Measuring and monitoring change in a strategic business context. Considerations on the role of organizations' composition elements

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Abstract

This paper brings theoretical arguments that support good business administration practices. The European business environment (see the EU motto: united in diversity) is as homogeneous in terms of legislative areas (i.e., the single market, economic and monetary union, fair competition practices), as heterogeneous in terms of particularities and cultural, regional and local contexts, which can be methodically extracted through the PEST analysis (political, economic, social and technological). In this business context but also of the desideratum of any organization to generate added value, regardless of its nature, the process of quantifying the status quo of the organization must be considered as a decisive factor in the change management process. The organization's strategy has to be therefore translated into criteria that are compatible with its goals and quantifiable - only then will it be possible to adequately assess the results of implementation. In the following lines I present the methodological norms for quantifying the status quo of an organization, as well as the potential types of indicators needed.

Keywords: strategic management, organisational change, change indicators, strategicstatus quo

Introduction

The activity of an organization takes place, if we consider the temporal dimension superimposed by the complexity of the decisions assumed by the management on the operational, tactical and strategic level. The aspects that operationalize the strategic objectives start from the premise of measurability.

Organizational management researchers argue that balanced assessments of organizational performance (i.e., the organization's status quo) must start from a variety of indicators and dimensions that reflect the functionalities and environments of the organization (see Cameron and Whetten, 1982; Sicotte *et al*., 1998; Irimiaș, 2018b, p. 83). A novel approach to change management emerges from the model of management consultants Hayes and Hyde (2016) who highlight the need for an indicator

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of change. The authors (Hayes and Hyde, 2016) reiterate[1] that it is accepted that about 70% of change programs fail. A solution to this problem can be continuous monitoring of change and finding the means by which such a process parallel to change can be executed (compare Buono and Kerber, 2008, p. 112). This is necessary in order to turn change management into a flexible process that allows for real-time improvement interventions, thanks exclusively to the characteristic of process monitoring.

The need to quantify the activity of an organization stems, among other things, from the actions taken at European level to develop methodologies for constructing composite indicators (compare Nardo *et al*., 2005; OECD, 2008; COIN, 2019) aiming (1) to increase interest in the indicators composed in academic circles, the media and those who do politics; (2) providing a wide range of methodological approaches to composite indicators and (3) meeting the need for international guidelines for this area (see El Gibari *et al*., 2019).

From the perspective of consulting in business strategies (Hayes and Hyde, 2016), it is concluded that, "in the long run, the success of planned changes can be assessed by performance indicators". Because one of the main imperatives of organizational change is to convince and have human resources on their side as active participants (i.e., promoters) in the change process, the indicators are intended to help organizations cope more effectively with change, by facilitating the information of all parties involved (compare Myers and Reed, 2018, p. 52).

Quantifying the status quo of the organization prior to strategic planning is recommended because (1) it creates *a picture of the current state of the organization* that can be reported at each step of the change implementation process to determine the evolution or involution of the undertaking, 2) it gives the change management process *visibility and transparency in relation to each resource*, process or structure of the organization and (3) it *facilitates the implementation* due to its features of quantification-measurement of the elements of the system which is subject to change.

Irimiaș (2018b, p. 84) highlighted the triggers of change in four distinct environments: social, political, technological and economic and the two dimensions of organizational activity, micro and macro. The working method consisted of evoking and analyzing different models and methods of scanning the organization and the business of the organization (compare Schreyögg and Koch, 2010, p. 81; Hungenberg and Wulf, 2015, p. 15), resulting in the division described above. This method aims to define the measurable status quo of the organization through indicators which are specific for the business at the time of the impact of change. An effective way to effectively and realistically

[1] Compare Beer, M., Eisenstat, R. and Spector, B. (1990), Why change programs don't produce change, *Harvard Business Review*, Vol. 68, No. 6, pp.158–167; Beer, M. and Nohria, N. (2000), *Breaking the Code of Change*, Harvard Business School press, Boston; Roberto, M.A. and Levesque, L.C. (2005), *The art of making change initiatives stick, MIT Sloan Management Review*, Massachusetts, Vol. 46, No. 4, pp.53–60.

capture the timing and magnitude of change is to consider the process of adopting and defining composite indicators. These are, according to the OECD (2008), compilations of singular indicators, which appear when it is desired to define a multi-dimensional conceptual model.

1. Determining the compositional elements of the organization and the relationships between them

1.1. The composition elements of the organization

This subchapter highlights the importance of the *real and desired value* of the indicators which are characteristic for the changes in the organization by building the discourse from the following perspectives:

- *elements within the organization* that are influenced by changing indicators,
- *recommended intervention techniques* for inducing change and
- *selection, evaluation and standardization* of the resources necessary for the intervention.

In the first phase, that of planning the necessary activities and resources, I recommend an overview of the organization perceived as a system (compare Okhrimenko, 2017, p. 509) of tangible and intangible forces, promoters of or against change, inherent -as a matter of fact, which digress the compositional elements of the organization. In short, I consider the system as a group of elements between which a set of connections and relationships is established. Continuing the same reasoning from this scientific approach, the compositional elements of the organization are the simplest parts of it, which can no longer be analyzed or detailed because it is no longer necessary or possible. They are generally represented by individuals, objects or other units.

In choosing the elements that make up the system, the optics built so far on the organization of a complex system were first taken into account, in a dynamic balance of forces, triggering and opposing change (Irimiaș, 2018a, p. 35) and secondly, the reasoning according to which, the triggers for change come from the four environments: economic, political, social and technological, each with their two micro and macro dimensions (Irimiaș, 2018b, p. 84). The set of predefined indicators that encompass, in a quantifiable form, the strategy of an organization, define the impact that change can have on the organization as a system, while establishing its boundaries.

The elements of the system indicate characteristics or states susceptible to undergo transformations in time. The state of an element or a conglomeration of elements is identified by means of an attribute or state variable and, in the case of this research, by one or more indicators of change. The relationships and connections in a system occur because the composition elements of the

organization are interconnected, the modification of one of them generating changes in one or more elements. The relationships between the elements are sequential, reciprocal or polar. At a given moment, the status quo of the organization is diagnosed with the help of all the states of its elements characterized by changing indicators; these states can change for various reasons, thus expressing the functioning of the system.

A system can be open or closed, depending on the intensity of its relationships with other systems that are external to it. In the case of the entity with primary economic functionality, for example, the organization is considered an open system with the ability to influence (at the micro level) and to be influenced (at the macro and micro level). The influences and communication between the organization and its living environments are given by the values and evolutions of the indicators that measure the effects of change, representing the input variables, given by the stages in which the composition elements of the organization are. Certain inputs can be considered disruptive factors, which change the state of some elements of the system. The category of input variables that can change the state of a system by influencing its operation in order to achieve a set goal is called the system control. The stage of the input variables is given either by the disturbing factors detected by modifying the indicators that measure the effects of the change, or by the desire of the management expressed by selecting some "desired values" of the indicators; I mention that the two actions described can also take place at the same time.

A particular form of control of a system is the regulation (represented by the transition between *real and desired* values), which for a control center, means to proceed in the manner in which the operation of a controlled subsystem leads to a certain desired state, that is, to achieve the target - objectives.

Like any system, the functioning of an organization is mirrored in changing its elements. One of the major transformations in an organization can be, for example, the production or provision of services, characterized by processes. The process of production/provision of services comprises two distinct sides - the technological process and the work process. The technological process represents the direct, quantitative and/ or qualitative transformation of the objects of work by modifying their dimensions, chemical composition, internal forms or structure and/or their spatial arrangement. The work process represents the activity of the executor in the sphere of production/provision of services or the fulfillment of a function in the non-productive sphere, but of existential nature regarding the organization as a system.

In order to produce/ provide services in the organization, the factors of production/ provision of existing services come together, merging in proportions that depend on both the availability and

condition of the composition elements of the organization and objectives. The purpose of these processes is, following the combinations of available composition elements, either material goods or services.

Due to the conceptual overlaps mentioned above, the application of the notion of system to that of organization can also be made from the perspective of different component elements. It is necessary to observe that the properties of the elements of the organization are interdependent, interinfluential and modifiable by managerial decisions of planning, organization, management, stimulation and/ or control. Viewed from the perspective of an economic system with political, social and technological implications, I propose the following composition elements of the organization:

- financial means (from an economic point of view) including the rights and obligations of the organization included in the balance sheet in value form. Financial means refer to the shares held in other companies and to the receivables of the organization and to the liquidities in the bank or in the house:
    - → ***rights*** (potential gain), ***obligations*** (potential expenses), ***liquidity*** (cash).
- the management network of the organization and the information-decision-making network (from a political point of view) with its different forms of propagation in the enterprise:
    - → ***accuracy and decisional efficiency*** (*strategy*), ***power exercised effectively*** (*management*), ***influence used*** (*leadership*). In the context of the elements of the political composition of the organization, it is mentioned that the "power" is formally acquired through the function, and the "influence" is acquired through the informal components of the organizational composition.
- human resources (socially), characterized by various state variables (e.g., efficiency, satisfaction, qualification, function). Also, in this category, the following can be included as entities from the perspective of the compositional elements of the organization: the set of ethnic knowledge and the social values (i.e., organizational culture) and the set of professional and scientific knowledge of the members of the organization.
    - → ***work efficiency*** (RU professionalism), ***job satisfaction*** (RU satisfaction), ***organizational values*** (RU organizational identity).
- material means (from a technological point of view): machine tools, equipment, installations for which the balance sheet retains two state variables: the value and the category of fixed assets. Other state variables may relate to the nature of the equipment, installed capacity or production capacity. The same category includes raw materials, representing finished, semi-finished or in-process products which are in the balance sheet under the name of holding values:

- → ***technological efficiency*** (as it should be), ***technological flexibility*** (as it should be), ***technological efficiency*** (as it should be).

The following table shows the 12 primary composition elements of the organization proposed in this theoretical research, divided by their areas of origin:

Table 1 The composition elements of the changing organisation

Perspective	The changing elements
(P) Political	*accuracy and decisional efficiency*
	power exercised effectively
	influence used
(E) Economic	*financial rights*
	financial obligations
	liquidities
(S) Social	*work efficiency*
	job satisfaction
	organizational values
(T) Tehnological	*technological efficiency*
	technological flexibility
	technological efficiency

1.2. Establish the necessary techniques and resources

This subchapter will detail the 12 composition elements of the organization, established in the previous subchapter and set out in Table 1. The composition elements of the organization which is subject to change are correlated with the bunch of techniques and resources required in order to modify them.

By *techniques* I mean the set of procedures and skills used in the exercise of the management of the composition elements of the organization. The steps to follow in the process of monitoring and controlling change will be:

1. Both the deadline for implementing the necessary change and the reporting and control time points are determined and these are graphically represented by using a Gantt chart;
2. The potential number of human resources necessary to induce change and respect the time frame follows from here;
3. Following the analysis prior to the implementation of the change, the budget necessary to carry out the change will emerge.

The term "*human resource*" will mean the person who manages or participates, taking into account also the anomalies of human behavior (see Avram and Irimiaș, 2018, p. 696) within the

processes of organizational change. Human resources actively or passively participate in the evolution or involution of the process.

In order to preserve the basic condition of a model, that of simplifying reality, the most comprehensive and general elements of composition in each environment of the organization are selected. Following this reasoning, three elements from each environment were considered (the justification for the importance for each of these elements that were selected was presented together with the description of the element). Next, the composition elements of the organization will be detailed from the perspectives of potential techniques and managers.

From a political perspective (P), the enterprise consists of all entities that aim to manage the organization's resources in order to achieve its strategic objectives; among these, there are: the management network (power, delegation, methods, techniques) and the information-decision-making network (information, tools). Thus, the micro and macro environments of the organization are reflected on the following three elements of composition: ***Accuracy and decision-making efficiency, Power exercised and Influence used.***

The techniques used in managing ***decision-making accuracy and efficiency*** (i.e., strategy and organizational structure) are consulting and openness to expert forecasting and management decision systems, monitoring and evaluating the results of the decision-making process and optimizing it, increasing the organization's capacity for collection, interpretation and operation with information as a support resource for decision making, permanent reporting in the decision making process to the strategic objectives of the organization. Taking into account the nature and purpose of each mentioned action, the accuracy and decisional efficiency is given by the capacity of comprehension and analysis, preparation and efficiency of the management network (managerial chain) of the organization.

The techniques used in managing the ***exercised power*** (i.e., management) are efficient punctual and nominal delegation, making and fulfilling promises, setting and meeting deadlines, sharing tasks and directions, and monitoring the activities of managers, monitoring and analyzing business processes within the organization. Taking into account the nature and purpose of each mentioned action, the efficiency of the exercised power is given by the professional training and the accumulated economic and political, theoretical (formal in nature) competencies of the human resource with managerial attributions.

The techniques used in managing ***the use of influence*** (i.e., leadership) are influencing and manipulating, harmfully or non-harmfully, of the human resources to perform tasks and objectives, creating a link between strategic objectives and management activity, evaluation and optimization of business processes within the organization. Taking into account the nature and purpose of each

mentioned action, the beneficial use of influence is given by the personal qualities (of an informal nature) and by the accumulated and possessed social competences of the human resource with managerial attributions.

From the economic perspective (E), the enterprise consists of all financial resources owned (shares, receivables, cash) and owed (debts). These financial resources are expressed in various forms and can be identified in the financial documents of the organization. Thus, the micro and macro environments of the organization are reflected on the following three elements of composition: ***Financial rights, Financial obligations, and Liquidities***.

The techniques used in the management of ***financial rights*** are the *analysis* of their evolution on the financial market and the *action* (modification) on them. Following the analysis of the financial rights owned by the company, the decision is made to keep or give up a benefit, or to claim or not a certain right. Taking into account the nature and purpose of each, these financial rights can be sold (shares), collected (receivables) or exercised (deductions, compensations, etc.).

The techniques used in the management of ***financial obligations*** are the *analysis* of their evolution on the financial market and the *action* (modification) on them. Following the analysis of the financial obligations of the organization, the decision is made to honor them or not. Taking into account the nature and purpose of each, these financial obligations can be paid (expenses - invoices), returned (loans) or repurchased (bonds).

The technique used in the management of the organization's ***liquidity*** provides guidance to the evolution of the financial rights and obligations possessed in order to maintain *a current supra-unit liquidity*. Current liquidity is one of the most important financial rates of an organization and indicates the financial possibilities to cover its debts through short-term assets. Current liquidity is the ratio of current assets to total short-term debt. The higher its value, the more timely the organization can pay its current debts without resorting to long-term financial resources or loans. The liquidity of the organization may increase or decrease depending on the financial intentions of the organization.

From the social perspective (S), the enterprise consists of all human resources that contribute from a productive or unproductive perspective, directly or indirectly, to the achievement of the fundamental objectives derived from organizational strategy, specific or individual, and all organizational values that contribute to training, maintenance and change of the organizational culture. Thus, the micro and macro environments of the organization are reflected on the following three elements of composition: ***HR Efficiency, HR Satisfaction*** and ***Organizational Values***.

The techniques used in the management of ***human resources efficiency*** (n.a. HR professionalism) are based on the functions of development and maintenance of human resources.These techniques are:

- *employee training and development* - problem solving, case studies, presentations, demonstrations, discussions, document work exercises, role-plays, simulations, out-door experiential learning.
- *career management* - through professional training, expanding and enriching the content of work, offering career counseling, organizing evaluation and development centers, organizing workshops on career-related topics.
- *maintaining discipline, safety and health* - ensuring optimal conditions of hygiene, labor protection and strict compliance with work discipline as well as in carrying out programs to combat the causes of indiscipline at work (reduction of fatigue, de-alcoholization programs, ensuring consistency between the purposes of employees and those of the organization, etc.).
- *maintaining discipline, safety and health* - ensuring optimal conditions of hygiene, labor protection and strict compliance with work discipline, as well as in carrying out programs to combat the causes of indiscipline at work (reduction of fatigue, de-alcoholization programs, ensuring consistency between the purposes of employees and those of the organization, etc.).
- *employees' counseling and stress management* - in organizations there are many stressors that can affect the efficiency of employees' work, regardless of the hierarchical level at which they work. Stress is the adaptation response, mediated by individual characteristics, response generated by external actions or events that require from the individual a special mental and / or physical effort. Stress can be both positive (eustres) and negative (distress). It is not what happens to us that matters, but how we react. The Greek philosopher Epictetus said that people are not afraid of reality, but of the image they have of it (Cornescu et al., 2003, p. 240).

The techniques used in managing human resource satisfaction (HR satisfaction) are based on the functions of motivating and maintaining human resources. These are the following:

- *evaluating employees' performance* in order to: improve performance, plan human resources, pay, promote, improve.
- *rewarding employees by* - ensuring consistent, balanced and motivating financial and non-financial rewards.
- *analysis, design and redesign of positions* - aims to define how the objectives, tasks, competencies and responsibilities will be organized and integrated into the positions so that

their occupation will lead to increased staff motivation and make necessary corrections periodically (Cornescu *et al*., 2003, p. 239).

- *maintaining discipline, safety and health* as well as *employees' counseling and stress management* mentioned above.

The techniques used in the management of organizational values (*organizational identity HR*) are based on the functions of development and provision of human resources. These are the following:

- *organizational development* which aims to ensure healthy relationships within and between groups and to help groups anticipate, initiate and lead change. Organizational development presupposes the existence of a normative, re-educational strategy, likely to affect value systems, attitudes, which also involve the formal reorganization of the organization, in order to cope with the accelerated pace of change (Cornescu *et al*., 2003, p. 232).
- *planning human resources by* - discovering the right people, the necessary number of human resources, the knowledge, skills and experience needed for a particular position, establishing the optimal / appropriate place and time and using the allocated financial resources appropriately.
- *recruitment and selection by* - defining the position, attracting candidates, selecting future employees.
- *integration of employees through* - presentation of the organization, working conditions, disciplinary procedures, the possibility of union organization if necessary, medical facilities, transport, canteen, training policies, payroll, career paths.
- *training and improvement of employees* as well as *the management of the aforementioned careers.*

From the technological perspective (T), the enterprise consists of all the material means that are available to human resources in order to exploit them so as to carry out the productive and non-productive activities of the organization; they are expressed in accounting through two state variables: the value and the category of fixed assets. Thus, the micro and macro environments of the organization are reflected on the following three elements of composition: ***Technological efficiency, Technological flexibility*** and ***Technological efficiency.***

The techniques used in the management of ***technological efficiency*** (*as appropriate*) are the rigorous control of the situation of stocks, acquisitions and costs, the maintenance of technological production resources in a good state by: observing the technical verification terms indicated by the guarantee and ensuring their operation in the parameters indicated, stimulating the research and development activity within the organization. Taking into account the nature and purpose of each

mentioned action, the technological efficiency is given by the way in which the material resources of the organization are used and maintained through the actions of politically regulated human resources with technical purpose.

The techniques used in the management of ***technological flexibility*** (*as necessary*) are the control and the clear theoretical and practical delimitation between the range, the working and rest times, the possibility and favorability of adaptation and readaptation offered by the technical characteristics of a certain material technological resource. Taking into account the nature and purpose of each mentioned action, the technological flexibility is given by the capacity of material and human resources to adapt and be adapted by interaction to the way of working imposed by political regulations with economic purpose.

The techniques used in the management of ***technological efficiency*** (*what is needed*) are the preparation of human resources from a professional, multidisciplinary point of view in order to operate with the material means of the organization from two simultaneous perspectives: technical and economic. The technical one refers to the minimum use of technological resources with obtaining a maximum result, and the economic one resides in the strictly necessary commissioning of the material means in order to reach the predetermined target. Taking into account the nature and purpose of each mentioned action, the technological efficiency is given by the capacity of human resources to reach maximum results with the allocation of minimum resources as a result of the return of the investments of the politically regulated organization with social purpose.

Section 2 presents a possible methodology for monitoring changes in an organization, an approach that presents a unique point of view in terms of how the change in the company has been analyzed so far (by making a way of quantification) and how the strategic management (using indicators of change) can be applied on an organization.

2. A methodology for quantifying the status quo of an organization

The objective of the scientific research undertaken is to *define the most efficient and effective possible intervention, with potential for change, that can be performed at a given time on the organization.* Following this desideratum, I propose the following arguments that support the theoretical discourse:

- the organization is considered the reference point under analysis;
- the organization is interconnected with the four environments: social, political, technological and economic;

- the condition of the averages can be translated into statistical data through relevant indicators;
- when the environment changes, there is a change in the organization due to the chain reaction and the dynamic balance that Lewin (1943) talks about (when the change is created, an imbalance is created).

The methodology of the process of quantifying the status quo of the organization is, through the ways of quantifying and defining the triggers and opponents of change, as complex as it is varied and difficult due to the following considerations:

- encompasses *all the sociological, technological and economic elements* of identification and description of the organization from all four environments (social, political, technological and economic) and its two dimensions (micro and macro);
- the triggers, with the highest degree of occurrence and generality, are divided into and measured by *three types of indicators*: concrete (have default values or are assigned existing values from the organization's environment), abstract (quantifiable by methods of sociological or non-quantifiable research);
- *the large volume of data,* collected following the research of questionnaires and market studies aimed at measuring and / or evaluating phenomena and processes in the dimensions of the organization (abstract indicators), must be constantly correlated with concrete indicators. This correlation is needed to calculate the effect of potential change.

2.1. Quantification of concrete indicators

The concrete indicators characterize the factors, with high potential of influence on the organization, that have values established within and following the social, political, technological and economic processes with quantitative specificity and with a palpable result.

In order to collect the data needed to give values to concrete indicators (measurable by weights, percentages/ decimals or values expressed in units specific to the process in question), it is necessary to resort to the following actions:

- Analysis of the organization's documents: financial-accounting records, formal organization, reports. This can be done by: reading, writing, comparing, calculating, measuring;
- Analysis of the market (at micro level) in which the company operates and its position in relation to stakeholders through: official public digital documents;
- Analysis of the macro context of operation of the organization by including national and international bodies for the analysis of flows, trends, trends and statistics in the macro-social,

-political, -technological and –economic environments. The analysis will be made on official public digital documents.

The sources of information on concrete indicators can be divided into: physical or electronic primary sources (scientific articles, reports and analyzes provided by specialized national and international institutions, accredited and recognized in the structuring of statistical data), physical or electronic secondary sources (collection and synthesis documents information, the written press) and physical or electronic tertiary sources (encyclopedias, discussion forums, webblogs and personal web pages).

For the purpose of achieving the process of quantifying the status quo of the organization, it is recommended to abandon tertiary sources of information and use as few secondary sources of information as possible. The primary sources of information must have the highest share in data collection in order to give values to concrete indicators because the latter have the following characteristics:

- They are the objective and credible results of novelty research in a certain field;
- They can be cited easily and confidently because they are verified and recognized;
- The verification of the information is done systematically and thoroughly by specialists.

Reliable sources must be apolitical in nature and have no interest other than to provide real and characteristic data to the matter in question in an objective and effective manner; some suitable examples are considered:

- The World Bank Group[2]
- Euromonitor International[3]
- Earth Trends Environmental Information[4]
- The Economist Intelligence Unit Limited[5]
- National Institute of Statistics[6]
- Organisation for Economic Co-operation and Development[7]
- Central Intelligence Agency, *The World Factbook*[8]

2 http://www.worldbankgroup.org/, căutare termen: „Romania”

3 http://www.euromonitor.com/, căutare termen: „Romania”

4 http://earthtrends.wri.org/, căutare termen: „Romania”

5 http://viewswire.eiu.com/, căutare termen: „Romania”

6 http://www.insse.ro/cms/rw/pages/index.ro.do

7http://www.oecd.org/home/

8https://www.cia.gov/library/publications/the-world-factbook/index.html

2.2. Quantification of abstract indicators

In quantification, the verbal formulations of indicators, especially social and political ones, are related to their quantitative expressions, using certain standards and criteria for this purpose. "The researcher's task is to retain the most natural wording, given the way in which the population perceives the area analyzed, but which is significant in relation to the objectives pursued in the research."[9] The first stage of the investigation consists in determining the object which, in the case of the present research, is each indicator of the change. The establishment of the survey universe and the composition of the sample precede the pre-testing of research tools to guarantee the accuracy and relevance of the feedback received.

The investigation and quantification strategies, in terms of abstract indicators, are:

- Methods and techniques for collecting empirical data;
- Empirical data processing techniques;
- Procedures for analysis, interpretation and construction or theoretical reconstruction based on empirical data.

In order to strengthen this approach that deals with both methods and techniques and procedures which are used synchronously, and have the purpose to quantify the status quo of the organization, we mention here the path from theoretical to empirical described by Chelcea (2001, p. 18): "if the investigation represents a method, the questionnaire appears as a technique, the method of application ... through self-administration, as a procedure, and the actual list of questions (the printed questionnaire), as an investigative tool."

The most commonly used primary data collection methods are the documentary research, the interview, the observation and the experimentation. The choice of data collection method is influenced by the researcher's availability of resources such as money, time or facilities.

The documentary research method involves historical analysis and comparative combination and is performed when a study is either completely historical or has a defined historical dimension.

The observation method (field work) can be applied with the help of human resources or by automation. The accuracy of the information obtained from this method is high but it has a major disadvantage in terms of revealing motivations, attitudes or opinions, explaining what happens but not why it happens. This method has been used in the development of indicators specific to the drivers of change and serves to detect the forces opposing change in the enterprise.

9 See www.dictsociologie.netfirms.com – Dicționarul de sociologie, căutare termen: „cuantificare".

The method of the survey by interview or questionnaire consists either in interviewing a limited number of people representative for a certain social group targeted by the research direction, or in applying a questionnaire regardless of the size of the sample. The types of interviews are: personal, where it is assumed a direct contact face to face with the subject, telephone and mail, physical or electronic. The latter are the most profitable in terms of financial resources but have a low response rate, feedback. The use of these methods is considered in the process of quantifying abstract indicators that require a different approach from that for concrete indicators.

The experimental method (experiment) can provide valuable information on a large scale despite the fact that research is done in a limited way. This method seems to be costly in terms of time and financial resources. This method will be used in testing the developed models and in concluding the results obtained from the research within the doctoral internship.

In order to process the empirical data related to defining abstract indicators for change management, the following elements are defined:

- creating, completing and updating an electronic database of empirical data collected;
- performing significance tests and calculating the correlations of the indicators;
- valid, accurate and sensitive coding (condensation, systematisation and normalization) and tabulation of information (manual, mechanical and electronic) showing their frequency of occurrence.

In the technical sciences, as well as in the economic ones, mathematical modeling is done with the help of classical mathematics tools. In order to model change management in an enterprise, the first approach is to try to quantify the status quo of the organization. To achieve this goal, we start from the assumption that there are defining indicators of change in the enterprise, characteristic of the triggers of change. These indicators are divided into two types, concrete and abstract, and in order to quantify the status quo of the organization, it is necessary to approach them in parallel.

For this reason and due to the fact that the data that help to compose the indicators can never be established and evaluated with full precision, the research on quantifying the status quo of the organization uses the fuzzy logic analysis procedure (see, Irimiaș and Pop, 2016). Fuzzy logic gives the process of modeling the organization's status quo some room for maneuver, in terms of accurately measuring the parameters of the change detection and quantification model, for the following two reasons:

- Real situations are often unclear and confusing as to their delimitation and cannot be accurately described.

- The detailed description of a real system, such as the enterprise, requires a conglomeration of detailed data that a human being cannot recognize, perceive, process and understand at the same time.

3. Proper diagnosis of the status quo of the organization

"By definition, an indicator is used to measure an objective to be achieved, a resource to be mobilized, an effect to be achieved, a quality level or a contextual variable" (MDLPL, 2007, pp. 17).

The purpose of this theoretical approach is to develop a functional framework for a system of indicators that aims to quantify the status quo of the organization. The approach of this procedure is the calculation of the forces and measures with which the intervention must be made on the organization in order to successfully start the process of managing and consolidating the organizational change. In addition to defining the triggering forces of change, this system of indicators allows effective and efficient monitoring.

When the management of a company aims to create a sense of urgency for change or crisis (compare Lorsch, 1986; Kotter, 1996; Teigland, 2009; Burnes, 2020), it needs support in order to take some decisions and policy approaches. From this point of view, the indicators can be at the disposal of the organization's management. They can transform social and abstract information into measurable units that can be used in the change management process.

The indicators of science, technology and innovation are essential in “telling the story of economic and social change” (Arundel *et al*., 2007). Thus, the focus will have to be shifted from the measurements on activities, to the measurements on impacts, in order to be able to observe the consequences of activities, such as innovation, and to support the monitoring of managerial interventions.

At present, the best opportunities and ways to improve living standards and reduce poverty have their origins in technological innovation, which is one of the main determinants of economic growth, as pointed out by Aghion and Howitt (1997). It is possible to observe the high degree of incidence of those stated by the fact that, at present, the need, still unsatisfied, for the analysis of the institutional forces triggering technological and economic changes has intensified. Only by analyzing and quantifying these factors can patterns and patterns of origin, development and dissemination of science and technology be discovered. This socio-institutional environment can lay the foundations for innovations that transform current luxury products and services into tomorrow's products - cheap and accessible to anyone (Coccia, 2010).

Moreover, state funding and aid for research and development can be considered relevant and justified as these investments return in the form of an increase in national economic well-being and in the form of higher living standards for society. Public funding, for example, of research and development may have a direct impact on the economic performance of enterprises or may indirectly influence their own R&D expenditure. This example highlights that a macro-level decision or event can influence the micro level of the organization.

It is added that the factors that determine innovation are part of the economic system and depend on the institutional structures and political regimes of countries which, through legislation, social rules and education systems, represent the catalysts for change. As Coccia (2010) observes, studies on the best political regimes are the main topics of discussion that relate to social and economic progress. The author completes by analyzing the political regime, which like all social institutions, is an entity that can adapt or respond to changes in the external environment.

An indicator system in an organization allows, in addition to defining the triggering forces of change, effective and efficient monitoring of the process of change. From this point of view, the indicators can be at the disposal of the organization's management. The features of the indicators specified in the change detection operation can be structured as follows:

- *indicators* can characterize the status quo of *an organization at a given time*;
- *the values that make up the indicators* come from the *social, political, technological and economic environments* that correspond to *the micro and macro dimensions of the organization;*
- *changing the indicators* has the effect of the need for a response, a *reaction from the organization;*
- *indicators are assigned values* or have *default values*.

Following the undertaken theoretical approach, the following characteristic elements of the change management quantification process have been found:

- The success of implementing a change on an enterprise is conditioned by: the moment, the content, the process and the context of its development.
- In order to highlight the catalysts for change in an enterprise, an overview of business processes, tangible and intangible material flows is needed.
- Recommendations on the selection of the set of indicators:
    - Quantitative perspective:
        - The set of indicators will be dimensioned without losing or neglecting the big picture and the origin of the basic information.
        - It provides the possibility to include additional information within a constant measurement limit.

- Procedural perspective:
  - In future processes of testing and refining, the chosen indicators will tend towards a certain symmetry that can facilitate their comparison and development.
- Qualitative perspective:
  - The selected indicators will be considered relevant in summarizing the complex, multi-dimensional reality of the organization.
  - They will facilitate communication with all parties involved through the broad scope of definition and will promote accountability.
  - They offer users or interpreters the ability to effectively compare complex dimensions.

Next, the methodology for diagnosing the stage of the organization will be presented by characterizing and quantifying the indicators and defining the forces that oppose the change. The forces that oppose the change will be discussed from a theoretical point of view and highlighted as a result of the moment of the analysis of the triggering forces because:

- The opposing forces of change are visible only at the point where the nature, magnitude and impact of the change that needs to be undertaken is known;
- The most important forces opposing change come from the area of sociology and their neutralization is possible by selecting and using change management methods and techniques, specific and adapted to the nature and type of potential change in the enterprise.
- Effective change management is possible only through continuous monitoring and control that continuously reflect the resulting force (frequency and extent of use of methods and techniques) with which change must be conducted for effective barrier neutralization and successful implementation.

Conclusions

The role of leaders and managers in a changing environment, by creating the urgency of change, among other things, is fundamental to the overall success of enhanced change. It is important to consider the impact of change on employees and culture while aligning with the vision, mission and strategic values assumed. Because change is already a way of life in the structures of any organization, by practicing its proper management, based on transparency, ethics and accountability, it can mean positive and successful experiences. Thus, the management of an organization requires knowledge of the relevant environments and dimensions to score optimal results in accordance with the strategy imposed by the vision and mission of the business undertaken.

It can be concluded that the situations that the company faces on a daily basis are, in most cases, under the sign of uncertainty. Hence, difficulties in describing these situations that allow only attributes derived from qualitative natural language, such as: customer satisfaction, brand impact, low/ reduced competitiveness, attitudes and social values. These examples highlight the problems that arise in using accurate mathematical models to describe and process inaccurate and unclear data/ information.

In this scientific approach, the methods and techniques applied in the realization and completion of *the process of quantification of sociological indicators and the process of conferring values to the usual indicators of political and technical-economic profile* are analyzed. Having a predominantly normative character, the methodology of the process of quantifying the status quo of the organization formulates investigation strategies, indicating both common difficulties and shortcomings and highlighting ways to obtain valid results from a scientific and practical point of view.

As mentioned in this scientific discourse, an effective way to realistically capture the timing and magnitude of change is to adopt and define *composite indicators*. These are, according to Arundel *et al*. (2007), compilations of singular indicators, which appear when it is desired to define a *multi-dimensional conceptual model*. Thus, the methodology of conferring values to indicators, concrete and abstract, which detect and measure change in the enterprise, was specified. If the factors with a high degree of abstraction are followed, by specifying the quantitative aspects, the nature and the characteristic expressions of the necessary indicators, subject to analysis, the quantification prepares and makes possible their measurement. For this reason, quantification is sometimes analyzed as part of the operationalization of concepts, other times as part of measurement.

From the perspective of the methodology of the process of quantifying the status quo of the organization, quantification can be nominated as a distinct stage of concrete research, not only because of its importance but also because of the sequence of the research process in which it falls, either before gathering information, by incorporating quantitative descriptions in the measuring instruments, or after collecting the information, based on the analysis of their structure.

According to the Ministry of Public Works and Housing Development (2010), an indicator provides quantitative information, with the role of helping the factors involved in public interventions to communicate, negotiate and make decisions. An indicator quantifies an element considered relevant for the monitoring and evaluation activity within a program. A good indicator must provide simple information that can be easily communicated and understood by both the provider and the user.

A complete analysis of change must contain both macro and micro elements characteristic of the enterprise which, according to the principle of sustainability, is part of the economy, which in turn is part of society, both (economy and society) being embedded in the natural environment whose state and status conditions the existential framework of the enterprise. This paper emphasizes the importance of the drivers of change, highlighting their characteristics by dividing them in dimensions and, more specifically, in source-environments.

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