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The way from Quality management system to Excellence at the university environment.

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1. INTRODUCTION

The Czech universities have passed during last decade the array of important changes connected both with the change of political orientation and with the convergence to the principles and legislation of EU. Many things have changed – the goals, the sources, the requirements and the conditions. The present management systems of universities do not reflect these changes, still utilise the traditional principles and are deficient of any element of modern management.

The management of universities is being based on the principles of "common law" that don't correlate in the most cases with the actual requirements of a dynamically developing society. Many problems and nearly standard situations are solved by the "ad hoc" way approach. In many cases there are not clearly defined responsibilities and authorities. The management systems are without the desired level of transparency and formalization. Currently the universities are situated at competitive environment. It is the principal reason why they have to identify as the organisations providing the services that satisfy theirs customers. To lead and operate an organization successfully, it is necessary to manage it in a systematic and visible manner. The implementation of Quality Management System (QMS), as an inherent part of university management, is the way how to reach this aim. The new management of VSB – Technical University of Ostrava decided to implement QMS after their election and appointment in first half of 2003.

2. VSB – TECHNICAL UNIVERSITY OF OSTRAVA.

More than 150 years history of VSB - Technical University of Ostrava is closely connected with the development of mining and metal extraction, which was the oldest industry in the Austro-Hungarian Empire. That is why the Emperor Frantz Josef I. decreed (1849) that a mining vocational school be set up in Příbram for the northern countries, and another in Leoben for the southern countries of the Empire. In 1904, the Příbram Academy was given

the status of University – Vysoká škola báňská (VSB). The President of the Czechoslovakia, E. Beneš, issued a decree No. 49 on 8th September 1945 by which the university was moved from Příbram to Ostrava. This ended the history of Příbram and opened a new era in the history of the university in Ostrava, the centre of a widespread chemistry, heavy engineering and mining region.
The 17th November 1989 was a historic event in the life of Czech universities and in the whole society. Significant changes have been made at VSB – Technical University of Ostrava (VSB – TUO). The reorganisation of all courses and the new provision of modern branches of study transferred VSB –TUO to a modern polytechnic university.
VSB –-TUO currently consists of seven faculties:

- Faculty of Economics,
- Faculty of Civil Engineering
- Faculty of Mechanical Engineering
- Faculty of Electrical Engineering and Computer Science
- Faculty of Mining and Geology
- Faculty of Metallurgy and Material Engineering
- Faculty of Safety Engineering.

There are more than 19 000 students in bachelor degree, master degree and doctoral degree programmes in daytime, distance and combined studies.

3. IMPLEMENTATION OF QUALITY MANAGEMENT SYSTEM AT VSB – TECHNICAL UNIVERSITY OF OSTRAVA.

Currently there are two basic concepts of QMS:

- the concept of ISO 9000
- the concept of TQM.

The concept of ISO 9000 is the holistic prescriptive approach based on International Standards ISO 9000 series. These standards define what is necessary to do (ISO 9001) and how to do the things (ISO 9004).
The concept of TQM is a non prescriptive approach, more or less a philosophy. TQM is applied according to different models that enable the evaluation the maturity of management system in the organisation. EFQM Model Excellence is used in Europe.
After revision of ISO 9000 series at 2000 we can observe the convergence of both concepts. The both of them are now based on more or less similar principles as you can see at udermentioned Table I.

Table I – The comparation of principles of ISO 9000:2000 and TQM

ISO 9000:2000 Quality Management Principles	**TQM - the EFQM Fundamental Concepts of Excellence**
Customer focus	Results orientations
Leadership	Customer focus
Involvement of people	Leadership & Constancy of purpose
Process approach	Management by processes & facts
System approach to management	People development & involvement
Continual improvement	Continuous learning, improvement & innovations
Factural approach to decision making	Partnership development
Mutually beneficial supplier relationship	Corporate Social Responsilility

The existence of explicit defined guidance, which has been successfully many times verified in the industry, led to the decision to implement QMS according to the ISO 9000 concept at VSB TUO. There are no principal reasons why the benefits of implementation of QMS in industry would differ in the case of the university. The decision was supported by the existence of ISO 9001 registration. The ISO 9001 certificate is outstanding supporting material. It is evidence that proclaims the university is being properly managed, the needs of their customers are identified and the environment to satisfy them is established.

To utilize the good practices from industry the management of VSB–TUO have employed the quality manager that had the long-term experience with QMS implementation and maintenance at the first class manufacturing company that was awarded by the Czech Republic National Quality Award 2001.

VSB-TUO is a huge institution with lot of various activities. The implementation of QMS in whole organisation simultaneously could be risky. The experiences from the implementation of QMS in industry are not fully transmitted into the university environment. There are at least two important differences:

- The cycle time of product realisation is significantly longer than in industry.
- The members of university staff and academic freedom.

It was the reason why we split the implementation of QMS into several stages. As each faculty is a relative autonomous part of the university, the first stage (2004) was the implementation of QMS at a selected faculty as a pilot project. This stage was successfully terminated and Faculty of Electrical Engineering and Computer Science was the first faculty in the Czech Republic that received the ISO 9001 certificate.

Fig.1.
The representative of VSB–TUO takes over the ISO 9001 certificate from deputy of ministry of education during the ceremonial evening hold at Prague Castle, as part of European Quality Week in Czech Republic.

The second stage (2005-2006) was the implementation of QMS at the next faculties with utilisation of the experiences from first stage. Final ongoing third stage (2007) is the implementation of QMS at the administration and executive part of whole university.

Each stage consisted of two phases:

- The preparation phase
- The implementation phase

The preparation phase included 5 steps:

1. The decision of top management about implementation of QMS as inherent part of management
2. The declaration of mission , vision and strategy (quality policy)
3. The definition of project team for implementation of QMS
4. The definition of terms
5. The reservation of sources (financial, HR, …)

The declaration of vision, mission and quality policy was fundamental step. They were formulated by top management and communicated. To reach the commitment of staff, the discussion on the meetings proceeded. The commitment to quality policy was the base for definition of quality goals on the faculty or university level. The quality goals were subsequently disseminated to department level and linked with personnel goals.

The implementation phase consisted of 7 steps:

1. The training the staff about QMS
2. The implementation of process approach. It consist of :
    a. *Identification of processes and definition of the process map*
    b. *Definition and documentation of processes*
    c. *Definition of criteria for process performance assessment*
3. The comparison of existing processes with ISO 9001 requirements
4. The implementation so far missing procedures (control of document, control of records, internal audits, control of nonconforming product, correctives action, preventive actions)
5. The evaluation of process performance and quality system review
6. The implementation of actions to improve the system performance
7. The certification of QMS.

From management point of view all faculties are doing the same work. They provide the university level education, R&D and cooperation with industry. Of cause there are some differences caused by different orientation of faculties. The experiences from pilot project were used during implementation of QMS at next faculties.

Processes at the faculty level were divided into three basic groups:

- Customer related processes (education – bachelor, master and doctoral level, R&D activities, and cooperation with industry and public sector)
- Managing processes (strategy management of faculty, operational management of faculty, and source management)
- Supporting processes (support of education process, support of R&D, purchasing, control of information system.)

There are different processes at university level. The faculties are looked as the internal customers of university. It means the university supports the faculties. The main, customer orientated processes from the point of view of university, are processes of source management:

- finance management
- facility management
- HR management
- IT management

These source management processes are executed and controlled by force of strategic management and operational management processes.

The descriptions of all existing processes and implementations of ISO 9001 required procedures were followed by evaluation of the process performance through the defined performance criteria. These process performance measurements were completed by customer satisfaction measurements. We evaluated the satisfaction of:

- students during their study at the university,
- students after some years of their professional career
- employers with graduate's skills
- industry and public sector partners

These measurements were, together with internal audits findings, the bases for analysis. The results of analysis defined area for improvement.

4. BENEFITS OF IMPLEMENTING QMS IN THE UNIVERSITY

The time from the beginning of implementation QMS at VSB – TUO is rather short in comparation with cycle time of main processes at university (3 yeas for the bachelor degree study programs plus 2 years for master degree and plus another 3 years dor doctoral degreee). It is too early to evaluate the effect of adopting ISO 9000 approach on the quality of university products. However we recognize the improvement of university culture in areas:

- **Increased level of managing processes in the university**

It is the main asset. In the past the most of standard situation were solved ad-hoc. QMS defines the accurate rules.

- **Better set-up of activities inside the university, accurate definition of authority and responsibility**

The process approach enables to define the activities and their relation inside university with corresponded authority and responsibility in the simple way

- **Forcing the university to identify and satisfy the actual needs and expectation of their customers**

In some situations in the past the university offers what their staff recognised important. Actual needs and expectation of their customer could be different. QMS forces the university to identify and satisfy the actual needs of their customers.

- **Saving of operating expenses**

The proper set-up of activities inside the university together with accurate definition of authority and responsibility leads to elimination of wasted effort and it brinks saving of operating expenses

- **Improvement of the educational processes**

The identification of actual needs and expectation of university customers, evaluation of customer satisfaction, better set-up of activities inside the university leads to improvement of the educational process.

- **Improvement of competitive ability of university**

ISO 9000 registration is a competitive advantage. It is the evidence the university is properly managed, the needs of their customers are identified and the environment to satisfy them is established.

- **Increased proactive behaviour of employees**

The existence of defined procedures for problem solving (control of nonconforming product, corrective action, and preventive action) and tools for independent assessment of any designed process or activity (internal audit) leads the employees to proactive behaviour.

5. THE WAY TO EXCELLENCE

The ISO 9001 approach is focused to the customer needs. The university management system has to be oriented not only to their customers but also to their stakeholders (interested parties). The ISO 9004 offers the guidance for performance improvements by including the needs of stakeholders. But bouth of the standards, ISO 9001 and 9004, do not offer the instrument for evaluation of maturity of management system. Therefore we were looking for some efficient instruments for university management system assessment, which can describe the university, live more complex. Because we are from the beginning of the management improvement focused to the use of industrial standards, it is not surprising, that we choose very complex industrial quality assessment system based on the EFQM Excellence Model (EFQM, 2003), see Figure 2. This model was also rearranged for education institutions (Centre for Integral Excellence Sheffield Hallam University, 2003),(TRIS-EFQM, 2003).

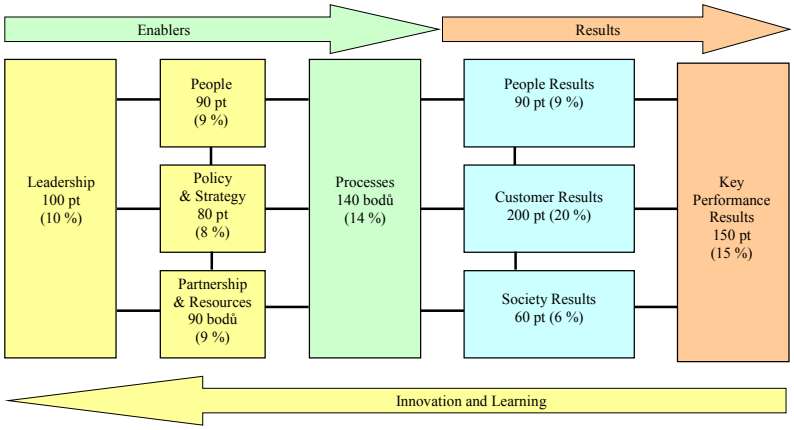

Figure 2 – EFQM Excellence Model [1].

The progress of implementation of TQM at the VSB-TUO is the nearly the same as in the case of implementation of QMS according to ISO 9000. We have started at selected faculty as a pilot project and we will continue at next faculties with utilizations of the experiences from pilot stage.

Significant motivation for orientation to the complex quality comprehension was also the Program of the Czech Republic National Quality Award, which was in year 2006 first time opened for non-profit organization and extended by two categories – based on the CAF Model and based on the EFQM Model Excellence.

Faculty of Mechanical Engineering was the pilot faculty where we started with implementation of TQM philosophy.

This faculty applies into the Program of the Czech Republic National Quality Award 2006 - part assessment of performance of organisation based on EFQM Model Excellence.

Many analyses were done during the self-assessment process. The most significant weaknesses and threads were selected, analysed and activities to their removal was run very fast. Many uncertainties were eliminated by new analyses by questionnaires for graduates, new students and unsuccessful students. Many external analytical projects were joined and supported, like REFLEX focused to the students graduated in the past three years, graduate employability, students assessment project realized by the ACSA – Academic Centre of Students Activities in the same time at all universities in the Czech Republic.

The next important area which was omitted in the past time was collaboration with suppliers; especially it means collaboration with the high schools. Project called “Partnership with high

schools" was started on the end of year 2006 by the concrete offers for their study support like special excursions to the faculty labs, university teachers lectures focused to actual technical problems and news and other real collaboration support.

Based on evaluation of self-assessment report, followed by site visit of assessors, the Faculty of Mechanical Engineering was awarded in Program of the Czech Republic National Quality Award 2006 by - "Recognised for Excellence" level..

The experiences with implementation of QMS at university environment are recognised very interesting also for all other technical universities. The main goals were presented at the International conference Principia Cybernetica (Farana, 2005), International Conference on Engineering Education (Farana, 2006) and 7st International Conference of Quality Managers (Hutyra, 2006)

6. SUMMARY.

The implemented QMS brings the benefits both to customers of the university (students, employers, society) and to university itself. It is the reason why we started this process at VSB – Technical University of Ostrava. The results of the implemented and certified Quality Management System at the VSB-TUO are very positive. The orientation to the complex quality system and use of the EFQM Excellence Model improved the university live, their processes and efficiency. Achieving of the official recognition for Faculty of Mechanical Engineering from Program of Czech Republic National Quality Award promoted the next faculties of university. Thanks to this we can recommend this way to all other technical faculties and universities.

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