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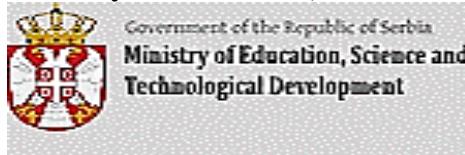
CONTINGENCY OF EMPLOYEES' TRAINING

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Abstract. *In order to be competitive in the market, many companies must, besides product quality, constantly monitor the efficiency of their organization and its employees. Factor analysis can reduce the number of significant areas, by grouping some of them into influential contingent factors that help in monitoring of the situation. Also, for good and reliable planning, it is important to know how the areas are correlated with each other, to which correlation analysis contributes. This paper aims to analyze the data collected from the survey, conducted on a sample of 56 companies operating in Serbia, and to find influential factors. Descriptive statistics and data reliability were first performed and after that by factor analysis the data were divided into groups of influencing factors and then the correlation between the data was examined. The obtained results indicate that it is possible to reduce 20 examined traits to 5 influential factors, and the correlation analysis shows the importance of employee training on level of innovation in processes and products and faster and appropriate reaction to solving and preventive problems.*

Key words: Contingency factors, Descriptive statistics, Reliability analysis, Factor analysis, Correlation analysis.

1. INTRODUCTION

At the present time, when the availability of different information in the company is great, the ability of the company to process that information in the right way, can be a key difference in the fight for market success, compared to the competition [1]. With the development of computer and information technologies, data on the situation in various sectors of the company can be monitored in real time. The problem that arises is how to understand this data and determine the factors that affect it. Namely, the collected data are often not easily interpreted and at first glance it is not possible to draw a concrete conclusion from them, but with the help of some qualitative and quantitative methods, a model of behavior can be found in them. The data model is much more understandable and, in addition to statistical values, it also contains links between data, that is, rules according to which modifying some data affects other data [2].

Contingency theory seems to be insufficiently researched in the available literature, as well as its connection with employee training [3]–[6].

Due to the aforementioned facts, the aim of this paper is to find significant links between contingency factors and training of employees, based on data collected from companies in Serbia that describe their characteristics, and group these characteristics into influential factors.

2. METHODOLOGY

The research included a survey that contained questions from 4 areas, where in the first area the questions were focused on the characteristics of the organizational structure (OS area). There are 6 questions here: how many hierarchical levels company has, what is director's span of control, how many employees company has, how many different positions in company has permanent employees, how many annual plans company has and how many job procedures are defined. The second area refers to examining the style and management of responsible staff (R area) and has 3 questions: whether manager thinks proactively or retroactively, whether he makes long-term plans and whether he motivates or punishes his subordinates. Third area is concerning the relations and behavior of employees (Z area) and has 9 questions: employee attitude towards quality, innovations, problem solving, competitive atmosphere towards other employees, relationship formality,

openness, cooperation and team spirit. The fourth area refers to staff training and their involvement (O area). This area contains 3 questions: is training important for company, how many resources they allocate and is quality training priority. The survey collected by the questionnaire data from 56 companies in Serbia, 40 of which are engaged in production, and the other 16 are from the IT, logistics, banking and design sectors.

Table 1. Descriptive statistics

Variable name	Mean	Std. deviation	Variance	Skewness		Kurtosis	
				Coefficient	Std. Error	Coefficient	Std. Error
OS_Num_of_hierarchical_level	0.434	0.190	0.036	-0.736	0.319	0.329	0.628
OS_Director`s_span_of_control	0.789	0.352	0.124	**1.885**	0.319	**7.141**	0.628
OS_Num_of_employees	1.788	0.529	0.28	0.861	0.319	1.325	0.628
OS_Tehnological_specialization	4.70	2.008	4.033	0.965	0.319	1.086	0.628
OS_Strategic_plan	2.23	1.221	1.491	0.593	0.319	-0.385	0.628
OS_Job_description	2.48	1.477	2.181	0.545	0.319	-1.079	0.628
R_Thinking	3.143	1.151	1.325	0.156	0.319	-0.838	0.628
R_Planning	3.018	1.104	1.218	0.216	0.319	-0.467	0.628
R_Motivation	3.250	1.225	1.5	-0.377	0.319	-0.831	0.628
Z_Quality	3.589	1.262	1.592	-0.631	0.319	-0.544	0.628
Z_Inovation	3.482	1.144	1.309	-0.521	0.319	-0.597	0.628
Z_Reaction	3.268	1.243	1.545	-0.357	0.319	-0.664	0.628
Z_Relations	3.107	1.436	2.061	0.073	0.319	-1.37	0.628
Z_Atmosphere	3.214	1.398	1.953	-0.108	0.319	-1.334	0.628
Z_Informality_Formality	3.464	1.235	1.526	-0.605	0.319	-0.443	0.628
Z_Tightness_Openness	3.536	1.026	1.053	-0.728	0.319	-0.118	0.628
Z_Cooperation	3.804	1.166	1.361	-0.885	0.319	-0.005	0.628
Z_Team_Individual	3.661	1.149	1.319	-0.56	0.319	-0.617	0.628
O_Training	3.875	1.192	1.42	-0.886	0.319	-0.077	0.628
O_Resources	3.464	1.25	1.562	-0.379	0.319	-0.901	0.628
O_Importance	3.214	1.303	1.699	-0.107	0.319	-1.084	0.628

Descriptive statistics showed that the variable OS_Director`s_span_of_control does not have a normal distribution based on the parameters of distortion and courtesy of the distribution of this variable, as shown in Table 1. Variables that represent number of hierarchical levels and total number of employees in company and in director span of control are represented in logarithmic scale for more accurate calculations

Table 2. Reliability analysis and Factor analysis

Variable name	"Cronbach's Alpha" coefficient	Contingency factors				
		F1	F2	F3	F4	F5
OS_Num_of_hierarchical_level	0.672	-0.428	0.519	0.275	-0.017	-0.455
OS_Director`s_span_of_control		0.028	0.581	0.009	-0.070	0.392
OS_Num_of_employees		-0.063	**0.785**	0.049	0.290	-0.237
OS_Tehnological_specialization		0.289	**0.738**	0.089	0.238	-0.020
OS_Strategic_plan		-0.115	0.630	0.265	-0.070	0.268
OS_Job_description		-0.106	0.697	0.196	0.125	0.058
R_Thinking	0.802	0.064	0.044	0.134	**0.842**	0.094
R_Planning		-0.002	0.177	0.003	**0.874**	0.137
R_Motivation		-0.311	0.170	0.068	0.675	0.308
Z_Quality	0.686	0.522	0.215	0.166	-0.143	-0.178
Z_Inovation		0.150	0.211	**0.728**	0.066	0.174
Z_Reaction		0.110	0.105	**0.747**	0.141	0.119
Z_Relations		-0.083	0.094	0.054	0.318	**0.702**
Z_Atmosphere		-0.068	0.073	0.205	0.179	**0.846**
Z_Informality_Formality		**0.769**	0.009	0.062	-0.142	0.029
Z_Tightness_Openness		**0.864**	-0.058	0.109	0.025	-0.052
Z_Cooperation		**0.784**	-0.132	0.161	0.019	-0.142
Z_Team_Individual		0.570	-0.042	0.106	0.132	0.380
O_Training	0.680	0.292	0.012	0.666	-0.009	-0.371
O_Resources		0.069	0.185	**0.811**	0.014	0.116

Table 3. Correlation analysis

Correlations

Spearman's rho

(Large correlation matrix table. Variables: @1511, @1521, @1522, @1531, @1541, @1542, @161, @162, @163, @171, @172, @173, @174, @175, @176, @177, @178, @179, @15, @16, @17, @221, @222, @223. Each variable row contains Correlation Coefficient and Sig. (2-tailed) values.)

Reliability analysis, displayed in Table 2, shows that collected data for importance of training is not reliable enough, so it is excluded from factor analysis. Other data is acceptable with Cronbach alpha coefficient larger than 0.61 [7]–[9]. Exception is second group of variables (style and management of responsible staff) that has 0.802 coefficient and therefore are good and acceptable. Factor analysis, displayed also in Table 2, as a result has reduction of number of variables from 20 to 5 influential contingent factors with level of significance larger than 0.7 [10] .

Table 3 represents correlations between all variables and if absolute value of Spearman rho is in range 0.2-0.39 the relationship is week, 0.4-0.59 relationship is moderate,

and larger than 0.6 the relationship is strong[11]. The stronger the relationship is, the darker is color of the field in table.

In that table, the variables are presented in an abbreviated notation referring to variables named in Table 1.

3. CONCLUSIONS

The aim of this paper is to investigate significant contingent factors and training factors of employees in domestic SMEs.

Even though after descriptive statistics (Table 1) most of variables seem to have a normal distribution based on skewness and kurtosis, there is a lot of deviation in those coefficients so that conclusion will be used carefully.

Factor analysis (Table 2) showed that 20 examined variables can be classified into 5 contingent factors, but 8 of the examined variables didn't reach the required level of significance of 0.7 for 56 samples taken. Contingent factors are: first factor, Factor of employee behavior (F1), second, Factor of company position division (F2), third, Factor of employee problem solving (F3), fourth, Factor of leadership management (F4) and fifth, Factor of employee feeling (F5). From the third factor can be seen that separate funds for training affect the same area as innovation of employee and their reactivity.

Correlation analysis (Table 3) indicates that importance of training is in weak correlation with degree of innovation in company, reactiveness of the employee on problems occurring, formality and openness of employee relationships and degree of confrontation with significance of less than 0.05. Another important conclusion from correlation analysis is that allocated resources for training are in weak correlation with number of hierarchy levels, number of procedures with job description and competitive atmosphere between employees and moderate correlation with degree of innovation in company and reactivity of the employee on problems occurring.

The conclusion from this research is that if the company appreciate the importance of training and invest resources in realization of training, it is proved that it has better and faster reaction to problems with proactive thinking on prevention of the cause of the problems and their employees are more innovative and improve processes and products.

The disadvantage of this research is the sample size, which satisfies, but it would be desirable if the sample is larger. The proposal for further research is to follow the effect of contingent factors on employee performance, and with the mediation of employee training, i.e. to make an adequate model and determine regression equations by applying multiple linear regression.

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