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University to Society Collaborations for Inclusive Digital Transformation in the Western Balkans

DIGITAL TRANSFORMATION CHALLENGE MANUAL FOR HIGHER EDUCATION INSTITUTIONS





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2024

ACKNOWLEDGEMENT

This document is produced in the framework of the Erasmus+ Capacity Building in Higher Education Project: U2SID - University to Society Collaborations for Inclusive Digital Transformation in the Western Balkans.

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EXECUTIVE SUMMARY

The U2SID is in line with the Call objectives in Strand 2 for building and strengthening partnerships for transformation in higher education. The project is in line with the aim of the call to contribute to the innovation in higher education to enhance relevance to labour market, regional development, and society by strengthening university to society collaborations and setting up a Digital Literacies Accelerator Programme and Digital Transformation Challenge. The project will impact the modernisation of HEIs which will not only transfer knowledge but also will create economic and social value through the transfer of their teaching and research results to the community and society at large.

The Digital Transformation Challenge (DTC) is a strategic initiative designed to position universities as key contributors to societal development by using digital technologies to solve complex real-world challenges. Through the DTC, students and faculty collaborate with external stakeholders—businesses, policymakers, and civil society organizations—to co-create innovative and impactful solutions. The challenge is structured around project-based learning and mentorship, enabling participants to apply academic knowledge in practical contexts and develop essential digital and problem-solving skills.

The DTC aligns with the university's Third Mission, which goes beyond traditional teaching and research to include active societal engagement. By promoting interdisciplinary teamwork, fostering digital literacy, and encouraging the use of digital tools for sustainable and inclusive development, the DTC enhances the university's capacity to respond to social, economic, and environmental challenges. The initiative strengthens partnerships between academia and society, reinforces the university's role as a driver of innovation, and contributes to building a more connected, equitable, and resilient community.

Close cooperation between scientific research institutions and the economy is recognized as a driving force for the further development of national economies. Therefore, among HEI objectives, it is the purpose of generally leading change and improving individuals and society.

DTC is the core work program of the U2SID project that puts into practice the competencies gained in previous actions. The challenge is designed to empower students and faculty by developing innovative solutions using digital tools and methodologies.





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PROJECT SNAPSHOT

Project Title	University to society collaborations for inclusive digital transformation in the Western Balkans
Project's acronym	U2SID
Webpage	[insert project website]
Project's budget	EUR 398,650.00
Funded by	Erasmus+ Programme Capacity building in Higher Education
Project number	101083131
Project duration	24 months
Project Coordinator	University of Shkodra Luigj Gurakuqi
Countries involved	Albania; Serbia; Montenegro; Italy
Project partners	<p>University of Shkodra Luigj Gurakuqi</p> <p>University „Fan S. Noli” of Korca</p> <p>Mediterranean University of Albania</p> <p>Center Science and Innovation for Development</p> <p>Center for Comparative and International Studies</p> <p>National Agency for Scientific Research and Innovation</p> <p>University of Montenegro</p> <p>University of Belgrade</p> <p>University of Salento</p>
Aim and objective	<p>Project's aim: To foster inclusive digital transformation in the Western Balkans through increased collaboration between universities with other stakeholders such as businesses, policy makers, civil society, and media.</p> <p><i>The specific objectives of U2SID are:</i></p> <p>SO1 – To strengthen digital competences of teachers, students, and professionals through the development of a Digital Literacies Acceleration Programme as a collaborative programme among universities on one side and businesses, civil society, local decision makers and media on the other.</p> <p>SO2 – To improve innovative teaching methods through piloting a Digital Transformation Challenge for students as a project-based and solution-oriented learning based on mentoring, coaching and placement at businesses, civil society, local decision makers and media.</p>





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	SO3 – To raise awareness on the importance of inclusive digitalisation by including vulnerable target groups in the digitalization process.
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ABBREVIATIONS

DX	Digital Transformation
DTC	Digital Transformation Challenge
HEIs	Higher Education Institutions
DLAP	Digital Literacies Accelerator Programme
TM	Third Mission
PBL	Project-based Learning
THM	Triple Helix Model





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Figure 1 Components of Digital Literacy

Figure 2 Structure of the Challenge

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Figure 4 Process and Timeline





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I. INTRODUCTION

The modern world is a world in which technological innovations has an increasingly important place and play an important role in all spheres of social life. New technologies are driven by inventions of new products and new ways of doing things (originating in advances in basic and applied science) that are transformed into usable innovations in markets to satisfy needs, achieve goals, solve problems (Coccia, 2021).

In modern history, technological development has progressed gradually during three industrial revolutions. Technological changes during this period made a significant contribution to the better and more advanced functioning of the economy, in addition they influenced the expansion of the urbanization process, the diversification of the media, cultural, political and other processes on the macro level as well as the improvement of the quality of life of the individual on the micro level. In recent decades, technological development has been characterized by the stronger action of digital technologies, which with even more potential produce changes whose limits are difficult to foresee. These changes, which indicate the beginning of the fourth industrial revolution, fundamentally change the perception and image of the world and the role of man in it.

Bearing in mind the achievements of digital technology so far, we can say without a doubt that they have a key role in shaping modern society. Thanks to digital technologies, the whole world is connected by a network of communications, that is, platforms and real-time applications that change and accelerate social and cultural dynamics. In the field of economics, digital technologies create a completely new system of selling goods and services via digital platforms, digital technologies reduced the negative impact on the environment, striving to decrease or eliminate pollution and waste while increasing production and efficiency (Haleem et al., 2022). In healthcare, digitalization has led to groundbreaking achievements in clinical practice, enabling remote healthcare services and advanced patient care. Additionally, digital technologies have revolutionized education, facilitating the development of smart cities, digital media, and a range of other innovations that define modern life.

Digital technologies have made a paradigm shift in education. In modern education they are not only a knowledge provider but also a co-creator of information, a mentor, and an assessor, which made the learning process easier (Haleem et al., 2022). Digital technologies have raised the learning process to the level of interactive and personalized learning, developing distance learning and blended education that is accessible to everyone regardless of geographic or economic constraints.

Unlike traditional teaching, digital tools create better conditions for learning. Technological aids such as interactive whiteboards, computers, the use of various educational applications and programs, improves teaching productivity, builds knowledge and understanding skills, improves communication between professors and students, building communicative skills and team work, contributes to better understanding and faster mastering of the material, better insight in learning difficulties, make learning more interesting and faster, students more motivated and inspired, help students to improve their learning experience and performance. The place of the classic classroom is being replaced by digital classrooms that focus entirely on teaching via the use of technology. The use of digital devices and other devices in conjunction with digital tools in digital classrooms allows students to play a more proactive role and be at the center of the process. Classroom teaching becomes more interactive and more participatory (Halverson & Shapiro, 2012). Technologies for education and technologies for learners: How information technologies are (and should be) changing schools. (Halverson & Shapiro, 2012; Haleem et al., 2022).





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Digital technologies and their tools proved to be particularly useful during the pandemic during the 2020. Then many HEIs worldwide shifted to teaching and learning in a virtual environment, i.e. online teaching and learning. The HEIs have been working for years on digitalisation as an important infrastructure precondition for communication within academic communities but new reality during pandemic demanded prompt and skillful reactions (Vučković & Premović, 2023), thereby giving impetus to the accelerated transformation of the teaching process to online teaching and learning.

U2SID Erasmus+ project is project oriented to boost inclusive digital transformation in the Western Balkans through increased collaboration between universities and other stakeholders such as businesses, policymakers, civil society, and the media. Its goal is to improve the quality of higher education in Montenegro and Albania through horizontal knowledge by third countries not associated with the Erasmus programme. In order to achieve these goals, the U2SID project, which includes four partner universities, University of Shkodra "Luigj Gurakuqi," University of Korça "Fan S. Noli," Mediterranean University of Albania, and University of Montenegro, set three basic tasks:

1. Strengthen the digital competencies of teachers, students, and professionals through developing a Digital Literacies Acceleration Programme as a collaborative programme among universities on one side and businesses, civil society, local decision-makers, and media on the other.
2. Enhancing innovative teaching methods by piloting digital transformation challenges for students as project-based and solution-oriented learning based on mentoring, teaching and placements in businesses, civil society, local decision-makers and the media.
3. Raise awareness of the importance of inclusive digitization by including vulnerable target groups in the digitization process.

The transformation of the educational process in accordance with new digital technologies does not mean only infrastructural preparation, but also the necessity that teachers must learn to utilize various gadgets, use all available online resources (Lewis et al., 2013). The U2SID project achieved this task by implementing two actions. First, by organizing workshops through the "Assessment of Digital Literacies Workshops Across U2SID Partner Universities" activity. The workshops successfully addressed digital literacy gaps, providing targeted trainings to enhance digital competencies among students, lecturers, and other stakeholders. The workshops were well aligned with the objectives of the next activity, ie Digital Literacies Accelerator Programme (DLAP), focusing on the horizontal transfer of digital skills, innovative teaching methods and inclusion of vulnerable groups.

The second action was held through "Digital Literacies Accelerator Programme" for Albania and Montenegro. This program represented a strategic response to the emerging needs of the digital age in Balkan countries. Through practical workshops, DLAP strengthened the digital competencies of teachers, students, and professionals through a collaborative programme among universities on one side and businesses, civil society, local decision-makers, and media on the other. By equipping individuals with the necessary skills and competencies, this initiative aimed to empower them to thrive in an increasingly digitalized environment, ultimately contributing to regional development and competitiveness.

The U2SID project aims to contribute to innovations in higher education and increase the relevance of HEIs for the labor market, regional development and society, thereby strengthening cooperation between universities and society. Therefore, these two actions represented theoretical and practical preparation for the final task of the project, which is to improve innovative teaching methods by piloting a Digital Transformation Challenge (DTC). DTC is project-based and solution-oriented learning,





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which contributes to social development through knowledge transfer and collaboration, in recent years called the "Third Mission" (TM) of the university.

The concept of the Third Mission emphasizes universities' roles in contributing to the social, economic, and cultural development of their regions. Often referred to as the "entrepreneurial university" or through the Triple Helix Model (THM) of university-industry-government partnerships, the TM requires universities to move beyond teaching and research, applying their knowledge to respond to societal needs and drive innovation (Trencher et al., 2014; Secundo et al., 2017; De Jong et al., 2014). Using digital tools for civic engagement can improve quality education at the university level and help prepare proactive, agile and critical thinkers and young experts for the future. These new capabilities are becoming increasingly prevalent in the education sector, presenting challenges but also setting the stage for incredible opportunities.

This Manual describes the framework of the Digital Transformation Challenge (DTC), which will be integrated into the core strategies of the partner universities to improve social engagement through digitization. It will serve as a guide for organizing the delivery of solutions to businesses, institutions, the community and for project-based learning (PBL), where students solve real-world problems posed by an external stakeholder. PBL enables students to apply theoretical knowledge in practice, fostering critical thinking and creativity. It also promotes teamwork, digital literacy, and the development of entrepreneurial skills.

The manual will give us an insight into the objectives of the Digital Transformation Challenge, outlines its structure and describes the roles of students, lecturers, and external stakeholders in the co-creation process. The DTC leverages project-based learning to create a collaborative environment where students develop solutions under the guidance of faculty and in partnership with businesses, policymakers, and civil society organizations.

By embedding the DTC within institutional strategies, universities can enhance their societal impact, ensure the practical application of academic knowledge, and create a sustainable framework for continuous innovation and development. This manual serves as a guide for implementing the DTC, offering a blueprint for organizing the challenge, evaluating solutions, and sustaining the university's engagement with societal actors.





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II OBJECTIVES OF THE DIGITAL TRANSFORMATION CHALLENGE

The Digital Transformation Challenge aims to:

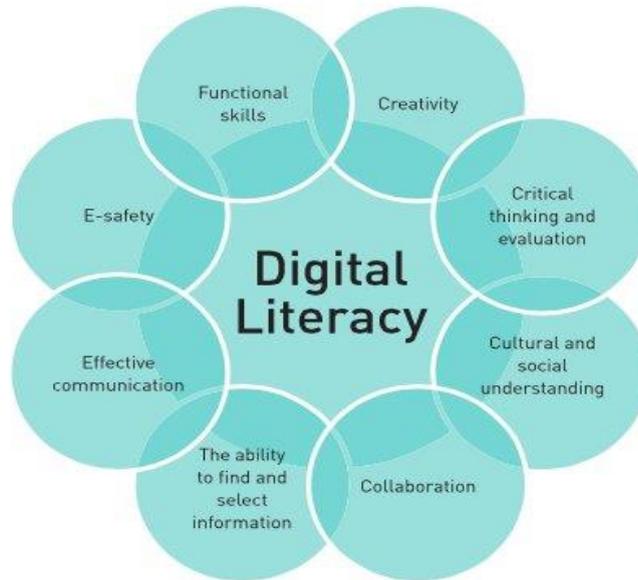
- ❖ **Apply digital literacies gained through university training programs in real-world scenarios.**

Digital literacy is critical to participation in a contemporary knowledge-based society and is requisite to both academic success and career development. When it comes to students, data literacy skills are very important as they help them to succeed in the digital age. In the last years educational institutions adapt more and more their methodologies to promote explicit and intentionally reasoned digital literacy strategies that combine the competencies possessed by users of technology with the generation of new competencies required to successfully participate in the digital transformation of education, business, and society (Murray et al., 2021). The DTC aims to provide students and faculty members with the opportunity to apply digital skills and literacies gained through university training programs to real-world challenges. Digital literacies encompass a wide range of competencies, including data analysis, digital communication, and the use of emerging technologies. These skills are critical for understanding and solving the multifaceted problems faced by contemporary societies. For instance, the European Commission's Digital Competence Framework for Citizens (DigComp) highlights the need for individuals to have a robust set of digital skills to participate effectively in the digital society and workforce (European Commission, 2016).

Figure 1. Components of Digital Literacy¹

¹ Shively, K. (2017) Reflections from the Field: Creating an Elementary Living Learning Makerspace, *Learning Communities Research and Practice*, Volume 5, Issue 1





- ❖ **Foster collaboration between students, lecturers, and external stakeholders, including businesses, policymakers, and civil society.**

The last decades have seen a fundamental upheaval in the organization of modern life, and the university as an institution has been as widely affected by these changes as business, governments, and civil society groups. The growing importance of knowledge production and innovation for economic life has created new potential roles for universities and challenged the traditional societal privileges and monopolies which they have long enjoyed. DTC lies and foster intensive interaction between universities and society. The role of the university today includes not only education, training and communication of research results, but also cooperation with other societal organizations that is, private and public actors (Zoomer & Benneworth, 2011). Solving the various tasks of stakeholders, leads to a strengthening of cooperation between students and lecturers who combine their knowledge, digital skills and creative ideas in teamwork. This collaborative approach encourages the exchange of diverse perspectives and expertise, leading to the co-creation of innovative solutions.

- ❖ **Develop innovative, project-based solutions to current economic and social challenges.**

In the modern society, University plays the role of the third mission, where universities are more institutionally interested in engaging in society and solving specific social problems, rather than to particular researchers. Universities work to identify social needs, create sustainable products or services, and contribute to the well-being of communities. They have made tremendous progress in responding to society's demands and problems and developing innovative and project-based solutions. Modern higher education is moving in that direction. Engaging in social projects, universities have developed infrastructures for technology transfer, including transfer offices, incubators, spin-off programs, venture capital funds and intellectual property management activities, strengthening their resources to successfully respond to economic and social challenges (Zoomer & Benneworth, 2011). By engaging in project-based learning, participants are better prepared to tackle the complexities of the modern workplace, where project management and problem-solving skills are highly valued. This approach also aligns with research findings that suggest PBL enhances students' ability to retain knowledge and apply it in new contexts (Thomas, 2000).



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- ❖ **Promote the use of digital technologies to create sustainable, inclusive, and scalable solutions.**

The DTC places a strong emphasis on the use of digital technologies to create solutions that are not only innovative but also sustainable, inclusive, and scalable. The use of digital technologies in learning environment provides an equal opportunity for each student. Virtual classroom, video, augmented reality, robots, and other technology tools make the class exciting and create inclusive learning environments that foster collaboration and curiosity (Haleem et al., 2022). So, digital technologies can be used to develop solutions that promote social inclusion, such as platforms that improve accessibility for marginalized groups or tools that provide equal opportunities to participate in the digital economy. Similarly, sustainable digital solutions can contribute to environmental sustainability by reducing resource consumption or promoting green technologies.

- ❖ **Support the transfer of academic knowledge to solve real-life issues, reinforcing the third mission of universities.**

One of the main objectives of the DTC is to facilitate the transfer of academic knowledge from the university to society. By engaging students and lecturers in solving real-life problems presented by external stakeholders, the challenge reinforces the university's role as a key driver of societal development. This knowledge transfer not only benefits the community but also enriches the academic environment by providing opportunities for applied research, experiential learning, and the development of new educational models. It enables universities to fulfill their Third Mission by creating tangible societal impact through academic excellence. The successful realization of these objectives will enhance the university's capacity to respond to societal needs, improve the employability of its graduates, and strengthen its position as a leader in digital transformation and innovation.

III STRUCTURE OF THE CHALLENGE

The Digital Transformation Challenge (DTC) is structured to facilitate interdisciplinary collaboration and the co-creation of solutions to address real-world challenges through digital innovation. The challenge is divided into several phases, each designed to engage participants and stakeholders in a meaningful way, ensuring the effective transfer of academic knowledge to society. This structure aims to foster learning, innovation, and societal impact, in alignment with the Third Mission of universities.

3.1 Open Call for Participation

The DTC begins with an open call for participation, inviting students, lecturers, and external stakeholders from diverse fields to join. Universities will announce the call through various communication channels, encouraging interdisciplinary teams to form and contribute their expertise. The call will also be extended to external partners, including business professionals, policymakers, and representatives of civil society organizations, to present pressing social, economic, and environmental challenges that require innovative digital solutions.

The open call should clearly outline the objectives, timeline, expected outcomes, and benefits for participants. The inclusion of external stakeholders ensures that the proposed challenges are grounded in real-world needs, making the DTC a valuable platform for knowledge exchange and societal engagement.





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3.2 Pairing Students and Lecturers

Following the open call, students and lecturers will be paired based on their skills, interests, and the nature of the challenges presented. Each interdisciplinary team will be mentored by a lecturer who will guide the participants through the problem-solving process. This mentorship aims to blend academic knowledge with practical application, fostering an environment of collaborative learning and innovation.

Teams will be encouraged to approach problems from multiple perspectives, utilizing digital tools and methodologies to propose creative and effective solutions. This pairing process is crucial for ensuring that the teams are equipped with the necessary expertise to tackle complex issues and that learning objectives are met.

3.3 Presentation of Challenges

External stakeholders, such as businesses, policymakers, and civil society organizations, will present their challenges at dedicated university-organized events. These presentations will serve as the foundation for the project-based learning tasks that teams will work on throughout the DTC.

Each stakeholder will provide a detailed description of the issue at hand, including relevant background information, potential impact, and desired outcomes. This direct engagement between the university and external partners enhances the relevance of academic activities, ensuring that students are working on challenges that have real societal significance.

3.4 Development of Solutions

Once challenges have been presented, teams will begin developing solutions using a project-based learning (PBL) approach. This phase will involve iterative cycles of ideation, prototyping, testing, and refinement. The focus will be on the practical application of digital tools and technologies, such as data analytics, software development, and digital communication, to create innovative solutions that are both feasible and impactful.

During this stage, participants will have access to mentoring sessions, workshops, and consultations with stakeholders, allowing them to refine their ideas and ensure that their solutions align with the needs of the challenge owners. This collaborative process not only strengthens the solutions but also enhances the learning experience for students and faculty.

3.5 Public Presentation and Evaluation

At the conclusion of the development phase, teams will present their solutions at public events organized by the university. These events will be attended by representatives from academia, industry, government, and civil society, providing a platform for showcasing the outcomes of the DTC and recognizing the efforts of the participants.

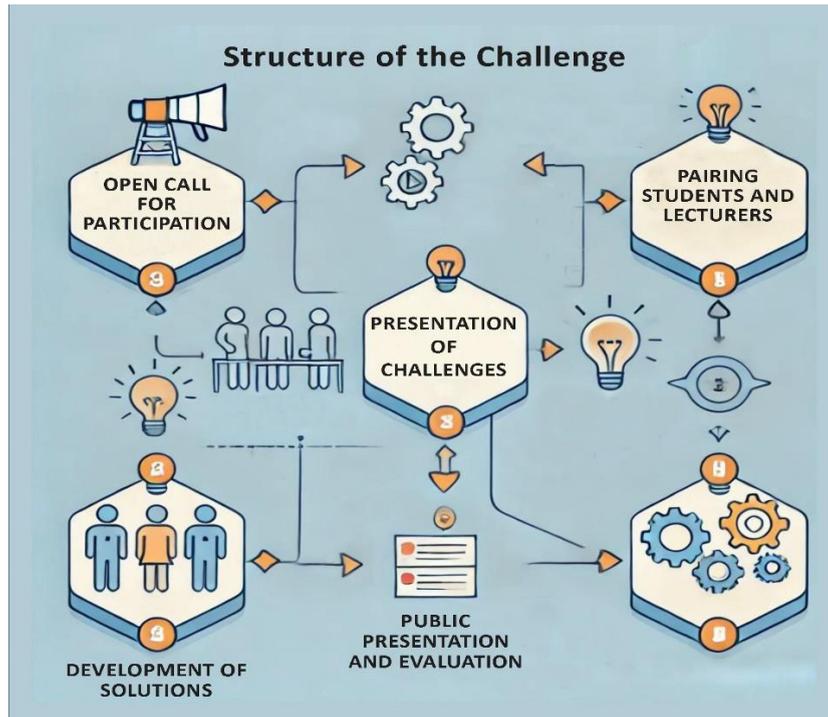
A jury composed of academic and industry experts will evaluate the projects based on predefined criteria, such as innovativeness, scalability, inclusiveness, and societal impact. The best solutions will



be selected for further development or implementation, with opportunities for continued collaboration between the university and external stakeholders.

The public presentation serves multiple purposes: it celebrates the achievements of the teams, encourages broader community engagement, and provides visibility for the university's efforts in fostering digital innovation and societal development.

Fig. 2. Structure of the Challenge



IV ROLES AND RESPONSIBILITIES

The success of the Digital Transformation Challenge relies on the coordinated efforts and active participation of all involved stakeholders, each of whom plays a crucial role in ensuring the program's effective implementation and achievement of its objectives. This section outlines the specific roles and responsibilities of the university, students, lecturers, and external stakeholders.

4.1 University

The university is the primary facilitator of the DTC, responsible for managing its overall organization, ensuring its alignment with institutional strategies, and providing the necessary support for all participants.

The university will organize the open call for participation, targeting students, lecturers, and external stakeholders. It will determine the criteria for participation, disseminate the call through appropriate channels, and ensure that it reaches all relevant parties. Additionally, the university will plan and host events where challenges are presented and discussed, creating a platform for engagement between academia and external partners.

The university will, also provide mentors from its academic staff to guide and support the student teams throughout the project. It will also ensure that teams have access to necessary resources, such



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as digital tools, training materials, and workspace, to facilitate project-based learning and solution development.

Specific responsibilities of the university is to ensure that the DTC is integrated into its long-term digital transformation and societal engagement strategies. This includes involving university leadership in supporting the initiative, allocating resources, and embedding the DTC into relevant academic programs and curricula.

4.2 Students

Students are the primary participants in the DTC, expected to contribute their creativity, skills, and knowledge to develop innovative solutions for the challenges presented. Student are expected to work in interdisciplinary teams, utilizing their diverse backgrounds and skill sets to collaboratively solve the presented challenges. They will apply digital tools and methodologies learned during their university studies, demonstrating their ability to address complex real-world issues.

It is also expected that through the DTC, students will engage in project-based learning, enhancing their problem-solving, critical thinking, and teamwork abilities. They are expected to take ownership of their learning, contribute actively to their team's efforts, and develop practical solutions that can be implemented in real-world settings.

4.3 Lecturers

Lecturers play a pivotal role in the DTC as mentors and facilitators, guiding student teams through the process of project development and ensuring that learning outcomes are achieved. Lecturers will act as mentors for the student teams, providing guidance on applying digital literacies and academic knowledge to solve real-world problems. They will encourage creativity, help students navigate challenges, and ensure that the teams remain focused on achieving their objectives. Lecturers will also facilitate interactions between student teams and external stakeholders, ensuring that the collaboration is productive and that the proposed solutions align with the needs and expectations of the stakeholders.

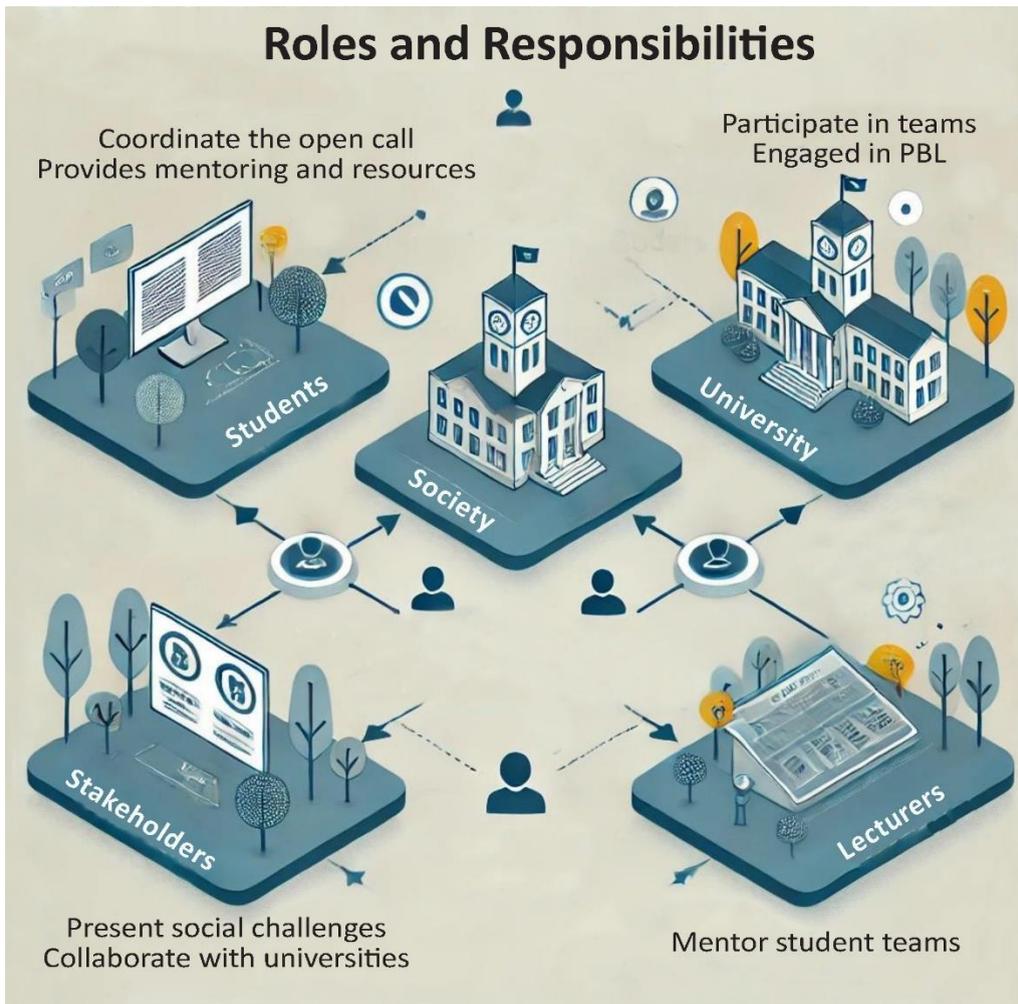
4.4 External Stakeholders

External stakeholders, including businesses, policymakers, and civil society organizations, are integral to the DTC, providing the real-world challenges that form the basis of the project-based learning tasks. External stakeholders will present relevant social, economic, and environmental challenges at university-organized events. These challenges should be clearly defined, with sufficient context and information to guide student teams in their solution development process.

Stakeholders will collaborate with universities and student teams throughout the project, offering feedback, resources, and expertise. This partnership ensures that the proposed solutions are feasible, impactful, and aligned with real-world needs.

Fig. 3. Roles and Responsibilities





V INTEGRATION INTO UNIVERSITY STRATEGIES

The successful integration of the Digital Transformation Challenge into a university's strategic framework is crucial for its sustainability and long-term impact. To achieve this, universities need to embed the DTC into their core activities, aligning it with institutional goals, academic programs, and broader societal engagement strategies. This will enable the DTC to become an integral part of the university's efforts to contribute to digital innovation and societal development.

To ensure effective integration of the DTC within institutional strategies, universities should undertake the following actions:



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- ❖ **Align the challenge with the university's long-term digital transformation and societal engagement strategies.**

The DTC should be aligned with the university's broader strategic objectives, particularly those related to digital transformation, innovation, and societal engagement. This alignment ensures that the DTC supports the university's mission and vision, enhancing its role as an agent of change in the community and innovative practices, helping the university remain at the forefront of digital innovation. By addressing real-world challenges and collaborating with external stakeholders, the DTC reinforces the university's commitment to societal development. It helps the university fulfill its Third Mission by actively contributing to solving social, economic, and environmental issues through academic knowledge and student engagement.

- ❖ **Ensure that the DTC complements the curriculum by integrating it into relevant courses and academic programs.**

To maximize its impact, the DTC should be embedded within the university's curriculum and academic programs. This involves incorporating the challenge into relevant courses, aligning it with learning outcomes, and ensuring that it complements existing teaching and research activities. Embedding the DTC within academic programs enhances project-based learning by providing students with hands-on experience in solving complex problems.

- ❖ **Involve university leadership to ensure institutional support and resource allocation.**

The active involvement of university leadership is essential for the success of the DTC. Institutional support ensures that the necessary resources are allocated and that the challenge is given priority within the university's strategic initiatives. University leaders, including deans, department heads, and administrative staff, should be engaged in the planning and implementation of the DTC. Their support is crucial for securing funding, promoting the initiative, and integrating it into the university's strategic agenda. The University should allocate resources such as funding, digital tools, mentoring support, and facilities to support the DTC. This provision demonstrates the institution's commitment to the challenge and ensures that participants have the necessary infrastructure to develop, and implement their solutions.

VI PROCESS AND TIMELINE

The Digital Transformation Challenge follows a structured process divided into four distinct phases. Each phase has specific activities, milestones, and outcomes to ensure a coherent progression from the initial preparation to the final evaluation and selection of solutions.

Phase 1: Preparation (two weeks)

This phase focuses on organizing the challenge, mobilizing resources, and establishing partnerships with external stakeholders. The preparation phase includes the following:





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1. The University will issue an open call for students and lecturers to participate in the DTC. This call should include detailed information on the objectives, timeline, and expected outcomes of the challenge. External stakeholders, such as businesses, civil society organizations, and policymakers, will be invited to present their challenges.
2. Organizing an event to present the challenge the University will organize events where external stakeholders present real-world challenges to participating teams. These events serve as a platform for knowledge exchange and enable participants to gain a deep understanding of the issues they will address during the DTC.

Phase 2: Project-Based Learning (one week)

During this phase, students and lecturers are paired into interdisciplinary teams, and the project-based learning process begins. Participants will be grouped into teams, ensuring a diverse mix of skills and expertise. Each team will be assigned lecturers as mentors to guide them through the challenge. The solution development phase begins with introductory workshops, mentoring sessions, and consultations with stakeholders. Teams will start brainstorming and conceptualizing their ideas, laying the groundwork for more detailed project development in the following phase.

Phase 3: Solution Development (one month)

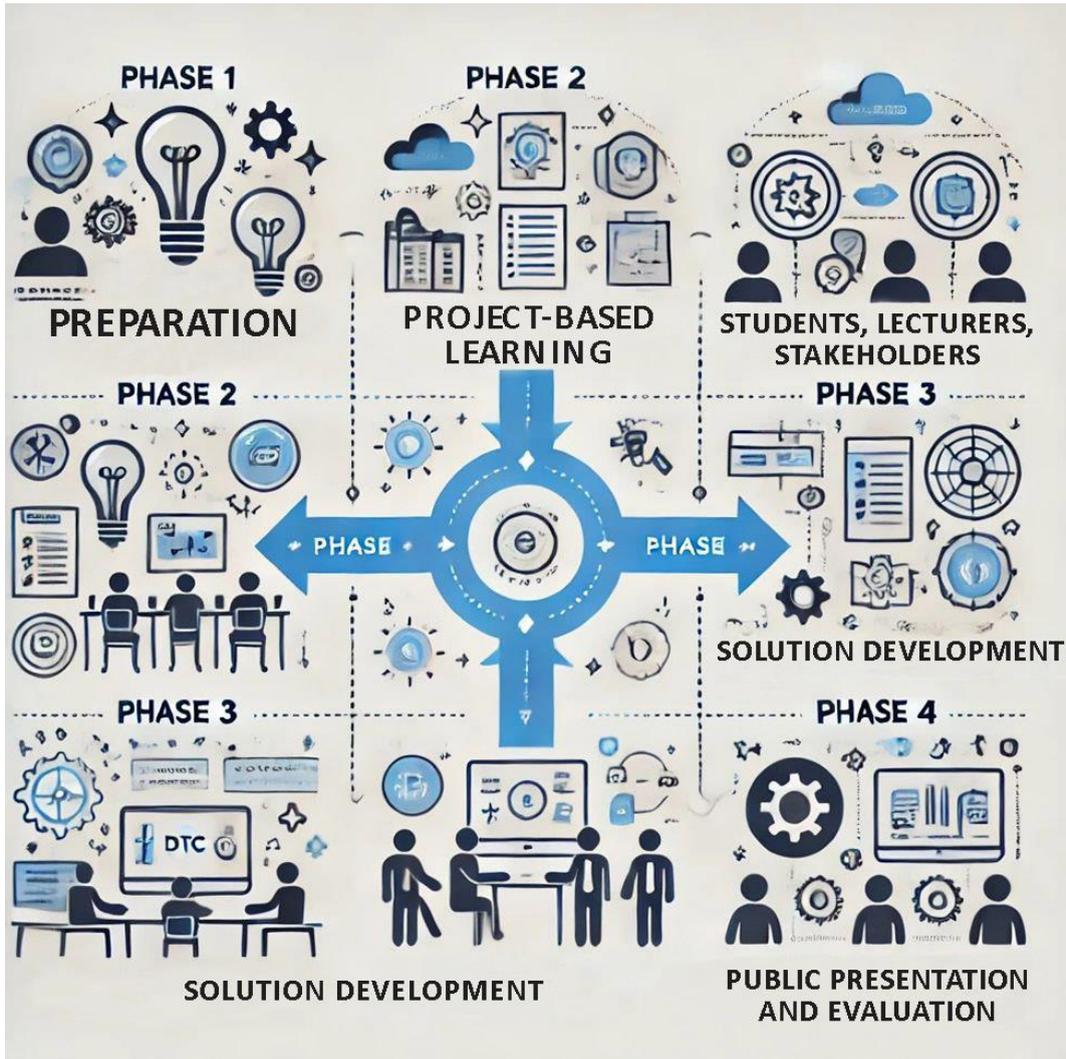
The focus of this phase is on the development and refinement of solutions using an iterative approach that involves continuous feedback and collaboration. Teams will work on developing prototypes and solutions, incorporating feedback from mentors and external stakeholders. This phase involves multiple iterations to refine and improve the solutions based on real-time inputs and testing. Regular meetings with external stakeholders ensure that the solutions align with the expectations and needs of those who presented the challenges. This collaboration also provides students with valuable insights and practical knowledge.

Phase 4: Public Presentation and Evaluation (one week)

The final phase culminates in public presentations, where teams showcase their solutions to a broader audience, including university representatives, stakeholders, and the community. Teams will present their solutions at a public event organized by the university. This event offers an opportunity for participants to communicate their ideas, receive feedback, and engage with a wider audience. A jury of experts from academia, industry, and civil society will evaluate the presented solutions based on criteria such as innovativeness, feasibility, scalability, and societal impact. The best ideas will be selected for further development or implementation, with the possibility of continued collaboration between the university and external stakeholders.

Fig. 4. Process and Timeline





VII PROJECT-BASED LEARNING APPROACH



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The Digital Transformation Challenge employs a comprehensive Project-Based Learning approach, which empowers students to become active problem-solvers and innovators by applying their academic knowledge to real-world scenarios. The PBL methodology is a cornerstone of modern education, promoting experiential learning that integrates theoretical understanding with practical application. This approach not only enhances students' academic development but also equips them with essential skills for navigating the complexities of the contemporary digital and socio-economic landscape. The DTC enables students to bridge the gap between theory and practice by applying academic concepts to address real-world challenges presented by external stakeholders, such as businesses, policymakers, and civil society organizations. This experiential learning environment fosters a deeper understanding of complex issues and enhances students' ability to think critically and creatively. According to Larmer, Mergendoller, and Boss (2015), PBL encourages students to engage in sustained inquiry, which leads to greater mastery of subject matter and improved problem-solving skills.

The DTC's PBL approach emphasizes the development of critical thinking and creativity by encouraging students to critically analyze problems, consider multiple perspectives, and generate innovative solutions. This is aligned with research findings which indicate that PBL fosters a culture of inquiry and discovery, enabling students to explore creative approaches to complex problems (Kokotsaki, Menzies & Wiggins, 2016; Savery, 2006). Such an environment nurtures a proactive learning attitude, as students are motivated to take ownership of their learning journey.

The DTC promotes teamwork and collaboration by forming interdisciplinary teams that work together to develop solutions. This mirrors the collaborative dynamics of modern workplaces, where diverse teams must coordinate to address multifaceted challenges. PBL not only builds teamwork skills but also enhances communication and interpersonal abilities, which are critical for professional success (Bell, 2010). By working in teams, students learn to leverage each member's strengths and perspectives, fostering an inclusive approach to problem-solving.

Through the use of digital tools and methodologies, students participating in the DTC strengthen their digital literacy and technical proficiency. They gain hands-on experience with data analytics, software development, and digital communication platforms, preparing them for the digital economy. Furthermore, the DTC emphasizes the development of an entrepreneurial mindset, encouraging students to identify opportunities, take initiative, and create sustainable and scalable solutions. Digital literacy and entrepreneurship are key competencies for future-ready individuals, making the DTC an essential component of preparing students for the workforce (OECD, 2018).

A distinctive feature of the DTC's PBL approach is the active involvement of external stakeholders who present real-world challenges. This engagement allows students to gain insights into industry practices, societal needs, and policy frameworks. In the Triple Helix model, collaboration between universities, industry, and government is essential for fostering innovation and knowledge transfer (Etzkowitz & Leydesdorff, 2000). By interacting with these stakeholders, students develop professional networks and learn to align their solutions with practical needs, thus enhancing their employability and societal impact.

The PBL approach in the DTC emphasizes continuous reflection and improvement. Students are encouraged to reflect on their experiences, identify areas for growth, and seek feedback from mentors and stakeholders. This reflective practice is critical for transforming experience into learning and fostering lifelong learning habits (Schön, 1983). Regular reflections enable students to internalize what





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they have learned and apply these lessons in future projects, making the learning process dynamic and iterative.

The DTC's evaluation process goes beyond traditional academic assessments by focusing on the practical applicability and societal impact of the solutions developed by student teams. Evaluation criteria include innovativeness, scalability, inclusiveness, and potential for positive societal change. This aligns with the European Commission's Higher Education Modernisation Agenda, which advocates for universities to engage in activities that generate societal value and foster community development (European Commission, 2017). The PBL approach in the DTC ensures that assessment is holistic, incorporating both academic rigor and real-world relevance.

The integration of the PBL approach within the DTC provides a robust framework for students to develop the competencies necessary for addressing the complexities of modern society. By combining academic knowledge with practical application and stakeholder engagement, the DTC cultivates graduates who are not only skilled and knowledgeable but also capable of driving innovation and contributing meaningfully to societal progress.





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VIII LINKING UNIVERSITY WITH SOCIETAL ACTORS

The Digital Transformation Challenge is strategically designed to foster collaboration between universities and a wide range of societal actors. This collaborative framework not only enhances the relevance and applicability of academic knowledge but also strengthens the university's capacity to respond to pressing social, economic, and environmental challenges.

This collaboration includes:

1. Businesses

Businesses play a crucial role in the DTC by providing challenges based on current industry needs. This engagement offers students a unique opportunity to work on projects that reflect real-world business problems, gaining valuable insights into market trends and industry practices. By collaborating with universities, businesses can tap into fresh perspectives and innovative solutions that contribute to their own digital transformation initiatives. This partnership also creates a bridge for the transfer of academic research into practical applications, facilitating mutual growth and development.

- *Example:* Companies may present challenges related to digital marketing strategies, process optimization, or the implementation of emerging technologies such as artificial intelligence and blockchain in business operations. These real-world scenarios allow students to develop digital solutions that are directly applicable in industry settings.

2. Policymakers

Policymakers contribute to the DTC by offering challenges that focus on regulatory, governance, and policy issues. Engaging with policymakers enables universities to play an active role in shaping policies that address contemporary societal challenges, such as digital inclusion, data privacy, and the ethical implications of technology. This collaboration not only broadens the scope of university research but also ensures that proposed solutions are informed by the policy environment, making them more viable for implementation.

- *Example:* Policymakers may introduce challenges centered on creating frameworks for smart city governance, developing guidelines for digital literacy, or establishing protocols for cybersecurity in public institutions. These challenges provide students with an understanding of the complexities of governance and the policymaking process.

3. Civil Society Organizations

Civil society organizations (CSOs) are instrumental in presenting challenges that focus on social issues such as inequality, education, healthcare, and environmental sustainability. By collaborating with CSOs, universities can contribute to social innovation and community development. This partnership provides students with a platform to develop solutions that address societal needs, ensuring that their work has a meaningful impact on communities.

- *Example:* A civil society organization may present a challenge related to improving digital access in underserved communities, developing educational tools for marginalized groups, or designing environmental monitoring systems. Addressing





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these challenges helps students apply their skills to projects that promote social justice and environmental stewardship.

IX MONITORING, EVALUATION, AND CONTINUOUS IMPROVEMENT

The Digital Transformation Challenge includes a robust framework for monitoring, evaluation, and continuous improvement to ensure its effectiveness and sustainability. These mechanisms are integral to maintaining the quality of the program, enhancing the learning experience for participants, and ensuring that the challenge aligns with the university's strategic goals and societal mission.

Monitoring

Monitoring is a continuous process that involves collecting and analyzing feedback from all participants, including students, lecturers, and external stakeholders. The purpose of monitoring is to track the progress of the DTC, identify areas for improvement, and ensure that the project activities are aligned with the expected outcomes.

Throughout the DTC, regular feedback will be gathered from participants through surveys, interviews, and focus group discussions. This feedback will cover various aspects of the challenge, such as the quality of mentoring, the effectiveness of collaboration between students and stakeholders, and the relevance of the challenges presented. By continuously engaging with participants, the DTC can promptly address any issues and adapt to the evolving needs of those involved.

The university will utilize various monitoring tools, such as progress reports, project dashboards, and monitoring templates, to systematically track the activities and milestones of the DTC. Key metrics may include student participation rates, project completion rates, and stakeholder engagement levels. These metrics provide quantitative data that complement qualitative insights gathered from feedback.

Evaluation

Evaluation is a systematic process used to assess the outcomes of the DTC and determine the extent to which its objectives have been achieved. The evaluation process is designed to be rigorous and comprehensive, ensuring that all aspects of the DTC are thoroughly analyzed.

The evaluation of projects will be based on several key criteria, including:

- *Innovativeness*: The extent to which the proposed solutions demonstrate creativity and originality in addressing the presented challenges.
- *Scalability*: The potential of the solutions to be scaled and adapted to broader contexts or different settings.
- *Inclusiveness*: The degree to which the solutions promote inclusivity and accessibility for diverse populations.
- *Societal Impact*: The potential of the solutions to generate positive societal change and address significant social, economic, or environmental issues.

A jury of experts from academia, industry, and civil society will be formed to evaluate the solutions





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presented by the student teams. The evaluation process will include both qualitative and quantitative assessments, incorporating presentations, project reports, and prototypes. This comprehensive evaluation methodology ensures that the best solutions are identified and recognized.

The evaluation process will also focus on the broader outcomes of the DTC, such as the development of students' skills, the effectiveness of university-stakeholder collaboration, and the overall impact of the challenge on the university's engagement with societal actors. This outcome-based evaluation helps in understanding the long-term benefits of the DTC beyond immediate project outputs.

Continuous Improvement

Continuous improvement is a core principle of the DTC, ensuring that insights from each iteration are used to enhance the challenge's design and implementation. This iterative process is key to maintaining the relevance and effectiveness of the DTC over time.

Insights gathered through monitoring and evaluation will be systematically analyzed and used to refine the DTC framework. This includes revising the structure of the challenge, updating the criteria for participation, and improving mentoring and support mechanisms. By learning from each cycle, the DTC can adapt to changing contexts and emerging challenges, ensuring its continuous evolution and impact.

Continuous improvement efforts will focus on embedding the DTC into the university's long-term strategic planning. This includes integrating the challenge into academic programs, securing ongoing support from university leadership, and building strong partnerships with external stakeholders. Such efforts ensure that the DTC becomes a sustainable and institutionalized initiative that contributes to the university's mission of societal engagement and innovation.





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X CONCLUSION

The Digital Transformation Challenge is a transformative platform that enables universities to actively engage with societal actors and contribute meaningfully to economic, social, and technological advancements. Through this initiative, universities can harness the power of digitalization to address complex challenges, foster innovation, and drive positive societal change.

By embedding the DTC into the university's core strategy, institutions can extend their reach beyond traditional teaching and research roles, aligning with the principles of the Third Mission of universities. This mission emphasizes the university's responsibility to contribute to societal development and community well-being through knowledge transfer, collaboration, and innovation.

The DTC framework encourages the application of academic knowledge in real-world contexts, promoting the development of digital solutions that are sustainable, inclusive, and scalable. By bringing together students, faculty, and external stakeholders—such as businesses, policymakers, and civil society organizations—the DTC facilitates the co-creation of solutions that address contemporary issues and promote long-term societal benefits.





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