

Advances in Economics, Business and Management Research, volume 81 1st International Scientific Conference "Modern Management Trends and the Digital Economy: from Regional Development to Global Economic Growth" (MTDE 2019)

# Digital University: an actual paradigm of the education informatization

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Abstract — The article is dedicated to current issues of digitization of the education sector. Along with the consideration of trends in the field of introducing digital technology in educational and research activity, a special attention was paid to modeling of a digital university. Some aspects of the digital university strategy are considered. The author states that the transition to the rules of the digital age is certainly an extremely difficult task. However, universities that are developing the right business strategy which provides for the effective introduction of digital technology, can use a large range of new opportunities which lie in the area of work organization with both internal resources: students, TS, administrative and managerial staff, and external stakeholders in their implementation activity. At the same time, the article stresses the fact that there is no universal solution that will help to achieve concrete results through the use of digital technology. But by listening to the opinion of the end users, it is possible to get valuable information and use it as a basis for further action. It was possible to form a conceptual model of a digital university based on foreign experience and domestic developments in the field of informatization of education in the study and come to the conclusion that the real transformation of universities is impossible without developing and implementing a conscious digitalization strategy that would take into account the characteristics and specifics of the university activity.

Keywords — digitalization of education, digital technologies, digital university, educational activity

#### I. INTRODUCTION

The digitization of all spheres of the country's economy is an issue of national security of the Russian Federation. This was stated by Russian President Vladimir Putin at a meeting of the Council on Strategic Development and Priority Areas: "Digital economics is not a separate industry, in fact, it is a way of life, a new basis for the development of the system of government, economy, business, social sphere, the whole society," he noted. "The formation of the digital economy is an issue of national security and independence of Russia, competition of domestic companies." [1]

In this regard, the digitalization of the education sector seems particularly relevant.

The active spread of digital technologies makes substantive changes both in the field of education and other sectors, such as healthcare and telecommunications. Pioneers in the development of trends in the introduction of digital technologies in educational and research activity are commercial organizations (private universities, business schools, comparative universities). At the same time, state universities and institutes are actively involved in this process, thinking about digital transformation. Mishota I.Yu. Russian State Humanitarian University Moscow, Russia irmish1@mail.ru

Many scientists are already thinking about what the university will look like in 20-50 years. Will universities have campuses or laboratories, or will education and research activity fully transform into virtual reality. These are conceptual questions that we will try to answer.

## II. THE IMPACT OF DIGITALIZATION AND NEW TECHNOLOGIES ON ALL SPHERES OF MODERN LIFE

The development of universities and other educational institutions around the world is based on modern digital technologies that provide new tools for it. Thus, digitalization contributes to the possibility of sharing experience and accumulated knowledge. This in turn leads to accelerating the process of learning and making informed decisions.

It should be noted the rapid development of online learning which stood out from the mass of digital innovations. It is most clearly presented in the form of blended learning. In addition, it has practical value in the functioning and development of courses of the MOOC (Massive on-line open course).

The current state of online learning is characterized by an annual doubling of online courses. Currently, they cover more than 500 universities, and their number exceeds 4,200.

Such a rapid development of the online education segment under consideration can significantly change the paradigm of this sphere. It is noted that the total income of the MOOC market is projected to increase by five times by 2020, according to some estimates.

In addition, another direction of such digitalization of education is the formation and development of digital libraries and digital campuses. This direction has already affected many universities in the USA, Europe and Russia.

Today everyone can get access to information that was previously available only to experts and scientists due to digitalization. The world of education and science has become global, it is now almost impossible to find a student, teacher or scientist who would not have visited foreign universities as part of academic mobility programs. In the course of unprecedented changes, many universities are trying to adapt and find their place on the global science and education map, while retaining their unique qualities and competitive advantages. [4]

The current trend in the development of digitalization of education requires specialists to start developing digital transformation programs that will be aimed at creating a competitive educational and research model.

Assessing the current urgent needs for updating, in the innovations of the educational process, we can confidently



assert that digitalization is an urgent need and an urgent task for universities.

Universities seeking to maintain their position in the global education market are faced with the task of entering the international scientific and educational space. In particular, a part of the criteria in the QS World University Ranking assesses the degree of globalization of the university in terms of the share of foreign students and teachers. The THE ranking takes into account the share of foreign students, the share of foreign teachers and the number of articles published jointly with foreign research groups.

Among the strategies of universities to integrate into the international educational space are the creation of open international campuses in other countries, the attraction of foreign scientists, teachers and students, the support of academic mobility programs for our scientists and the organization of foreign practices for students.

Trends in globalization are vividly confirmed by statistical data on the dynamics of the number of international students. A dynamics of OECD countries shows an annual 5% increase in the number of foreign students. In addition, according to the ICEF Monitor, by 2020 it is planned to increase funding for the Erasmus + academic mobility program by 40% - to 14.7 billion euros.

Along with countries such as the United States and the United Kingdom in which there is a high quality of education which attracts a large mass of foreign students, new educational centers appear in other countries that can compete in this area. In the future, Russia can take its rightful place in this row.

#### III. RESULT AND DISCUSSIONS

It should be noted that regardless of the chosen strategy, any university or other educational organization must go through a digital transformation. Moreover, such a digital transformation consists not so much in the implementation of IT technologies, which are obvious, but, in fact, should change the very culture and organization of universities. Obviously, the transition to a digital university should lead to an optimization of the educational process.

Let us note a number of factors that determine the need and urgency of the specified transition to the digitalization of the educational process.

First, an analysis of characterizing student data shows that the vast majority of them belong to the generation of "digital natives". A feature of this generation is that they tend to IT technologies both in education and in everyday life. Thus, the digitalization of universities is aimed at the target audience and will make them more adaptive. Of course, this will be the determining factor in attracting students.

Secondly, there is a competition among universities. So, digitalization can be a factor in increasing a competition between educational institutions. Since we live in an era of globalization of markets, the struggle for the applicant will occur at the international level, and not within the framework of one country. This will certainly serve as an incentive for the introduction of new technologies and, as a consequence, the creation of a new generation educational system.

The third argument is that the digitalization of what is happening inside universities increases the efficiency of interaction between departments of the entire educational institution. This is a mandatory condition for the necessary innovative transformations required in the transition to a new education model. [4]

What does digitalization mean for universities? What spheres of university life are most vulnerable to digitalization?

Based on foreign experience and domestic developments in the field of informatization of education, it is possible to form the following conceptual model of a digital university which consists of five levels and a supporting platform.

The first level is the most important, it is represented by teaching staff (TS), students, industry and academic partners of the university, graduates and applicants. The first level is, in fact, the internal and external founders of the university.

The second level is represented by basic information services. Their task is to create a single information space for digital interaction within the university. At the same time, these flexible tools play a special role. Such services, for example, can be represented by video screens used for classes, wireless communication (Wi-Fi) at universities, cloud storages, etc.

The third level includes services that significantly make life easier for students and teaching staff in a modern university. For foreign teachers and students, they are already a mandatory element of the university; in Russian universities, a number of services are still at the initial stage of implementation.

The digital library gives free access to the user of educational services to scientific and specialized literature from any devices, regardless of where it is and at what time of day. At the same time, it should be noted that in modern universities traditional libraries and digital libraries are merging. It allows in this case to have access to the paper-based media (book, magazine), at the same time, it is possible to find the corresponding details of these media in the electronic catalog to get them directly in campus. The convergence of traditional and innovative technologies noted in this way is capable of providing comfort for students and teachers as users of services and has a positive effect on the image of an educational institution.

Digitalization of scientometrics consists in monitoring, accumulating and analyzing scientific metric information using modern methods of storing and processing large database. This direction is extremely important for universities, as it serves two purposes. The first purpose is to identify promising research areas that are now most relevant to the university. The second purpose is to determine the current indicators of publication activity and citation of the university.

The fourth level is the most resource-intensive from the point of view of implementation, but at the same time allows the university to get the highest added value. It consists of such services as digital marketing, research project management, procurement management, interaction with applicants and students.

It should be noted that the emerged digital marketing has become a completely new area for educational institutions. The implementation of digital marketing in this area is aimed at solving the following tasks:

- optimization of the organization of internal and external interaction in an educational institution (with auxiliary educational staff, teaching staff, students, applicants, graduates), carried out using the entire arsenal of digital communication channels; - monitoring of ongoing changes and fluctuations in the attractiveness of the brand of educational institutions in the target markets with the involvement of the results of monitoring social networks;

- implementation of various preventive and reactive activities to create a proper image of the educational institution;

- implementation of incentive activities for the formation of new digital communities and innovations throughout the entire educational process;

- creation of new communications for broadcasting the content of educational programs for applicants;

- preparation of relevant marketing materials for different target audiences using the analysis of actual data from different sources.

The organization of interaction with applicants and students is carried out in solving the following tasks:

- the information support of applicants using digital technologies to track all stages of the passing and processing of the application for admission;

- the use of digital analytics to identify the most trained and promising applicants in order to increase the rate of their enrollment;

- the use of various communication channels - both digital and traditional - to provide applicants with the most complete information about the university. This task is most relevant for foreign applicants who cannot visit the university and want to know about it using information from the Internet;

- the use of analytics to identify the most successful and least successful students;

- the automation of the so-called "Student office" work.

The fifth level consists of digital technologies which with a high degree of probability will be widespread in the university environment in the near future. Such technologies, for example, include drones (unmanned aerial vehicles). According to a recent PwC study, the global market for potential drone-based solutions in 2015 was \$ 127 billion. Of course, it seems to us quite logical that universities, especially technical ones, will want to participate in the development of this market. In this context, as a first step, universities will actively introduce drone technologies into the internal educational and research space, purchasing equipment, forming laboratories, encouraging students and researchers to test and work with the new technology. This trend is already observed in several American universities. [2]

It should be noted that a full-fledged transition to a digital university can be difficult without appropriate supporting activities which should be targeted at introducing changes at the university. Such activities can be represented by the following organizational and functional provisions:

- development of functional modules in the framework of educational programs aimed at improving the digital education of students;

- creation of an organizational and methodological base for support of teaching staff which is the innovative core of innovative tendencies and the development of digital culture and skills and engaged in the development and implementation of innovative teaching methods;

- development of criteria for the incentive system of priority use of training platforms by TS that can ensure high results of

learning activity that affect the efficiency of the university in general;

- organization of practical assistance to TS in mastering digital technologies.

In our opinion, in order to transfer to a modern level, a university should adequately close all levels of the digital university model described above and constantly provide feedback to key stakeholders - students, teaching staff, industry and academic partners, graduates, and applicants.

#### IV. DIGITAL UNIVERSITY TRANSITION STRATEGY (CONCLUSION)

It should be noted that the transition to the rules of the digital age is certainly an extremely difficult task. However, universities that are developing the right business strategy which provides for the effective introduction of digital technology, can use a large range of new opportunities which lie in the area of work organization with both internal resources (students, TS, administrative and managerial staff) and external stakeholders in their implementation activity.

At the same time, it should bear in mind that there is no universal solution that will help to achieve concrete results through the use of digital technology. But by listening to the opinion of the end users, it is possible to get valuable information and use it as a basis for further action.

The university, providing carte blanche to individual employees for the introduction of new methods of working with digital technologies as well as providing support in solving these problems, can receive a powerful impetus to be transformed into an educational institution of a new format with optimized internal processes.

It is obvious that the project on digital transformation of the university should be initiated by top management and supported at the level of institutes / faculties / strategic academic units / departments. The last ones should take under their personal control the implementation of measures aimed at achieving the necessary results, and link their action plans with the overall development strategy of the university.

The improvement of IT service should be carried out both in the technological direction, within which it is planned to use new IT methods and approaches, and in the direction of simplifying the interaction of stakeholders with these technologies. In our opinion, the priority tasks of IT service in the context of the university's digital transformation are the following:

- tracking technological innovations and consultancy on options for their possible use to achieve the goals set for the university;

- improvement of policy and procedures aimed at stimulating the use of innovative digital technologies among the administrative staff of the university, students and teaching staff;

- provision of maximum open and convenient access to information resources and systems in order to ensure the possibility of using data by means of new technologies;

- optimization of the use of cloud solutions to stimulate innovation and rapid turnover of a new digital functionality, products and systems.



- development of labour contracts and continuing education programs to ensure the continuous development of digital literacy skills;

- attaching great importance to learning processes, along with the processes of scientific activity to promote innovation in the development of new methods and ways of learning with maximum use of the potential of digital technologies. [5]

Based on the above, it seems reasonable to draw a certain conclusion about the currently high concentration of new digital technologies. Analysis of the modern educational process, its informatization shows that universities have yet to be significantly transformed in order to realize the benefits of digitalization and provide applicants, students, academic staff and partners with more opportunities. Transformation is impossible without the development and implementation of a conscious strategy of digitalization which would take into account the characteristics and specifics of the university. What strategy will be most effective, it remains to be seen.

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