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# IMPLEMENTATION OF EXCELLENCE MODEL CAF IN TRAINING AND CONSULTANCY ORGANIZATION CEMAKS

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**Abstract**
In our contribution are described experiences concerning the development and implementation of excellence model CAF in training and consultancy company CEMAKS at the Slovak University of Technology in Bratislava (Slovakia). There are described criteria and sub-criteria of model CAF and fulfilling of these criteria by company CEMAKS. In contribution will be presented some ideas and opportunities for continuing improvement of quality level in education organization. CEMAKS has prepared automated system of evaluation of model CAF which allows to measure quality level in time. This CAF model is useful tool for schools and universities on way to find new approach to increase quality level in education process.

**Key Words:** Quality, model, education, process.

## 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[8]. It is based on the premise that excellent results in organizational performance, citizens/costumers, people and society are achieved through leadership driving strategy and planning, people, partnerships and resources and processes. It looks at the organization from different angles at the same time, the holistic approach of organization performance analysis.

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 CAF model is a basis for assessment and evaluation of a business aspiring to receive the European Quality Award (EQA), but also the National Quality Award of the Slovak Republic. In order to win the EQA, the model must be applied for at least three years and yield the corresponding results.

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[8] is specially designed for public administration). There are several literature sources, which describe the structure of EFQM and CAF model[2,4,5] and offer methodology, how to implement and evaluate it, but for customers are very brief and hardly understandable. Therefore 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).

## MAIN PURPOSES OF MODEL CAF

The CAF is offered as an easy to use tool to assist public sector organizations across Europe to use quality management techniques to improve performance. The CAF provides a self-assessment framework that is conceptually similar to the major TQM models, CAF in particular, but is specially conceived for the public sector organizations, taking into account their differences. The CAF has four main purposes[8]:

- to introduce public administration to the principles of TQM and progressively guide them, through the use and understanding of self-assessment, from the current "Plan-Do" sequence of activities to a full fledged "PDCA" cycle,
- to facilitate the self-assessment of a public organization in order to obtain a diagnosis and improvement actions,
- to act as a bridge across the various models used in quality management,
- to facilitate bench learning between public sector organizations.

The CAF model is based on 9 criteria[8]: 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.

## 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. The actual implementation of the methodology and the manual is designed to avoid confusion and unnecessary complexity, what require starting again and resulting to time loss.

### 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.

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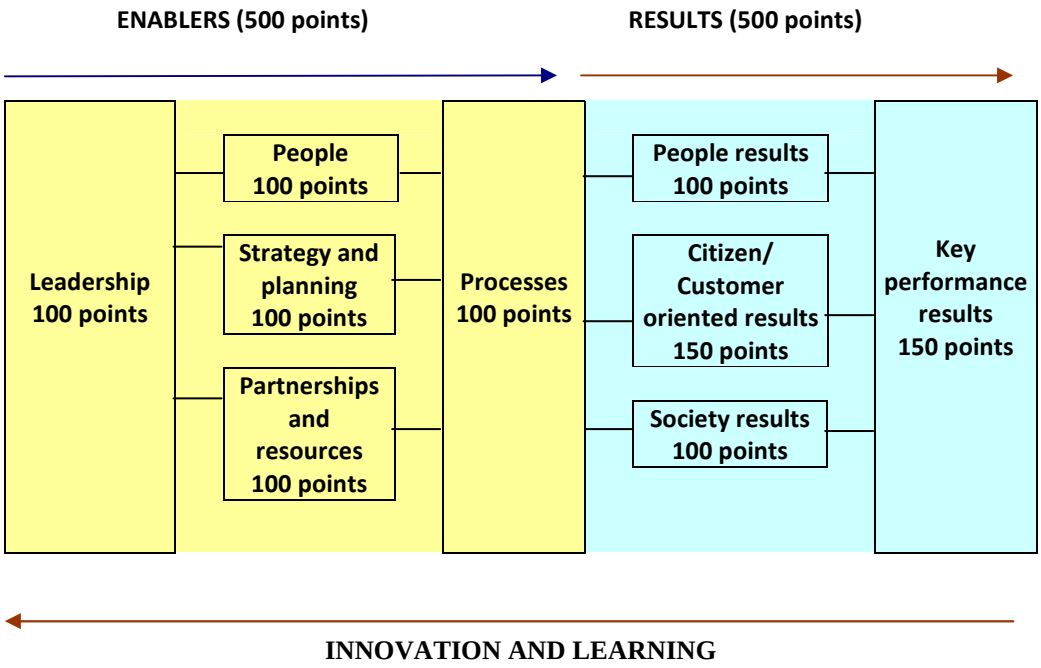


Figure 1: Structure of model CAF (last revision in year 2006)

## 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 three 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.

### 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 is:

1 x 10 + 1 x 15 + 1 x 20 + 0,5 x 25 = 57.5 (%)
PLAN DO CHECK ACT

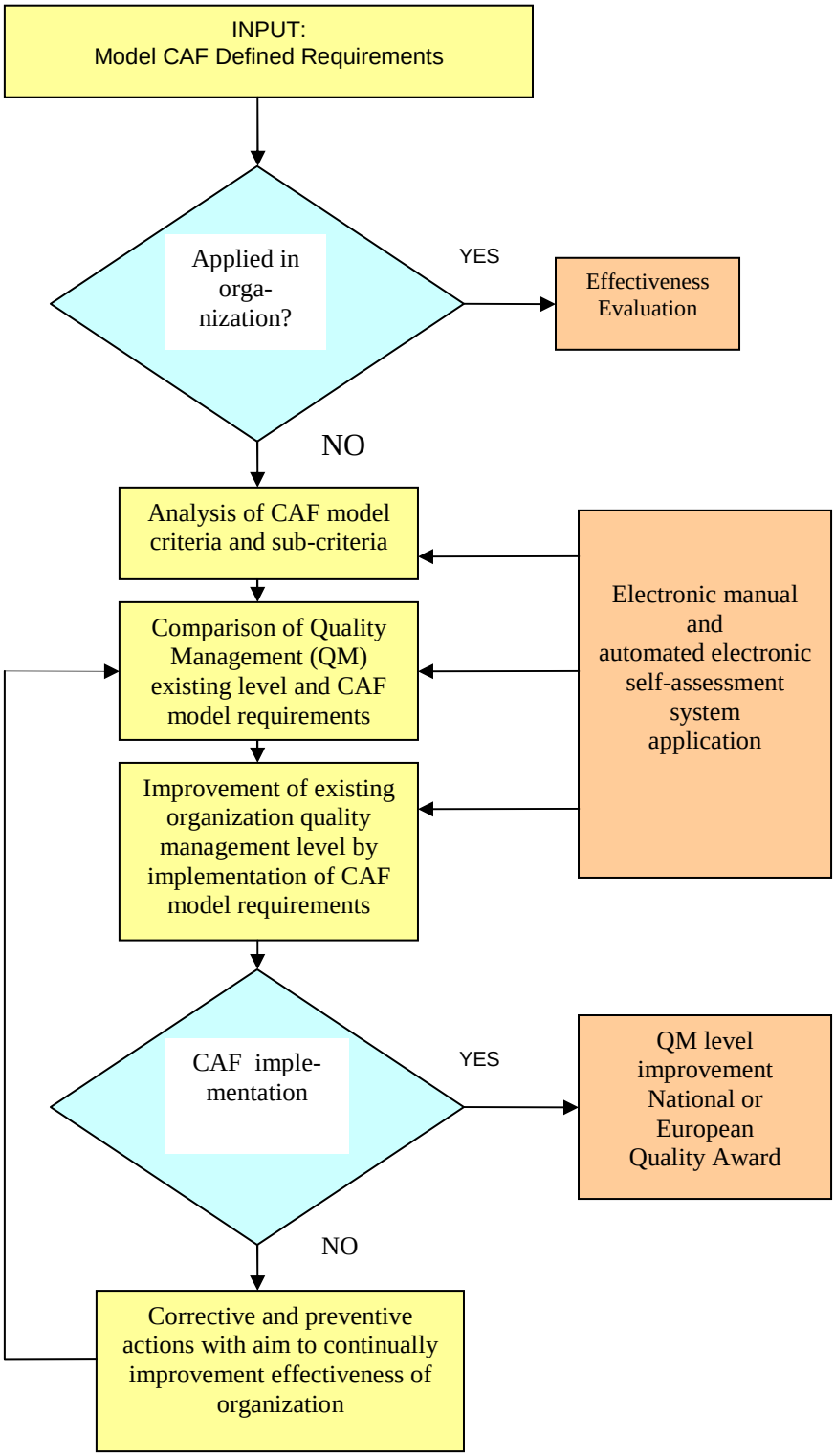


Figure 2: Steps to apply CAF model in education organization

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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)[9,10] | 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 |

By this way is calculated the percentages evaluations for all requirements $P_{KiSj}$. 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. $P_{KiSj}$ is calculated according to this formula[6]:

$$P_{K_iS_j} = \frac{\sum_{r=1}^{n} P_{K_iS_jR_r} . d_{K_iS_jR_r}}{\sum_{r=1}^{n} d_{K_iS_jR_r}} \quad (1)$$

where

$P_{KiSj}$ is achieved percentage evaluation of "j" sub-criterion in "i" criterion
r = 1,2...n – number of requirements in criterion $K_i$ and subcriterion $S_j$,
$d_{KiSjRr}$ is coefficient of importance for "r" requirements of "j" sub-criterion in "i" criterion

Each of the criterions of the CAF model has a defined maximum point value which can be achieved. It is evenly distributed among the individual sub-criteria. The resulting number of points for the sub-criterion we obtain by multiplying of the achieved percentage value by maximum number of points. Generally we can for any criterion express[6]:

$$B_S = B_{max} \cdot \frac{P_s}{100} \quad (2)$$

where

$B_S$ is achieved score in evaluated sub-criterion
$B_{max}$ is maximum score which can be in a given sub-criterion obtained
$P_S$ is achieved percentage evaluation for given sub-criterion

The resulting score for each criterion is the sum of achieved point value of its individual sub-criteria. The total achieved point value concerning the enablers is the sum of achieved points for criterion 1 to 5. The maximum possible score can be 500 points (see enablers - Figure 1).

### 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.

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

Application of the proposed methodology and the electronic manual was made for an education company CEMAKS in Slovakia, in which both authors of this contribution are working.

CEMAKS (Quality Management Centre in Construction) was founded in the year 1996 at the Department of Building Technology of the Faculty of Civil Engineering of the Slovak Technical University in Bratislava with an aim to secure training and consulting activities at introduction and implementation of quality management systems and integrated management systems according to STN EN ISO 9001:2009, STN EN ISO 14001:2005 and STN OHSAS 18001:2009. In its training activities, CEMAKS provides its customers the world-class management trends, such as total quality management (TQM), the KAIZEN method, reengineering and excellence models EFQM and CAF. CEMAKS is, since the year 1998, a holder of a certificate for SMK according to ISO 9001, granted by the certification organization Bureau Veritas Slovakia.

In this part of the contribution, the approach of CEMAKS at fulfilling the criteria of the CAF model will be described. After the analysis of criteria and sub-criteria of the CAF model (see Figure 1), CEMAKS elaborated in the year 2009 a self-assessment report with an aim to investigate opportunities for further improvement of its activity.

### Leadership

The director of CEMAKS endeavours since founding of the organization to encourage by personal example to active work for the benefit of the customers the quality manager and his/her co-workers at assurance of quality of the products and services. To the essential attributes of the CEMAKS leadership there belong:

- an aspiration to continually make headways in the field of quality management, with an aim to satisfy the needs and requirements of internal and external customers,
- the ability to encourage the colleagues in fulfilling the vision and quality policy at implementation of the quality targets of the organization,
- personal example as the most powerful motive for enforcing new ideas, opinions and targets,
- joining the moral credit and professional attitude at work,
- bringing new thoughts, ideas and their implementation in practice,

- openness towards the employees and colleagues,
- active scientific and research activity with an aim to offer the clients the brand-knew pieces of knowledge,
- non-conflicting solution of problems at the workplace,
- customer care with an aim to keep the trust and loyalty of our customers.

The CEMAKS management secures the aforementioned intentions by means of documents such as ethical codex of the organization, the vision and quality policy, strategy of quality management and of quality improvement and quality targets, which are in compliance with the quality policy and are annually set and reviewed.

### Strategy and planning

Our organization aims to interconnect effectively the internally associated activities with the vision by means of a clear strategy. The strategy is transposed into plans, intentions and measureable targets. Planning and strategy reflect the attitude of the organization to accomplish modernization and innovation, especially in the form of scientific and research projects. The essential activities of CEMAKS in this field are:

- clearly stipulated strategy of management and quality improvement,
- systematic investigation of the needs and requirements of the interested parties,
- flexible response to the requirements of the interested parties and adaption of the products and services,
- transposing the strategy into plans and targets with their subsequent realization,
- using every occasion to integrate CEMAKS into new projects,
- systematic innovation of products and services of CEMAKS with an aim to attract and satisfy the customer and the interested parties.

### Employees

CEMAKS has only 3 internal employees (a director executing also the function of Quality Management representative, a quality manager, an administrative worker), but it has a number of external co-workers to whom, at the time of their integration into the CEMAKS processes, it approaches as to their own ones. The CEMAKS management strives not only to create good working conditions for the employees, but it also takes care for consistent application of the company culture. Mutual respect, esteem, dialogue, empowering and also granting safe and medically convenient working environment represent a fundament for securing loyalty and participation of the employees on the course of the organization to exceptionality.
The organization manages, develops and transfers the full potential of its employees from the individual level up to the level of the whole organization in order to support strategy, planning and effective functioning of is processes. In this field, CEMAKS focuses mainly on:

- permanent raising of qualification of the employees,
- creating opportunities for education and training according to specific needs of CEMAKS and personal interest of the employees,
- securing a high quality, safe and medically convenient working environment in course of building its infrastructure,
- such attitude to the employees, which will lead to their loyalty to the organization,
- effective communication and teamwork of its employees,
- building up the infrastructure for quality and safe work of its employees.

### Partnerships and resources

CEMAKS considers partnerships to be an important resource of correct functioning of the organization. Besides partnerships, the organization also needs traditional sources, such as material, financial and, first of all, human resources for securing its efficient functioning. Those are being used and developed to support the strategy of the organization and its most important processes, to achieve the targets of the organization as effectively as possible. All CEMAKS resources are being secured in a transparent way, in compliance with the principles of the entrepreneurial activity of the Faculty of Civil Engineering of STU Bratislava.

CEMAKS selects its partners in its home country and abroad and it creates resources with an aim to:

- permanently raise the effectiveness of processes and improve the quality of the products and services,
- secure specific requirements of its customers and spread its enterprising potential,
- acquire valuable information for further development,
- promote its activities,
- get into broader consciousness at home and abroad,
- improve the infrastructure for realization of the products and services,
- utilize the resources in a legitimate and transparent way,
- secure resource reserves for unpredictable economic situations and crises.

Among the distinguished recent partners of CEMAKS there is also the International Association for Automation and Robotics in Construction (IAARC) with its residence in Eindhoven, the publishing organization Verlag Dashofer in Bratislava and TRIBUN EU in Brno, Slovak Association of Construction Supervision (SASDARS) in Slovakia etc...

**Processes**

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. The main activities in this field are:

- identification of the key processes and their interaction, process management and control,
- permanent improvement of quality of the products and services of CEMAKS by education of the CEMAKS employees and by scientific and research activities,
- innovation and updating of methodic handbooks for training courses and education of the customers,
- innovation of methodic and specialist documents for the needs of construction organizations,
- improvement of quality of the consulting services on the basis of practical experience and train-up activities of the CEMAKS employees,
- willingness to consult with the customers the topic of managerial systems, free of charge,
- patience at preparation and realization of the processes of our organization,
- organizing courses, specialist colloquia and scientific conferences at home and abroad in the field of managerial systems,
- spreading the offered services abroad (Czech Republic, Kuwait, Cyprus, Ukraine).

**Results in relation to the customer/citizen, to the employees and the society**

From its origination, CEMAKS keeps building its positive image at its customers. The CEMAKS employees behave towards the customers openly, but friendly, they possess good communication techniques and they honestly fulfill the conditions agreed in the contract. The customers engage themselves actively in the process of CEMAKS quality assessment. Within the last 5 years, the assessment of customers' satisfaction for the complex consulting and training services in the scale from 1 (excellent) to 5 (unsatisfactory) ranged between 1.0 and 1.2. The results of assessment of the courses are even better. The CEMAKS employees attend personally as observers the certification audits of their customers, and they receive thereby a feedback regarding the quality of consulting and products. Until nowadays, all organizations prepared by us passed through the certification for the first time.

In relation to its employees, CEMAKS applies the following principles:
fair and objective approach to the employees,

- motivation and deserved remuneration of the employees for the results achieved,
- support of specialist progress of the employees and the possibilities of employees to actively influence the events in the organization,

- support of education of the employees according to the requirements of CEMAKS and their interest,
- securing satisfaction of the employees in the economic and social sphere.

The assessment of employees' satisfaction is being performed on the basis of a form, and the results in the scale from 1 (excellent) to 5 (unsatisfactory) range between 1.0 and 1.2. CEMAKS finances the employees' training courses, colloquia and conferences at home as well as abroad (Cyprus, Croatia, Bosnia). Because of good economic results, the employees of CEMAKS have very good working conditions created (infrastructure) and they are fairly remunerated in accordance with preset rules.

In relation to the society, CEMAKS actively influences the educational level of the citizens in the sphere of quality, environmental protection and occupational safety by its pedagogical activities at universities and by providing educational courses. The CEMAKS employees present the results of their scientific and research work in the area of managerial systems by active participation in international conferences in over 12 countries in Europe and worldwide. The director of CEMAKS is a member of the executive committee of the International Association for Automation and Robotics in Construction (IAARC) with its residence in Eindhoven and CEMAKS has partnership cooperation with this organization. CEMAKS actively cooperates also with the third sector (Academia Istropolitana).

### Key results of performance

For the 15 years of existence of CEMAKS, the following results may be considered as the most important:

- 145 construction companies certified for the system of quality management according to ISO 9001 in Slovakia and in the Czech Republic and 24 organizations certified for Integrated management System (IMS) according to ISO 9001, ISO 14001 and OHSAS 18001,
- at least 1300 students of the Faculty of Civil Engineering from all departments, trained for the function of „quality manager", 5200 workers from practice trained in the field of quality management and 2550 workers from practice trained for the function of internal auditor of the quality management system according to ISO 9001,
- 20 publications and 30 lectures in the area of quality management abroad,
- 3 successfully finished research projects VEGA in Slovakia in the field of managerial systems and 2 projects abroad (Leonardo da Vinci) focused on quality,
- specialist and organizational guarantor of 3 international conferences (Bratislava, Bosnia); the most important of those was the international symposium on automation and robotics in construction (ISARC 2010) held in June 2010 in Bratislava, being of a world importance,

Process of self-evaluation of model CAF in CEMAKS was realized using our software for automated evaluation of quality management level in company according to CAF model criteria. 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 5).

## 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

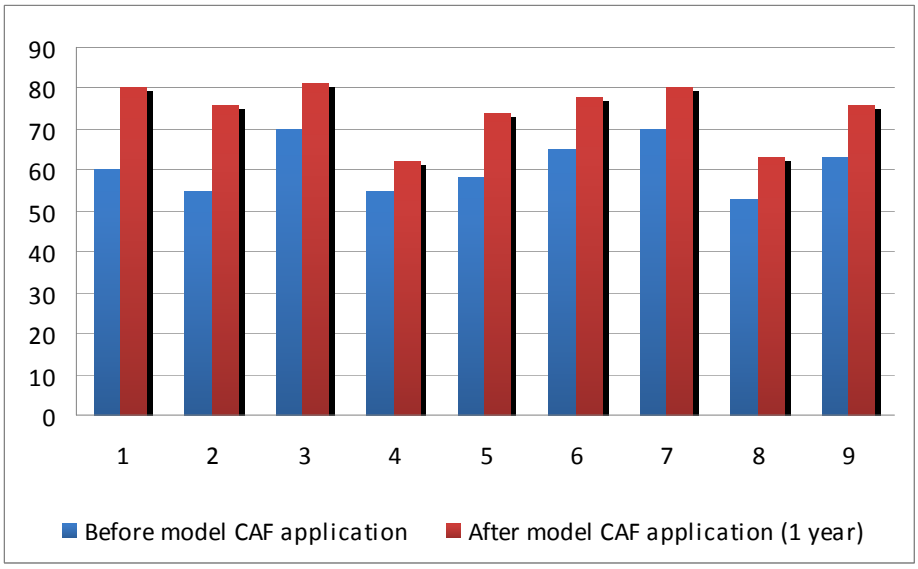


Figure 5. Effects in CEMAKS after model CAF application

Legend to Figure 5:
1 – Leadership 2 – Strategy and planning 3 - People (employees) 4 - Partnership and resources
5 - Processes, 6 – Citizen/ Customer oriented results 7 - People results 8 – Society results
9 – Key results

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.

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