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The Digital Transformation of Higher Education in Poland: Current Status and Prospects for Development*

Cyfrowa transformacja szkolnictwa wyższego w Polsce: stan obecny i perspektywy rozwoju

Abstract

This article addresses issues related to the digital transformation of higher education in Poland. Currently, one of the fundamental prerequisites for its effective and efficient operation is the implementation of integrated management systems based on data analysis, as well as the digitization of teaching and administrative processes. Accordingly, the aim of this study was to analyze and evaluate the key regulatory conditions governing the digitization of higher education in Poland under the current legal framework, while identifying prospects for future development.

It was found that digital transformation is undoubtedly one of the key imperatives for development and a fundamental structural challenge for contemporary higher education institutions. Taking into account the legal regulations in force in Poland, it can be concluded that in the area of higher education administration, the state, through legal norms, is driving a digital transformation toward the computerization of specific aspects of the activities of the Minister of Science and Higher Education and the supporting apparatus under his authority, and toward the consolidation of these processes over time. At the same time, in the area of the administration of higher education institutions, the state, through legal norms, does not impose obligations but rather creates a normative framework for digital transformation by individual institutions of higher education, recognizing their autonomy within legal limits.

KEYWORDS: digital transformation, higher education, information and communication technologies.

SŁOWA KLUCZOWE: transformacja cyfrowa, szkolnictwo wyższe, technologie informacyjno-komunikacyjne.

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1 Introduction

Today, one of the fundamental prerequisites for the effective and efficient functioning of higher education is the implementation of integrated management systems based on data analysis (data-driven management) and the digitization of teaching and administrative processes. Undoubtedly, these factors influence universities' ability to adapt quickly to dynamic changes in the macroenvironment, digital transformation, and the evolving needs of the labor market.

It is worth noting that, broadly speaking, digital transformation is understood as a change in the way digital technologies are used to create a new business model for an organization[1]. This model helps create added value and increases the efficiency of the company that uses it[2]. In this case, the enterprise is a university, along with its entire administrative infrastructure.

At the same time, the management of a university goes far beyond the administration of its infrastructure, research activities, and teaching processes[3]. Furthermore, as Ł. Sułkowski notes, the digital transformation of universities is a process that affects not only scientific research but also collaboration with the socio-economic environment and the promotion of innovation and the resulting knowledge transfer[4]. In other words, digital transformation is the process of implementing digital technologies in all areas of a university's

1 Paweł Kawalec, „Transformacja cyfrowa: szanse i wyzwania dla przedsiębiorstw" *Nowe Tendencje w Zarządzaniu*, no. 1 (2021): 45–69.

2 Marek Jabłoński, Adam Jabłoński, Agnieszka Szpitter, „Dynamika modeli biznesu przedsiębiorstw w gospodarce cyfrowej – perspektywa monetyzacji" in *Zarządzanie strategiczne w dobie cyfrowej gospodarki sieciowej*, eds. Sylwester Gregorczyk, Grzegorz Urbanek (Łódź: Wydawnictwo Uniwersytetu Łódzkiego, 2020), 9–15.

3 Grzegorz Mazurek, „Transformacja cyfrowa – perspektywa instytucji szkolnictwa wyższego" in *Transformacja akademickiego szkolnictwa wyższego w Polsce w okresie 30-lecia 1989–2019*, ed. Jerzy Woźnicki (Warszawa: KRASP, 2019), 315.

4 Łukasz Sułkowski, „Transformacja cyfrowa uczelni" *PWN Nauka*, no. 2(23) (2023): 4–5.

operations. It fundamentally changes the way the university functions and delivers value. It involves not only purchasing new software, but also changing its strategy, organizational culture, and methods of serving students and stakeholders in order to increase its competitiveness in the market[5].

The transition from the traditional model of education and administration to the digital space is no longer a matter of choice for Polish universities, but a reality. Their strategic survival depends on it. While the COVID-19 pandemic and the creation of e-learning platforms provided a certain impetus for change, the process actually began much earlier[6].

The dynamic – and indeed expansive – development of artificial intelligence is the factor driving universities to adapt online tools and implement new instruments for digital transformation at an ever-faster pace. It is increasingly influencing the organizational environment of universities, their infrastructure, the competencies of their staff, and their relationships with students.

It should be noted that the process of digital transformation has many dimensions, including international, national, and local ones. Thus, it is not limited solely to the domestic higher education system but affects the entire economy. When considering this topic, one cannot overlook the positions and solutions adopted at the EU level. Specifically, in the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, and the Committee of the Regions, "2030 Digital Compass: the European way for the Digital Decade," the Commission notes that pursuing a digital policy will enable citizens and businesses to take advantage of the opportunities arising from a human-centered, sustainable, and more prosperous digital future[7]. In turn, in the Digital Decade Policy Programme 2030, the European Parliament and the Council emphasize that it should encompass digital sovereignty while maintaining openness, respect for fundamental rights, the rule of law, and democracy, as well as inclusion, accessibility, equality,

5 IPS, „Dlaczego transformacja cyfrowa jest kluczowa dla polskich przedsiębiorstw?" Instytut Przedsiębiorczości Społecznej, 2024, https://fips.pl/dlaczego-transformacja-cyfrowa-jest-kluczowa-dla-polskich-przedsiebiorstw/ [accessed: 8.07.2026].

6 Julia Boiko, Aleksandra Gulc, Agnieszka Rzepka, „Transformacja cyfrowa – wyzwanie czy bariera w budowaniu relacji międzyorganizacyjnych uczelni wyższych. Studium przypadku w Polsce" *Akademia Zarządzania* 9, no. 3 (2025): 69–82.

7 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: *2030 Digital Compass: the European way for the Digital Decade*, COM(2021) 118 final.

sustainability, resilience, security, improved quality of life, access to services, and respect for citizens' rights and aspirations[8]. Furthermore, it should contribute to the creation of a dynamic, resource-efficient, and equitable economy and society within the Union[9]. At the same time, they emphasize that digital transformation is not possible without strong support for science, research, development, and the scientific community, which are the driving forces behind the technological and digital revolutions.

As recognized in the European Declaration on Digital Rights and Principles for the Digital Decade, digital transformation also poses a challenge to democratic societies, economies, and citizens[10]. At its very core, however, is the human being, as technology affects every aspect of a person's life, particularly education. Therefore, technology should serve and benefit people and enable them to pursue their aspirations in complete safety, while respecting their fundamental rights[11].

The purpose of this research paper is to analyze and evaluate the key regulatory factors influencing the process of digitization in higher education in Poland under the current legal framework, while identifying prospects for future development. In particular, the authors aim to answer the question: Do existing legal regulations create conditions conducive to the digital transformation of higher education? A further question is whether the current regulations will help accelerate the pace of digital transformation in higher education in light of the challenges, aspirations, needs, and expectations.

The issue addressed in the title should be considered, so to speak, from two basic perspectives. On the one hand, it concerns the macro level – that is, the context that illustrates the functioning of the entire higher education system – and in this regard, the category that captures this scale is the concept of "higher education administration." On the other hand, it concerns the micro level – that is, all the aspects that characterize the operations of an individual institution of higher education – and in this regard, the relevant term is "higher education

8 European Declaration on Digital Rights and Principles for the Digital Decade 2023/C 23/01, PUB/2023/89, OJ C 23, 23.1.2023, pp. 1–7.

9 Recital 1 of Decision (EU) 2022/2481 of the European Parliament and of the Council of 14 December 2022 establishing the Digital Decade Policy Programme 2030 (Text with EEA relevance) PE/50/2022/REV/1, Official Journal of the European Union L 323, 19.12.2022, pp. 4–26.

10 European Declaration..., op. cit.

11 See Chapter 1, Section 1 of the Declaration.

administration." This latter term is applicable to both public and private institutions of higher education, since regardless of whether they are viewed as administrative entities, public corporations, legal entities, economic entities, or scientific institutions[12], their administration performs analogous functions.

Added to this is the broader perspective of the activities of states and the international organizations supporting their efforts to drive the digital transformation of higher education. These issues fall within the scope of public policy, as implemented by both European Union institutions and the governments of Member States.

2 | Public Policy on the Digital Transformation of Higher Education

With the development and widespread adoption of digitalization, the mission of higher education has undergone a certain redefinition. It is no longer sufficient to speak solely of the role of universities as educational or research institutions, as collaboration with the broader socio-economic environment plays a significant role. This implies that universities must be innovative, competitive, and – most importantly – responsive to the needs of contemporary society.

Digital transformation has been incorporated into the 2022 National Science Policy strategic document, which outlines the priorities for the functioning of the higher education and science system, including the most important development challenges[13]. These include the development of the latest digital econ-

12 See Jarosław Dobkowski, „Desygnaty prawne współczesnego uniwersytetu" in *Międzynarodowy wymiar i kierunki rozwoju szkolnictwa wyższego. Zagadnienia prawne i systemowe*, ed. Marcin Skinder (Bydgoszcz: Wydawnictwo Mass, 2011), 22–35; Tomasz Brzezicki, *Ustrój szkolnictwa wyższego w Polsce* (Toruń: Towarzystwo Naukowe Organizacji i Kierownictwa „Dom Organizatora", 2010), 73; Agnieszka Bednarczyk-Płachta, *Status szkoły wyższej jako podmiotu administracji publicznej* (Warszawa: Wolters Kluwer, 2016), 56; Natalia Miłostan, „Szkoła wyższa jako przedsiębiorca w warunkach społecznej gospodarki rynkowej" in *Zarządzanie szkołą wyższą*, eds. Jolanta Blicharz, Agnieszka Chrisidu-Budnik, Aleksandra Sus (Wrocław: E-Wydawnictwo. Prawnicza i Ekonomiczna Biblioteka Cyfrowa, 2014), 61–69; Anna Wójtowicz-Dawid, „Uczelnie wyższe jako przedsiębiorstwa" *Folia Pomeranae Universitatis Technologiae Stetinensis. Oeconomica*, no. 270 (55) (2009): 89–96.

13 Ministerstwo Edukacji i Nauki, *Polityka Naukowa Państwa*, Warszawa 2022. See Article 5 of the Act of July 20, 2018 – Law on Higher Education and Science, Journal

omy technologies to meet market needs to the greatest extent possible[14]. The authors of the strategy recognize not only the need to create specialized educational tracks to attract specialists to the labor market (e.g., programmers, software architects, system administrators, data analysts, bioinformaticians), but also the necessity of supporting education in the digital competencies essential for the development of all scientific disciplines. In addition to education, which is at the core of the strategy, the necessity of developing national IT systems has been recognized. In particular, this refers to systems that support the management of academic institutions and the development of tools to facilitate the digitization of student services (including digital versions of diplomas based on blockchain technology). It is worth noting that higher education is not alone in this process. All efforts related to digital transformation are a response to the changes taking place in the country's economy, which relies on increasingly modern telecommunications networks[15].

This transformation involves creating an appropriate technical foundation for its development. In a broader sense, the process of implementing digital technologies comprises three fundamental elements: optimization and automation (the use of cloud computing, artificial intelligence, and the Internet of Things to streamline daily tasks); data-driven decision-making (collecting and thoroughly analyzing information to respond more quickly to market changes and the needs of students, stakeholders, and public authorities); and what is known as "digital culture"[16].

In addition to the National Science Policy, another document of significance for the digital transformation is the National Action Plan for the "Road to the

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of Laws, consolidated text of 2026, item 187, as amended. The policy is developed for 5-year periods.

14 Other priorities include: the development of the higher education and science system (in terms of making optimal use of its potential), Poland's role in global development (international research), natural resources and the environment, and society and quality of life. In addition to the digital transformation itself, this priority encompasses development in areas such as artificial intelligence, quantum technologies, Open Science, and smart cities.

15 From an economic perspective, the development of information and communication technologies contributes to increased productivity and labor efficiency, improved social welfare, more efficient spending in various sectors of the economy, and the optimization of resource use.

16 See MF, *W drodze ku doskonałości cyfrowej. Raport końcowy z badania rynku na temat gotowości wdrożenia, poziomu wiedzy i wykorzystania nowych technologii cyfrowych w jednostkach administracji centralnej* (Warszawa: Ministerstwo Cyfryzacji, 2023).

Digital Decade" policy program through 2030, adopted in 2024[17]. It implements the Digital Decade Policy Programme 2030 adopted at the EU level. The plan includes four digital objectives at the European Union level, the achievement of which by 2030 will require cooperation between the European Parliament, the Council, the Commission, and the EU Member States[18]. These objectives include: 1) a digitally literate society and highly qualified professionals in the digital field, with a focus on achieving gender balance; 2) secure, resilient, efficient, and sustainable digital infrastructures; 3) the digital transformation of businesses; and 4) the digitization of public services, which also covers higher education administration.

In the context of digital transformation, it should be noted that the Ministry of Science and Higher Education (MNiSW) offers both packages of modern IT solutions – including platforms and e-services – and programs and initiatives related to infrastructure and institutional development. Among these are those aimed at scientific and research activities and the digitization of university infrastructure. Universities may submit applications to the MNiSW for investments related to scientific activities and digitization. These funds cover, among other things, the expansion of specialized IT infrastructure and research equipment with a value exceeding PLN 500,000 gross[19]. The transformation is also supported by the National Recovery Plan (known as "Digital Poland")[20].

The FERS program (European Funds for Social Development) plays a significant role in supporting the digitization of higher education. It is the main source of funding for this transformation, and its funds are allocated to the implementation of modern hybrid solutions, education in critical technologies (including AI), the development of e-services, and the modernization of IT infrastructure. Specific areas of support include: 1) modern educational environments (funding for the creation of hybrid educational spaces, lecture record-

17 Resolution No. 125 of the Council of Ministers of October 22, 2024, on the National Action Plan for the "Road to the Digital Decade" Policy Program through 2030, Monitor Polski 2024, item 989.

18 Article 4 of Decision (EU) 2022/2481.

19 See Announcement of the Minister of Science and Higher Education dated April 24, 2026, regarding the publication of the consolidated text of the Regulation of the Minister of Science and Higher Education on the allocation, accounting, and transfer of funds for the implementation of investments related to education and scientific activities, Journal of Laws 2026, item 596.

20 The National Recovery Plan, https://www.polskacyfrowa.gov.pl/strony/o-programie/dokumenty/program-polska-cyfrowa-2014-2020/.

ing systems, and professional audiovisual infrastructure)[21]; 2) education for critical technologies (the green and digital economy, AI, digital skills)[22]; and 3) the so-called "accessibility" of higher education (the digitization of teaching and administrative processes).

With regard to science, and in particular scientific research, it is also worth mentioning the government's very important position as set forth in the Open Access to Research Data Policy announced in 2025[23]. Its goal is to establish a framework that ensures the security and accessibility of research data generated through research projects funded or co-funded by public funds. Digital transformation is reflected in its content through, among other things, the creation and improvement of research data repositories (platforms) that enhance the standing of Polish institutions on the international stage, ensuring universal digital access to publicly funded research results, publications, and research data (Open Science), as well as by building the resilience of academic infrastructure and reducing dependence on external technologies.

3 | Digital Transformation in Higher Education Administration

Digital transformation processes in higher education administration in Poland have a relatively long history and vary in quality. Over the years, individual initiatives have been ad hoc in nature and implemented only after funding was secured. The accompanying legal frameworks were also developed on an ad hoc basis. An attempt to integrate data was the launch of the POL-on ICT system, which was developed between 2010 and 2014 as part of the project "Creation of a Higher Education Information System" and subsequently received a statutory basis. Nevertheless, existing public registries continued to operate alongside this ICT system, and separate IT solutions were also launched.

Since mid-2025, the Minister of Science and Higher Education, in cooperation with the National Information Processing Institute (OPI PIB), has been implementing an integrated suite of digital services to ensure greater accessi-

21 For more information: https://erasmusplus.org.pl/transformacja-cyfrowa.

22 For more information: https://www.gov.pl/web/ncbr/ksztalcenie-na-potrzeby-technologii-krytycznych.

23 MNiSW, *Polityka otwartego dostępu do danych badawczych finansowanych ze środków publicznych* (Warszawa: Ministerstwo Nauki i Szkolnictwa Wyższego, 2025).

bility, transparency, and efficiency in the functioning of the higher education system, as well as to facilitate its use.

The "Services for Science" portal (uslugi.nauka.gov.pl) is intended to serve as an access point where tools are organized, among other things, by user groups, specifically covering digital services: "For universities and research institutes," "For researchers," "For students," and "For businesses." This portal is another step toward the digital transformation of higher education in Poland and the development of a knowledge-based economy. It brings together and organizes by topic tools that were already in use. One example is the modern search engine for degree programs (Studia.gov.pl), which allows prospective students to compare university offerings in terms of, among other things: admission requirements, mode of study, location, and high school graduation exam subjects. This information about degree programs offered by universities and institutions within Poland's higher education and science system comes from the POL-on system. Another example is the application for high school students (ELA Uczeń), which presents earnings, job prospects, and career paths for various fields of study; the current version of the system also includes information on job stability, unemployment, and the time it takes to find one's first job. It draws information from two systems: POL-on and the system of the Social Insurance Institution (ZUS). While the ZUS Comprehensive IT System was created for different purposes, the POL-on Integrated Information System on Higher Education and Science has been under development for a long time and has a statutory basis. Its operation is currently governed by the provisions of Article 342 et seq. of the Act of July 20, 2018 – Law on Higher Education and Science[24]. The POL-on system includes the following databases: 1) a list of academic faculty, other instructors, researchers, and individuals involved in research activities; 2) a list of foreign nationals admitted to undergraduate and doctoral programs; 3) a list of students; 4) a list of doctoral candidates; 5) a list of institutions within the higher education and science system; 6) a repository of written theses; 7) a database of documents related to promotion proceedings; 8) a database of persons authorized to sign documents; 9) a database of planning and reporting documents; 10) a repository of electronic diplomas. The Act also specifies what each database must contain. The system is maintained by the minister responsible for science and higher education. Data collected in the POL-on system are processed for the purpose of performing tasks related

24 Journal of Laws, consolidated text of 2026, item 187, as amended.

to establishing and implementing the state's science policy, conducting evaluations of the quality of education, evaluations of doctoral schools, and evaluations of the quality of scientific activity, conducting proceedings for the conferral of doctoral degrees, postdoctoral degrees, and the title of professor; determining the amount of subsidies and grants; supervising the higher education and science system; and the implementation of tasks by the National Agency for Academic Exchange, the National Centre for Research and Development, and the National Science Centre. It is the most comprehensive repository of data on Polish science and higher education. The system comprises nearly 40 modules. In terms of the scope of data collected, it is the largest ICT system created for the needs of higher education administration.

The Unified Anti-Plagiarism System, operated by the Minister of Science and Higher Education, also has a statutory basis; it provides support in combating violations of copyright and related rights laws and utilizes data contained in the repository of written theses and the database of documents used in promotion proceedings. However, this is not an ICT system in the strict sense of the term, but rather specialized software enhanced with intelligent data processing methods. Nevertheless, it constitutes a public registry.

Methods for collecting and storing information on higher education may, in other respects, continue to be carried out in the traditional manner – in documentary form (recorded on paper) – or may be subject to processes of collection and dissemination in electronic form as legally protected databases. Under Polish law and EU law, a database is defined as a collection of data or any other materials and elements organized according to a specific system or method, individually accessible by any means – including electronic means – and requiring a significant investment, in terms of quality or quantity, to create, verify, or present its contents. Database protection is governed by the Polish Act of July 27, 2001, on the Protection of Databases[25], which implements Directive 96/9/EC of the European Parliament and of the Council of March 11, 1996, on the Legal Protection of Databases[26].

"Computerization," understood in this way – which essentially boils down to the operation of databases – does not yet imply "digitization" in the full sense of the word. We can speak of digitization in the relevant context when the collection, storage, and sharing of specific data take place using information and

25 Journal of Laws, consolidated text of 2024, item 1769.
26 Official Journal of the European Communities L 77, 27.3.1996, pp. 20–28.

communication technology systems. In light of the Act of July 18, 2002, on the Provision of Electronic Services[27], an information and communications technology system is defined as a set of interoperable IT devices and software that ensures the processing and storage, as well as the transmission and reception, of data via telecommunications networks using terminal equipment appropriate for the given type of telecommunications network. The exact same definition of an information and communications technology system is found in Article 3(3) of the Act of February 17, 2005, on the Computerization of the Activities of Entities Performing Public Tasks[28]. A telecommunications terminal device, in turn, is defined in the Act of July 16, 2004 – Telecommunications Law[29] – and refers to a telecommunications device intended for direct or indirect connection to the terminations of a telecommunications network. Undoubtedly, the POL-on system is an information and communications technology system.

The above overview shows that the digital transformation in the field of higher education administration is taking place through various legal mechanisms. Nevertheless, traditional paper-based forms are giving way not only to protected databases but, above all, to implemented ICT systems. A clear shift from "computerization" to "digitization" can be observed here. This process is reinforced by modern integrated digital services, as well as the requirement that certain official documents be issued primarily in electronic form. This will apply to academic credentials such as bachelor's, master's, doctoral, and postdoctoral diplomas, which will be stored in a repository of electronic diplomas. E-diplomas will be available in the mObywatel app.

4 | Digital Transformation in the Administration of Higher Education Institutions

Digital transformation processes in higher education administration reflect the universities' own initiatives. Admissions may take place in the traditional manner or through university systems such as the Online Candidate Admissions System or the University Student Services System. Admission to a degree program may occur through enrollment on an electronic student roster. A denial

27 Journal of Laws, consolidated text of 2024, item 1513.
28 Journal of Laws, consolidated text of 2025, item 1703, as amended.
29 Journal of Laws, consolidated text of 2024, item 34, as amended.

of admission, which is issued by way of an administrative decision, may take the form of an electronic document. Furthermore, universities may issue student ID cards to students, but they may also implement university portals such as the University Student Services System. Higher education institutions may issue student ID cards in the form of electronic smart cards, but the ID card may also take the form of a mobile document as referred to in Article 2(7) of the Act of May 26, 2023, on the mObywatel app[30]. Records of academic progress (student yearbooks, student personnel files, and the diploma register) may be maintained in electronic form.

The teaching process itself does not have to take place through direct contact with the faculty member leading the course. E-learning is not only a significant supplement to traditional lectures and classes in auditoriums, classrooms, and laboratories, but it can even encompass the entirety of higher education. Quality management processes in higher education can also be carried out using electronic systems, particularly with regard to course evaluations. Added to this is the circulation of documentation using electronic document management (EZD) systems, which apply not only to individual administrative matters but also cover personnel, student, academic, and financial affairs.

Importantly, regulatory provisions do not dictate a specific course of action for universities but rather provide them with a legal framework to take advantage of the opportunities offered by IT solutions. Nevertheless, the absence of specific legal provisions in this area does not grant universities unrestricted authority; while they are autonomous in all areas of their operations, they must operate within the principles set forth in the law.

5 Conclusions

Digital transformation is undoubtedly one of the key imperatives for development and a fundamental structural challenge for contemporary institutions of higher education. It is also worth emphasizing that the implementation of digital technologies creates favorable conditions for maximizing access to knowledge capital and stimulating scientific and research processes. At the same time, it presents an opportunity to address social problems more effectively. Its development should be consistent with public values and the public inter-

30 Journal of Laws, consolidated text of 2024, item 1275.

est. Similarly, it requires a certain level of engagement at the international, national, and regional levels. The digital transformation process must be accompanied by a responsible and coherent technology implementation strategy that takes technical and ethical criteria into account in equal measure.

Digital transformation offers many benefits. Among other things, it facilitates rapid decision-making without unnecessary delays. It also increases the efficiency and productivity of the administration by enhancing the digital competencies of higher education institution staff themselves. It improves communication and collaboration within the academic community. Furthermore, it significantly streamlines services for students, stakeholders, and public authorities, while enabling the collection and analysis of data in real time. From the perspective of researchers, it not only accelerates but also improves the process of applying for and carrying out research projects[31]. However, digital transformation is not possible without the significant role played by public administration, for example, by creating favorable conditions for its development. Thanks to this, various forms of support are being implemented that facilitate access to technology and enable education in the field of cybersecurity.

Considering the legal regulations in force in Poland, it can be concluded that in the area of higher education administration, the state – through legal norms – is driving digital transformation toward the computerization of specific aspects of the activities of the Minister of Science and Higher Education and the supporting apparatus under his authority, and toward the consolidation of these processes over time. Nevertheless, the governing body itself can create digital tools and services that are highly useful to stakeholders. In the area of the administration of higher education institutions, however, the state does not impose obligations on universities through legal norms but rather creates a regulatory framework for digital transformation by individual universities, recognizing their autonomy within legal limits.

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