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DIGITAL TRANSFORMATION STRATEGY
WITHIN TRANSILVANIA UNIVERSITY OF BRAȘOV

1. Context

This document presents the strategic directions for the digital transformation within Transilvania University of Brașov (UNITBV) in the period 2022-2032, and it is drafted in accordance with the national and European strategic documents regarding the digitalization of education.

The adaptation of the higher education system to technological evolution is an essential element of human resource development through flexible teaching processes, in line with the students' current needs and lifestyle. At the same time, digital transformation and the use of advanced digital infrastructure (hardware and software) is an indispensable condition for increasing competitiveness in scientific research.

UNITBV's strategy for digital transformation in education, research and administration is consistent with the following European programs and strategic directions:

- Action Plan for Digital Education 2021-2027
- European Education Area
- European Skills Agenda for Sustainable Competitiveness, Social Equity and Resilience
- European Council Recommendation on Vocational Education and Training for Sustainable Competitiveness, Social Equity and Resilience
- UNESCO Recommendation on Open Educational Resources.

2. Mission

Development of the digital infrastructure, and digitalization of education, research, administrative and management processes in order to provide students, academic teaching personnel, researchers and administrative staff with advanced digital solutions and services designed to support current activities and lead to performance.

3. Vision

Transilvania University of Brașov will become a reference institution on a regional and national level for the implementation of digital services in the education, research and administrative processes. It must be flexible enough to adapt to future changes in Romanian higher education.

4. Current stage

At present, UNITBV provides the academic community members with a wide range of centrally managed IT services, hosted within its own data centre. These services, together with the related infrastructure (hardware and software), have had, since 2000, a generally conjunctural development (research and education projects, COVID-19 pandemic), without a detailed needs analysis, advance testing or continuous adaptation to user satisfaction.

Its main available IT services, based on existing resources, for academic teaching personnel, students, researchers and administrative staff include:

- **email**: although it is accessible on any type of device, being one of the first IT services implemented at UNITBV, there are still community members who use unofficial communication channels in institutional communication (Gmail, Yahoo, WhatsApp, etc.);
- **eLearning**: the Moodle platform has been available through browser and mobile application since 2007, but has been in intensive use since 2020 (due to the changes caused by the COVID-19 pandemic);
- **video-conferencing system**: it allows the online conduct of teaching activities, and it is accessible from any type of device. At the same time, the video-conferencing system allows virtual meetings between professors and students on various topics (project consultations, tutoring, etc.) as well as administrative meetings (of various types) without the need for all participants to travel to a university hall;
- **presentation websites**: university, faculties, research institute, support structures, projects and grants;
- **file sharing and collaborative work system**: offers a range of facilities (sharing, editing, calendar, questionnaires, voting, video-conferencing, etc.) on any type of device;
- **intranet portal**: electronic catalogue, fee management, teacher evaluation, information / notices, distribution of document templates with UNITBV's visual identity;
- **IT notification management system**: allows reporting malfunctions and asking questions about IT&C, setting priorities and following up on application resolution.

However, there are still people who send applications by email or who try to contact the IT Office (BIT) members over the phone.

- **unique authentication system (SSO):** it was implemented on a trial basis within a limited set of services;
- **eduGAIN:** this identity provider interconnection service has been implemented since 2019, but the facilities offered by the membership in this federation are little known within UNITBV;
- **registration and admission portal:** allows electronically registering the candidates, uploading documents and displaying the results of the admission competitions.
- **internally developed applications for the management of teaching processes:** AGSIS (application for managing both the undergraduate and the graduate students' tuition), application for managing the doctoral students' activity;
- **mobile application for students:** Student@UniTBv is available in Google Play and App Store, allows receiving notifications regarding the daily aspects of the student life: timetable, exam scheduling, grades, map of buildings, online payment of fees, canteen menu, news and events, etc. The application is developed and administered by the TSG Group, made up of UNITBV students.

UNITBV currently offers its users the following ways to access the services provided:

- from the public Internet with RoEduNet as the main service provider and back-up providers;
- using the wired network of UNITBV buildings (including student dormitories). Some of the connections are not sized to meet current data transfer requirements;
- using wireless connections in the **Campus WiFi** networks (UNITBV's own network) and **Eduroam**. These largely cover UNITBV buildings and student dormitories. The following areas need to be improved, which is known:
- Development and modernization of digital infrastructure for education, research and administrative processes.
- Development of a unitary policy and an integrated set of own IT regulations (use of services, administration of services, information security, audit, backup, etc.).
- The technical procedures applied at BIT level are not sufficiently documented, in some cases being based on the BIT specialists' expertise.
- The human resource available to BIT is rather undersized to cope with the coming technological challenges.
- There are still multiple administrative procedures performed with printed documents and forms, handwritten and signed by hand.

5. Strategic development directions

UNITBV's digital transformation strategy is based on modernizing and developing the digital infrastructure for education, research and administration, along with a series of actions focused on the concept of cloud technologies. The realization of an area of integrated digital infrastructures and services is proposed, as an effective alternative to the traditional model of acquisition of IT platforms by each faculty, research group or project, which will diminish the level of expensive, redundant and unrelated investments. The services offered through the **private Cloud** solution will be flexible, integrated and scalable, ensuring security, superior performance and at the same time allowing the fulfilment of high-complexity requirements.

A **High-Performance Computing** infrastructure (HPC, the ability to process data and to perform complex calculations at high speeds) can facilitate UNITBV's development in the field of artificial intelligence (AI) / "Big Data", which can be applied, in a multidisciplinary manner, in several directions (from cybersecurity to industrial applications, from medicine to silviculture or energy management). An interdisciplinary and multidisciplinary approach is in line with the specifics and strategy of UNITBV's Research and Development Institute (ICDT). Such a self-service infrastructure (with automation and a friendly interface) would have the advantage that, the resources being centralized, if a faculty / research group / project does not use its own resources, they will not remain untapped, but can be capitalized on by other users.

Such an infrastructure has multiple roles:

- **digital research infrastructure** in accordance with the thematic fields of the Research Centres within the University's Research and Development Institute;
- **digital infrastructure for the teaching activity** of all study cycles;
- **labs in Cloud with the students** (the lab infrastructure will be gradually removed from the university buildings, and replaced by centralized investments, easier to manage);
- support infrastructure for the **implementation of various services** in the University / Digital Campus, which includes the migration of some services that are already offered in a decentralized way, into the UNITBV Cloud;
- **area of prototyping and collaboration with the business environment** and support infrastructure for business incubation and acceleration activities.

The infrastructure needs to be developed with the concept of Digital Campus (a set of mobile applications that facilitate academic life through a secure digital identity). The digital infrastructure will be improved through continuous expansion, consolidation and adaptation: modernization of internal network, endowment with equipment and software, internal and external interoperability, security, data protection, cyber hygiene and IT ethics, technical assistance.

A particularly relevant aspect in the context of operationalizing the IT infrastructure is the cybersecurity component, which involves ensuring the confidentiality, integrity and availability of the data transmitted at the level of basic infrastructure, applications and platforms used.

With a view to **ensuring the cybersecurity** of UNITBV's IT infrastructure, the unitary application of the following principles should be considered, principles included in a cybersecurity management system:

- To ensure the cybersecurity of UNITBV's IT infrastructure in all stages of its development and operation by reference to the confidentiality, integrity and availability of the data.
- To protect the data in transit against exfiltration and respectively alteration activities.
- Operational security – mechanisms for detecting and preventing cyber-attacks, by reporting a tiered approach, according to the concept of "defence in depth computing".
- Identity management and access control, including through mechanisms of "digital rights management".
- Implementation of specific cloud security technologies.

All actions carried out within the cybersecurity management system at the level of IT UNITBV's infrastructure must abide by the recommendations of good practice standards in the field, as well as by the regulations and laws in force (ISO 27001, GDPR).

Strategic development directions include:

A. IT infrastructure development
1. To ensure data security in accordance with applicable law and standards.
2. To ensure Internet access in all buildings at the level of local requests for users and applications.
   - To increase the capacity of local networks in dormitories.
   - To provide WiFi Internet access in all buildings for both students and staff.

B. Education and research
1. To develop and modernize the digital infrastructure for the didactic and research activity; to use the digital infrastructure in order to create education-research synergies; to initiate and attract undergraduate and graduate students into the scientific research activity.
2. To develop the students' digital skills through specialized disciplines, training stages and non-formal activities. To develop the teaching personnel's digital skills through appropriate continuing education activities, according to the needs of various groups: beginner or experienced; with STEM (Science, Technology, Engineering and Math) or SSHA (Social Sciences, Humanities and Arts) specializations

3. To analyse the needs for the diversification of the educational offer in view of the introduction of disciplines and study programmes focused on entrepreneurial development, and the digitalization of several professions and their implementation according to UNITBV's development strategy.
4. To create specific digital educational resources, to participate in the exchange of good practices on local, national and international e-Learning educational platforms.
5. To provide technical and human resources to be able to carry out teaching and research activities based on the principles of digital education:
   o Introduction of disciplines related to the assimilation of digital skills in all study cycles
   o Support of hybrid education (online and traditional, face to face)
   o Additional digital services offered to students (communication, collaborative document editing, video conferencing, online self-assessment).
6. To develop partnerships with the economic environment through the participation in digital networks, including with European and international bodies;
7. To use a self-service collaborative platform to disseminate information inside and outside UNITBV. To centralise all research directions so that the individual research interest, skills and competences in different fields are transparent.
8. To integrate UNITBV into the flow of Open Science processes and gradual implementation of Open Science principles.

C. Administration

1. To digitalise all administrative information processes and flows through specific applications.
   o Implementation of electronic signatures for documents related to school records and administration.
   o Digital signatures for academic teaching personnel (who sign student grades) and administrative and management staff (who sign administrative documents).
   o Automation of routine, repetitive administrative activities (timetable, staffing schedule, payroll, applications, certificates, acquisitions, registration, etc.)

In order to pursue the strategic directions mentioned in the previous paragraph, the following priorities need to be kept active:
   1. **Creation of a digital culture for all users.** Training courses offered to employees (academic teaching personnel, auxiliary teaching staff) and students, with a view to developing their digital skills. Information and awareness-raising actions on the risks and benefits of digitalization.

2. **Permanent integration of the infrastructure and services provided, alignment with the initiatives promoted by the specialized institutions** both nationally (RoEduNet, ICI) and at European level (GEANT, EUA), such as: eduId, eduGAIN, Erasmus Student Card, Erasmus without Paper, National Blockchain Network, Quantum computing EuroQCI, European Open Science Cloud etc.).

3. **Comprehension of the development trends in various industries**, by strengthening and extending the collaboration with the partners in the social, economic and cultural environment.

These Strategy were debated and approved in the meeting of the Senate of Transilvania University of Brașov on the 22nd of June 2022.

Prof. Dr. Eng. Mircea Horia ȚIEREAN,
President of the Senate of Transilvania University of Brașov