliniai), o iš viso testuotų darbuotojų yra 124.

Toliau rezultatų dalyje pristatytas įvairaus tipo organizacijų reitingas pagal komandinio darbo funkcionalumą. Reitingas sudarytas naudojant standartinio normaliojo skirstinio z skalę. Gauti reitingo duomenys rodo, kad stambios gamybinės įmonės sistemingai atsiduria normavimo reitingo apačioje. Nuo normavimo vidurkio gamybinių organizacijų įverčiai nukrypsta į neigiamų vertinimų sritį bemaž per pusę standartinio nuokrypio, o nuo geriausių pasiekimų organizacijų gamybos įmonių įverčiai nukrypsta bemaž per vieną standartinį nuokrypį. Tai reiškia, kad stambioms gamybinėms įmonėms būdingas palyginti prasčiau išplėtotas ir mažiau veiksmingas komandinis darbas nei kitokio tipo organizacijoms. Pažymėtina, kad panašus dėsningumas nustatytas ir kitame tyrime, kuriame buvo diagnozuojamas organizacinis klimatas. Tai leidžia kelti šią hipotezę: visai tikėtina, jog stambioms gamybinėms įmonėms apskritai sunkiau sekasi plėtoti žmoniškuosius išteklius nei tai pavyksta padaryti kitokio tipo organizacijoms. Esama nemažai skirtingo tipo verslo organizacijų, kuriose komandinis darbas, pasak testavimo duomenų, plėtojamas žymiai efektyviau nei stambiose gamybinėse įmonėse. Čia paminėtinos tokios taip pat stambios organizacijos kaip draudimo kompanija, bankai. Minėtinos ir kaimo verslo bei SVV įmonės, kurių komandinio darbo pasiekimai irgi gerokai aukštesni nei stambokų gamybinių įmonių.

Tyrimo metu konstatuota, kad tos pačios organizacijos komandose (padaliniuose) testuojamas įvertis labai kontrastingai skiriasi. Didžiausias pasitaikęs skirtumų precedentas tarp organizacijos padalinių siekė 6,36 z-skalės punktus. Akivaizdu, jog ganėtinai problemiška yra reitinguoti ir klasifikuoti organizacijas vien tik pagal testo įverčio vidurkį. Išsamiau pagrįstai nagrinėjamų organizacijų klasifikacijai pagal komandinio darbo raišką atlikti pasirinktas MDS (*multidimensional scaling*) metodas. Klasifikuota pagal dvi dimensijas – vidurkį ir požymio sklaidą (vertinimo homogeniškumą). Sklaidos matu pasirinkta variacijos apimtis. Abu į modelį įtraukti dydžiai išmatuoti standartinio normaliojo skirstinio z įverčiais. Distancijos tarp organizacijų įverčių buvo išskaičiuotos iš duomenų matricos, pasirinktas distancijos matas – Euklido atstumas. MDS modelis buvo sudarytas keliais variantais: a) įtraukiant visus normavimo imtyje buvusius organizacijų tipus; b) atmetus organizacijų tipus, kurių įverčiai sudaro statistines išskirtis. Abiem atvejais apie stambias gamybines organizacijas gauta vienoda išvada. Didelėse gamybinėse organizacijose komandinis darbo veiksmingumas vertinamas prastai, o išsakoma nuomonė nėra vienalytė. Komandinio darbo ir kitų žmoniškųjų išteklių parametrų raiška stambiose gamybinėse įmonėse ateityje reikalauja išsamesnių tyrimų.

Raktažodžiai: *komandinis darbas, norminis testavimas, faktorinė analizė, reitingas.*

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