Vision TUL 2050

Long-term Strategic Vision for the Development of Lodz University of Technology 2025–2050

90-924 Łódź, ul. Ks. I. Skorupki 6/8, budynek B1
tel. +48 42 631 20 83, +48 42 631 28 83,
e-mail: roo@adm.p.lodz.pl, www.p.lodz.pl

Politechnika Łódzka
Rada Politechniki Łódzkiej

Vision TUL 2050

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Executive Summary

This document presents a draft of the Strategic Vision of Lodz University of Technology (TUL) for the years 2025–2050. The document was prepared by members of the University Council, based on discussions initiated in the first half of 2023. The process began with a meeting held in the University Senate Hall on May 25, 2023. It was subsequently continued in a digital space on the University Advisors Committee (UAC) Forum (https://tul2050.p.lodz.pl/ – FORUM section). This document reflects, to the broadest possible extent, the topics raised on the forum (over 170 posts across 42 threads), as well as selected comments submitted during the second UAC meeting on May 6, 2025. It constituted a basis for developing the final version, delivered in the last months of 2025.

The document is structured as follows:

❖ **Guiding Slogan / Motto:**

"TUL – Where Science, Humanism, and Technology come First"

❖ **Introduction:** Inspiration and mission: Four pillars for creating a holistic research-and-education environment at the University. The University's mission.

❖ **The University's environment and threats** to its development in the second quarter of the 21st century

❖ **Implementing the strategic vision** through four key components: SCIENCE, STUDENT, PROGRAMME, OUTREACH.

Motto of the Strategic Vision:

TUL - Where Science, Humanism, and Technology come First.

Inspirations and Mission

Drawing on the synergy between science, technology, and humanism, Lodz University of Technology is committed to educating a new generation of engineers, innovators, and leaders, equipped not only with modern, broad technical knowledge but also with a deep understanding of the principles that shape contemporary science, and a strong commitment to humanistic values.

Over the next quarter-century, we will strive to create a holistic research-and-education environment that supports the creation and development of an active academic community, built on four pillars:

I. **SCIENCE** – Advancing scientific excellence, research and implementation activities as well as cooperation with the socio-economic environment.
II. **STUDENT** – Supporting students' development and the academic community co-created by them.
III. **PROGRAMME** – Aligning study programmes with global trends and local labour-market needs.
IV. **OUTREACH** – Radiating academic values in the University's wider environment.

The mission of our University is to be a globally recognized scientific and educational centre that ignites intellectual curiosity in prospective students and supports students' development by providing education of the highest quality; a centre that actively contributes to the global arena of science and technology, advances scientific research and cutting-edge technologies, engages alumni by involving them in scientific and R&D work, and positively impacts the communities of Łódź, Poland, Europe, and the world.

The University's environment and threats in the second quarter of the 21st century

To present an effective strategic vision for Lodz University of Technology for the next 25 years, it is necessary to carry out an in-depth analysis of the University's environment and the threats that may emerge at the outset of the second quarter of the 21st century. In the sections below, we identify five areas of risk and, within them, about a dozen key elements that could challenge academic activity during the period.

I. Geopolitics, finance, and the institutional environment

Geopolitical instability

The years 2022–2025 brought abrupt geopolitical shifts: the war in Ukraine, the escalation of conflict in the Middle East, a political shift in the United States, China's growing power, and EU efforts to strengthen its military autonomy. These developments compel changes in educational and research priorities as well as in the forms of international cooperation. Demand is rising for competencies in security, policy, and emerging technologies. Universities must adapt their strategies to remain competitive, support innovation, and respond to global challenges.

The University's financial stability – research funding and innovation

European universities, including Polish ones, are exposed to heightened risks resulting both from constrained public budgets and higher education funding becoming entangled in complex socio-political contexts. Shifting demographic trends and the need to diversify revenue streams create further challenges. Funding for scientific research, which largely relies on national and European grants, is subject to significant fluctuations driven by economic and political conditions in both the European Union and Poland.

Academic freedom and the risk of political interference

The growing political polarization in the first half of the 21st century carries the risk of attempts to limit academic freedom through interference in curricula, especially in areas related to social issues. This creates a major challenge: shaping both internal and external university policies in ways that will effectively protect freedom of research and scientists' freedom of expression. At the same time, universities should remain largely apolitical, open to diverse worldviews, able to withstand attempts at political influence over research and educational programmes.

Cooperation with local government and the economic environment

Young people's choices of study programmes are closely linked to perceived career-development opportunities in the city where they study. As a result, study programmes and academic disciplines may come under pressure to change rapidly in response to the qualifications seen as desirable at a given time. It is therefore necessary to

develop a methodology and procedures for assessing the validity of changes proposed by external stakeholders, and to introduce an appropriate decision-making process.

II. Technological transformation and educational competition

Digital transformation and shifts in technological paradigms

Over the coming quarter-century, digital transformations will increase their impact on social life, particularly in education. Key academic resources are undergoing rapid virtualization, even more in the form of data stored in the cloud, which is changing the nature of their ownership and control. At the same time, technological paradigms are shifting: more objects are becoming "hybrid," combining the physical and digital worlds. Examples include Software-Defined Vehicles and Digital Twins. These developments are reinforcing the Knowledge Economy, in which knowledge, rather than physical resources, is becoming the key asset of the global economy.

Artificial intelligence and its impact on education and research

The dynamic development of artificial intelligence in the twenty-first century is having a profound impact on education and scientific research. AI supports personalized learning, fosters critical thinking, and enhances research processes, creating a more interactive academic environment. However, its misuse may lead to a decline in the quality of education and to stagnation in innovation if it replaces original intellectual creativity. AI is already becoming one of the key challenges facing universities.

Globalization and international competition

Regardless of the deglobalization trends that have emerged in various countries during the first quarter of the twenty-first century, globalization will continue to significantly shape academia. The influence of ideas, technologies, and scientific knowledge originating outside the university's current cultural and intellectual community will only keep growing. The need for universities to exert greater influence on global ideas, technological development, and scientific progress is beyond dispute. Therefore, universities must increase their competitiveness and strengthen their position in the global education market.

Competition from alternative forms of education

In the knowledge-based economy, alternative forms of education are becoming increasingly important. Platforms offering Massive Open Online Courses (MOOCs), hybrid learning models, and Competency-Based Education (CBE) are developing rapidly. Microcredentials and nanodegrees are also gaining popularity. Advances in AI are accelerating these changes, with personalized virtual teachers (AI tutors) already appearing on the horizon and likely to revolutionize access to knowledge. For universities, the ability to respond to this new educational competition is becoming crucial.

III. Labor market and skills development

Evolving labor market needs

The dynamic development of technology is reshaping labor market needs. New professions are emerging in such areas as renewable energy, the circular economy, biotechnology, and healthcare. The most significant changes, however, are taking place in IT, particularly in connection with artificial intelligence, cybersecurity, and cloud-based resources, leading to the emergence of new specializations. At the same time, remote work and creativity are becoming increasingly important. These rapid changes require continuous updating of curricula and teaching methods.

Lifelong learning

Lifelong Learning, a key component of the knowledge-based economy, is gaining importance in the context of ageing societies. Lodz University of Technology is developing its University of the Third Age, which already serves nearly 700 senior learners. However, considering the trend known as the “Silver Tsunami” and the declining number of traditional students, the University should treat adult education not as a challenge, but as an opportunity, adapting its offer, among other things, to needs related to the development of artificial intelligence and cybersecurity.

The education system prior to higher education

Higher education institutions have limited influence over the scope and form of education at the stages preceding the choice of a field of study. Combined with the evaluation metrics applied to primary and secondary education, this results in insufficient preparation of prospective students for university-level study. The University should therefore consider how it might exert greater influence in encouraging secondary school students, fostering a culture in which pursuing higher education becomes a conscious and valued choice.

IV. Culture, society, and the well-being of students and University staff

Equality policy, cultural and ethnic diversity

Because the scale of cultural and ethnic diversity in Polish universities was relatively limited at the end of the twentieth century and in the early years of the twenty-first century, one of the key challenges facing Polish higher education institutions today is the implementation of effective and ethically sound equality policies. Universities should strive to become models and places of best practice in these important dimensions of the contemporary world, in which cultural and ethnic diversity is playing an increasingly significant role.

Student well-being and rising expectations

Rising student expectations present universities with new challenges. Students increasingly prefer practical, project-based classes, and flexible forms of education, including part-time, hybrid, and online learning. They also expect personalized academic support, mentoring, and opportunities to gain micro-credentials tailored to professional needs. It is therefore becoming essential for the University to offer internships, cooperation with industry, international programmes, and initiatives fostering entrepreneurship, such as incubators, hackathons, and startup training.

Workload and burnout among academic staff

The specific economic conditions of academic work in Poland often make it necessary for scholars to have other jobs. This phenomenon, together with staffing shortages, frequently places a heavy burden on academic staff, which in turn contributes to a decline in the quality of both research and teaching.

Over the longer term, this leads to professional burnout, the effects of which may include both reduced quality of academic work and staff leaving the university.

An important issue is the lack of appropriate regulations governing the combination of academic work with employment outside the university, which could help counteract these negative trends.

V. Academic Strategy and the University's Reputation

The University's global standing and reputation

Building a university's global reputation requires a clear long-term vision and active participation in international rankings and global trends. Realistic and meaningful metrics, the ability to attract international talent, the development of research through access to global funding, and modern teaching methods are all essential. Organizing international conferences also plays an important role for the University, although this has become particularly challenging today due to changing models of participation and event organisation.

Sustainable development in the context of the natural environment

Sustainable development is becoming a key challenge for universities — from initiatives such as the "Green Campus" and carbon footprint reduction to the creation of green spaces. This affects both curricula and research directions, especially in environmentally related fields. Universities must also respond to social and governmental expectations connected with decarbonisation, while maintaining a balance between environmental goals and economic development.

Interdisciplinary collaboration

In science, technology, and education, the future belongs to those who can recognise and connect relationships between different fields of human activity. In a world shaped by complexity, the most important breakthroughs emerge not in complete isolation, but at the intersection of different areas of knowledge. Unfortunately, contemporary university curricula and organisational structures often contradict such principle. The University therefore faces the intellectual and organisational need to create genuine and well-functioning platforms for interdisciplinary collaboration within the institution. One possible solution may be the establishment of interfaculty, thematically focused teams.

Foundations for Implementing the Strategic Vision

To effectively meet the abovementioned challenges, it is necessary to define with precision the foundations on which the University's strategic vision should be built.

We believe these foundations correspond to four key pillars. At the very beginning of the vision-building process, intensive discussions within the University Advisory Committee forum resulted in the formulation of several dozen important ideas. These have been incorporated into the description of the foundations and provide a solid base for the University's future directions of development.

I. SCIENCE – Fostering scientific development, research and innovation implementation, and cooperation with industry

Over the next twenty-five years, Lodz University of Technology must not only maintain but also strengthen its status as a research university. To preserve its position as a leading institution with an established international reputation, it must systematically monitor global trends and local needs in the field of scientific research, including basic, applied, and implementation-oriented research, aligned with the needs of the socio-economic environment.

A key factor in building the University's recognisability is the clear definition and development of strategic research areas that will form the foundation of the Lodz University of Technology's brand. In this context, particular attention must be given to attracting and supporting outstanding researchers and to ensuring the highest quality of scientific work.

The development of research infrastructure, including laboratories and their equipment, must keep pace with global standards, even if this entails high costs for advanced apparatus. In an era of rapid development of artificial intelligence and its growing use in routine and repetitive activities, creativity and the advancement of basic research are becoming increasingly important. At the same time, the importance of applied and implementation-oriented research must not be overlooked, as it directly contributes to the innovativeness and competitiveness of the economy.

In the coming years, the open-access publishing model and the dynamic digitalisation of knowledge resources will become increasingly widespread. This process also extends to the humanities, where we are witnessing growing use of tools and methods derived from the technical and natural sciences, such as data analysis, semantic modelling, natural language processing, and information visualisation. As a technical university, Lodz University of Technology

can play an important role in supporting this process by providing the technological and methodological foundation for the development of digital humanities. It is therefore worth considering, in cooperation with other institutions, the establishment of an interdisciplinary centre for digital humanities that would act as a catalyst for synergy between engineering and the social sciences and humanities.

Building the University's brand as a research institution is possible through support for and concentration on those areas of science in which Lodz University of Technology has the highest level of competence, and where the outcomes of research have the potential for practical application or contribute to increasing the University's international visibility.

It is of key importance to support and strengthen all attitudes conducive to international scientific activity and to promote the research achievements of the academic staff.

Even minimal activity within international scientific communities provides a guarantee of engagement with the most current and relevant issues within individual disciplines. At the same time, it is the best source of ongoing inspiration and practical solutions that translate into the effectiveness and quality of research.

The successive five-year strategies of the University should encourage the sharing of experience and knowledge gained through international cooperation, the dissemination of innovative approaches, and the building of lasting and formalised pathways of collaboration with scientific centres in Poland and around the world, with particular emphasis on Europe.

Best organisational practices, inspirations, and proven solutions relating to the organisation of prestigious scientific conferences and congresses should be systematically analysed and implemented across all units of the University. This also applies to the exchange of knowledge and experience related to the preparation of scientific publications of international reach and the highest substantive quality.

Recommendations for the University

Identifying and continuously monitoring interdisciplinary and strategic research areas that distinguish Lodz University of Technology should be based on global trends and scientific rankings. Supporting interdisciplinary research teams that operate beyond traditional divisions into faculties and disciplines is essential for developing innovative research directions and building the University's scientific advantage.

The University's researchers should receive comprehensive support across all aspects of their work so that they can pursue research projects without unnecessary barriers, secure funding, disseminate research results both within the socio-economic environment and internationally, and inspire future generations of doctoral candidates and students to choose an academic career path.

Systemic support should include, among other areas:

i. Professional assistance in preparing, submitting, and administering research projects.
ii. Organizing symposia, conferences, and scientific congresses, both within Lodz University of Technology and in the city's public space.
iii. Relieving researchers of organizational and teaching duties by engaging academic staff employed in teaching-focused positions as well as administrative employees.
iv. Identifying and mentoring the most talented students, developing their research passion by actively involving them in teams led by outstanding scientists.

Taking the above priorities into account, it is recommended to organize regular meetings and training sessions for faculty leadership and the chairs of Scientific Discipline Councils, devoted to:

i. Developing mechanisms for systemic support of scientific activity.
ii. Reviewing the rules and opportunities for access to national and international funding sources.
iii. Building competencies in establishing and maintaining international scientific cooperation, including developing procedures that support the creation of lasting, formalized partnerships with academic centres in Poland and abroad, with particular emphasis on Europe.
iv. Defining principles for funding interdisciplinary research teams in the context of expected scientific outcomes at the national and international level.

The exchange of best practices between faculties will be an important element in building a culture of scientific excellence and strengthening the University's position as a leader of innovation in the region and globally.

Given the extremely dynamic development of science, which has long ceased to fit within the boundaries of single disciplines, the creation of durable platforms for interdisciplinary collaboration between faculties, supported by the University's authorities, becomes crucial.

We recommend organizing regular joint meetings of Scientific Discipline Councils at which the greatest research challenges and the most important achievements in particular fields would be presented. Such an exchange of knowledge and experience will enable identification of potential for forming interdisciplinary research teams, more precise definition of the University's key research areas, and inspiration for integrating and developing existing research directions and generating new knowledge.

An important element of future strategies should also be supporting the exchange of ideas and creating space for debate for representatives of different industries and socio-economic communities. In this context, the Łódź region's ICT Cluster, coordinated by Lodz University of Technology, should be recognized as an exemplary model: it effectively integrates the IT community in the Łódź region by supporting cooperation, exchanging inspiration, and developing shared industry positions.

It is therefore necessary to highlight and actively support members of the Lodz University of Technology academic community who, in a similar spirit, initiate the creation of new thematic groups (new "clusters") operating in areas of strategic importance. We recommend establishing groups focused on issues such as, for example: modern urban development trends, urban revitalization, medicine and biomedical technologies, security and defense, automation of industrial processes, textile industry and design, as well as other key research areas defined within the University's development strategy.

The University's Patent Attorneys Office should also be supported and further developed so that, just as it does today, it can continue to actively support efforts to protect the University's and its employees' intellectual property at both the national and international level.

The active role of Lodz University of Technology as an initiator and coordinator of these activities is fundamental to promoting academic values, strengthening the University's position in the scientific and social environment, and maximizing the synergy effects that result from integrating knowledge and experience across diverse communities.

Recommendations for the Scientific Discipline Councils

The development of Lodz University of Technology's research policy should therefore be based on an analysis of its research potential and the possibilities for its use in interdisciplinary projects carried out in cooperation with other scientific disciplines represented within the University's structure.

From the perspective of building the future, it is essential to consider the current competences of research teams, their actual involvement in international projects, and the degree of genuine scientific cooperation at the global level.

The activities undertaken should support the strategic objectives proposed in this Strategic Vision at the level of the entire University and should focus on creating interdisciplinary research teams that transcend the boundaries of faculties and scientific disciplines.

A modern university that seeks to deepen its cooperation with the economic environment in research and innovation should consider preparing a dedicated offer for graduates employed in industry, in areas corresponding to individual scientific disciplines. One element of such activity could be the development and implementation of mechanisms enabling graduates, as well as other employees of enterprises, to participate actively in the University's research teams whose work focuses on solving technological and engineering problems relevant to their companies.

It should be borne in mind that enterprises employing graduates from Lodz University of Technology operate daily in an environment of intensive technological challenges, making use of the latest knowledge, tools, and engineering methods. This environment generates significant research and development potential, which can and should be systematically integrated into the University's scientific activity.

Therefore, a priority should be the creation of a fast and effective pathway for cooperation between enterprises and the research teams of Lodz University of Technology, in particular:

i. Conducting joint research on specific technological problems.
ii. Preparing scientific publications based on practical implementations, solutions, and achievements of graduates.
iii. Creating mechanisms that enable enterprise employees to obtain a doctoral degree based on their ongoing development work.

Such initiatives may form the foundation of lasting relationships between the University and industry, while at the same time accelerating the professional development paths of graduates, reducing the time needed to reach expert level from fifteen years to as little as five.

At the same time, through such cooperation, the University's academic staff gain direct insight into the real needs and technological challenges of the economic environment, which supports research in areas that are current and of practical relevance. This type of feedback loop makes it possible to monitor the expectations of external partners on an ongoing basis and to adapt effectively the development directions of Lodz University of Technology's research teams.

It is particularly important for the Discipline Councils to actively establish and develop ongoing cooperation with representatives of scientific communities from other European countries in areas corresponding to the individual disciplines.

Building relationships with the academic staff of analogous faculties at universities across Europe will not only strengthen the international position of Lodz University of Technology, but above all ensure greater ease of participation in European scientific, research, and publishing structures.

Such activities foster long-term integration with the European Research Area and enable better access to international projects, grants, and prestigious publication channels.

Recommendations Concerning Doctoral Candidates

There is no doubt that doctoral candidates, alongside employees in post-doctoral positions, constitute a key component of research teams. For this reason, it is important for Lodz University of Technology to pursue coherent and targeted promotional activities aimed at highlighting the value and competencies associated with obtaining a doctoral degree.

In recent years, a significant decline in the number of doctoral candidates enrolled in the Doctoral School has been observed. This trend should be actively counteracted, as it may pose a threat to the process of academic staff renewal at Lodz University of Technology.

Given that the path to obtaining a doctorate is demanding, time-consuming, and intellectually engaging, the University's marketing message should clearly emphasize the specific skills developed through education at this level: analytical thinking, the ability to synthesize facts, a critical approach to information, and the precise and concise formulation of ideas. We recommend the use of diverse, appropriate, and modern promotional tools tailored to different target groups.

In this context, an important direction for development is also the strengthening of cooperation with university graduates employed in industry, who often possess up-to-date knowledge of trends and development directions within their sectors. Such cooperation carries significant synergistic potential: academic staff gain access to real technological challenges, while graduates, by contributing practical experience, can further develop their expert careers through participation in research work and the pursuit of doctoral degrees on a part-time basis or within the framework of an "implementation doctorate" programme.

Considering the above, it is worth developing and formally establishing pathways for obtaining doctoral degrees by professionals who are active outside the University, giving this form of education an organisational structure comparable to fee-based study programmes. At the same time, it is necessary to standardise the rules of cooperation between doctoral candidate and supervisor, to define precisely the scope of responsibilities of both parties, and to ensure transparent financial conditions.

Promoting this form of cooperation between Lodz University of Technology and its graduates should contribute to building a lasting community of engineer-practitioners connected with the University. Such cooperation may support the effective identification of current research and implementation challenges and strengthen the development potential of the University's scientific teams. The development of clear mechanisms of cooperation with graduates will simplify the process of establishing such relationships and create a solid foundation for broader joint scientific and industry-oriented projects.

In addition, we recommend strengthening the prestige of scientific awards granted within the structures of Lodz University of Technology, as well as consistently promoting science communication and outreach activities carried out by the University's research staff as an important element in building the image of a strong academic centre of growing social significance.

Summary

In the above recommendations, a significant share of responsibility and expectation has been assigned to the leadership of the Scientific Discipline Councils. Therefore, it is recommended that appropriate instruments be introduced to support the integration of Lodz University of Technology's academic community and to highlight the role and importance of those leading the Discipline Councils.

It should, however, be emphasized that the practice of international scientific activity should begin right from the first contact with the University, both for students and researchers. As a result, the implementation of the strategic vision within the Science pillar rests with all academic teachers, regardless of the functions they perform.

The proposed measures also align with Pillar IV (Emanation), which emphasizes the importance of supporting human development between the ages of 24 and 60. Through effective strategies for promoting academic values, support for initiatives integrating the scientific community, and investment in events and forms of activity that advance this mission, Lodz University of Technology has an opportunity to significantly increase the number of doctoral candidates and strengthen its position as a modern research university.

II. STUDENT – Supporting students' development and the academic community they co-create

Inspiring prospective students – building interest in the University

We offer students an education of the highest standard and participation in projects at the forefront of global science and technology. We teach in modern ways and focus on what is needed in the global technology market. At the same time, we support the growth of student-led communities, what truly connects people, underpins social development, and serves as a forge for future leaders. It is worth remembering that every such leader of a student organization will become an ambassador of our university. In this pillar **we care for young people aged 19–23**, adapting our actions and communication to their future needs.

We help upper-secondary school pupils "fall in love" with Lodz University of Technology. The University must take responsibility for its brand image and ensure the sound intellectual preparation of future prospective students. Here **we focus on young people aged 15–19**, tailoring our actions and communication to their age and preferred ways of engaging.

Current social trends show a declining popularity among young people of studying as such. Decisions to opt out of higher education are most often made:

1. At upper-secondary school stage, when the prospect of several years of study becomes less attractive to those entering adulthood.
2. In the first two years of study, when requirements in foundational subjects such as mathematics and physics are so demanding that they lead to significant attrition and, for many students, the need to repeat a year.

This situation is influenced by many social and global factors beyond the University's control. However, there are also factors the University can influence, for example: promoting the value of intellectual work; communicating the long-term benefits of studying; and highlighting access to interesting career opportunities. Another important lever is the promotion of effective methods of learning mathematics among upper-secondary pupils in Łódź and the Łódzkie Voivodeship, and inspiring them to develop intellectual agility. Promoting knowledge-based work requires active communication by the University, tailored to the preferences of young people. Promotional and informational activities should help upper-secondary pupils become genuinely interested in Lodz University of Technology and ignite in them a desire for personal growth, an essential motivational driver for engagement during their studies.

Such activities will also support preparation for the intellectual demands of the first years of study. They can inspire students to overcome their own limitations throughout their academic path. To succeed, the message and means of expression must be adapted to the 15–19 age group. The most effective forms of cooperation with upper-secondary teaching staff should be defined.

In the late 1990s, Lodz University of Technology was the first to introduce the "combined matriculation" system. Thanks to the presence of a TUL academic staff member in the upper-secondary school participating in the programme, results of selected examinations were recognized in the recruitment process for university studies. Our university pioneered a solution that was adopted nationally several years later. Although the system was subsequently discontinued, it is worth considering similarly forward-looking, active recruitment methods in upper-secondary schools in Łódź and across the Łódzkie Voivodeship. A personal and systematic presence of TUL academic staff—linked both to information about studying at TUL and to promoting the value of intellectual development—supported by IT tools, could significantly increase the number of applicants to the University.

Modern Education and Academic Excellence

We must build the conviction that students who begin their studies at Lodz University of Technology are offered education of the highest standard, grounded in up-to-date benchmarks and best practices. We support the involvement of teaching staff in projects at the forefront of global science and technology. In doing so, we also bring students into these initiatives.

For first-year students whose knowledge and skills fall short of the expected standards, we provide voluntary additional classes aimed primarily at strengthening self-learning methods and confidence in their own abilities.

Teaching staff should use the latest tools that support cognitive processes, allowing for trials and experimentation with new applications and new forms of communication between teachers and students – always keeping the human being at the centre.

We must teach in modern ways, attentive to rapid changes in the labor market and in technology. We use solutions such as micro-courses and micro-credentials, enabling students to gain additional certification for acquired knowledge and skills. The University continuously implements new, available methods and formats of education.

Community and Leadership

We support the development of student-created communities, including groups, clubs, and activities run by TUL students in culture, arts, and sports. These communities should receive special support from the University, because it is within them that the strongest relationships are formed – relationships that matter after graduation and positively influence how the University is perceived, as well as graduates' willingness to identify with it. These

communities are key to social development and a forge for future leaders. Remember that every leader of a student organization will become an ambassador of our university. Outstanding achievements in sports, artistic, cultural, and organizational activities should be recognized with scholarships and presented as a model for the wider academic community.

International Experience

We recommend highlighting every available opportunity for TUL students to engage with the international world of science—starting with well-functioning student exchange programmes; through support for study trips by members of scientific clubs, sports teams, and artistic groups; summer courses organized with partner universities, culminating in the development of dual-degree initiatives, first launched at IFE at the beginning of the 21st century. Every activity that builds the academic community's confidence on the international stage should be supported by the University and showcased as an example to follow.

Student Well-being

Openness to dialogue and the need to create space for constructive exchange of views will be discussed in more detail in Pillar IV of the Strategic Vision. Here, however, we wish to emphasize the importance of creating places on the University campus that actively support such exchange. A combined café space, serving as a venue for cultural initiatives, informal academic meetings, and intergenerational exchange of ideas – is highly important for delivering the assumptions outlined above. It is worth considering locating such a space within or near the Main Library – the symbolic and literal treasury of knowledge and the experiences of generations.

For every person, the period of study is a time when key habits are formed. Beyond the above-mentioned aspects of supporting the development of engineering culture, interpersonal skills, and teamwork, it is important that TUL graduates possess basic knowledge related to financial security and caring for their own well-being. Today's widespread access to tools enabling participation in global financial markets creates an opportunity to build long-term financial security in a prudent way, but only if these instruments are used consciously and responsibly. Moreover, regulations concerning, for example, IKE and IKZE accounts[1], as well as other instruments planned by the Polish state to support citizens' savings, provide ample opportunities to build long-term financial stability. Success in using these tools requires basic literacy in this area. Importantly, such knowledge also helps in understanding fundamental macroeconomic processes and the basics of the global economy, making it even more advisable to address this topic within studies at Lodz University of Technology.

Similarly, also in a general format, it is important to provide at least a simplified introduction to the principles of healthy nutrition and to broader factors that significantly affect human well-being. The modern world faces so-called "civilization diseases" linked to overweight and poor diet, as well as widespread mental-health disorders. Allocating even a small amount of time to this type of education and to promoting healthy habits can meaningfully improve the future quality of life of TUL graduates.

[1] Specific financial instruments in Poland: Individual Retirement Accounts (IKE - Konto Zabezpieczenia Emerytalnego) and Individual Retirement Security Accounts (IKZE - Indywidualne Konto Zabezpieczenia Emerytalnego).

In addition, depending on the development of the geopolitical situation, it is worth considering incorporating basic training in civil defense and behaviour in emergency situations related to the security of the Polish state into the curriculum at TUL.

Our goal here is to reach young people aged 19–23, considering the specific nature of their needs and preferred communication styles.

Establishing the TUL Entrepreneurship Incubator

To foster entrepreneurial attitudes among students and doctoral candidates at Lodz University of Technology, we recommend establishing the TUL Entrepreneurship Incubator – a unit dedicated to supporting start-up initiatives and the creation and growth of companies. The Incubator should create an environment conducive to creativity, experimentation, and the practical use of the intellectual potential developed during studies, offering participants mentoring, legal and financial advice, access to infrastructure, and support in securing initial funding. Establishing the Incubator will help integrate the University's activities in innovation and entrepreneurship and strengthen its role as a centre that shapes future leaders of the knowledge-based economy.

Alumni and Outstanding Talent

It is also essential to maintain active contact with graduates of first- and second-cycle degree programmes. They will be engaged through initiatives supporting scientific development and research-to-implementation activities, as we see them as the best ambassadors of Lodz University of Technology within their own professional environments. We recommend dedicated communication that sustains the University's strong reputation as an academic environment and a community. It will be important to develop programmes of regular alumni gatherings – both within specific degree programmes and faculties, and across the entire Lodz University of Technology community. Showcasing distinguished alumni and companies that operate based on talent educated at Lodz University of Technology can strengthen students' motivation for scientific development and encourage them to pursue ambitious challenges.

Equally important is the creation of a systematic mechanism for identifying, supporting, and promoting exceptionally talented students, enabling them to develop beyond the standard curriculum. In this context, it is worth renewing and expanding the idea of individualized study paths, including both mentorship for high-potential students and the opportunity to participate in research projects and international scientific initiatives already at an early stage of education.

III. PROGRAMME – Aligning the curriculum with global trends and local labor-market needs

Standing at the threshold of the second quarter of the 21st century, Lodz University of Technology must meet the challenges of the future in a flexible and forward-looking way.

In a rapidly changing world – shaped by unpredictable global trends – it is impossible to determine with full certainty which directions in science, technology, and education will prove most critical in the decades ahead. Especially today, as civilization undergoes profound and rapid transformations, we must shape our strategy in a way that is open to the future, while at the same time grounded in rigorous analysis and responsible foresight.

A similar situation applies to the local labor market. Looking back at the last 25 years of Łódź's economic transformation, we see fundamental changes in employment structures, the nature of business activity, and the competencies considered essential for the region's development. Lodz University of Technology must not only respond to these changes, but above all help shape them – educating the leaders and innovators of tomorrow.

As part of our work on the University's strategic vision, we have identified more than 20 key recommendations, grouped into five thematic areas, which address these challenges. They can form the foundation of our long-term development – responding both to evolving socio-economic needs and to Lodz University of Technology's ambitions as a leading research university in Europe. Some recommendations are proposals to be incorporated into the University's periodic strategies and therefore require discussion, agreement, and formal decisions by the University authorities.

We are ready for the future – not only by anticipating it, but by shaping it. We are not on the defensive, merely responding to the world's expectations. We are on the offensive, helping define what the world will expect.

RECOMMENDATIONS

A. Future-Oriented Education Programme and Modern Learning Models

Implementing micro-modules and micro-credentials

Within our strategic vision, during the development of the University's periodic strategies, we recommend considering the implementation of micro-modules and micro-credentials as a flexible form of education that enables rapid adjustment of the educational offer to the needs of students and the labor market. Through these short, focused modules, the University will be able to transfer the latest research findings more effectively while also enabling learners to acquire up-to-date competencies in a way tailored to individual needs.

We are convinced that micro-modules and micro-credentials enhance the University's competitiveness, support its teaching mission, and strengthen cooperation with industry. Moreover, digital micro-credentials will provide clear and widely recognizable confirmation of acquired skills, which will translate into better visibility of graduates' achievements on the labor market and further reinforce the University's image as a modern centre of science and innovation.

In this area, it will be necessary to align any potential implementation of these instruments with statutory requirements that may apply in Polish law.

Diversifying educational pathways through the introduction of “minor tracks”

In the face of dynamic social, technological, and economic change, while maintaining a high standard of specialist education, the University must also preserve flexibility in shaping educational pathways tailored to students’ individual needs.

Therefore, we recommend considering the introduction of minor tracks (the so-called “minor path”) as an additional, complementary course of study pursued in parallel with the main programme (major). This will allow students to broaden their horizons, develop interdisciplinary thinking, and acquire a diversified set of competencies that are increasingly valued on the labor market.

This concept aligns with the idea of Lodz University of Technology as a space where knowledge from different domains is integrated. Such a track would enable, for example, computer science students to complement their education with elements of psychology, philosophy, management, or the arts – enriching their academic profile and fostering the creation of innovative solutions at the intersection of disciplines.

Introducing minor tracks also strengthens the personalization of education by giving students a real opportunity to shape their own development paths in line with their interests, passions, and career plans.

Implementing this model will require appropriate organizational and curricular changes. We assume that the programme of such a track would involve a defined, well-calibrated number of ECTS credits and would be available to students from different faculties, with due consideration for necessary academic prerequisites and content alignment. It will also be crucial to provide advisory support to help students select a minor that complements their major – or enables them to discover entirely new fields of knowledge.

In this way, the University will become not only a place where knowledge is transmitted but also a space for creative growth, informed choices, and preparation for the challenges of a multidimensional world. The Minor Track is a step toward a modern, individualized model of education that genuinely responds to the needs of both students and the world around us.

Promoting “gap years” for students and “sabbatical years” for academic staff

As a modern research university, combining high-quality teaching with intensive scientific activity, flexible models of intellectual and professional development are essential. Two important elements that support this vision are:

A “gap year” for students – understood as allowing a planned break during studies, aimed at gaining practical experience, developing soft skills, and consciously exploring potential career paths. This concept would build on the long-term leave option already provided for in the current Study Regulations, but would place greater emphasis on,

and actively promote activities that strengthen professional competencies (e.g., internships, projects, volunteering, entrepreneurial initiatives).

"Sabbatical years" for academic staff, that is periods of work outside the home university, focused on research, the development of teaching competencies, and building international cooperation within another institution.

Promoting student gap years and incorporating sabbaticals for academic staff into the strategy of our research university should be understood as:

→ Supporting the pursuit of scientific excellence: more high-quality research and publications.

→ Better preparing students for professional careers: stronger integration between the University and the labor market.

→ Building the University's international reputation by increasing the mobility of students and academic staff.

→ Increasing the University's flexibility and innovativeness through the adoption of modern approaches to education and research.

These initiatives will strengthen the prestige of our university and increase its attractiveness to ambitious students and researchers seeking an environment that supports dynamic growth.

Introducing micro-competency courses aligned with entrepreneurs' needs, supported by regular surveys among selected Łódź-based businesses

In the context of a rapidly changing economy and ongoing digitalization and automation, research universities should not only educate future scientists and highly qualified specialists but also actively support entrepreneurs and current management teams in continuously upgrading their competencies.

Within the University's strategy, we recommend considering the introduction of micro-competency courses, tailored to current business needs and developed on the basis of regular studies and surveys conducted among selected entrepreneurs in Łódź.

Desired features of such micro-competency courses include:

→ Short duration – from a few days to a few weeks.

→ High-quality teaching staff – courses delivered by both academics and business practitioners.

→ Up-to-date content – aligned with real market needs.

→ Certificates for participants – upon completion, participants receive a certificate confirming acquired competencies (e.g., micro-credentials).

A package of measures to analyze market needs and expectations

Analyzing market needs and expectations makes it possible to better understand the requirements of future employers as well as the career aspirations of prospective students. To acquire and use this knowledge effectively, the University should implement a coordinated package of actions that may include:

→ **Industry research and consultations** – regular meetings with representatives of industry and sector organizations to identify emerging trends and the competencies sought by the market.

→ **Surveys and workshops with stakeholders** – surveys among alumni, students, and applicants, as well as joint workshop sessions with entrepreneurs and experts to understand their needs and expectations regarding the content and delivery of education.
→ **Analysis of employment and career-path data** – using external databases and labor-market reports to capture shifts in demand for specific competencies and professions.
→ **Monitoring technological trends** – tracking innovation and economic development directions to flexibly update curricula and create new specializations.
→ **Evaluation and continuous updating of the offer** – ongoing review of degree programmes, course structures, and teaching methods, introducing changes based on collected input and analysis of achieved outcomes.

Such coordinated actions, together with the University's current active role in the Łódź ICT Cluster around information technologies, will enable the University to design modern, market-aligned programmes and ensure that graduates gain an education that translates into real professional attractiveness, while employers gain access to highly qualified specialists.

Recommendation: Building an "AI tutor" platform for Lodz University of Technology

We recommend considering the development of an **"AI tutor"** platform for the University, based on the concept of open online courses, but enhanced with personalized educational support. The goal would be to make high-quality content created by TUL staff available at scale, while providing users with an interactive "tutor" supporting learning – explaining concepts, guiding learners step by step, asking checkpoint questions, and suggesting further development paths.

Such a platform would allow TUL to reach a much broader audience than full-time on-campus students alone – particularly working professionals, people seeking reskilling, postgraduate students, and remote learners. In the Polish context, where there is no single widely recognized MOOC platform with international reach, a TUL initiative could become a distinctive differentiator and an element of building the University's recognition as a modern centre for lifelong learning.

An additional benefit would be the ability to collect data on learning difficulties (e.g., which concepts cause the most problems), engagement, and the effectiveness of learning paths. This information can support continuous improvement of programmes, updating of content, and better alignment of the educational offer with market needs and technological trends.

Work on the platform should be coordinated with the previously described ideas of micro-courses and micro-credentials, so that the "AI tutor" supports not only learning but also credible verification of learning outcomes and the creation of modular competence-development pathways.

Initiating an MBA programme at Lodz University of Technology

We recommend considering the launch of an **MBA programme**, enabling the University to expand its educational offer with a programme aimed at future leaders who combine modern management with technological innovation.

Such a programme should emphasize practical issues, the context of our current cooperation with industry, and existing international partnerships – preparing graduates to lead transformative projects, including those already referenced: reindustrialization, revitalization, enterprise digital transformation, and the adoption of Artificial Intelligence solutions.

Offering multidisciplinary degree programmes

We recommend considering the launch of **interdisciplinary programmes** jointly delivered by two or more faculties. This approach would enable the integration of knowledge across domains and the creation of unique, competitive educational solutions.

A co-delivery model will allow students to gain a broad, practically useful set of competencies – particularly important in areas of rapid technological and economic change. At the same time, it will support the development of interdisciplinary research, which may translate into innovative projects, including in reindustrialization and AI applications. Joint programmes will also strengthen collaboration between research teams, increase the University's prestige and recognition, and respond to the growing market demand for specialists who can work effectively at the intersection of disciplines.

Increasing flexibility in the University's organizational structure

The concept of increasing flexibility in the University's organizational structure enables rapid adaptation to a dynamically changing academic and market environment.

A potential new organizational model could:

→ Facilitate interdisciplinary collaboration between faculties, supporting the creation of new, innovative education and research programmes.
→ Optimize the use of resources, enabling organizational structures to be better aligned with the current needs of the University and its industry partners.
→ Accelerate decision-making through a flatter organizational structure – important in the context of fast technological and market changes.

Introducing greater flexibility will allow the University to become a more responsive and competitive educational institution, capable of effectively addressing new challenges.

B. Digital Technologies, Artificial Intelligence, and Industrial Transformatio

Developing a dedicated University policy on the use of Artificial Intelligence in teaching and research

It is essential that the University promptly develops and incorporates into its strategy a coherent and comprehensive policy on the use of artificial intelligence in both the teaching process and research activity. This policy should treat AI as a tool that supports education and research, while actively encouraging its informed and responsible use. A key principle should be to emphasize that although AI can streamline data analysis, content generation, teaching processes, and the automation of organizational workflows, the core ideas, critical thinking, creative innovation, and the ability to define the purpose and direction of research must remain the domain of human beings.

Accordingly, the University should establish clear principles for an ethical and academically sound use of AI tools, with an emphasis on intellectual authorship, originality in scientific and educational work, and the conscious definition of research goals and educational programmes.

In an era of rapid AI development, the University should adopt the principle referred to as HUMANICS – a commitment to placing human values at the centre of teaching and research – grounded in three competencies: data literacy, technological literacy, and human literacy. In practice, human creativity, dignity, ethics, agency, and social responsibility remain paramount over algorithmic efficiency. By adopting the HUMANICS principle, we educate students not only to use artificial intelligence, but above all to shape it in ways that serve society and strengthen the foundations of our civilization.

Given the pace of AI progress, this policy should be reviewed and updated regularly—at least once every two years—to reflect the latest ethical, social, and technological challenges.

Robotics, digitization, and decarbonization of manufacturing processes, including research on low-carbon-footprint materials

Within our strategic vision, a key element of the University's development is to intensify research and implementation activities in areas such as robotics and the decarbonization of manufacturing processes. We must strive to develop innovative solutions – from automated production lines and control systems to advanced technologies that reduce greenhouse-gas emissions.

An important pillar of these efforts is also research into the development of low-carbon-footprint materials, which can significantly contribute to the sustainable transformation of industry. Cooperation between the academic community, other research centres, and business partners will enable the effective deployment of new technologies and the education of a highly qualified workforce prepared to meet the challenges of the modern economy.

Integrating quantum technologies into curricula and scientific research

We recommend that the University consider a systematic inclusion of modern quantum technologies in educational programmes, as well as the active engagement of academic staff in research related to the so-called Second Quantum Revolution (Quantum Revolution 2.0).

This applies to three pillars of quantum-technology development:
→ quantum computing (including quantum information science),
→ quantum metrology,
→ quantum communication (including quantum cryptography systems).

This recommendation reflects not only the global importance of quantum technologies in the 21st century but also the publication – by the Government of the Republic of Poland in mid-2025 – of assumptions for the Polish National Quantum Strategy. The document explicitly highlights the need to build national academic competencies in this field and creates new opportunities to secure funding for quantum research, which – according to the strategy – will be among the priorities of the state's science policy.

Guided by a long-term development vision, the University should take an active position in this area—through the development of teaching and research, as well as participation in national and international research and education initiatives in quantum technologies.

Initiating reindustrialization processes and bringing industrial production back to Poland and Europe

The University should become one of the key centres supporting the reindustrialization of Poland and Europe. Through targeted actions in research, talent development, cooperation with business, and internationalization, we can:

→ **Educate a modern workforce** equipped with competencies in advanced technologies, supply-chain management, and sustainability.
→ **Develop and deliver innovative solutions for industry**, helping companies implement new technologies and strengthen their competitiveness in international markets.
→ **Contribute to public policy** through expert analysis and advisory work, shaping conditions conducive to investment and industrial development.
→ **Create and strengthen networks of cooperation** between academia, business, and the public sector at the local, national, and international levels.

Reindustrialization brings major challenges but also exceptional opportunities for the development of our university. Leveraging the potential of a research university will help shape a more innovative, resilient, and sustainable European industry—based on knowledge, responsible use of resources, and advanced technologies.

Integrating dual-use technologies and satellite technologies into the University's programmes

In the face of rapid geopolitical shifts at the end of the first quarter of the 21st century, the need to strengthen the military potential of Poland and Europe encourages universities to place greater emphasis on dual-use technologies – those combining civilian and defense applications.

Mindful of our core values of peace and international cooperation, introducing these technologies into the curriculum can be an expression of patriotism and European solidarity, and a strong impulse for the development of research and education in advanced technologies.

At the same time, the University already holds substantial competencies in many areas of space and satellite technologies. Integrating these competencies into strategic research and educational programmes will not only leverage existing potential but will also strengthen the University's position as a modern institution capable of co-shaping the European space ecosystem.

Such a development path – linking dual-use technologies with space technologies – opens the door to new national and international partnerships, research projects, industry collaboration, and a tangible contribution to security and innovation at both the national and European level.

C. Green Transformation and Climate Responsibility

Setting the goal of climate neutrality – achieving net-zero emissions by 2050

The University should develop a comprehensive climate policy, by defining and implementing the goal of achieving climate neutrality. A key element of this policy should be the reduction of greenhouse-gas emissions so that by 2050 the University reaches net zero – a full balance between emissions and removals. Within this policy, the University should define concrete actions such as improving building energy efficiency, expanding renewable energy sources, ensuring sustainable resource management, and promoting pro-environmental attitudes among students and staff. In addition, climate-change topics should be integrated into both curricula and research, so that the University not only pursues climate neutrality itself but also shapes future generations who are aware of environmental challenges.

Increasing focus on educating engineering staff in energy generation and transmission

We recommend considering – within the University's strategy – placing greater emphasis on educating highly qualified engineering talent in energy generation, conversion, and transmission. In the face of global challenges related to the energy transition, sustainable development, and decarbonization of the economy, it is crucial to provide students with modern study programmes that combine solid theoretical foundations with practical experience. Emphasis should be placed on developing competencies in renewable energy technologies, smart transmission grids, energy storage, and modern methods for optimizing energy transport and distribution. The University should also actively cooperate with industry and research institutions to align curricula with rapidly evolving market needs and to inspire students to pursue innovative activity in the energy sector.

Introducing circular-economy topics into study programmes

We recommend considering – at the level of the University's strategy – the inclusion of topics related to the circular economy in study programmes, especially in fields related to construction, to educate specialists capable of designing and managing processes in ways aligned with sustainable development. In this way, our university will actively contribute to the growth of economic sectors that focus on maximizing resource use, reducing waste, and reusing materials.

In practice, this means enriching curricula with elements such as:

- ➔ designing buildings with a full life-cycle perspective (from raw-material sourcing through end-of-life and recycling),
- ➔ selecting construction materials regarding environmental impact and reuse potential,
- ➔ optimizing logistics and production processes in line with closed-loop principles,
- ➔ cooperating with industry to develop innovative solutions and directly implement circular-economy models in practice.

As a result, TUL graduates will gain knowledge and skills that enable them to design, build, and modernize construction projects in an environmentally friendly way and in line with sustainable development principles. By incorporating circular-economy principles into its programmes, Lodz University of Technology will strengthen its position as an institution shaping future engineering talent capable of addressing climate challenges – and will help drive modern, green sectors of the economy.

D. Demographic and Social Challenges

Leveraging the potential of the “silver economy” / “silver wave”

The silver economy / silver wave is a demographic and economic phenomenon resulting from the progressive ageing of society. Our university can harness this trend in a positive way, for example by:

- ➔ educating specialists in gerontechnology – the design of devices, spaces, and systems that make life easier for older people, improving their safety, independence, and quality of life,
- ➔ cooperating with business and public institutions, offering internships and projects related to services for seniors,
- ➔ conducting research and developing innovations that improve older adults’ quality of life
- ➔ providing lifelong learning for professionals and dedicated programmes for seniors,
- ➔ promoting intergenerational dialogue and volunteer engagement.

E. Internationalization of Programmes and Strategic Cooperation

Increasing the role of IFE in the University’s international activities

IFE (the International Faculty of Engineering) is an important pillar of Lodz University of Technology’s strategic vision for the next 25 years, as it combines traditional engineering education with an international dimension and innovative teaching methods. Thanks to many years of experience in delivering courses in foreign languages, IFE supports the University’s global ambitions by attracting talented students from around the world.

The further development of IFE should extend its existing innovative teaching approaches through modern educational platforms, a greater involvement of international academic staff, internationally scoped teaching-and-research projects, and close cooperation with industrial partners from abroad. IFE graduates, alongside advanced technical knowledge, develop leadership skills and gain experience in a multicultural environment, which naturally makes them ambassadors of the University on the global market.

Through IFE, Lodz University of Technology strengthens its position as a modern educational and innovation hub, capable of meeting the challenges of an evolving economy.

Leveraging the University's membership in the European Consortium of Innovative Universities (ECIU)

As a member of the European Consortium of Innovative Universities (ECIU), the University can, over the next 25 years, strengthen its position within the consortium and become a key centre for the development of innovative educational methods and research collaboration. In practice, this means more active participation in ECIU projects, especially those focused on challenge-based and interdisciplinary solutions.

Joint development of study programmes, exchange of academic staff and scholarships, and the implementation of initiatives supporting entrepreneurship and technology transfer across the partner-university network will contribute to deeper integration within the consortium. Over the longer term, Lodz University of Technology can also promote new learning models (including micro-credentials and hybrid education) and implement solutions that enhance student and staff mobility. This creates an opportunity to become a leading ECIU university – one that not only benefits from international connections but also helps shape the consortium's development directions.

Establishing organizations analogous to the ICT Cluster for other industries

The ICT Cluster established in 2012 by Lodz University of Technology – bringing together key Łódź-based companies in IT, communications, and technology – has become a benchmark of quality and effective university–business collaboration.

Creating similar clusters in other sectors that are important to the region's economy would strengthen cooperation between the University, enterprises, and local government, and foster an innovation-friendly environment. It would create a platform for joint R&D projects that translate into new technological solutions and greater competitiveness of local companies. The University would gain stronger pathways for practical implementation of research results, while students would gain access to real-world case studies and internship opportunities in the region's key industries.

Clusters are also spaces for exchanging experience and jointly developing competencies, which supports integration between academic and economic communities. Such an initiative strengthens the position of both the University and the region, making it a more attractive place for investment and for the development of innovative ventures.

IV. OUTREACH - Radiating academic values into the University's wider environment

Throughout its history, notably through the legacy of Professor Jan Krysiński, Lodz University of Technology has repeatedly drawn inspiration from French academic culture. We recommend implementing a model inspired by the phenomenon known in French diplomacy as *rayonnement culturel de la France* – France's cultural "radiance" or influence[2]. In the context of Lodz University of Technology, we understand this recommendation as a significant expansion of the University's ability to emanate academic values into its surroundings through an adapted concept of Rayonnement— the spreading of light.

At its core, *Rayonnement* means the subtle diffusion of values and ideas that are born within the University and then permeate the surrounding community. Every lecture hall, laboratory, library, and the whole campus becomes a source of inspiration and a developmental impulse for the environment around it. By "radiating outward," these places help weave a coherent fabric of relationships between science, technology, and social life.

For this influence to be strengthened over the next quarter-century, it must be expressed through regular encounters between scientists and the residents of the city and the region; through initiatives that engage school youth; and through more frequent events with scholars held both outside the University (for example in the MEMO Mediateka) and on campus (in spaces such as "BAR Politechnika"). We recommend paying greater attention to these seemingly small gestures: open lectures, thematic workshops, and science festivals, because they shape the imagination and ambitions of the broader community. It is also worth drawing inspiration from recurring events such as ŁDI – Łódź IT Days – and creating similar initiatives that explore other areas of knowledge and technology.

A university that shares the discoveries and knowledge of its scholars becomes a source of intellectual light and enriches developmental pathways for people of all ages. In doing so, it fulfills the mission of socially responsible science, so important in today's world. Such actions strengthen a sense of unity and cooperation: academics benefit from the experience of local partners, and residents learn from lecturers and students. The result is a synergy in which science and practice intersect, encouraging joint efforts to seek new solutions – both to local challenges and to problems of global scale. A vital element of this process is also the strengthening of ties with alumni.

It is crucial to continuously emphasize the importance of the University's autonomy, understood as the freedom of decision-making exercised by the University's leadership and academic community. Autonomy makes it possible to define a development path aligned with the University's own aspirations and to shape an organizational culture that supports innovation and openness to dialogue. One of the elements underpinning the idea of *Rayonnement* is the freedom to conduct scientific research. It is this freedom that enables the search for innovative solutions and the creation of pioneering concepts in engineering and the exact sciences. It is a necessary condition for sustaining creative energy and fostering the development of academic thought.

To strengthen the identity of the academic community and ensure that shared values are upheld in everyday practice, it is advisable to articulate a set of fundamental principles and values that will serve as a reference point for students, researchers, and administrative staff. One useful instrument could be a kind of honor code, defining ethical standards and conduct across the University's activities. In contrast to the existing Code of Ethics for Employees of Lodz University of Technology, such an honor code should be more "chivalric" in spirit – serving as an inspiration for attitudes rooted in dignity, self-respect, and loyalty – rather than primarily normative, prescribing obligations.

[2] We used term "Emanacja" (Emanation) in original Polish version of this Vision.

In this way, every person connected with Lodz University of Technology would have a clear understanding of both the rights and responsibilities that come with belonging to the academic community, and all initiatives undertaken would be expected to remain consistent with the core assumptions of the University's mission and vision.

The role of the University is not only to educate engineering talent but also to shape social attitudes grounded in respect and empathy. In this context, Lodz University of Technology should actively implement policies and uphold practices that promote justice, equality, and, above all, human rights. Standing up for those exposed to discrimination or social exclusion is an expression of responsibility for the community of which we are a part.

Such an emanation of academic values – openness to dialogue, a continuous pursuit of truth, and critical reflection – can transform entire generations. The University ceases to be merely a "fortress of knowledge" and becomes a living centre of cultural and innovative radiance, building bridges between theory, technology, and everyday life.

This is precisely the deepest meaning of the French idea of *Rayonnement*: we want Lodz University of Technology not only to educate but also to radiate good practices, inspire dialogue, and provide impulses for broadly understood social development. Through freedom of research, autonomy, shared values, and a sense of responsibility for others, we can strengthen our positive impact on the world around us – working for the future in a spirit of justice, equality, and innovation.

CONCLUSION

This document represents an important stage in the development of the Strategic Vision of Lodz University of Technology for 2025–2050, shaped through the discussions and commitment of the members of the University Council and the University Advisory Committee. It serves as a starting point for further reflection, consultation, and refinement of the University's development directions in the context of the challenges of the second quarter of the 21st century – and, ultimately, for the creation of the Strategic Development Vision of our University.

How can we meet the challenges of the 21st century?

The world, science, and education are at a pivotal moment. The growing role of artificial intelligence, the need for sustainable development and stronger global cooperation, and the rapid pace of technological change all demand bold and far-sighted strategic decisions.

To meet these challenges, Lodz University of Technology should consistently pursue a vision of a modern, open, and interdisciplinary university, founded on innovation, humanism, and social responsibility.

The next step in the process is consultation with the University's authorities and the members of the University Advisory Committee (UAC), a process initiated in 2023. We believe that continued work on the strategy will enable the formulation of a coherent and comprehensive vision—one that not only responds to future challenges but also strengthens Lodz University of Technology's position as a centre of science, technology, and humanism at both the national and international level.

What next? The perspective of 2050

With full awareness of our responsibility for the future of the University, we call upon the future authorities of Lodz University of Technology to undertake, in 2050, the work of developing a new, updated development vision: "Lodz University of Technology 2100." May it stand as a testament to continuity of thought and to the courage required to face the challenges that the second half of the 21st century will bring.

We believe that future generations of the Lodz University of Technology academic community – researchers, students, alumni, and administrative staff – will take up this task with the same commitment and passion with which we are, today, seeking to chart directions for the decades ahead, in a spirit of innovation, the pursuit of truth, responsibility, and humanism.

May the development of the "TUL 100" vision become a symbol of the durability of our community, of our faith in the power of science and technology, and in the value embodied by the human being – and an expression of the conviction that the future belongs to those who can shape it with courage.