

Digital Transformation of a University as a Factor of Ensuring Its Competitiveness

Marat R. Safiullin, Elvir M. Akhmetshin

Abstract: Digital economy brings new opportunities and threats to modern reality, covering almost all the fields of life of the population, including education. Digital economy opens up new strengths and weaknesses of a university. In this regard, a relevant task is to determine a set of goals for the development of the university and ensure movement towards these goals.

The transition from the University 3.0 model to the University 4.0 model involves a comprehensive transformation of all processes in a university. Taking into account that the innovative educational and entrepreneurial activities played a leading role in the previous model, it is advisable, first of all, to ensure the digital transformation of these processes during the transition to the new model. An important factor in ensuring the competitiveness of a modern university is the digitalisation of its services.

In the modern realities of the development of digital economy, universities are facing the need for digital transformation, the essence of which is based not only on the introduction of digital technologies in the activities of universities, but also on the cultural and organisational changes. The main features of the digitalisation process of the universities shall be: the university's orientation on the implementation of "smart manufacturing"; the use of digital communication technologies in the educational process; the introduction of network and distance learning; the development of basic information services; the creation and implementation of the "digital university management" service.

Thus, digital transformation of the universities will make it possible for teachers, students, applicants and partners to provide more opportunities in the context of digitalisation. The transformation is impossible without the development and implementation of a digitalisation strategy that takes into account the features and specific nature of the university.

Keywords: digital transformation of a university, digital educational platform, digitalisation of educational services, platforming.

I. INTRODUCTION

Educational institutions all over the world strive to increase the efficiency and quality of educational services provided, and thereby increase their competitiveness both within their own country and in the world [1, 2]. For this purpose, it is necessary to optimise the training of specialists. In our opinion, optimisation shall be carried out in several directions:

- increasing the speed of training. Speed is undoubtedly important in today's dynamic world. The standard term for preparing bachelors today is 4 years full-time and 5 years extramural. But this is a long term for modern business environment. School 21 (Russia) is ready to train a specialist

in 1.5 years and the employing company is ready to hire these people. School 21 - a programming school - is a unique educational initiative of Sberbank based on the methodology of the "school of the future" - the innovative French school of programming "Ecole 42" (without teachers, without lectures, without ratings) [3]. In addition, the organisations (personnel agencies) that provide short-term training for specialists for a specific position are being developed now. When announcing a vacancy, the employer declares a list of skills and competencies that the applicant shall master. The personnel agency carries out the personnel selection and can conduct personnel training by teaching the specific skills for working in a particular position. Under the FSES (Federal State Education Standards), it is impossible to prepare a bachelor in the same fast time frame. And this is an important challenge for modern universities.

- improving the quality of training. There is no doubt that the use of digital technology allows for better visualisation and assimilation of knowledge. Digital technologies make it possible to transform the educational process and transfer it to a qualitatively new, user-friendly level.

- ensuring the mobility of educational services. Online technology erases the distance between the student and the university, and it does not matter in which country the student is located now.

- individualizing the educational trajectory. Each student has individual features that shall be taken into account when designing his/her personal educational program.

In modern literature, the digitalisation of university activities is widely discussed by the scientists from various countries [4].

Modern universities are beginning to acquire and test new forms of their existence. One of these new forms is the "open university", whose main mission is the implementation of affordable distance education programs for people around the world, regardless of their location. And although such universities already exist in the UK (Open University of Great Britain), the Netherlands (Netherlands Open University), Israel (Open University of Israel), Thailand (Open University Sukhothai Thammarat), etc., the development of distance education will not stop there. Many universities in the USA and Europe develop MOOCs (Massive Open Online Courses) and SPOCs (Small Private Online Courses), while the Massachusetts Institute of Technology, Stanford and Harvard purposefully develop free LMS distance learning platforms [5-8]. The outside-the-box strategies are successful because MOOCs and SPOCs allow global competition [6, 9-11].

Revised Manuscript Received on October 30, 2019.

* Correspondence Author

Marat R. Safiullin, Kazan Federal University, Kazan, Russia

Elvir M. Akhmetshin, Kazan Federal University, Kazan, Russia

The universities aim to offer complete, up-to-date and consistent information on their key information assets to their many users through various digital services and communication channels. Key university assets include people, research results, educational courses, and research projects. The main difficulty lies in the internal fragmentation and diversity of data: data on key assets is scattered across several information repositories, data is often duplicated and difficult to match due to differences in format, metadata, conventions and terminology used. Maltese V. illustrated how this difficulty can be solved and described the work done at the University of Trento in Italy [12-22-23].

In the information age, the presentation of educational information sources has changed markedly. Paper materials are gradually losing their relevance and are being superseded by resources placed on open Internet access, including online courses. Currently, the traditional information service can no longer meet the information requirements of users. On this basis, Ma, L. H., Zhao, J., & Zhao, Y. L. (2015) created a “supermarket of information services”, adopting the idea of a “supermarket” and information technology to provide “onetop” service for users of the university digital library [13-20-21].

II. METHODS

The research methodology is based on an analysis of the experience of Russian and foreign universities that have successfully succeeded in digitalising various types of their activities, and selecting the best practices. First of all, it is necessary to deeply understand the problem of universities, carefully analyse the problems existing in Russian education and in Russian science and the experience of universities that offer such solutions, including digital ones, which really move forward Russian education and science towards technical development and breakthrough. Working in the direction of solving these problems, the authors proposed their own methodological developments aimed at optimising the university activities through the introduction of digital technologies.

III. RESULTS

The essence of the concept proposed by the authors is to create a university educational platform with a user-friendly interface. The presence of a convenient user interface and a convenient mobile application is important, because the platform is designed to centralise all the university services, and unite all users in a single social network.

The platform shall allow a user from anywhere in the world registering for free on the web-site or download and install a mobile application, create his/her own user profile and gain access to all educational resources of the university.

Educational content shall include modern online courses. The main criteria: user-friendly interface, presence of video lectures, presentations, interactive elements. It can be online courses for the development of new professions, applied knowledge, practical skills. Thus, the user will be able to master any profession that interests him/her, to obtain the necessary knowledge and skills through this application.

The main indicators for assessing the platform competitiveness will be the following:

- the number of users enrolled in the course (including the number of users from other countries);
- the number of downloads of the mobile application, and ratings in PlayMarket and AppStore;
- the number of users, who have completed the online course to the end and passed the final testing.

Commercialisation will be ensured by the fact that if the user needs a certificate of the course completion, then he/she can get it for a fee.

In addition, the platform shall allow each user creating his/her own personal page on the platform’s web-site and provide users with the opportunity to exchange messages. The interface shall be no less convenient and faster than the interface of the social networks Facebook, VKontakte, Instagram, etc., popular all over the world, but here, unlike them, the main emphasis shall be given to education in the logic of interface construction. Key indicators of each user are as follows: the number of courses for which he/she is registered, the number of courses that he/she has successfully completed.

IV. DISCUSSION

A similar study was conducted by Ma, L.H., Sun, N.N., & Zhang, G.S. (2015). They propose the concept of personalised information service for the university library in a networked environment, and it will become a new service model for the digital university library. The authors analysed the mode of university library information service in a traditional environment, indicated the need to build a personalised university digital library information service mode in a network environment, and established a specific mode for the current personalised university digital library information service based on the network environment [14].

The current capabilities of cloud-based educational services are studied by implementing competency-based assessment as a cloud service for software programs. The study of Sánchez, A.C., Romero, C.S., & Hernández, J. F. C. (2017) offers a conceptual model based on cloud services and the process of automatic assessment of competencies used in the field of software development. The offer is based on multiple choice tests as an assessment tool and establishing the relationship between competencies, learning outcomes and criteria for evaluating the rubrics used for assessment. By linking competencies with learning outcomes, the students can know their academic learning needs in order to apply for a specific position in the labour market. This process is applied to real educational programs defined on the e-learning portal, which provides this process as an educational service [15-19].

V. SUMMARY

The formation of a new concept of the university platform of the future was mainly influenced by:

- a) the need to have an own platform with a convenient interface (P. Diamandis: “Be a Platform”) [16].
- b) the need to maximise online representation (Webometrics rating) [17].
- c) the opinions of experts in the field of digitalisation of university activities (University of NTI 20.35, etc.) [18].



A university shall become a platform for promoting new ways of thinking and innovation, a launching site for new enterprises and a powerful global community of leaders, who will be able to solve the biggest problems of mankind when united.

The universities shall be prepared for the following transformations:

- digital transformation of the product, i.e. educational services in the broadest sense (creation of online courses, use of modern technologies in education: virtual reality, augmented reality, etc.).

- digital transformation of delivery channels. The delivery of educational services in a digital environment occurs through a digital (mobile) platform.

- digital transformation of promotion channels.

The employer shall be included in the process of training a specialist at all stages of the educational process. Topics for graduate qualifications shall be determined by employers. New educational programs are created only when they are in demand by employers. The employer shall be ready to offer students a base of practice and provide real support in implementing the educational program in cooperation with the university.

It is important to note that the digital transformation process will never end. It will be so because requirements for the education system will change (increase) during the development of society. And if universities do not change in accordance with these trends, then they will risk losing their relevance.

VI. CONCLUSION

If a university strives to ensure that the democracy of teachers and students becomes an organised process, the university can create such a platform and bring together all the teachers and students of this university in a single platform. And then, in addition to the fact that it will be a convenient solution for managing the educational process, in which the students and teachers participate, it will also become a powerful analytical tool for monitoring the quality of education for the university administration (for the rector, deans and department heads). They will be able to track on the platform all the activity of students and the activity of teachers. The platform shall include teacher feedback section on a strictly determined profile. Similar option shall be available to the teachers. In addition to grades, they shall be able to distinguish strong students for different qualities. And all this information is collected at the level of the university manager, while he/she can easily analyse it, present information in the form of graphs, tables and make decisions on awarding the employees, who have distinguished themselves for success, and granting scholarships for the best students.

ACKNOWLEDGMENT

This article is performed at the expense of the subsidy allocated to Kazan State University for the fulfillment of the state task in the field of scientific activity (No. 26.9776.2017/BCH (Russian: 26.9776.2017/БЧ)

REFERENCES

1. Safiullin, M. R., & Elshin, L. A. (2019). Role of higher school in the formation of the fourth industrial revolution in the Russian federation. *International Journal of Civil Engineering and Technology*, 10(2), 1669-1676.
2. Abramov, R. A., Koshkin, A. P., Sokolov, M. S., & Surilov, M. N. (2018). Transformation of the public administration system in the context of integration of the national innovation systems of the union state. *Espacios*, 39(14).
3. School 21 – Programming school. Autonomous Nonprofit Organization School 21. Retrieved July 15, 2019, from <https://21-school.ru/en>
4. Bockschecker, A., Hackstein, S., & Baumöl, U. (2018). Systematization of the term digital transformation and its phenomena from a socio-technical perspective - A literature review. Paper presented at the 26th European Conference on Information Systems: Beyond Digitization - Facets of Socio-Technical Change, ECIS 2018.
5. Hennessy J. Virtually It's our Best Shot // THE. October, 2012. <https://www.timeshighereducation.com/world-university-rankings-2012-2013/virtually-its-our-best-shot>
6. Neboskiy, E. V. (2017). Development of University Education in the Context of Globalization Processes. *Pedagogy*, (2), 102-105.
7. Korableva, O., Durand, T., Kalimullina, O., & Stepanova, I. (2019). Usability testing of MOOC: Identifying user interface problems. *ICEIS 2019 - Proceedings of the 21st International Conference on Enterprise Information Systems*, 2, 468-475.
8. Askhamov, A. A., Konysheva, A. V., & Gapsalamov, A. R. (2016). Use of E-resources of the learning environment in teaching mathematics to future engineers. *International Journal of Environmental and Science Education*, 11(5), 673-684. doi:10.12973/ijese.2016.340a
9. Korableva, O., Durand, T., Kalimullina, O., & Stepanova, I. (2019). Studying user satisfaction with the MOOC platform interfaces using the example of coursera and open education platforms. *ACM International Conference Proceeding Series*, 26-30.
10. Christensen, C. M., Johnson, C. W., Horn, M. B. (2010). *Disrupting Class, Expanded Edition: How Disruptive Innovation Will Change the Way the World Learns* (5th ed.). New York, McGraw-Hill.
11. Neboskiy, E. V. (2018). Transformation of Development Strategies of Universities Abroad in the Context of Global Risks (Doctoral Dissertation). Institute for Educational Development Strategy of the Russian Academy of Education, Moscow, Russia.
12. Maltese, V. (2018). Digital transformation challenges for universities: Ensuring information consistency across digital services. *Cataloging and Classification Quarterly*, 56(7), 592-606. doi:10.1080/01639374.2018.1504847
13. Ma, L. H., Zhao, J., & Zhao, Y. L. (2015). Building an "information service supermarket" of the university digital library in the information era. Paper presented at the Proceedings of the International Conference on Management, Information and Educational Engineering, MIEE 2014, , 1 357-360.
14. Ma, L. H., Sun, N. N., & Zhang, G. S. (2015). Exploration on personalized information service mode of university digital library based on the network environment. Paper presented at the Proceedings of the International Conference on Management, Information and Educational Engineering, MIEE 2014, 1, 61-64.
15. Sánchez, J. A., Valle, B. M., Nicolás, J., De Gea, J. M. C., García-Berná, J. A., Toval, A., Fernández-Alemán, J. L., Puptsau, A., Misnevs, B. (2019). Cloud service as the driver for university's software engineering programs digital transformation. Paper presented at the *Procedia Computer Science*, 149 215-222. doi:10.1016/j.procs.2019.01.126
16. Diamandis, P. H., Kotler, S. (2015). *Bold: How to Go Big, Create Wealth and Impact the World*. New York, NY: Simon and Schuster.
17. Webometrics. Ranking Web of Universities. Retrieved July 15, 2019, from <http://www.webometrics.info/en>
18. 20.35 NTI University. What Is University 20.35. Retrieved July 15, 2019, from <https://2035.university/en/>
19. Sadeghpour, F., Far, M. G., Khah, A. R., & Akbardokht Amiri, M. A. Marketing Strategic Planning and Choosing the Right Strategy using AHP Technique (Case Study: Ghavamin Bank Mazandaran). *Dutch Journal of Finance and Management*, 1(2), (2017). 45. <https://doi.org/10.29333/djfm/5821>.



20. Gamarra, M., Zurek, E., & San-Juan, H. Addendum for: A Study of Image Analysis Algorithms for Segmentation, Feature Extraction and Classification of Cells. *Journal of Information Systems Engineering & Management*, 3(1), (2018). 05.
21. Kord, H., Noushiravani, Y., Bahadori, M. D., & Jahantigh, M. Review and Analysis of Telework Perspective in the Administrative Systems. *Dutch Journal of Finance and Management*, 1(2), (2017). 44. <https://doi.org/10.29333/djfm/5820>
22. Godino, J. D., Rivas, H., Burgos, M., & Wilhelmi, M. R. Analysis of Didactical Trajectories in Teaching and Learning Mathematics: Overcoming Extreme Objectivist and Constructivist Positions. *International Electronic Journal of Mathematics Education*, 14(1), (2019).147-161. <https://doi.org/10.12973/iejme/3983>
23. Taubaye, Z., Rivers, W., Mussabekova, U., & Alimbayeva, A.. Peculiarities and problems of eponyms (on the material of Kazakhstani periodicals). *Opción*, 34(85-2) (2018), 221-236.