METHODOLOGICAL CONTRIBUTIONS
TO THE ASSESMENT OF PROSPECTS FOR SUCCESS
OF CHANGE PROCESSES IN MANUFACTURING

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ABSTRACT

In an environment in which the only constant is the change, there is a continuous concern to maximize the outcome. Chances of success, regarding the achievement of the settled level, increase in proportion to their orientation to analyze the framework in which the change is implemented and its adaptation to the necessary condition.

Based on knowledge and results of research a tool was accomplished to prior evaluation of chances of success in the implementation of a change project in the production activity.

Using the instrument of prior evaluation of chances of success offers an overview of the relevant characteristics to achieve the ultimate goal. Based on this diagnosis it can be recommended a development plan of the weak components, or of those that show improvement potential.

KEYWORDS: *change, prior evaluation, evaluation tool, continuous improvement, manufacturing*

The main goal of change management is to implement with success the new processes, products and technologies, by minimizing the negative aspects. A change is generated either by economical reasons or by the need of organizational structure improvement, or this change can be generated by both reasons, with a single purpose: the competitiveness of the company in the industrial specifically domain. These reasons have been identified through a study realized by application of a questionnaire to the companies with manufacturing profile in the Bistriţa–Năsăud County. In the majority of the collected answers there have been found the following aspects as generating changes: cost reduction, inefficient organizational structure, the existence of an unadapted organizational structure in conducting the activity and the own process improvement. In the production function, the improvement direction is the ground for the implemented changes.

The preparation phase of the implementation of a change needs a proportional attention with the potential impact in the final result. Often the preparation phase is mistaken for the establishment of the plan and with defining the persons in charge and their responsibilities. In the context where change is necessary in a business, there is the certitude that the change projects are to be a continuous process, the preparation phase starts with professional development of the employees and the system and processes adjustment or the adjustment of the ones to be created.

Thereby, the identification of the necessary development level in these directions is needed, a level which is based on the expectations and needs of a company and on the monitoring of the developments.

Based on the knowledge and the results of the research activity, an evaluation tool ex/ante of the success chances was built in order to implement a change project in the production activities. This can be used as a startup for preparing a plan for "insurance of fulfillment of objectives", following the continuous improvement process. The organization can be described through an implementation team, the favorable or not favorable climate to change and the communication climate, by applying the developed method, we will analyze and take into consideration the lessons learnt until present by the company, the obtained results and the ability to learn from the encountered problems. In addition, the characteristics of the process submitted to changes can shape the chances of success of the implementation and this it presents a guide source in order to set achievable objectives.

In order to test the applicability level of the pre-evaluation tool for the chances of success of the change projects, we will use a study applied in a manufacturing company in the automotive industry. In this case study a group of 9 members was involved in improving a process in the technological flow.

The pre-evaluation tool of the chances of success of the change project leads to a graphic representation. The practical application, presented later in the paper, is materialized in figure 1.
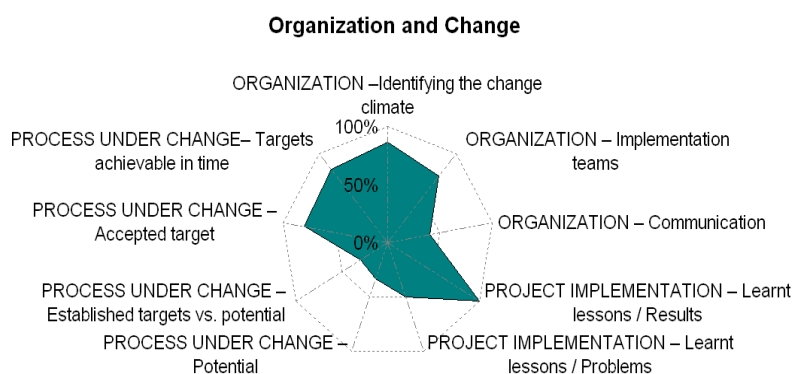
Organization and Change

Figure 1 Organization and Change

Sections that are visualized are presented in Table 1.

Explanation of visual representation

Table 1

ORGANIZATION	Identifying the change climate
	Implementation teams
	Communication
PROJECT IMPLEMENTATION	Learnt lessons / Results
	Learnt lessons/ Problems
PROCESS UNDER CHANGE	Potential
	Stability/ Training for changing
	Established targets vs. potential
	Accepted target
	Targets achievable in time

Using the proposed instrument requires three steps:
1. Data collection
2. Review of results – based on the obtained graphical representation
3. Prepare an action plan for increasing the chances for success in implementation of a change.

Data collection is done by applying a set of relevant questions. The number of these questions was reduced to the minimum in order to facilitate obtaining clear results, focused on the directions with impact in final results.

These questions are:

"ORGANIZATION – Identifying the change climate"
1. How necessary is the change to be implemented?
2. In what proportion do you consider that there are available resources, information and improvement support?
3. What is the trust degree from the management for the implementation team?
4. To what extent does the vision answer your questions about the future?

"ORGANIZATION – Implementation teams"
1. Is there a desire for involvement in the project?
2. Is there the necessary know how?
3. Do you consider the team adequate for implementation of such a change?
4. Are the roles and the responsibilities of the teammates clear?
5. Did the team establish clear targets regarding the implementation of the change?
1. Did the team communicate the established targets?
2. Are there skills for solving conflicts?
3. Does the team have support from the management?

"ORGANIZATION – Communication"
1. What is the information level about the plans and the progress?
2. Are there sufficient opening to allow for communicating ideas to the management team?
3. Do you know the communication tools and ways used by the company?
4. Do you think that the management team knows the way its employees have perceived the message?
5. Do you know the latest decisions and changes?
6. Is it necessary for you to check frequently whether the communicated information is accurate?
7. Do you have timely access to information?

"PROJECT IMPLEMENTATION – Learnt lessons / Results/ Problems"
1. To what extent the results were achieved? 5 – Exceeded; 4 – Accomplished; 3 – Underachieved -10%; 2 – Underachieved -20%; 1– Underachieved by more than 20%.
2. To what extent was the statement found "The implementation took longer than the allocated time?" as problem in the last implemented change project?
3. To what extent in the last implemented change project the following problem appeared: "The implementation took longer than initially planned"?
4. To what extent in the last implemented change project the following problem appeared: "The coordination of activities was not effective"?
5. To what extent in the last implemented change project the following problem appeared: "Implementing conflicting activities lead to crises which distracted attention from implementing the strategic decision"?

6. To what extent in the last implemented change project the following problem appeared: "The skills of the staff involved in implementation were not sufficient"?
7. To what extent in the last implemented change project the following problem appeared: "The training of operators was not effective (by mismatching the information with the needs)"?
8. To what extent in the last implemented change project the following problem appeared: "Uncontrollable factors in the external environment had a negative effect on implementation?

"PROCESS UNDER CHANGE – Stability/ Training for change"
1. What is the difference between the cycle times of the supplier's and customer's processes? 5: over customer's cycle time by 10%; 4: equal to customer's cycle time; 3: under customer's cycle time by 10%, 2: under customer's cycle time by 15%, 1: under customer's cycle time by more than 15%
2. What is the actual level of efficiency of the process, in comparison with the potential efficiency, considered at the level of 100%? "5: over than 100%; 4: equal with 100%; 3: between 99-90%; 2: between 89%-80%; 1: less than 80%.
3. Which is the current level of quality level versus proposed goal? 5: current level is lower than goal by 30%; 4: lower by 20%; 3: lower by 15%; 2: lower by 10%; 1: no major difference;

"PROCESS UNDER CHANGE – Established targets vs. potential"
1. What is the difference between the objective set for the cycle time of the process to be improved and customer's cycle time? 5: +10%; 4: equal; 3: -10%; 2: -15%, 1: more than 15% under customer's cycle time.
2. What is the difference between the potential efficiency (considered as 100%) and the efficiency objective? 5: over 100%; 4: 100%; 3: 90%, 2: 85%, 1: less than 85%.
3. What is the difference between the potential quality objective and the proposed objective ("zero defects" is the potential quality objective)? 5: none; 4: 5% defects; 3: 10%, 2: 15%, 1: more than 15% defects.

"PROCESS UNDER CHANGE – Accepted target"
To what extent do you think the proposed targets are achievable? 5: the targets can be exceeded by 10%; 4: the targets can be met 100% ; 3: targets will be missed by 10%; 2: missed by 15%), 1: missed by more than 15%.

"PROCESS UNDER CHANGE – Targets achievable on time"
Are you sure that the project will be finalized in time? 5: yes; 4: very likely; 3: I don't know; 2: very unlikely; 1: no.

The questions that require non-quantitative evaluations were answered using a Likert scale: 1 – full disagreement, 2 – disagreement, 3 – neutral, 4 – agreement, 5 – full agreement.

The applicability of the tool is not limited by the user's company size. Figure 2 presents the way collected data is entered by respondents.

The answers to the questions have been graphically represented for the tool to offer a clear image of the existing situation and of the employees' perception of the aspects of change.

In addition, there is a possibility to graphical represent the specific levels of each section (figure 3)

	Answer 1	2	3	4	5	6	7	8	9	Max Va	Procentaj
	9									5	100%
ORGANIZATION –Identifying the change climate	5	4	4	4	4	5	4	5	5	4,333	87%
1. How necessary is the change to be implemented?	5	5	5	5	5	5	5	5	5	5	100%
2. In what proportion do you consider that there are available resources, information and improvement support?	5	5	4	4	5	5	4	4	5	4,556	91%
3. What is the trust degree from the management for the implementation team?	5	4	3	2	4	5	3	5	4	3,889	78%
4. To what extent does the vision answer your questions about the future?	5	3	3	4	3	4	4	4	5	3,889	78%
ORGANIZATION – Implementation teams	3	4	4	3	4	4	4	4	4	3,764	75%
1. Is there the desire of involvement in project?	3	4	5	4	3	4	4	5	4	4	
2. Is there the necessary know how?	3	4	3	4	4	3	4	2	4	3,444	
3. Do you consider the team adequate for implementation of such a change?	3	4	4	4	5	5	4	5	5	4,333	
4. Are the parts and the responsibilities of the teammates clear?	3	4	3	1	3	4	3	3	4	3,111	
5. Did the team establish clear targets regarding the implementation of the change?	3	2	4	3	4	4	5	3	4	3,556	
6. Did the team communicate the established targets?	4	4	4	4	4	4	4	4	4	4	
7. Are there abilities of solving of conflicts?	4	3	4	3	4	4	4	3	4	3,667	
8. Does the team has support from the management side?	4	3	5	4	4	4	3	4	5	4	
ORGANIZATION – Communication	4	4	4	3	4					2,016	40%
PROJECT IMPLEMENTATION – Learnt lessons / Results	5	5	5	5	5	5	5	5	5	5	100%
PROJECT IMPLEMENTATION – Learnt lessons / Problems	2	3	3	3	3	2	3	3	2	2,492	50%
PROCESS UNDER CHANGE – Potential	2	2	2	2	2	2	2	2	2	1,667	33%
PROCESS UNDER CHANGE – Established targets vs. potential	2	2	2	2	2	2	2	2	2	1,5	30%
PROCESS UNDER CHANGE – Accepted target	4	4	4	4	4	4	4	4	4	4	80%
PROCESS UNDER CHANGE– Targets achievable in time	4	3	5	4	4	4	5	4	4	4,111	82%
										3.61	**72.21%**

Figure 2 Entering collected data

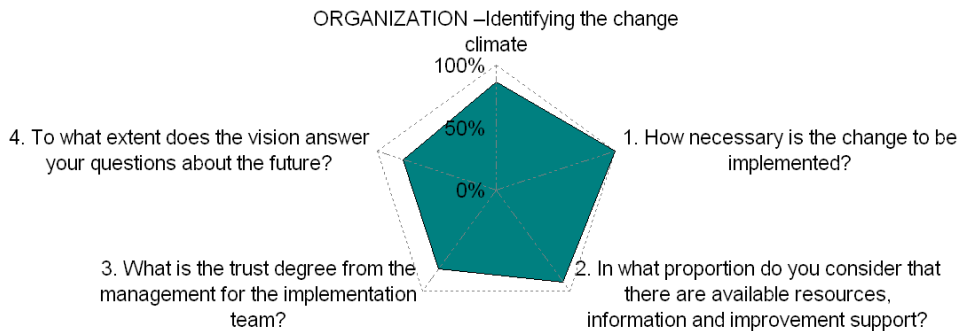**Organization and Change**

Figure 3 Graphical Representation for ORGANIZATION – Identifying the change climate

Processing of the responses started from the matrix bellow (figure 4). We find the answers of each respondent for each question on the columns. The number of columns represents the number of respondents. Each line represents the answers to each question.

$$\begin{pmatrix} 5 & 2 & 3 & 2 & ..... & 2 \\ 1 & 3 & 2 & 1 & ..... & 1 \\ 1 & 1 & 1 & 1 & ..... & 2 \\ . & & & & & \\ . & & & & & \\ . & & & & & \\ 1 & 2 & 3 & 4 & ..... & 5 \end{pmatrix}$$

Figure 4 Processing of the responses

If we will consider as:
        i = the answer to a question, and
        n = number of the questions,
the value of the applied formula presented below, it is the one represented in the final graphic.

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$$

This value will describe the characteristics which were designed to be used. The "radar" graph has 3 main sections: Organization, Project implementation/experiences, and the Process to be improved.

In the end conclusions will be drawn based on the graph which is and analyzed by the three sections mentioned above:

1. The organization has a very favorable climate for change, but communication needs an action plan for improvement. The management's confidence in the implementation teams can be increased by providing teams with the needed level of knowhow and by including in the teams members who have proven expertise on specific matters. The competences of the implementation team members should be evaluated with reference to the required level, having in view both the aptitudes and skills. Cohen (2005) has developed a model based on a check list which can be used for the selection of suitable team members. The organization can benefit in the long term from such an approach since the premises for the successful implementation of change projects will be created.

2. Regarding the experiences already "lived" by the company in the most recent implementation of change, we can say they were positive. The excellent results achieved compared to the initial goals prove the statement. Besides, fewer than 50% of the problems the implementer often faces were found in the finalized project. The goal for the next project is to reduce or do away with the "classical", already known problems.

3. The proposed goals for improving the process undergoing change are largely accepted by the respondents (80%). They believe the objectives can be achieved on time. The improvement potential of this project is not very high and the goals set by the project team are placed above the potential.

4. The process selected for change should present high improvement potential in order to obtain results of high impact. (In this respect, the recommendation is to address

20% of the problems in order to obtain 80% of the results). Also the level of process stability is characterized and the proposed goals are compared with the already defined potential. It is important to know the acceptance level of the objectives by the employees.

We consider the indicator reported in this paper as preliminary, and 72,21% is a likely assessment of the chances of successful implementation. The next step in our research should lead to refining the calculation of this indicator.

5. The tool for the pre-evaluation of the chances of implementation success needs improvements by bringing in new relevant aspects and by completing the set of questions in order to be able to make a clearer diagnosis. The aspects that we identify as having impact on the results following the implementation of change, in the production area and elsewhere, are demographic diversity/diversity in behavior, organizing, leading style, motivation as a determinant of behaviors, emotional intelligence, understanding and accepting change. Those aspects can be accounted for by completing the tool with specific questions. We will also try to capture the real chances of implementation success in an easy to use indicator.

6. In a similar manner, we intend to develop a method for the post-implementation evaluation of a change project. This is to be developed as a set of tools (e.g., programming the closing of the project and the follow-up, evaluation of the characteristic of affected processes, implementation ways, "learnt lessons").

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