ORGANIZATION RESPONSABILITY TO CONSUMERS' SATISFACTION RELATED TO THE SUPPLIED SERVICES

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ABSTRACT: Customer satisfaction represents a modern approach for quality in enterprises and organizations and serves the development of a truly customer-focused management and culture. The purpose of this research is in finding out consumers opinions about changes within organization and how can help to adapt to changes in the economic environment in Romania. Research results follow: determining feedbak consumer regarding the services provided by organization; configuration of the managerial strategy; collecting the views of consumers on quality. Customer satisfaction measures offer a meaningful and objective feedback about client's preferences and expectations. The research method used in this case will be an original methodological approach of customer satisfaction evaluation, using multi criteria satisfaction analysis.

Keywords: Customer Satisfaction Measurement, Multi criteria Analysis, organization, implementation, of a marketing research

JEL Codes: L15, L92

Introduction

Today's managerial methods and instrument overbuild tomorrw's business environment. Whether it involves changing the economic approaches or the nature of work and organizations' values or transformation of our lives, today, more than ever before, there are pressing needs for direction, application and, as well, information. This work paper issues a business philosophy based on quality matters as its goal ist o deliver on a approach related to strategy effectiveness within this changing Romania economic environment. The quality yields an effective strategy if managers act considering a few key management contents that may provide worthiness and optimum results through long term. These management means are referring to: overall ranking – by gathering results from customer surveys and ranking the company's products and services. This work paper provides a few more steps toward improvement: by identify what steps the company can take to improve specific functions in order to align the organization to its role (goals). The most important step is to empower each employee to help the company reaching the goals set aut by the executive management team therefore, the management has to create awareness (by letting employee know the direction the company is taking, why, and how they can help make it a reality) and has to define objectives (show employees how their teams fit into the organization's strategy, and outline each team's contribution to startegic objectives). By considering the quality standards according to clients' expectation and profitability coordinates, it is described an applied a method that makes strategy a continuous process.

The research on consumer satisfaction is one of the fastest growing segments in marketing. The marketing and management services are currently focusing on coordinating all the activities of

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the organization, in order to obtain goods and services that can best meet the specific needs of current and potential clients (Matsatsinis et al. 2001).

In order to strongly re-enter and strengthen the orientation towards the customer on a permanent basis, a growing number of companies choose their customer satisfaction as the main indicator of their performance. The present methodology was applied to the results of a customer satisfaction marketing research of a company.

The MUSA (Multicriteria Satisfaction Analysis) system is a customer-based tool for service/product quality evaluation. The system analyzes customer satisfaction using survey-based data, while the analysis of collected information is based on an original preference disaggregation methodology. The MUSA methodology follows the principles of multicriteria analysis using mainly ordinal regression techniques. The provided results are mainly focused on the determination of the critical service dimensions in order to prioritize improvement actions. Furthermore, these results are sufficient enough to analyze customers' needs and expectations and to aid service quality decision process. The main advantage of the MUSA method is that it fully considers the qualitative form of customers' judgments and preferences. The development of a set of quantitative indices and perceptual maps makes possible the provision of an effective support for the satisfaction evaluation problem.

The papers of Grigoroudis and Siskos (2000, 2001, 2002) presents an overview of the information systems that may be used in the customer satisfaction evaluation problem, focusing in the presentation of the MUSA (Multictiteria Satisfaction Analysis) system in some private sectors (a mobile phone company and an airline company or a fast food company) or public sectors (department of an university) and Loukeris (2009) presents MUSA in the shipping enterprises. All the above analysis came from the Greek market. Measuring satisfaction can also be considered as an internal service quality evaluation process for a university department (Siskos et al. 2001). This application refers to a public and business administration department. Although it is focused on students' satisfaction, department's global evaluation should be oriented to all academic personnel (professors, administrative personnel, etc), as well as to external evaluators (business organizations, community, etc). Segmentation satisfaction analysis is performed through the implementation of the MUSA method in each student's cluster separately.

For this reason, the fitting and the stability level of the results may vary causing a problem of "inconsistency" when trying to compare global with segmentation analysis results. In this particular application, the problem mainly concerns the average satisfaction indices due to the high error level in the global satisfaction.

During the implementation process of the MUSA method, a preliminary stage for searching such inconsistencies should be applied. If the problem appears in a small portion of customers, the particular data should be removed, while in the opposite case the defined satisfaction criteria set should be reconsidered. Another problem that may appear concerns the existence of distinguished customer groups with different preference value systems (value functions, criteria weights, etc.). This problem can be noticed by the high variance of the variables during the post-optimality analysis and is due to the collective nature of the MUSA method. The segmentation of the total set of customers into smaller groups according to particular characteristics (age, sex) is the most reliable solution to the previous problem (Grigoroudis and Siskos 2001).

The preference disaggregation methodology is an ordinal regression based approach (Lagrèze and Siskos 1982; Siskos et al. 1998; Siskos and Yannacopoulos 1985) in the field of multicriteria analysis. It is used for the assessment of a set of marginal satisfaction functions in such a way that the global satisfaction criterion becomes as consistent as possible to customers' judgments. According to the model, each customer is asked to express his/her judgments, namely his/her global satisfaction and his/her satisfaction with regard to the set of discrete criteria.

The MUSA system is a survey-based software, which is able to provide complete and effective results to the user, through the evaluation of concrete and understandable indices of

customer satisfaction. The required information is collected via a simple questionnaire in which the customers evaluate provided service, i.e. they are asked to express their judgments, namely their global satisfaction and their satisfaction with regard to the set of discrete criteria. A predefined ordinal satisfaction scale is used for these customers' judgments. The main advantage is that MUSA fully respects the qualitative form of customers' judgments and preferences. Other important features of the proposed software include simplicity, friendliness, and effectiveness. As described in the previous section, a customer satisfaction problem may be easily constructed, solved, and analyzed using MUSA. Furthermore, obtained results are sufficient to give a clear understanding, and analyze in depth customer satisfaction. It should be emphasized that the MUSA system is more than decision aid software because it serves for the development of a truly customer-focused management and culture.

Customer satisfaction represents a modern approach for quality in enterprises and organizations and serves the development of a truly customer-focused management and culture. Customer satisfaction measures offer a meaningful and objective feedback about client's preferences and expectations. In this way, customer satisfaction is a baseline standard of performance and a possible standard of excellence for any business organization (Gerson 1993). To reinforce customer orientation on a day-to-day basis, a growing number of companies choose customer satisfaction as their main performance indicator. However, it is almost impossible to keep an entire company permanently motivated by a notion as abstract and intangible as customer satisfaction. Therefore, customer satisfaction must be translated into a number of measurable parameters directly linked to people's job-in other words factors that people can understand and influence (Deschamps and Nayak 1995).

Several applications of the method in original customer satisfaction surveys can be found in Mihelis et al. (2001), and Siskos et al. (2001). Also, the MUSA method may be used in a similar way to measure and analyze employee satisfaction (Grigoroudis et al. 1999b). Furthermore, analyzing clients' preferences and expectations is the basic step to evaluate customer loyalty.

The installation of a permanent customer satisfaction barometer is considered necessary, given that it allows the establishment of a benchmarking system (Edosomwan 1993). Thus, the implementation of the MUSA method through a period of time can serve the concept of continuous improvement.

The MUSA method avoids the arbitrary quantification of the collected information, because, as emphasized in the paper, the coding of the qualitative scale is a result, not an input to the proposed methodology. This does not occur in a simple linear regression analysis. Other advantages of the method include the following (Grigoroudis and Siskos 2001):

1. The post-optimality analysis stage gives the ability to achieve a sufficient stability level concerning the provided results, while the linear programming formulation offers a flexible model development.
2. The provided results are focused not only on the descriptive analysis of customer satisfaction data but they are also able to assess an integrated benchmarking system.
3. A significant effort has been devoted in order for all the provided results to be easily and directly understood.

The implementation of the MUSA method requires completely and correctly answered questionnaires as input data, which cannot always be achieved. Missing data analysis and data mining techniques may be used to overcome this problem by filling in the empty cells in the data table (Matsatsinis, *et al*. 2001). Other possible extensions of the method include:

- The development of an extended MUSA method in a customer satisfaction survey for a set of competitive companies, given that the currently presented version is focused on the satisfaction evaluation problem for a single business organization.

- The assessment of a "critical" satisfaction level that can relate customer satisfaction level and repurchase probability. Hill (1996) notes several research efforts for the determination of a

customer tolerance band. Furthermore, combining MUSA method with several brand choice models, the segmentation of the total set of customers into smaller groups with different loyalty levels can be achieved. A pilot survey in the context of multicriteria analysis is proposed by Grigoroudis, *et al*. (1999).

Grigoroudis and Siskos (2001) propose several extensions and future research regarding the MUSA method. Among others, the comparative analysis between the results of the MUSA method and the financial indices (market share, profit, etc) of a business organization can help the development of business strategies and the evaluation of the cost of quality. It should be mentioned that, although customer satisfaction is a necessary but not a sufficient condition for the financial viability, several researches have shown that there is a significant correlation among satisfaction level, customer loyalty, and profitability (Dutka 1995; Naumann and Giel 1995).

Section 2 presents the MUSA model for measuring the consumers' satisfaction, section 3 is an application of this model for a large Romanian firm of auto sales and service and section 4 concludes the paper.

Customer satisfaction analysis model

The MUSA model (Multi Criteria Satisfaction Analysis), for measuring customer satisfaction, provides indicators of the attributes with the highest and lowest performance, emphasizing the development opportunities and weaknesses of the company. The main objective of the MUSA methodology is to aggregate the individual judgments into a collective value function by formulating a linear programming problem. The overall customer satisfaction depends on a lot of criteria related to the characteristics of the product or service. Each client expresses his/her overall satisfaction or regard to many discrete criteria. The MUSA method estimates the global and partial satisfaction functions Y* and Xi*, based on the opinions of the customers Y and Xi. The analyzed regression equation is: $Y^* = \sum_{i=1}^{n} b_i X_i^*$, $\sum_{i=1}^{n} b_i = 1$ (1)

where: Y – overall customer satisfaction, α - number of overall satisfaction levels; y^m - level m of overall satisfaction; n - number of criteria; Xi - customer satisfaction with respect to i criterion; αi – number of satisfaction levels for i criterion; x_i^k level k of satisfaction of i criterion; Y* - function value of Y; y^{*m} – the value of the overall satisfaction level of y^m; X_i^* function value of Xi; x_i^{*k} the value of the satisfaction level. The normalization conditions are: $y^{*1}=0$ $y^{*\alpha}=100$, $x_i^{*1}=0$ $x_i^{*\alpha i}=100$. Due to the ordinal values of Y and Xi, the following preference relations are assumed:

$$y^{*m} \le y^{*m+1} \Leftrightarrow y^m \prec y^{m+1},\ x_i^{*k} \le x_i^{*k+1} \Leftrightarrow x_i^k \prec x_i^{k+1} \quad (2)$$

where „$\prec$" means „less preferred or indifferent", and m has values ranging from 1 to α-1 and k from 1 to α_i-1.

The MUSA method estimates a collective satisfaction function Y* and a lot of partial satisfaction functions X_i^* based on the preferences expressed by clients. The main objective of the method is to obtain a maximum consistency between the function value Y* and the preferences expressed by clients. If 'Y* is an estimate of the value function Y* and a double error variable is inserted (σ+ the overestimation of the error and σ – the underestimation of the error), the ordinal regression equation becomes: $'Y^* = \sum_{i=1}^{n} b_i X_i^* - \sigma^+ + \sigma^-$ (3)

the equation is valid for the customers who have expressed a lot of opinions on satisfaction. For this reason, a lot of error variables will be assigned to each client separately.

The previous linear programming problem size can be reduced by removing the monotony restrictions. This is achieved by introducing a set of transformation variables which represent the successive transformations of the value functions Y* and X_i^*:

$$z_m = y^{*m+1} - y^{*m} \text{ for m = 1,… α-1; } w_{ik} = b_i x_i^{*k+1} - b_i x_i^{*k} \text{ for k = 1,… } \alpha_i\text{-1; i = 1,… n} \quad (4)$$

By using these variables the non-linear model turns into (where Y* and bi need to be estimated) the linear model:

$$\min(F)=\sum_{j=1}^{M}(\sigma_j^+\sigma_j^-),\ \sum_{i=1}^{n}\sum_{k=1}^{t_{ij}-1}w_{ik}-\sum_{m=1}^{t_j-1}z_m-\sigma_j^++\sigma_j^-=0\ ;\ \sum_{m=1}^{\alpha-1}z_m=100,\ \sum_{i=1}^{n}\sum_{k=1}^{\alpha_i-1}w_{ik}=100 \quad (5)$$

$z_m\geq 0,\ w_{ik}\geq 0,\ \sigma_j^+\geq 0,\ \sigma_j^-\geq 0$ where: M is the number of clients; tj and tji represent the opinions expressed by the customer j in relation to global and partial satisfaction. By solving the model, we get a set of optimal solutions or an asymptotically optimal solution. In order to define the optimal solution we determine the polygon $\{F\leq F^*(1+\varepsilon)\}$, with $\varepsilon\to 0$. In this polygon n objective functions are maximized for the weights of the criteria: $\max(F')=\sum_{k=1}^{\alpha_i-1}w_{ik}$; the average of the optimal solutions given by the n linear programming problems can be considered a solution.

The estimated value functions show the level of partial or global satisfaction expressed by customers, on a scale from 1 to 100. The value functions are utility functions. They are monotonic, increasing and discrete (linear range). The function form indicates the degree of customer demand.

The value function has a linear form, the more the customers express their level of satisfaction, the higher is the percentage of the fulfillment of expectations (Fig. 1).

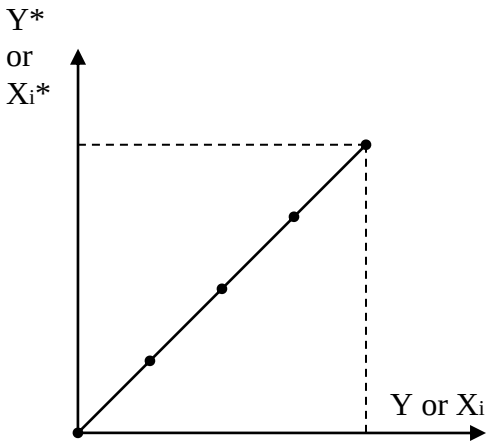

Figure no. 1 - Neutral customers

The value function is convex, customers do not express their satisfaction until they receive the highest level of quality (Fig. 2).

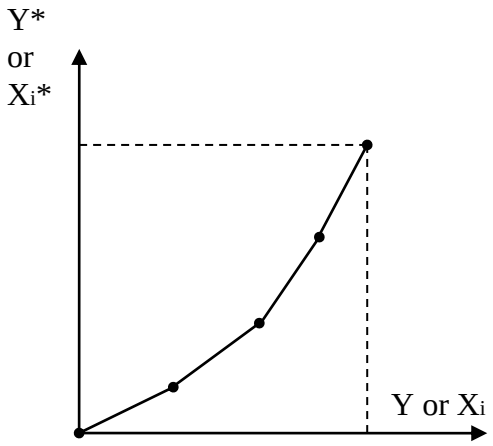

Figure no. 2 - Customers who demand high quality

The value function is concave; customers express their satisfaction, although only a small part of their expectations is fulfilled (Fig. 3).

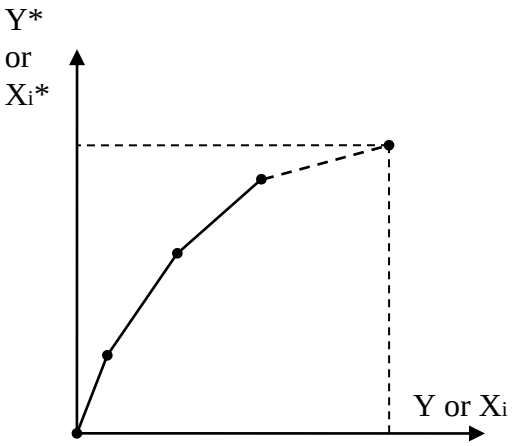

Figure no. 3 - Customers who do not demand high quality

The average satisfaction indices represent the customer satisfaction level in relation to each and all criteria. They are the weighted averages of the levels of satisfaction, and they are included in the range of [0,100%]:

$$S = \frac{1}{100}\sum_{m=1}^{\alpha} p^m y^{*m}\ ,\ S_i = \frac{1}{100}\sum_{m=1}^{\alpha_i} p_i^k x_i^{*k} \tag{6}$$

where p^m and p_i^k represent the frequencies of customers with the level of satisfaction y^m and x_i^k.

The average indices of demand represent a quantitative measure of the quality demanded by the customers:

$$D = \frac{\sum_{m=1}^{\alpha-1}\left(\frac{100(m-1)}{\alpha-1} - y^{*m}\right)}{100\sum_{m=1}^{\alpha-1}\frac{m-1}{\alpha-1}} \text{ for } \alpha>2;\ D = \frac{\sum_{k=1}^{\alpha_i-1}\left[\frac{100(m-1)}{\alpha_i-1} - x_i^{*k}\right]}{100\sum_{k=1}^{\alpha_i-1}\frac{k-1}{\alpha_i-1}} \text{ for } \alpha_i>2,\ i=1,\ldots n \tag{7}$$

These indices belong to the interval [-1,1] and represent the average deviation of the curves estimated from the linear function:
- if D = 1 and Di = 1, it is recorded the highest level of quality demand from customers;
- if D = 0 and Di = 0, the customers are neutral to quality;
- if D = 1 or Di = -1, it is recorded the lowest level of quality demand from customers.

Average improvement indices represent the limits of the increase of the performance of a specific attribute and take into account the weighting criteria in the overall assessment and satisfaction provided by each of them: $I_i=b_i(1-S_i)$, i=1,...,n. These indices belong to the interval [0,1] and: $I_i=1 \Leftrightarrow b_i=1$ *and* $S_i=0$; $I_i=0 \Leftrightarrow b_i=0$ *and* $S_i=1$

Based on the estimated weight, on the average indices of satisfaction, on the average indices of demand and average improvement indices, a series of charts can be drawn, in order to determine the weaknesses and strengths of customer satisfaction and to define the required improvement efforts. First, by correlating the importance of these criteria with their noticed performance, a chart is created for the classification of the actions that may be taken:

- Quadrant I - high performance / high importance: the characteristics of this quadrant can be used as an advantage over competitors;
- Quadrant II - low performance / high importance: the features in this quadrant require special attention;
- Quadrant III - low performance / low importance: the features in this quadrant require no intervention;
- Quadrant IV - high performance / low importance: the company resources can be better used in other areas.

In quadrants II and I the dimensions are indeed important to the customer. These are the characteristics of a product or of a service on which the management and production must focus their attention. The number one priority of the company is to increase the performance of the attributes from quadrant II, because they are very important to the customer and they are not sufficiently improved.

In quadrants I and IV there are the important dimensions for the customer according to his/her statements. The marketing department should focus its attention on them. The second priority of the company is to use the attributes in quadrant I, as an advantage over competitors by designing campaigns that focus on advertising, on product presentation and on the advantages of using it etc.

The third priority of the company is the characteristics of quadrant III, which may become important for the client in the future. In this case, on must increase their performance.
(Fig.4) shows towards which directions one needs to take action, but it does not show the results of the improvement efforts. To this end, the effect is correlated with effort, that is, the average improvement demand of customers with the average improvement indices, the result being the improvement chart. The number one priority of the company is represented by the attributes from quadrant II, as performance enhancement effort is small compared to the effect produced by these improvements. Further, the company must deal with attributes in quadrants I and III, because the rapport effort / effect is constant.

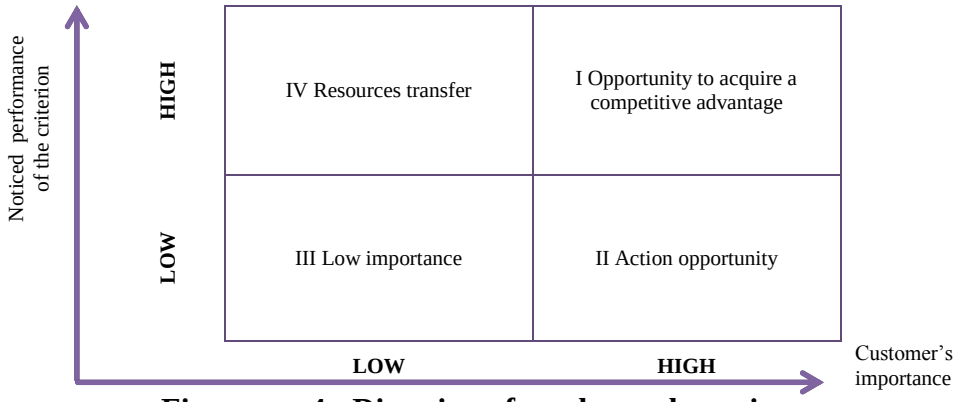

Figure no. 4 - Direction of needs to take action

On the attributes in quadrant IV, the company does not have to operate, because the effort is greater compared with the effects obtained (Fig. 5).

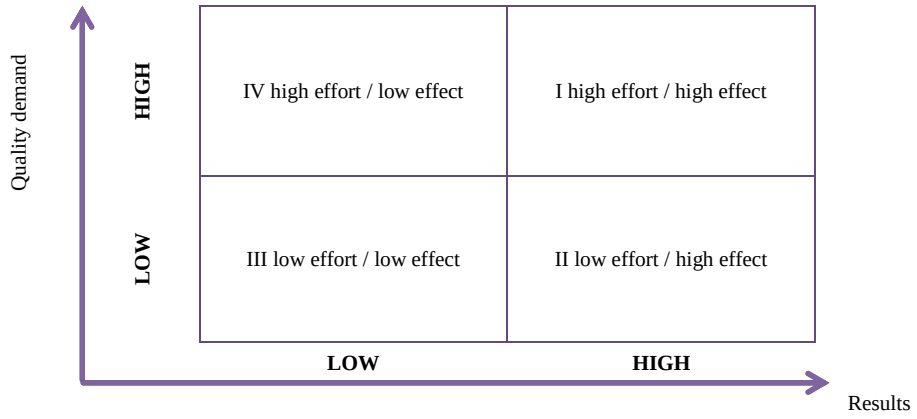

Figure no. 5 - Improvement chart

Marketing research on customer satisfaction regarding the services provided by AMAT S.A.

The development of the business opportunities and the managerial strategies designed and applied by the largest Romanian firms will determine the domestic economic environment. The study conducted at AMAT firm presents the configuration of the managerial strategy right in the context of the changing in the Romanian economic features, starting from a key element for success: quality. The organization uses some exit elements of the analysis for improving the Quality Management System and includes marketing strategies and initiatives for consumers' satisfaction. The firm activates in the commercial area (auto sales and service) and the development of the AMAT processes was based on a very well settled strategy that identified the needs and the real expectations of all their clients, its mission being to orientate toward clients by measuring their satisfaction level and the processes regarding its relation with clients and their satisfaction.

Overall satisfaction is based on three major criteria: the offered product, the purchasing process and additional services. In addition, other determined criteria can be added for the overall customer satisfaction, but this example is used only to illustrate the implementation of the MUSA method. Both for overall and partial satisfaction, in relation to the three established criteria, an ordinal scale with three levels is used: 1. Not satisfied, 2. Satisfied 3. Very satisfied, there are 20 clients included in the survey, and their answers are presented in the table 1 (Table 1).

Table no.1

Clients included in the survey

Customer	**Overall satisfaction**	**Product**	**Purchasing process**	**Additional services**
Repondent 1	Satisfied	Very satisfied	Satisfied	Not satisfied
Repondent 2	Not satisfied	Not satisfied	Not satisfied	Not satisfied
Repondent 3	Very satisfied	Very satisfied	Very satisfied	Very satisfied
Repondent 4	Satisfied	Very satisfied	Not satisfied	Satisfied
Repondent 5	Not satisfied	Not satisfied	Not satisfied	Not satisfied
Repondent 6	Very satisfied	Very satisfied	Very satisfied	Very satisfied
Repondent 7	Satisfied	Very satisfied	Not satisfied	Very satisfied
Repondent 8	Satisfied	Very satisfied	Not satisfied	Very satisfied
Repondent 9	Satisfied	Satisfied	Satisfied	Satisfied
Repondent 10	Not satisfied	Not satisfied	Not satisfied	Not satisfied
Repondent 11	Satisfied	Satisfied	Very satisfied	Not satisfied
Repondent 12	Not satisfied	Not satisfied	Not satisfied	Not satisfied
Repondent 13	Very satisfied	Very satisfied	Very satisfied	Very satisfied
Repondent 14	Satisfied	Satisfied	Very satisfied	Not satisfied
Repondent 15	Not satisfied	Not satisfied	Not satisfied	Not satisfied
Repondent 16	Very satisfied	Very satisfied	Very satisfied	Satisfied
Repondent 17	Very satisfied	Very satisfied	Very satisfied	Very satisfied
Repondent 18	Very satisfied	Very satisfied	Very satisfied	Satisfied
Repondent 19	Satisfied	Satisfied	Satisfied	Satisfied
Repondent 20	Not satisfied	Satisfied	Not satisfied	Not satisfied

In the first stage, the problem of linear programming must be established and solved, in which M=20 and $\alpha=\alpha_1=\alpha_2=\alpha_3=3$. Therefore, the linear programming problem will be:

$$\min(F)=\sum_{j=1}^{20}(\sigma_j^+ + \sigma_j^-);\ w_{11}+w_{12}+w_{21}-z_1-\sigma_1^+ + \sigma_1^- = 0$$

$$-\sigma_2^+ + \sigma_2^- = 0;\ w_{11}+w_{12}+w_{21}+w_{22}+w_{31}+w_{32}-z_1-z_2-\sigma_3^+ + \sigma_3^- = 0$$

$$w_{11}+w_{12}+w_{31}-z_1-\sigma_4^+ + \sigma_4^- = 0;\ -\sigma_5^+ + \sigma_5^- = 0;$$

$$w_{11}+w_{12}+w_{21}+w_{22}+w_{31}+w_{32}-z_1-z_2-\sigma_6^+ + \sigma_6^- = 0$$

$$w_{11}+w_{12}+w_{31}+w_{32}-z_1-\sigma_7^+ + \sigma_7^- = 0;\ w_{11}+w_{12}+w_{31}+w_{32}-z_1-\sigma_8^+ + \sigma_8^- = 0$$

$$w_{11}+w_{21}+w_{31}-z_1-\sigma_9^+ + \sigma_9^- = 0;\ -\sigma_{10}^+ + \sigma_{10}^- = 0;\ w_{11}+w_{21}+w_{22}-z_1-\sigma_{11}^+ + \sigma_{11}^- = 0$$

$$-\sigma_{12}^+ + \sigma_{12}^- = 0;$$

$$w_{11}+w_{12}+w_{21}+w_{22}+w_{31}+w_{32}-z_1-z_2-\sigma_{13}^+ + \sigma_{13}^- = 0;\ w_{11}+w_{21}+w_{22}-z_1-\sigma_{14}^+ + \sigma_{14}^- = 0$$

$-\sigma_{15}^{+}+\sigma_{15}^{-}=0;\ w_{11}+w_{12}+w_{21}+w_{22}+w_{31}-z_1-z_2-\sigma_{16}^{+}+\sigma_{16}^{-}=0$

$w_{11}+w_{12}+w_{21}+w_{22}+w_{31}+w_{32}-z_1-z_2-\sigma_{17}^{+}+\sigma_{17}^{-}=0;$

$w_{11}+w_{12}+w_{21}+w_{22}+w_{31}-z_1-z_2-\sigma_{18}^{+}+\sigma_{18}^{-}=0$

$w_{11}+w_{21}+w_{31}-z_1-\sigma_{19}^{+}+\sigma_{19}^{-}=0;\ w_{11}-\sigma_{20}^{+}+\sigma_{20}^{-}=0$

$z_1+z_2=100,\ w_{11}+w_{12}+w_{21}+w_{22}+w_{31}+w_{32}=100;\ z_m\geq 0,\ w_{ik}\geq 0,\ \sigma_j^{+}\geq 0,\ \sigma_j^{-}\geq 0$

This problem has several optimal solutions the minimum of the objective function is zero. An optimal solution to this problem is w_{11}=0; w_{12}=25; w_{21}=25; w_{22}=25; w_{31}=25; w_{32}=0; z_1=50; z_2=50; F*=0.

In the second stage, a post optimality analysis will be performed, by solving three linear programming problems to maximize the weights in the polygon determined by the constraints of the problem, and also, the amount of errors must to be smaller or equal to the objective function value plus a percentage of it. Therefore, the problems will be solved: $\max(b_1)=w_{ii}+w_{ii+1}$. The optimal solutions obtained by solving these three problems are presented in (Table 2).

Table no. 2

The optimal solutions

	w11	w12	w21	w22	w31	w32	z1	z2
(P1)	10	22.5	22.5	22.5	22.5	0	55	45
(P2)	0	23.75	23.75	28.75	23.75	0	47.5	52.5
(P3)	0	20	20	30	30	0	50	50
Avg.	3.3333	22.0833	22.083	27.083	25.416	0	50.83	49.16

b_1=3,333+22,083≈25,42
b_2=22,083+27,083≈49,16
b_3=25,423+0,00≈25,42
$b_1+b_2+b_3$=100

Further, the value functions are represented in the chart and the outcome of the analysis of these charts is the following:

The overall satisfaction (Fig. 6.) and purchasing process (Fig. 7.) are neutral for customers: the higher is the performance level, the more they express a higher degree of satisfaction.

Figure no. 6 - Overall satisfaction

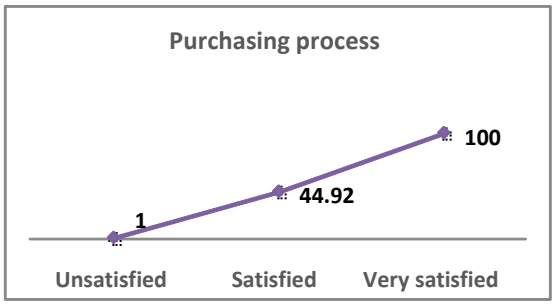

Figure no. 7 - Purchasing process

The product issues (Fig. 8.) are the most important to customers: they only express their satisfaction if the performance level is very high.

Figure no. 8 - Product

The issues related to the additional services (Fig. 9.) are not very important to customers: they express their satisfaction even if the performances are achieved only to a limited extent.

Figure no. 9 - Additional services

The average satisfaction indices are:

$$S = \frac{1}{100}\sum_{m=1}^{\alpha} p^m y^{*m} = \frac{\frac{6}{20} + 50{,}83\frac{8}{20} + 100\frac{6}{20}}{100} = 0{,}50332$$

$$S_1 = \frac{1}{100}\sum_{m=1}^{3} p_1^k x_1^{*k} = \frac{\frac{5}{20} + 13{,}11\frac{5}{20} + 100\frac{10}{20}}{100} = 0{,}53277$$

$$S_2 = \frac{1}{100}\sum_{m=1}^{3} p_2^k x_2^{*k} = \frac{\frac{9}{20} + 44{,}92\frac{3}{20} + 100\frac{8}{20}}{100} = 0{,}46738,$$

$$S_3 = \frac{1}{100}\sum_{m=1}^{3} p_3^k x_3^{*k} = \frac{\frac{9}{20} + 100\frac{5}{20} + 100\frac{6}{20}}{100} = 0{,}55$$

It is noticed that a very low level of customer satisfaction is recorded, noting an average overall satisfaction of 50.33%. This thing is justified by the recorded statistical frequencies, 30% of the customers were overall satisfied. If one analyzes the weights of the criteria, it appears that the largest share in the overall satisfaction is represented by the purchasing process that also records the lowest satisfaction index. So basically, in order to improve the purchasing process, one should know, to a significant extent, the effect of the increasing overall satisfaction. The same conclusion can be drawn from the chart action (Fig. 10.). The "purchasing process" criterion is noticed to be in quadrant II, and therefore it is the number one intervention management priority. Since the "additional services" and "product" criteria are in the quadrant IV, it means that the achieved performance level is very high and the resources allocated to increasing the performance of these attributes can be transferred to other areas.

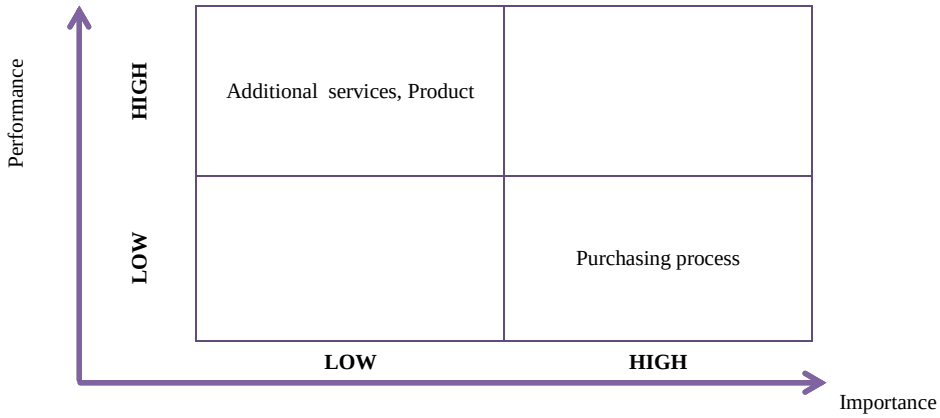

Figure no. 10 - Action chart

In order to study the influence of the achieved effects in relation to the efforts made, the improvement chart is drawn, based on the average indicators of demand and on the average improvement indices.

The average indices of demand are:

$$D = \frac{\sum_{m=1}^{\alpha-1}\left[\frac{100(m-1)}{\alpha-1} - y^{*m}\right]}{100\sum_{m=1}^{\alpha-1}\frac{m-1}{\alpha-1}} = \frac{\frac{100}{2} - 50{,}83}{100\frac{1}{2}} = -0{,}0166,$$

$$D_1 = \frac{\sum_{k=1}^{\alpha_1-1}\left[\frac{100(m-1)}{\alpha_1-1} - x_1^{*k}\right]}{100\sum_{k=1}^{\alpha_1-1}\frac{k-1}{\alpha_1-1}} = \frac{\frac{100}{2} - 13{,}11}{\frac{100}{2}} = 0{,}7378$$

$$D_2 = \frac{\sum_{k=1}^{\alpha_2 - 1}[\frac{100(m-1)}{\alpha_2 - 1} - x_1^{*k}]}{100\sum_{k=1}^{\alpha_2 - 1}\frac{k-1}{\alpha_2 - 1}} = \frac{\frac{100}{2} - 44{,}92}{\frac{100}{2}} = 0{,}1016\,,\ D_3 = \frac{\sum_{k=1}^{\alpha_3 - 1}[\frac{100(m-1)}{\alpha_3 - 1} - x_1^{*k}]}{100\sum_{k=1}^{\alpha_3 - 1}\frac{k-1}{\alpha_3 - 1}} = \frac{\frac{100}{2} - 100}{\frac{100}{2}} = -1$$

The average improvement indices are: $I_1=b_1(1-S_1)=0{,}2542(1-0{,}5328)=0{,}1188$, $I_2=b_2(1-S_2)=0{,}4916(1-0{,}4674)=0{,}2618$, $I_1=b_1(1-S_1)=0{,}2542(1-0{,}55)=0{,}1144$

In (Fig.11) "additional services" criterion is placed in quadrant III, so it can be improved, because even if its effects are not very important, the effort made to improve performance is small, and it can become beneficial in the future. The "product" and "production process" criteria are placed in quadrant IV, so the effort made in order to achieve an improvement is great, but its effects are small.

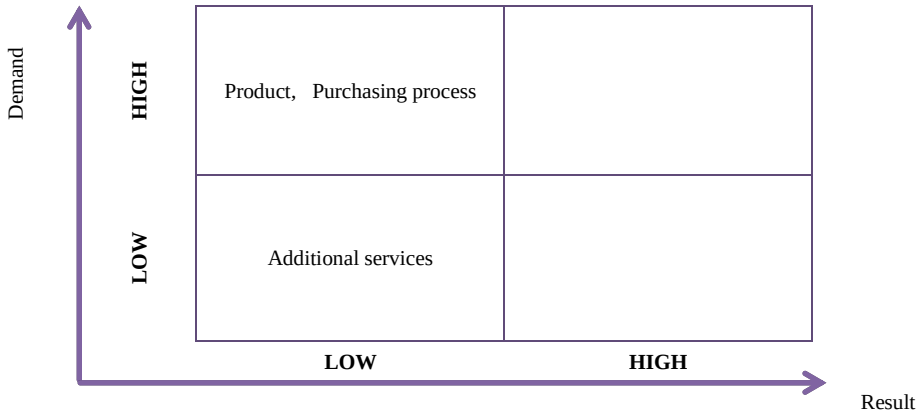

Figure no. 11 - Improvement chart–absolute values

In general, since the effects obtained by increasing the performance of a criterion are interesting, compared with the effects of other criteria, the average relative improvement indices are represented, instead of the absolute ones. In (Fig.12), the "purchasing process" is placed in quadrant I, so, even though the effort made is high, the obtained effects are also high, so the company has to invest in the growth of the performance of this criterion.

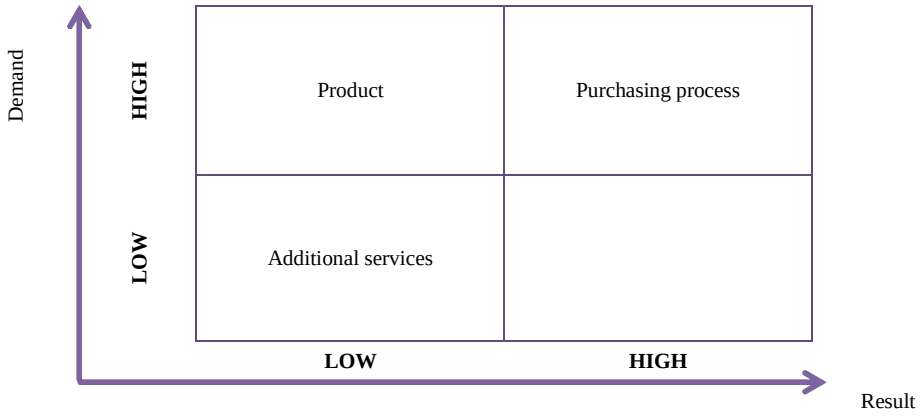

Figure no. 12 - Improvement chart–relative values

Conclusions

The proposed MUSA method is based on the principles of multicriteria analysis, and particularly on aggregation-disaggregation approach and linear programming model. The implementation of the method in customer satisfaction surveys is able to evaluate quantitative global and partial satisfaction levels and to determine the strong and the weak points of a business organization. In conclusion, the maximum weight in global satisfaction includes the "purchasing process" criterion. For this attribute the lowest satisfaction index is recorded. For this reason and because the growth effects of the performance of this attribute are great, the company will have to strive towards improving the purchasing process. Also, the company can invest in increasing the performance of the additional services, because the effort made is small, and in the future, substantial benefits can be obtained. Although the product is very important in expressing customer satisfaction, they express their discontentment only when the product's level of performance is maxim and one does not have to invest in improving it. The product's performance is high and the effort made for development is very high compared to the results obtained.

- the organization needs to be aware of the responsibilities or needs to form an organizational culture that creates a competitive mood and therefore, value
- a system that assesses the performance, first of the staff, as long as the performance criteria change.

Following the conclusion we reached, our requirements for implementing are:

Product policy:

- provide a product that meets the basic needs;
- offering products by avoiding extreme market niche;
- offering innovative products that meet the expectations of new requests made.

Organization of production:

- commodity quality assurance and maintaining it throughout the production;
- standardization and streamlining production;
- design and construction of highly reactive organization to the external environment and wave propagation marketing messages in line with the most effective decisions;
- generalization capabilities of innovation based on market message;
- avoid large variations in the production.

Human resources policy:

- rewarding competence and flexibility;
- incitement to achieve competitive labor time;
- valuing professionalism and work well done;
- providing a career;
- capitalization of innovation, experience and power to react.

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