Process approach to quality management in education

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In the past, ISO 9001:1994, ISO 9002:1994 and ISO 9003:1994 were the standards used for certifying production organizations, but seldom in educational institutions, although it concerns the quality of products and service. The new standard ISO 9001:2000 introduces process approach to quality management. Definitions for quality in education, and examples of processes, according to ISO 9001:2000, in higher education institution, e.g., Military Academy, are given in this paper. These examples can be used as a base to define process approach in quality management in a higher education institution.

Introduction

Striving for the highest possible quality can be considered a world process. The implementation of standard ISO 9001:1994 and its new version ISO 9001:2000 (with the so-called process approach) has been done mostly in the area of production and production organizations, and less in the area of service (service is one of four product categories).1 The new ISO 9001:2000 standard: Quality management systems, Requirements (including ISO 9000:2000 Quality management systems, Fundamentals and vocabulary, and ISO 9004:2000 Quality management systems, Guidelines for performance improvements), introduces some new requirements and modifies some old ones, and uses the process approach to quality management. Process approach is referred to the systematic identification and management of the processes employed within an organization and particularly the interactions between such processes. ISO 9001:2000 Quality Management System consists of many processes, and these processes are glued together by means of many input-output relationships. In order to developed a quality management system that meets the new ISO 9001:2000 standard, one must develop, document, implement, monitor and improve each process.

When we speak about education, which falls into the category of services, implementation of these standards worldwide, and especially in the countries in transition, is still in its infancy. The same goes for Serbia and Montenegro.
Now there is no doubt that requirements of standards ISO 9001:2000 (JUS ISO 9001:2001 in the Serbia and Montenegro) can be implemented in quality management of educational organizations. The possible definition of quality in the area of education and identification of processes in educational institutions as a base for the introduction of quality management system based on the process approach is discussed in this paper.

**Definition of quality in education**

In schools and colleges we can very often hear words such as: quality, quality of production, quality of education, quality of teaching, quality of instruction. The general meaning of quality is defined in Ref. 1 as degree to which a set of inherent characteristics fulfils requirements. However, there are a few attempts to define the term of quality in education more precisely.

Some attempts to define quality in education can be found in Refs 2–4 but without any explicit introduction of the process approach to quality management.

The term quality, in the sense that an institution can take measures of certain quality, in order to get accreditation, is discussed in Refs 5, 6 in three categories:

- Quality as a measure of value,
- Quality as a measure of achieving a goal, and
- Quality as a measure of reaching a threshold.

Quality as a measure of value is considered to express the traditional meaning of quality in an academic community: the goal of which is to be the best, in a certain area of education, according to the self-established criteria and the self-evaluated results.

The concept of quality as a measure of achieving a goal is based on the following idea: quality of each curriculum depends on the ultimate students’ goal of the curricula, according to students’ needs.

Quality as a measure of reaching a threshold presuppose the existence of the sets of norms and criteria that are considered the threshold of quality, so that all the institutions that satisfy the established threshold are considered “qualified educational institutions”. Most often that threshold is the minimum criteria that has to be reached by an educational institution. It is due to change in time in accordance with the increasing needs in the area of education.

This short explanation shows that these definitions of quality in education have both advantages and disadvantages summarized in Table 1.
Table 1. Advantages and disadvantages of definitions of quality in education

<table>
<thead>
<tr>
<th>Quality</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
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<tbody>
<tr>
<td>“measure of value”</td>
<td>Responsibility of institution, strive to be better</td>
<td>Difficult to objecting</td>
</tr>
<tr>
<td>“measure of achieving the goal”</td>
<td>Considering the needs of users</td>
<td>Difficult to define precisely because of many different users (goals)</td>
</tr>
<tr>
<td>“measure to reach the threshold”</td>
<td>Objectivity, verification, uniformity</td>
<td>Static norms, the same threshold is not appropriate for different users</td>
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It is obvious that all of the educational institutions must satisfy the minimum requirements (threshold) in order to get the permission to work – to become a legal part not only of the higher educational system of the given country, but also to be acclaimed as such worldwide. And that is the meaning of the third definition of quality in education. This generally does not mean that every institution can and should strive to increase the level of quality. But the renewal and efficacy of each institution depends on the degree in which it surmounts the threshold (the measure of value) and the extent to which they take into consideration individual student needs (the measures of achieving a goal of each student).

**Processes in educational institutions**

The new ISO 9001:2000 standard requires identifying all business processes* within an organization, to define their relations and interactions and to manage the processes.\(^7\)\(^,\)\(^8\) The ISO 9001:2000 has a new structure, definition, emphasis, flexibility, approach and new requirements, and its intent is to encourage the adoption of the process approach to manage an organization.

Accordingly, it is necessary to define all processes. That means we should determine: the name of process; the goal (mission) of the process; borders of the process (initial and final activities); inputs in process and their producers (suppliers); outputs of the process and their byres/users; the owners of the process – the person responsible for functioning of process; and flow diagram of process.

The result of such an analysis is the process model that is often shown graphically. For complex organizations it is useful to make the grid of processes or matrix of mutual influences on the processes.

* Any activity, or set of activities, that uses resources to transform inputs to outputs can be considered as a process.\(^7\)
Defining of the processes in an organization is a complex task and often requires a team of experts. One can identify the processes by analyzing the functioning of the organization. The starting point in defining the processes would be the system structural analysis. Not going into too much detail, an example from the Military Academy of the State Union of Serbia and Montenegro practice will be presented. We consider these to be the processes in a higher military educational institution:

- Students applying for studies;
- Scheduling classes (including the special forms of instruction);
- Scheduling exams;
- Classes and special forms of instruction;
- Evaluating student’s knowledge (by professors and assistants);
- Gathering and handling the results of exams (evaluation of knowledge);
- Diploma exam;
- Upgrading study material;
- Writing and publishing specialized literature;
- Purchasing the literature;
- Evaluating of the curricula;
- Improving of the existing and creating new curricula;
- Scientific and research work;
- Electing teachers and assistants;
- Studying for specialist, master’s and doctor’s degree;
- Public relations (with student’s parents, community and etc.).

Most of these processes are interrelated. They generally consist of more than one activity, and some of these activities can be considered a process too. Here are two examples.

The first example would be the *procedure of application of students* with the following steps: assessing the needs for a certain profile of students that are to be educated on the Military Academy; publishing contests; assembling students’ applications; health evaluation; exam in mathematics; general physical examination; psychological evaluation; evaluation of final results; informing the candidates (applicants) about the results of the contests and etc.

The second example would be the *evaluation process of students’ knowledge* that is made up of a chain of activities: (a) defining the possibilities and the types of examinations before starting the instruction in a subject (course); (b) defining the forms of exams during the instruction (control exams, partial exams etc. and their impact on the final score in the exam of the subject); (c) defining the types of exams before the instruction begins (if it is necessary); (d) defining the impact of the results of exams
during the instruction on final score; (e) defining subject-matter and the level of knowledge for the marks on the grading scale; (f) defining the grading scale for evaluation of students’ knowledge; (g) introducing the contents of instructions to the students for the realization of each subject (specially with part of evaluation of student’s knowledge); (h) defining the ways of evaluating the students’ knowledge (written paper, oral exam, combined exam); (i) defining the ways in which the examination will be carried out and giving marks when there is more than one teacher for the same subject; (j) coordinating the terms of exams; (k) presenting the terms of exams; (l) creating exam questions and tasks; (m) copying and protection of the exam questions and tasks; (n) designing application for exams; (o) teachers collecting the students’ exam application; (p) marking students’ written papers; (r) concluding the marks; (s) informing students about the marks; (t) signing students’ exam application forms; (u) transferring students’ application forms to the student’s service; (v) analyzing the process and results of evaluation of students’ knowledge; (z) noting the results of evaluating of student’s knowledge and analysis of exams; (x) proposing the measures for better ways of evaluating of students’ knowledge and analysis of the results of exams.

Grid diagram for the second example (evaluation process of student’s knowledge) is shown on Figure 1. Letter linked to the arrows represents the activities as indicated in the text above. The dotted lines stand for the fictive activities.

Figure 1. Grid diagram of activities of the evaluation process of student’s knowledge
There are, however, some critical points on the diagram on Figure 1. The circle with number 1 stands for the starting of the process, it is usually marks the point when that class schedule is finished and given to the teachers. Circle with number 5 marks the beginning of the classes. Circle with number 8 means that the exam schedule is finished and given to the teachers, and activities concerning the preparation of teachers to carry out the exam with student can start. Circle with number 13 marks the point when exams start, and finally circle with number 20 marks the end of the whole process of the evaluation of the students’ knowledge.

It is obvious from the previous analysis that process can comprise a large number of activities. Some of these activities are simple and require a short time to be finished and some of them are more complex and require more time to be finished. But, all of these activities are important and if they are omitted it can have negative impact on overall student’s results and results of the education institution. Some of the activities must be done before others, and some must be done simultaneously. The same situation goes for processes. Therefore, it is necessary to create a flow in a process or processes and show it, for example, in the form of a grid diagram.

**Conclusion**

When certification according to ISO 9000:2000 standard is discussed, it is not enough only to documented the procedures in order to demonstrate that they are consistent with ISO 9000 but it is necessary to manage the processes in an organization in order to get better results in business or doing the organizational job. In order to do this, we must identify all of the processes and their interactions.

Process approach is applicable and useful for all organizations, including educational. The advantage of the process approach is a continuum in managing, which is ensured by this approach through relations between the processes in the system of processes, as well as through their combination and interactions.

Process approach in education can be defined as an application of system of processes in an educational institution, along with the identification and interaction of these processes, as well as their management.

Not all of the processes within an educational institution have been identified in this work and we hope that this work will initiate future ones in the area of analysis. The identification and analysis of these processes is a job for a group of experts.
References

2. V. ČEPUJNOŠKA: Quality assurance in educational process, Quality and Reliability, (1990) 69–70.