EDUCATION AND SUSTAINABLE DEVELOPMENT

PERFORMANCE MANAGEMENT AND KEY PERFORMANCE INDICATORS FOR HIGHER EDUCATION INSTITUTIONS IN SERBIA

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Abstract: Higher education is enduring fundamental changes - universities are experimenting with new ways of funding and forging partnerships with private companies, competition is fiercer than ever before. All these changes indicate that higher education is becoming an industry. Thus, in order to succeed, institutions of higher education, just like profit oriented organizations, have to know how to enhance an manage their performance. The paper depicts the process of defining key performance indicators for higher education institutions in Serbia. Once determined, key performance indicators become a basis for improving control of use of organizational resources, quality of business results and for aligning business strategy with business technology.

Introduction

Higher education is more than ever enduring fundamental changes - universities are forced to look for new sources of funding and enter into partnerships with private companies, competition is increasingly assuming the characteristics of an open market. The World Bank estimates that global spending on higher education amounts to $300 billion per year or 1% of global economic output (The Economist, 2005). All these changes indicate that higher education is gradually transformed into a specific type of industry. Higher education institutions that want to succeed in these changed circumstances must begin to behave more like profit-oriented organizations - they have to understand their business processes and, more importantly, know how to enhance and manage their business performance.

At the same time, performance management is one of the most popular issues in the area of business intelligence and ranks among the top ten technology trends significant for enterprise management. According to AMR Research, total investments of North American companies in business intelligence and performance management for 2007 are estimated at $23.8 billion. Gartner predicts that investments in performance management software will increase to about $2 billion by 2010, and Forrester Research predicts even faster growth of investments - that performance management software sales will reach $2.7 billion by the end of 2009 (Ariyachandra and Frolick, 2008).

Performance management for higher education institutions

Higher education institutions have until recently had the character of public non-profit institutions, funded and regulated entirely (or mostly) by the state. Their primary purpose was the provision of well educated workforce that possesses the knowledge and skills necessary for easier and faster economic development and prosperity of the entire society. With global changes in day-to-day business the needs and requirements of institutions of higher education are also changing. Fundamental changes in higher education are gradually transforming it into a specific type of industry. Higher education institutions are increasingly denied state funding from the budget and are forced to look for new sources of funding, such as scholarships and funds for research projects. Growing number of institutions of higher education are forging partnerships with private companies. With the proliferation of profit-oriented and private institutions competition in the area of higher education is becoming fiercer than ever before.

The causes of these changes are numerous, but several stand out. For some time democratization of higher education is present in developed countries, and recently this trend is spreading to developing countries, especially China and India. Democratization of higher education is leading to its massification - it is becoming available to a larger part of the population. In Serbia, the situation is the same, as reflected in the extreme increase in number of higher education institutions since the middle of last century to the present (Table 1).

Knowledge economy is on the rise and it is replacing physical resources as the main driver of economic growth. Institutions of higher education are the main provider of educated and skilled workers that possess the necessary knowledge. The same institutions participate in the process of acquiring and spreading new knowledge by conducting research projects. At least one third of the world's leading companies' investments include intangible knowledge-based areas, such as research and development, licensing and marketing. So it's not surprising that these companies form

partnerships with institutions of higher education. Globalization is transforming business worldwide, but it also affects the educational process. Higher education is transformed into an export industry in many countries whose universities opened departments around the world. The new conditions of competition are forcing universities to compete for students and funding for research projects. Private companies appear as new participants in the sector of higher education and, in addition to investing in research and development projects, they are founding their own institutions of higher education.

TABLE 1. NUMBER OF HIGHER EDUCATION INSTITUTIONS IN SERBIA PER ACADEMIC YEAR

Academic year	Number of higher education institutions
1938/39	11
1947/48	16
1955/56	31
1966/67	97
1976/77	127
2002/03	135
2003/04	201
2004/05	223
2005/06	243
2006/07	272

Source: data from statistical data bank, SORS, 2008
Note: * Statistical Office of the Republic of Serbia (SORS, 2008, pp.354).

In order to achieve success, higher education institutions must apply business concepts inherent for profit-oriented companies, such as management performance. Management performance can be described as a series of business processes and applications designed to optimize both the development and implementation of business strategies (Ariyachandra and Frolick, 2008, pp.114). Understanding, planning, measuring and evaluating performance of the organization and its processes is impossible without identifying critical success factors, performance indicators and, especially, the key performance indicators. Key performance indicators are a set of measures focused on those aspects of organizational performance that are most critical for current and future success of the organization (Parmenter, 2007). Application of the concept of performance management dictates the necessity of taking into account characteristics of business processes of higher education institutions. Although institutions of higher education must start to operate more like profit oriented enterprises, they still have some characteristics of public non-profit institutions, and similarities with the service sector.

As with most public and non-profit institutions, institutions of higher education struggle with defining measures of success in the process of managing their performance. They often don't have fully or adequately defined mission statement and their business goals are intangible and vague, making it difficult to identify critical success factors and performance indicators. Like public institutions, they depend on the state that regulates their work, and it affects the manner and method of defining performance management system. Thanks to the nature of activities of institutions of higher education, performance is measured through use of numerous qualitative indicators, which are difficult to quantify. The mission and purpose of public and non-profit organizations is mostly associated with non-financial aspects and global social contribution, which also applies to institutions of higher education. Financial aspects primarily represent limitations or basic prerequisites.

Therefore, the focus of performance measurement should be primarily on non-financial indicators.

The process of developing key performance indicators for higher education institutions

The methodology used to develop key performance indicators for higher education institutions is based on the CMMI (Capability Maturity Model Integration) concept, and it was adapted to specific characteristics of higher education institutions, whose business process is similar to the service sector, public sector and nonprofit sector. Development of key performance indicators of the educational process involves the following steps:

1. Collecting and analyzing relevant information necessary to identify and develop the set of key performance indicators;

2. Compiling existing data on previous measurements;

3. Determining the purpose for which performance indicators will be used;

4. Determining perspective, areas and levels of performance;

5. Compiling a preliminary list of indicators;

6. Evaluation and final selection of performance indicators;

7. Determining methods and templates for collecting data on selected indicators;

8. Documenting the selected indicators.

We started the process of determining key performance indicators of the educational process by collecting the necessary information from existing legal and business documents of the higher education institution. Interviews were conducted with the associate dean for education, experts from relevant fields and heads of departments. As a result we collected information regarding the vision, mission and goals of the institution that were the basis for defining critical success factors and the set of key performance indicators. Also, it was determined that the institution does not already poses a developed and implemented performance

management system. Information were collected regarding the desired purpose of defining a set of key performance indicators and at what level and for what area and perspective we want to measure performance, whether there were previous attempts to measure performance in the institution and the effects that were achieved.

All attempts of measuring performance in the past were carried out occasionally and partially, without a developed plan, system or standards. Some basic data about the success of the institution can be gathered from the institution's income statement (e.g. standard financial indicators), its market share (measured through number of students enrolled), and through the compulsory records of scientific and research production of its teachers and researchers. One of the mandatory parts of the process of accreditation of higher education institution was the business process and operations analysis, in which some data on the performance of the institution were collected, but these data have not been aggregated and appropriately used.

In recent years, there were attempts to introduce the practice of analysis of students' accomplishments in exam terms, although such efforts face different challenges, due to conflict of opinions about the proper way of measuring students' accomplishments. Occasionally, an anonymous survey was carried out, in which students have evaluated assistants and teachers, but the questionnaires were badly structured and too open, hence the collected data weren't objective and representative. There were also efforts to develop a practice of student criticism, praises and suggestions, but they still haven't produced the desired effect, and they also do not provide objective data. Since all efforts to measure the performance have remained partial and ad-hoc, limited amount of data that can be collected and analyzed remains incomparable, and the results of analysis are either not published or not available to everybody.

The primary purpose of developing and applying performance indicators of the educational process is the strategic control and improvement of higher education institutions' business processes. The aim of monitoring the performance is to improve the efficiency of studies and to better prepare students for work in different sectors of the economy. At the same time, the goal is to increase student and teaching staff satisfaction and to provide information to all interested parties. Long-term improvement of the teaching process contributes to creating a better ranking and reputation of the institution, but it also benefits the prosperity of the local community, the region and the state.

Performance perspectives of the educational process were determined based on the data collected in the interviews mentioned above. Five perspectives were determined:

1. Potential and utilization of staff potential;
2. Resource quality (student assessment);
3. Success of the educational process;
4. Success of scientific-research and consulting activities of the higher education institution;
5. Finances.

The above perspectives are no entirely equivalent to BSC perspectives (Kaplan, 2001), but certain parallels can be established. The potential and utilization of staff potential

perspective and resource quality perspective can be associated with BSC internal process perspective, and the success of the educational process perspective with BSC customer perspective, for in the case of institutions of higher education students are the customers, i.e. person to whom service is provided. The success of scientific-research and consulting activities of the higher education institution perspective corresponds to BSC research and development perspective, and the finance perspective fully coincides with the same BSC perspective.

It is necessary to monitor and manage performance at the level of departments, sectors, centers, for all levels of study, for each enrolled generation of students, every study program, all the way down to the level of individual students and subjects. A preliminary list of performance indicators was defined based on the collected data. The indicators are grouped according to the perspectives and areas of performance identified in the previous step. In the next step, all preliminary indicators were rated and those that did not meet the characteristics of good indicators of performance were rejected. All remaining indicators represent the final set of selected performance indicators.

Tracking of the values of selected performance indicators is an essential part of performance management and it entails the collection of relevant data. Possible sources of data in higher education institutions are diverse and include enrollment data, student files, different types of records (employee records, records of business activities, student class attendance records, exam records, records of extracurricular activities), business documents (balance sheet, income statement, the data from current operations) and conducted surveys (by the students, employees, other institutions, commercial entities). The biggest problem related to collecting data for performance management of higher education institutions is the lack of integrated systems and standardized method for continuous collection of necessary data. This leads to the impossibility of monitoring the changes in values of selected indicators and the lack of timely information necessary for performance management. It is especially challenging to collect data on indicators that are in part qualitative - indicators related to different evaluations by the students, employees, institutions and companies. For such indicators, qualitative data have to be collected by appropriate methods, and then transformed into quantitative data using suitable techniques. Sources of data needed for monitoring performance indicators can be external, such as graduate students, domestic and foreign scientific research and other institutions and different companies. With external data sources, it is particularly important to ensure fitting incentives for providing the data.

Last step in the process of developing key performance indicators is documenting the selected indicators by determining the BSC perspective and area to which they belong, their definition, methods of measurement and calculation, frequency of measurement and data sources. Among the selected indicators of educational performance, fallowing indicators can be distinguished as key process indicators:

- teachers to students ratio;
- indicator of the systematic planning of professional development of teachers;

- student evaluation of the quality of teaching and examination for each teacher;
- evaluation of the expertise of teaching and scientific staff by the foreign institutions and companies;
- indicator of the success of enrolled students on the entrance exam;
- percentage of students that have enrolled in the next academic year;
- percentage of students passing the subject for each exam term;
- percentage of students that have completed their primary studies within three years;
- percentage of teachers that participate in scientific research - participation in projects, papers, awards, etc.;
- profitability of individual study programs.

Of course, the selection of key indicators from the set of performance indicators always depends on the higher education institution in question and its characteristics. Once defined and documented, the key performance indicators are the basis for measuring, monitoring and managing performance of higher education institution and they make it possible to focus the entire institution on achieving determined business goals.

Conclusion

Although primarily applied to profit-oriented enterprises, the concept of performance management is also applicable in the segment of higher education. One of the biggest challenges in developing and implementing performance indicators of higher education is to collect the necessary data. The data required to monitor the changes of the values of selected indicators and to provide timely information for performance management can be collected only if the process of data collection within the institution is standardized and transformed into a continuous activity, as an integral part of everyday work and business operations. External sources should be motivated to provide the data and qualitative data should be transformed into quantitative data by appropriate techniques. It is necessary to establish a unified database, which will include information about students that have graduated at the institution, about contact persons in domestic and foreign institutions, about companies. Only then can high quality, relevant, reliable, consistent, comparable and timely data be provided, data needed to define the timely actions to improve the performance of the institution.

Defined performance indicators should serve as the basis for the development of dimensional data models and DW integrated architecture, which are the foundation for further development of all management support applications for higher education. Development of business intelligence models for support of higher education institutions management should provide adequate and timely information required for business process management and performance management of higher education institutions.

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