Approach to assessing the maturity level of an educational institution of secondary vocational education

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Abstract. This article discusses the approach to determining the maturity level of the organization of secondary vocational education on the example of the Krasnoyarsk College of Radio Electronics and Information Technology. The study is based on a survey of teachers and college staff for different periods of time. The research structure is based on the Voyager Plant Optimization methodology, the questionnaires are designed in accordance with the McKinsey model and adapted to the system of secondary vocational education in Russia. The survey was conducted in two directions: personnel management and increasing efficiency and showed the degradation of the organization's maturity level under the influence of environmental factors of the organization. The results reflect a prolonged transition process in the college caused by a continuous sequence of organizational changes, such as: transfer to the Krasnoyarsk Territory in 2012, merger with the Krasnoyarsk College of Radio Electronics, Economics and Management in 2015, a constant change of leadership from 2015 to 2019.

1. Introduction

Business process management is one of the most important management technologies in modern economic conditions. The basis of a methodological framework family of standards ISO 9000 is a business process management, therefore, each enterprise developing a quality management system based on these standards must be guided by this approach. As the ISO Survey study shows, the number of such enterprises in the world exceeded one million, which confirms the high relevance of the task of managing business processes. The process approach to management was first described in the work of Philip Crosby “Quality is Free” [1], its further development was proposed in the works of Watts Humphrey [2]. The best business process management practices are described in the Business Process Management Knowledge Base - BPM CBOK.

One of the important characteristics of enterprises engaged in business processes is their organizational maturity. In [3-4] organizational maturity is defined as the degree to which the organization explicitly and sequentially implements practices or processes that are documented, managed, measured, controlled and constantly improved. The maturity of the organizational process can be measured using expert judgment, for example, in the form of a survey of stakeholders. The description of the maturity management framework for business processes is presented in the international standards ISO / IEC 15504, ISO 9004, ISO 10014. The maturity of the organization is equivalent to the presence of
its leaders the ability to really manage the processes of development, design and creation of products, and not to expect the results of reactive improvisations of managers. Project management and product creation involves both working and newcomers. Work is carried out in accordance with plans and procedures. Documented processes are used in practice and bring real benefits. These processes are modified and improved as necessary. Responsibilities and responsibilities are clearly defined both within the framework of individual processes and throughout the organization.

Diogo Proença in [5] developed an approach to automating the assessment of the maturity of organizations based on its structure.

In [6], the application of the Voyager Plant Optimization methodology to build a model for managing the improvement of business processes based on an assessment of the maturity level of an organization is considered.

The question of determining the maturity of an educational organization arises in connection with the changes taking place in the vocational education system and related primarily to a change in attitude towards education in principle.

The strategic goal of the state policy in the field of education in accordance with the "Concept for the Development of Education of the Russian Federation until 2020" is to increase the availability of quality education that meets the requirements of innovative development of the economy, the modern needs of society and every citizen. For this, it is necessary to ensure equal conditions of access for state and non-state organizations providing high-quality educational services to educational infrastructure and state and municipal funding.

In the market for the provision of educational services with a high degree of probability there is competition between educational organizations for the right to educate students both on a budget and on an off-budget basis. This means that, as in production companies, the educational organization should organize monitoring and a continuous cycle to improve the quality of service delivery, both for the development of the organization itself and for increasing its competitiveness and attractiveness for potential customers, which means increasing profits.

C. Demir and İbrahim Kocabuş [7] consider the Project Management Maturity Model (PMMM) in educational organizations.

Duarte Duarte and Paula Ventura Martins are considering a project to expand the maturity model of business processes for universities.

In this paper, we consider an approach to the analysis of the processes of the educational organization of secondary vocational education and determine the level of its maturity based on the application of the Voyager Plant Optimization technique. The Krasnoyarsk College of Radio Electronics and Information Technology was chosen as the base organization for the study.

Hypotheses:

- The activities of the educational organization of open source software can be evaluated to determine the current level of maturity.
- The Voyager Plant Optimization technique can be applied to develop the model and structure of questionnaires for the main areas of college activities.

2. Method

The study is based on the application of the Voyager Plant Optimization technique of Anheuser-Busch InBev. In accordance with it, a model of the questionnaire was developed to assess the maturity level of the educational organization of secondary vocational education (figure 1).
The following main and auxiliary processes implemented by the educational organization of secondary vocational education, which fully describe the activities of the college, were selected as the areas of research:

- The educational process (core);
- Methodological support of the educational process;
- Recruitment of contingent (career guidance activities);
- Work with the contingent (movement);
- Subsequent employment of graduates;
- Work with the founder;
- Material and technical support of the educational process;
- Information support of the educational process;
- Financial support for the educational process;
- Increased efficiency;
- Personnel Management.

The structure of each of the questionnaires is developed in accordance with the McKinsey model: the questionnaire is divided into sections, sections are grouped and a pyramid of management is built on their basis. For example, the questionnaire in the area of “Human Resources” includes such sections as:

- College Management,
- Information about benefits
- Staff training program,
- Internal hiring procedure,
- External hiring procedure,
- Competency assessment process,
- Recognition Achievement Program,
- Individual development programs;
- Leadership.
Elements of the pyramid are painted in colors (red, yellow, green) depending on the total score for the section. Red color means that at the time of assessment no more than 40% of the interrogated criteria are implemented or used, yellow - from 40% to 80%, green - over 80%.

The components of the pyramid are distributed by maturity level. In this work, the model of maturity levels is somewhat simplified compared to the base, including three levels instead of the five provided by the standard model. The reduction in the number of levels was achieved by grouping the levels of the standard model into one.

![Maturity pyramid of the process “Increasing Efficiency”](image1)

![Maturity pyramid of the Personnel process.](image2)

### 3. Results

The survey of college staff and teachers was carried out in two areas: personnel management and improving efficiency. The survey involved teachers working from 3 to 20 years old, heads of structural divisions (for example, an IT department), one of the former heads of the institution who had been in office for 1.5 years in the analyzed period, and a deputy leader with more than one seniority 20 years.

The survey results were grouped into three main periods of the educational institution: until 2015, from 2015 to 2018 and from 2018 to 2020.

Figure 4 presents the dynamics of the development of organizational maturity of the college in terms of the business process "Personnel Management", figure 5 presents in part of the business process "Improving Efficiency".

![The results of the assessment of the process "Human Resource Management".](image3)
4. Discussion
As a result of the study, the degradation of the maturity levels of the studied educational organization was revealed. The results obtained describe the prolonged transitional period of the college, associated with a number of global transformations, namely:

- By order of the Government of the Russian Federation of December 29, 2011 N 2413-r Krasnoyarsk College of Informatics and Computer Engineering (the name of the institution was before 12.01.2015) was transferred to the jurisdiction of the Krasnoyarsk Territory.
- By order of the Government of the Krasnoyarsk Territory dated April 2, 2014 N 206-r and Order of the Minister of Education of the Krasnoyarsk Territory 01/12/2015. By merging the Krasnoyarsk College of Informatics and Computer Engineering and the Krasnoyarsk College of Radio Electronics, Economics and Management, a new educational institution was created - the Krasnoyarsk College of Radio Electronics and Information Technology.
- For the period from January 12, 2015 to the present, 4 directors and 2 acting directors have been replaced at the college, the average working period of each of them does not exceed 1 calendar year.
- In connection with the frequent change of senior management, there is a frequent change in the direction of college development, which prevents the formation of positive dynamics in development.

5. Conclusions
Thus, the developed model for the study of organizational maturity of the educational organization confirmed the hypotheses put forward in the work. The dependence of the maturity level of the organization on administrative influences is demonstrated.

However, the results obtained are only part of the study. A full study (on 11 processes) will give a broader understanding of the current situation and ways to resolve it. In the future, it is possible to apply process mining technology to the analysis of the basic processes of the college and determine the level of its maturity. The development of the project is possible by studying the dynamics of the indicators of the main processes and assessing the relationship between the level of maturity and the indicators of the processes under consideration.

References
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