

## IMPLEMENTATION AND EVALUATION OF EXCELLENCE MODEL CAF IN EDUCATION ORGANIZATION WITH SOFTWARE SUPPORT

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### ABSTRACT

*In our contribution are described experiences concerning the development, implementation and evaluation of excellence model CAF in education organizations. There are described criteria and sub-criteria of model CAF and example of fulfilling these criteria by company Quality Management Centre (CEMAKS) at the Slovak University of Technology in Bratislava. In contribution will be presented some ideas and opportunities for continuing improvement of quality level in education organization by application this model, analysis of model CAF criteria, methodology to develop this model, automated system of evaluation of model CAF which allows to measure quality level in time. This CAF model is useful tool for public sector on way to find new approach to increase its quality management level*

**Keywords:** quality, model CAF, process, public sector, improvement

### 1. INTRODUCTION

The Common Assessment Framework (CAF) is a total quality management tool inspired by the Excellence Model of the European Foundation for Quality Management (EFQM) and the model of the German University of Administrative Sciences in Speyer . The CAF model is an European model based on Total Quality Management – TQM [1,2]. It is designed for all organizations of public sector that are interested in continuous improvement and progress towards excellence. The main purpose of the CAF model is self-assessment of the organization in order to achieve continuous improvement of quality. It helps identify strengths and opportunities for improvement and encourages solutions. It allows for an independent view on the organization and its functioning. The EFQM model may be used in any business as well as any governmental organization [4,5] (however, the Common Assessment Framework – the CAF model is specially designed for public administration). We decided in our research work to propose integrated electronic manual, which will offer to

public organizations complex and total information concerning the implementation and evaluation of all criteria of CAF model. Our electronic manual contains total 9 criteria, 32 sub-criteria and 121 sub-sub criteria of CAF model. Users of this manual can self-evaluate own activity in a given sub-criterion and using automated system (software) determines point value of quality level (see next chapters).

## 2. STRUCTURE OF CAF MODEL

The CAF model is based on 9 criteria: leadership, strategy and planning, people, partnerships and resources, processes, citizen/customer oriented results, people results, society results and key performance results. The first 5 criteria are enablers (what the organization has got) and the remaining 4 criteria are results (what the organization achieves). All criteria are divided into sub and sub-sub criteria. The diagram of the model, together with score for each criterion is shown in Figure 1. The direction of arrows shows the dynamic nature of the model. Innovation and learning help improve enablers, which leads to improved results. This process is continuous. Criteria and sub-criteria of the model are very sophisticated and deal with all areas of the organization, even with the environment surrounding it. The model emphasizes the ethical principle crucial for those who are exceptional.

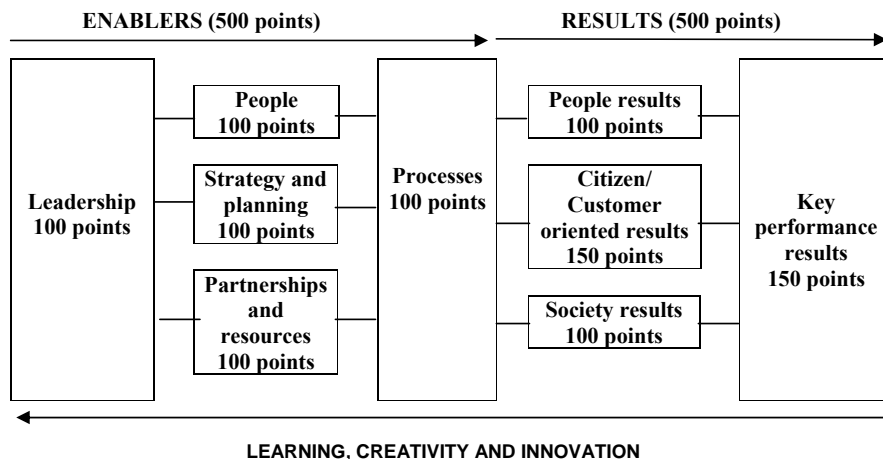


Figure 1. Structure of model CAF (last revision in year 2006)

## 3. METHODOLOGY FOR THE CAF MODEL APPLICATION IN ORGANIZATION

During the research work at this area, we propose a methodology for application of the CAF model, which is proposed especially to education organizations, which have developed and implemented Quality Management System (QMS) according to standards ISO 9001 and plan further development and improvement of the existing management system using the model CAF. Steps of the methodology are illustrated in Figure 2.

The methodology is designed in conjunction with manual and automated self-assessment system to enable the organization to apply the CAF model in less time and evaluate their performance level and effectiveness by more transparent way. The methodology enables to get an idea of what is necessary to do in the process of CAF model application.

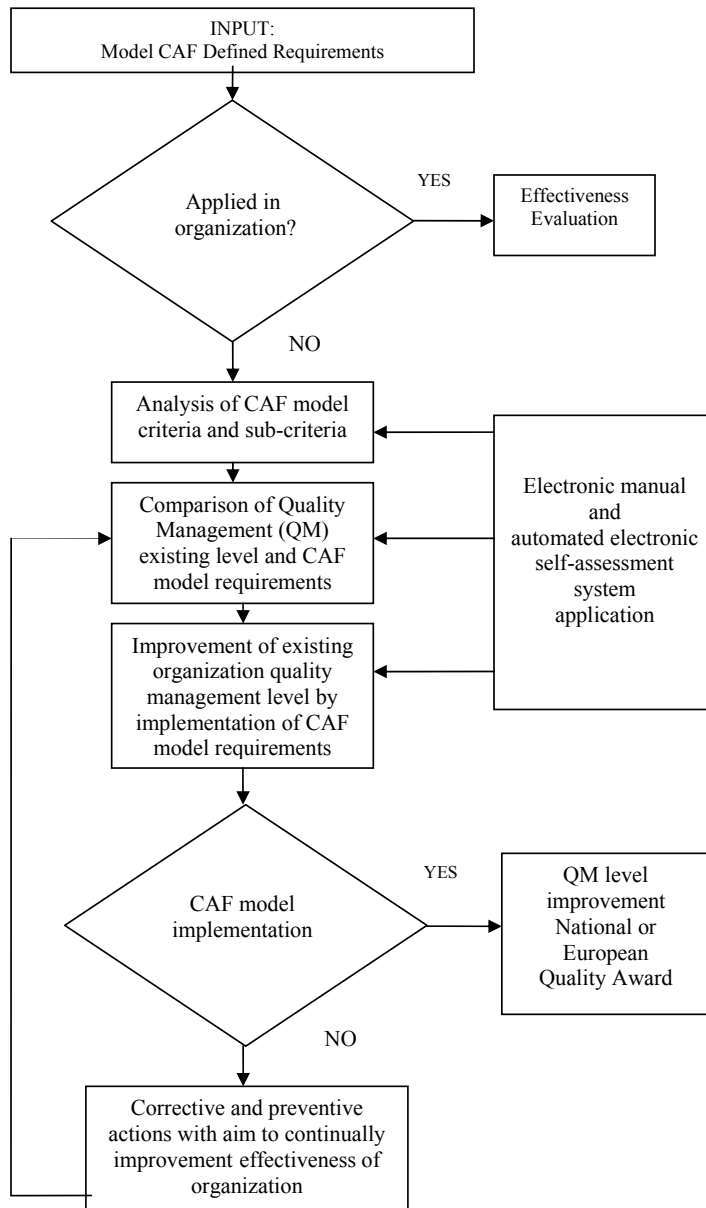


Figure 2. Steps to apply CAF model in education organization

### 3.1. Used scientific methods

Selected scientific methods of problem solution can be divided into two main groups: empirical and logic (scientific analysis and synthesis). Empirical methods are applied to an electronic survey that aimed to determine knowledge of the CAF model and its use in practice among organizations operating in Slovakia. The logical method was utilized for the problem solving analysis and synthesis. Methods of scientific analysis was used to evaluate the current issue of Quality Management level and CAF implementation in public sector, analysis of criteria and sub criteria of the CAF model, exploring the possibilities of applying

the CAF model in public organizations and examination of existing systems of assessment under the CAF model. Scientific synthesis method was used during the process of CAF model development and implementation including the creation of electronic manual and during the process of automated evaluation system of public company quality management level.

#### 4. MANUAL FOR THE CAF MODEL IMPLEMENTATION

Electronic manual is designed on the basis of the CAF model criteria and sub criteria requirements and helps to organization in a shorter time to understand and apply the CAF model and evaluate their own performance and effectiveness. The structure of the proposed manual consists of these main parts:

- analysis of CAF model requirements defined by criteria and sub criteria and determine the existing quality level of the organization and opportunities for improvement,
- self-assessment system of organization quality management level using the criteria and sub criteria of the CAF model by electronic automated system.

##### 4.1 The evaluation system of the CAF model criteria

CAF model consists of enablers and results parts. For each of them is in the manual suggested a specific method of evaluation. In this paper we provide an example evaluation of enablers part of the CAF model. In the process of self-assessment of the organization is for each of the manual requirements of enablers part of the CAF model selected phase of applications based on the Deming cycle (Table 1) and the performance level (Table 2).

The selected phase applications and performance levels are the basis for calculating the assessment for the achievement of the criterion and sub-criterion requirement. Position in the current phase of the application assumes management of the previous phases. If the company in meeting this requirement found for example in phase "act" with the degree to 0.5, the overall percentage achieved in meeting this requirement are:

$$1 \times 10 + 1 \times 15 + 1 \times 20 + 0,5 \times 25 = 57.5 (\%)$$

PLAN    DO        CHECK    ACT

By this way is calculated the percentages evaluations for all requirements  $P_{K_i S_j}$ . The percentage evaluation of each sub-criterion is the weighted average of achieved percentage values for each of its requirements, and a set of weights represents the coefficients of importance.  $P_{K_i S_j}$  is calculated according to this formula [6]:

$$P_{K_i S_j} = \frac{\sum_{r=1}^n P_{K_i S_j R_r} \cdot d_{K_i S_j R_r}}{\sum_{r=1}^n d_{K_i S_j R_r}} \quad \dots (1)$$

where

$P_{K_i S_j}$  is achieved percentage evaluation of "j" sub-criterion in "i" criterion,

$r = 1, 2, \dots, n$  – number of requirements in criterion  $K_i$  and sub criterion  $S_j$ ,

$d_{K_i S_j R_r}$  is coefficient of importance for "r" requirements of "j" sub-criterion in "i" criterion.

All other mathematical model connected to automated system of self-evaluation of CAF model criteria are described in [6].

*Table 1. Evaluation of activity level application according to requirements of CAF model sub-criterion in organization*

Activity is:	Description	Evaluation in %
P (planned)	Organization plans the activity to apply	10
D (done)	Activity is implemented	15
C (checked)	Organization checks the effects	20
A (acted)	In a case of positive effects activity is used in practice	25
B (benchmarked)	Organization compares the activity with best organization in market	30

*Table 2 Level of CAF model sub-criterion fulfilling in a given phase of application*

Level of fulfilling	Description
0	There is no evidence to fulfill the requirements
0,25	There exist indicators of compliance requirements
0,5	Partial evidence of requirement fulfilling
0,75	Significant evidence of requirement fulfilling
1	Clear evidence of requirement fulfilling

#### **4.2. Electronic evaluation of the proposed solution**

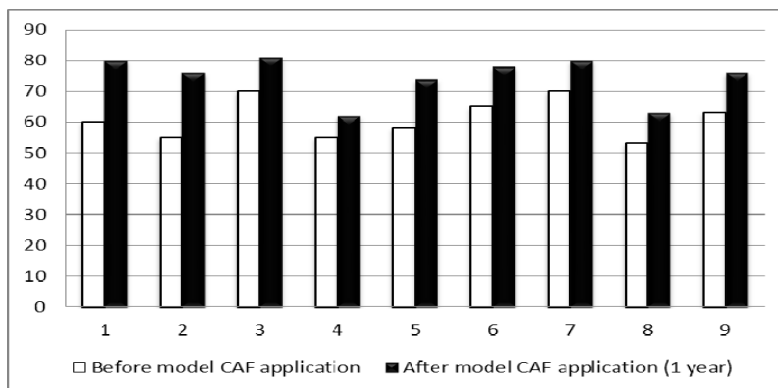
Electronic solution of proposed evaluation system is realized by using Microsoft Excel Program [6]. The aim was to design and develop an automated system using computer technology, which would on the basis of defined requirements in electronic manual and in evaluation system allow easy, fast and comfortably realize evaluation of business performance and effectiveness, as well as clear and understandable display output of the evaluation process. Entering of inputs is handled through a questionnaire form, by selection of predefined options from "drop down menu" (dropdown list). The user does not perform any calculations, nor inscribe the input values. The results are updated immediately after any change in input data. The selected values the user can change at all time during the evaluation process. Sheets "enablers" and "results" clearly show achieved percentage scores for each sub-criteria and requirements, and from these values is automatically calculated score for sub-criteria, and all criteria of "enablers" and "results" sections. Changes of point values are automatically transferred to the sheet CAF - assessment, in which is a graphical view of the structure of the CAF model with the nine criteria and the corresponding percentage and scoring for each of them for the "enable" and "result" part and also total assessment of all criteria.

#### **5. APPLICATION OF THE PROPOSED METHODOLOGY AND MANUAL INTO EDUCATION COMPANY CEMAKS**

Application of the proposed methodology and the electronic manual was made for an Quality management Centre - CEMAKS at the Slovak University of Technology (SUT) in Bratislava. CEMAKS was founded in the year 1996 at the SUT with an aim to secure training and consulting activities at introduction and implementation of quality management systems and higher philosophies of quality management.

CEMAKS identifies, manages, improves and develops its key processes with an aim to support the specified strategy and planning. The moving spirit of our organization is

creativity and seeking new ways and ideas at creation of new products, which will surpass the expectations of our customers. Another important factor is innovation and the need to create added value for the customers and also for our citizens and other interested parties, in order to satisfy their desires, wishes and expectations. By application of the higher described methodology and electronic manual company CEMAKS during one year increased quality management level in all criteria of the CAF model (see Figure 3).



*Figure 3. Effects in CEMAKS after model CAF application  
Comment: Numbers 1, 2 ... 9 are model CAF criteria*

## 6. CONCLUSIONS

Model CAF is useful to implement after development and implementation of Quality Management System (QMS) according to ISO 9001. QMS represents very good basis for application of higher quality management philosophy, like TQM, KAIZEN or model CAF. Research work described at this contribution results in the form of its own methodology and electronic manual allows to public (education) organizations effectively introduce and implement CAF model requirements to practice in a relatively short period of time with aim to constantly improvement its performance towards excellence. Model CAF is an effective tool for continual improvement of organization quality, which leads not only to higher level of quality, but also to customer satisfaction, success at national and world market and to increasing the culture of whole organization. This contribution was prepared as a part of scientific research project VEGA N. 1/0184/12.

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