UNIVERSITY OF
THESSALY

DIGITAL TRANSFORMATION PLAN

December 2024

UNIVERSITY OF THESSALY
Digital Governance Committee

DIGITAL TRANSFORMATION PLAN
OF THE SERVICES OF THE UNIVERSITY OF THESSALY

1. Introduction

The University of Thessaly (U.Th.) is a large regional public university, consisting of 35 departments, which cover a wide range of academic disciplines and are spread across 5 cities. Even within each city, the facilities of U.Th. are not, in all cases, located in a single campus.

U.Th. offers a large number of undergraduate and postgraduate programs of study, as well as training programs; it carries out extensive research that is largely supported by funded research projects; and all the administrative procedures of a public university are fully operational.

U.Th. has digital infrastructures and services in place that make it possible for it to function (despite its size and geographical dispersion) across its three pillars: Education, Research, and Administration. However, a series of Digital Transformation actions are required in order to maintain and enhance the effectiveness of the university's services, as well as to keep up with and apply modern developments in the field of digital technologies.

The recording of these actions in the present Digital Transformation Plan was undertaken by the Digital Governance Committee of the University of Thessaly, which was established by decision 4323/24/ΓΠ/11.03.2024 (ΑΔΑ: 91Δ1469Β7Ξ-ΜΧΦ) of the Governing Council of the University of Thessaly, under the provisions of Article 221 of Law 4957/2022, and consists of the following members:

1. **Michail Vasilakopoulos**, Professor, Department of Electrical and Computer Engineering, School of Engineering, University of Thessaly – Chair.
2. **Ioannis Konstantinou**, Assistant Professor, Department of Informatics and Telecommunications, School of Science, University of Thessaly.
3. **Georgios Karetsos**, Professor, Department of Digital Systems, School of Technology, University of Thessaly.
4. **Paraskevi Tsoutsa**, Assistant Professor, Department of Accounting and Finance, School of Economics and Administrative Sciences, University of Thessaly.
5. **Charalampos Karagiannidis**, Professor, Department of Special Education, School of Humanities and Social Sciences, University of Thessaly.
6. **Ioannis Lychnaropoulos**, member of E.D.I.P. (Laboratory Teaching Staff), Department of Mechanical Engineering, School of Engineering, University of Thessaly.

The Committee's meetings were also attended by Vice-Rector **Chrysi Laspidou**, as head of the Digital Governance Unit of the University of Thessaly, without voting rights.

2. Vision

The vision of the Digital Transformation of U.Th. is encapsulated in the phrase: "Digital technologies for an effective and sustainable University.

3. Objectives

The main objectives of the Digital Transformation of U.Th. are summarized as follows:

- To enhance the integration of electronic educational platforms and software into the educational process.
- To establish infrastructures for high-quality distance and hybrid education, as well as for in-person electronic examinations (eExams).
- To provide modern hardware and software infrastructures aligned with contemporary technological developments.
- To ensure that the digital operation of U.Th. is carried out with the protection of personal data of all stakeholders, as well as with the security of its systems and services.
- To reduce dependence on paper-based processes, or on digital imitations of paper usage. The input, processing, storage and output of each process must be digital. Administrative services should be delivered electronically via the internet.
- To interconnect and ensure interoperability of U.Th.'s information systems with those of Public Administration.
- To promote sustainability, energy saving and eco-friendliness through digital technology and the adoption of environmental initiatives, aiming for a green and sustainable university.
- To make U.Th.'s digital services user-friendly, so that they are adopted in everyday practice. Likewise, the university's interaction with society should be strengthened through user-friendly digital tools, increasing its connection with the community.
- To facilitate interaction of individuals with special needs with the services and processes of U.Th. through digital technology.
- To strengthen the use of digital technologies for the connection of U.Th. with businesses, organizations, and the labor market.

Within the framework of the above objectives, actions are planned in the following strategic pillars.

4. Pillars

4.1 Infrastructures

For the effective provision of digital services, it is necessary to have modern and capable hardware and software infrastructures that can cover the full range of U.Th. services, the large number of users for each service and their geographical distribution.

Actions will be undertaken for the design, development, and management of the university's computational infrastructures, with the goal of adequacy and uninterrupted operation, focusing on:

- The required data storage infrastructure (servers and cloud computing) for each digital service.
- The computing power of the servers (standalone or in clusters).
- Network infrastructures for interconnection, as well as connectivity with users (based on the current and near-future technological level and the experience of the U.Th. IT Directorate, the minimum requirements for wired and wireless networks sufficient for the academic community are set at: 10Gbps to the provider (GRNET – ΕΔΥΤΕ), 10Gbps for inter-building connections, 100Gbps between data centers, 1Gbps – eventually 2.5Gbps – per user, and wireless coverage in 100% of buildings with a minimum uplink of 5Gbps**).**
- Cloud computing services and infrastructures.
- The definition of minimum requirements for adapting data centers and distribution spaces to international safety and uptime standards, covering:
    - fire protection,
    - protection against natural disasters,
    - secure and controlled access,
    - uninterrupted power supply.
- The minimum requirements that ICT devices connected to the network must meet, forming ecosystems (e.g., laboratories, teleconferencing/e-learning rooms).
- Availability of system and application software used by the entire academic community (e.g., MS Office, etc.).
- Availability of software used in education and research (e.g., SPSS, MATLAB, Microsoft tools, eClass, etc.).
- Availability, maintenance and upgrading of software used by administrative services.

A **hybrid cloud model** for computing infrastructures (processing power, storage, and networking equipment) will be considered. In this model, the on-premises infrastructure serves as the university's private cloud, which can transparently extend to a public cloud when needed to cover temporary demands. This approach combines the advantages of private cloud (e.g., reduced operational cost, economies of scale, data privacy) with those of public cloud (e.g., flexible pay-as-you-go billing). Potential connections could be made with academic cloud services provided by organizations such as GRNET (e.g., through ~okeanos or other third-party providers).

Centralization of computing infrastructure and its distribution through cloud services to different university units can reduce both **CAPEX (equipment acquisition costs)** via bulk purchasing and **OPEX (operational costs)** through efficient use of technical personnel.

With the emergence of **Large Language Models (LLMs)** and **Generative Artificial Intelligence (GenAI)**, traditional methods of research and teaching will be significantly impacted. U.Th. must ensure seamless access to these technologies. Beyond commercial subscription-based closed solutions (e.g., ChatGPT, Gemini), which require sending data to third-party infrastructures, there are also open-source solutions that can leverage local infrastructure without restrictions. However, efficient operation of such technologies requires access to powerful, dedicated computing infrastructure. U.Th. will explore acquiring **GPU clusters** capable of running open-source generative AI models.

It is also essential to implement actions ensuring the integrity of U.Th.'s IT systems, with strong security measures against malicious attacks. Continuous compliance checks with cybersecurity legislation and personal data protection are required. Furthermore, actions will be undertaken for the certification of ICT services under **Business Continuity Management (BCM)** standards, enhancing resilience against risks or operational threats that may affect U.Th.'s functioning.

All of the above will be designed and implemented while considering the **energy footprint** of infrastructures and their supply, as much as possible, from renewable/alternative energy sources. As existing systems are replaced or decommissioned, systematic recycling will be required, minimizing environmental impact (see Section 4.6).

Additionally, after studying best practices in Greek and international academic and administrative contexts, U.Th. will identify desirable/necessary (paid or free-open) IT systems beyond or complementary to those already in place, for:

- teaching,
- research,
- administration.

These will be acquired and deployed into production, with appropriate integration into the university's existing systems.

It is also deemed necessary to ensure **interconnection and interoperability** of U.Th.'s IT systems both internally and with external organizations, such as linking the Research Committee's information system or the Procurement Department's system with the national **DIAS payment system** and the **Central Electronic Public Procurement Registry (ΚΗΜΔΗΣ)**.

4.2 Human Resources

The development of digital skills is a cornerstone for the modernization and improvement of any organization's efficiency. Designing training programs that aim to strengthen digital competencies and familiarize the community with digital services is critical.

A comprehensive training program could include interactive seminars, workshops, and educational platforms tailored to the needs of the U.Th. academic community. Additionally, the ability to deliver such programs via distance learning is a valuable tool, as it allows flexibility and mass participation regardless of geographical constraints.

Continuous awareness of the opportunities and infrastructures offered by digital services is a fundamental step toward strengthening digital culture and mobilizing users. Designing outreach activities—such as presentations, information days, and actions on social media—can contribute to raising awareness and engaging both the U.Th. community and local society. For U.Th., the development of targeted initiatives to disseminate information about its processes and infrastructures can enhance accessibility and the use of services by both the academic and student community.

Digital Transformation is a complex and large-scale project that requires the participation of appropriate and sufficient human resources. The development and advancement of human resources constitutes a key pillar of digital transformation.

Within this framework, the following actions are planned:

Training / Education of U.Th. Academic Community and Local Society

- **Needs Assessment**: Conduct surveys (questionnaires and/or interviews) to identify gaps in the digital skills of staff and the broader academic community.
- **Educational Material**: Create videos, guides, and podcasts on digital technology topics. Special emphasis will be given to cross-cutting skills, such as creating accessible digital content, protecting personal data, ethical and deontological issues in technology use, accessibility for people with disabilities, etc.
- **Collaboration with Experts**: Invite specialized professionals to conduct workshops or webinars.
- **Mentoring Programs**: Establish groups where more experienced staff, students, etc., support less experienced members.
- **E-learning Platform**: Use existing e-learning platforms to provide educational material and monitor training progress.
- **Continuous Training**: Ongoing education and training so that academic community members acquire the knowledge, skills, and culture necessary to take advantage of digital opportunities.
- **Certification**: Provide certifications (e.g., micro-credentials) to participants who successfully complete training programs, as certification of digital skills is considered essential.

Awareness of U.Th. Academic Community and Local Society

- **Guides and Tutorials**: Create user-friendly manuals for digital services, available online and in print.
- **Information Days**: Organize in-person or online meetings where users can learn about digital services.
- **Social Media Use**: Provide continuous updates through platforms like Facebook, Instagram, and LinkedIn.
- **Newsletter**: Periodically send out emails with news about digital infrastructures and services.
- **Smartphone Applications**: Develop apps that provide direct access to information and usage guides for digital infrastructures and services.

Utilization and Development of Human Resources (U.Th. Academic Community and Local Society)

- **Leverage Internal Resources**: Utilize the human capital of the university (administrative, teaching, research, student personnel) for digital transformation—for example, involving students through internships in digital modernization projects, providing valuable experience and contributing to innovative actions.
- **Volunteer Programs**: Design volunteer schemes for implementing specific actions that engage all members of the academic and local community, fostering participation and collaboration.
- **New Staff Recruitment**: Plan the recruitment of additional personnel (staffing U.Th.'s ICT Services) for actions where current staff are insufficient or lack the necessary expertise. Recruitment of specialized ICT personnel is deemed essential, such as Software Engineers

with expertise in Artificial Intelligence, Databases, Web Application Development, Information Systems, Private Cloud Systems, IT System Management, and Network Equipment. New personnel are needed both centrally (university-wide infrastructures) and in individual Departments/Schools.
- **Institutionalize Collaboration**: Formalize cooperation between the IT Directorate and the IT staff of departments and other university services.

4.3 Processes and Organization

The provision of digital services in a large organization largely depends on the **digitization of processes** in a way that makes them more automated, faster, clearer and simpler.

At U.Th., although many administrative processes already use digital tools, they often replicate handwritten practices instead of implementing true digitization—for example, automatically retrieving existing data, notifying stakeholders at each stage, completing the process based on a predefined workflow, and delivering the outcome digitally to the final recipient.

As part of this reorganization of university services, the following actions will be carried out:

- **(Re)design of university processes** aimed at their digitization, simplification, automation, and the establishment of monitoring mechanisms.
- **Universal implementation of electronic document circulation** and **digital signatures** by all stakeholders (administrative and academic staff), forming the foundation of service reorganization.
- **Enhancement of virtual learning environments** with the creation and enrichment of virtual classrooms and laboratories to support distance learning and interactivity.
- **Support for the development of digital educational content**, by encouraging and assisting faculty in creating and using digital materials such as lecture videos and interactive presentations.
- **Update and implementation of the university's personal data protection policy**.
- **Design of user support structures** for all categories of users of the university's digital infrastructures and services.
- **Ensuring accessibility** of processes for individuals with special needs.

Since these actions represent a fundamental reorganization of many services, the following steps are planned to ensure effective implementation:

Needs Analysis and Design

- Gather stakeholder feedback to identify problems and areas for improvement in administrative, academic, and research processes.
- Analyze existing processes to identify gaps and recurring issues (e.g., inefficient communication channels, repeated errors, user complaints, unnecessary steps, inadequate control, lack of resources, poor inter-process collaboration).
- Define digitization goals, prioritizing efficiency improvement and cost reduction.
- Document processes: record and understand them; analyze activities and their interrelations; collect and visualize data; prepare supporting materials for training.
- Map service workflows for handling academic community requests.

- Document the process architecture and create a **process repository** for the university (similar to MITOS – i.e., creation of MITOS-U.Th.), improving understanding, structure, and effectiveness.

Process Automation

- Identify processes to be automated and define the services involved in digital transformation and their cooperation modes (choreography).
- Install, configure, and use automation tools such as the **PAPYROS electronic document circulation system** and **chatbots** for handling routine inquiries in department secretariats and other administrative services.
- Cleanse registries/databases by conducting audits and ensuring completeness and data quality enabling process automation and system interoperability.

Staff Training and Change Management

- Develop training programs for redesigned processes and promote collaboration among departments to support the digital initiative.
- Apply change management as a holistic approach to ensure successful implementation of new processes, including impact assessment, setting clear measurable goals, and stakeholder engagement through effective communication strategies that build consensus for a smooth transition.

Implementation and Monitoring

- Pilot small-scale deployment of digital solutions to identify weaknesses.
- Monitor and evaluate process effectiveness using **Key Performance Indicators (KPIs)** for continuous improvement and regular reviews, incorporating feedback.
- Review/draft regulations for the use of infrastructures and obtain approval from competent bodies.
- Review/draft regulations for electronic services and obtain approval from competent bodies.

Sustainability and Resilience

- To ensure a smooth transition to a fully digitized university and its long-term viability, activities for redesign will be categorized into short-, medium- and long-term actions. Implementation will follow these timelines, while funding sources will be identified to support the plan.
- The resilience and uninterrupted operation of digital services are critical to ensuring the continuous provision of educational and administrative functions, even during emergencies or crises. By investing in reliable digital infrastructures and comprehensive training for staff and students, the university can quickly switch to remote teaching and learning environments.
- This approach includes deploying secure cloud platforms for seamless management of academic and administrative tasks, as well as developing contingency plans and regularly testing systems and users to ensure readiness for potential disruptions. Thus, the University can maintain operational continuity and safeguard its academic standards, even in the face of unforeseen challenges.

Organizational Restructuring

- To achieve the plan's goals, it is deemed necessary to transform the university's IT Directorate into the legally foreseen **"Digital Governance Unit"**, with an appropriate restructuring of its organizational chart (Directorate, Sub-Directorates, Departments), expanded responsibilities, and strengthened staffing and infrastructures.

4.4 Funding

Digital transformation expands the range of services offered, but its implementation requires **significant funding**, both in terms of technological equipment and human resources, to ensure proper service operation.

Since the university's resources are limited, additional funding sources must be sought. It is necessary to:

- **Estimate the cost** of all Digital Transformation actions and define the timeline for required expenses.
- **Identify permanent and temporary funding sources** (e.g., Recovery and Resilience Fund, project proposals, Public Investments, Research Committee, regular university budget) and initiate applications/claims for sufficient funding.
- **Set a minimum investment percentage** (defined by the University Council) of the U.Th. budget and Research Committee budget dedicated to Digital Governance.
- **Define the priority and necessity level** of each Digital Transformation action for the university's services.

4.5 Development and Application of Advanced Digital Technologies

As a space of research, science, and technological innovation, U.Th. seeks not only to integrate current and emerging technological developments into its own operations, but also to provide technological solutions with broader applicability to the economy and society.

Artificial Intelligence, the Internet of Things, Big Data Management, Data Analytics and Knowledge Mining, Augmented/Virtual Reality, Smart Mobile Applications, and 5G networks are among the key technological developments that can elevate U.Th. to the level of a next-generation educational and research institution.

Within this framework, the following actions (indicatively) will be promoted:

- **Design and implementation of automated and personalized services** delivered by digital assistants, advisors, and agents for both administrative and educational functions (e.g., study advisors for students, assistants for locating administrative regulations for staff, agents for identifying teaching resources for faculty).
- **Application of knowledge mining and data analytics techniques**, based on data warehouses, to identify strengths and weaknesses and to support decision-making/re-design of processes

and educational activities (e.g., analysis of student performance, processed anonymously, to detect weaknesses in curricula and guide reform decisions).
- **Further development of distance learning** to enrich the teaching/learning experience and maximize effectiveness (e.g., through augmented and virtual reality).
- **Development of energy consumption monitoring and automation systems** for building heating and cooling (e.g., using Internet of Things (IoT) technologies for data collection, data analytics, and automated system control, combined with geothermal, solar, or wind energy solutions).
- **Development of mobile applications** to make university services accessible via smartphones, through easy-to-use and engaging apps (e.g., a course evaluation app for students, aiming to increase participation in the evaluation process).
- **Development or use of ready-made applications/services** to support individuals with special needs in their interaction with U.Th. (e.g., a speech-to-text app for people with hearing impairments).
- **Development of applications for improving recycling processes** at U.Th. (e.g., a digital advisor providing personalized recycling guidance depending on activity and personal habits).
- **Development of applications/systems for connection with the economy and labor market** (e.g., a system for the Career Office that intelligently and personally identifies and suggests to students and graduates job opportunities and companies interested in their skills and knowledge).

The development of such applications may involve university members, external collaborators, and partnerships with other universities, provided that sufficient funding is secured in each case.

4.6 Digital Technology for a Green and Sustainable University

In a green university, environmentally friendly and sustainable practices must be combined. The concept of a green university and green campus offers an institution the opportunity to redefine its operations and develop new strategies that are environmentally friendly and more sustainable. A green university is associated with reducing wasteful practices. The use of renewable energy sources, such as solar energy and biomass, could cover part of the energy needs of an educational institution. The university may also prioritize sourcing environmentally friendly materials.

Responsibility for achieving a green and environmentally friendly university lies with all stakeholders. It is the duty of administration, faculty, administrative staff, and students to work closely together and make the campus greener. Emphasis should be placed on implementing the latest technologies to provide clean and renewable energy sources as substitutes for traditional ones, as well as on conducting an effective recycling program, incorporating ICT monitoring technologies and reward systems.

Specific steps U.Th. can take to become more environmentally friendly through digital technologies include:

Use of Renewable Energy Sources for Computing Infrastructures

- Due to the need to reduce greenhouse gas emissions and rising electricity costs, systematic installation of photovoltaic systems could cover part of the energy requirements of computing

infrastructures. At the same time, protection against power outages could be ensured through the use of batteries storing photovoltaic energy.

Transition to Energy-Efficient Computing Infrastructures

- Establish specifications for the procurement of new computing infrastructures, where **energy efficiency relative to computing power** is a key selection criterion.

Energy Monitoring and Control with Digital Technology

- Using Internet of Things (IoT) sensor technologies, energy consumption in buildings (heating, cooling, ventilation, lighting) will be monitored relative to usage, with automatic optimization adjustments applied (see also Section 4.5).

Environmental Monitoring with IoT Sensors

- Monitor environmental compliance actions regarding sustainability and resource saving, using IoT technologies.

Distance Learning to Reduce Energy Needs

- Within the framework of current legislation on undergraduate and postgraduate programs and training initiatives, part of educational activities will be conducted remotely. The goal is to reduce energy-intensive commuting and the energy consumption of buildings (heating, cooling, ventilation, lighting) and computing infrastructures used for teaching purposes.

Promoting Research on Green Digital Technologies

- Fund interdisciplinary research initiatives focused on the development of green technologies and sustainability in the university environment, leveraging digital technologies and emphasizing student involvement.

Recycling and Reduction of IT/Office Automation Consumables – Recycling of Retired Computing Infrastructures

- Promote the reduction of IT consumables (e.g., elimination of paper use in document circulation), systematic recycling of used consumables (with particular focus on device batteries at end-of-life), and recycling of computing infrastructures that have completed their lifecycle.

4.7 Monitoring, Updating, and Specialization of the Digital Transformation Plan

Digital transformation is an **ongoing process**, influenced by:

- the rapid progress of available technologies,
- their application at national and international level by organizations similar to U.Th. (or those offering comparable services),
- the social acceptance of emerging technologies (and therefore their acceptance by the academic community), and

- the changing cost of digital technologies.

It is considered useful to establish a **Digital Transformation Observatory** at U.Th., which will:

- monitor the implementation progress of the university's Digital Transformation Plan using appropriate quantitative and qualitative indicators,
- prepare periodic reports and
- provide these reports to the Digital Governance Committee, so they can be taken into account in the **updating and specialization** of the plan, as well as in the **prioritization of actions**, based on:
    - their importance,
    - prerequisites,
    - funding,
    - and the available human and material resources of U.Th.