MANAGEMENT INFORMATION SYSTEMS APPLICATION AT UNIVERSITIES OF RUSSIAN FEDERATION

Oleg Podolyakin

Vologda Science-Coordination Center (VSCC)

Mikhail Selin

Vologda Dairy-Economic Academy

Abstract

A large number of universities in Russian Federation, especially universities located in the regions, started to solve problems of strategic planning and control systems improvement by means of modern information-communication technologies only several years ago. Despite of universities comprehensible equipment with computers and local area networks, there are a large amount of problems and obstacles basically of organizational and methodical character which are necessary to solve for successful MIS introduction.

Keywords: *Management Information System, University, Evaluation, Russia.*

1 INTRODUCTION

A large number of universities in Russian Federation, especially universities located in the regions, started to solve problems of strategic planning and control systems improvement by means of modern information-communication technologies only several years ago.

One of the reasons of Management Information Systems (MIS) development and introduction delay in Russian universities was no need for allocated resources rational use. One more difficulty for MIS development was an absence of acceptable university management models until nowadays.

The majority of universities have to function in new market conditions which are close to those of enterprises. The educational market with the rise of society comprehension of education value and importance gradually becomes consumer market, and education quality provided by university, its availability acts as a primary role of economic and social university growth.

Universities have to construct basic administrative functions effectively in such conditions. At the same time, (Belyaev D., 2005, Ruzanova N. *et al*, 2003) universities are poorly studied from the point of theoretical and practical management. Now there are no scientifically proved and empirically approved standards and methods of Russian universities management in the conditions of market economy developing in Russia. The scientific and practical research direction which can be named as "university management" is just being formed. At the same time foreign theories and techniques of university management, in our opinion, cannot be fully implemented in Russian conditions.

Nowadays university management development can be provided by the use of information-communication technologies and information systems. Information technologies applied to the management, will give an opportunity to:

- Coordinate administrative activity in university goals achievement.
- Supply Information and consulting assistance for administrative decisions making.
- Create and maintain corporate MIS functioning.
- Make administrative processes more rational due to all management aspects standardization.

Implementation of MIS in university will provide (Krjukov V. *et al*, 2005):

- Education quality improvement due to advanced methods of the educational process organization introduction and multimedia education and methodical materials mass introduction into education process.
- Improvement of knowledge availability for those personalities who has an opportunity to access he Internet.
- Teacher's labour productivity increasing during studies with the use of multimedia presentation equipment and supplying of education and methodical materials to the student's computers.
- Education and methodical content controllability, presented in a digital form, improvement.
- Student's motivation improvement due to modern multimedia technologies influencing perception of knowledge, providing interactivity and reducing dependence from teachers.
- University functioning efficiency increasing due to the teacher's labour productivity growth and training aids duplicating and delivery costs decreasing.

2 MIS APPLICATION AT UNIVERSITIES

2.1 Modern information-communication technologies (ICT) usage for management purposes at universities

For university MIS construction process successful ending it is necessary to describe it's basic and key stages precisely in the university strategy.

Some experts (Durdenko V. *et al*, 2005) define organization developing strategy as corporate competences generalized model, which are necessary for corporate goals achievement on the basis of the several parameters and rational resources distribution.

Corner stone in strategic university management is allocation of the external and internal surroundings and its constant analysis. Keller (Keller G., 1983) has named an external surrounding and internal institutional surrounding "critical areas for strategic management".

Experts (Smelyansky R. and Ievenko M., 2004) allocate following weaknesses of strategic planning processes realization and modern Russian Federation university management:

- Strategic planning and management processes are episodic which paid attentions one or two times in a year.
- Strategic goals and tasks which are defined by a management, frequently are of declarative nature and are not supported by corresponding control and monitoring means of their achievement.

- There is no communication between strategic problems and operative management level. Problems of separate university departments often are not coordinated and can contradict the certain strategic management goals.
- Strategic planning processes of and budget formation process often are not connected.
- Organization strategy development absence or formalistic approach to its creation consequence is low quality of administrative decisions.

Additional organizational reasons of such decisions quality are the following (Titova N. and Balaeva O., 2004):

- Information unreliability, bad communications organization.
- Low performing discipline.
- Large number of decisions.
- Low decision-making processes "standardization".
- Insufficient coordination of various decision-making hierarchical levels interests.
- Imperfect system of decisions management.
- Insufficient executors' competence.

Many organizational reasons possibly can be eliminated by means of university MIS.

Analyse of Russian universities MIS history on the basis of present-day publications and literature gives an opportunity to allocate a number of specific problems (Belyaev D., 2006) which IT-experts and universities have to surmount (sorted by acuteness decreasing) during MIS application:

- Working personnel unwillingness to be engaged in introduction of new information technologies (resistance to changes inside university) and:
  - situation deterioration fear;
  - respect and trust absence to the person who performs changes in the field of information technologies;
  - changes necessity conviction absence;
  - discontent with the changes spread from above;
  - infringement of usual habits and relationships;
  - different employees age.
- Lack of the qualified and prepared staff in the field of information technologies.
- Interest absence from university management, and as a consequence delay in terms of project performance.
- Methodological problems information technologies application in universities. Concerns of internal marketing and information resources audit carrying complexity as a result of management, functions formalization problems peculiarity.

Additional problems which interfere with fast and successful realization of MIS construction projects are (Belyaev D., 2005.):

- Limited financing.
- Organizational complexities.
- Uncertainty of responsibility zones.

For regional Russian universities (on an example of some Vologda area universities) the following is characteristic:

- University employees' sufficient provision with computers (about 80 %).
- Universities have local area networks and Internet connection.

- Low expenditure for information technologies application (from 5 up to 20 % from university supply budget).
- Measured benefits and the purposes which it is planned to reach during application of information-communication technologies are not designated in about 60 % of universities.
- Approximately in 40 % of universities economic benefits of decisions in the field of automation are not evaluated.
- Financial activity and university entrants' admission are automated in the first place.

2.2 Necessary conditions for successful MIS application

Smooth MIS application in universities can be implemented with the following conditions:

- Crucial and demanded by the majority of university personnel processes primary inclusion in the plan of university automation which performance is impossible without IT application.
- MIS is not created for one or two managers.
- MIS application responsibility division between administrative personnel, developers and employees.
- Advanced development of administrative and educational problems solution techniques and technologies focused on IT application.
- Necessary resources (material and human) allocation for high-grade preproject inspection, analysis and technical designing of MIS components.
- Standardizations and documenting of all automation stages.
- University structure reorganization and processes re-engineering management.
- Firm belief about transition to modern information technologies inevitability creation in university collective.
- Parameters system creation, which will allow defining an extent of goals achievement in the field of MIS application.
- Economic and other kinds of MIS effects on university's activities estimation.

In consideration of the technical aspects the most suitable conception for MIS creation is rather popular during last years ideas of integration connected with WEB-technologies use. The concept of WEB-technologies or WEB-services allows uniting various technologies in the uniform information environment and is deprived negative sides of other integration technologies.

In many sources an opinion can be found, that WEB environment is suitable for training and supervising systems creation (Okopelov O., Dimitrieva L., Sherbakov S., Bocharov V. *et al*, 1999).

The component information system model based on the WEB-services conception contains three basic layers. The first are databases, if it is necessary, of different architectures. The second layer is a level of components which can be made on the basis of WEB-services; however other technologies can be used. The third level is a level of applications. Using this model, changes in one database structure do not cause changes in the structure of many programs; service modification that is interacts with the changed database is required only.

The experts (Gluhih I., 2005.) say that the most convenient access to the MIS information and databases gives corporate portal. MIS corporate portal is integrated and provides personnel and students uniform access to corporate databases, and the regulated access to MIS services, including educational environments.

Corporate portal can be defined as protected WEB-based point convenient in use and giving access for internal and external users to potentially personalized corporate information, services, applications, data and knowledge.

3 APPROACHES TO MIS APPLICATION EFFICIENCY EVALUATION

3.1 Existing methods

MIS usually needs significant capital investments in particular MIS constructed on the basis of the most advanced and expensive technologies, therefore such investments should be proved. Especially it is essential to universities due to limited financing.

University activities economic and financial parameters changing caused by MIS introduction, is difficult to link with investments into information systems and technologies. The expert estimations, allowing making the decision in this area do not give a opportunity to estimate economic benefit of new information technologies use precisely.

Investments into MIS economic efficiency estimation is referred to project potential opportunity to provide profitableness demanded level definition. Efficiency of the project can be characterized by parameters system reflecting a parity of costs and results with reference to interests of its participants.

Basic principles of information-communication technologies application efficiency estimation are (Gorfinkel V. and Shvandar V., 2003):

- Resource flow modeling on every project stage.
- Comprehensive external and internal investment factors calculation.
- Effects definition by investment costs and results comparison.
- Investments discounting calculation.

During project economic efficiency estimation (investments in IT estimations) the following methods and techniques can be used:

- Money flow's discounting (profitable method).
- Activity Based Costing (ABC).
- Total Cost of Ownership (TCO).
- Balanced Scorecard (BSC).
- Real Option Valuation (ROV).
- Customer Index.
- Portfolio management.
- Economic value sourced.
- Applied information economics.
- System life cycle analysis.
- Information economy.
- Critical success factors (CSF).

Besides the listed techniques, in the literature and other sources it is possible to find the description of other techniques.

3.2 Suggestions

By our opinion, all mentioned above methods does not give absolutely satisfying results for universities, because:

- Every technique does not include examination of all MIS application aspects, quantitative and quality indicators, costs and benefits.
- No technique is specially developed for use in universities.

MIS efficiency estimation is assumed to include calculation of all factors and conditions variety, and also those purposes and problems by which necessity of carrying out such estimation is defined.

In our opinion, the methodological conception which allows estimating university MIS economic benefit should include the following:

- Costs calculation with the TCO method. It will allow defining direct and indirect costs for MIS developing and maintaining.
- Calculation of economic gains, profitability by means of the methods using money flow's discounting, in view of particular university features and specialization.
- Social and other kinds of MIS project efficiency definition.
- Definition of MIS effects quality.
- Comparison of various MIS variants.

4 CONCLUSIONS

In conclusion it is possible to say following:

- The Problem of MIS construction for large number of Russian universities has became relevant only during last years.
- Despite of universities comprehensible equipment with computers and local area networks, there are a large amount of problems and obstacles basically of organizational and methodical character which are necessary to solve for successful MIS introduction.
- There is a necessity for technique, which allows estimating possible effects and efficiency of MIS use in universities.

References

Belyaev D. 2005. 'University administrative management information systems construction and use'. *Dissertation*.

Belyaev D. 2006. 'Economic processes management services and IS application for its automation'. *University management*. 41(1): 99-105.

Bocharov V., Korshunov I., Popov U. 1999. 'Internet and education process'. *Proceedings of Internet, society, personality Conference.*

Dimitrieva L., Sherbakov S. 1999. 'Education process management automation in conditions of active uducation methods usage' *Information systems, labour and production management. Science proceedings.*

Durdenko V., Melnikova P., Spiridonova S. 2005. 'Strategy development and realization problems: municipal university experience'. *University management*. 40(7): 50-56.

Gluhih I. 2005. 'University corporate Information System on the basis of Internet/Intranet portal'. *University management*. 38(5): 68-76.

Gorfinkel V., Shvandar V. 2003. 'Organization (enterprise) economy'.

Keller G. 1983. 'Academic Strategy. The management revolution in higher education.' The Johns Hopkins Press.

Krjukov V., Shahgeldyan K. 2005. 'Information technologies of university management'. *University management*. 35(2): 85-94.

Okopelov O. 1999. 'Digital education course'. *Higher education in Russia.* (4).
Ruzanova N., Nasadkina O., Shtivelman, Y. 2003. 'MIS creation as a basis for university united surrounding forming'. *Proceedings of Information-communication technologies in university management Conference.*
Smelyansky R., Ievenko M. 2004. '"REDLAB University" system potential in university development strategy forming and realization'. *University management*. 31(3): 18-25.
Titova N. Balaeva O. 2004. 'Management decisions development and making processes perfection in universities: research scheme'. *University management*. 33(5-6): 143-151.