

# An Interaction Model Development between the University and the Related Markets Elements

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**Keywords:** The Market of Educational Services, Labor Market, Scientific and Technical Products Market, Educational Programs, Provision of Educational Services, Educational Institution Business Unit, University Competitiveness.

**Abstract:** The article is devoted to relevant issues of the effectiveness between the departments of the research university, with the educational services market subjects and the elements of the related markets. The awareness of education as a service and its entry into the market implies the inclusion of market levers, including the financial relations between the educational services market subjects and related markets. The department, as a business unit of the university, interacts with such markets as the educational services market, the labor market, the consumer market, the intellectual property market, the financial market, etc. Taking as a basis domestic and foreign experience, the authors, within the framework of the proposed model, developed a number of measures, the implementation of which will increase the prestige and competitiveness of departments as independent business units. A distinctive feature of this model is a comprehensive assessment of the university activities and the integration of the university activities not only with the market of educational services, but also with other related markets.

## 1 INTRODUCTION

On the background of the modern international openness of economies and the subsequent globalization of economic relations, there is practically no state that would not declare increasing the level of competitiveness of the education system one of the most basic tasks of economic policy. In turn, it is worth noting that the economic development of modern states largely depends on the availability of educated and qualified personnel. Higher education is now becoming a productive factor in the development of the economy, becoming increasingly important as countries move to the post-industrial stage of development.

The main purpose of the research is to develop a model of interaction between university departments, as a business unit, with all objects of the educational services market, as well as related markets.

To achieve this goal, the following tasks were set and solved:

- The review of modern scientific literature on the problems of research;
- Evaluation of university departments as business units, the consideration of departments interaction features with other university departments, as well as with related markets;
- the analysis and classification of global trends in the development of the educational services market and related markets;
- The formation of an interaction model of the university with the market of educational services and with related markets, main interaction problems identification.

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## 2 RESEARCH METHODOLOGY

The research is based on the following methods: dialectical scientific cognition and private scientific methods (analysis, synthesis, comparison, logical and system-structural analysis, formalization, analysis of normative legal documents), modeling.

## 3 RESULTS OF RESEARCH

As part of the review of the research literature, the works of the following authors were analyzed: A.E. Vorobyov, N.I. Lobanova, N.A. Lukasheva, I.V. Khamalinsky, M.A. Yurieva, B. Berman, M. Bitner, J.R. Evans, and others.

The analysis of these works helped identify the features of the department interaction with related markets and, focusing on the development of key factors, to propose a new model that meets the present day requirements.

At the present stage, the educational policy issues are of particular importance in the development of the state. The development of civilized market relations is inextricably linked with the formation and development of the educational services market. It is obvious that at the present stage of society development, the education is increasingly referred to as a service sector, therefore, an educational institution, in this regard, is considered as an enterprise that provides educational services. Thus, an enterprise that seeks to survive or improve its competitive position in the market must constantly improve the way it organizes and manages its business processes.

Thus, it can be argued that a new paradigm is being formed, a new model of higher education, which is significantly different from the classical, traditional model. In this model, the central place is occupied by educational business processes, business development processes and supporting business processes. The identification and optimization of which will allow to effectively implement the process approach in the activities of educational institutions.

## 4 RESULTS AND DISCUSSION

The process approach allows you to focus the university activities on business processes; the university management system on the management of each business process individually, and all business processes as a whole; the university quality system on

ensuring the quality of technologies for performing business processes.

The authors define a business process as a system of various interrelated and regulated activities, in which, under the control of certain resources, the input processes are transformed into outputs, the results that are valuable for the consumers of the process (both external and internal).

Business processes are divided into main, supporting, management and development processes (Figure 1)

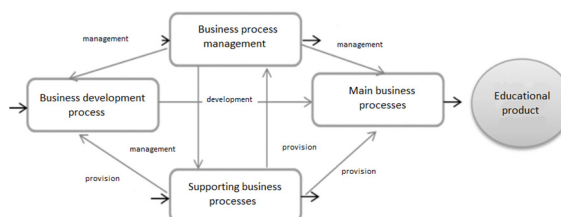


Figure 1: The relationship of business processes in an educational organization.

The optimal interconnection of all business processes within an organization forms the system level, or business system. At the university, you can distinguish educational, research activities that include different functions, different sets of business processes aimed at achieving different goals.

Thus, all business processes can be classified by management levels. The strategic level includes the business processes of development and management (rector's office, Vice-rector for Academic Affairs, Vice-rector for Research, Vice-Rector for Economics). It is here that a new quality of business processes arises, which is absent at other level. That is the strategic plan, including the organization mission, the main strategic goal. Strategic decisions made at the highest level set the target orientation, the orientation of the organization venture set of business processes, forming the priorities and basic requirements for the results they receive.

The level of tactical management can include supporting business processes (training management, training department, institute directors). And the tactical level is the main business processes, i.e. the direct activity of the departments (head of the department, faculty).

Based on the above, it is possible to define the department as part of the university system, a kind of strategic business unit in the market of educational services. The department is the main structural unit of the university, carrying out educational, methodological and research activities in one or more

areas, while realizing its main task, that is the training of highly qualified personnel.

Considering the department as a business unit of the university, the following main areas of activity can be distinguished (Figure 2).

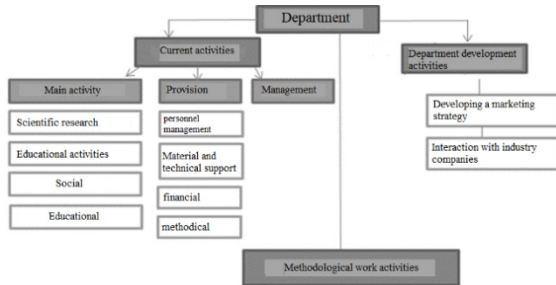


Figure 2: Department main activities.

Each of the above mentioned areas of activity ultimately creates a single management strategy, the result of which is the formation of the overall department rating.

Consequently, the department interacts with the various departments presented in Figure 3 in order to ensure the educational process, the research organization and training activities, as well as the development of the material and technical base.

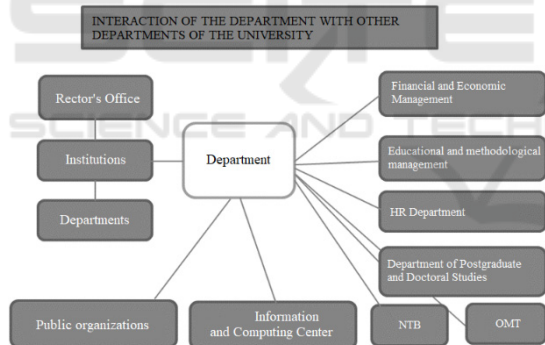


Figure 3: The scheme of the department interaction with the other university departments.

The department as a university structural unit, in addition to interacting with the university departments, also interacts with the market of educational services and related markets (Figure 4).

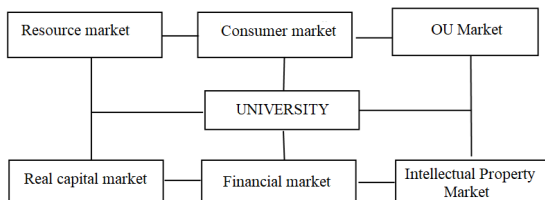


Figure 4: The university scheme of interaction in the educational services market and in related markets.

The awareness of education as a service and its entry into the market implies the inclusion of market levers, including the financial relations between the educational services market subjects and related markets.

It is an effectively functioning system of mutually beneficial, constructive, long-term interaction of these markets subjects that can become the mechanism that will allow us to develop common rules for mutually beneficial activities aimed at meeting the needs of all interested parties.

Thus, the modern model of education should be aimed at improving the efficiency of interaction between the university structural divisions with the educational services market and other related markets. To form an effective model of interaction, it is necessary to take into account global changes that occur under the influence of global megatrends of the future.

There are three groups of megatrends: technological, socio-economic and cultural. They are shown in Figure 5.

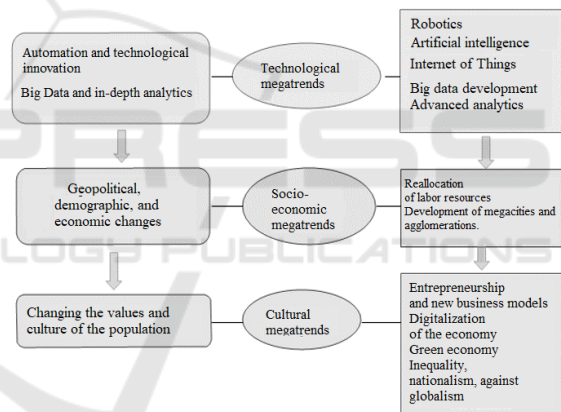


Figure 5: Global megatrends of the future.

The first group includes the automation processes and the technological innovations development, the widespread digitalization of all the economy sectors.

The second group of megatrends is associated with demographic and geopolitical changes, the formation of regional and industry clusters.

Finally, the last group of megatrends refers to changes in the values and the population culture. As a result, there is an increase in public demand for ensuring diversity and inclusiveness in the labor market, which in turn implies an increase in the requirements of potential employees for the employer's corporate social responsibility and an increase in the demand for mobility opportunities.

The conducted research allows us to draw the following conclusions: the current education system

is not fully capable of being rebuilt under the influence of global megatrends, which confirms the need to develop an interaction model of the university with the market of educational services and related markets. Figure 6 shows the interaction model of the university with the market of educational services and related markets, compiled by the authors.

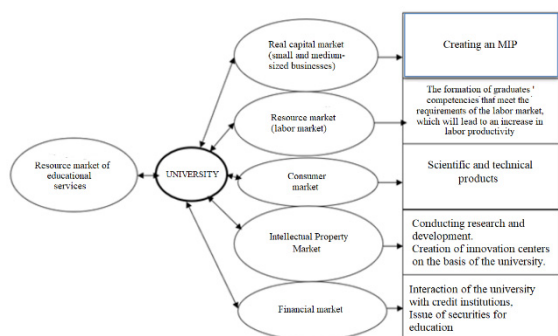


Figure 6: The interaction model of the university with adjacent markets.

The department, as a business unit of the university, interacts with such markets as the educational services market, the labor market, the consumer market, the intellectual property market, the financial market, etc. This requires the integration of the departments activities with the subjects of the educational services market and other related markets.

Analyzing the foreign experience, the interaction of universities with related markets, we can conclude that most foreign universities have evolved into large research centers that unite industrial and research organizations. For example, in such countries as the United States, Sweden, and Germany, large business incubators (Technopol, Innovation Bridge, Stockholm Innovation and Growth, Karolinska Development, UU Innovation) have been established. Their activities are aimed at promoting and commercializing research and development sphere, for the integration of science, education, and business.

At the Berlin University of Applied Technical and Economic Sciences (Hochschule für Technik und Wirtschaft Berlin), the Science-Practice cooperation Center has been established and it is successfully operating. Thanks to the close cooperation of the university with small and medium-sized businesses, with the support of this center, the technologies introduction created by university students is implemented. Consequently, enterprises support innovative developments, as well as provide jobs for graduate students.

Taking as a basis domestic and foreign experience, the authors, within the proposed model framework, developed a number of measures, the implementation of which will provide the individual departments competitiveness and increase the university competitive position as a whole.

The first is the MIP creation on the basis of or with the support of universities, that will ensure the integration with real capital market. This is an opportunity to apply in practice the knowledge that was obtained by students in the theoretical training framework, as well as the opportunity to update the educational programs content in accordance with modern market requirements. The creation of MIP can solve another important issue related to the medium and small businesses development. Universities can successfully act as intermediaries between investors and business ideas carriers, while acting as a guarantor for all interested parties.

Within the framework of interaction in the consumer market and the intellectual property market, the proposed activities are closely interrelated. Scientific and technical products are usually based on the results of scientific research and development (R&D), scientific and technical documentation on the results of completed fundamental and applied research and development, new equipment experimental samples, scientific and technical services, and other scientific, engineering and information activities results intended for use in production, management and planning (Saginova and Maksimova, 2017).

The Russian Federation already has experience in integrating the activities of educational institutions, scientific organizations and industrial enterprises on a contractual basis in order to carry out scientific developments, introduce them into production and attract students and postgraduates to research, scientific, technical and production activities.

However, a number of barriers, such as the high degree of production monopolization, the immunity of many manufacturing enterprises to the use of scientific and technological progress, the shortcomings of the organization existing models in the scientific field, slowed the scientific and technological progress achievements implementation. It led to the scientific, technical and innovative sphere underdevelopment (Gudkova and Ketoeva, 2017).

Therefore, in order to strengthen the role of universities in the innovation sphere, it is necessary to create innovation centers on the basis of universities with state support. The Center can bring together laboratories and research groups of

universities and industrial companies specializing in high-tech industries, as well as individual researchers and entrepreneurs. The creation of such centers will have a positive impact on the activities and prestige of the university, as well as help to make a significant contribution to the interaction of the department with the intellectual property market and, as a result, with the consumer market.

The interaction of the university with the financial market can be manifested in the form of the securities issue, namely, educational vouchers. The voucher system is still practiced only in a few countries (for example, in Denmark and in the United Kingdom).

The basic idea of a voucher is that successfully enrolled students receive a voucher for a certain amount to be used at the university or higher education institution of their choice. Vouchers alone do not create additional money for education and thus are not an additional source of funding. When using vouchers, government funding is distributed not through an educational institution (as is usually the case), but through individuals.

An unused voucher can retain its real value for the entire life of its owner. Thus, the voucher-based funding scheme is quite consistent with the current trend of "continuing education", i.e., lifelong learning.

Due to the fact that over the past 5 years, the qualification gap level has been growing for a long time, i.e. the university graduates competencies do not meet the modern labor market requirements. One of the most important issues is integrating the university activities with the labor market. The root of the problem lies in the knowledge and competence of graduates who get a job, their experience and skills do not meet the companies needs. Skills in the labor market are rapidly becoming obsolete and irrelevant, and the education system is not able to fully compensate them.

To solve this problem, the authors propose voluntary or mandatory certification of university graduates to confirm their competence, as well as cooperation with employers in the formation of the studied disciplines practical part.

The implementation of the proposed measures will increase the prestige and competitiveness of the departments as independent business units. The developed system of indicators is presented in Table 1.

Table 1: System of indicators for evaluating the effectiveness of the university's interaction model with related markets.

Type of activity/market	Indicators
Educational (educational services market)	Number of implemented EP; Number of students, all forms of education; Number of Bachelor's and Master's degrees;
Educational (financial market)	Number of students on a fee basis and on a budget basis. Income from educational activities, etc.
Educational (labor market)	Demand for graduates; Number of employed graduates Number of bases for practical training, etc.
Scientific (consumer market)	Number of publications indexed in the WAC; WOS. Scopus. Students involvement in scientific activities; etc.
Research (intellectual property market)	Number of R&D projects; Number of filed grant applications Number of grants won, etc.
Innovative (intellectual property market and consumer market)	Number of patents Number of developed technologies and products, etc.
Enterprising (real capital market)	Number of households contracts; Number of products developed in the interests of the customer, etc.

The proposed system for evaluating the effectiveness of this model should reflect the indicators of educational, scientific, innovative and enterprising activities of the university, reflecting the university internal and external effectiveness. This will let the university management analyze the departments integrated activities effectiveness, as well as to make operational management decisions aimed at improving the departments efficiency, which will also have a positive impact on the activities of the university as a whole.

## 5 CONCLUSIONS

Thus, the proposed model of interaction of the university with the educational services market and related markets is characterized as an adaptive, dynamic model that can be applied in any higher

education institution. A distinctive feature of this model is a comprehensive assessment of the university activities and the integration of the university activities not only with the educational services market, but also with other related markets. Based on the aforesaid, the purpose of the study has been achieved.

## ACKNOWLEDGEMENTS

The article was prepared at the expense of the grant of the Federal State Budgetary Educational Institution National Research University Moscow Power Engineering Institute within the framework of the PSI "Industry 4.0 Technologies for Industry and Robotics".

## REFERENCES

- Ketoeva, N.L., Kiseleva, M.A., Zargaryan, M.T. and Mikheev, D.V. (2019). Determination of trends in the influence of the labor market on the educational services market in the energy sector. *Modern science: topical problems of theory and practice. Series: Economics and Law*, 2.
- Kirilov, S.N., Gulieva, S.A.K. and Zargaryan M.T. (2018). Concept and modern practice in the field of education for energy. *Materials of the All-Russian scientific-practical conference dedicated to the 90th anniversary of G.S. Arefieva. Science, culture, technology: the creative potential of Russia. Fourth Arefiev Readings*. Under the general editorship of Z.K. Selivanova, I.V. Yudin.
- Vasiliev, V. L., Ustyuzhina, O. N., Akhmetshin, E. M. and Sharipov, R. R (2017). Modernization of the higher education system: levels of development of innovative activities. *Innovation*, 6.
- Shekhonin, A. A., Tarlykov V. A., Voznesenskaya A. O. and Bakholdin A. V. (2017). Harmonization of qualifications in the higher education system and in the world of work. *Higher education in Russia*, 11.
- Ketoeva, N.L., Lisin, E.M., Kiseleva, M.A., Korin, V.S. and Zargaryan M.T. (2020). Development and structural analysis of the model of organizational management of information interaction of subjects of the scientific and educational process. *Economics and Entrepreneurship*, 12.
- Ketoeva, N.L., Kiseleva, M.A., Zargaryan, M.T. and Sysoeva, E.A. (2020). Academic student mobility as a factor in the formation of key competencies of a graduate in the digital economy. *Economics and Entrepreneurship*, 8.
- Vakhitov, D.R., Grinevetskaya, T.N., Samovich, Y.V., Magdeeva, M.R. and Gusarova L.V. (2019). Climate Change Influenced by Technologies: Legal, Social and Economic Implications. *International Journal of Recent Technology and Engineering (IJRTE)*.
- Novikov, A.G. (2017). Foreign experience of the innovative infrastructure of the region. *Business strategies, electronic scientific and economic journal*, 9 (41).
- Saginova, O.V. and Maksimova, S.M. (2017). Experience of interaction between universities and business structures. *Russian Entrepreneurship*, 18(3).
- Ketoeva, N.L. and Malysh, E.A. (2019). The system of key indicators as a tool to improve performance. *Theses of reports in the book: radio electronics, electrical engineering and power engineering*.
- Gudkova, E.E. and Ketoeva, N.L. (2017). Interaction of participants in innovative activities in the process of forming an innovative environment. *Proceedings of the VIII scientific and practical conference with international participation: Innovative clusters in the digital economy: theory and practice, edited by A.V. Babkin*.