

THE PREDICTION OF MANAGING CHANGE IN THE CONTEMPORARY ECONOMY BY USING SIMULATION AND MATHEMATICAL MODELING

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Abstract. *The main aim of this study is to contribute to the understanding of the organizational change and the effect of the human factor within the management of change in the context of an industry. This article is designed to be a qualitative study in which the quantitative and qualitative data are collected and properly analysed in parallel, the qualitative ones having a greater importance, which means operating with the paradigm change (C), motivation (M) and performance (P). For this phase of the research we have used an improbable (non-random) sampling technique, ie proportional quota sampling followed by a measurement of each item from the established hypotheses, by subdividing components and classifying variables after the causality criterion. Addressing this topic of research started from the idea that any organization, therefore the bank as well, is a social construct that has to be based on strategies defined as „finalization, creation preparation, and management of a human collective action of economic type in a conflictual environment”. The design of the contingent Model of change is due to the limits of the model of Organizational Development (OD) and the prescriptive and planned vision of the unidirectional growth and a stable environment. The main aim of this article is to deepen and discover a reality which is more or less known at the level of common sense. The analysis carried out (The CMP paradigm) may be implemented in the banking system, an open system, in order to regulate the activity of self-regulation.*

Keywords: *management of change, the CMP paradigm, resistance to change, mathematical modeling, ANOVA.*

1. INTRODUCTION

In a world of rapid expansion, the change is inevitable and omnipresent. This landscape of numerous external forces makes the existence and survival of prosperity to be extremely difficult. Indeed, the major problem the businesses face today is represented by the efficient management of the initiatives of strategic change and, according to Ulrich [31], a fundamental difference between the successful organizations and those that fail is given by their ability of keeping up with the change. In other words to be put, the organizations have to monitor and study the external environments, to anticipate and to quickly adapt to a

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continuous change. An important statement of Pettigrew, Woodman and Cameron [28] is that the organizations have a problem of anticipation and adaptation to what happens in their environment of existence and functionality. This inability to recognize the changes in the business environment could be a factor that determines the lack of performance in the field of competitiveness. In order to succeed the organizations have to ensure a systemic approach of change. In this respect, they will have to simultaneously manage all the challenges of the change. The causing of these changes, at organizational level, increased the importance of managing change, and especially, managing the experience of change of personnel. This thing is due to the fact that major changes have an impact on all the members of the organization as they can create new dimensions of uncertainty.

Globalisation has as effect the change of economy and the markets where the organisations operate. The development of online business sector changes the way of distribution and achieving work by using information and communication technology (ICT). Managerial innovation becomes more important than a form of answer to competition and trends of information technology [4].

Many articles and books were written about the way management of change is approached. However, the organizational change is far from being understood in terms of dynamics and effects in time, of the processes that occur, of discontinuity and context. The technical change in the industry of services represents an area poorly represented in the literature of speciality, despite the importance that innovation and employment have. The empirical studies, that try to demonstrate the connection between change and organizational performance, are very rare. This lack is partly due to the difficulty of producing real evidence; to these categories of factors it can be added the socio-cultural factors such as demographic factors, polarisation of contemporary society, the system of values, shared traditions, politico-legislative, factors such as political instability, government intervention in economy (attempt of nationalization of some companies, attitude towards entrepreneurship, economic legislation), ecological factors (climate change, the mutual negative consequences of the relationships between ecosystems and the components of society as system of implementation).

The management of change underlines the issue of managing change, managing change being itself a phrase that has at least two meanings [26]. The first one refers to adopting changes in a structural, planned and organized manner in order to efficiently implement some methods and systems within a fully active organization, as the changes that have to be managed are found within an organization and they are controlled by it. The second meaning of management of change refers to the reaction and the answer to the changes that the organization don't control or do them in a small measure (legislative changes, the change of social or political climate, competitiveness, and the changes of economic connections). We can say that the successful management of change is important for the survival and success of any organization in today's business environment as it is extremely competitive and in a continuous evolution. However, the theories and approaches of management of change that are available for the theoreticians and practitioners, often argue one against the others, and many of them lack the empirical evidence supported by incontestable hypotheses regarding the nature of contemporary organizational management of change.

2. LITERATURE REVIEW

Contemporary society launches industrial and organizational challenges that triggered a new rhythm of change with many faces. These forces that act over change are strong and

universal. It results the necessity to make a contextual analysis of external conditions and of the internal forces that affect the development of the strategies of change. These challenges, no matter their nature, are content of the forces for change. Thus, the relations between internal forces of change, external forces of change and the organisational characteristics may be the cooperating initiators of the process of change [36, 22]. The external forces of change include the market, the legislation, tax structures, new technology and political interests. The internal forces of change are profitability, reorganization, conflicts between the entities that are part of the organization and the changes in the organizational culture.

Kets de Vries and Miller introduce the concept of pathology which describes the instability through which an organisation, that fails to achieve its objectives, passes [19].

Harari [12] and McCune [24] reiterate the idea that there can appear various uncontrollable factors which can have an overwhelming impact on the organization: the explosion of technological progresses, the collapse of global barriers on the market entry, the numerous competitors, the dislike of the most talented employees toward the bureaucratic control and the insistence of clients to be treated as individuals and not as a component of the market.

The management of organizational change is a continuous process of experimentation and adaptation that has as main target the correlation of capabilities of an organization to adapt to a volatile, changing environment [7]. In the same terms, Lichtenstein [23] sees the organizational change as a transforming change performed with the help of an adaptive and complex model system of change, which is made up of three stages: the growth of the organization, the appearance of tension in the activity of the organization and a threshold, as well as the new emerged configuration.

In the article „Management of Quick Change: From Theory to Practice”, McDonald [25] notes that some theoreticians applied for the theory of organizational change the theory of Darwin “survival of the strongest” [33].

For a long time, the concept of change inside organisations drew the attention of both theoreticians and practitioners.

Burke and Litwin [6] claim that, in spite of the complexity of problems of change, the notion of transforming and traditional dynamic can be identified, inherent in the efforts for a successful change. Kennerfalk and Klefsjo [17] suggest that the fundamental changes in organizations can be classified into two great categories: changes in culture and changes in structure. Regarding the structural change in the organization, in the past 50 years, Fenton and Pettigrew [11] studied the evolution of the theoretical concepts regarding the organization, from the bureaucratic organization [34] to the network organization [32]. On the other hand, Chandler [9] comments that the importance of management of change can be better understood if it is regarded in the context of expansion, shrinkage and restructuring of the corporation.

In an overview of the model of management of change, the major organizational characteristics, the core systems and the economic strategies are thoroughly investigated and are essential for the adaptation of transformation [20].

The changing agents or the people that trigger and mobilize changing schemes rise the issue of how the effort of change can be evaluated. Basically, the magnitude of change is difficult to be measured due to the unprecedented situations and the environmental organizations involved [8, 27, 16]. Fenton and Pettigrew [11], consider that, given the conditions of knowing the society that we live in, the initiatives of change have to be translated into practice quickly. Networking and information technology will never be effective, unless they are done gradually. To take advantage of the benefits of organizational change, stimulated mainly through innovation, the firms have to think and act holistically and make changes on several levels.

In the studies regarding the management of change, the problem of resistance to change was always considered an essential element in finding the ways to get advanced management. It is argued that the employees do not resist to all the changes, but only to those that they don't understand or they see as a psychological or economical threat. As such, usually, they answer with a proper behaviour: dissatisfaction, frustration, confusion and anxiety. The resistance to change can conduct to a lower level of productivity, activity slowdown, hostility, and pessimism regarding the achieving of the aim. The causes are multiple: political, cultural, legal and individual. In terms of understanding the term of resistance to change, Hayes [13] states that a person has to identify the factors underlying this resistance. They are self- peer pressure and inertia.

Piderit [30] postulates that there are three different aspects of the conceptualization of resistance to change: as interest, fear, a cognitive state, as an emotional state and as behaviour. In other words, the resistance to change is manifested both at individual level and the level of the organization.

After examining the force of change and the possible resistance to change within an organization, formulating strategies of change is the further important step to be done. There are various ways to formulate strategies of change, according to the size of the possible change, to the available time and information, depending on the distribution of power inside the organization. Buchanan and Boddy [5], quoted by Burnes, analyse the skills and the essential competence to be a successful agent of change saying that *"the picture of the agent of change is that of an operator with a high qualification and politically well trained who doesn't have only a thorough knowledge of the processes and the tools for change but also the personal qualities and experience to use them both on open stage, but, especially, behind the scene"* [8].

To formulate a strategy of change, a series of stages must be carefully examined. Traditionally, Lewin [21], quoted by Burnes [8], provides a classical framework of levels of change: unfreezing, movement and refreezing. Each step corresponds to certain social behaviours and to a special cognitive state. A better understanding of change was supported by empirical proves from various authors, namely Weiss [35], Bloodgood and Morrow [2], Bolman and Deal [3], and Day [10], Isabella [14] and Jaffe et al. [15] propose a model of the stages of change rather similar to the reaction of employees.

No matter how well the strategies of change are formulated, the implementation of change is a decisive step in its successful achievement. Managerial practice has shown that the failure of the strategy implementation of change is the basic reason why people are anxious about organizational change.

The diversity of views expressed in the literature of specialty referring to change and management determined us to approach the positioning of our scientific research of the new challenges of the management of change into the context of contemporary economy.

3. MODELS AND METHODS USED IN THE PREDICTION OF CHANGE MANAGEMENT

The purpose of this article is to set the base of a particularly rigorous framework of research, so that to ensure the scientific nature of the results and conclusions drawn from the research. The operational framework to achieve the scientific approach is based on the development of an opinion questionnaire to establish the respondents' views regarding our issue. The questionnaire is divided into two parts referring to the staff motivation in the process of implementation of change – Major theme 1 (MT1) and the assessment of the

attitude toward change – Major theme 2 (MT2). In order to avoid reluctance from the respondents in expressing their opinion, the evaluation of their responses was made with the help of the Likert scale, having five levels: strongly agree, agree whatever, disagree, and strongly disagree. The questions proposed were with closed character. The questionnaires distribution and filling were conducted during the year of 2017, June 2017 - October 2017. To ensure the objectivity of answers the respondents were proposed to be provided with a climate of anonymity.

The activities efficiency and effectiveness carried on inside an organization represent its ultimate goal. Hypotheses of work in order to explain the central hypothesis „Every organization must have the capacity to make the change, ie explaining the necessity of change, acceptance of change by the members of the organization and their transformation into the leading actor to achieve the change” are:

H1: Transforming employees into the main actors of supporting the change by promoting proper motivation strategies.

H2: Conditioning the acceptance of change by taking into account the employee's own interests and the interests of the group to which he belongs.

H3: Ensuring convergence of the interests of all the categories of actors participating in the process of change.

During the investigation concerning the new challenges of management of change in the contemporary economy, we used a complex strategy of research, combining both, quantitative and qualitative methods of investigation. Therefore, specific methods were used in the preliminary stage of design and preparation of the research analysis, presented as tables that allow optimal concentration of information. All the scientific process involved taking into account all parameters / variables considered useful in identifying the answer to the central question of the research. The entire process of research involved completing specific rules, long research, collection, analysis and selection of information that can be proved, objectivity and a lot of rigour, within a determined period of time. We believe that the results obtained are valid and reproducible as they are based on a well-chosen research methodology which offers credibility to the conclusions to which we have reached at the end of the research period.

Although some statistics works ignore the existence of improbability techniques (for reasons that are related to the impossibility of applying the theory of probability), due to the characteristics specific to the socio-economical domain, which sometimes makes almost impossible the fulfilment of the conditions of compliance of a sample that will not violate the laws of probability at all, we consider that they are very important and useful for the research. For this phase of the research we used a technique of improbable sampling (non-random) ie proportional quota sampling, due to the fact that the literature of specialty considers it as being adequate for the exploratory studies, having a greater accessibility and low cost. Defining for this method is the fact that the selected respondents represent the characteristics of the included population. The figure below presents the model of research proposed by this study. In essence, this model starts from the premise highlighted in the literature of specialty that there is a directly proportional correlation between the organizational change and the organizational culture.

The process of organizational change triggers, generally, after the report of the managers or the owners of the concerned organization of some possibilities of improving the activity of the organization as a whole, of a department or a group of people from that organization. Problems that can arise within an organization may be more obvious, such as those related to the poor quality of products, conflicts between departments, absenteeism etc.; more or less obvious, such as those referring to the reduction of innovative spirit within the

organization, reduction of competitiveness or diminishing of economic efficiency of the use of inputs.

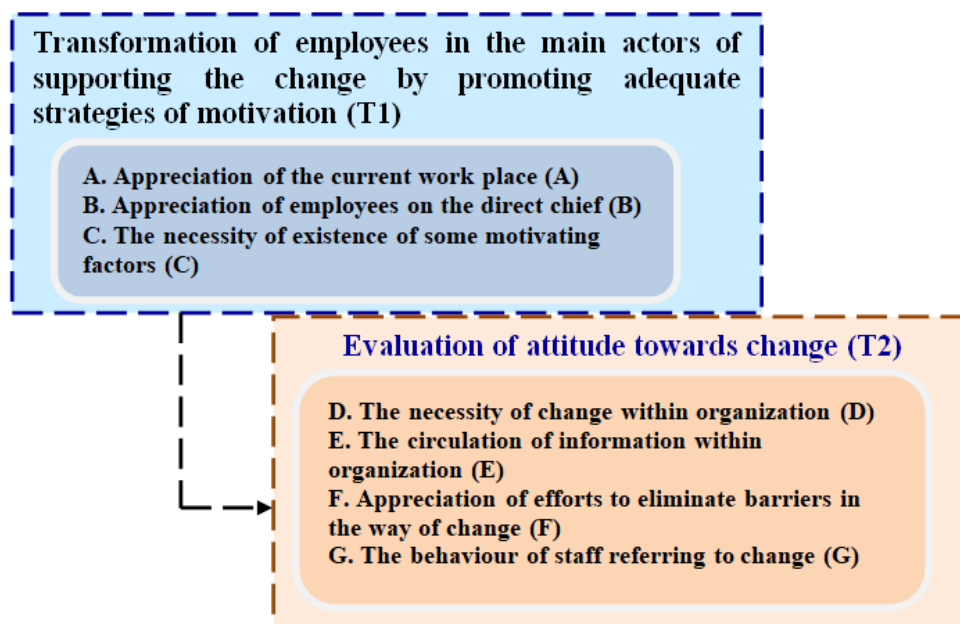


Figure 1. The model of research proposed in the analysis of management of change within the banking organizations in Romania.

Triggering the process of organizational change assumes identification of the main problems the organization faces, the development opportunities and setting the collaboration relationships between the specialist in the management of change and the members of the organization where the change is going to be made.

Summarizing the results of the analysis and interpretation of the collected data, two stages will be driven: the first step is to identify the strong points and the weak ones of the management of change in the banking system in Romania from the aspect of the importance of motivating in the success of change and the attitude towards change, and the second step is to analyse and interpret, based on the statistical and econometric methods, the items set in determining the management of change in organizations according to T1 and T2.

For a start the research began with an empirical research conducted on the 7 subsystems of the two major themes that allowed the calculation of scores for each item which will facilitate our analysis of scores. Based on the results obtained by submitting scores and comparing them with those identified in the strong points (SP) and the weak ones (WP) it can proceed to the validation and invalidation of items, step II. According to the research model the questionnaire was structured in a logical sequence on VII sections, and in step II the items established in determining the interdependence of components that allow the identification and characterization T1 and T2, will be analysed and interpreted. The logical architecture of the questionnaire allowed us to quantify each item from the established hypotheses, by subdividing components and classification of variables according to the criterion of causality.

The first theme is explained by the following equation:

$$T1 = \beta_0 + \beta_1 (Y_1^A) + \beta_2 (Y_2^B) + \beta_3 (Y_3^C)$$

Table 1. The indicators of the central and variation tendency regarding the items- validation / invalidation of items for T1.

Symbol	Items	Indicators of central and variation tendency				
		Average	Standard deviation	Coeff. of variation %	PF/ PS	Validation/inv validation
Section A. Appreciation of organizational climate (Y_1^A)						
$x_{1.1}^A$	There is a pleasant atmosphere in the company	3.93	0.734	53.9	PF	Validation
$x_{1.2}^A$	Are your opinions listened within the company?	3.90	0.675	45.5	PF	Validation
$x_{1.3}^A$	Does the job you have highlight your talent?	4.04	0.679	46.1	PF	Validation
$x_{1.4}^A$	Are the results of your work seen?	4.03	0.727	52.8	PF	Validation
$x_{1.5}^A$	What you do is important for the company?	4.33	0.472	22.3	PF	Validation
$x_{1.6}^A$	Do you have the chance to promote?	3.95	0.522	27.2	PF	Validation
$x_{1.7}^A$	Do you have the needed equipment to fulfil your tasks?	4.17	0.499	24.9	PF	Validation
$x_{1.8}^A$	Do you have the chance to learn new things?	4.31	0.799	63.8	PS	Invalidation
$x_{1.9}^A$	Do you know what tasks you have to fill?	5.52	0.500	25.0	PF	Validation
$x_{1.10}^A$	Is the work you do appreciated?	4.09	0.548	30.0	PF	Validation
$x_{1.11}^A$	Are the abilities and knowledge of each employee used on an appropriate position?	3.69	0.545	29.6	PS	Invalidation
$x_{1.12}^A$	Am I satisfied by the current salary?	3.21	1.145	131	PS	Invalidation
$x_{1.13}^A$	Am I correctly paid for my job?	3.31	1.122	126	PS	Invalidation
$x_{1.14}^A$	Would I change my current job for a better salary with x%?	3.98	0.860	74.0	PS	Invalidation
$x_{1.15}^A$	Is there a great salary system?	3.66	0.798	63.8	PS	Invalidation
$x_{1.16}^A$	Is there a transparent salary system?	3.57	0.937	87.9	PS	Invalidation
$x_{1.17}^A$	Do you have competent colleagues?	4.30	0.458	21.0	PF	Validation
$x_{1.18}^A$	Do you know the objectives of the company for the next year?	3.89	0.832	69.3	PS	Invalidation
$x_{1.19}^A$	Do you have a satisfying level of authority?	3.61	0.729	53.2	PS	Invalidation
$x_{1.20}^A$	To what extent are you satisfied of your current job?	3.76	0.844	71.2	PS	Invalidation
Section B — Coordinates of the relationships boss – subordinate (Y_2^B)						
$Y_{2.1}^B$	Is he a specialist in the field?	4.50	0.850	72.2	PF	Validation
$Y_{2.2}^B$	Does he always know what is happening within the company?	4.30	0.825	68.1	PF	Validation
$Y_{2.3}^B$	Does he make good decisions in the majority of time?	4.48	0.569	32.4	PF	Validation
$Y_{2.4}^B$	Does he appreciate the employees to their real value?	4.24	0.769	59.1	PF	Validation
$Y_{2.5}^B$	Does he assign the tasks clearly?	4.35	0.603	36.3	PF	Validation
$Y_{2.6}^B$	Does he take into account the opinions of the employees?	4.13	0.663	44.0	PF	Validation
$Y_{2.7}^B$	Does he monitor the fulfilment of the tasks carefully?	4.49	0.638	40.8	PF	Validation

Symbol	Items	Indicators of central and variation tendency				
		Average	Standard deviation	Coeff. of variation %	PF/ PS	Validation/invalidation
$Y_{2.8}^B$	Is he correct when he praises or criticizes?	4.22	0.781	61.0	PS	Invalidation
$Y_{2.9}^B$	Does he trust the employees?	3.92	0.982	96.3	PS	Invalidation
$Y_{2.10}^B$	Does he have the right attitude every time?	3.88	0.889	79.0	PS	Invalidation
Section C- The level of material satisfaction (Y_3^C)						
$Y_{3.1}^C$	Stability of job	4.31	0.760	57.7	PS	Invalidation
$Y_{3.2}^C$	Potentially good salary	4.55	0.498	24.8	PF	Validation
$Y_{3.3}^C$	The perspective of promotion	4.32	0.541	29.3	PS	Invalidation
$Y_{3.4}^C$	Ensuring an appropriate logistic support	3.78	0.888	78.8	PS	Invalidation
$Y_{3.5}^C$	Bonuses	4.48	0.564	31.8	PF	Validation
$Y_{3.6}^C$	The attractiveness of the job done	4.35	0.545	29.7	PF	Validation
$Y_{3.7}^C$	Authority, responsibility and autonomy on the job	4.17	0.674	45.4	PS	Invalidation
$Y_{3.8}^C$	Personal development	4.57	0.495	24.5	PF	Validation
$Y_{3.9}^C$	Comfort at the working place	3.97	0.881	77.7	PS	Invalidation

The modelling of the equation can be made by selecting the validated items from table 1 and the resultative ones, Y_1^A , Y_2^B and Y_3^C which involve a multicollinear direct equation and by using the regression linear function from Excel the parameters and the additional regression statistics were estimated for Y_1^A , Y_2^B and Y_3^C thus, Tables 2-4.

Table 2. Indicators of central and variation tendency regarding Y_1^A

Symbol	Items	Indicators of the central and variation tendency			
		Coefficients	Multiple R	R ²	F
	Intercept	-19.17731438	0.746037850304756	0.698157333965439	15.7608501526652
$x_{1.1}^A$	There is a pleasant atmosphere in the company	-5.070410409			
$x_{1.2}^A$	Are your opinions listened within the company?	-58.29484707			
$x_{1.3}^A$	Does the job you have highlight your talent?	-88.93774402			
$x_{1.4}^A$	Are the results of your work seen?	-10.17009518			
$x_{1.5}^A$	Is what you do important for the company?	52.65495557			
$x_{1.6}^A$	Do you have the chance to promote?	110.5721929			
$x_{1.7}^A$	Do you have the needed equipment to fulfil your tasks?	54.09926991			
$x_{1.9}^A$	Do you know what tasks you have to fulfil?	-2.976719111			
$x_{1.10}^A$	Is your work appreciated?	-60.94557662			
$x_{1.17}^A$	Is there a transparent salary system?	57.35767191			

This criterion can be expressed through a multifactorial equation. The modelling of the equation can be made by selecting the factorial items validated by the first step ($x_{1.1}^A, x_{1.2}^A, x_{1.3}^A, x_{1.4}^A, x_{1.5}^A, x_{1.6}^A, x_{1.7}^A, x_{1.9}^A, x_{1.10}^A, x_{1.17}^A$) and the resultative one Y_1^A which involve a multicollinear direct equation and using the function LINEST from Excel were estimated the parameters and the additional statistics of regression for Y_1^A .

$$Y_1^A = -19,17731438 - 5,070410409 (x_{1.1}^A) - 58,29484707 (x_{1.2}^A) - 88,93774402 (x_{1.3}^A) - 10,17009518 (x_{1.4}^A) + 52,65495557 (x_{1.5}^A) + 110,5721929 (x_{1.6}^A) + 54,09926991 (x_{1.7}^A) - 2,976719111 (x_{1.9}^A) - 60,94557662 (x_{1.10}^A) + 57,35767191 (x_{1.17}^A).$$

After the analysis of these data is found:

- the coefficient of determination Multiple R is equal 0.74 indicates the presence of a strong and positive connection between the appreciation of the organizational climate and the 10 factorial variables in the study;
- the coefficient of correlation R Square indicates the fact that 69.81% of the appreciation of organizational climate is explained by the influence of the 10 factorial areas;
- the checking of plausibility of the model with the help of the analysis of variance (ANOVA) performed though the F-test, leads to the conclusion that the linear model is appropriately estimated for a probability of approximately 95 % this being used to forecast the emerging of risks (*Significance F* < 0.05);
- according to the parameters of the linear equation the most appreciated at the organizational climate is considered to be the factor related to the chances of promotion.

Table 3. Indicators of the central and variation tendency regarding Y_2^B

Symbol	Items	Indicators of central and variation tendency			
		Coefficients	Multiple R	R ²	F
	Intercept	124.6497857	0.80224936900094	0.913546810614663	6.28371428029982
$Y_{2.1}^B$	Is he a specialist in the field?	-0.889461297			
$Y_{2.2}^B$	Does he always know what is happening in the company?	-27.0770206			
$Y_{2.3}^B$	Does he make good decisions in the majority of time?	7.162380771			
$Y_{2.4}^B$	Does he appreciate the employees to their real value?	31.41628514			
$Y_{2.5}^B$	Does he assign the tasks clearly?	-42.69645097			
$Y_{2.7}^B$	Does he carefully monitor the fulfilment of the tasks?	46.43574983			

The modelling of the equation can be done by selecting factorial items validated by the first step ($Y_{2.1}^B, Y_{2.2}^B, Y_{2.3}^B, Y_{2.4}^B, Y_{2.5}^B, Y_{2.7}^B$) and the resultative one Y_2^B which involve a direct multicollinear equation and using the function LINEST from Excel were estimated the parameters and the added statistics of regression for Y_2^B .

$$Y_2^B = 124.6497857 - 0.889461297 (Y_{2.1}^B) - 27.0770206 (Y_{2.2}^B) + 7.162380771 (Y_{2.3}^B) + 31.41628514 (Y_{2.4}^B) - 42.69645097 (Y_{2.5}^B) + 46.43574983 (Y_{2.7}^B)$$

After analysing these data is found:

- the coefficient of determination Multiple R is equal to 0.80 indicates the presence of strong positive link between the coordinates of the boss-subordinate relationship and the 6 factorial variables studied;
- the coefficient of correlation R Square indicates the fact that 91.35 % of the coordinates of the boss-subordinate relationship is explained by the influence of the 6 factorial areas;
- the checking of plausibility of the model using the analysis of variance (ANOVA) analysed through the F- test, leads to the conclusion that the linear model is accordingly estimated, for a probability of approximately 95% this can be used to forecast the emerging of risks (*Significance F* <0.05);
- according to the parameters of the linear equation related to the coordinates of the relationship boss-subordinate is considered the legal factor of carefully monitoring the fulfilment of tasks.

Table 4. Indicators of the central and variation tendency regarding Y_3^C

Symbol	Items	Indicators of central and variation tendency			
		Coefficients	Multiple R	R ²	F
	Intercept	106.7828373	0.640496092359082	0.678383704399881	5.78591426665784
$Y_{3.2}^C$	Potentially good salary	53.34825278			
$Y_{3.5}^C$	Bonuses	-18.208631			
$Y_{3.6}^C$	Attractiveness of the work done	-19.67475274			
$Y_{3.8}^C$	Professional development	1.837817058			

Modelling the equation can be made by selecting the factorial items validated by the first step ($Y_{3.2}^C, Y_{3.5}^C, Y_{3.6}^C, Y_{3.8}^C$) and the resultative one Y_3^C which involve a multicollinear direct equation and using the LINEST from Excel were estimated the parameters and the additional statistics of regression for Y_3^C .

$$Y_3^C = 106.7828373 - 18.208631 (Y_{3.2}^C) + 99.25418277 (Y_{3.5}^C) + 22.18804493 (Y_{3.6}^C) + 10.028783 (Y_{3.8}^C)$$

After the analysis of these data is found:

- the coefficient of the determination Multiple R is equal 0,64 indicates the presence of positive and strong connection between the level of material satisfaction and the 4 factorial variables studied;
- the coefficient of correlation R Square indicates the fact that 67,83% of the coordinates of the relationship boss-subordinate is explained by the influence of the 4 factorial areas;
- the checking of the plausibility of the model with the help of the analysis of variance (ANOVA) performed by F-test, leads to the conclusion that the linear model is

properly estimated for a probability of approximately 95% this can be used to forecast the emerging of risks (*Significance F* < 0.05);

- according to the parameters of the linear equation related to the level of material satisfaction is considered the factor connected to the monitoring of obtaining bonuses.

T1: Motivating staff within the process of implementation of change is positively influenced by the appreciation of the current job, appreciation of the employees regarding the direct boss and the need of the existence of motivating factors within the enterprise.

This hypothesis is explained by the following equation:

$$T1 = \beta_0 + \beta_1 (Y_1^A) + \beta_2 (Y_2^B) + \beta_3 (Y_3^C)$$

where:

Y_1^A = appreciation of the current job – the values present the average of the items 1, 2, 3, 4, 5, 6, 7, 9, 10 and 17.

Y_2^B = appreciation of employees regarding the direct boss - the values present the average of items 1, 2, 3, 4, 5 and 7.

Y_3^C = the necessity of the existence of some motivating factors – the values present the average of the items 2, 5, 6 and 8.

And the resultative variable T1– represents the average of the items Y_1^A , Y_2^B and Y_3^C .

β_1 , β_2 , parameters that are expected to be positive.

$$T1 = 0.37708 + 0.599891 (Y_1^A) + 0.373126 (Y_2^B) + 0.465878 (Y_3^C)$$

The greater influence of the first factor on the variation of the resultative factor T1 is a logical justification through the fact that hierarchically it is more important to identify for a start the organizational climate, and then to be able to determine the level of material satisfaction and the coordinates of the boss-subordinate relationship within the analysed enterprises. Thus, only through a correct identification of the management of change the organizational climate can be attributable to it.

The second theme is explained by the following equation:

$$T2 = \beta_0 + \beta_1 (D) + \beta_2 (E) + \beta_3 (F) + \beta_4 (G)$$

Table 5. Indicators of central and variation tendency regarding the items –validation/invalidation items for T2.

Symbol	Items	Indicators of central and variation tendency				
		Media	Standard deviation	Coeff. de variation %	PF/ PS	Validation / invalidation
Section D – The level of acceptance of change (Y_1^D)						
$x_{1.1}^D$	Is your organization in a process of change?	3.70	0.936	0.877	PF	Validation
$x_{1.2}^D$	In your organisation is there necessary to implement an organizational change?	3.50	0.992	0.984	PS	Invalidation
$x_{1.3}^D$	The change in the organization will end successfully?	3.40	0.815	0.664	PS	Invalidation

Symbol	Items	Indicators of central and variation tendency				
		Media	Standard deviation	Coeff. de variation %	PF/PS	Validation / invalidation
$x_{1.5}^D$	I like to try new and different things	4.30	0.526	0.277	PF	Validation
$x_{1.6}^D$	Every time life becomes routine I always find ways to change something	3.98	0.834	0.686	PF	Validation
$x_{1.7}^D$	I would prefer to be surprised in any way rather than get bored	4.05	0.689	0.474	PF	Validation
$x_{1.8}^D$	I often change my mind	3.10	0.822	0.675	PS	Invalidation
$x_{1.9}^D$	I change my opinion if convincing arguments are brought to me	3.90	0.811	0.657	PF	Validation
$x_{1.10}^D$	My opinions are consequent in time	3.97	0.521	0.272	PF	Validation
Section E – Appreciation towards the way of communication of change (Y_1^E)						
$x_{1.1}^E$	I feel comfortable to share my ideas directly with the members of the superior management	3.88	0.804	0.647	PS	Invalidation
$x_{1.2}^E$	In most of the situations I receive information I need to fulfil my tasks	3.94	0.816	0.666	PF	Validation
$x_{1.3}^E$	The managers don't have any hesitation to communicate information about the organization to the subordinates	3.83	0.917	0.841	PS	Invalidation
$x_{1.4}^E$	A lot of the information I receive every day is detailed and precise	3.94	0.757	0.573	PF	Validation
$x_{1.5}^E$	I receive the information I need to fulfil my tasks on time	3.88	0.716	0.512	PF	Validation
$x_{1.6}^E$	It doesn't happen to be late in fulfilling my tasks due to the lack of the information I need	4.07	0.811	0.657	PF	Validation
$x_{1.7}^E$	The greatest part of daily communication I receive from the superior management	3.83	0.740	0.548	PS	Invalidation
$x_{1.8}^E$	This organization often supports "polis" meetings where the employees meet to share information	2.98	0.918	0.843	PS	Invalidation
$x_{1.9}^E$	The most part of the information I need I receive through formal channels	3.78	0.892	0.796	PF	Validation
Section F – evaluation of determining factors in the success of change (Y_1^F)						
$x_{1.1}^F$	Recruitment and selection of personnel according to well defined criteria	3.93	0.821	0.674	PF	Validation
$x_{1.2}^F$	Training programs	4.54	0.499	0.249	PF	Validation
$x_{1.3}^F$	Development of leader abilities	4.17	0.701	0.492	PF	Validation
$x_{1.4}^F$	Management of performances	4.30	0.693	0.481	PS	Invalidation
$x_{1.5}^F$	Compensation of employees	4.43	0.622	0.387	PF	Validation
$x_{1.6}^F$	Stimulation of the involvement of the employees	4.30	0.728	0.530	PF	Validation
Section G – Evaluation of the level of resistance to change (Y_1^G)						
$x_{1.1}^G$	Great part of the information I receive daily is transmitted to the inferior levels through a kind of "colander"	2.80	1.069	1.142	PF	Invalidation
$x_{1.2}^G$	I usually find out the news of the company with a few months later	2.29	1.277	1.632	PF	Invalidation
$x_{1.3}^G$	Changing plans seems a real drudge for me	2.69	1.189	1.413	PS	Validation

Symbol	Items	Indicators of central and variation tendency				
		Media	Standard deviation	Coeff. de variation %	PF/ PS	Validation / invalidation
$x_{1.5}^G$	When someone puts pressure on me to change something, I have the tendency to oppose myself, even if in the end it will be in my advantage	2.56	1.124	1.262	PF	Invalidation
$x_{1.6}^G$	Sometimes I have the tendency to avoid changes of any kind, even if I know I will benefit from them	2.07	1.123	1.262	PS	Validation
$x_{1.7}^G$	When I am informed of the changes of plans I start to be tensed	2.71	1.084	1.176	PS	Validation
$x_{1.8}^G$	When things do not go according to the plans I am stressed	2.99	1.032	1.065	PS	Validation
$x_{1.9}^G$	If my boss changed the evaluation criteria of performance I would probably feel uncomfortable	2.59	0.966	0.933	PF	Invalidation
$x_{1.10}^G$	If I were informed that there will be some significant changes at work I would probably feel stressed	2.80	0.976	0.953	PS	Validation
$x_{1.11}^G$	I would chose an ordinary day instead of a day with unexpected events anytime	2.80	0.980	0.961	PF	Invalidation
$x_{1.12}^G$	Things would go better if your boss changed?	2.28	1.397	1.953	PF	Invalidation
$x_{1.13}^G$	Do you say that you do not have time, when in fact you are not in a mood?	2.08	1.392	1.938	PS	Validation
$x_{1.14}^G$	Do you make your breaks as long as you can?	1.93	1.417	2.009	PS	Validation
$x_{1.15}^G$	Do you do overtime?	3.63	1.218	1.484	PF	Validation
$x_{1.16}^G$	Are you late for work?	2.22	1.401	1.962	PF	Invalidation
$x_{1.17}^G$	Is my job too tiring?	2.58	1.006	1.012	PS	Validation

The modelling of the equation can be made by selecting the items validated in table 5 and the resultative ones, Y_1^D , Y_1^E , Y_1^F and Y_1^G which involve a multicolinear direct equation and using the regression linear function from Excel were estimated that parameters and the statistics of additional regression for Y_1^D , Y_1^E , Y_1^F and Y_1^G thus, Tables 6-9.

Table 6. Indicators of the central and variation tendency regarding Y_1^D

Symb ol	Items	Indicators of central and variation tendency			
		Coefficients	Multiple R	R ²	F
	Intercept	-134.3172169	0.716341313950714	0.76660835249235	19.4227783381494
$x_{1.1}^D$	Is your organization in a process of change?	-20.46039156			
$x_{1.4}^D$	In general I consider changes to be something positive	-31.31058402			
$x_{1.5}^D$	I like to try new and different things	13.94174989			
$x_{1.6}^D$	Every time life becomes routine I always find ways to change something	64.07621887			
$x_{1.7}^D$	I would prefer to be surprised in any way rather than get bored	-12.28375298			
$x_{1.9}^D$	I change my opinion if convincing arguments are brought to me	-33.2509931			
$x_{1.10}^D$	My opinions are consequent in time	83.42951525			

This criterion can be expressed through a multifactorial equation. The modelling of the equation can be made by selecting the factorial items validated by the first step ($x_{1.1}^D, x_{1.4}^D, x_{1.5}^D, x_{1.6}^D, x_{1.7}^D, x_{1.9}^D, x_{1.10}^D$) and the resultative one Y_1^D which involve a multicollinear direct equation using the function LINEST from Excel were estimated the parameters and the additional statistics of regression for Y_1^D .

$$Y_1^D = -134.3172169 - 20.46039156 (x_{1.1}^D) - 31.31058402 (x_{1.4}^D) + 13.94174989 (x_{1.5}^D) + 64.07621887 (x_{1.6}^D) - 12.28375298 (x_{1.7}^D) - 33.2509931 (x_{1.9}^D) + 83.42951525 (x_{1.10}^D)$$

After the analysis of these data is found:

- the coefficient of the determination Multiple R is equal 0.71 indicates the presence of positive and strong connection between the level of acceptance of change and the 7 factorial variables in the study.
- the coefficient of correlation R^2 indicates the fact that 76.66% of the level of acceptance of change is explained by the influence of the 7 factorial area.
- the checking of the plausibility of the model with the help of the analysis of variance (ANOVA) performed by F-test, leads to the conclusion that the linear model is properly estimated for a probability of approximately 95% this can be used to forecast the emerging of risks. (*Significance* $F < 0.05$).
- according to the parameters of the linear equation the most appreciated at the level of acceptance of change is considered the factor related to the views of employees that are consistent over time.

Table 7. Indicators of the central and variation tendency regarding Y_1^E

Symb ol	Items	Indicators of central and variation tendency			
		Coefficients	Multiple R	R^2	F
	Intercept	51.91410216	0.684972210874902	0.469186929670851	66.4694580511546
$x_{1.2}^E$	In most of the situations I receive information I need to fulfil my tasks	68.33032079			
$x_{1.4}^E$	A lot of the information I receive every day is detailed and precise	72.56281385			
$x_{1.5}^E$	I receive the information I need to fulfil my tasks on time	-112.7869833			
$x_{1.6}^E$	It doesn't happen to be late in fulfilling my tasks due to the lack of the information I need	-17.99509445			
$x_{1.9}^E$	The most part of the information I need I receive through formal channels	42.42228707			

This criterion can be expressed through a multifactorial equation. The modelling of the equation can be made by selecting the factorial items validated by the first step ($x_{1.2}^E, x_{1.4}^E, x_{1.5}^E, x_{1.6}^E, x_{1.9}^E$) and the resultative one Y_1^E which involves a multicollinear direct equation and using the function LINEST from Excel were estimated the parameters and the additional regression statistics for Y_1^E .

$$Y_1^E = 51.91410216 + 68.33032079 (x_{1.2}^E) + 72.56281385 (x_{1.4}^E) - 112.7869833 (x_{1.5}^E) - 17.99509445 (x_{1.6}^E) + 42.42228707 (x_{1.9}^E)$$

After the analysis of these data is found:

- the coefficient of the determination Multiple R is equal 0.74 indicates the presence of positive and strong connection between the appreciation between the way of communication of change and the 5 factorial variables in the study.
- the coefficient of correlation R Square indicates the fact that 69.81% of the appreciation toward the way of communication of change is explained by the influence of the 5 factorial areas.
- the checking of the plausibility of the model with the help of the analysis of variance (ANOVA) performed by F-test, leads to the conclusion that the linear model is properly estimated for a probability of approximately 95% this can be used to forecast the emerging of risks. (*Significance F* < 0.05).
- according to the parameters of the linear equation the most appreciated toward the way of communication of change is considered the factor connected to the fact that the most part of the information the employees receive every day is detailed and precise.

Table 8. Indicators of central and variation tendency regarding Y_1^F

Symbol	Items	Indicators of central and variation tendency			
		Coefficients	Multiple R	R ²	F
	Intercept	193.2797377	0.82104462124094	0.603069648827738	8.64151556663882
$x_{1.1}^F$	Recruitment and selection of personnel according to well defined criteria	13.28751677			
$x_{1.2}^F$	Training programs	22.96888389			
$x_{1.3}^F$	Development of leader abilities	-48.31438719			
$x_{1.5}^F$	Compensation of employees	-12.61880581			
$x_{1.6}^F$	Stimulation of the involvement of employees	22.45921438			

This criterion can be expressed through a multifactorial equation. The modelling of the equation can be made by selecting the factorial items validated by the first step ($x_{1.1}^F, x_{1.2}^F, x_{1.3}^F, x_{1.5}^F, x_{1.6}^F$) and the resutative one Y_1^F which involve a direct multicolinear equation and using the LINEST function from Excel were estimated the parameters and the added statistics of regression for Y_1^F .

$$Y_1^F = 193.2797377 + 13.28751677 (x_{1.1}^F) + 22.96888389 (x_{1.2}^F) - 48.31438719 (x_{1.3}^F) - 12.61880581 (x_{1.5}^F) + 22.45921438 (x_{1.6}^F)$$

After the analysis of these data is found:

- the coefficient of the determination Multiple R is equal 0.82 indicates the presence of positive and strong connection between the evaluation of determining factors in the success of change and the 4 factorial variables in the study.
- the coefficient of correlation R Square indicates the fact that 60.30% of the appreciation towards the evaluation of determining factors in the success of change is explained by the influence of the 4 factorial areas.
- the checking of the plausibility of the model with the help of the analysis of variance (ANOVA) performed by F test, leads to the conclusion that the linear model is properly estimated for a probability of approximately 95% this can be used to forecast the emerging of risks. (*Significance F* < 0.05).

- according to the parameters of the linear equation the most appreciated toward the way of evaluating the determining factors in the success of change is considered the factor connected to the development of the abilities of leader.

Table 9. Indicators of the central and variation tendency regarding Y_1^G

Symb ol	Items	Indicators of central and variation tendency			
		Coefficients	Multiple R	R ²	F
Section G – Evaluation of the level of resistance to change (Y_1^G)					
	Intercept	9.154980023	0.648102316187259	0.800416149009838	15.9315271678873
$x_{1.3}^G$	Changing plans seems a real drudge for me	-74.22772994			
$x_{1.4}^G$	I often feel a little bit uncomfortable even when it is about changes which, possibly can improve my life	-5.891432591			
$x_{1.6}^G$	Sometimes I have the tendency to avoid changes of any kind , even if I know I will benefit from them	22.90372168			
$x_{1.7}^G$	When I am informed of the changes of plans I start to be tensed	75.7652003			
$x_{1.8}^G$	When things do not go according to the plans I am stressed	43.3886084			
$x_{1.10}^G$	If I were informed that there will be some significant changes at work I would probably feel stressed	-40.2696931			
$x_{1.13}^G$	Do you say that you do not have time, when in fact you are not in a mood?	35.50724653			
$x_{1.14}^G$	Do you make your breaks as long as you can?	2.108634416			
$x_{1.15}^G$	Do you do overtime?	8.870493224			
$x_{1.17}^G$	Is my job too tiring?	-24.57359582			

This criterion can be expressed through a multifactorial equation. The modelling of the equation can be made by selecting the factorial items validated by the first step ($x_{1.3}^G, x_{1.4}^G, x_{1.6}^G, x_{1.7}^G, x_{1.8}^G, x_{1.10}^G, x_{1.13}^G, x_{1.14}^G, x_{1.15}^G$) and the resultative one Y_1^G which involve a direct multicollinear equation and using the LINEST function form Excel were estimated the parameters and the added statics of regression for Y_1^G .

$$Y_1^G = 9.154980023 - 74.22772994 (x_{1.3}^G) - 5.891432591 (x_{1.4}^G) + 22.90372168 (x_{1.6}^G) + 75.7652003 (x_{1.7}^G) + 43.3886084 (x_{1.8}^G) - 40.2696931 (x_{1.10}^G) + 35.50724653 (x_{1.13}^G) + 2.108634416 (x_{1.14}^G) + 8.870493224 (x_{1.15}^G)$$

After the analysis of these data is found:

- the coefficient of the determination Multiple R is equal 0.64 indicates the presence of positive and strong connection between the evaluation of the level of resistance to change and the 9 factorial variables in the study.
- the coefficient of correlation R Square indicates the fact that 80.04% of the evaluation of the level of resistance to change is explained by the 9 factorial areas.
- the checking of the plausibility of the model with the help of the analysis of variance (ANOVA) performed by F test, leads to the conclusion that the linear model is properly

estimated for a probability of approximately 95% this can be used to forecast the emerging of risks. (*Significance* $F < 0.05$).

- according to the parameters of the linear equation the most appreciated in the evaluation of the level of resistance to change is considered the factor connected to the fact that when the employees are informed by the changes of plans, they start to be tensed.

T2: The evaluation of the attitude towards change is positively influenced by the necessity of change within the organization, circulation of information within organization, appreciation of the efforts to eliminate barriers in the way of change but also of the behaviour of the staff referring to change within enterprise.

This hypothesis is explained by the following equation:

$$T2 = \beta_0 + \beta_1 (Y_1^D) + \beta_2 (Y_1^E) + \beta_3 (Y_1^F) + \beta_4 (Y_1^G)$$

where:

Y_1^D = The need of change within the organization- the values show the average of items 1, 4, 5, 6, 7, 8, 9 and 10

Y_1^E = The circulation of information within the organization –the values show the average of items 2, 4, 5, 6 and 9

Y_1^F = Appreciation of efforts to eliminate the barriers in the way of change- the values present the average of items 1, 2, 3, 5 and 6

Y_1^G = The behaviour of the personnel referring to change- values present the average of the items 3, 4, 6, 7, 8, 10, 13, 14, 15 and 17

And the resultative variable T2 – represents the average of the items Y_1^D , Y_1^E and Y_1^F , Y_1^G .

$\beta_1, \beta_2, \beta_3, \beta_4$ parameters that are expected to be positive.

$$T2 = 0.442395 + 0.199651 (D) + 0.097454 (E) + 0.251622 (F) + 0.339912 (G)$$

The greater influence of the first factor on the variation of the resultative factor T2 presents a logical justification though the fact that hierarchically it is more important to identify for a start the behaviour of the staff referring to change, so that we can determine the appreciation of efforts to eliminate barriers in the way of change, the need of change within organization and the circulation of information within the analysed firms. Thus, only through a correct identification of the management of change can the evaluation be attributable toward the change within firms. It is found that 58.02% from the total number of 81 items are validated, which determines us to state that all the three hypotheses are validated and there is no need of their reformulation and which argues once again the need of a model of implementation of change.

4. RESULTS AND DISCUSSION

The design of the model of the five factors was based on the view of Kets de Vries who considers that change is based on five categories of behaviour [18]: behaviour of concern, confrontation behaviour, behaviour of classification, behaviour of convergence of the efforts to achieve the organization's goals and behaviour of change. To each behaviour it corresponds a factor that will determine the ways of action to design the model of the five factors that make up the content of the CMP paradigm (change, motivation, performance):

1. Behaviour of concern	→	Contextual analysis (CA)
2. Confrontation behaviour	→	Directing change (DC)
3. Classification behaviour	→	Correlation of the strategic change with the operational one (CSCO)
4. Behaviour of convergence of efforts	→	Treating human resources as passive and actives of the organization (THR)
5. Behaviour of change	→	Ensuring the coherence in management of change (ECMC)

Figure 2. The content of the CMP paradigm.

In order to develop the change strategy, within an organization, we must to take into account of five factors.

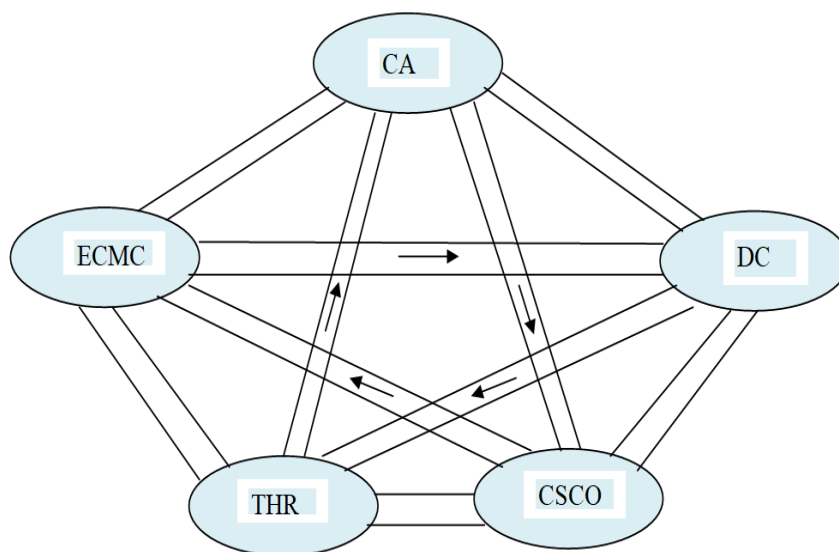


Figure 3. Management of change for the competitive success.

Recommendations

- A. Managerial measures to strengthen the determining features to become dominant, IT MUST:
 - be a coherence of the objective even if there are certain individual differences;
 - to achieve knowledge that will complete the determining features of the strategy;
 - to be created an inter-organizational coherence in which it should be included the customers, the suppliers, the distributors and the collaborators of the organization.
- B. Successive changes have to be treated in their networking.
- C. Complementarity, correlation and implementation of the two main elements of each factor, the initial determining conditions and the consecutive mechanisms empowers the organization to ensure its success on the market which is an uncertain and consecutive process. This process requires from the organization:
 - particular requirements regarding the capacity of adaptation to the five factors;
 - efforts to enhance the organization's ability to create and maintain the competitive advantages toward competition.

From the perspective of change, the complex problems the managers are facing cannot be analysed objectively and continuously within the current tasks. Each manager forms a set of beliefs and essential, specific premises relevant for the organization where he works.

Although this set of beliefs and premises is different from one individual to another, there is a core of beliefs and assumptions shared by all the managers that the specialists called:

- ideational culture, mythology;
- interpretative scheme [1];
- paradigm [29].

The SMP paradigm has an essentially cultural character. Over time, the content of the paradigm included different categories of premises that strengthen the history and the success of the organization through a set of actions and answers to the signals that the managers interpret and can demonstrate as relevant (Fig. 4).

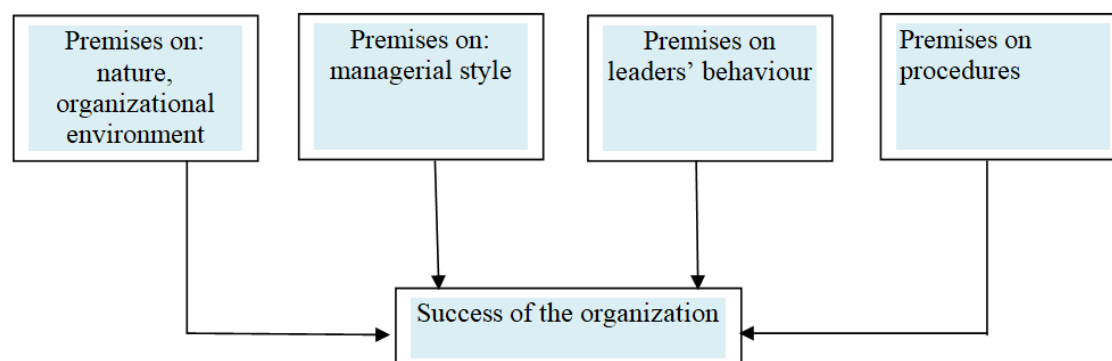


Figure 4. Premises of the success of the organization.

The paradigm is easily detected by those outside the organization, than by its members as the elements that compose it are understood by it self. The managers receive a plurality of signals, often contradictory, that they interpret through the paradigm. In this context the paradigm is both an interpretation instrument and a formula of action, as the organizations form their strategies. Summarizing the words said above, we can say that, in each of us there is the capacity to become a master of change “No one else outside you can control your mental attitude. We must all make an effort to abandon the comfortable idea of blaming others and to understand that we are equally responsible for the events in our life as much as it is any other influence from outside. Most of the times we make decisions that have a negative impact on our lives, as we do not see the important situations from the point of view of the others too, not only from ours. If we want for others to like us, to love us and respect us more, we have to respect and honour all around us, even those that are difficult to love. When we waste energy on things that cannot be changed, we fight against the inevitable, we steal our own energy that we need in all the other areas of our life. Every day, each of us has the possibility to see the change as an opportunity-it is just our choice.”

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