

ANNEX 2

RESEARCH FRAMEWORK OF THE UNIVERSITY OF PARDUBICE

Introduction

The framework of research activities of the University of Pardubice is elaborated and presented in connection with the Plan for the implementation of the Strategic Plan of Scientific, Research, Development and Innovation, Artistic and Other Creative Activities of the University of Pardubice for 2020 as its integral part.

It develops and specifies the direction of scientific, research, development and innovation, artistic and other creative activities of the University as a whole and their components for the upcoming period in connection with the University's strategic documents and national and international strategic documents.

With its size and specialization, the University of Pardubice (UPa) ranks among medium-sized public higher education institutions (PHEIs) of the university type with a multi-disciplinary structure. It was established gradually from a former college of chemical science (1950), transformed into a university (1994)¹, both by establishing new faculties with a different field of specialization, and by the integration, unique in the Czech Republic, of a private higher education institution into the structure of the University (now FR). UPa is the only university in the Pardubice Region, which is important in terms of regional cooperation (RIS3) and the so-called University's Third-Mission in relation to society.

The dynamic development at the turn of the millennium demonstrates that UPa is able to quickly adapt to changes in external conditions, to respond effectively to technological and social developments and labour market demand and to use its current results of research and development (R&D) in educational activities. In some areas of education, research and development (E&R&D), UPa has an important national and international position. This fact was confirmed by institutional accreditation (2018) obtained for 6 areas of education, which characterize the basic spectrum of the main activities and potential of further development of E&R&D at UPa.²

Traditionally, UPa belongs to universities with a predominant technical focus. This corresponds to the key position of technical faculties (especially FChT, FTE and FEEI) in basic (BR) and applied (AR) research. The advantage of UPa is its multidisciplinary, which is evident from the achieved level of social science disciplines and humanities, the achievements of which are internationally relevant in both BR (FAP) and AR (FR). Its Centre for Materials and Nanotechnologies is engaged in the ERC Starting Grant and is located on the European Research Infrastructure Roadmap.

Mission

As an internationally respected centre of education and a prominent scientific and research institution, The University of Pardubice intends to continue to perform the cutting-edge research, development and innovation (R&D&i) to contribute to the development of scientific knowledge, creative human potential and advanced technologies to improve quality of life and prosperity.

Vision

To strengthen its position as a modern E&R&D institution with significant research and innovation potential, active and competitive nationally and internationally by:

- developing the achieved excellence of the basic research disciplines and their interconnection with applied research, in relation to the National Research, Development and Innovation

¹ Chronologically: Faculty of Chemical Technology (1950) [FChT]; Faculty of Economics and Administration (1991) [FEA], Faculty of Transport Engineering [FTE] (1993); Faculty of Arts and Philosophy [FAP] (2001); Faculty of Restoration (Litomyšl) [FR] (2005); Faculty of Health Studies [FHS] (2007); and Faculty of Electrical Engineering and Informatics [FEEI] (2008).

² Transport, Economics, Historical Sciences, Chemistry, Informatics, Medical Disciplines.

Policy 2016-2020, National R&D&I Priorities and in line with the Innovation Strategy of the Czech Republic 2019-2030 and key trends of the Smart Intelligence Strategy,

- enhancing innovation performance and competition research capability by intensifying cooperation with the application and industrial sectors and developing efficient technology transfer with the potential for commercialization through intellectual property protection, in line with the National Research and Innovation Strategy for Smart Specializations of the Czech Republic (National RIS3 Strategy),
- increasing the quality of research and relevant international results by intensifying engagement in international research cooperation and programmes not only within the European Research Area, and by strengthening the internationalization of the research and development environment at the University towards the Europe 2020 Strategy goals,
 - increasing the efficiency of R&D&I by improving the institutional environment, management and evaluation of R&D&I, modernization of the R&D&I infrastructure and targeted and system support and development of excellent scientific teams and individuals.

Main objectives and strategies to achieve them

Objectives:

- (1) To systematically produce excellent internationally recognized results of basic research.**
- (2) In the long term, to bring relevant research and development results that will be effectively transferred to the application sphere.**
- (3) To deepen cooperation with foreign universities and other scientific workplaces and engage in international project designs and competitions.**
- (4) To use functional institutional support systems and management tools to improve R&D&I and achieve objectives 1-3.**

Starting points for meeting the objectives:

FChT, which has a share of up to 70% in BR of the University and shows long-term growing achievements in AR (in the BR/AR ratio of 3: 1), continues to concentrate its R&D&I activities dominantly on 27 science areas corresponding to national and international trends in R&D development in the scientific areas [SA] 1 (1.3, 1.4, and 1.6) and 2 (2.4 and 2.5). BR and AR are interconnected through several topics and research teams. The faculty has achieved internationally comparable excellence in the long term.

FES indicates the potential for development of BR within SA 5 (5.2 and 5.6) and 1 (1.2). The Faculty has defined one main thematic area of economic and administrative sciences with the support of informatics disciplines and established a specialized scientific team.

FTE will develop long-term oriented AR mainly in SA: 2 (2.1, 2.2 and 2.3) and 5 (5.2 and 5.7). An important support for the further development of the AR is the unique in the Czech Republic and highly specialized workplace - the Education and Research Centre in Transport.

FAP will continue to develop R&D activities in areas in which it currently significantly contributes to the overall performance of the University in BR (11%), mainly within SA 6 (6.1 and 6.3). The Faculty has identified 3 research teams and 3 priority thematic areas to achieve the objectives in BR, which is still dominant for it. AR is not significant, but there is a potential here (e.g. European and non-European exhibitions, expertise in preservation of monuments, sociological analysis or in resocialization care).

FR will continue to focus on the development of the AR in the field of the preservation of the tangible cultural heritage (inherently interdisciplinary): the development and application of conservation techniques; analysis of historical materials and technologies; optimization of restoration methods and techniques, etc.

FHS focuses on SA 3 (3.2 and 3.3). The main topics are the quality of health care provided to specific patient groups, the quality of life in the context of this care, and methods of introducing new

procedures into clinical practice on the basis of evidence-based practice principle.

FEEI focuses on the AR development in SA 1 (1.2) and 2 (2.1 and 2.2). It cooperates with the application sphere with an emphasis on international reach and great potential for further development, especially in the fields of electronics and electrical engineering, sensor technology, navigation and detection systems, automation and robotics, and transport systems and equipment.

STRATEGIES:

STRATEGY for achieving OBJECTIVE 1

Creating conditions for increasing the scientific performance of academic and research staff with an emphasis on the quality of the achievements.

- Developing the fields linked to the areas of education for which UPa has proven quality and obtained institutional accreditation, and fields of study with accredited doctoral studies or a provable potential for accreditation of doctoral studies during the upcoming planning period.
- Deepening the field-specific orientation of individual workplaces and research teams on BR or AR.
- Maximum support to identified leading scientists and their teams with long-term internationally recognized achievements with significant citation response.
- Ensuring the sustainability of existing research centers in relation to the long-term performance, results and quality of research, in particular the CEMNAT Centre for Materials and Nanotechnologies.
- Support to prospective teams of excellent research with high societal benefits.
- Motivation to increase the success rate in obtaining projects and the productivity of researchers while improving the quality of research results.
- Increasing the participation of young workers in research and enabling their career growth (in line with the Incentive Scheme for Research Activities of Students and Young Academics and Researchers).
- Creating favorable conditions for the involvement of gifted bachelor and master students in scientific work.
- Developing multidisciplinary cooperation with domestic and foreign partners in order to generate internationally competitive research results.

STRATEGY for achieving OBJECTIVE 2

Strengthening innovation performance and competitiveness through more intensive cooperation with the application and industrial sectors.

- Intensification of cooperation with important entities in the application sphere, especially in application research projects and contract research.
- Active use of the system of commercialization of research and development results.
- Involvement in regional and supra-regional structures and consortia in fields relevant to RIS3 Strategy and ITI.
- Developing the potential in government-defined emerging industries that are strategic to the development of cluster cooperation (such as Digital-based Industries, Logistical Services, Mobility Technologies as well as Environmental Industries and Blue Growth Industries).
- Further developing the activities of the Centre for Technology and Knowledge Transfer and strengthening its role in cross-sectoral research cooperation for more effective use of research and development results in practice, efficient technology transfer and commercialization of the results.
- Raising awareness among academics, researchers and students about market needs, collaboration with the application sector, technology transfer opportunities and intellectual property protection.

STRATEGY for achieving OBJECTIVE 3

Intensifying the involvement in international research cooperation and internationalization of environment at UPa for international competitiveness of R&D&I activities and results.

- Strengthening and developing cooperation with foreign, European and non-European partners and scientific workplaces.
- Maximizing the acquisition of and involvement in international R&D&I projects of interdisciplinary and intersectoral cooperation, in particular within Horizon Europe 2020, involvement in bilateral inter-institutional and international project teams, research networks and consortia.
- Development of R&D&I activities based on successful ERC and ERC CZ projects, support to investigators of such projects and their teams and use of experience from their implementation to gain further new projects.
- Strengthening international knowledge transfer cooperation for AR (such as with the Indian Institute of Technology Guwahati, India, or by participating in the SPARK Stanford Global programme, which UPa joined as the first Czech university).
- Developing and further extending collaboration to support international long-term research mobility, in particular young researchers and doctoral students (such as the “International Cooperative Graduate Program” with the National Institute for Materials Science, Tsukuba, Japan).
- Creating facilities for strengthening the internationalization of the university environment and the creation of international teams following the Internationalization Audit (2018) “Monitoring Internationalization of Czech Higher Education” (MICHE).
- Developing conditions leading to the strengthening of UPa research teams by excellent foreign workers.

STRATEGY for achieving OBJECTIVE 4

Institutional support and management tools to improve R&D&I.

A) Development and promotion of creative human potential

- Setting up a transparent motivational environment leading to the creation of competitive, internationally relevant results of the creative work of scientific teams and individuals.
- Providing stronger support to identified quality research teams.
- Performing regular analyses of the results achieved and indicating the potential of other quality research teams.
- Active application of incentive tools and transparent rules to improve the quality of research.
- Setting up rules for creating international scientific teams and postdoctoral positions.
- Consistent application of demanding doctoral study rules and qualification growth for young scientists and academics.
- Implementation and development of the Incentive Scheme for Research Activities of Students and Young Academics and Researchers.

B) Institutional management and systems

- Development of tools to support the system of internal evaluation of the quality of creative activities, in accordance with the Rules of the Quality Assurance and Evaluation System of Educational, Creative and Related Activities of the University of Pardubice.
- Strengthening of strategic management by preparation of strategic development plans of scientific, research, development and innovation activities with indication of the potential of development of R&D and AR according to the branch specifics of individual faculties.
- Consistent implementation of the system of internal evaluation of R&D results at UPa at the level of UPa and its components according to the new Methodology of Evaluation of Research Organizations M17+.
- More efficient use and further development of already established tools and information systems to support internal evaluation of quality of R&D results and creative activities and identification of the most efficient scientific teams.
- Innovation of the system of institutional financing and the concept of allocating funds to the Long-term Conceptual Development of the Research Organization (LCDRO), which will take into account

the long-term measurable results and the derived AR and BR potential of individual RT, up to the level of UPa constituents.

- Development of and maximum support to obtaining other sources of R&D&I funding outside the institutional funding.
- Implementation and innovation of the incentive scheme to support R&D&I activities of PhD students (e.g. innovation of internal grant competition, international mobility, etc.).
- Support to differentiation of management and evaluation processes at the level of faculties while respecting the differences of branch specialization.
- Central coordination of all management and evaluation processes using university management structures and bodies in both horizontal and vertical lines.
- Development of management tools for increasing international and branch competitiveness.
- Participation in surveys to identify market needs, or that of society, and in national and international evaluations.
- Adapting the institutional environment, management structure and processes and procedures with legal and organizational standards of the organization supporting the implementation of quality R&D&I.
- Strengthening management and organizational facilities (establishment of an international scientific board, commercialization board, ethical board, research and development department, etc.).

C) More efficient use of capacities

- Development of the existing infrastructure, reconstruction of the premises and continuous modernization of instrumentation as a basic condition for increasing the scientific performance of academic and research workers.
- Maximizing the use of the established unique instrument infrastructure.
- Ensuring sustainability and continuing the use of the capacities of the Centre for Materials and Nanotechnologies on the European Research Infrastructure Roadmap.
- Modernization of R&D&I capacities by systematic support of project financing.

D) Conditions for activities positively presenting and emphasizing R&D&I and the role of the University

- Raising awareness of lay and professional public, partners and application practice about R&D&I activities, latest knowledge and scientific results of the University workplaces.
- Emphasizing the research role of the University and increasing the attractiveness of the career of the scientist and his/her position in society.
- Promoting open research and innovation, their social impact and ethical aspects.

The development of UPa R&D&I and all processes to support them will be significantly supported at the University of Pardubice from 2020 by the implementation of a project aimed at obtaining the HR Award.

NATIONAL AND INTERNATIONAL R&D&I CONTEXT IN RELATION TO HIGHER STRATEGIC GOALS

The development of R&D&I at the University of Pardubice and their strategic management and institutional support as well as the above-mentioned objectives and strategies of the UPa are based and long-term designed in accordance with the basic strategic documents of the Czech Republic and European standards and documents.

- National Research, Development and Innovation Policy of the Czech Republic for 2016-2020,
- National priorities of oriented research, experimental development and innovation,
- Innovation Strategy of the Czech Republic for 2019-2030,
- Industry 4.0 Initiative, the fourth industrial revolution,
- National Research and Innovation Strategies for Smart Specialization of the Czech Republic (National RIS3 Strategy),
- Action Plan for the Development of Human Resources for Research, Development and Innovation and Gender Equality in Research, Development and Innovation in the Czech Republic for 2018-2020,
- EU cohesion policy and its financial instruments, European Structural and Investment Funds, ESIF, Europe 2020 - A European Strategy for Smart, Sustainable and Inclusive Growth),
- Responsible Research and Innovation Horizon 2020.