

## APPLICATION OF THE QUALITY CONTROL IN EDUCATION AREA ON THE FACULTY OF MANUFACTURING TECHNOLOGIES OF TU KOŠICE, SLOVAKIA

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### ABSTRACT

*The personnel of the Faculty of Manufacturing Technologies share compiling and permanent improving of the quality management system (QMS) at the Technical University of Košice compliance with requirements ISO 9001:2000 and its consecutive certification. In paper are presented the experiences with application of Quality Management System on Faculty of Manufacturing Technologies of TU of Košice in area of university education, university science and enterprising activities.*

**Keywords:** quality control, quality management system, quality of education

### 1. INTRODUCTION

The quality of higher education has emerged as a key element in the establishment of the European Higher Education Area, and in supporting national progress and competitiveness. Thus quality assurance is one of the main action items of the Bologna Process. In the Berlin and Bergen Communiqués the European Ministers of Higher Education committed themselves to supporting further development of quality assurance at institutional, national and European level, and stressed the need to develop mutually shared criteria and methodologies on quality assurance. They also stressed that the primary responsibility for quality assurance in higher education lies with each institution itself and this provides the basis for real accountability of the academic system within the national quality framework. They agreed that the national quality assurance systems should include evaluation of programs or institutions that would involve internal assessment, external review, participation of students and the publication of results [2].

### 2. QUALITY MANAGEMENT SYSTEM

A quality management system (QMS) is a system that outlines the policies and procedures necessary to improve and control the various processes that will ultimately lead to improved business performance. One of their purposes is quality control in education area.

The concept of quality evolved from inspection, measurement and testing, which had been in practice for many, many years. Long ago, an artist or a sculptor took pride in his work and as a result always tried to excel in what was created. Mass production systems brought the concept of inspection by someone other than the craftsman in the first half of the 20th

century. Application of statistical control came later as a result of World War production methods. Quality management systems are the outgrowth of work done by W. Edwards Deming, a statistician, after whom the Deming Prize for quality is named.

Quality, as a profession and the managerial process associated with the quality function, was introduced during the second-half of the 20th century, and has evolved since then. No other profession has seen as many changes as the quality profession. The quality profession grew from simple control, to engineering, to systems engineering. Quality control activities were predominant in the 1940s, 1950s, and 1960s. The 1970s were an era of quality engineering and the 1990s saw quality systems as an emerging field. Like medicine, accounting, and engineering, quality has achieved status as a recognized profession [1].

Quality management is a method for ensuring that all the activities necessary to design, develop and implement a product or service are effective and efficient with respect to the system and its performance.

The International Organization for Standardization created the Quality Management System (QMS) standards in 1987. These were the ISO 9000:1987 series of standards comprising ISO 9001:1987, ISO 9002:1987 and ISO 9003:1987; which were applicable in different types of industries, based on the type of activity: designing, production or service delivery. The standards have been regularly reviewed every few years by the International Organization for Standardization (ISO). The version of these standards was revised in 1994 and was called the ISO 9000:1994 series; comprising of the ISO 9001:1994, 9002:1994 and 9003:1994 versions. The last revision was in the year 2000 and the series was called ISO 9000:2000 series. However the ISO 9002 and 9003 standards were integrated and one single certifiable standard was created under ISO 9001:2000. Since December 2003, ISO 9002 and 9003 standards are not valid, and the organizations previously holding these standards need to do a transition from the old to the new standards. The ISO 9004:2000 document gives guidelines for performance improvement over and above the basic standard (i.e. ISO 9001:2000).

The Quality Management System standards created by ISO are meant to certify the processes and the system of an organization and not the product or service it. ISO 9000 standards do not certify the quality of the product or service.

Recently the International Organization released a new standard, ISO 22000, meant for the food industry. This standard covers the values and principles of ISO 9000 and the HACCP standards. It gives one single integrated standard for the food industry and is expected to become more popular in the coming years in such industry.

### **3. APPLICATION OF QMS ON TECHNICAL UNIVERSITY OF KOŠICE, SLOVAKIA**

In order to secure compatibility of the university control systems with every single administrative unit of the university in entire organizational structure and processes with requirements of the international standards EN ISO 9001:2000 Quality Council of the Technical university of Košice (QC TU) was created by the decree of university rector. Functions, organizational structure, authorities and responsibilities of this council are defined in the statute of QC TU (signed 1. 5. 2004). Faculty QC and rector QC are subjects to QC TU. Rector of TU is responsible for asserting the principles of the quality management system of TU. Taking care of the understanding, enforcement and maintenance of the Quality policy he cooperates with vice-rectors and in faculty scope with deans in all fields of activities while securing the quality of TU. By the decree of rector of TU representatives of management were nominated as well:

- Quality assignee I. – vice-rector for education
- Quality assignee II. – TUKE bursar

- Quality specialist

Quality managers of faculties (nominated by deans of the faculties) and quality managers of other organizational units of TU – authorized employees of TU, with responsibilities and authorities defined in decrees [4].

Quality monitoring in TU comes out of ISO 9001:2000 international standard requirements. Testimonial audit has been successfully realized between 21. 11. 2005 and 25. 11. 2005. Information about project of building the quality management system according to ISO 9001:2000 are published on TUKE website as a Project of building QMS. Informational prospects were distributed to all workplaces of TU in order to familiarize the employees of TU with goals of project and with the core of quality management system. The culture of quality in TU is sustained by the basic project documents, which present the vision and the general trend of TU in the matters of quality: Quality policy of TU and quality objectives of TU. Every employee of TU was provable familiarize with these documents [3, 5].

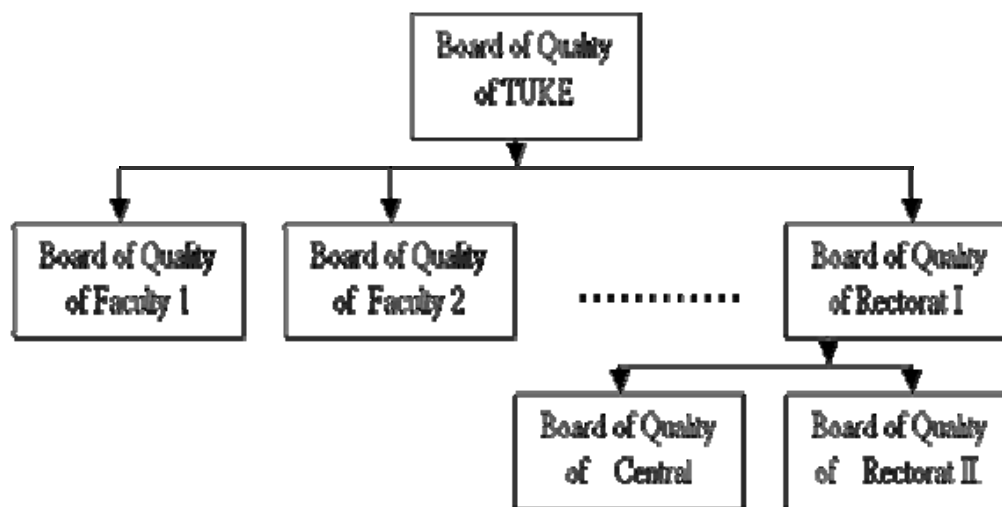


Figure 1. Structure of the Quality Council of the Technical University of Košice

Quality monitoring procedures are described in individual organizational instructions (OI). In the scope of QMS the map of processes on TU was created where managerial, basic and support processes were defined. Individual processes were redistributed to so-called sub-processes, which are described in OI and operation orders of TU. As the main processes was defined: education, science and research, business. Every of these processes are described in organizational instruction where the criterions of quality monitoring are defined as well. These are:

1. Education (OI/TUKE/H1/01): - student's interest in study and study programs, selection process results, number of students registered for an academic year, test results from component subjects, credits from subjects, final exams results from subjects, successfulness of study through years (subjects, final state exam results, final successfulness of study, number of graduates, pedagogical demand of teachers) departments (faculties) TU.
2. Science and research (OI/TUKE/H2/01): - number of national and international projects of research and development planned, number of international projects of research and development, financial resources amount from international projects, number of national projects of research and development granted, financial resources amount from national projects of research and development, number of finished projects (international projects including), number of projects finished and applied in business groups, publish activity, number of patents and inventions, project's fulfilment in time period given, efficiency of

the achieved results of research and development – practicality of appointed goals fulfilment, quality of complex conference service, workshops, exposition, active part in internal and international conferences.

3. Business (OI/TUKE/H3/01): - total business activity costs per calendar year, business activity's profits, economic result of business activity, number of contracts on less than 50 000 Sk signed per calendar year, number of contracts on above 50 000 Sk signed per calendar year, number of contracts for one-time rental signed, number of discussions with potential customers, profits from contract's fulfillment, number of customers with whose the contracts were signed, contracts on above 1 mil. Sk, contracts with foreign companies. Business activities are considered through university management, rector's college and Science council of TU once per year.

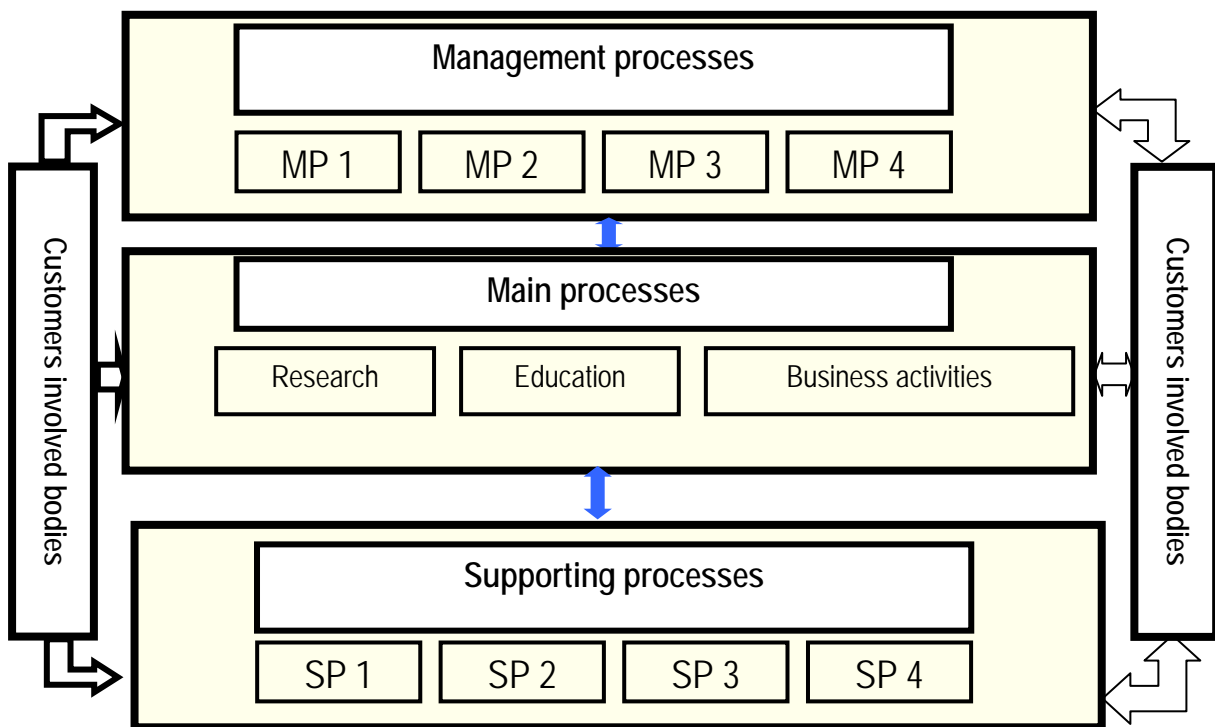


Figure 2. Main processes in QMS on TU of Košice

Monitoring procedures for individual projects of TU are described in procedural diagrams and descriptive tables for relevant OI. For measuring customer's satisfaction level separate instruction was created: Customer's satisfaction measuring.

Entries (indicators) defined in order of TU processes monitoring are adequate and extensive enough to suggest applicative remedies after analyzing them.

In the scope of maintenance and improvement of quality management system, so-called Report from performance rating of QMS of TU once per year is being prepared. This report gives an overview about quality level of individual processes (in the scope of the map of processes on TU) and the results of analysis are overturned to suggested remedies. Alongside an internal audits are running on TU (according to OI/TUKE/P6/01 Quality audits). Audit's results are noticed in audit's reports where recommended remedies are suggested including dates and responsibilities. Fulfilment of these remedies is checked.

Results of these activities are used in full extent in decision process and strategically planning of TU.

#### 4. CONCLUSION

In the scope of project of building QMS on TU the management of TU ordered the policy of quality. This policy was made in succession to Long-term objective of TU, it includes an obligation to fulfil the requirements of QMS and obligation of permanent improvement of its efficiency, gives space where quality goals can be set and checked, and where quality is published and comprehended. Quality policy objectives of TU are subscribed by quality goals of TU, these are short-term (appointed for 1 year), real, measurable and regularly evaluated by TU. State of quality securing in TU is described in Report from performance of QMS of TU, which was composed according to requirements of international standard ISO 9001:2000 and applied to TU conditions. Results for individual activities realized on TU are described in Annual reports of TU.

Slovak Ministry of Education supported this work; contract of application research No. aAV/1107/2004 and contract of agency VEGA No. 1/3177/06.

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