

## QUALITY INSTRUMENTS UTILISED IN PROJECT MANAGEMENT

Dan Săvescu<sup>1</sup>, Mihaela Georgia Sima<sup>2</sup>, Simona Clara Bârsan<sup>3</sup>

<sup>1</sup> Transilvania University of Braşov, [dsavescu@unitbv.ro](mailto:dsavescu@unitbv.ro)

<sup>2</sup> Bucharest Chamber of Commerce and Industry, [georgiasima@yahoo.com](mailto:georgiasima@yahoo.com)

<sup>3</sup> ICIA-CENTI Cluj- Napoca, [simonaclara\\_barsan@yahoo.com](mailto:simonaclara_barsan@yahoo.com)

**Keywords:** quality, project management, cause-effect, control, evaluation

**Abstract:** paper presents some aspects regarding instruments utilized in project management, starting with the cause - effect diagram, Pareto diagram, control graphics, also methods of evaluation and control, meaning people, informance, materials, and finance. There are presented under a table form questions requiring answers to all the problems that are to be solved by the project leader (PL).

### 1. Introduction

“An organization and its suppliers represent interdependent entities; a mutual relation with bilateral benefit helps both parts to create values”

Based on this principle, the requested actions are:

- Identifying and selecting key suppliers;
- Finding relations that establish an equilibrium between the benefit obtained short run with this influences upon the organization on long time run or, for society in general;
- Create a clear and open communication channel;
- Initiate actions for process and products improvement;
- Establish a good understanding of client' needs;
- Disseminate information taking into account futures plans;
- Recognize supplier's improvement and realizations.

Benefits obtained from this principle are useful to: formulate strategy and politics for the company; define objectives; operational management; human resources management.

### 2. Quality instruments used in project management

#### 2.1. Cause- Effect Diagram

Studying this diagram is important because:

- It allows the identification of causes for a particular effect;
- Identifies ways of efficiency, efficacy improvement.

In figure 1, there are presented causes like: man, machine, method and material (the 4 “M”), that produce effects, presented as questions.

Table 1 also presents generally questions that need answers from all implicated parts [3].

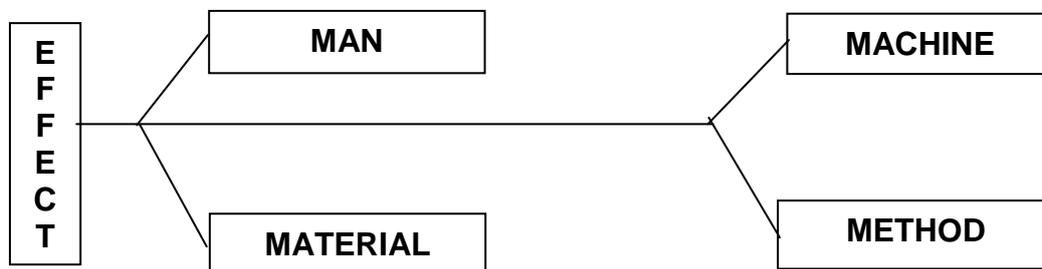
**Table 1**

WHO?	WHERE?	WHY?
<ul style="list-style-type: none"> <li>• Who is usually doing it?</li> <li>• Who does it now?</li> <li>• Who should do it?</li> <li>• Who else can do?</li> <li>• Who else should do?</li> </ul>	<ul style="list-style-type: none"> <li>• Where does something need to be done?</li> <li>• Where is it done?</li> <li>• Where should it be done?</li> <li>• Where else can it be done?</li> <li>• Where else should it be done?</li> </ul>	<ul style="list-style-type: none"> <li>• Why should he do it?</li> <li>• Why do it?</li> <li>• Why do it there?</li> <li>• Why do it then?</li> <li>• Why do it this way?</li> </ul>

WHAT?	WHEN?	HOW?
<ul style="list-style-type: none"> <li>• What is to be done?</li> <li>• What is being done now?</li> <li>• What should be done?</li> <li>• What else can be done?</li> <li>• What else should be done?</li> </ul>	<ul style="list-style-type: none"> <li>• When is there something to do?</li> <li>• When is it done?</li> <li>• When should it be done?</li> <li>• When else can it be done?</li> <li>• When else should it be done?</li> </ul>	<ul style="list-style-type: none"> <li>• How can it be done?</li> <li>• How is it done?</li> <li>• How should it be done?</li> <li>• Can this method be used in other fields?</li> <li>• How else can it be done?</li> </ul>

Does he respect the standards?  
 Is his work's efficiency acceptable?  
 Is he aware of some problems?  
 Is he responsible and temper minded?  
 Is he qualified?  
 Does he have experience?  
 Is he on the right job?  
 Is he eager for improvement?  
 Are there good human relationships?  
 Is he healthy?

Does it meet the production requirements?  
 Does it meet process possibilities?  
 Is its lubrication adequate?  
 Is its inspection adequate?  
 Is it regularly shut down due to mechanical problems?  
 Does it meet precision standards?  
 Is its position adequate?  
 Are there sufficient facilities?  
 Is everything OK for production?

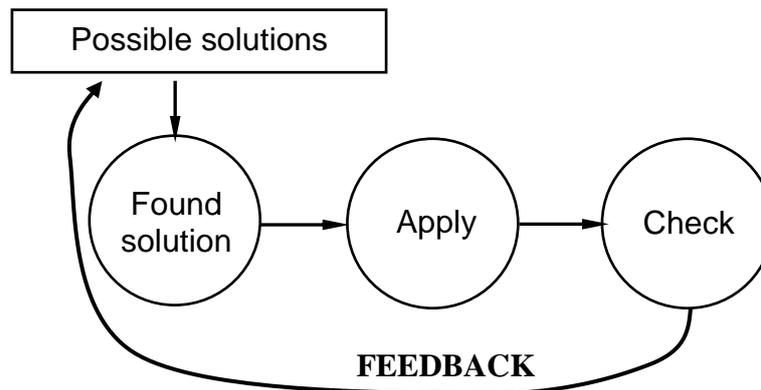


Are there volume errors?  
 Are there brand errors?  
 Are there equality errors?  
 Does it contain impurities?  
 Is the stock level adequate?  
 Are there some technological wastes?  
 Is the handling adequate?  
 Is the process canceled?  
 Is its positioning convenient?  
 Is the quality standard adequate?

Are work standards adequate?  
 Are standards exceeded?  
 Is the method effective and efficient?  
 Does the method ensure a good product?  
 Is the work sequence adequate?  
 Is the method's implementation correct?  
 Are the temperature, ventilation, illumination and humidity adequate?  
 Are there adequate links between previous processes and the next ones?

**Figure 1. Questions referring Cause – Effect Diagram**

Finding solutions represents the improvement plan of quality (Deming cycle: P - plan, D - do, C - check, A - act), first of all is to check, after to apply, finding solutions from a data base of possible solution, also taking into account the feedback (figure 2) [3, 8].



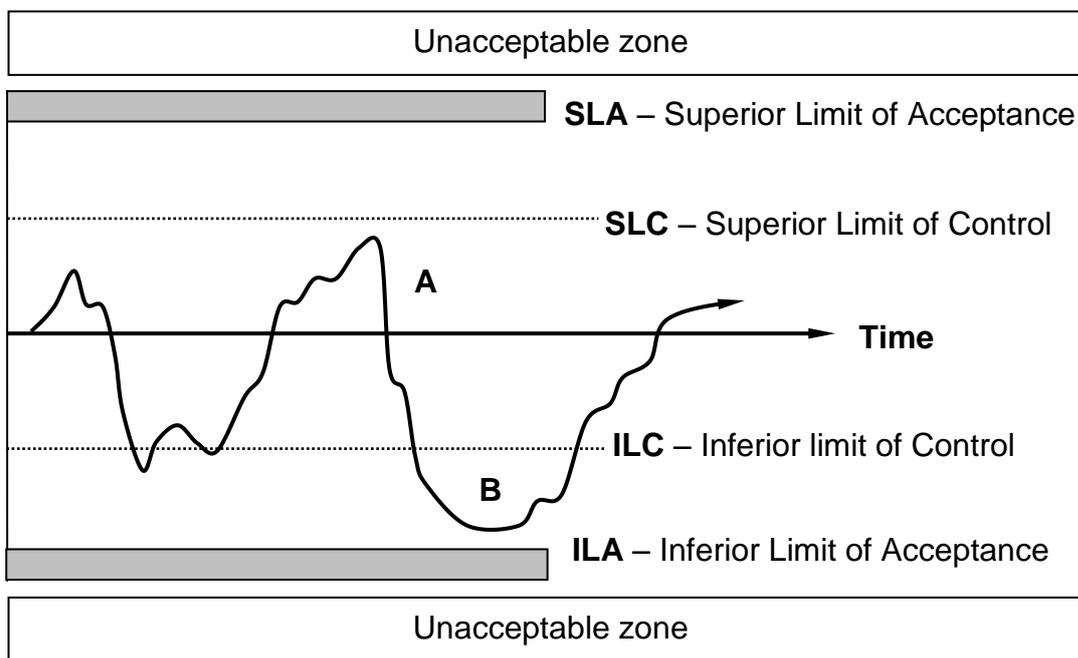
*Figure 2. Ways from check to solution based on Deming cycle [8]*

## 2. 2. Pareto Diagram (Pareto rule)

It is the rule 80 – 20.

- E. g.:
- 20% of clients give 80% of profit;
  - 20% of stock (material for products, material) cost 80% of total value.

## 2.3. Control graphics



Zone A – the process is stabile, variations are natural, predictable, due to internal factors;

Zone B – the process is instable, out of control, variations causes to external factors [2, 3].

*Figure 3. Control graphics*

Control graphics are utilized to survey economic processes. For the critical parameters of project/production there are registered all graphic values, in different moments. The control is assured if the obtained values are between acceptable limits. For example, the project budget is established between a superior and inferior limit, under which there is a tunnel of acceptance, related to project planning [2, 3, 10].

There are a lot of other instruments for the quality control of project activities. For example: affinity diagram, relationship diagram, tree diagram, matrix, alternatives, flash, analyze of principals components, histograms, stratifications, flux diagram and so on. What is important is to know clients and their needs, to know if all is established in preplanning period, or there a good negotiation team should exist, with the specific purpose of finding out precisely what these clients need. If one manages to satisfy them, the success is assured.

A study made in USA by Westinghouse shows that there are 6 ways to lose yours clients:

- Client dies .....1%
- Client change his address.....3%
- Client has a friend unsatisfied by you .....5%
- Client „stolen” by competition .....9%
- Client unsatisfied .....14%
- Client’s believes that you don’t care about him..... 68% [1, 3].

Having alternatives means a good management, as seen in table 3

**Table 3**

PROCESS	ALTERNATIVES
<ul style="list-style-type: none"> <li>◆ Ensuring raw materials;</li> <li>◆ Ensuring a good work environment;</li> <li>◆ Acquisitioning materials;</li> <li>◆ Participation of team members;</li> <li>◆ Managerial leading on.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Manufacturing <b>or</b> from exterior;</li> <li>◆ One location <b>or</b> more locations;</li> <li>◆ Stock <b>or</b> JIT;</li> <li>◆ Consultations <b>or</b> negotiations <b>or</b> imposed decisions;</li> <li>◆ autocrat <b>or</b> participative <b>or</b> permissive <b>or</b> tyrannical <b>or</b> ...</li> </ul>

### 3. Evaluation and control

If something cannot be measured, it cannot be managed.  
 If it cannot be managed, it cannot be improved. (W. Clarke)

This rule is correct: a project’s **SUCCESS = 50% PLANNING + 50% CONTROL.**

The basics elements of control:

- 1) Standards regarding performance level;
- 2) A technical measuring method, instrument;
- 3) Comparison of the achieved performance as compared to the forecasted one;
- 4) Deviations estimating „plus" or „minus" compared to the estimated;
- 5) Report to control factor (feedback);
- 6) Other ways;
- 7) The new actions’ impact on the budget, time, quality and expectations;

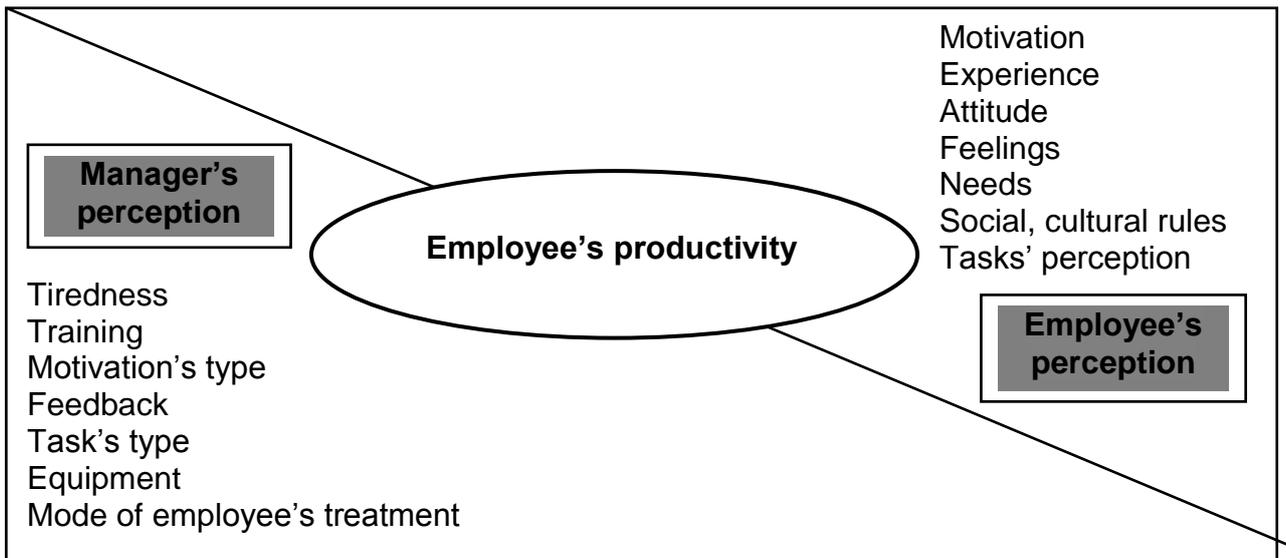
If big variations appear it is necessary to analyze – Why? What can be done?

What do we have to? Corrective actions? Expected results?

Control includes  people;  
 information;  
 materials;  
 finances.

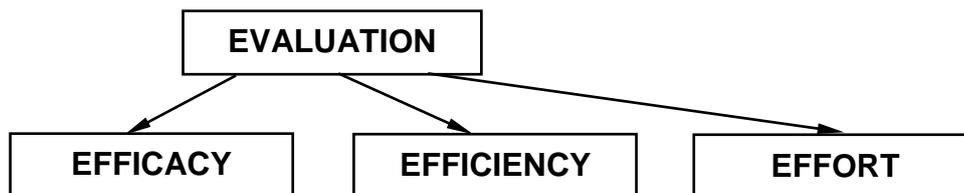
A) People

In figure 4, there are presented factors which influence person's productivity.



*Figure 4. Factors which influence person's productivity*

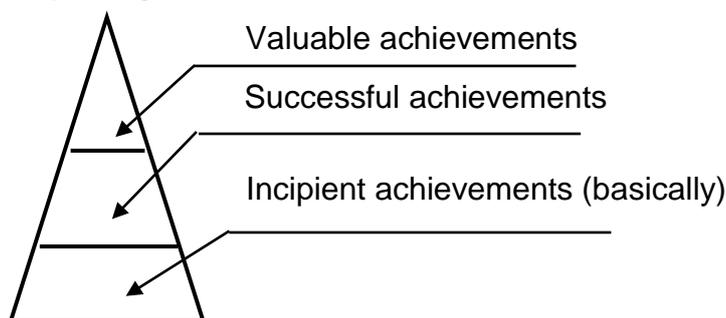
For a good people evaluation it is necessary to periodically measure performances [5]. Evaluation means measuring **efficacy**, **efficiency** and **effort** (the 3 "E"), as seen in figure 5:



*Figure 5. Evaluation process*

For offering a stable and objective feeling in the way to establish employees' tasks it is necessary to make an achievement analysis achievement package  
 duty process

a) achievement package



*Figure 6. Achievement package*

b) duties process „at the third mistake you're fired"

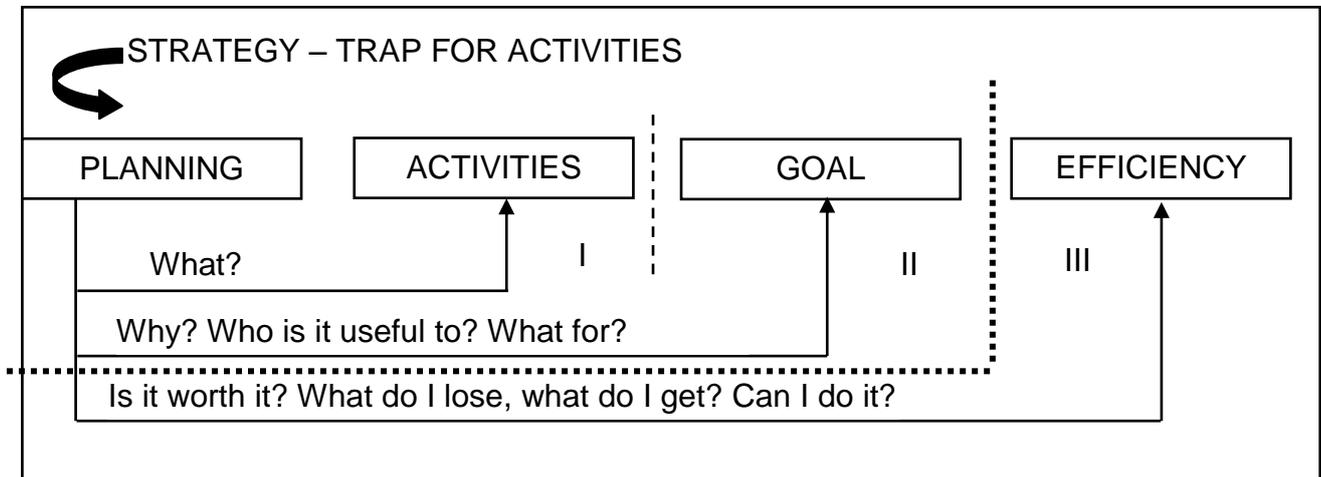
- 1<sup>st</sup> mistake – **is forgiven** (system or people's weakness);
- 2<sup>nd</sup> mistake – **attention** (system and people were not correctly managed);
- 3<sup>rd</sup> mistake – people **didn't want** to change themselves.

Any mistake has two causes:

- Bad system, malfunction procedure;



Materials and equipments will be available regarding  quantities  
 quality  
 place  
 right time



D) Finances      - estimation before planning      **THOUGHT ÷ EFFORT – EFFECT**  
 - budgetary control  
 - comparison between effective expenses and the forecasted ones  
 - periodically report

#### 4. Conclusions

In 1992 Bank (1992) suggested 5 criteria for quality measuring:

1. Destination: what should I expect from the product;
2. Conforming to needs: does it meet the consumer expectations?
3. Reliability: does it keep its quality in the future;
4. Cost: how much should one pay for the product / service;
5. Delivery: when do I get the product?

Bank gives a new definition of quality: Quality means a complete and satisfactory fulfillment of buyer's demands at the lowest internal cost. This means satisfying clients: beneficiaries of the product /service; realization of the product by many departments (design, forge, turnery, rectification, assembling etc. linked through the TQM).

Inside of an organization, its members have the quality of being client and supplier  
 ⇒ TQM

By TQM point of view – the new role of management is to develop the supplier-client relationships (organization's culture).

Some negative aspects of TQM:

- Loss of some skills: clients are interested in asked products; clients' demands determine the organization's members to focus on those, losing some skills; loss by training, perfecting only of necessities ⇒ loss of personnel elasticity;
- Increase of control level: quality approach implies quality control intensifying; the employees lose their freedom to act and control their own activity; the employees become "clients' slaves";
- Division between winners and defeats: competitive system, many suppliers existence and their selection, coming up on the market;

- Quality is a „caprice”: some authors say that TQM is a fashion, a caprice to camouflage the real problems of the organization.

In fact quality management means a lot of questions and a lot of answers.

Stupid questions get stupid answers. (Anonymous)

## References

1. Barker, Sunny, Baker, Kim. The complete idiot's guide to project management: New York, Macmillan, 1999, ISBN 0-13-215609-1.
2. Breecham, Smith Kline. Introduction to project management: Budapest, 1999, ISBN 185805-085-5.
3. Dăneț, Adrian. Managementul proiectului : Editura Dsz Tipo Brașov, 2001, ISBN 973-98575-3-1
4. Eysenck, Hans. Descifrarea comportamentului uman : București, Teora, 1999, ISBN 973-601-893-8.
5. Hill, Terry. Production & operations management: Londra. Prentice Hall, 1991 ISBN 0-13-723727-8.
6. Kerzner, Harold. Project management – a systems approach to planning scheduling and controlling: New York. Van Nostrand Reinhold, 1984.
7. Marinescu, Nicolae-Mihail. The challenge – provocarea managerială modernă: Cluj Napoca. Promedia, 1993, ISBN 973-96114-1-9.
8. Săvescu, Dan, Budală Adrian. Methodes et outils pour la gestion de projet. Notes de cours. Metode si instrumente pentru managementul proiectelor : Note de curs. Universitatea Transilvania din Brașov, Brașov, 2007, ISBN 978-973-635-923-1.
9. Săvescu, Dan, Budală, Adrian, Alexandru, Cătălin. Managementul firmei : Editura Universității Transilvania din Brașov, Brașov, 2005, ISBN 973-635-352-4.
10. Săvescu, Dan. Quelques aspects sur les principes de la productivite et la structure organisatrice en Gestion de Projet : Analls of the Oradea University. Fascicle of Management and Technological Engineering. Vol VI (XVI), pag. 1302- 1307, Oradea, 2007, ISBN 1583-0691.
11. Săvescu, Dan. Sur la planification en Gestion de Projets : Analls of the Oradea University. Fascicle of Management and Technological Engineering. Vol VI (XVI), pag. 1308- 1313, Oradea, 2007, ISBN 1583-0691.
12. Săvescu, Dan. Some aspects about planning and risk evaluation. Annals of Oradea University, Fascicle of Management and Technology Engineering, Vol.IX (XIX), 2010, nr.2, pag.4237-4243, ISSN 1583- 0691.