Automation of Organizational Management of the Technical Higher Education Institute's Faculty on the Basis of Balanced Scorecard

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Abstract - **Results of balanced scorecard methodology application for modelling, optimization and automation of processes of organizational technical university's faculty management are considered. Strategic card, ascertained system of key activities, basic actions on their achievement and swot-analysis are described. ARIS, as one of the fullest platforms for modelling and optimization of business – processes, is used for information support of a created new organizational faculty management system. Methods of an artificial intellect, in particular, the description of an information subsystem on the basis of semantic networks, are applied to increase the effectiveness of system management of high educational institute's balance structure. The suggested approach allows to accumulate knowledge of organizational managerial processes, to carry out their monitoring, to perform on-the-fly substantial interpretation and visualization.**

Key Words- Balanced scoreboard methodology, Management of the faculty, Organizational Structure

Last years balanced scorecard methodology (BSC) is often used at the creation of effective systems of organizational systems' management, especially abroad. It is available not numerous positive experience in the sphere of educational establishments for improvement of educational service quality. One of the basic subsystems is information system (IS) by means of which gathering of measured values of key parameters, their storage and maintenance of monitoring is carried out. Lack of existing methodological approaches to construction of organizational systems on the basis of the BSM is the weak level of formalization of procedures of structure synthesis, a strategic card and other elements of the business-processes description [1,2,3].

For the decision of this problem it is offered to use IS, constructed on the basis of intellectual methods, in particular, use of semantic networks. The semantic network combines semantic and industrial relations of processes, and also data and connections between information objects [7] besides it allows describing visually official instructions of employees. The combination of BSC and a semantic network gives opportunities of operative acceptance of set of decisions in various situations, automation of document circulation, gathering of the information and quality assessment of the organization departments' activity.

It is organized the working group consisting of employees of dean's office and heads of departments for creation of BSM which within 3 months of continuous work has executed the following processes:

- definition of mission and vision of the faculty;
- elaboration of the development strategy of the faculty;
- definition of prospects at decomposition of the strategic purpose of the faculty development;
- definition of the strategic purposes of the faculty;
- definition of key factors of success of achievement of the strategic purposes;
- choice of parameters for monitoring movement to the faculty strategic purpose;
- formation of target values of parameters on the basis of expert estimations of the working group;

- elaboration of initiatives, i.e. the plan of concrete actions for achievement of objects in view of strategic development of the faculty.

Activity of an educational institution represents sequence of the interconnected processes which are taking place through all departments, therefore a basis of IS construction is the process approach which is easily described in the form of a semantic network (see fig. of the strategic card of the faculty of electronic techniques and instrument making).

Let's briefly examine the maintenance of five prospects for strategic management of the faculty of electronics and instrument making of Saratov State Technical University (SSTU), which can be of interest for similar faculties of technical Universities.

I. Prospect "Society"

The faculty of electronics and instrument - making is a part of state organization, which should be equitable to interests of a society. Mission of the faculty assumes the achievement of the following public purposes:

- the dynamical scientific environment integrated with a real sector of economy;
- . leadership in an innovative direction of computer science, management and instrument making;
- . object of pride of university, city, region, Russia.

For achievement of these purposes it is necessary for the faculty to become the spontaneous innovative faculty satisfying growing needs of a society in new scientific and technical achievements and highly skilled experts of a global level in the field of cybernetics, radio engineering, instrument making, information technologies, that, in turn, it will be provided by performance of the purposes of the following prospects.

II Prospect "Finance"

2.1 Excess of incomes over charges. The purpose of the top level, being an embodiment of strategy of the proprietor on continuation of business.

2.2. Growth of incomes. Achievement of the given purpose is necessary for realization of the purpose 1.1. Growth of volume of proceeds is planned as due to increase in volumes of rendering of services in the mastered markets, and due to introduction for the new markets.

2.3. Optimization of costs. For everyone business-operation it is necessary to find such optimum volume of costs which maximizes profit that is necessary for realization of the purpose 1.1.

III Prospect "Clients"

The clients of the faculty of electronics and instrument – making are:

- entrants,
- parents of entrants,
- students,
- parents of students,
- organizations acting as customers of educational services (higher, additional, accelerated, postgraduate education),
- organizations acting as consumers of graduates,
- organizations acting as consumers of innovative researches of the faculty, carried out on practical industrial agreements.

3.1. Growing quantity of clients. Achievement of the given purpose is planned due to an intensification of methods of attraction of clients of services traditional for institute: higher, additional, accelerated, postgraduate education, and also new kinds of services, activization of contacts with the enterprises.

3.2. Increase of quantity and volumes of commercial works. It is planned expansion of types of practical industrial works, increase in volumes of the educational and other commercial services which are resolved by the current legislation of Russia and not contradicting of the University Charter.

3.3. Development of the market. Promotion of results of research and innovative works on the market. Increase in a share of institute in educational services, expansion of assortment of these services, including on the basis of opening new, perspective educational services, formation of readiness of the market to these services. Expansion of a spectrum of educational courses (for example, for beginners, advanced, or professionals). Increase of image of institute for potential clients. The analysis of available opportunities and formation of assortment of service services rendered by university (a complex meal of students, the subscription on visiting of a sport center and so on).

3.4. The effective price policy. The faculty of electronics and instrument - making is positioned in the market of standard consumption, therefore the price aspect is important for a client. Tracking and formation of an effective price level on various kinds of services, introduction and development of system of discounts (may be discount cards).

3.5. Development of innovative products and technologies. The central direction of development is perfection of educational process on the basis of innovative technologies, and also innovations in scientific activity in the field of computer science, management and instrument making, introduction of their results in various branches. The further development of institute, university and as a whole Russia should be focused on creation and an effective utilization of innovative products and technologies as alternative of an unpromising way of an intensive use of natural resources.

3.6. Qualitative education of a world level. The central aspects of lessons quality are highly skilled teachers, teachers-experts, modern methods of training, quality of subject contents, effective structures and assortment of courses (presence of a complex of modern, demanded, popular educational programs). Modern innovative educational disciplines and programs, educational technologies, both for traditional, and for additional education. Reception of the international certificates on educational programs.

IV Prospect "Internal processes"

4.1. Effective work with the client. Creation and introduction of system of works in the following directions: monitoring of needs of all groups of clients and estimations of quality of the rendered services, work with a client

database, increase of efficiency existing, creation and introduction of effective methods of work with clients, the analysis and work above image.

4.2. Improvement of quality of educational programs. Creation and introduction of a system of an estimation of efficiency and quality of educational activity and its results. An intensification and the control of processes of development and perfection of the study-methodical documentation.

4.3. Development of scientific researches. Development of the fundamental and applied scientific researches demanded in the market. The analysis of the regional market and own opportunities with the purpose of search of directions of scientific researches and orders for them.

4.4. An effective utilization of actives. Creation and introduction of a system of the economic analysis and a substantiation of decision-making on the organization of business-processes. The control of questions of pricing, decision-making over realization of projects, increases of efficiency of use of material resources, etc.

4.5. Perfection of material base. Use of the newest equipment, technologies of training and modern teaching materials.

4.6. Development of corporate information system. Systematic work on introduction in all aspects of the faculty activity of the integrated information system giving an opportunity of convenient access to the necessary information and the operative analysis of data with formation of reports.

4.7. Creation and maintenance of a favorable climate necessary for development of departures of the organization. Creation of an atmosphere among the personnel in which employees accept corporate idea and support it actively.

V Prospect "Employees/infrastructures"

5.1. A management system of mutual relations with clients. Investigation of market needs, formation of an innovative product under the actual and generated requirements, construction of relations with a client at which he/she becomes a customer.

5.2. A management system of the personnel. It is necessary for achievement of strategic purposes:

- cCorporate ideology in the field of the staff, including a policy of personnel hiring, their development, deduction and dismissal,
- employees with a high level of professionalism, interested in performance of their duties,
- formation of clear, transparent and accepted by all motivation system transforming creative efforts and diligent execution of official duties in various kinds of encouragement, including material compensation,
- regular improvement of professional skill of employees for maintenance of a high professional level and the further growth,
- creation of conditions for fast adaptation of new employees with peak efficiency by means of intra-university and external courses and trainings.

5.3. The corporate environment of information technologies of collective using. Creation of the system including a hardware-software complex and highly skilled experts, capable to develop and realize corporate ideology in the field of the information technologies, determining priority directions in the development of corporate information system.

5.4. System of economic efficiency and the analysis of the market. Creation of system for achievement of strategic parameters of economic efficiency of University activity on the basis of the analysis of an existing condition. Formation of operating organizational influences and tracking of timeliness and correctness of their working off.

5.5. The management system of quality of educational services. Creation and introduction of quality management system focused on ISO 9001. Certification of a management quality system according to one of the international standards.

5.6. Flexible multilevel organizational structure. Creation and introduction of the flexible organizational structure of institute (matrix, linear, hierarchical), being the most effective and including a regulation of mutual relations between functional departments, projects and a management, duty regulations, the rights, duties and etc.

5.7. Enterprise innovative corporate culture. Creation and introduction of the system providing development of corporate culture followed by the majority, focused on an international market, flexibility and stability, team work.

Let's examine the following set of aspects of the University activity: management of the organization, teaching and training, management of the personnel, student's services, material-economic maintenance, automation of a document circulation of a dean's office.

Semantic IS network of a dean's office

$$S \in [X, Y, P, A] \quad (1)$$

includes a set of the external processes carrying human $_{Xi}$ and automated $_{Yj}$ character, and also a set of internal processes of the employees carrying human $_{Pm}$ and automated $_{An}$ character. Tops in a semantic network show concepts of the objects of a dean's office and situations with a set of information attributes, and arches is a relation between them. The fragment of a semantic network of a system of the account of examination registers is presented on fig. 1

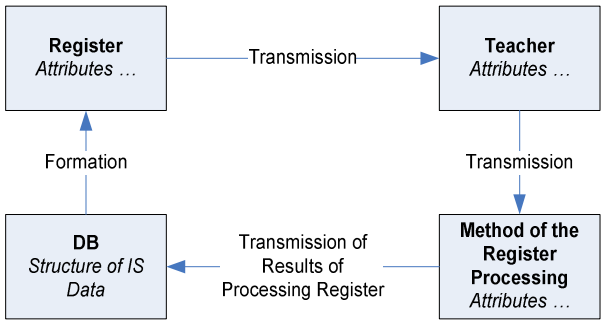

FIGURE 1
PART OF THE SEMANTIC NETWORK OF IS-DEAN'S OFFICE.

For construction of organizational-functional model of a semantic network on management of study-methodical

processes it is offered to use methodology of CASE-technologies and on their base to develop an intellectual automated model of IS of ERP class integrating in themselves the data necessary for a University management system. One of widespread ERP - systems is the strategic platform ARIS, being an effective tool for designing a complex BSC, an architecture of an organization and modelling, optimization and management business-processes [6].

A contextual diagram of IS - dean's office, based on methodology of IDEF0 which orders a construction of hierarchical system of diagrams - decomposition of subsystems with their separate description [5] is presented on fig.2

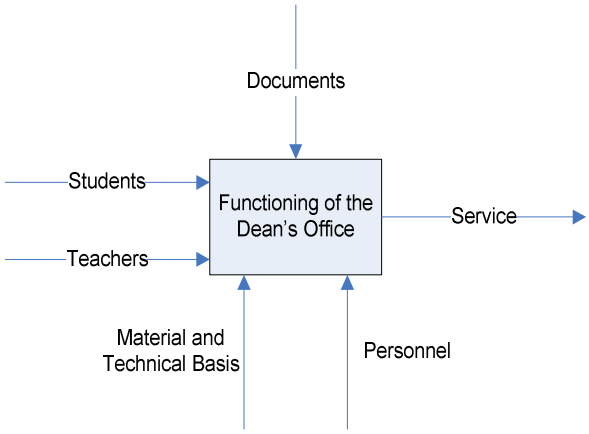

FIGURE 2
CONTEXTUAL DIAGRAM OF IS-DEAN'S OFFICE.

According to the methodology of ARIS the received functional model of process of the account of examination registers is described on fig.3

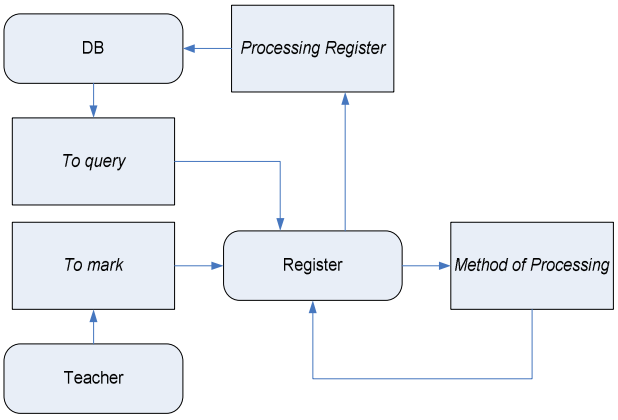

FIGURE 3
MODEL OF THE PROCESS OF EXAMINATION REGISTERS ACCOUNT.

Introduction of information system promotes a reception of more rational variants of the administrative problems solution on the basis of introduction of mathematical methods and intellectual systems.

The offered technique of IS - designing of a quality management of educational services gives an opportunity to form the relation between departments following a principle "supplier-consumer", as a result of it, the overall University activity increases, duplication of procedures is excluded and educational process quality also increases. Thus the purpose of BSC containing the increase of image and competitiveness of educational establishment is achieved.

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