STUDY REGARDING THE AUDIT OF MANAGEMENT PRINCIPLES

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Abstract: In this study we developed a check list and we applied a scale to measure the implementation quality of the management principle, as set in the standard ISO 9000. The audit was for the organizations that are included in small and medium organizations category, from North Moldavia and Banat.

Keywords: principles, audit, discriminate analysis, standards.

1. Introduction

Management must fulfill quality criteria. Applying the principles of quality management to management practice is the base transition to the total quality of applying the management functions [1]. Modern management systems must answer the challenges linked to quality assurance, employee safety, information security, environmental protection or social responsibilities and for some specific organizations, to the insurance of food safety.

The term Total Quality Management (TQM) seems to be an universal remedy that can be applied to all organization regardless of the profile processes which take place in the organization. In practice, this concept is transposed in a new culture [10] with values [11], principles and procedures [12]. The management principles can be found in the TQM and are especially adopted by the organizations which implement the requests specified in the standard 9001 [7].

The standard 9000 sets forward the eight principles regarding:

1. Customer focus
2. Leadership
3. Involvement of people / stakeholders
4. Process approach
5. System approach to management
6. Continual improvement
7. Factual approach to decision making
8. Mutually beneficial supplier relationships

The implementation of the standards has as purpose the management of the management systems, regarding the compliance of these principles in order to create a culture oriented towards the quality of the processes from the system [3]. The requirements expressed by the standards SR EN ISO 9001 [9]; SR EN ISO 14001 [5]; SR OHSAS 18001 [8]; SR EN ISO 27001 [6] etc. are implemented in order to answer two important directions: ensuring satisfaction of clients/interested parties and ensuring compliance with the requirements of the standard. Requirements specified in table 1 reflect the management principles from the analyzed standards.

The management systems are implemented in organizations following the quality assurance cycle: plan, do, check and act. Client orientation and the interested parties involve a strategic approach of all the processes that are part of the system. The evaluation of the functionality of the system can be obtained through monitoring, control and audit [4].

The management of the organization uses the audit as one of the instruments which can help evaluate the status of the audited entities. Audit, as an instrument used by management determines: if the management principles are complied to, if there are established objectives for the process development, if there are performance criteria which establish targets for the development of activities which account as a process, which are the results of the processes and if the results correspond to the pre-established criteria, the level of compliance of the requests to the objectives, etc. The audit has the great advantage that it allows obtaining much more complete information than the administration of questionnaires to determine the status of a system or process.

Table 1. Management principles reflected in the requirements from standards ISO 9001; ISO 14001; ISO 18001and ISO 27001

Crt. no.	Management Principles	ISO 9001	ISO 14001 / OHSAS 18001	ISO 27001
1.	Customer-Focused Organization	5.2; 7.2 (7.2.1; 7.2.2; 7.2.3); 7.3.6; 7.5.2; 7.5.4; 8.2.1	4.3 (4.3.1; 4.3.2); 4.4.3; 4.4.6	5.1;
2.	Leadership	5.1; 5.3; 5.4 (5.4.1; 5.4.2); 5.5 (5.5.1; 5.5.2; 5.5.3); 5.6 (5.6.2; 5.6.3); 6.1; 6.2.2; 6.3; 6.4; 7.3.1; 7.3.4; 7.4.1; 7.5 (7.5.1; 7.5.2; 7.5.3); 8.2 (8.2.3; 8.2.4); 8.3; 8.4; 8.5 (8.5.1; 8.5.2; 8.5.3)	4.2; 4.3.3; 4.4 (4.4.1; 4.4.2; 4.4.3; 4.4.6; 4.4.7); 4.5 (4.5.1; 4.5.2; 4.5.3); 4.6	4.2 (4.2.1; 4.2.2; 4.2.3); 5.1; 5.2.1; 8.1 (8.2; 8.3)
3.	Involvement of People	5.5 (5.5.1; 5.5.3); 6.2.2	4.4 (4.4.1; 4.4.2; 4.4.3)	5.1; 5.2.2
4.	Process Approach	02; 7.1; 7.5.2; 8.2.3; 8.4	4.5.1	02;
5.	System Approach to Management	02; 4.1; 5.1; 5.4.2; 5.5.2; 5.6 (5.6.1; 5.6.2; 5.6.3); 6.1; 7.1; 7.4.2; 8.1; 8.2 (8.2.1; 8.2.2; 8.2.3); 8.4	Introduction; 1; 4.2; 4.3 (4.3.1; 4.3.2); 4.4 (4.4.1; 4.4.2; 4.4.3); 4.6	4.2 (4.2.1; 4.2.2)
6.	Continual Improvement	1.1; 4.1; 5.1; 5.3; 5.6 (5.6.1; 5.6.2; 5.6.3); 6.1; 8.1; 8.4; 8.5.1	4.1; 4.2; 4.3.3; 4.4 (4.4.1; 4.4.2); 4.6	4.2.2; 7.2; 8.1; 8.2; 8.3
7.	Factual Approach to Decision Making	01; 4.1; 5.6.3; 6.2.2; 5.1; 5.3; 5.5 (5.5.1; 5.5.3); 6.3; 6.4; 7.2.3; 7.3.1; 7.4.2	4.4; 4.4 (4.4.1; 4.4.3; 4.4.3; 4.4.6); 4.6;	4.1; 5.2.1; 7.2
8.	Mutually Beneficial Supplier Relationships	02; 5.1; 5.3; 5.5 (5.5.1; 5.5.3); 6.3; 7.2 (7.2.2; 7.2.3); 7.3 (7.3.1; 7.3.3); 7.4.2; 7.5.1; 8.2.1; 8.4	4.2; 4.4; 4.3.1; (4.4.1; 4.4.3; 4.4.6; 4.4.7); 4.5.1	5.1;

2. Methodology

We focused on two regions from Romania: Banat (Timişoara and Reşiţa counties) and North-Moldavia (Suceava and Botoşani counties). In total 34 organizations have been audited from which 19 in the Moldova area and 15 in the Banat area. In each organization all top managers and 82 intermediary managers were audited: 46 in the Moldova area, 36 in the Banat area. The number of management systems implemented in the organizations was different, between one system and up to four systems. Quality management systems (QMS) were implemented in all the organizations. Besides this system the following systems were also implemented: Environmental Management System (EMS); Occupational Health and Safety Management Systems (OHSMS); Information Security Management System (ISMS). The audited management systems were found in the following combinations: QMS + EMS; QMS + EMS + OHSMS; QMS + EMS + OHSMA + ISMS.

Information gathering was achieved by direct interview with each process owner found in the organizational process of the organization. They were addressed questions which had the purpose to obtain answers referring the way in which the management principles are implemented.

3. Results and discussions

The evaluation of the way in which management applies the management principles was achieved by following two directions: the evaluation of the way in which management perceives the level of importance of the management principles and the evaluation of the way in which the management principles have been implemented. The implementation stage of the principles was done by the following considerations of the auditor: met, partially met, and not applied.

The evaluation was done through statistical modeling and it was applied to the results in table 2 in order to see to which degree are there differences between the way the organizations, from the analyzed regions, approach the

management principles. The data from table 2 was adjusted according to the number of participants. The number of managers which answered was taken into consideration and also the number of queries for each principle. The obtained data represent the average of each considered criterion. Each principle was assigned a number of questions which were addressed to the top and executive managers.

Table 2. The resulting data

Region	Management	Criteria	P1	P2	P3	P4	P5	P6	P7	P8
Moldova	Top	M	0,789	0,880	0,833	0,805	0,861	0,900	0,861	0,860
		PM	0,114	0,082	0,105	0,128	0,096	0,074	0,090	0,079
		NM	0,096	0,038	0,061	0,068	0,043	0,026	0,049	0,061
	Executive	M	0,746	0,786	0,594	0,742	0,769	0,815	0,629	0,645
		PM	0,132	0,145	0,264	0,099	0,146	0,061	0,182	0,225
		NM	0,121	0,069	0,141	0,158	0,085	0,124	0,189	0,134
Banat	T	M	0,822	0,926	0,933	0,838	0,873	0,927	0,919	1,056
		PM	0,122	0,041	0,089	0,143	0,079	0,053	0,038	0,122
		NM	0,078	0,033	0,022	0,019	0,048	0,020	0,043	0,078
	E	M	0,343	0,386	0,389	0,349	0,364	0,386	0,383	0,440
		PM	0,051	0,017	0,037	0,060	0,033	0,022	0,016	0,051
		NM	0,032	0,014	0,009	0,008	0,020	0,008	0,018	0,032
No. of questions			12	18	6	7	11	10	14	6

The obtained data were processed according to the multiple discriminator analysis method (). The basic technique of the analysis is to estimate the position of an element towards a line which better separates two different population classes. With the current method, estimations can be made upon the belonging of certain elements to one or multiple categories. Application of the discriminator analysis sought to determine a minimum number of variables that can express the separation of behavior which managers have towards the approach of management principles. The determination of the associated model follows the calculation of the sums, the square sums and the sum of products for the eight characteristics, without taking into consideration the differences between the categories of managers from the two regions. The next step was to determine deviations from their mean values of the square and product sums with the relation (1).

$$\sum_{1}^{12} y_i \cdot y_j = \sum_{1}^{12} X_i \cdot X_j - \frac{\sum_{1}^{12} X_i \cdot \sum_{1}^{12} X_j}{12} \qquad (1)$$

The obtained data was entered in a system with eight equations with eight unknowns in order to determine the value of the coefficients a_i, $i=1...8$ (2).

$$\begin{vmatrix} y_1y_1 & y_2y_1 & y_3y_1 & y_4y_1 & y_5y_1 & y_6y_1 & y_7y_1 & y_8y_1 \\ y_1y_2 & y_2y_2 & y_3y_2 & y_4y_2 & y_5y_2 & y_6y_2 & y_7y_2 & y_8y_2 \\ y_1y_3 & y_2y_3 & y_3y_3 & y_4y_3 & y_5y_3 & y_6y_3 & y_7y_3 & y_8y_3 \\ y_1y_4 & y_2y_4 & y_3y_4 & y_4y_4 & y_5y_4 & y_6y_4 & y_7y_4 & y_8y_4 \\ y_1y_5 & y_2y_5 & y_3y_5 & y_4y_5 & y_5y_5 & y_6y_5 & y_7y_5 & y_8y_5 \\ y_1y_6 & y_2y_6 & y_3y_6 & y_4y_6 & y_5y_6 & y_6y_6 & y_7y_6 & y_8y_6 \\ y_1y_7 & y_2y_7 & y_3y_7 & y_4y_7 & y_5y_7 & y_6y_7 & y_7y_7 & y_8y_7 \\ y_1y_8 & y_2y_8 & y_3y_8 & y_4y_8 & y_5y_8 & y_6y_8 & y_7y_8 & y_8y_8 \end{vmatrix} \times \begin{vmatrix} a_1 \\ a_2 \\ a_3 \\ a_4 \\ a_5 \\ a_6 \\ a_7 \\ a_8 \end{vmatrix} = \begin{vmatrix} z_1 \\ z_2 \\ z_3 \\ z_4 \\ z_5 \\ z_6 \\ z_7 \\ z_8 \end{vmatrix} \qquad (2)$$

The determined coefficients a_i, $i=1...8$ offer information about the relative importance of each management principle as assessed by the two studied groups. In order to determine the importance of one or another characteristic the coefficients of the associated model are compared. The calculated values were adjusted to their score dispersion values, without taking into account the region and type of manager. The values of the coefficients are given in table 3. The coefficient Table 3.

with the largest algebraic value will have the highest degree of importance, in this case $a_2 = 1,397$.

Since the difference between the average score obtained by the managers from Moldova and Banat for a management principle P_i, $i=1...8$, has the smallest value for P8, this attribute has a less important discrimination degree for the analyzed category. The difference between the average given points is 0,037.

Principle no.	P1	P2	P3	P4	P5	P6	P7	P8
Coefficients a_i	1,997	3,83	1,870	2,276	-3,538	-3,781	2,745	-4,540
Standard Deviations σ	0,311	0,3647	0,3269	0,3205	0,3442	0,3739	0,3355	0,3534
Coefficients $a_i \times \sigma$	0,6205	1,397	0,6113	0,7295	-1,218	-1,414	0,921	-1,6042
Importance level	4	1	5	3	6	7	2	8
Average difference	0,092	0,097	0,087	0,097	0,097	0,097	0,097	0,037

4. Conclusions

Discriminator analysis provides us with information on the level of importance which the management principle has. The use of the audit has allowed obtaining results through which it can be established that the leadership principle is the most important. The second principle, as level of importance, is linked to a management feature, Factual Approach to Decision Making. These findings show that managers believe that in order to implement a management system, the most important elements are linked to management. A surprising element is the location on the second smallest spot of the principle referring to Continual Improvement. This is a sign of weakness of the management system which can be explained by a lack of understanding of the benefits arising from reducing the risk of non-conformities.

5. References

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