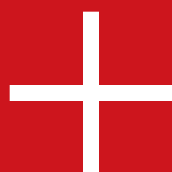


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# University North

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## Scientific - research strategy of University North

for the period 2014 - 2019

UNIVERSITY  
NORTH

**University North**

**Scientific-research strategy  
of University North  
for the period 2014-2019**

Koprivnica and Varaždin, November 2014

**University North**

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## **SCIENTIFIC-RESEARCH STRATEGY OF**

### **UNIVERSITY NORTH for the period 2014 – 2019**

Compiled in the Rectorate of the University in the period of January – November 2014.

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## CONTENTS

1.HISTORICAL DEVELOPMENT OF THE UNIVERSITY NORTH.....	4
1.1 ABOUT THE INSTITUTION IN BRIEF.....	4
2 STARTING POSITIONS FOR COMPILING THE SCIENTIFIC STRATEGY .....	5
2.1 INTRODUCTION .....	5
2.2 SCIENTIFIC MISSION AND SCIENTFIC VISION OF UNIVERSITY NORTH.....	6
2.3 SWOT ANALYSIS.....	6
3 SCIENTIFIC OBJECTIVES .....	10
3.1 PRINCIPLES IN THE IMPLEMENTATION OF SCIENTIFIC ACTIVITIES AND REALIZATION OF SCIENTIFIC OBJECTIVES .	10
3.3 DETAILED ANALYSIS OF GOALS AND TASKS DETERMINED BY THE SCIENTIFIC STRATEGY .....	11
3.4 DESCRIPTION OF THE ACTIVITIES STEMMING FROM SPECIFIC OBJECTIVES AND TASKS .....	14
4 INDICATORS OF CONDITIONS FOR THE SCIENTIFIC ACTIVITIES OF UNIVERSITY NORTH.....	23
4.1 SCIENTIFIC POLICY AND ORGANIZATIONAL STRUCTURE OF THE INSTITUTION.....	23
4.2 SCIENTIFIC HUMAN RESOURCES FOR THE IMPLEMENTATION OF SCIENTIFIC ACTIVITIES.....	24
4.3 PHYSICAL ASPECTS OF THE FEASIBILITY OF SCIENTIFIC ACTIVITIES.....	31
5 LIST OF ATTACHMENTS.....	33

## 1. HISTORICAL DEVELOPMENT OF THE UNIVERSITY NORTH

### 1.1 ABOUT THE INSTITUTION IN BRIEF

University North was created with the merging of two institutions: the Polytechnic of Varaždin was merged with the Media University, and on the basis of their organization, an integrated university was created - University North. The founders of the University North are the City of Koprivnica and the City of Varaždin in equal shares. On 18 March 2013 in Koprivnica, i.e. 21 March 2013 in Varaždin, the City Councils of founding cities adopted the decision to integrate the Polytechnic of Varaždin and the Media University. At its session held on 19 December 2013, the Senate of the Media University adopted the decision that starting from the day of the integration, the new institution will carry the name University North, and on the basis of the decision of the Commercial Court in Varaždin from 22 January 2014, the process of integration of the two institutions was completed.

University North has 119 employees and 245 external associates. The main activity of the University North as a scientific organization is a teaching-scientific (or teaching-research) one.

University North carries out 11 study programmes and is made out of 11 departments, respectively:

- Department of Journalism,
- Department of Business and Management in the Media,
- Department of Media Design,
- Department of Communication Sciences and Public Relations,
- Department of Business Economics,
- Department of Electrical Engineering,
- Department of Mechanical Engineering,
- Department of Multimedia, Design and Application,
- Department of Civil Engineering,
- Department of Technical and Economic Logistics,
- Department of Biomedical Sciences.

This summary is a part of more detailed history of the University North and it constitutes an integral part of the Scientific study of the institution (see Attachment 1).

## 2 STARTING POSITIONS FOR COMPILING THE SCIENTIFIC STRATEGY

### 2.1 INTRODUCTION

Taking into consideration the development of higher education in other parts of Croatia, both city administrations (of Koprivnica and Varaždin), the administration of the institution and teachers recognized the fact that the then-current form of the institution (polytechnic) was inappropriate with regard to the development needs and aspirations of the region, and also limited in terms of the vertical of the existing study programmes. They also realized that there was a large discrepancy in the development of higher education of north-western Croatia compared to other parts of the Republic of Croatia in terms of the development of higher education institutions.

By the time the work on the development of this strategy began, University North did not have an accepted or systematically worked out comprehensive strategic programme (with all the activities, not only the scientific ones), and due to that this scientific-research strategy covers areas that are not only scientific, but are also associated with the future development of science and scientific research at the University North. The result of that is a flexible and dynamic approach to the development of the scientific strategy, which can be well adapted to possible changes observed later on. Changes and adjustments take into account the impacts of the University's micro and macro environment in the next five years, as well as the overall condition of the society, especially in the immediate academic environment that will certainly have a significant impact on the partial and very dynamic, but still necessary changes in the course of the planned five-year implementation.

Recognizing the necessity of an integrated and comprehensive approach to education in different professions, one of the key features of the University is its interdisciplinary character. Therefore, the proposed programmes, in addition to the key knowledge and skills for the said branch, i.e. a particular profession, offer a number of courses common to all the sectors, as well as basic knowledge acquired in the form of compulsory courses, along with optional and complementary knowledge and skills in the form of optional courses.

The scientific research strategy of the University North is primarily focused on:

- a) scientific improvement and affirmation of the existing educational programmes for which the University North is recognizable;
- b) systematic establishment of a larger number of the University's own (national and international) scientific-research and scientific-artistic projects, known for their innovation,

- proactivity, excellence and undisputed standard quality and applicability in the domestic and international environment;
- c) systematic introduction of high-quality and well-established new programmes required by the immediate environment, the region and the whole society in which the University North operates, and beyond (the border region, area of the EU and global environment),
- c) systematic development and affirmation of programmes that nurture and develop all the features of the founding cities (and the wider area of the northern region of Croatia), but also the special features outside the region (Croatian and European).

## 2.2 SCIENTIFIC MISSION AND SCIENTIFIC VISION OF UNIVERSITY NORTH

Non progredi est regredi - To not go forward is to go backward

The primary mission of the University North is the education of high quality and internationally recognized and socially responsible researchers for the purposes of science and the Croatian society as a whole, and in particular for the purposes of the northern region of Croatia in the field of technical, biomedical, biotechnical, and social sciences, humanities, and interdisciplinary sciences and art.

The stated mission stems from the scientific vision of the University North, according to which this institution is at the leading position of internationally renowned quality in scientific-research, artistic, professional and socially responsible activities, and in the higher education of personnel in the fields of engineering, biomedical, biotechnical, and social sciences, humanities, and interdisciplinary sciences and art.

The mission and the vision of the University North are the starting point for the functioning of the institution, and are thus the foundation of this scientific strategy.

A detailed review of the mission and vision of the institution is presented in a separate section of the Scientific study of the institution (see Attachment 2).

## 2.3 SWOT ANALYSIS

Together with recognizing the needs of the environment, and taking into account the existence of satisfactory conditions for the development of scientific activities, and also the early development phase in which the University North is, it was necessary to conduct a complete and thorough analysis of all the strengths and weaknesses,



opportunities and threats (SWOT) to the development of science at the University North in order to create a complete and accurate scientific research strategy.

### *Strengths*

- equipped space for scientific-research and artistic work (digital printing, various technical, information and other (similar) measurements, experimentation and simulation (and other) studies;
- existence of laboratory and field equipment (equipment with electric resistant strain gauges - Wheatstone bridge, other equipment supplied by sponsors and projects) that is used for scientific purposes (conducting research for the needs of doctoral dissertations, etc.), and can be used for scientific research whose results can be applied in the economy;
- large number of young scientists and artists (enrolled in doctoral studies);
- sufficient number of experienced scientists elected to appropriate scientific-teaching titles (from Assistant Professors to Professor Emeritus and Emerita) who are ready for mentoring and assistance in the development;
- quality scientific staff already working on the preparation of scientific texts that are rare in the world, and of which there are none in Croatia (in the field of Communication Sciences, etc.);
- large number of ambitious students interested in participation in science, especially through participation in the implementation of scientific research;
- access to a part of University's own financial resources that can be directed to scientific-artistic research work.

### *Weaknesses*

- Lack of a number of University's own, specific, conceptual, planning and project feasible research programmes;
- lack of a number of University's own, specific study programmes prepared exclusively on a scientific-research and artistic basis;
- continuity in the development of human potential by means of motivation and investment for a greater participation in scientific research; a higher number of teachers elected to scientific-teaching titles; a greater number of assistants;
- continuous investment in laboratories and necessary equipment; continuous modernization of facilities and equipment (which requires large and new investments);

- large number of professional programmes which are yet to be prepared for the university level;
- lack of a single scientific journal of the University within which it would be possible to consolidate all scientific contributions completed within the institution (*Tehnički glasnik* specializes mainly in the technical field and is not at the desired scientific level, *Podravina* specializes in social sciences, but has no desired impact factor (Impact Factor, IF), *InMediRes* is a predominantly humanistic and interdisciplinary focused magazine in development).

### Options

- Development of new and original scientific-research projects that will contribute to the appropriate development of science within the institution, but also in the region;
- development of new graduate studies in the field of social, technical and natural sciences;
- interdisciplinary linking of social, technical and natural sciences both in project and study terms;
- possibility of a greater and more concrete cooperation in scientific-research and artistic project and teaching terms with other universities in the Republic of Croatia, the EU and beyond;
- possibility of extending and concretising the already signed and new general agreements on international and national cooperation (Erasmus, bilateral, and other agreements, and similar exchanges of students, teachers, researchers and staff), as well as of the creation of new, potential cooperation that have so far not been achieved due to the current lack of scientific status and a relatively short period of the University conducting all the mentioned activities;
- larger and more recognizable productivity of scientists and artists (a larger number of recognizable works, creating better conditions for the acquisition of scientific-teaching and artistic titles);
- better connection with the economy and other institutions in the field of education, which would lead to the obtaining of the leading position in certain segments of activity (for example, communication sciences, etc.); the possibility of influencing significant development of the economy by transferring knowledge based on scientific results;
- as a potential leader in the field, the development of platforms for the placement of knowledge and scientific achievements to the general (especially scientific) public, such as specialized journals with a high scientific classification and recognisability,

- as well as organizations of specialized domestic and international congresses and symposiums;
- linking different segments (departments) and their activities in a recognizable scientific and research unit.

### *Threats*

- Unsystematic and vague further action in the concretization and linking of distinctive resources in the coming period;
- excessive influence of the unfavourable recessional financial activities from closer and wider environment;
- decrease in the motivation of researchers (for intrinsic reasons or conditioned by the influence of the system — non-recognition of labour, unfavourable working conditions, financial demotivation, etc.);
- poor management of time and space, and inadequate monitoring of the achievement of objectives in the set deadlines;
- failure to renew, update or adjust the strategy during certain time periods (tracking real changes according to the environment and the defined goals and tasks);
- failure to achieve the conditions for successful and recognizable scientific activity (unsatisfactory procedure management, possible corrections, lack of a real concretization of the strategy, implementation plans, tactics and realistically measurable and corrective operationalization).

A review with a detailed explanation of the qualitative analysis of the feasibility of the scientific strategy is an integral part of the Scientific study of the institution (see Attachment 3).

### 3 SCIENTIFIC OBJECTIVES

#### 3.1 PRINCIPLES IN THE IMPLEMENTATION OF SCIENTIFIC ACTIVITIES AND REALIZATION OF SCIENTIFIC OBJECTIVES

A rational scientific strategy is based on optimum, progressive and systematic realization of accepted principles and the immediately defined goals. The starting principles permeated with the entire scientific activity of the University refer to the ensuring of a high level of:

- creativity,
- innovation,
- proactivity,
- quality,
- social responsibility,
- interdisciplinarity and
- recognition in all the conducted activities.

#### 3.2 DIRECT INCENTIVE PRIORITIES

- Ensuring a systematic increase of the estimated funding for excellently implemented and evaluated scientific-research and development projects and programmes.
- Primarily envisioning the establishment of recognizable specialized and/or mixed/hybrid scientific-research centres, and secondarily, ensuring university reorganization which encompasses setting up new organizational forms that would enable the realization of long-term and priority scientific research activities.
- Smart investing in the development of the University's own distinctive scientific-research infrastructure and the system for the transfer of knowledge and technologies.
- Achievement of a more significant active participation in the scientific-research EU projects and programmes in a stronger and more systematic manner.
- Constant analytical monitoring, correction, guidance and systematic promotion of recognizable scientific-research partnerships, which greatly strengthens the system of support and development of high-quality young researchers and successful mentors.

- Rational organization and increase of the number of recognizable postgraduate specialist and doctoral studies and/or schools.
- Introduction of legally and ethically justified measures to encourage rational commercialization of academic scientific-research work and action, and especially of the work that is directly connected with the distinctive economic competitiveness.

### 3.3 DETAILED ANALYSIS OF GOALS AND TASKS DETERMINED BY THE SCIENTIFIC STRATEGY

The ultimate strategic objective (a long-term one which goes beyond the five-year programme of scientific development) is to create a small or medium (international and national), recognizable competitive public university in the north of the Republic of Croatia which successfully creates a new scientific, social, cultural and economic value and climate.

Direct and minimal scientific, research, and research-teaching objectives of the University North in the five-year strategic phase of the development of science are:

- Education of a high quality staff that will primarily meet the needs of the labour market region of the northern region of Croatia,
- improvement of the economy of the northern region based on scientific achievements and the development of a stronger connection between the city and other centres in the region,
- development of an internationally recognizable and innovative scientific activity and
- equipping of the University North and its partners for more productive and more recognizable scientific research and collaboration.

Table 1: Analytical review of immediately planned objectives, tasks and measurable indicators of monitoring the realization of tasks and objectives of the University North for the next five years

Objectives	Tasks	Indicators of realization monitoring
Education of a high quality staff that will primarily meet the needs of the labour market region of the northern region of Croatia.	Development of a connection and continuous collaboration with the local authorities in order to identify the real needs of the labour market.	Conducting research on the needs of employers at least every other year.
	Harmonization of educational programmes in relation to the needs and changes in the society.	Complementing and/or making changes in the teaching, scientific and other literature before the start of each semester.
		Enrichment of all university and other types of teaching programmes at the level of the semester, with continuous reporting procedures, checks and possible corrections.
		Continuous work on the organization of new university and other scientific-teaching based programmes (university programmes and teaching courses) which will be applied once a year.
	Acquisition of the preconditions for improving the quality of the scientific staff of the University.	Motivating teachers elected to higher titles to participate in scientific events by financing the cost of the registration fees, travel and stay at a scientific gathering. Each scientific worker of the University is given the possibility of having the costs of his/her active participation in at least one scientific meeting annually financed.
		Encouraging assistants to acquire their PhD by means of funding postgraduate studies. University will, on an annual basis, fund at least five doctoral students in total, and with the future development of a number of scientific areas, it will fund at least two doctoral students in each area.
Acquisition of new scientific achievements and facts.	The University will each year fund at least three scientific-research projects according to the real needs of the society.	
Improvement of the economy of the northern region based on scientific achievements and a development of a stronger connection between the city	Linking the University with entrepreneurs from the region through cooperation with the local authorities.	Each year there will be a 10% increase in the number of agreements on scientific cooperation with the economic entities in the region.
		University will for the needs of the economy of the region do at least one research project per year.

centres and other centres in the region.		
Development of an internationally recognizable and innovative scientific activity.	Realization of international scientific cooperation in terms of educational exchanges.	Realization of a minimum of three incoming and three outgoing cases of teaching mobility during one academic year.
	Involvement in international research projects.	Implementation (participation) of at least one international project per year in each scientific area.
	Providing a platform for the exchange of scientific achievements.	Organization of an international conference every two years in the beginning of the development of scientific activity (later once a year).
		Publication of scientific journals with an international editorial board and reviews (according to the field of scientific activity) once a year in the beginning (later twice a year).
Equipping the University North and its partners for more productive and more recognizable scientific research and collaboration.	Realization of national and international scientific cooperation in terms of use and sharing of existing facilities and equipment.	Realization of a minimum of two incoming and two outgoing cases of scientific cooperation with the use of scientific-research laboratories and equipment during one academic year.
	Involvement in national and international calls for the procurement of new financial and/or other means in terms of having better spatial and technological equipment for scientific research and cooperation.	Preparation and implementation (active participation in) a minimum of two national and/or international calls annually as part of the project of physical and/or technological equipping for scientific-research work and cooperation, at least in two scientific areas of interest.
	Ensuring the development and use of the platform for the exchange of spatial and/or technological capacities for the purposes of being rationally more equipped for recognizable scientific-research work and cooperation.	Organization of a national and/or international meeting with partner institutions on the topic of development planning and the use of the platform for the exchange of spatial and/or technological capacities for the purposes of being rationally more equipped for recognizable scientific-research work and cooperation, at least once every two years in the beginning of the development of scientific activity (later once per year).
		Publication and exchange of publications with the descriptions of existing regional and/or technological capacities for the purposes of being rationally more equipped for recognizable scientific-research work and cooperation (according to the field of scientific activity), annually in the beginning (later twice a year).

### 3.4 DESCRIPTION OF THE ACTIVITIES STEMMING FROM SPECIFIC OBJECTIVES AND TASKS

#### Activity no. 1: The organization of effective procedures of the Office for Science and Art.

1. Duration of the implementation of the activity: Until the end of the academic year 2014/2015.
2. Brief description of the activity: The Office for Science and Art and the International Relations Office have compiled the majority of the necessary acts for the implementation of scientific and research activities, and the completion of the organisation of the Office for Art and Science and the International Cooperation Office is under way. During the next academic year, by activating the projects and activities from this strategy, what will be implemented are the outlined procedures which will in the future make a regular practice. Based on the experience, upon the completion of the first year, interventions with the aim of improving and strengthening the efficiency of procedures are expected.
3. Who has the responsibility of conducting the activity: The Office of Science and Arts, Vice-Rector for Scientific and Artistic Work and International Cooperation, International Cooperation Office, everyone involved in the implementation of scientific and research activities in the first year of conducting the activity.
4. Expected results after the implementation of the activity: maximum simplicity, efficiency and transparency of procedures and legislation necessary for the implementation of scientific and research activities.
5. Indicators of the success of the implementation of the activity: Compliance of acts with the comments of users (there are no indicators because the percentage of intervention cannot be determined; in the case of successfully defined procedures and laws, there will be no interventions).
6. Required capacities/resources: Regular work of all scientists, especially of the employees in the Office of Science and Art, and partially of the employees of the International Cooperation Office.

#### Activity no. 2: Research on the needs of employers.

1. Duration of the implementation of the activity: (the implementation for 2014 is in progress); winter semester of the year 2015/ 2016 with a deadline of January 2017; winter semester of the year 2017/2018 with a deadline of January 2019.
2. Brief description of the activity: A detailed research (surveys and in-depth interviews) of the northern region of the Republic of Croatia on the labour market needs in order to timely begin planning the corrections to the existing teaching plan and programme (adaptation of courses, introduction of new courses)



- and creating the new teaching syllabi for new study programmes based on the actual needs of the economy.
3. Who has the responsibility of conducting the activity: University Administration (the Rector, Vice-Rector for Scientific and Artistic work and International Cooperation, Acting Vice-Rector for Education and Student Affairs, Acting Vice-Rector of the University Centre Koprivnica, Acting Vice-Rector of the University Centre Varaždin).
  4. Expected results after the implementation of the activity: A study plan and programme that will enable the creation of a high-quality cadre required by the labour market.
  5. Indicators of the success of the implementation of activities: Increased employability of graduates from 10% after making interventions in the study programme.
  6. Required capacities/ resources: Human resources. Regular work of the administration and heads of departments.

*Activity no. 3: Monitoring changes in science and the profession.*

1. Duration of the implementation of the activity: Conducted continuously, with a deadline of bringing in a report in March of the current academic year.
2. Brief description of the activity: Monitoring and analysing all changes in the field of science and activities of the profession that affect the necessary changes in the teaching content of the study.
3. Who has the responsibility of conducting the activity: Holders of certain subjects, heads of study departments, the Vice-Rector for Scientific and Artistic Work and International Cooperation, Acting Vice-Rector for Education and Student Affairs.
4. Expected results after the implementation of the activity: Harmonisation of educational programmes with the changes in the environment.
5. Indicators of the success of the implementation of the activity: An innovative plan and programme with recent literature; long term: recognition of the cadre by employers. The indicator of successful implementation of activities encompasses at least 5% of the adaptation of content of each course.
6. Required capacities/ resources: Human resources — teaching resources.

*Activity no. 4: Harmonisation of existing educational programmes with the changes in the environment.*

1. Duration of the implementation of the activity: During April and May of the current year for the implementation in the next academic year.

2. Brief description of the activity: Based on the report and suggestion of the course holder —an expert for a certain field, changes are made in the teaching plan and programme of courses conducted in the next educational period.
3. Who has the responsibility of conducting the activity: Heads of departments, the Acting Vice-Rector for Education and Student Affairs, Vice-Rector for Scientific and Artistic work and International Cooperation.
4. Expected results after the implementation of the activity: Study plan and programme aligned with the recent achievements of science and the needs of the activities of a particular profession.
5. Indicators of the success of the implementation of the activity: Increased employability of graduates of the University North for 10% per year and recognisability of the institution (indicator: conducted surveys on the image of the institution with a minimum total score of 4.5).
6. Required capacities/resources: Regular work of teachers in coordination with the heads of departments.

*Activity no. 5: Designing new studies.*

1. Duration of the implementation of the activity: Conducted continuously after the report on labour market needs with a deadline (ready for implementation) of 18 months (September 2017; September 2019; September 2021).
2. Brief description of the activity: Based on the results of the research on the needs of employers in the first activity, the necessary competences on the basis of which the design of new study syllabi consolidated in new study programmes are described.
3. Who has the responsibility of conducting the activity: University Administration (the Rector, all Vice-Rectors, and heads of departments).
4. Expected results after the implementation of the activity: A new study plan and programme on the basis of which professionals with skills necessary to employers in the region are educated.
5. Indicators of the success of the implementation of the activity: Increased employability of graduates of the University North for 10% per year after students who graduated according to the new content enter the labour market; recognisability of the institution (indicator: conducted surveys on the image of the institution with a minimum total score of 4.5).
6. Required capacities/resources: The existing teaching staff for the designing of courses related to existing ones; new human resources for covering the new teaching areas.

*Activity no. 6: Increasing scientific production.*

1. Duration of the implementation of the activity: Conducted continuously. A plan on an annual basis is made in September of the current year.
2. Brief description of the activity: Every scientist at the University North (regardless of the current title) is entitled to funding (registration fees, accommodation and travel) with the purpose of presenting their own scientific work. The terms of selection and the number of funded activities in a year and are defined by the plan for each year.
3. Who has the responsibility of conducting the activity: Administration and the Office for Science and Art of the University North.
4. Expected results after the implementation of the activity: Scientific papers presented at scientific gatherings; published in publications.
5. Indicators of the success of the implementation of the activity: A larger number of scientific outputs; a larger number of staff members with the terms of scientific-teaching advancement. It is expected that at the time of the implementation of the re-election to scientific and/or academic titles, all scientists meet the necessary conditions (one of the implementation indicators). An indicator of the satisfactory increase in the number of scientific outputs is an increase of 30% in the first year of funding and later on 5% per year.
6. Required capacities/resources: Financial resources planned for the development of scientific activity.

*Activity no. 7: Launching new research projects.*

1. Duration of the implementation of the activity: During a three-year or five-year period; with a one-year status control by conducting an analysis of an achievement report.
2. Brief description of the activity: Every year, University Norths makes an open call on the basis of which funding of scientific-research projects in the field of study programmes implemented at the institution is approved. Taking into account the scope of the research, a three-year or five-year project may be granted. The project leader is obligated to submit a one-year report on the status.
3. Who has the responsibility of conducting the activity: the Office for Science and Art, Vice-Rector for Scientific and Artistic Work and International Cooperation, Acting Vice-Rector for Education and Student Affairs.
4. Expected results after the implementation of the activity: New scientific achievements (facts, knowledge) that contribute to the development of activities in the field of studies.
5. Indicators of the success of the implementation of the activity: A larger number of successfully implemented research projects; a greater scientific production based on the results of scientific-research work. After three years from the beginning of the funding

of scientific-research projects, it is expected that there will be at least two successfully completed projects annually.

6. Required capacities/resources: The existing scientific-research personnel; space and capital equipment for research; additional funding.

Activity no. 8: Active cooperation with the economy.

1. Duration of the implementation of the activity: Conducted continuously throughout the year with the expected indicators in December of the current year.
2. Brief description of the activity: The University encourages and participates in the funding and implementation of a research project in cooperation with the economy which leads to direct and priority needs of the economy of the region.
3. Who has the responsibility of conducting the activity: University Administration; the Office for Science and Art, International Cooperation Office.
4. Expected results after the implementation of the activity: New knowledge necessary for the improvement and development of the economy in the region.
5. Indicators of the success of the implementation of the activity: Published research results compiled in cooperation with experts from the economy. It is expected that at least one work and will be published per year.
6. Required capacities/resources: Research staff; financial resources.

Activity no. 9: Intensification of the conditions for achieving international cooperation.

1. Duration of the implementation of activity: Conducted continuously.
2. Brief description of the activity: The International Cooperation Office and partially the Office for Science and Art will continuously work on achieving cooperation with scientific-teaching institutions from abroad to create preconditions for future joint activities in order to develop scientific activities, but also the economic development of the region.
3. Who has the responsibility of conducting the activity: University Administration; the International Cooperation Office, partially the Office for Science and Art.
4. Expected results after the implementation of the activity: Launch of research projects at the international level; opening opportunities for the development of student and teacher mobility and thus acquiring greater experience and knowledge.

5. Indicators of the success of the implementation of the activity: Annual realization of at least three new bilateral cooperation agreements.
6. Required capacities/resources: The existing staff, especially the mentioned offices; financial resources for the implementation of travel and making new contacts.

Activity no. 10: Active international cooperation.

1. Duration of the implementation of the activity: Conducted continuously throughout the year with the expected indicators in December of the current year.
2. Brief description of the activity: The University encourages and participates in the funding and implementation of the research project aimed at the development of science and activities in the field of studies in cooperation with international partners. Involvement in interdisciplinary international programmes and projects is also encouraged. The aim is to strengthen international links, promote interculturality and the international transfer of knowledge and experience.
3. Who has the responsibility of conducting the activity: The International Cooperation Office, University Administration; Office for Science and Art.
4. Expected results after the implementation of the activity: New knowledge necessary for the improvement and development of scientific activity; creation of a network of international contacts for future activities.
5. Indicators of the success of the implementation of the activity: What is expected is the involvement in at least one programme/project a year, or the publishing of at least one scientific paper per year, created on the basis of cooperation with scientists from abroad.
6. Required capacities/resources: Research staff; financial resources.

Activity no. 11: Connecting with other scientific institutions from Croatia.

1. Duration of the implementation of the activity: Conducted continuously.
2. Brief description of the activity: The University conducts activities of creating and strengthening the links with other scientific institutions of the Republic of Croatia with the aim of creating conditions for greater cooperation, dissemination of research results and the creation of a consortium for future projects in the interest of the wider scientific community. Activities include the signing of bilateral agreements, exchange of ideas and launching of joint projects and programmes.

3. Who has the responsibility of conducting the activity: The Vice-Rector for Scientific and Artistic Work and International Cooperation; Office for Science and Art.
4. Expected results after the implementation of the activity: More competent interdisciplinary programmes/projects of interest to the wider scientific and professional public.
5. Indicators of the success of the implementation of the activity: It is expected that at least one agreement will be signed annually and that at least one project/program will be implemented (in progress) annually.
6. Required capacities/resources: Research staff; regular work of scientists.

*Activity no. 12: Dissemination of scientific achievements.*

1. Duration of the implementation of the activity: Conducted continuously.
2. Brief description of the activity: The Office for Science and Art will organize activities that will enable the scientists to disseminate the results of scientific-research work. With regular journals published by the University, the organization of scientific events (lectures, panel discussions, conferences) will also be worked on.
3. Who has the responsibility of conducting the activity: The Office for Science and Art; the Vice-Rector for Scientific and Artistic Work and International Cooperation.
4. Expected results after the implementation of the activity: Transfer of knowledge and creation of a database of scientific contacts for the purposes of scientific-research activities of the employees of the University North.
5. Indicators of the success of the implementation of the activity: Organization of at least one scientific event per year.
6. Required capacities/resources: Spatial resources; financial resources; organizational human resources.

*Activity no. 13: Raising the level of quality editions for the dissemination of scientific results.*

1. Duration of the implementation of the activity: Conducted continuously.
2. Brief description of the activity: The Office for Science and Art will devote its attention to raising the quality of the existing journals published by the University in order to direct the focus from the professional to scientific orientation, ensure the involvement of international, eminent scientists in the editorial board of the journal, acquire international, scientific reviews and to ensure the visibility and accessibility of the journal to a broader scientific community in Croatia and abroad.

3. Who has the responsibility of conducting the activity: The Office for Science and Art; Vice-Rector for Scientific-artistic Work and International Cooperation.
4. Expected results after the implementation of the activity: The transfer of knowledge and creation of a database of scientific contacts for the purposes of scientific-research activities of employees of the University North.
5. Indicators of the success of the implementation of the activity: Involvement of at least 10% of new international experts; by the end of the academic year 2015/ 2016 the establishment of a journal in which only full research papers will be published
6. Required capacities/resources: Financial resources; regular work of the Office for Science and Art; a base of international contacts.

**Activity no. 14: Strengthening the library centre.**

1. Duration of the implementation of the activity: Conducted continuously according to the annual plan and budget.
2. Brief description of the activity: By regular enrichment of library materials with recent headlines, the University Library of the University North creates the necessary platform for scientific-research work of its staff and students.
3. Who has the responsibility of conducting the activity: Head of the University Library; leaders of research projects; University Administration, especially the Vice-Rector for Scientific and Artistic Work and International Cooperation.
4. Expected results after the implementation of the activity: A rich library according to the number of titles and copies of literature and the established online connections with libraries all around the world.
5. Indicators of the success of the implementation of the activity: Increase of library material for 10% per year, opening of 5% of new on-line connections per year.
6. Required capacities/resources: Spatial resources; financial resources; regular work of the employees of the library.

**Activity no. 15: Ensuring the quality of scientific activity.**

1. Duration of the implementation of the activity: Conducted continuously.
2. Brief description of the activity: The Office for Science and Art will conduct all the required measures for the ensuring of the implementation of high-quality, transparent and effective scientific activities.
3. Who has the responsibility of conducting the activity: The Office for Science and Art; Vice-Rector for Scientific and Artistic Work

and International Cooperation; all employees involved in scientific-research work.

4. Expected results after the implementation of the activity: Effective implementation of the activity on the basis of clear, competent, thought-out and transparent procedures prescribed by laws in the domain of scientific activity.
5. Indicators of the success of the implementation of the activity: After the first year in which three non-compliances per research project are tolerated, after the first year of the organization of procedures further non-compliance is not expected.
6. Required capacities/resources: Clearly defined acts; regular work of staff on the organization and quality control.

*Activity no. 16: Ensuring the implementation of scientific activities within the prescribed ethical principles.*

1. Duration of the implementation of the activity: Conducted continuously.
2. Brief description of the activity: The Office for Science and Art will encourage the implementation of scientific activities in accordance with the ethical principles of education included in the research work.
3. Who has the responsibility of conducting the activity: The Office for Science and Art; Vice-Rector for Scientific-Artistic Work and International Cooperation; all employees involved in scientific-research work.
4. Expected results after the implementation of the activity: Implementation of scientific activities with the ethical standards set by the University North.
5. Indicators of the success of the implementation of the activity: Ethical norms belong to the area of zero tolerance, which means that from the start of the implementation of research activities, it is not expected that any non-compliances will arise and if they do, that will not be tolerated.
6. Required capacities/resources: Regular work.



## 4 INDICATORS OF CONDITIONS FOR THE SCIENTIFIC ACTIVITIES OF UNIVERSITY NORTH

### 4.1 SCIENTIFIC POLICY AND ORGANIZATIONAL STRUCTURE OF THE INSTITUTION

University of North carries out scientific activities as a scientific organizations of the type "university and its components." As a scientific institution, University North carries out activities in the performance field according to the prescribed national legal framework and the Statute of the University. University North, with its administration, has six professional services that enable and directly contribute to the development of scientific activity.

Overall activities in the field of scientific activities are covered by the Department of Scientific and Artistic Activities and International Cooperation within which a separate Office for Scientific and Artistic Activity is being established. The scope of work of this Department, among other things, relates to the implementation, supervision and monitoring of all scientific activities at the University North.

The University Library, as one of the professional services of the University North, contributes to the scientific activities of the University, primarily through the acquisition and ensuring of the availability of printed and electronic resources, information and information resources necessary for scientists and researchers. Scientists have the access to two libraries with 9829 titles, subscriptions and the access to 38 databases, about 20,000 titles of foreign (electronic) journals and 350 titles of local (electronic) journals.

The Centre for IT Support of the University North is an independent non-teaching organizational unit in directly connected to scientific and educational activities.

CIMS is the abbreviation of the Centre for Publishing and Media Studies which was established with the aim of contributing to the visibility and recognition of the scientific activities of the University, not only at a national level, but also at an international one. Activities of CIMS include a system for the education of staff and students in the field of electronic publishing, through the production of scientific, but also other university publications and through the increase of their visibility and accessibility.

In collaboration with the Office for Science and Art and the International Cooperation Office, the Accounting Office of the University takes care of the financial aspect of scientific activity, but also of the financial planning of future expenses of research projects.

The legal expert service significantly contributes to the development of science at the University North through preparing and monitoring the implementation of legislation, preparing and implementing contracts and managing the archives of the scientific staff and associates.

The administration of the University North works to improve the overall scientific-research activities and development, and it also work on the promotion of a recognizable scientific activity. Presenting their scientific-research projects and other programmes to the public, the University provides a systematic popularization of science and research, and it directly justifies the reasons of its own survival and development in the local, regional and wider community. The scientific policy of the University North represents the realization of the necessary preconditions for a better and more powerful presentation of the results of the University's scientific research and for the popularization of science in the founding cities, their counties, and the society in general, within the EU and beyond.

A more detailed view of the scientific policy and organizational structure can be found in the Science study of the institution (see Attachment 4).

#### 4.2 SCIENTIFIC HUMAN RESOURCES FOR THE IMPLEMENTATION OF SCIENTIFIC ACTIVITIES

Despite its formal status as a university scientific-teaching institution, the University North is primarily an educational institution, and only then is it a scientific-research and artistic one. The reasons for that are the programmes that are currently being conducted and a growing orientation towards university and vocational teaching.

At the University North, currently there are 2,695 students enrolled (in professional undergraduate, university undergraduate and graduate study programmes, including graduate students). University classes are currently conducted by 37 employees elected to scientific-teaching and/or scientific titles and 20 doctoral students.

The total number of conducted elections to appropriate titles is greater than the number of the employed scientific staff for an average of 29%, i.e. one-third.

University North currently has no postgraduate studies of its own (independent), but in cooperation with the mentoring University of Rijeka, it has been participating from 2014 with its teacher and student potential in the implementation of the new postgraduate doctoral study "Publishing and the Media." About a dozen of employees elected to scientific-teaching titles participate in the implementation of that study, and a total of three of our doctoral students (employees of the University North) have enrolled in the same postgraduate course (with the financial support from the University North).

Table 2: Overview of the number of employed scientists in the scientific fields with regard to the level of their scientific and educational title.

		Scientific titles			Scientific-teaching titles				Doctoral students	Total
		Scientific Associate	Senior Scientific Associate	Scientific Advisor	Assistant Professor	Associate Professor	Full Professor	Tenured Full Professor		
<b>Natural Sciences</b>	Physics				1 (in re-election)					1
<b>Technical Sciences</b>	Electrical Engineering				1					20
	Civil Engineering		1			1				
	Graphics Technology	2	2	1	3					
	Mechanical Engineering	1	1	1	1	1				
	Transport Technology and Transport		1			1				
	Textile Technology		1		1					
<b>Biomedicine and Public Health</b>	Clinical Biomedical Sciences	1						1		4
	Public Health and Health Care			1				1		
<b>Social Sciences</b>	Economics	3	1		4			1		34
	Political Sciences		1		1					
	Information and Communication Sciences	3	3	3	8	2	1	1		
	Psychology		1		1					
<b>Humanities</b>	Philosophy		1			1				10
	Philology	2			3					
	History	1			1					
	Interdisciplinary Humanities	1								
<b>Artistic area</b>	Fine Art				5	1	1			7
<b>Interdisciplinary areas of Science</b>	Geography	1								1
<b>Total</b>		15	13	6	29	7	2	4	20	

Source (July 2014): Analysis of the University's own data – reports.

The scientific employees of the University North have in the last five years participated in the implementation of a total of 42 scientific-research projects and programmes (29 projects and 13 programmes). Expressed by the absolute number, 25 employees (scientists) took part in 42 projects, i.e. 0.60 or 60% of scientists per project and/or programme, or, more precisely, one scientist participated in 1.68 projects and/or programme. Considering the fact that individual employees have been elected in more than one scientific title, an average of 90% of scientific titles (scientific-teaching and/or scientific title) participated in one scientific-research project and/or programme (ratio of 38 scientific vocations in 42 projects, i.e. 0.90). The majority of research projects was carried out in the field of social sciences and humanities, and according to the fields, the distribution is shown in the table of the Overall statistics of scientific-research projects and programmes.

From the listed total number of scientists, 69% of them were included in the status of contributors to projects of other/external institutions, and less than 17% were in the role of the head researcher-project leader, while only 14% of them participated in international projects. The analysed data indicate that the majority of scientists at the University North were completely scientifically active, because according to statistics, a large number of individuals participated in a number of different projects.

The distribution of employees by departments (with a participation in projects and/or programs) is not uniform, because some departments have a very different level of participation of individuals in scientific-research activities (i.e. a project and/or programme).

**Table 3: Overall statistics of scientific-research projects and programmes**

Overall statistics			
Number of scientists who participated	Project leaders	Participated	in international projects
25	7	20	6

Source (July 2014): Analysis of the University's own data – reports

**Table 4: Detailed statistics of scientific-research and other projects and programmes**

		Scientific and other projects and programmes			
		Scientific programmes	Projects	International projects	From other institutions
<b>A</b>	Information and Communication Sciences	1	1	-	2
<b>B</b>	Sociology	1	-	-	1
<b>C</b>	Psychology	-	-	-	-
<b>D</b>	Pedagogy	-	6	3	-
<b>E</b>	History	-	-	-	-
<b>F</b>	Philosophy	-	-	-	-
<b>G</b>	Philology	-	-	-	-
<b>H</b>	Technical and Natural Sciences	9	15	2	22
<b>I</b>	Interdisciplinary	1	5	2	4

Source (July 2014): Analysis of the University's own data – reports

**Table 5: List of scientific and professional projects in which the employed scientists of the University North participated as associates and/or project leaders**

Title of projects and programmes	Project leader from the University North	Number of associates from the University North
Scientific research project of MSES (no. 227-2271694-1699), "Analytical model of the monitoring of new educational technologies in lifelong learning", scientific and artistic research	✓	3
Scientific project of MSES, "Information-communication competencies of educators"	✓	-
Project "Equal opportunities for all - better integration of Roma children into the educational system of the Republic of Croatia"	✓	-

Project "Optimization of fractal production with polymer constructs (120-036)"	-	1
Project "Comparative study of the functioning of management in Croatian companies and companies of developed countries - Implications for the development of the Croatian management"	-	1
IPA project "Knowledge for All"	✓	-
Project "Modernization of web technologies"	✓	-
Project "Modernization of graphic design"	✓	-
International project "English in Logistics"	-	1
International project "Cultural Values"	-	1
Project "Role of Social Networks in the Knowledge Society"	-	1
Project "Modulation of the systemic inflammatory response in heart surgery"	✓	-
Project "Study of the model of assisted circulation and respiration"	-	1
Project "Extracorporeal circulation in emergencies"	-	1
International project "Randomized Double-blind Placebo–Controlled Phase 3 Study to Assess the Safety and Efficacy of ATR-123 on Subjects with severe Sepsis and Coagulopathy"	-	1
Project "New technologies in diagnostics and management of marine propulsion systems"	-	1
Project "Applied macroeconometrics in Croatia: the VAR methodology"	-	1
Project "Financial stability, macroeconomic policy and financial market activity"	-	1

International project "TEMPUS Fostering Entrepreneurship in Higher Education"	-	1
Project "Research of long-term effects of war on the health of population"	✓	
Project "Mapping and verification of traffic signals by using computer vision and satellite navigation"	-	1
Project "Evaluation of the quality of multimedia educational spaces and systems"	(Prof. PhD Siniša Fajt, Faculty of Electrical Engineering and Computing, Zagreb)	4
International project "Tempus IV" – "Modernising Teacher Education in a European Perspective"	-	2
Scientific project "Prediction of residual stresses due to solidification in molded plastic layers"	-	1
Scientific project "Modeling bonded structures in automotive applications during striking effects"	-	1
Scientific project "Test od detaching, experimental and numerical aspects"	-	1
Scientific project "Quantum field theory, noncommutative spaces and symmetry"	-	1
Scientific project "Lie groups, integrable systems and symmetry"	-	1
Scientific project in progress "Bioactive compounds in food"	-	1
Scientific project of MSES "Evaluation of quantitative and qualitative criteria of the process of graphic reproduction"	(Prof., PhD Nikola Mrvac, Faculty of Graphic Arts in Zagreb)	2
International project "Improvement of reliability in production and exploitation of welded construction and products"	-	1
International "Erasmus Mundus Basileus II" project	-	1
International "Erasmus+ Key Action 2" project "Innovation Gate – Knowledge Alliances"	-	1

Scientific project "Research of new multi-purpose dyes and optical brighteners"	(Prof. PhD Vesna Tralić-Kulenović)	1
Professional project "Sanation of landslides in northwestern Croatia"	-	1
Professional project "Planning of road widening in a hilly landscape"	-	1
Professional project "Planning and supervision of building foundations on problematic soil"	-	1
Professional project "Planning and supervision of building a construction pit"	-	1
Professional project "Development of the project of the establishment of a hybrid digital printing center of the Croatian Post"	-	2
Professional project "Development of the project and the establishment of the DVBT2 digital television standard of the Croatian Post"	-	2
Project "Development perspectives of higher education in the city of Varaždin"	-	A larger number of the University's researchers
Project "International Competences for the Unemployed" in the Leonardo da Vinci programme framework	✓	-

Source (July 2014): Analysis of the University's own data – reports

A more detailed view on scientific-teaching part of the employees of the University North can be found in the Scientific study of the institution (see Attachment 5).



#### 4.3 PHYSICAL ASPECTS OF THE FEASIBILITY OF SCIENTIFIC ACTIVITIES

Scientific-research work and publishing is primarily financed from the University's own funds, and a truly small part is financed from budget funds (approved research projects and grants). Furthermore, there is a growing number of registered and conducted projects financed from other sources (mostly international, European and other).

University North regularly monitors the spatial and technological adequacy and appropriateness of the equipment, and prepares its own and joint, national and EU projects (in terms of equipment used in scientific and scientific-teaching purposes).

The planned allocation of financial resources provided by the University North for scientific research and scientific development will be carried out in accordance with the methodology and distributions used by the EU for scientific-research priorities (e.g. in the Horizon 2020 framework programme).

University North ended 2014 with significant capital investments in the two university campuses in Varaždin and Koprivnica, which will, with the completion of equipping represent a significant space for scientific and research activities (laboratories and other scientific-research facilities), and scientific-teaching activities of the University North.

At two locations, i.e. two university centres, one in in Koprivnica and one in Varaždin, the University covers a total of 7473 m<sup>2</sup> of space that is used in scientific-teaching purposes. Both centres count a total of 42 rooms for laboratory and other scientific activities that constitute 2174 m<sup>2</sup> in total quadrature of the University area and count 1112 research workplaces. In addition to the mentioned, University North has 57 cabinets/ offices for the employed scientists of an average size of 17.4 m<sup>2</sup>.

University North will direct most of its "scientific" investment (quantitative, financial, etc.) primarily in the development of its scientists/researchers and their scientific-research projects, and secondarily in the procurement of scientific-research equipment, and will try to invest in the building of new facilities the least.

Scientists have at their disposal the latest technology equipment of superior quality which is there in sufficient quantities for carrying out successful scientific-research activities.

Within the scope of the work of the University Library, scientists have access to the following databases: Academic Search Complete, Current Contents, Emerald, Eric, Medline, Scopus, Science Direct, Springer, Web of Science, Biomed Central, CBC, EBMR, Inspec and MathSciNet.

The completion of the Centres for the preparation and development of digital and other (print and multimedia) scientific and teaching contents both in the University Centre Varaždin and Koprivnica is under way. It has to do with technologies (preparation and realization of digital and hybrid printing) which would be used as a laboratory for scientific-research work and as a scientific-teaching space. University North is the co-founder and co-owner of one third of the Varaždin Technology Park, which is a significant platform for development and scientific research.

Data presented in this chapter are described in more detail in the Scientific study of the institution (see Attachment 6).

## 5 LIST OF ATTACHMENTS

List of attachments from the scientific study of University Northin which the data presented in this strategy are explained in more detail:

1. History of the University North
2. A detailed review of the mission and vision of the University North
3. Review of the qualitative analysis of the feasibility of the scientific strategy
4. Overview of the scientific policy and the organisational structure
5. Scientific research-teaching personnel principles for the implementation of scientific activities
6. Spatial resources, equipment and financial support for the implementation of scientific activities

Attachment 1

**History of the University North**

## **HISTORY OF THE HIGHER EDUCATION INSTITUTION - IN BRIEF**

University North was created with the merger of two institutions: the Polytechnic of Varaždin merged with the Media University, whose organization was created integrated university - University of the North. The merger was carried out under the provisions of the 69th Institutions Act, and under the Article 75 of the same Act and Article 522 of the Companies Act the registration at the Commercial Court in Varaždin was implemented on 22 January 2014, under company's (court) registration number: 060260692 and personal identification number: 59624928252. With the merger, the name of the institution was changed into University North, with its headquarters in Koprivnica, Trg dr. Zarka Dolinara 1. University North is represented by two University Centers: the University Centre Koprivnica and the University Centre Varaždin. University North carries out 11 study programmes and is comprised of 11 Departments, which are the following:

- 1) Department of Journalism,
- 2) Department of Business and Management in the Media,
- 3) Department of Media Design,
- 4) Department of Communication Sciences and Public Relations,
- 5) Department of Business Economics,
- 6) Department of Electrical Engineering,
- 7) Department of Mechanical Engineering,
- 8) Department of Multimedia, Design and Application,
- 9) Department of Civil Engineering,
- 10) Department of Technical and Economic Logistics,
- 11) Department of Biomedical Sciences.

The founder of the University North is the "Media Uni" Ltd. The founders of the company "Media Uni" are the City of Koprivnica and the company VELV Ltd., whose shares have been fully transferred to the City of Varaždin. The above shows that the founders of the University North are the City of Koprivnica and the City of Varaždin in equal shares. University North has 122 employees and 245 external associates. The main activity of the University North as a scientific organization pertains to the teaching-scientific area.

The beginnings of the development of the project of establishing and constructing a university in north-western Croatia date back to the period of a little more than 13 years or, more precisely, to 17 May 2001. Namely, the teachers and the administration of the then School of Electrical Engineering in Varaždin, with the approval of the relevant Ministry and with the help of the city of Varaždin, established a professional study of Electrical Engineering - accredited four-year college (Class: 602-03/01-01/2; File No.: 2186/01 -03-01-7), which operated from the aforementioned date at the said high school. The financing of the public institution was in the same year taken over by the Ministry. After several years of successful work, a sufficient number of students enrolled and the first employment of teachers with the necessary elections in teaching positions, the conditions needed for the establishment and growth of the College into a

recognizable institution form were achieved. Thus, on the basis of a License for carrying out scientific activities issued by the Ministry of Science and Technology (Class: 602-01/01-7/103, File No.: 533-08/828-02-7) on 16 May 2002, the City Council of the City of Varaždin, during their 28th session which was held on 19 October 2002, adopted a decision on the new name of the institution, "College of Electrical Engineering", Accredited; with the study programme of "Electrical Engineering", orientation of "Automation" and "Biomedical Electronics". It was also decided that the headquarters of the newly named institution would be in Križanićeva Street in Varaždin, house number 33/6,

During 2003 and 2004, the "College of Electrical Engineering" developed two new study programmes, the vocational study of "Mechanical Engineering" and professional study "Multimedia, Design and Application." The conditions were met, i.e., the legal provisions needed for re-registering a college which carries out three different professional study programmes in an institution of higher order, i.e. a polytechnic, were met. Therefore, after obtaining the License issued by the Ministry of Science, Education and Sports for the implementation of professional studies ("Electrical Engineering"; orientation of "Automation" and "Biomedical Electronics" - Class: UP/I-602-04/05-16/475, "Mechanical Engineering" - UP/I-602-04/05-16/477, "Multimedia, Design and Application" - UP/I-602-04/05-16/479, all File No.: 533-07-05-2) on 7 July 2005, the City Council of the City of Varaždin, at the meeting held on 8 November 2005, adopted a decision on the establishment of a new higher education institution of higher order under the name "Polytechnic of Varaždin". The institution continues to develop with regard to the development of new study programmes and, after making new studies and getting them approved by the Ministry of Science, Education and Sports, two new study programmes were implemented in the academic year 2007/2008, both from the area of technical sciences. The study programmes in question were the study programme of "Technical and Economic Logistics" and the study program of "Civil Engineering", with the orientation of "Construction" and "Building Construction". On the basis of the Decree of the Government of the Republic of Croatia from 12 November 2007, the Polytechnic of Međimurje was established in Čakovec, while the rights and duties of the founder were carried out by the Ministry of Science, Education and Sports. Under the initiative of the Government of the Republic of Croatia, the Polytechnic of Varaždin, supporting the development of higher education in north-western Croatia, carried out its two (existing) study programmes in Čakovac, in a public institution still in the process of establishment (by joined forces), and in the next two years carried out the mentoring in that same institution. The foundations of mutual cooperation are both the newly issued license of MSES from 21 December 2007 for the implementation of the professional study of "Computing", and the teaching staff of the Polytechnic of Varaždin.

Taking into consideration the development of higher education in other parts of Croatia, the city leaders, the administration of the institution and teachers realized that the then form of the institution (polytechnic) was inappropriate with regard to the development needs and aspirations of the

region, i.e. that it was very limited in terms of the vertical of the then existing study programmes, levels of MSES funding, but also that there was a large gap between the development of higher education in north-western Croatia compared to other parts of the Republic of Croatia in terms of the development of higher education institutions.

Namely, in the cities of coastal Croatia, the local government enabled the launch of no less than three new universities or, to be more precise:

- University of Zadar - established on 8 July 2002. Created by the integration of the Faculty of Humanities and Social Sciences in Zadar - component of the University of Split, Student Center of Zadar and the Teacher Training College in Zadar, which transforms it into a new institution - the University of Zadar.
- On 16 December 2003, with the integration of the Polytechnic of Dubrovnik and the dislocated study of Tourism - Faculty of Economics of the University of Split, with the merger of the Student Centre of Dubrovnik, the University of Dubrovnik was founded.
- The University of "Juraj Dobrila" in Pula was established on 29 September 2006 with the integration of the Faculty of Economics and Tourism "Dr. Mijo Mirkovic" and the Teacher Training College in Pula.

Teachers and the administration of the Polytechnic, by recognizing the aforementioned trends in the higher education of the Republic of Croatia and perceiving the meaning, historical terms, but also the needs of business entities, in addition to taking into account the perspective of the future of the student population, and with regard to the number of inhabitants of our region, made a decision to undertake activities necessary to transform the Polytechnic into a university. Legal provisions (Act on Scientific Activity and Higher Education - Article 54) in this regard define the following: (1) A university is an institution that establishes and conducts university studies in at least two scientific and/or artistic areas in a larger number of fields. Given that the Polytechnic conducted a larger number of study programs in various fields - specifically five programmes, but in only one scientific area - i.e. technical sciences in order to meet the labour market requirements and the conditions of transforming into a university, the institution made a decision to make a development plan of a new degree program in another scientific area, namely the area of "Biomedicine and Health", with the professional study of "Nursing". Throughout the next two years the number of students increased to almost 3000. The institution employed (through employment and external cooperation) 50 new professors. Financial operations were stabilised, excess revenue intended for investment in the development of laboratories and in the improvement of material conditions, working conditions and infrastructure in general was realized.

Since 2006, the City of Koprivnica is also parallelly (in relation to the City of Varaždin) working on a project of the development of higher education and the establishment of a university. The City established a Committee for the Development of Higher Education and the City of Koprivnica signed an agreement with the Republic of Croatia on the donation of the former barracks in Koprivnica, and in return it made a commitment to establish a university (until the end of 2013), and to build a new building of the municipal (county) court for the needs of the Republic of Croatia. Recognizing the needs of the citizens of north-western Croatia (region with more than 500,000 inhabitants), representatives of the cities of Varaždin and Koprivnica launched an initiative for the development of the first regional University of the Republic of Croatia, operating equally in both the cities/counties. Namely, by recognizing the fact that cities together have more than 80,000 inhabitants and the counties (without the adjacent ones) nearly 300,000, the idea of a realization of a project of forming a university in accordance with the needs of the citizens of the mentioned region is rational and realistic. In the early 2012, the cities of Koprivnica and Varaždin acquired (took over) the ownership rights to the institution of the Media University, an institution that did not carry out scientific activities since the grant of the license. On 12 September 2012 a partnership agreement between the cities of Varaždin and Koprivnica was signed. The agreement laid the foundations and established the guidelines in the development of a modern European university, oriented towards the needs of the local community.

Undergraduate university study programmes of the Media University were implemented in Koprivnica in the academic year 2012/2013, and graduate university study programmes were implemented that same academic year in Varaždin. Media University was established to meet the academic educational needs in the field of media and communication, and to encourage the development and improvement of analysis and criticism of the media and communication in Croatia and south-eastern Europe. The University offers study programmes for future journalists, media managers, media designers, experts in communication, public relations, and business economics. Taking into account the fact that quality education in journalism, public relations, media design, media communications, and business in the media cannot be acquired without the principal settings - critical thinking, academic writing, but also practical training, i.e. simultaneously enabled access to and cooperation with the professional environment, it was decided that academic and practical work would be represented in all study programmes of the University. The objective of the University is to contribute to the development and progress of communication, modern and independent media, and generally, the development of the region in the global context. By recognizing the necessity for an integrated and comprehensive approach to education in a variety of professions, the specific character and one of the key characteristics of the University is its interdisciplinary character. For the same reason, the proposed programs offer, in addition to key knowledge and skills for the mentioned branch, i.e. a narrowly defined profession, a number of courses common to all the mentioned branches. Students acquire the basic knowledge in the form of compulsory



courses, as well as optional and additional skills and knowledge in the form of elective courses.

On 18 March 2013 in Koprivnica, i.e. 21 March 2013 in Varaždin, the City Councils of the founding cities made a decision on the integration of the Polytechnic and the Media University. The Senate of the Media University, at its session held on 19 December 2013, made a decision that from the date of the integration the new institution would carry the name University North. With the Decision of the Commercial Court in Varaždin from 22 January 2014, the process of integration of the two institutions was completed. Therefore, University North is an institution whose current founders are the cities of Koprivnica and Varaždin, and it is organized in two equal university centres that operate in those cities.

Until the making this document, University North did not have a systematically elaborated comprehensive strategic programme of scientific research which is why the "Strategic programme of scientific research at the University NORTH for the period from 2014 to 2019" in some of its units considers fields and areas that are not only scientific, but are associated with the future development of science and scientific research at the University North. The consequence of that is that the "Strategic programme of scientific research at the University NORTH for the period from 2014 to 2019" is elaborated quite flexibly and dynamically. It is elaborated so that it can be well adapted to possible dynamically observed changes which ask for new changes and amendments (possible corrections) at the time when the strategic programme is adjusting to the observed flaws or advantages in its implementation, which in the end corresponds to the planned realization of this strategic programme of scientific research for the five-year period and the complete strategic development of the University North. Changes and adjustments take into account the influence of the University's micro and macro environment in the coming five-year period in every aspect, and the overall condition of the society, especially in the immediate academic environment that will certainly have a significant impact on the partial and very dynamic, but still necessary changes in the course of the planned five-year implementation.

**Attachment 2**

**A detailed review of the mission and vision of the  
University North**

The primary mission of the University North is the education of high quality researchers for the needs of science and the Croatian society, along with the achievement of better and internationally recognized results and outcomes of scientific-research projects and the teaching curriculum of the University North and its partners. In order to realistically achieve that, it is necessary to have a clear and systematic vision of the development of the University, which (in accordance with the basic development strategy of the University), has to open new areas of scientific research and teaching that have so far primarily been oriented towards educational and vocational (specialist) development of most study programmes and research initiatives at the University.

Consequently, the overall strategy of the development of science of the University North in the next five years (explicitly stated in the document: "The strategic programme of scientific research at the University NORTH for the period from 2014 to 2019") is primarily focused on:

- a) scientific advancement and affirmation of its existing educational programmes for which the University North was immediately recognizable;
- b) systematic establishment of an increasing number of its own (national and international) scientific-research and scientific-artistic projects, which are reasonably recognizable both nationally and internationally due to their innovativeness and proactivity, and their excellence and undisputably standard quality and applicability;
- c) systematic introduction of quality and affirmed new programmes required by the immediate environment, the region and the whole society in which the University North operates, and beyond (the area of the EU and the global environment);
- d) systematic development and affirmation of programmes that nurture and develop all the particularities of the founding cities and broader regional particularities (both Croatian and European), especially the particularities that are oriented towards the wider area of northern Croatia.

The orientations of this university strategy of the development of science are diverse. Firstly, it is necessary to reorient and reorganize the current organization of the teaching process in the direction of "a more scientific orientation and foundation" which would then relieve a substantial part of the working space and time for scientific and scientific-artistic research and testing. The immediate aim of the first direction is the achievement of a real empowerment of scientific and scientific-artistic research and testing through various incentives and grants, such as the realization of a larger number of the University's own scientific-research and scientific-artistic projects. That would lead to the actualization of a greater base for establishing new university graduate study programmes, university centres, institutes, laboratories, new multimedia systems and new institutes in social sciences and humanities, technical and natural sciences, biomedicine and health; and also to the launch of new postgraduate doctoral studies and postgraduate specializations, which can be

independent and/or a part of the work programme of doctoral schools, interdisciplinary and collaborative, national and international, but certainly very applicable and recognizable. Therefore, it is necessary to actively support and strengthen the systematic work on the University's own realization of larger domestic (e.g. Croatian national foundation for science and the like.) and international (e.g. Horizon 2020 and the like) scientific-research and scientific-artistic projects. Secondly, it is necessary to achieve targeted programme continuity and increase the changes aimed at the transformation from "professional" to "university" and from "old" to "new" scientific study plans and programmes, in which process the preference should always be given to those for which realistic analysis of their potential and community needs show a real justification, and for which there is a need and interest, but an orientation direction to profit which is to the detriment of science, art and professionalism should by no means be expressed. Proactivity and achievement of recognition, innovativeness and creativity of new programmes and orientations must be encouraged. Thirdly, a truly important direction is recognizable profiling both of the University's own and joint scientific and scientific-artistic research and testing related to the specificities of the founding cities (Varaždin and Koprivnica) and their immediate and wider regional-spatial environment and environment of interest, with the north of Croatia and the wider regions in the EU (by realization of sustainable development and affirmation of scientific-research based projects and programmes that foster and develop all the particularities of the founding cities and broader regional particularities - both Croatian and European; especially the particularities oriented on a wider area of northern Croatia). University North must co-exist with its founding cities and their regions in Croatia and the EU; the programme should encourage the development of science should actively encourage the formation of a connection between the scientific potential of the University and the scientific-research and scientific-artistic needs and interests of cities, counties and wider regions of Varaždin and Koprivnica in order to influence a real, common scientific and economic development. This will facilitate and support the preservation and improvement of their unique natural, cultural and scientific heritage. Therefore, for everything mentioned to be realistically and well supported (by the University North), and analytically and continuously checked, evaluated and validated, it is also necessary to install a permanent link with the process of insuring and verifying of optimum quality, both spatial, financial and material, and the most important technical-technological infrastructural support, which must always strive for quality assurance and excellence both in the narrow and broad sense, e.g. in the construction of all supporting systems for the improvement of science and scientific support, along with scientific excellence – from virtual, over physical to mixed (hybrid).

## SCIENTIFIC MISSION AND SCIENTIFIC VISION

The general vision of the University North is to be the leading scientific, artistic, professional and socially responsible research and higher education institution for the education of personnel in area of technical, biomedical, biotechnical, social and humanistic, and interdisciplinary sciences and art in the region of north-western Croatia and its environment within the country and beyond, i.e. in the EU. Graduates of the University will be and will remain desirable and employable professionals due to the high level and the width of the acquired knowledge and competencies, prepared for independent and creative work in science, art and the profession, and for the needs of the economy in the north-western region of Croatia and in its environment within the EU and beyond. In its work, University North cherishes the principles of quality in science and higher education, the principles of ethics, creativity, transparency, cooperation with other institutions of higher education and, above all, good interpersonal relations. In its vision, the University emphasizes the development of all aspects of the activities of the institution of higher education - scientific, artistic and professional - in order for it to become a recognized regional leader in the area of technical, biomedical and interdisciplinary sciences. In those areas the University will develop new and interdisciplinary study programmes on the second level of the Bologna scale. With that process, graduates will receive additional competencies needed to effectively and independently solve problems within their scope to the benefit of the social community and the economy. In addition to professional competencies, students are continuously enriched with values of good interpersonal relationships, ethics, fairness, teamwork and cooperation, which are desirable traits in the labour market. The University will also, in collaboration with its mentor University of Rijeka (and possibly other universities), organize and conduct doctoral scientific studies in the interdisciplinary field of science. In accordance with the needs of the labour market and jobs in short supply, the University will develop new programmes on the first level of the Bologna process in order to actively monitor the planned dynamic of the development of the real sector of north-western Croatia, e.g. In the field of technical and biotechnical sciences. The most important features of the statement of mission and vision of the University North will be included in the oath of graduates during the graduation ceremony, which will be a publicly declaration of the value of the institution. The oath of the University North addressed to graduate students shall read (paraphrased): "That they will, as academic citizens, respect University North and strive to increase its social, scientific, artistic and professional status, according to their possibilities. That they will in their work always respect and be guided by the principles of science, art and profession, and will continue to deepen and develop their knowledge so that they could contribute to progress and prosperity of our community as much as possible, and will use the acquired competencies for the good and the honour of our country and the University North. That they will, when carrying out their own activities, take care of human relations and needs, and will encourage cooperation in the light of the diversity of ideas, attitudes and views."

The general mission of the University North is the education of competent scientific, artistic and professional staff for the needs of the real economy, social needs and the health system in the region of north-western Croatia through quality performance of university studies according to the demands of the Bologna declaration. In the implementation of this objective, University North is organized as a dynamic organization that continuously monitors, applies and installs scientific and professional knowledge with the modernization of existing and the development of new study programmes, promotes the concept of lifelong learning and deepens and maintains contact with the economy and cooperation with the related institutions of higher education both in Croatia and abroad. In its primary activity, that of higher education, the University is currently being established as the dominant technical, social and biomedical institution of higher education and thus significantly contributes to the development of regional economic entities, and also educates the staff needed for the purposes of care in health facilities in the wider region. Given the fact that the institution educates the staff needed for jobs in short supply, and that it is the only higher education institution of its kind in the region (based on the variety of study programmes and the size), the University is continuously trying to meet the labour market needs of the region (north-western Croatia), an area that has more than 500,000 inhabitants. Each time a new entry is recorded, an increasing number of applications of students from other regions of the Republic of Croatia and the neighbouring Bosnia and Herzegovina is recorded. The above is prompted by excellent implementation of the educational process in accordance with the Bologna system of higher education. The mobility of students and teachers among related institutions of higher education is encouraged, along with the development of laboratories and practicum rooms for the purposes of scientific and professional work, and the involvement of students in their work. Cooperation between students and mentor teachers and mentors from business entities is also encouraged, along with the transfer of knowledge through publishing activities and collaboration with the industry. The importance of the University North stems from the development needs of the region of north-western Croatia in which the facility operates, i.e. its units of local self-government: Varaždin, Koprivnica-Križevci and neighbouring counties for scientific and technical personnel of various technical, biomedical, biotechnical, social, artistic and interdisciplinary profiles. The perceived lack of scientific and professional profiles which will now be educated at the University North are undoubtedly hindering further development of existing enterprises, cultural and social development of the region, but also the attraction of more extensive foreign investment in the region.

The scientific mission of the University North is in compliance with the general mission of the University; its priority is the education of competent scientific and professional staff (in scientific and teaching terms) for the needs of the real economy, the health system and social needs in the region of north-western Croatia through quality performance of graduate, professional and interdisciplinary studies according to the Bologna declaration. In the implementation of this objective, University North is organized as a dynamic organization that

constantly monitors, applies and installs scientific and professional knowledge with the modernization of existing and the development of new study programmes, promotes the concept of lifelong learning and deepens and maintains contact with the economy and cooperation with the related institutions of higher education both in Croatia and abroad. University North, in its strategic programme of scientific research for the period from 2014 to 2019 (abbreviated "Strategic Research Program") for a scientific mission, i.e. the basis of its scientific mission, puts organization and implementation of scientific research, university education of young people and their involvement in scientific research and testing, along with the development of knowledge and transfer of technology, onto industry and the society in general. The strategic five-year scientific programme of the University North, as a "university of the Croatian north", is based on the proactive maintenance of acquired values of the University and its environment and the development of new innovative and creative new ones, and in building and maintaining its own identity in the academic and social community. The slogan behind such scientific strategic orientation is "innovative, creative and recognizable." A noticeable difference between University North and other universities is reflected in the fact that, as the youngest Croatian university, it is not concerned with too much inertia, inefficient upgrade, protection on many levels of the achieved positions, fear of innovation, creativity, recognition, the Bologna mode of study and possible consequences caused by major scientific-teaching changes. The conditions for the realization of a strategic scientific orientation (realization of the vision of the University North) characterized by the slogan "innovative, creative and recognizable" are: investing great effort in scientific and teaching work in the immediate future of the University, achieving a stronger academic cooperation and tolerance, constant encouraging of a dynamic and proactive scientific and teaching activities and accepting innovative, creative and distinctive scientific development that strives for excellence in all segments of the University North and its active environment. University North cherishes the principles of quality in scientific-research and scientific-teaching work and the principles of ethics, creativity, transparency, cooperation with other international and national higher education scientific-teaching and research institutions and, above all, the development of good academic and interpersonal relationships.

To ensure the realization of the described mission, the scientific-research strategy of the University North provides the development of platforms through which it will constantly upgrade its own scientific quality, but will also actively participate in the scientific development of the local community. The University will develop the mentioned platforms in terms of synergic cooperation with public and private businesses in the region by applying the concept of research – Living Lab – oriented towards customers which acts in the city-agglomeration-region context and which will integrate both research and innovation processes applicable in real economic life.

The scientific vision is adapted to the general vision of the University North, which states that the University North aims to be the leading

educational, scientific, professional and socially responsible higher education institution for the education of personnel in the area of technical, economic, biomedical and biotechnical sciences in north-western Croatia. University North will take account of the formation of ever more independent and creative people, i.e. of a desirable/competent and employable professionals with the adopted knowledge outcomes required by the qualification frame of their professions and the targeted labour market. University North will nurture, develop and constantly upgrade its principles of scientific quality in the education of higher education professionals and scientists, the principles of scientific ethics and creativity, transparency and democracy, permanent cooperation with other domestic and foreign institutions of higher education and, above all, good academic and interpersonal relationships.



Attachment 3

**Review of the qualitative analysis of the feasibility  
of the scientific strategy**

The orientations of this university strategy of the development of science are diverse. Firstly, it is necessary to reorient and reorganize the current organization of the teaching process in the direction of "a more scientific orientation and foundation" which would then relieve a substantial part of the working space and time for scientific and scientific-artistic research and testing. The immediate aim of the first direction is the achievement of a real empowerment of scientific and scientific-artistic research and testing through various incentives and grants, such as the realization of a larger number of the University's own scientific-research and scientific-artistic projects. That would lead to the actualization of a greater base for establishing new university graduate study programmes, university centres, institutes, laboratories, new multimedia systems and new institutes in social sciences and humanities, technical and natural sciences, biomedicine and health; and also to the launch of new postgraduate doctoral studies and postgraduate specializations, which can be independent and/or a part of the work programme of doctoral schools, interdisciplinary and collaborative, national and international, but certainly very applicable and recognizable. Therefore, it is necessary to actively support and strengthen the systematic work on the University's own realization of larger domestic (e.g. Croatian national foundation for science and the like.) and international (e.g. Horizon 2020 and the like) scientific-research and scientific-artistic projects. Secondly, it is necessary to achieve targeted programme continuity and increase the changes aimed at the transformation from "professional" to "university" and from "old" to "new" scientific study plans and programmes, in which process the preference should always be given to those for which realistic analysis of their potential and community needs show a real justification, and for which there is a need and interest, but an orientation direction to profit which is to the detriment of science, art and professionalism should by no means be expressed. Proactivity and achievement of recognition, innovativeness and creativity of new programmes and orientations must be encouraged. Thirdly, a truly important direction is recognizable profiling both of the University's own and joint scientific and scientific-artistic research and testing related to the specificities of the founding cities (Varaždin and Koprivnica) and their immediate and wider regional-spatial environment and environment of interest, with the north of Croatia and the wider regions in the EU (by realization of sustainable development and affirmation of scientific-research based projects and programmes that foster and develop all the particularities of the founding cities and broader regional particularities - both Croatian and European; especially the particularities oriented on a wider area of northern Croatia). University North must co-exist with its founding cities and their regions in Croatia and the EU; the programme should encourage the development of science should actively encourage the formation of a connection between the scientific potential of the University and the scientific-research and scientific-artistic needs and interests of cities, counties and wider regions of Varaždin and Koprivnica in order to influence a real, common scientific and economic development. This will facilitate and support the preservation and improvement of their unique natural, cultural and scientific heritage. Therefore, for everything mentioned to be

realistically and well supported (by the University North), and analytically and continuously checked, evaluated and validated, it is also necessary to install a permanent link with the process of insuring and verifying of optimum quality, both spatial, financial and material, and the most important technical-technological infrastructural support, which must always strive for quality assurance and excellence both in the narrow and broad sense, e.g. in the construction of all supporting systems for the improvement of science and scientific support, along with scientific excellence – from virtual, over physical to mixed (hybrid).

It was therefore necessary to start the development strategy from a detailed and complete analysis (SWOT) of all the strengths and weaknesses, opportunities and obstacles to the development of science at the University North. Very briefly described: the greatest strengths and opportunities lie in the existing (already achieved) results and previous tradition of developing quality human resources and its own projects, laboratories and the technology park, and in the unique natural position of the University North, i.e. the attractiveness of the founding cities and the counties in which they are located. Of course, University North also actively participates in the wider regional EU environment of university and scientific interest and activity. The basic obstacles and main weaknesses lie in a very poor enforcement of the national and regional strategy of the development of science and the already achieved continuity of unsystematic, disorganized and truly uneven (almost "ad hoc") investment in science and scientific activity in general; with a visible ongoing resistance towards everything that is new, different and was previously unknown, both in the founding cities and their counties (in which they are located), and in our academic community, especially in the expressed persistent obstructive actions of certain rigid academic and administrative structures in the immediate environment and in some of the national administrative structures and universities.

It is important (in short) to notice that this "Strategic programme of scientific research at the University NORTH for the period from 2014 to 2019" implementary monitors the action plan from 2014 to 2019. Solely because of the necessary credibility and accountability, individuals and authorities of the University North, who will in practice implement all that is planned and listed in the Strategy, a series of figures, data, information and knowledge that underpin this document is presented here. Data (information and knowledge) have been systematically collected and/or are based on current estimates and projections outlined as realistically as possible. The degree of reliability of reported estimates and predictions is exclusively associated with the use of the majority of the famous ("crisp") and some relatively obscure ("fuzzy") factors. Therefore, it is necessary to understand that the effort of this document is to make predictions as realistically as possible, and to recognize as clearly as possible and explicitly express in the predictions all that has been taken into account (the so-called "crisp" and "fuzzy" environment of judgement and reasoning).

SWOT ANALYSIS OF THE FEASIBILITY OF THE STRATEGIC PRORAMME (Appendix 1)

SWOT analysis of the feasibility of the development of scientific activity at the University North:

<p><b>Strengths:</b></p> <ul style="list-style-type: none"> <li>- equipped space for scientific-research and artistic work</li> <li>- laboratory and field equipmet ;</li> <li>- adequate human resources;</li> <li>- future potential in a large number of ambitious students;</li> <li>- access to a part of its own financial resources.</li> </ul>	<p><b>Weaknesses:</b></p> <ul style="list-style-type: none"> <li>- lack of research;</li> <li>- lack of specific scientific study programmes;</li> <li>- continuity in the development of human potential;</li> <li>- continued investment;</li> <li>- - lack of a unique scientific journal of the University.</li> </ul>
<p><b>Possibilities:</b></p> <ul style="list-style-type: none"> <li>- development of scientific-research projects;</li> <li>- development of new graduate studies;</li> <li>- interdisciplinary affiliation;</li> <li>- possibility of greater scientific-research cooperation;</li> <li>- possibility of formalizing the contract of international and national cooperation;</li> <li>- greater scientific productivity;</li> <li>- economic affiliation;</li> <li>- - development of platforms for the placing of knowledge and scientific achievements.</li> </ul>	<p><b>Dangers:</b></p> <ul style="list-style-type: none"> <li>- unsystematic and vague features of further action;</li> <li>- impact of recession-financial activities;</li> <li>- decrease of research motivation;</li> <li>- poor management;</li> <li>- failure to renew and modernize the strategy;</li> <li>- failure to achieve the conditions needed for carrying out successful scientific activity.</li> </ul>

DETAILED EXPLANATIONS:

Strengths

1. Last spring the University invested in the equipping of adapted facilities for the implementation of scientific-research work and the teaching listed in the curriculum. Spaces are multifunctionally decorated in accordance with the standards and recommendations for the performance of educational and

scientific work. The University has at its disposal two complexes of new, modern buildings - one in Varaždin and one in Koprivnica.

2. Laboratories are equipped with cutting-edge technology that enables research in the study programme fields, while IT equipment monitors the latest trends and allows the implementation of the most challenging tasks. The University owns numerous pieces of equipment supplied by sponsors (apparatus with electroresistive strain gauges - Wheatstone bridge) that was used for scientific purposes during the implementation of research for the needs of a doctoral dissertation and that remained at the disposal of scientists at the University. Equipment can also be used for scientific research, and the results can be directly applied in the economy. In this way, one can safely say that spatial resources and equipment of the University enables scientists to achieve top results.
3. University North employs high-quality scientific-research staff that participates in the implementation of the teaching of study programmes. Of the total number of employees, 38 of them have been elected in scientific-teaching and/or scientific titles. However, the University is developing its own future scientific cadre which is currently enrolled in postgraduate doctoral studies. The ratio of experienced and young scientists is optimal and future PhDs can count on full support in their research development, and also on competent mentoring. The synergistic action of these two groups is why a number of scientific texts are already in preparation.
4. In the moment of the compilation of this strategy, the University has 2,695 active students and there is a tendency of growth of the listed number in future enrolments, and especially with the opening of new space resources that will enable the University to enrol a larger number of students and organize superb, high-quality teaching. This number ensures a sufficient number of students who show a strong interest in the involvement in scientific research. Ambitious students who demonstrate scientific results in the future may become a part of the scientific cadre of the northern region of the Republic of Croatia and through their work contribute to scientific and economic development.
5. University North, partly co-financed by the local government, has its own financial resources which, although insufficient for the overall scientific activity, significantly contribute to scientific-artistic research. In that regard, the autonomy of the

University enables the allocation of total funds through procedures precisely in that direction.

### Weaknesses

1. Given the fact that the activities of institutions from which University North was created were largely directed towards the implementation of professional programmes, the scientific segment did not experience significant development. Due to that, there were also no investments in scientific-research projects for the implementation of which there was primarily a lack of precise and comprehensive research strategies. In such an environment, scientists and potential scientific personnel were not motivated to conduct research activities or work on the development of specific conceptual, planning and project feasible research programmes. Everything here described results in a lack of scientific research.
2. Due to the aforementioned reasons, i.e. being directed towards the professional field, study programmes were until recently developed in the field of professional studies. Graduate studies of Public Relations and Business Economics have only recently been implemented. Currently, that means that there is a lack of specific scientific-research and artistic study programmes, which is a weakness which can very quickly be overcome through the development of scientific activities and the scientific resources necessary for the implementation of scientific-research teaching. Scientists involved in the implementation of professional studies will in that sense have a task and obligation to continuously work on the introduction of scientific contents in order to transform those programmes in university undergraduate studies in a short amount of time, and also, to respond to the needs of the regional community.
3. The demotivation of staff for scientific work stemming from the past leads to delays in the scientific development of individuals and their scientific productivity. By initiating significant measures that primarily arise from this scientific strategy, and the announcement of annual calls for the funding of research projects, the University takes the helm and directly influences employees to be more active in order to achieve scientific results and a personal satisfaction which then result in the acquisition of conditions needed for the election to higher scientific and/or scientific-teaching titles. A larger number of research projects and the outflow of the working hours of scientists in the field of research will require the employment of a number of research assistants that will, with careful guidance, have the opportunity to develop into high-quality scientists and that will lead to a significant expansion of the University, but also to continuity in the development of scientific human resources.

4. Through current, significant financial investments in spatial resources and equipment, University North is getting foundation for scientific work, but it is necessary to provide funding for continuous investment in laboratories and the necessary equipment, and for the continuous updating of facilities and equipment. Considering the fact that prestigious research requires the latest technology and conditions of implementation, maintaining that continuity implies large investments which can only be acquired through careful planning and cost control.
5. University North publishes journals that are not on a sufficient scientific level. Tehnički Glasnik (The Technical Bulletin) specializes mainly in the technical field and focuses primarily on the professional area, less on the scientific one. Podravina specializes in social sciences, but does not have the desired impact factor (Impact Factor, IF). According to the above-mentioned, it can be concluded that the current weakness lies in the lack of a single scientific journal of the University in which it would be possible to include all scientific contributions that came into existence within the University. A journal which would serve as a response to this weakness should be thoroughly and precisely planned, have an international editorial board which would evaluate all works according to high scientific criteria, and also, be recognizable and widely available to the international scientific community, thus reaching the desired impact factor. According to this strategy, scientific activities are planning to reply to this weakness.

### *Options*

1. The development of scientific activity based on this strategy includes a number of activities, especially scientific-research ones, which will in a very short period of time lead to new facts and knowledge. Scientific results of research projects will directly influence the development of scientific resources, and then the development of scientific achievements and scientific recognition of the University, but also of the scientific activity in the wider region.
2. New facts and knowledge as results of scientific research will inevitably lead to the enrichment of the teaching content, but also to the development of new courses. Scientific development of the University will lead to new graduate studies that will respond to the needs of employers in the region. Due to the set strategy, along with the targets and indicators of the needs of the labour market, development of new study programmes based on scientific achievements in the field of technical, social and natural sciences is expected.

3. Given the departmental organizational structure, University North has closely related study programmes, which is difficult to achieve with faculty organizations. Organizational association of programmes, unification of the management structure and local lack of dispersion create prerequisites for the actualization of interdisciplinarity. At the University North it is also possible to accomplish interdisciplinary association in the research-project sense and in terms of the development of interdisciplinary studies in the field of technical, social and natural sciences, or through the development of interdisciplinary courses that will be conducted at studies pertaining to different areas.
4. Development of the scientific image and recognition of scientific achievements leads to a higher interest of eminent scientific institutions of the Republic of Croatia, the EU, and beyond in developing a collaboration with the University North. An increase in scientific productivity, for which dissemination based on a proper, planned and minutely elaborated and conducted strategy has been carried out, opens the door to the development of cooperation and involvement of the University in numerous future scientific-research projects, but also in teaching mobility, which allows students to obtain relevant up-to-date facts first-hand, i.e. from lectures of researchers themselves.
5. In the previous period, within the institutions - precursors of the University North, significant efforts were made to expand international contacts and create a base for future cooperation. A large number of signed bilateral agreements on cooperation remained a dead letter because of insufficient scientific development. Lack of development has caused the lack of international interest for the realization of specific activities. In the future, through the strengthening of the scientific image, it is expected that the number of institutions of international and national scientific community that will find interest not only in the conclusion of the agreement, but also in the implementation of teaching or research mobility, along with the mobility of students, will grow.
6. A larger number of scientific projects which will be realized within the University will have an impact on the greater productivity of scientists and research associates who will, by presenting their work and their findings, create the necessary conditions for the election to scientific and/or academic titles, and will thus achieve personal prosperity, but will also contribute to the strengthening of the scientific personnel of the University. Scientific-research projects promoted and implemented within the University provide scientific affirmation of experts from the economic sector of the wider region. Their inclusion in the status of external collaborators



in the scientific activities of the University allows for the affirmation of the scientific productivity of individuals who can apply their achievements directly in practice and thus directly contribute to the economic development of the region based on modern scientific achievements.

7. Cooperation with the economy is in part described by the already mentioned involvement of external associates employed in the sector of the economy and/or public administration in scientific-research projects. However, cooperation with other institutions in the field of education contributes to improved scientific productivity and creates the possibility of a more significant impact on the economic development of the region by transferring knowledge based on scientific results. Entering into consortiums strengthens the scientific impact, while University North, as a central scientific institution, is given the possibility of acquiring the status of a leader in certain segments of different activities.
8. The absence of a unique interdisciplinary journal of a high scientific level (international editorial council, international evaluation based on strict criteria of quality, total orientation to science) were diagnosed as a weakness of the current scientific situation of the University North. Through the development of science and the assumption of leadership in the scientific development of the northern region of the Republic of Croatia will create the basic conditions needed for the launching of such a journal which will serve as a platform for placing the knowledge and scientific achievements to the general (especially scientific) public. In addition to the journal, an influential platform for the dissemination of achievements lies in various forms of scientific events (forums, round tables, conferences) that will be organized by the University.

### Dangers

1. At the beginning of the organization of scientific activity there is a risk of deviation from the defined procedures and incomplete or inadequate establishment of the system, which can ultimately result in the ambiguity of further specific activity in the concretization and networking of resources in the oncoming period. University North employs a high-quality scientific cadre which approaches scientific work with earnestness that is expected from them. At the same time, the University administration made sure that it, in cooperation with experienced researchers, creates the necessary preconditions in terms of preparing all the necessary legislative acts and associated procedures, which are carefully designed and pre-determined.

2. The expected impact of the recessionary financial activity of the closer and wider environment represents a realistic danger. The direct impacts of a recessionary situation are usually primarily reflected in the lack of funds for the area of science and education. Previous scientific achievements have shown that the period of financial uncertainty is precisely when additional investments in the economic development that will contribute to stabilization are needed. The plan of the University North was to secure funding for a five-year investment in science from currently reliable sources. Furthermore, it is expected that through the development of scientific activity and the direct impact on the needs of businessman, the general public will become more perceptive and that additional co-financing will be secured.
3. The strategy of the development of scientific activity anticipates further incentive for scientists to engage in research work, and the activities associated with it are specific and offer great opportunities for personal development and the prosperity of individuals. By adhering to prescribed laws, especially with the procedures prescribed by the system for quality and with the principles deriving from the Code of Ethics of Scientific Activity, it is not expected that researches will experience a motivational decline. By adopting a strategy of scientific activity, University North commits itself to continuous investment, primarily in human resources, and to the recognition of their scientific involvement and contribution, which will directly affect the increase of the intrinsic motivation of scientists, as well as continuous investment in the maintenance and modernization of the equipment and the creation of favourable scientific-research work conditions (either for intrinsic reasons or due to the impact of the system - non-recognition of labour, unfavourable working conditions, financial demotivation, etc.).
4. University North has an established quality management system on the basis of which rigorous assessment of compliance to the prescribed procedures is carried out at least once a year. If a lack of coordination in activities and achievement of objectives, along with the compliance with deadlines are not noted earlier, during the very implementation of activities, the audit of the quality system will inevitably affect the compliance with the prescribed plans and procedures. Although inadequate time management and inadequate monitoring of the achievement of objectives in the given deadlines represents real danger, University North has made all the prerequisites that this does not happen.
5. The failure to update and modernize the strategy over a certain period of time can lead to developmental delays and even setbacks of scientific activities of an institution. In the case of the

University North, that possibility is not realistic if all participants in scientific activity competently approach the activities planned for the implementation of the tasks necessary to achieve the prescribed desired goals. Monitoring and observing the changes in the defined objectives that can possibly occur in an environment where changes are constant and rapid, and changes that occur by generating new knowledge from scientific-research work, is a commitment of all scientists, but also of the administration of the University. University North will, through regular annual evaluations, take care of the implementation of activities, achievement of objectives and compliance with the time limits.

6. As is the case with the earlier mentioned monitoring of changes in achieving the objectives and fulfilling deadlines, the University administration is fully responsible for providing the necessary conditions for successful scientific activity, monitoring the performance of given tasks and objectives, but before that, it has to concretize the strategy by creating operational plans that include measurable indicators of development.

Attachment 4

**Overview of the scientific policy and the  
organisational structure**

For the development of research-scientific activities it is necessary to achieve a relatively better and more effective connection between the existing and future scientific-teaching activities and all university scientific-research processes. Therefore, it is necessary to more creatively and quickly connect the further development of science, in terms of the development of scientific staff, with the organization of relevant teaching processes and scientific and teaching activities at the University North. The previously met preconditions necessarily require the predicting of future rationalization and reorganization of the entire University North in scientific-teaching terms, as the Senate of the University North did in June with its decision to establish the Office for Science and Art and the International Cooperation Office, that now function as a supplement to the existing organizational scheme and the pyramid of responsibility and communication of the University North (Figure 3.1.1 and Figure 3.1.2).

Figure 3.1.1 Organizational scheme of the University North

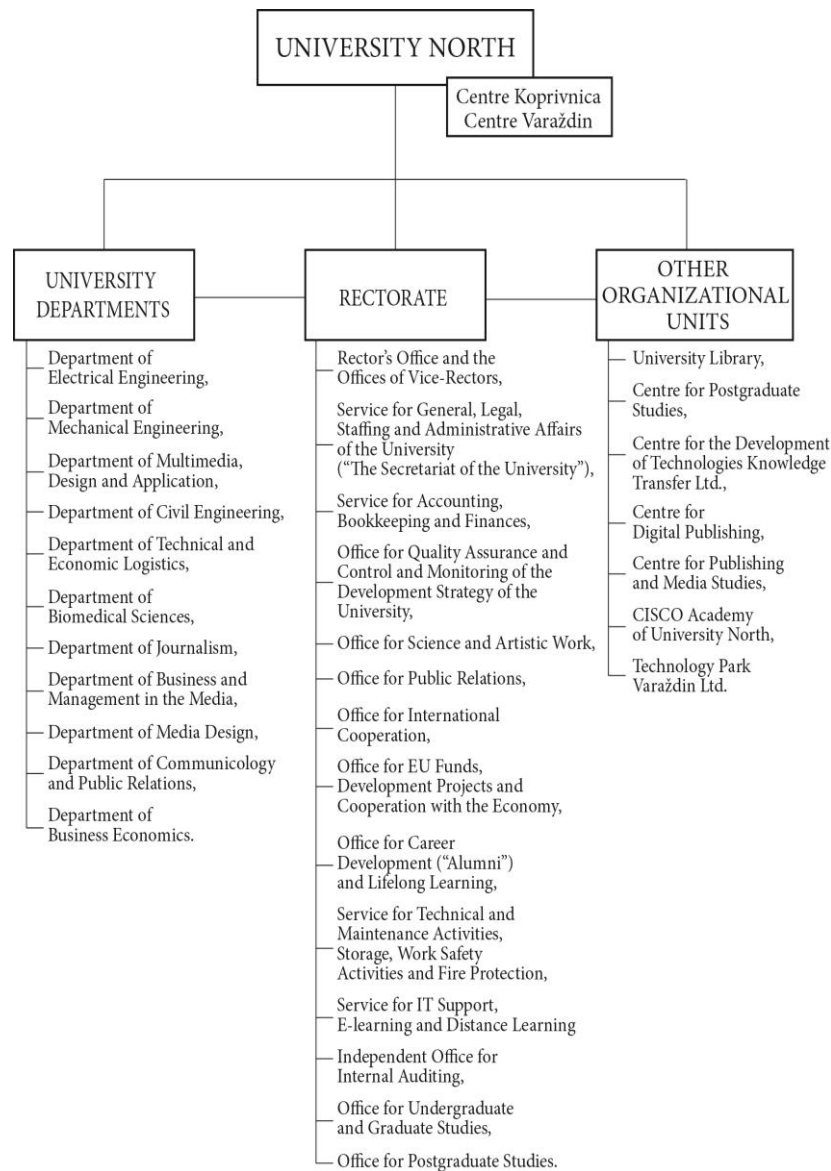
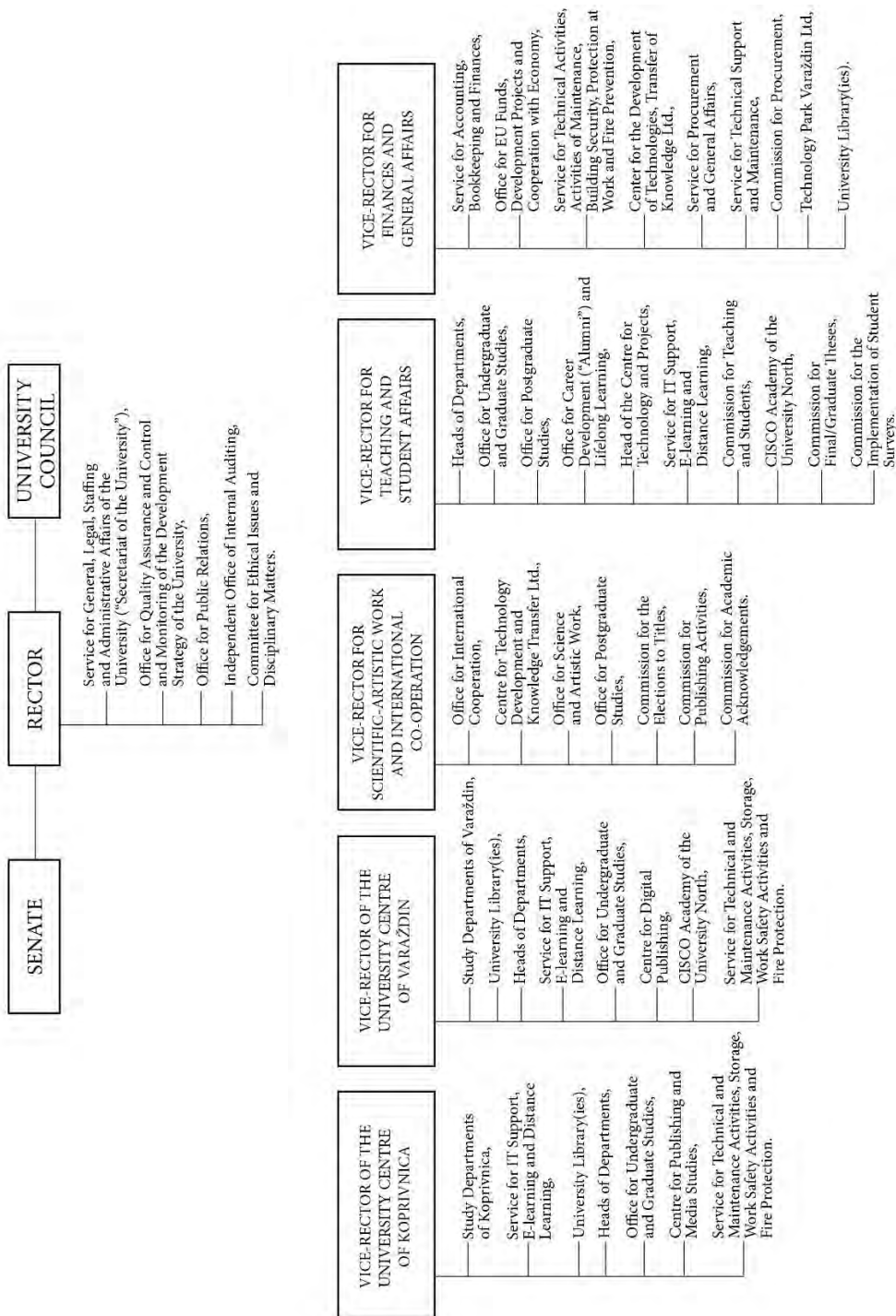


Figure 3.1.2 Main pyramid of responsibility and communication of the University North

THE BASIC PYRAMID OF RESPONSIBILITIES AND COMMUNICATION



The primary described changes will necessarily require a rational and optimal reorganization of almost all management and administrative processes at the University North. It would be rational to direct the reorganization of administrative processes in an "analytically grounded" manner towards the increase of time, capacity expansion, greater investments in supporting technologies and new spaces which would then secure a bigger and better scientific-research and scientific-teaching activities at the University North. The above asks for the planning of further education for more a rational and better use of new technologies and capacities.

It is necessary to develop and enhance the development of scientific-research activities outside the primary scientific-teaching activity, either by rapid development of research cores and the establishment of new research organizational university units, such as centres of scientific excellence and/or university institutes, institutions, technology parks and the like. Currently it is necessary to systematically increase the development of scientific-research activities and the active participation of the existing scientists in the Varaždin Technological Park and elsewhere. Thus, a systematic support to a quicker and better development of the University's own scientific potential with a slight outflow of university scientific and/or scientific-teaching staff should be strengthened, and there should be no interferences with the existing research-teaching and teaching processes in certain departments of the University North.

The University will ensure a balanced development of the old polytechnic study plans and programmes into new university graduate and postgraduate study plans and programmes, along with an equitable development and improvement of the existing scientific areas and fields, and the development of new interdisciplinary ones. Namely, due to the merging the Polytechnic of Varaždin with the Media University and transforming them into University North, a great turning point occurred in various activity fields. Most of the existing educational and scientific areas and fields were slightly improved, even though new, mostly graduate, study programmes were introduced in the University Centres of Varaždin and Koprivnica. The permitted, quality and mainly useful software innovations were realized, but in the current model of the functioning and organization of scientific-research activities, generally speaking, certain important (but planned) changes have not yet occurred. The very realization of the scientific part of the general Vision of the development of the University North should certainly support the development of certain scientific-research areas and fields in a strong manner, but not at the expense of others. This requires the establishment and implementation of criteria of excellence with a fast preparation and publication of a clear system of criteria and standards by which fair assessment would be carried out and a good monitoring of the systematic financing of quality results of the University's own projects would thus be achieved. It is necessary to establish and strengthen the system as soon as possible, not only to fairly select the proposed projects on the basis of which has the highest quality, but also secure and implement the planned rationalization and optimisation of the development of science and the

proclaimed scientific policy, regardless of the project expressed field and field of research. Therefore, the mentioned is not only in the intended domain of the activity and responsibility of the Office for Science and Art, but of the whole University North.

University North plans to improve the existing and develop new and modern scientific-research infrastructure, both its own and of its partners, in a high quality manner. The infrastructure requirements for scientific-research activities at the University North cannot be reflected only in the possible establishment and operation of new centres and institutes, but it is also necessary to improve the efficiency of the existing University's own and joint scientific-research space with systematic and planned integration and/or displacement of scientific-research project and other types of activities through the reorganization of space in the old and the new building of the University North in the University Centre Varaždin and a new building at the campus of the University Centre Koprivnica, but after all the departments have settled in. The new spaces are for the most part intended for scientific-teaching and teaching activities, but a large part is intended for both Centres for the development of the cores of new scientific-research centres. It is necessary to quickly anticipate and provide better physical, technical and technological preconditions for an almost smooth and efficient performance of scientific-research activities. The space of the modern University Library must be quickly prepared for more intense scientific-research activities (database searching, etc.) and a possible reallocation to a new location. The equipment for the scientific-research activities is currently insufficient, but it is also not always rationally and optimally utilized so it is necessary to quickly create better operational criteria of its procurement, distribution and use. It is necessary to develop new and improve the existing subsystems for the publication of new results of the scientific-research activities and to ensure better access to existing scientific infrastructure, especially in the domain of publication and presentation of own serials, subsystems of reviewing and categorizing their attachments, etc.

Already in 2013, the University performed all the necessary preparations for the construction of a new university library. A software and architectural base as a basis for the realization of an architectural and urban solution was made. A call was conducted and the optimum solution between the considered offers was chosen, because the university library is perceived as one of the most important educational, information-communication and cultural centres of the University North. Together with the work on the university library, in 2014 the University worked on completing the Centres for the preparation and development of digital and other (print and multimedia) scientific and teaching contents in both University Centres. It has to do with technologies (preparation and realization of digital and hybrid printing) which would be used as a laboratory for scientific-research work and as a scientific-teaching space. All scientific-research laboratories and other similar areas being fully equipped with scientific-research equipment and scientific tools is a constant concern of the University North, which regularly monitors the spatial and technological adequacy and appropriateness of equipping and



preparing its own and the joint, national and EU projects (in terms of equipment used in scientific and scientific-teaching purposes). It is often about capital equipping required by the "joint" and the University's "own" projects, because external funding has so far been received only exceptionally. For example, only in 2014 all the requirements at the level of all of the departments of the University North for capital equipment and other capital investments that are reoriented from more fragmented, smaller projects into one joint project have been consolidated. In 2014 the use (for scientific-teaching and research purposes) of considerable approved funds, technology was planned, along with the use of the equipment of the Varaždin Technology Park (of the total approved € 15.5 million), whose co-founder and co-owner of one third is the University North. University North almost ended 2014 with significant capital investments in the two university campuses in Varaždin and Koprivnica, which will, with the completion of equipping, represent a significant space for scientific and research activities (laboratories and other scientific-research facilities), and scientific-teaching activities of the University North (a couple of thousand modern equipped square metres).

All forms of cooperation of University North should primarily be in the function of the development of science. That refers to international cooperation, collaboration with the local, regional and wider community and all forms of internationalization. From unsystematically organized and conducted international cooperation, which was primarily related to the preferences of individual students and professors, and/or even accidentally achieved contacts, it is necessary to reorient and reorganize in a more focused manner, and international cooperation, collaboration with the local, regional and wider community should be systematically planned and implemented. Its organization should be better planned and should include more experienced teachers/mentors and young scientists/researchers, as well as the best students. Therefore, the mentioned scientific-research and scientific-teaching oriented cooperation and internationalization should primarily help the University North to systematically replace its objective weakness and better express its advantages. Cooperation with the local, regional and wider community involves better cooperation with the founding cities, their counties, their wider environment and the EU environment. The existing forms of cooperation have been very good in the field of realization of primarily spatial and one part of financial issues. University North has realized its existing spatial capacities in the form of two campuses, i.e. spaces of two university centres in Varaždin and Koprivnica, due to its good cooperation with the founding cities. However, what should be pointed out and presented is the fact that the University North is a particularly good urban and regional product that equally contributes to the well-being of the inhabitants of the founding cities and their counties, and to their innovative and creative economic, social and cultural progress and development in the Republic of Croatia, the EU and beyond. That is why cooperation needs to be nurtured, strengthened and developed; then it will be a true support to scientific-research based development of the University North and its associates. That can only be realized by a planned and systematic increase in the quantity and quality of new partners, both

in the domain of the economy and joint projects, as well as in academic, educational, wider social, cultural and artistic domain (e.g. strong and successful economic entities such as Podravka, clinical medical centres with which the University already cooperates, prominent city institutions, development agencies of counties, foundation, etc.). It is necessary to establish and transparently publish strategic, tactical and operational directions of the planned cooperation at the local, regional, national, EU and broader level. For example, it is possible to institutionally, not only contractually, in collaboration identify, organize and plan the integration of some joint functional subsystems of the University North and some clinical medical centres (e.g. quantitatively and qualitatively increase the number of interdisciplinary projects, work together on sustainable partnership development, develop graduate and postgraduate studies and centres of excellence, set up systematic activities with guest teachers, increase the existing scientific and intellectual capacity in joint projects, and improve the performance of the study programme of nursing, etc.).

The University will work on the design and implementation of a systematic procurement of additional sources of financing of the continuity of scientific-research activities. What that encompasses are not the commonly used sources of financing of scientific-research activities - the existing university budget and the system of scientific-research projects (national and international), but the additional sources, such as sponsorships, foundations, sales of the scientific library foundation and University's own products, eventual establishment of a business centre of the University North, and/or the work of Alumni "Universitas Septentrio" (Latin translation for "University North"), and/or the work of the association of former teachers and students "Universitas Septentrio."

Quality assurance is a process that needs to be constantly monitored and upgraded, which is why University North began to develop its own quality assurance system (abbr. QAS). The Office for Quality has been established as a university unit, along with a number of committees which on the executive level deal with the implementation and improvement of quality, regardless of whether they are dealing with the introduction of mechanisms for quality assurance in almost all the important activities of the University North, such as science, teaching, organizational and administrative aspects and others activities. One of the tasks of QAS is to compile the necessary documentation, which includes the strategy and the related regulations and rules of procedure, which should be the basis for all future evaluation of scientific-research activities.

Figure 3.1.3 Organizational scheme of the organization of the quality assurance system (QAS) of the University North

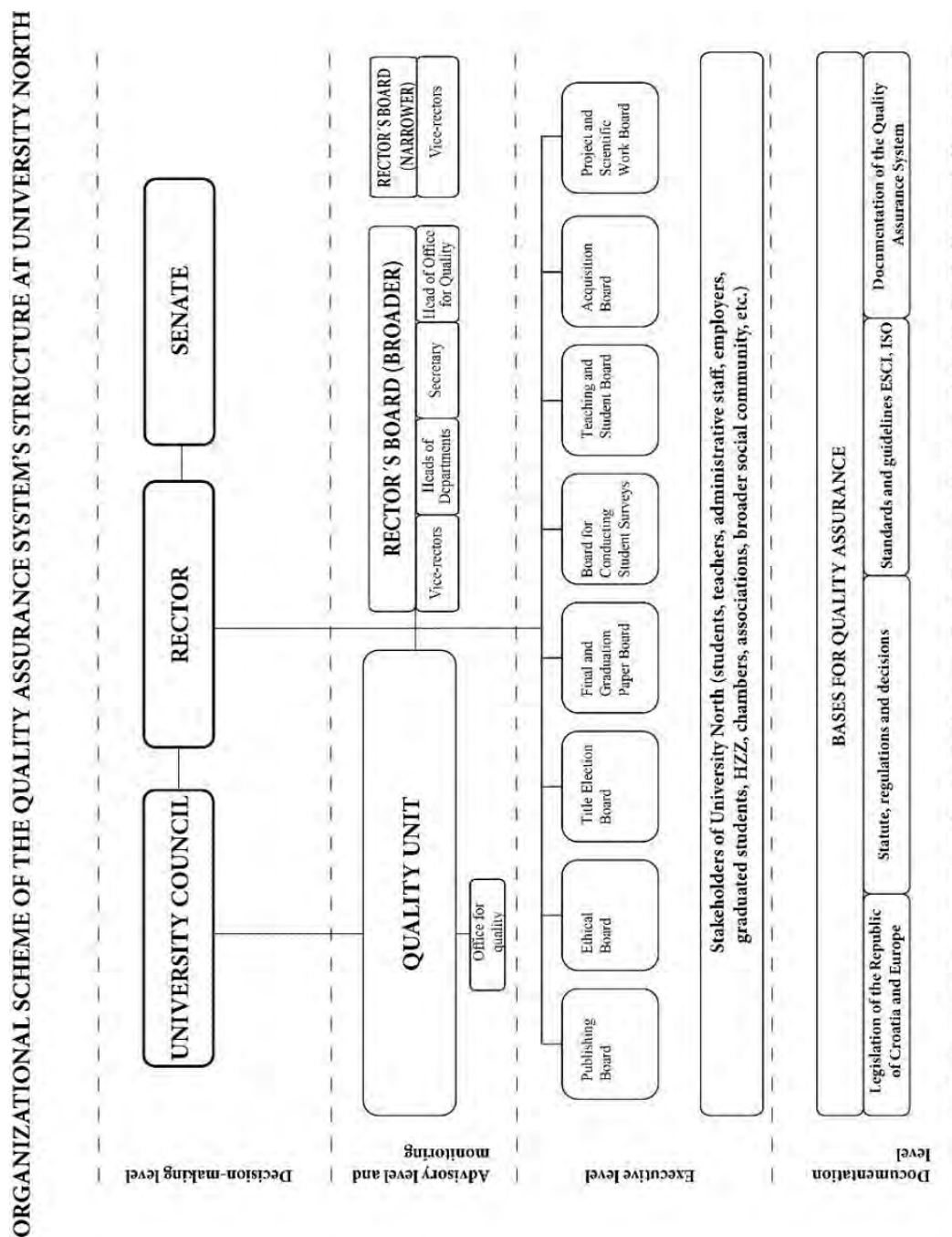
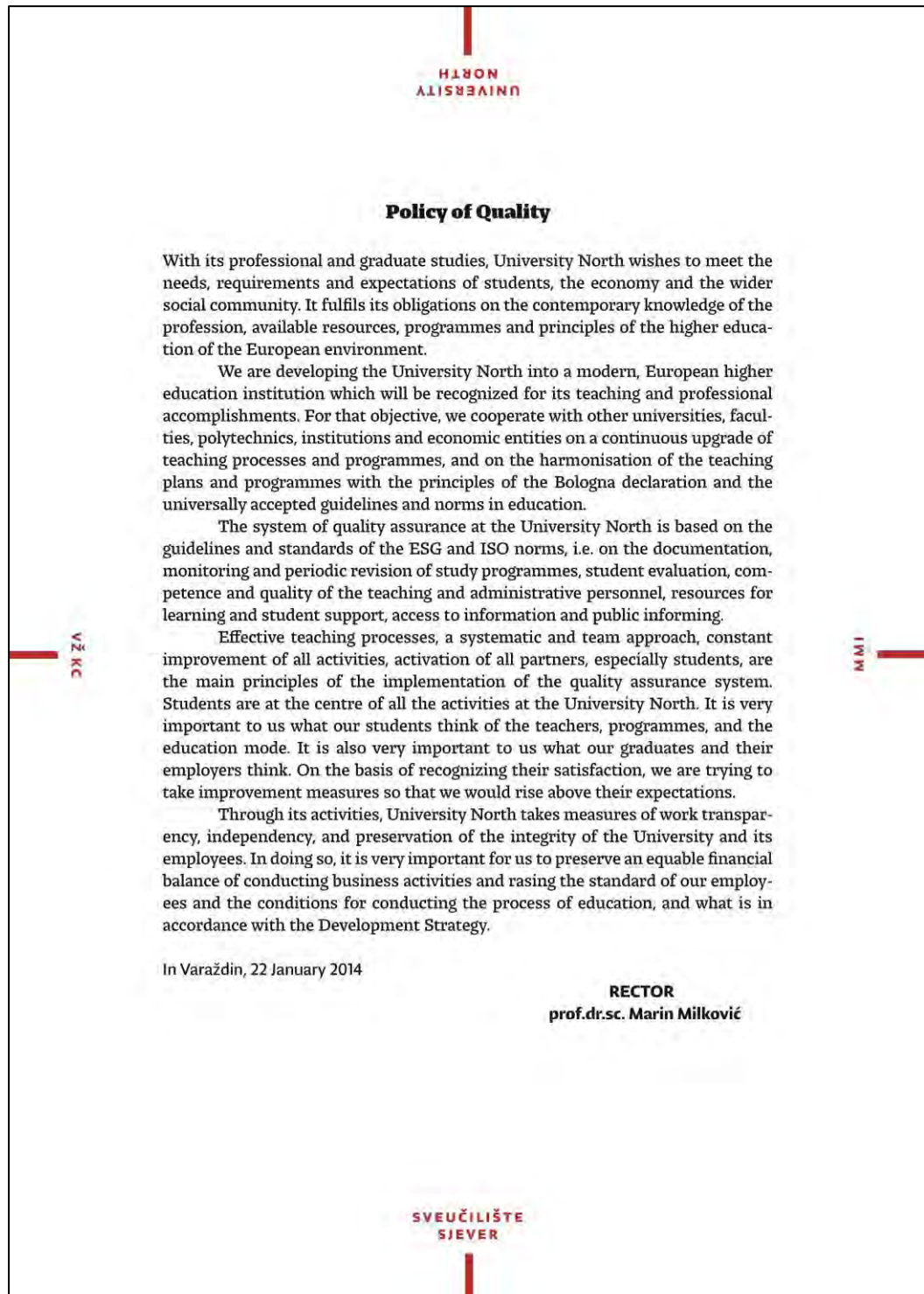


Figure 3.1.4 Proclaimed quality policy of the University North



Furthermore, it is also necessary to work on the promoting of scientific-research activities and the development and promoting of the University North and its partners. University North should present its scientific-research projects and other programmes as good as possible to the public and ensure the systematic popularization of science and research, which is indirectly the reason of its survival and development in the local, regional and wider community. Until recently, such a system did not exist, because universities often represented a close "world unto itself". University North should achieve all the necessary preconditions for a better and more powerful presentation of the results of its scientific-research activities and for the popularization of science in the founding cities, their counties, our society in general, the EU and beyond.

*What is the system of principles underlying the strategic programme of the development of scientific activities of the University North?*

A rational scientific strategy is based on optimum, progressive and systematic realization of accepted principles and the immediately defined goals. The current circumstances, both objective (primarily direct and determine behavior, adaptations and / or orientation) and subjective (currently dominated by the University of North and characterize it), should clearly and precisely define the fundamental objectives and detailed predict all possible and applicable procedures and standards and ways of systematic verification of feasibility, as well as the necessary corrective actions and adjustments, especially in relation to its objectives and all other strategic documents relevant to the implementation of scientific strategy.

*The scientific development strategy of the University North is based on the principles of:*

- Creativity, innovation, proactivity, quality, interdisciplinarity and recognition

In this, almost crucial phase of the development of the University of North, it is necessary to establish a system of principles and implement them in all aspects. Therefore, it is necessary to encourage all forms of creativity and innovation, especially now when there is a need for stronger proactivity of scientific-research activities and a more significant recognisability of the scientific-teaching activities of the University North, especially in the aspects of achieving great scientific-research excellence, i.e. of high quality. Globalization trends, especially those presented in the form of regionalization and internationalization, are perceived as a necessary imperative of university activities and impact at all the levels of the development of science, scientific diversity, scientific-research creativity and innovation, along with the need for a more significant regional and international scientific recognition of the University North. University North can accomplish all that partly through its scientific research and educational capacities and forces, and partly by joint

interdisciplinary forces and scientific-research and educational cooperation with its regional and international partners. University North is aware of its current weaknesses in the scientific-research aspects, especially now, when it is still developing its scientific-research potential, and realistically cannot be compared or deal with a number of large and modern universities in the Republic of Croatia, the EU and beyond. Therefore, it is rational to focus most of its capacity in the direction of greater scientific recognition, and of course, in the direction of proactive encouragement of scientific research that guarantee creativity, innovation and quality. The scientific orientation of the University North will be directed towards new trends in scientific-research activities and the mastery of modern technologies. All this should result in new scientific-teaching programmes for which there is a real and long-term interest in the contemporary environment, and which are characterized by great dynamism and speed of change, with a significant scientific-research specialization and internationalization, and sometimes even by a partially interdisciplinary approach in the implementation of university graduate and postgraduate specialist and doctoral studies (which are the imperative of recognisability in scientific research terms and the imperative of large inter-institutional and international cooperation). A prerequisite for such a thing is the willingness to increase the effort and hard work, and relatively demanding changes both in the individual and team approach to scientific-research activities, with the elimination and/or suppression of feelings of lesser value and failure.

- A more systematic support to new and promising scientific-research and scientific-teaching concepts and orientations, especially in younger and/or promising researchers and scientists, as well as during the designing and realization of more welcome scientific-research environment (projects, programmes, etc.).

University North employs a number of assistants, lecturers and associates, among which there is a number of students of postgraduate doctoral studies. In the near future, i.e. in several years, most of them could be elected to fundamental scientific titles, which will give the University new, young scientific-research strength. The University must take into consideration that a smaller number of scientists will over the years have to go into retirement, and that some might go to other universities and/or other institutions. However, there is a constant demand for the influx of new scientists outside the University, who can improve the scientific-research capacities of the University North, which must therefore come up with a smart and prosperous scientific-research personnel policy. Data suggest that in the last few years, at the University of North there has been a major change in the capacities of the scientific research personnel, which should be used in the near future by compiling a better scientific policy and achieving a more systematic development of science and scientific activities. One of the necessary directions of a wise university scientific-research policy is the planning of a renewal and rejuvenation of the scientific-research personnel. Not only would the new and younger researchers and scientists be a breath of fresh air, but they would also contribute to the development and easier acquisition of new

scientific-research approaches, trends and technologies, including new international methodologies used by the EU and worldwide projects. University North therefore needs to consider and plan all prospective new forms of giving systemic support to younger scientists and researchers so that they could more easily prepare and adjust to the proactive, creative, innovative, team and/or individual distinctive and highly useful scientific-research activities. In addition to achieving their active participation and support in their participation in national and international scientific-research activities, such as participation in scientific meetings, participation in the preparation and creation of basic scientific-research development documents (e.g. scientific strategy, strategic plans of scientific-research activities in national and international cooperation, etc.) and the like, it is necessary to connect them with harmonious successful/prospective individual mentors and/or successful/promising scientific research centres. This approach requires the design and implementation of a more systematic training of one part of scientific-research staff that is, on the basis of years of service, in the middle of their working life, and innovative models of "taking care" of a prospective part of the senior scientific-research personnel, and which is still able to provide significant help to young and promising researchers and scientists at the University North (Alumni, the Professor Emeritus or Emerita system, etc.). It is necessary to design and realize in a more creative and innovative manner a better scientific-research staff mobility and an easier occasional and/or longer arrival and departure (to the University North) of the best and/or most promising, i.e., outstanding/excellent domestic and foreign scientists and researchers. Part of this can be achieved by planned and increased participation in European scientific projects and by making international calls for vacant scientific-research positions; and part can be achieved by planned and increased participation in national and/or joint projects and programmes (e.g. of the Croatian Science Foundation). It is important to accomplish projects with the founding cities, their counties, cities in the EU, and the cities of other partner institutions (universities, faculties, institutes and other institutions). An important part could be realized on the basis of internationalization and international cooperation through the achievement of creative and innovative networking of scientific-research and scientific-teaching process (new graduate and postgraduate study programmes, doctoral schools, etc.). The concept that the entire scientific-research work (and related/relevant process) at the integrated University North become more harmoniously connected with the scientific-teaching activities (and processes) is a realistic one. This will involve a greater level of association and affiliation of some university departments, both at the organizational and personnel level, as well as at the project level of its own scientific-research activities, which will necessarily create better preconditions for the release of a greater scientific-research potential, whether in terms of personnel, or in terms of joint courses and/or spatial and technological conditions for individual and/or team activities (mutual, with students and/or exclusively for the involvement in research and science). It is necessary to ensure a greater connection of new scientific-research projects and the establishment of new doctoral schools and/or studies, which is still one of the main

directions of the future development of science at the University North. Until the announcing of open calls for the application of new national scientific-research projects, University North should plan the involvement of a growing number of its partnering scientists and researchers as future available human resources for the launching of major individual and joint interdisciplinary scientific-research projects, which are thematically and substantially oriented according to the expressed interests of the University North and its partner institutions, and in which scientists and researchers from universities and partner institutions who are really interested in the listed themes would participate. In addition to that, apart from focusing of the social sciences and humanities, it is necessary to increasingly reorient towards technical and natural sciences, biomedicine and health, etc. When steering postgraduate specialist and doctoral studies and/or schools, what should primarily be taken into consideration are the interests and topics of personal scientific-research activities, expressed through national and international projects, and the interests of several university departments from different scientific-research fields and areas, and lastly, the scientific-research interests of the partner institutions in the Republic of Croatia, the EU and beyond.

*What is planned predictability of the future aspirations of University North?*

All investments in scientific research carried out by the University North and its partners, and the evaluation system of scientific research will primarily be based on the criteria of rationality and ethics (ethical, organizational and cost efficiency and sustainability), creativity and quality (research creative excellence), recognisability and relevance (special/new meaning for the northern part of Croatia, the whole of Croatia, the EU, and possibly beyond), innovation (proactive research innovation in a particular scientific field and interdisciplinarily). The way of scientific election and progress of university researchers and teachers will be redirected from the quantitative evaluation towards a team and/or individual qualitative assessment of results and their real applicability, but with paying attention to human relations, and an aspiration to retain and develop a high quality level of mutual academic and human relations at the University and beyond. Efforts will be made to rationally establish/co-establish doctoral schools at the university institutional level, national doctoral and postgraduate professional studies and international joint doctoral and postgraduate professional studies with at least 70-80% of a scientific-research component, as well as postdoctoral professional and other types of training. University North will seek to participate more strongly in the active establishment of national and possibly international centres of excellence in a particular field of research which is of special interest for University North.

It will support the following recommendations:

- National and international centres of excellence should not only be linked to one location, institution and/or research team, but that they will creatively and proactively gather and network through the



development of "innovative e-infrastructure" for the existing and new/young researchers, research centres and other research facilities;

- Interactive mechanisms which create the biggest changes, i.e. joint research projects of cooperation of public and other universities, institutes and economies and/or social activities, and that are primarily based on creative, innovative, distinctive and realistic scientific-research based doctoral studies should be used;
- Joint projects with the realization of innovative financing schemes of co-funding doctoral studies in order to strengthen cooperation with the economy and social activities while resolving current social challenges should be primarily encouraged. That is why all mechanisms of the development of knowledge, transfer of technology and intellectual property of the University North and its partners in the economy will be actively supported, but only if there is a rational commercialization of research results, and a constant and systematic opening to active international cooperation and scientific-research and university education market. Active mobility of the University's own researchers will be strengthened systematically, which includes active and systematic help in the employment of students in the business sector and/or other sectors after graduation, as well as in the employment and/or temporary residence of researchers from other partner universities and institutes. That will lead to an increase in the assistance to projects which are a direct or indirect support to employment of doctors of science through the establishment of innovative companies in the economy and public services.

The basic scientific conviction of the University North is a faster establishment of competence networks that cover all the activities related to scientific research, higher education and development and production companies in order to improve the University's own and partner innovation abilities and competitiveness of our research and administrative university sector. The basic reason for such networking is the fact that it is very difficult to independently organize all and/or most of the necessary research capacities, which could definitely in the future adversely affect our innovative and creative scientific-research capacity. Certain internal, external and hybrid clusters of competitiveness of University North will primarily be oriented towards and develop in the direction of the competence networks of scientific-research centres, and on the basis of that, it will be sought to facilitate close collaboration within and between particular sectors and to accomplish innovations with higher added value. It is well known that European technological priorities are related to the industrial leadership and are focused on the support to research and innovation in ICT, nanotechnologies, advanced materials, biotechnology and advanced manufacturing. University North developed its direction of scientific-research and technological development (with a possible development of the key enabling technologies) from European and Croatian technological settings (and the so-called "smart specializations"), on the basis of which it will systematically define its own

priorities for all planned university, scientific-research and possible economic activities and the related technologies. It is the foundation of a more thought-out and rational involvement of the University North in national and European projects and cooperation. As new knowledge and related innovations occur only in an environment with an appropriate advanced research infrastructure, university scientific-research and innovation infrastructure of centres with public access to the existing and new research equipment, goods, funds and information will be built and promoted, together with the involvement and building a connection with European and/or national research infrastructures, and with the use of their resources. Research and innovation infrastructures, with a shared e-infrastructure, include laboratories in which research potential capable of the inclusion into its own, national and large international collaborative programmes and centres of excellence is created. National and/or European models of cooperation for achieving joint and harmonized procurement and use of equipment will be applied. Investments in research and development need to grow as well as what they give back through contributions to the social and economic development of the University North, possibly opening new workplaces and improving the quality of life.

The legal framework for carrying out scientific-research activities is represented in the form of the Law on Science and Higher Education (and its implementing regulations), the Law on Quality Assurance in Science and Higher Education and the Statute of the University North and the corresponding regulations and other relevant documents. The area of quality assurance in science in the Republic of Croatia is regulated by the Law on Quality Assurance in Science and Higher Education (OG 45/09). The conditions for obtaining a license for carrying out scientific activities through means of public funding are regulated by the Ordinance on the Conditions for Issuing the License for Carrying out Scientific Activities, the conditions for re-accreditation of scientific organizations and content of the license (OG 83/10; Articles 2 to 6). University of North carries out scientific activities as scientific organizations of the type "university and its components." Referentially to its status (public or private scientific organization), it is prescribed in more detail what the conditions that have to be met for the issuance of the license for carrying out scientific activities are.

#### *The contribution of professional services*

University North offers six professional services that enable and directly contribute to the development of scientific activity.

Overall activities in the field of scientific activities are covered by the Department of Scientific and Artistic Activities and International Cooperation within which a separate Office for Scientific and Artistic Activity is being established. The scope of work of this Department, among other things, relates to the implementation, supervision and monitoring of all scientific activities at the University North.

The University Library contributes to the scientific activities of the University, primarily through the acquisition and ensuring of the availability of printed and electronic resources, information and information resources necessary for scientists and researchers. If the Library is not able to obtain the necessary materials, users can satisfy their scientific-research needs by using the interlibrary loan, i.e. by borrowing materials from other libraries through the University Library. The Library personnel constantly monitor the novelties in scientific publishing and inform users about it. The Library also significantly contributes to the scientific activities of the University by assisting users when searching for scientific information (databases, catalogues, bibliography).

The Centre for IT Support of the University North is an independent non-teaching organizational unit in directly connected to scientific and educational activities. The Centre for IT Support provides all research-teaching and non-teaching staff and other users with a support in planning, procurement and maintenance of computer and network equipment and software, maintenance of computer and network services, administering of users, coordination of the activities carried out through CARNet and SRCE, planning of the security information infrastructure, videoconferencing transmission, and organizing of anti-virus protection.

CIMS is the abbreviation of the Centre for Publishing and Media Studies which was established with the aim of contributing to the visibility and recognition of the scientific activities of the University, not only at a national level, but also at an international one. Activities of CIMS include a system for the education of staff and students in the field of electronic publishing, through the production of scientific, but also other university publications and through the increase of their visibility and accessibility.

In collaboration with the Office for Science and Art and the International Cooperation Office, the Accounting Office of the University takes care of the financial aspect of scientific activity, but also of the financial planning of future expenses of research projects. The Accounting Office is also responsible for the financial monitoring and implementation of all the agreements of the University, including contracts related to scientific activity, particularly scientific-research projects.

The legal expert service significantly contributes to the development of science at the University North through preparing and monitoring the implementation of legislation, preparing and implementing contracts and managing the archives of the scientific staff and associates.

The scope of activities of fundamental professional services that make a direct contribution to the scientific development which would not be possible without synergistic activities and mutual cooperation of all the mentioned offices is described in the Attachment.

Attachment 5

**Scientific research-teaching personnel principles  
for the implementation of scientific activities**

# 1. THE CURRENT STATUS OF SCIENTIFIC AND TEACHING ACTIVITIES

## 1.1. INTRODUCTION

The current state of scientific-teaching and/or scientific (not teaching) forces and their arrangement within the University the North and its University Centres of Varaždin and Koprivnica is reflected in the number of people (38 of them) elected to scientific-teaching and/or scientific titles: Social Sciences: 16, Humanities: 5, Technical Sciences: 8, Natural Sciences: 1, Biomedicine and Health: 3, Interdisciplinary Sciences: 8, Art: 8. The total number of conducted elections is greater than the number of the employed scientific staff for an average of 29%, i.e. for nearly one-third. Almost one third of scientists has been elected to additional (at least one, and some even more) scientific title(s), which is currently a significant advantage for the institution. Therefore, 38 employed scientists have been elected to the following scientific-teaching titles: 27 Assistant Professors, 5 Associate Professors, 2 Full Professors and 4 Tenured Full Professors. Finally, 38 employed scientists have been elected to 33 scientific titles, respectively: 18 Scientific Associates, 11 Senior Research Associates and 4 Scientific Advisers, due to the fact that some have been elected to artistic-teaching titles and do not have the scientific title, while some have been elected to three scientific titles and only professional teaching titles (2 College Professors and 1 Senior Lecturer).

A table listing the scientists of the University North and their elections to scientific and scientific-teaching titles in relation to the field of election

Name and surname	Academic title	Type of employment	Date of the last election to the scientific title and the acquired scientific degree	Date of the last election to the scientific-teaching title and the acquired scientific-teaching degree	Area and field of the election to title/scientific work
Winton Afrić	PhD	full working hours	17/4/2012, Scientific Associate	13/6/2012, Assistant Professor	Social Sciences, field of Information and Communication Sciences
Magdalena Najbar-Agičić	PhD	full working hours	6/6/2012, Scientific Associate	5/2/2013, Assistant Professor	Humanities, field of History
Sead Alić	Associate Professor, PhD	full working hours	21/5/2012, Senior Scientific Associate	5/2/2013, Associate Professor	Humanities, field of Philosophy
Iva Matija Bitanga	Assistant Professor, PhD	full working hours		19/7/2013, Assistant Professor	Artistic area, field of Fine Art
Simon Bogojević Narath	Associate Professor, PhD	full working hours		14/2/2014, Associate Professor	Artistic area, field of Fine Art
Krešimir Buntak	Assistant Professor, PhD	full working hours	9/5/2014, Senior Scientific Associate	19/7/2013, Assistant Professor	Social Sciences, field of Economics

Antun Franović	Assistant Professor, PhD	full working hours		19/7/2013, Assistant Professor	Artistic area, field of Fine Art
Anica Hunjet	Assistant Professor, PhD	full working hours	21/3/2013, Senior Scientific Associate	10/2/2013, Assistant Professor	Interdisciplinary area (field of Psychology and field of Textile Technology)
			14/6/2012, Scientific Associate		Interdisciplinary areas of Science
Ino Husedžinović	Tenured Full Professor	cumulative employment, 25%	10/5/2010	10/5/2010, Tenured Full Professor	Biomedicine and Health, field of Clinical Medicine, branch of Anesthesiology, Reanimatology, and Intensive Care Medicine
Anita Jeličić	Assistant Professor, PhD	full working hours	12/2/2012, Scientific Associate	31/5/2012, Assistant Professor	Social Sciences, Information and Communication Sciences
Mato Jurković	Full Professor, PhD	full working hours		8/6/2010, Full Professor	Artistic area, field of Fine Art
Tanja Kesić	Tenured Full Professor	full working hours		13/1/2004, Tenured Full Professor	Social Sciences, field of Economics
Živko Kondić	Associate Professor, PhD	full working hours	4/7/2012, Scientific Advisor	28/3/2013, Associate Professor	Technical Sciences, field of Mechanical Engineering, branch of Production Engineering
			15/9/2010, Senior Scientific Associate		Technical Sciences, field of Mechanical Engineering
Dinka Kovačević	PhD	full working hours	2007, Scientific Associate, 7/11/2013, Senior Scientific Associate	26/11/2009, Assistant Professor	Social Sciences, field of Information and Communication Sciences
Goran Kozina	Assistant Professor, PhD	full working hours	3/5/2013, Scientific Associate	20/6/2013, Assistant Professor	Social Sciences, field of Economics
			20/3/2013, Scientific Associate		Interdisciplinary area of Science, field of Economics
				22/5/2013, Assistant Professor	Social Sciences, field of Information and Communication Sciences
Igor Kuduz	Assistant Professor, PhD	full working hours		28/3/2013, Assistant Professor	Artistic area, field of Fine Art
Dubravko Kuhta	BA	full working hours		21/2/2013, Assistant Professor	Artistic area, field of Fine Art

Petar Kurečić	Assistant Professor, PhD	full working hours	30/9/2013, Senior Scientific Associate	5/12/2013, Assistant Professor	Social Sciences, field of Political Sciences
			25/1/2010, Scientific Associate		Interdisciplinary area of Science, Geography
Franjo Maletić	Assistant Professor, PhD	full working hours		6/7/2011, Assistant Professor	Social Sciences, Information and Communication Sciences
Rudolf Milanović	PhD	cumulative employment, 25%	10/7/2012, Scientific Associate		Biomedicine and Health, Clinical Medical Sciences
Irena Miličić	Assistant Professor, PhD	full working hours		5/6/2014, Assistant Professor	Interdisciplinary field of Science, Philology
			8/7/2013, Scientific Associate		Humanities, Interdisciplinary field of Humanities
Petar Miljković	Assistant Professor, PhD	full working hours	21/3/2014, Scientific Associate		Interdisciplinary field of Science, Graphics Technology
			6/3/2014, Scientific Associate	5/6/2014, Assistant Professor	Technical Sciences, Graphics Technology
				17/7/2014, Assistant Professor	Social Sciences, Information and Communication Sciences
Marin Milković	Full Professor, PhD	full working hours	15/1/2013, Scientific Advisor		Social Sciences, Information and Communication Sciences
			5/12/2013, Scientific Advisor		Interdisciplinary area of Science, Graphics Technology
			3/6/2014, Scientific Advisor		Technical Sciences, Graphics Technology
				19/7/2013, Full Professor	Social Sciences, Information and Communication Sciences
				5/11/2013, Associate Professor	Social Sciences, Information and Communication Sciences
				19/2/2014, Assistant Professor	Technical Sciences, Electrical Engineering

Dinko Primorac	Assistant Professor, PhD	cumulative employment , 50%	13/12/2013, Scientific Associate	19/2/2014, Assistant Professor	Social Sciences, field of Economics	
Dinko Puntarić	Tenured Full Professor	cumulative employment , 50%	12/3/2007, Scientific Advisor	2/4/2012, Tenured Full Professor	Biomedicine and Health, Public Health and Health Care	
Ante Rončević	Assistant Professor, PhD	full working hours	9/5/2011, Scientific Associate	24/1/2013, Assistant Professor	Social Sciences, field of Economics, branch of Finances	
Božo Soldo	Associate Professor, PhD	full working hours	18/4/2011, Senior Scientific Associate	18/4/2011, Associate Professor	Technical Sciences, field of Civil Engineering	
Marko Stojić	Assistant Professor, PhD	full working hours		21/4/2009, Assistant Professor in re-election	Natural Sciences, field of Physics	
Vladimir Šimović	Tenured Full Professor	full working hours	5/2/2009, Scientific Advisor	5/6/2014, Tenured Full Professor	Social Sciences, field of Information and Communication Sciences	
Gordana Tkalec	Assistant Professor, PhD	full working hours	24/4/2014, Scientific Associate	4/6/2014, Assistant Professor	Humanities, field of Philology, branch of Theory and History of Literature	
Ljubica Bakić-Tomić	Associate Professor, PhD	full working hours	15/1/2013, Scientific Advisor	20/10/2010, Associate Professor	Social Sciences, field of Information and Communication Sciences	
Mario Tomiša	Assistant Professor, PhD	full working hours	21/3/2014, Senior Scientific Associate		Interdisciplinary area of Science, Graphics Technology and Information and Communication Sciences	
					27/3/2013, Assistant Professor	Social Sciences, field of Information and Communication Sciences
					5/12/2013, Assistant Professor	Artistic area, Design
Vlado Tropša	Assistant Professor, PhD	full working hours	16/1/2013, Scientific Associate	30/4/2013, Assistant Professor	Technical Sciences, field of Mechanical Engineering, branch of General Mechanical Engineering (construction)	
Dean Valdec	Assistant Professor, PhD	full working hours	26/11/2013, PhD	5/6/2014, Assistant Professor	Technical Sciences, field of Graphics Technology	
Vinko Višnjic	Associate Professor, PhD	full working hours	14/10/2009, Senior Scientific Associate	14/6/2010, Associate Professor	Technical Sciences, field of Transport Technology and Transport	



Damir Vusić	Assistant Professor, PhD	full working hours	21/3/2014, Senior Scientific Associate		Interdisciplinary area of Science, Graphics Technology and Information and Communication Sciences
				28/3/2013, Assistant Professor	Social Sciences, Information and Communication Sciences
			19/3/2013, Scientific Associate	5/6/2014, Assistant Professor	Technical Sciences, Graphics Technology
Iva Rosanda Žigo	Assistant Professor, PhD	cumulative employment, 50%	17/10/2012, Scientific Associate	19/7/2013, Assistant Professor	Humanities, Philology

University North currently employs 37 people who have been elected to scientific-teaching and/or scientific titles. University North is an integrated university; it is composed of 11 departments and two University Centres. At the University North there are currently 2,695 students enrolled (professional, undergraduate, graduate students, and graduates). It is a fact that the majority of the teaching programmes of University North still consist of programmes that are primarily professional, non-scientific, i.e. currently, in the whole structure of studying there is smaller proportion of university graduate programmes. Due to that, for their implementation it is important to not only have a scientific-teaching staff, but also a staff elected to teaching and associate titles. Despite the formal status of a university scientific-teaching institution, University North is primarily an educational, and then scientific and artistic institution. The reason for this is because it puts emphasis on university and vocational teaching. Scientific-research work and publishing is primarily financed from the University's own funds, and a truly small part is financed from budget funds (approved research projects and grants). Furthermore, there is a growing number of registered and conducted projects financed from other sources (mostly international, European and other). Within the existing, primarily the University's own funding and scientific-research projects and programmes (mostly foreign-partner ones), almost all (24) young scientists of the University North are progressing (some of them are MA students, and 16 of them are students at postgraduate, i.e. doctoral studies). Outside the University North there is a significant number of people (mostly in Varaždin, and less in the city of Koprivnica) who are involved in scientific activities (primarily due to the activities of two institutions: "Faculty of Organization and Informatics - Varaždin" and "Podravka - Koprivnica"). Project and academic orientation has so far mostly been driven by scientific interests of individual employees of the University North, i.e. by a series of personal scientific and educational interests. Projects were indeed rarely analysed and directed towards economic, social-humanistic and other needs of the cities of Varaždin and Koprivnica and their counties. Moreover, there was almost no basic (fundamental) research. The existing relationship of the community, the Ministry of Science, Education and Sports, some university and scientific

institutions towards projects in the field of Humanities and Social Sciences is not appreciated by scientists from these fields, and they make up 42.86% of the number of all the employed scientists (elected to scientific-teaching and/or scientific degrees) at the University North. A change in the existing situation does not depend only on the change of the general social and specific scientific requirements (incompleteness of the financing system of Humanities and Social Sciences, incompleteness of the financing system of science at small and insufficiently equipped and staffed universities), but on the present realistic lack of a custom system of creating, promoting and developing the University's own and partner scientific-research and scientific-teaching requirements. In recent years, the recruitment and financing of a (relatively) large number (23) of young employees (mostly young Research Assistants and teachers) of the University North was carried out solely from the University's own resources. This scientific strategy provides an even more systematic development of more clearly integrated and transparently published criteria of the development of young employees. The organizational well-defined structure of the University indicates that even though the University is formally (primarily fiscally) integrated, it is in part also relatively disintegrated in scientific-research terms. Due to that, many actions taken by individuals indicate that the situation will not change easily, nor will it get resolved on its own. University North needs to find and/or build up the strength for such significant changes, to activate a part of its own existing and social will for changes, which has still not matured, despite certain positive indicators. All of the mentioned are the determinants of the current situation and the development level of the scientific production of University North.

## 1.2. DESCRIPTION OF SCIENTIFIC-RESEARCH ACTIVITIES

### Scientific-research projects and programmes and their results

Table 2.2.1 Detailed statistics of scientific-research and other projects and programmes

		Znanstveni i drugi projekti i programi			
		Scientific programmes	Projects	International projects	From other institutions
A	Information and Communication Sciences	1	1	-	2
B	Sociology	1	-	-	1
C	Psychology	-	-	-	-
D	Pedagogy	-	6	3	-
E	History	-	-	-	-
F	Philosophy	-	-	-	-
G	Philology	-	-	-	-
H	Technical and Natural Sciences	9	15	2	22
I	Interdisciplinary	1	5	2	4

Source (July 2014): Analysis of the University's own data – reports

In the last five years, the existing scientists at the University North have participated in the implementation of 29 scientific-research projects and 13 programmes, i.e. a total of 42 programmes. On average, 90% of employed scientists (elected to scientific-teaching and/or scientific title) participated in one scientific-research project and/or programme (the ratio of 38 scientists on 42 projects, i.e. 0.90). To be more precise, 1.11 employed scientists participated in one project and/or programme. They mostly participated in scientific projects in the field of Social Sciences and Humanities. Distribution according to the fields is shown in the previous table (Table 2.2.1).

In reality, 25 scientists took part in 42 projects, i.e. an average of 0.60, or 60% of scientists per project and/or programme. To be more precise, 1.68 scientists (almost 2) participated in one project and/or programme. Out of those scientists, 29 of them were associates on projects carried out by other/external institutions, i.e. an average of 69% of them collaborated with their colleagues from other scientific-research and/or scientific-teaching institutions (ratio 29:42, or slightly more than every other). From the total number of scientists, less than 17% of them, i.e. only 7 of them, had the role of a head investigator, i.e. the project leader (ratio 7:42, i.e. an average of 0.17 or every seventh scientist). From the total number of scientists, 14% of them, i.e. only 6 of them, participated in international projects (ratio 6:42, i.e. an average of 0.14 or one on almost every seventh project). The analysed data indicate that the majority of scientists at the University North were completely scientifically active, because a relatively large number of individuals listed in these statistics participated in a number of different projects.

Table 2.2.2 Overall statistics of scientific-research projects and programmes

Overall statistics			
Number of scientists who participated	Project leaders	Participated	in international projects
25	7	20	6

Source (July 2014): Analysis of the University's own data – reports

The distribution of employees by departments (with participation in projects and/or programmes) is not uniform, since some departments have a very different level of participation of individuals in scientific-research work (i.e. project and/or programme).

Table 2.2.3 List of the title of analysed projects and programmes

:		Title of projects and programmes	No.	Project leader	Associates
	I	Scientific research project of MSES (no. 227-2271694-1699), "Analytical model of the monitoring of new educational technologies in lifelong learning", scientific and artistic research	1	Prof. Vladimir Šimović, PhD	Prof. Marin Milković, PhD; Assistant Professor Winton Afrić, PhD; Assistant Professor Goran Kozina, PhD
	A	Scientific project of MSES, "Information-communication competencies of educators"	2	Associate Professor Ljubica Bakić-Tomić, PhD	Prof. Marin Milković, PhD
	D	Project "Equal opportunities for all - better integration of Roma children into the educational system of the Republic of Croatia"	3	Associate Professor Ljubica Bakić-Tomić, PhD	
	H	Project "Optimization of fractal production with polymer constructs (120-036)"	4	Prof. Igor Čatić, PhD – Faculty of Mechanical Engineering and Naval Architecture	Krešimir Buntak, PhD
	A	Project "Comparative study of the functioning of management in Croatian companies and companies of developed countries - Implications for the development of the Croatian management"	5	Prof. Pere Sikavica, PhD – Faculty of Economics and Business	Krešimir Buntak, PhD
	D	IPA project "Knowledge for All"	6	Polytechnic of Varaždin	
	H	Project "Modernization of web technologies"	7	Robert Geček	

	H	Project "Modernization of graphic design"	8	Robert Geček	
	D	International project "English in Logistics"	9		Ivana Grabar
	?	International project "Cultural Values"	10		Ivana Grabar
	I	Project "Role of Social Networks in the Knowledge Society"	11		Assistant Professor Anica Hunjet, PhD
	H	Project "Modulation of the systemic inflammatory response in heart surgery"	12	Ino Husedžinović, PhD	
	H	Project "Study of the model of assisted circulation and respiration"	13		Ino Husedžinović, PhD
	H	Project "Extracorporeal circulation in emergencies"	14		Ino Husedžinović, PhD
	H	International project "Randomized Double-blind Placebo-Controlled Phase 3 Study to Assess the Safety and Efficacy of ATR-123 on Subjects with severe Sepsis and Coagulopathy"	15		Ino Husedžinović, PhD
	H	Project "New technologies in diagnostics and management of marine propulsion systems"	16		Damir Maderić
	I	Project "Applied macroeconometrics in Croatia: the VAR methodology"	17		Dinko Primorac, PhD
	I	Project "Financial stability, macroeconomic policy and financial market activity"	18		Dinko Primorac, PhD
	I	International project "TEMPUS Fostering Entrepreneurship in Higher Education"	19		Dinko Primorac, PhD
	B	Project "Research of long-term effects of war on the health of population"	20	Dinko Puntarić, PhD	
	H	Project "Mapping and verification of traffic signals by using computer vision and satellite navigation"	21		Vladimir Stanisavljević

	H	Project "Evaluation of the quality of multimedia educational spaces and systems"	22	Prof. Siniša Fajt, PhD	Prof. Marin Milković, PhD; Prof. Vladimir Šimović, PhD; Assistant Professor Goran Kozina, PhD; Associate Professor Ljubica Bakić-Tomić, PhD
	D	International project "Tempus IV" – "Modernising Teacher Education in a European Perspective"	23		Prof. Marin Milković, PhD; Prof. Vladimir Šimović, PhD
	H	Scientific project "Prediction of residual stresses due to solidification in molded plastic layers"	24		Assistant Professor Vlado Tropša, PhD
	H	Scientific project "Modeling bonded structures in automotive applications during striking effects"	25		Assistant Professor Vlado Tropša, PhD
	H	Scientific project "Test od detaching, experimental and numerical aspects"	26		Assistant Professor Vlado Tropša, PhD
	H	Scientific project "Quantum field theory, noncommutative spaces and symmetry"	27	Stjepan Meljanac, PhD, from the Ruđer Bošković Institute in Zagreb	Assistant Professor Marko Stojić, PhD
	?	Scientific project "Lie groups, integrable systems and symmetry"	28	Saša Krešić-Jurić, PhD, from the Faculty of Science in Split	Assistant Professor Marko Stojić, PhD
	H	Scientific project in progress "Bioactive compounds in food"	29		Natalija Uršulin-Trstenjak, PhD
	H	Scientific project of MSES "Evaluation of quantitative and qualitative criteria of the process of graphic reproduction"	30	Nikola Mrvac, PhD, Faculty of Graphic Arts in Zagreb	Prof. Marin Milković, PhD; Assistant Professor Mario Tomiša, PhD

	H	International project "Improvement of reliability in production and exploitation of welded construction and products"	31		Prof. Marin Milković, PhD
	?	International "Erasmus Mundus Basileus II" project	32		Prof. Vladimir Šimović, PhD
	I	International "Erasmus+ Key Action 2" project "Innovation Gate – Knowledge Alliances"	33		Prof. Vladimir Šimović, PhD
	H	Scientific project "Research of new multi-purpose dyes and optical brighteners"	34	Prof. Vesna Tralić-Kulenović, PhD	Assistant Professor Anica Hunjet, PhD
	H	Professional project "Sanation of landslides in northwestern Croatia"	35		Matija Orešković
	H	Professional project "Planning of road widening in a hilly landscape"	36		Matija Orešković
	H	Professional project "Planning and supervision of building foundations on problematic soil"	37		Matija Orešković
	H	Professional project "Planning and supervision of building a construction pit"	38		Matija Orešković
	H	Professional project "Development of the project of the establishment of a hybrid digital printing center of the Croatian Post"	39		Prof. Marin Milković, PhD; Domagoj Frank, MSc
	H	Professional project "Development of the project and the establishment of the DVBT2 digital television standard of the Croatian Post"	40		Prof. Marin Milković, PhD; Domagoj Frank, MSc
	D	Project "Development perspectives of higher education in the city of Varaždin"	41	Polytechnic of Varaždin and Ivo Pilar	A larger number of the University's researchers
	D	Project "International Competences for the Unemployed" in the Leonardo da Vinci programme framework	42	Assistant Professor Vlado Tropša, PhD	

Source (July 2014): Analysis of the University's own data – reports

The results of scientific-research work are also presented at national and international conferences. Therefore, in the last five years, a large number of scientific meetings and conferences in which the employees of University North either participated, and/or led them were held. There is a high level of participation and a large number of different workshops, courses and seminars are also organized. The number of presentations of books and other scientific-research content was relatively important. It can be deduced that there is an increasingly clearer trend of the University North promoting, developing and nurturing this type of scientific work, communication and activation in a stronger and more systematic manner.

*The publication of scientific papers and the results of scientific-research work and cooperation*

Scientific production is systematically documented in the files of the employees of the University North, and almost all scientists are members of the Croatian scientific bibliography - CROSBI. The University has three of its own scientific journals ("Podravina" - primarily for social sciences and humanities, "Tehnički glasnik (Technical Bulletin)" - primarily for technical sciences, and "In Media Res" - primarily for interdisciplinary sciences) which are referenced in the recognized bases, and in accordance with the recommendations of the Ministry and the contemporary needs, journals have their electronic version (portal of Croatian scientific journals "Hrčak"). In addition to journals, University North has so far published an average of about 6 titles of monographic publications per year. The University established the Publishing Commission and is also working on a project of its own university library network (in cooperation with its mentor University of Rijeka). In 2013, the University Library was established in its own premises in Koprivnica and Varaždin with a significant body of its own and other scientific material, all with the aim of completing the work on the modern furnished space for which a conceptual architectural design was created, and space and resources were provided. This will significantly improve the conditions of study and training, and will facilitate the availability of scientific and professional literature in the University Library, both to scientists and students, and PhD students who can already access electronic sources and publications through online database. Furthermore, that will serve as the foundation for easier scientific planning of webometric and/or bibliometric analyses of published papers of the University's own staff. From 2014, the University has been systematically working on finalizing the unification of all data on scientific and professional papers of the scientific-teaching, teaching and associate staff at the University in one single database. Furthermore, management of data on all published results on scientific and specialized research projects and programmes has been unified, including the data on similar activities at the University North and international cooperation in student and teaching mobility (incoming and outgoing).



Indicators of achieved mobility:

**A) Outgoing teacher mobility:**

**ERASMUS:**

Ivana Živoder – Laurea University of Applied Sciences, Laurea, Finland

- 13/4/2014 — 16/4/2014

- 10 hours of classes

Antonia Bogadi – Polytechnic Institute of Bragança, Portugal

- 5/5/2014 — 10/5/2014

- professional development

Matija Orešković – Faculty of Civil Engineering, Maribor, Slovenia

- 10/6/2014 — 13/6/2014

- 8 hours of classes

Marijana Neuberg – Faculty of Health Sciences, Novo Mesto, Slovenia

- 5/6/2014 — 7/6/2014

- 5 hours of classes

Jurica Veronek – Faculty of Health Sciences, Novo Mesto, Slovenia

- 5/6/2014 — 7/6/2014

- 5 hours of classes

Ivana Grabar – University of Applied Sciences, Kotka, Finland

- 24/9/2014 — 29/9/2014

**OTHER (Bilateral agreements):**

Ana Globočnik Žunac – Vitrina University, Tirana, Albania

- 8/6/2014 — 12/6/2014

- 10 hours of classes

Ljubica Bakić Tomić - Vitrina University, Tirana, Albania

- 8/6/2014 — 12/6/2014

- 10 hours of classes

Vladimir Šimović - University of Münster (Westfälische Wilhelms Universität), Germany

- 1/10/2013 — 30/9/2014

- 60 hours of classes i 30 hours of e-learning

Vladimir Šimović - University of Mostar - FPMOZ Mostar, Bosnia and Herzegovina (Faculty of Science and Education)

- 1/10/2013 — 30/9/2013

- 60 hours of classes

**B) Incoming teacher mobility:**

Ana Podhosnik – Faculty of Health Sciences, Novo Mesto, Slovenia

- 17/4/2014 — 18/4/2014

Ljiljana Leskovic – Faculty of Health Sciences, Novo Mesto, Slovenia

- 17/4/2014 — 18/4/2014

Vesna Zupančič – Faculty of Health Sciences, Novo Mesto, Slovenia

- 17/4/2014 — 18/4/2014

Adnan Rovčanin- School of Economics and Business, Bosnia and Herzegovina

- 16/6/2014 — 18/6/2014

### **C) Outgoing student mobility:**

Student Alvaro Taučer, professional study of Technical and Economic Logistics;

- professional practice, company Mizzi Motors, Mosta, Malta
- 1/4/2014 — 1/7/2014

Student Marko Zidarić, professional study of Civil Engineering,

- professional practice, company Gebas atelier architects s.r.o., Hradec Karlove, Czech Republic
- 15/4/2014 — 15/7/2014

Student Juraj Vrzan, professional study of Multimedia, Design and Application;

- professional practice, company Evolution Media, Zebbung, Malta
- 15/4/2014 — 15/7/2014

Student Boris Pongrac, professional study of Technical and Economic Logistics;

- professional practice, company TKK Tomberger Kuhlkost GmbH, Graz, Austria
- 14/4/2014 — 14/7/2014

Student Dario Gregurić, professional study of Technical and Economic Logistics;

- professional practice, company F.A. Maik d.o.o. Maribor, Slovenia
- 21/5/2014 — 21/8/2014

Students of Nursing Ana-Marija Čurdija, Nikolina Hanžek and Andreja Vadlja.

- On the basis of a bilateral agreement with the Faculty of Health Sciences, Novo Mesto, an outgoing study stay has been contracted.
- 19/5/2014 — 19/8/2014

### **D) Incoming student mobility:**

Students of Nursing from Novo Mesto: Vanja Vodusek i Kristijan Jovanov

- On the basis of a bilateral agreement with the Faculty of Health Sciences, Novo Mesto, an incoming study stay has been contracted.
- 19/5/2014 — 19/8/2014

Attachment 6

**Spatial resources, equipment  
and financial support  
for the implementation of scientific activities**

Sources of funding, their purpose and the legal framework for carrying out scientific-research activities

University North draws the majority of its funding for scientific-research work exclusively from its own assets, and a far smaller part through the participation of its employees in projects and support of the Ministry of Science, Education and Sports (MSES) of the Republic of Croatia, as well as from certain projects and support of some universities that they either led or participated in them as researchers.

The assets of the University North for scientific and research work, and international and national cooperation amount to more than HRK 665,000, only for the calendar year 2014.

Appropriations from other sources, only for the calendar year 2014:

- national projects (Ministry of Science, support for projects of the University of Zagreb, etc.): HRK 40,000,
- EU projects and international cooperation (joint): around € 55,000.

In 2014, University North planned to allocate HRK 665,000 from its own resources for scientific-research work and international and national cooperation. From that sum, it planned to allocate HRK 400,000 for its own scientific-research projects (structure: 30% for equipment and material costs, 30% for travel and registration fees, 30% for royalties and technical support, etc., and 10% for the costs of support of the University North - spatial, power sources, etc.), and additional HRK 265,000 primarily for international and partly for national scientific-research and scientific-educational cooperation. From that sum, HRK 115,000 was planned for Erasmus and bilateral cooperation, HRK 100,000 to support travel to scientific and similar conferences, and HRK 50,000 for other unexpected expenses. In 2015, University North plans to allocate HRK 1,000,000 from its own resources for scientific-research work and international and national cooperation. It plans to follow the same distribution structure, with the possibility of restructuring due to possible significant changes in the scientific macro- and microstructure of the University's activities and environment. In 2016, University North plans to allocate HRK 1,250,000 from its own resources for scientific-research work and international and national cooperation. It again plans to follow approximately the same distribution structure, with the possibility of restructuring due to possible significant changes in the scientific macro- and microstructure of the University's activities and environment. In 2017, University North plans to allocate HRK 1,650,000 from its own resources for scientific-research work and international and national cooperation. It again plans to follow approximately the same distribution structure, with the possibility of restructuring due to possible significant changes in the scientific macro- and microstructure of the University's activities and environment. In 2018, University North plans to allocate HRK 2,000,000 from its own resources for scientific-research work and international and national cooperation. It again plans to follow approximately the same distribution structure, with the possibility of restructuring due to possible significant changes in the scientific macro- and microstructure of the University's activities and

environment. It is planned that in 2019 the existing five-year period of the development of science will be completed, and a new one created.

University North will search for additional resources at the national level primarily through cooperation with the founding cities, for example through cooperation with their public companies and utility, more developed companies and medium- and small-sized enterprises in founding cities and their counties. The University will ask the local authority for additional funds either by applying to open tenders or by forming proactive partnerships in projects related to the strengthening of scientific research, development and innovation capacities. The University will try to acquire part of the funding from state institutions, which govern assets already provided for effective incentives and support, and for the investment in scientific-research work and development. It will do so either by proposing joint projects that encompass joint scientific-research interests or activities in the EU countries. The role in research, development and innovation will strengthen, and the role in large enterprises will both strengthen and be preserved. It will be sought to carry out the planned allocation of financial resources provided by the University North for scientific research and scientific development in accordance with the methodology and distributions used in the EU for scientific-research priorities, e.g. In the framework programme Horizon 2020 and the like. University North will primarily direct most of its "scientific" investments (quantitatively, financially, etc.) towards its scientists/researchers and its scientific-research projects, and secondarily towards the procurement of scientific-research equipment. It will also try to invest the least in building new facilities. It will primarily seek to resolve all the mentioned through its projects in the framework of EU funds, and other national and international sources and projects. If the publicly proclaimed aspiration that the public funding of research and development becomes the assumption of long-term stability, autonomy and international competitiveness of the Croatian science and scientific-research work is achieved, it will become possible for the University North to focus on the gaining of additional national funding sources of its own research and development in an even more significant and stronger manner. Therefore, University North should relatively quickly devise innovative business models and modernize its practices concerning the creative connection between its modern organized scientific-research work and technology. This will lead to greater marketing results in the University's environment needed in order for every achievement of noticed scientific-research results to have its more effective social and human dimension in which it will then be sought to open new doors for further cooperation in scientific research, creative development and innovation. The anticipated imposes an obligation that the University North has to, in the immediate future, focus on the development of, for instance, mixed professional teams that would aspire to secure a more active participation of the University and its partner polytechnics and other scientific institutions in the implementation of the process of the so called smart and scientific-research focused specialization. Such specialization would enable active concentration and the formation of a connection between knowledge capacities and the most promising

economic activities in the founding cities, their counties, and beyond. By achieving the mentioned, University North would acquire a greater level of competitiveness, along with its partners, in the broader area of action and the global economy in general. The goal is to create, along with constant and dynamic encouraging of scientific-research and entrepreneurial curiosity and innovation-oriented creation, new and greater scientific-research, economic and social values of the University North and its partners.

University North developed primarily on the foundations of social and humanistic, and technical, natural and biomedical tradition. It tried to compensate for possible lag behind other universities in relation to the development of information and communication and other technology infrastructure primarily through private funds and sponsorships. University North is a part of the national ICT infrastructure (primarily through the Carnet network in Varaždin) through the regional centres in Varaždin and Koprivnica. The ICT (information and communication) equipment of the University North is improving. It is primarily financed and equipped from its own resources, and a little bit from the equipment of the city of Koprivnica. However, the state of the ICT equipment is inadequate. Specifically, the data on ICT equipment from 2014 are the following: the number of personal computers is 372, and only 53 of those are laptops. The functioning and the improvement of the ICT equipment and subsystems are primarily burdened by the lack of University's own financial resources and the inadequate staffing with relatively low salaries (in the system of the University) for this activity. The need for equipping a growing number of computer classrooms, laboratories and classrooms for ICT-supported teaching has hitherto been a dominant one. The purchase of more powerful and sophisticated ICT and other technological equipment for scientific research and testing, and scientific-research teaching (e.g. For simulation and similar type of research, digitization of materials, computer support for scientific experiments, ICT research, comparative measurements in scientific projects, etc.) was relatively neglected until 2014, when a different approach and support to the increased involvement in the scientific work of a growing number of computer and information-communication specialists intensified.

Already in 2013, the University performed all the necessary preparations for the construction of a new university library. A new software and architectural base as a foundation for the realization of a conceptual architectural and urban solution was made. An open call was announced and the optimal solution between the submitted offers was chosen, because the university library was conceived as one of the most important educational, information-communication and cultural centres of the University. In 2014, along with the work on the university library, the University is working on the completion of the Centres for the preparation and development of digital and other (print and multimedia) scientific and educational contents in both University Centres, in Varaždin and Koprivnica. It has to do with technologies (preparation and realization of digital and hybrid printing) which would be used as a laboratory for scientific-research work and as a scientific-teaching space. Fully equipping

all scientific-research laboratories and other similar areas with scientific-research equipment and scientific tools is a constant concern of the University North, which regularly monitors the spatial and technological adequacy and appropriateness of the equipping and is preparing its own and joint, both national and EU projects (in terms of equipment used in scientific and scientific-teaching purposes). Often it comes to capital equipping required by the "joint" and "private" projects, because so far the external funding has been only exceptionally received. For example, only in 2014, all the requirements at the level of all departments of the University North for capital equipment and other capital investments that have been reoriented towards the more fragmented small projects into one joint project have been brought together. In 2014 the plan is to use (for scientific-teaching and research purposes) a considerable deal of approved funds, technology and equipment of the Varaždin Technology Park (of the total approved € 15.5 million), and whose co-founder and the co-owner of one third is the University North. In 2014, University North was almost done with significant capital investments in the two university campuses in Varaždin and Koprivnica, which will, with the completion of equipping, constitute an important area both for scientific and research work (laboratory and other scientific research facilities), and for the scientific-teaching activities of the University North (the campuses cover an area of a few thousand modern equipped square meters).

Table 2.2.4 Partial detailed analytical example of an excerpt from the financial plan of the University North for the period of five years

		N - current year	N+1	N+2	N+3	N+4
	<b>EXPENSES</b>					
1.	<b>EMPLOYEE EXPENSES</b>	130,000.0 0	156,000.0 0	170,000. 00	186,000. 00	200,00 0.00
1.1	Staff pay					
1.2.	External associates – fees	130,000.0 0	156,000.0 0	170,000. 00	186,000. 00	200,00 0.00
1.3.	Total remaining expenditure (specify)					
2.	<b>MATERIAL AND ENERGY EXPENSES</b>	110,000.0 0	150,000.0 0	184,500. 00	208,000. 00	249,50 0.00
2.1.	Office supplies and other material costs	16,000.00	19,000.00	23,500.0 0	30,000.0 0	42,500. 00
2.2.	Laboratory supplies	29,000.00	35,000.00	42,000.0 0	26,000.0 0	31,000. 00
2.3.	Energy	15,000.00	19,000.00	21,000.0 0	28,000.0 0	33,000. 00
2.4.	Material and equipment for current and	20,000.00	37,000.00	53,000.0 0	74,000.0 0	88,000. 00

	investment maintenance					
2.5.	Small inventory	30,000.00	40,000.00	45,000.00	50,000.00	55,000.00
2.6.	Total remaining expenditure (specify)					
3.	<b>SERVICE EXPENSES</b>	60,000.00	90,000.00	151,500.00	206,500.00	284,500.00
3.1.	Telephone, postal and transport costs	4,000.00	4,700.00	7,000.00	7,500.00	8,000.00
3.2.	Current and investment maintenance services	18,000.00	19,000.00	47,000.00	58,000.00	97,000.00
3.3.	Information and promotion	7,000.00	7,600.00	15,000.00	19,000.00	23,500.00
3.4.	Communal services	3,000.00	5,200.00	9,500.00	11,000.00	15,500.00
3.5.	Lease, rent	5,000.00	7,500.00	10,000.00	15,000.00	25,000.00
3.6.	Intellectual and personal services (fees, contracts)	20,000.00	42,000.00	63,000.00	82,000.00	96,000.00
3.7.	Computer services	3,000.00	4,000.00	9,000.00	14,000.00	19,500.00
3.8.	Total remaining expenditure (specify)					
4.	<b>NON-FINANCIAL ASSET EXPENSES</b>	168,000.00	345,600.00	417,000.00	633,500.00	767,000.00
4.1.	Business facilities	5,000.00	21,500.00	37,000.00	79,000.00	91,000.00
4.2.	Computer equipment	22,000.00	40,000.00	45,000.00	66,500.00	70,500.00
4.3.	Laboratory equipment	60,000.00	100,700.00	113,000.00	158,000.00	183,000.00
4.4.	Office equipment and furniture	8,000.00	15,500.00	28,500.00	43,500.00	61,000.00
4.5.	Communication equipment	3,000.00	4,900.00	5,500.00	12,000.00	20,000.00
4.6.	Other equipment	25,000.00	55,000.00	61,000.00	77,000.00	82,500.00
4.7.	Scientific infrastructure/Literature	35,000.00	79,000.00	91,500.00	111,500.00	160,000.00
4.8.	Investment in production facilities, machines and other equipment	5,000.00	14,000.00	17,500.00	38,000.00	43,000.00
4.9.	Additional investment in building facilities	5,000.00	15,000.00	18,000.00	48,000.00	56,000.00
4.10.	Total remaining expenditure (specify)					
5.	<b>EMPLOYEE</b>	130,000.00	171,900.00	204,000.00	287,000.00	339,000.00



	<b>REIMBURSEMENT</b>	<b>0</b>	<b>0</b>	<b>00</b>	<b>00</b>	<b>0.00</b>
5.1.	Business travel costs	100,000.0 0	131,900.0 0	144,000. 00	212,000. 00	249,00 0.00
5.2.	Professional training costs	30,000.00	40,000.0 0	60,000.0 0	75,000.0 0	90,000. 00
5.3.	Total remaining expenditure (specify)					
6.	<b>OTHER BUSINESS EXPENSES NOT MENTIONED ABOVE</b>	<b>67,000.00</b>	<b>86,500.00</b>	<b>123,000. 00</b>	<b>129,000. 00</b>	<b>160,00 0.00</b>
6.1.	Insurance premiums	10,000.00	10,000.00	10,000.0 0	10,000.0 0	10,000. 00
6.2.	Representation costs	50,000.00	60,000.0 0	70,000.0 0	70,000.0 0	70,000. 00
6.3.	Membership fees	2,000.00	2,500.00	3,000.00	3,500.00	4,000.0 0
6.4.	Banking and financial transaction services	1,000.00	2,000.00	3,000.00	4,000.00	5,000.0 0
6.5.	Interest	500,00	1,000.00	1,500.00	2,000.00	3,000.0 0
6.6.	Other financial expenses	3,500.00	11,000.00	35,500.0 0	39,500.0 0	68,000. 00
B	<b>TOTAL BUSINESS EXPENSES</b>	<b>665,000.0 0</b>	<b>1,000,000 .00</b>	<b>1,250,00 0.00</b>	<b>1,650,00 0.00</b>	<b>2,000,0 00.00</b>
C	Balance brought forward from the previous year					
	<b>TOTAL BALANCE on 31 December (A-B+C)</b>					

Source (2014): University's own analytical data.

Note: Additional data on income needs to be added in the previous table.

## PHYSICAL ASPECTS OF THE FEASIBILITY OF THE STRATEGIC PROGRAMME

Table 4.1 Detailed analytical representations of space and equipment of the University North as a scientific institution

<b>Buildings and spaces of the scientific institution</b>					
Building ID	Location of the building	Year of construction/last annexed building or reconstruction	Total space in m <sup>2</sup>	Number of hours of weekly use*	
VŽ-UNIN (use) „Zgrada 1“	104. brigade 1	~ 1900/2001	2014		
VŽ-UNIN (use) „Zgrada 2“	104. brigade 3	~ 1900, 2014	3181		
VŽ-TTF (rental)	Hallerova aleja 6	-	340		
VŽ-OBV (rental)	Ivana Meštrovića b.b.	-	260		
VŽ-GSDV (rental)	Šetalište F.Tuđmana 1	2009	301		
VŽ-PM - „Former building of EPOS-a“ (rental)	Pavleka Miškine 43a	-	708		
VŽ-ESŠ (rental)	Hallerova aleja 5	-	XXX		
KC - Building owned by the city of Koprivnica (use)	Trg bana Jelačića 6, Koprivnica	1956/2000-2002	537.41		
KC - Building of the Croatian Chamber of Economy of Koprivnica (use)	Frankopanska 3, Koprivnica	2011	131.92		
University building campus	Trg Žarka Dolinara 1, Koprivnica	2013	No data		
* in the case of joint use					
<b>Laboratories/spaces used for scientific activities</b>					
Building ID	Internal designation of the laboratory	Area (in m <sup>2</sup> )	Number of places for students	Number of hours of weekly use	Equipment rating (1 – 5)

VŽ-UNIN B1	K2	35	12	45	5
VŽ-UNIN B1	K3	40	12	32	4
VŽ-UNIN B1	K5	42	15	28	5
VŽ-UNIN B1	K9	36	24	34	5
VŽ-UNIN B1	K10	42	15	28	5
VŽ-UNIN B1	K11	42	15	48	4
VŽ-UNIN B1	K21	37	10	5	4
VŽ-UNIN B1	K24	16	10	18	4
VŽ-UNIN B1	K26	42	28	48	4
VŽ-UNIN B1	K27	15	3	18	4
VŽ-UNIN B1	K29	36	14	42	5
VŽ-UNIN B1	K31	23	3	18	5
VŽ-UNIN B1	K32	15	10	18	5
VŽ-UNIN B1	K33	42	18	38	4
VŽ-UNIN B2	K-105	41	10	-	5
VŽ-UNIN B2	K-106	21	10	-	5
VŽ-UNIN B2	K-108	36	10	-	5
VŽ-UNIN B2	K-109	32	10	-	5
VŽ-UNIN B2	K-116	34	18	-	5
VŽ-GSDV	GSDV-R	50	15	10	5
KC - Building owned by the city of Koprivnica	L1	68.97	15	22	5
KC - Building owned by the city of Koprivnica	L2	65.70	15	21	5
VŽ-ESŠ	A-60	60	40	25	5
VŽ-GSDV	GSDV-P	301	250	64	5
KC - Building owned by the city of Koprivnica	P1	143.49	88	39	4
KC - Building owned by the city of Koprivnica	P2	81.06	60	20	4

KC - Building owned by the city of Koprivnica	P3	77.03	58	39	4
KC - Building owned by the city of Koprivnica	P4	59.38	34	42	4
KC - Building owned by the Croatian Chamber of Economy	1	131.92	120	4	5
Recording studio	Trg Žarka Dolinara 1, Koprivnica	16.62	1	No data	5
Tonal production	Trg Žarka Dolinara 1, Koprivnica	14.40	4	No data	5
Laboratory 2	Trg Žarka Dolinara 1, Koprivnica	40.36	15		No data
Laboratory 4	Trg Žarka Dolinara 1, Koprivnica	36.69	15		
Laboratory 5	Trg Žarka Dolinara 1, Koprivnica	46.79	15		
Laboratory 6	Trg Žarka Dolinara 1, Koprivnica	38.39	15		
Laboratory 7	Trg Žarka Dolinara 1, Koprivnica	39.69	15		
Laboratory 8	Trg Žarka Dolinara 1, Koprivnica	39.69	15		
Laboratory 9	Trg Žarka Dolinara 1, Koprivnica	38.39	15		
Laboratory 10	Trg Žarka Dolinara 1, Koprivnica	50.51	15		
Laboratory 11	Trg Žarka Dolinara 1, Koprivnica	50.51	15		
Laboratory 12	Trg Žarka Dolinara 1, Koprivnica	48.65	15		
Laboratory 13	Trg Žarka Dolinara 1, Koprivnica	48.65	15		
* well-equipped implies the quality of research, technical and other equipment					
<b>Workplaces for practical teaching</b>					

Building ID	Location	Number of scientists/staff taking part in the research	Number of hours of weekly use	
Special Hospital for Medical Rehabilitation Varaždinske Toplice	Training lessons	24	15	
General Hospital Varaždin - Service for Prolonged Treatment and Palliative Care Novi Marof	Training lessons	32	45	
County Hospital Čakovec	Training lessons	80	45	
General Hospital Varaždin	Training lessons	100	45	
General Hospital Koprivnica	Training lessons	80	45	
Health Centre of the Varaždin County	Training lessons	150	30	
Home for the Elderly and Infirm Varaždin	Training lessons	100	45	
Home for the Elderly and Infirm Ivanec	Training lessons	50	45	
<b>Equipment of computer classrooms*</b>				
Number of new computers/ programmes (up to 3 years)	Number of computers older than 3 years	Functionality rating (1 – 5)	Maintenance rating (1 – 5)	Number of hours of weekly use
	244	4	5	?
136		5	5	43
258		5	5	In procurement
*including programmes, bases or some other type of scientific computer equipment				
<b>Scientists' offices</b>				
Building ID	Number of offices	Average space in m <sup>2</sup>	Equipment rating (1 – 5)	Average area in m <sup>2</sup> per full-time scientist/ associate *
VŽ Unin (Building 1)	17	20.8	5	15.43
VŽ Unin (Building 2)	13	20.19	5	11.93

VŽ - P.Miškine	3	9	5	9 m <sup>2</sup> (1 per office)
KC - Building owned by the city of Koprivnica	2	20.52	5	0.64125
University building, Campus - Trg Žarka Dolinara 1, Koprivnica	22	16.47	No data	0.72437
*or number of scientists/associates who share an office				
<b>Space used only for scientific-research and professional work</b>				
(if different from the above)				
Building ID	Internal room or laboratory designation	Space (in m <sup>2</sup> )	Number of hours of weekly use	Equipment rating (1 - 5)
<b>Capital equipment</b>				
(available capital equipment with purchase value exceeding HRK 200,000)				
Name of the instrument (equipment)	Purchase value	Age (years)		
Laboratory for electrical drives, electrical machines and power electronics	306,836.03	10		
SHEARMATI C 300 - a large machine for direct shift with a 300x300 mm cell, with software and accessories	344,280	In procurement		
Simulator for welding in virtual space (for MMA, TIG, MIG / MAG procedures)	230,000	In procurement		
GNC machining center with equipment and tools (GOC), 2x2x2 1520 kg, 5 cubic meters	280,000	In procurement		
<b>Library space and its equipment</b>				
a) data on the library space				
Total area (in m <sup>2</sup> )	Number of employees	Number of seats	Number of researchers using the library	Is there an electronic database of your books and

							journals
66	1		12		44		Yes
42	1		34		28		Yes
b) data on the equipment of the library space							
Number of book titles	Number of bases with a subscription/access	Rating of books and textbooks as being up to date (1- 5)	Number of foreign journal titles (including the electronic ones*)	Number of Croatian journal titles*	Rating of functionality and catalogue of books and journals (1- 5)	Equipment rating (1- 5)	Assess the quality and availability of electronic content (1-5)*
9829	38	4	approximately 20000	350	4	4	4
* The number includes electronic editions of journals							
<b>Service/teaching or other spaces</b>							
Total area (in m <sup>2</sup> )		Number of employees			Working hours		

Source (2014): University's own analytical data.

**Note:** Filled analytically and in accordance with the current status-kind of the scientific institution, University North.

## SPACE AND EQUIPMENT

*People, space and equipment for scientific research - a brief description:*

People carrying out scientific research have their own space in offices that have an average size of 17.4 m<sup>2</sup>. On average, every person has at their disposal a 7.55 m<sup>2</sup> space. Offices are equipped with a desk, anatomical office chair, cupboard for storing documents and a PC or laptop. Some offices also have printers, scanners and copiers, and if the office is not equipped with those devices, employees who work such offices are connected via network with multifunctional printers located in the shared premises. Each person has access to the Internet over a local network or over a wireless one. The technical staff directly involved in the implementation of research also has at its disposal the office space the size of 10.8 m<sup>2</sup>, which amounts to 5.4 m<sup>2</sup> per person. The technical staff has a desk, office chair, cupboard for storing documents

and a PC or laptop. Professional services have at their disposal an office space of an average of 19.52 m<sup>2</sup>. Persons employed in the professional service have at their disposal a working area the size of 7.5 m<sup>2</sup>, equipped with a desk, office chair, cupboard for storing documents, a computer and their own multifunctional device for printing documents, scanning and photocopying.

*Scientific infrastructure - a brief description of the laboratory, etc.:*

Scientists have at their disposal 14 laboratories with equipment used in teaching for the courses of CISCO network systems, electronic components, electronic circuits, digital electronics, electric motor drives, power electronics, electrical machines, joining techniques, process instrumentation, machinery and equipment automation, supervision and visualization of processes, basics of electrical engineering, measurements in electrical engineering, switching devices, power distribution, audio-video laboratory, recording studio, tonal directing and mechanical engineering courses. All laboratories are equipped with adequate machinery, equipment, instruments, computers and the appropriate software. Furthermore, they have at their disposal two libraries with 9829 titles, subscription and access to 38 bases, about 20,000 foreign titles of (electronic) journals and 350 titles of local (electronic) journals. From major bibliographic databases, scientists have access to the following databases: Academic Search Complete, Current Contents, Emerald, Eric, Medline, Scopus, Science Direct, Springer, Web of Science, Biomed Central, CBC, EBMR, Inspec and MathSciNet.

At the University North there are currently 32 laboratories, all intended for different purposes. They occupy the area of 1290.04 m<sup>2</sup>, which is an average of 40.31 m<sup>2</sup> per laboratory, and they include a total of 468 research sites. Most of the research sites located in one laboratory is 28, while one research site in one laboratory is the lowest number. From that number, 18 laboratories are equipped with computer equipment and the appropriate software and projector, and can be used by scientists of all profiles and orientations for their research work. From those 19 computer laboratories, 4 are 100% equipped and can be used for research in which work with computers is needed. The remaining 15 are 70% equipped and the rest of the equipment in the procurement plan with an additional 58 computers of various specifications and 16 graphic tablets. Moreover, 4 laboratories are equipped with audio-visual equipment such as cameras, video cameras, mixers, speakers and computers with the appropriate licensed software such as AVID Media Composer for video editing. The audio-visual laboratory is sound isolated, and in the laboratory with photographic equipment there are backgrounds for photographing and tripods with different light sources. Laboratories are equipped to the extent of 50%, and the remaining 50% of the equipment is in procurement, meaning that the



purchase of new digital video cameras, digital cameras, microphones, audio mixers, video mixers, studio audio monitors, programmes for audio mixing, counters for tonal direction and other related equipment is under way. For the purposes of research in the field of printing techniques, the plan is to purchase a digital colour printing device and a hydraulic knife for cutting, equipment for which it will be necessary to secure a properly equipped laboratory space. Furthermore, 4 laboratories are equipped for the needs of electrical engineering research with oscilloscopes, wattmeters, multimeters, transformers, teslameters, frequency inverters, electroscopes, function generators and other equipment. They are 100% equipped only the recovery of equipment that is defective or out of date is in the procurement plan. Finally, two laboratories are equipped for research in the field of production engineering. They are 40% equipped, and equipping of laboratories with a simulator for welding in the virtual space (for MMA, TIG, MIG / MAG procedures), a computer for the CAD / CAM, FEA / FV analysis, CNC machining centre with equipment and tools ( GOC), thermal imager, a device for measuring and analysing vibration and different types of software are in the procurement plan. After the completion of the procurement, it will be necessary to open at least one laboratory for the development of products equipped with a 3D printer and scanner. In particular, five laboratories are 60% equipped with the equipment for biomedical sciences, with a variety of anatomical aids and puppets or models that simulate the human body. The remaining 40% includes furniture that is in the process of delivery, while aids such as birth simulators, incubators, defibrillators, various models of human body parts and various pieces of furniture specific for work in a hospital environment (wheelchairs, hospital beds, etc.) are in the phase of the procurement. Only one laboratory equipped with the equipment research in civil engineering is equipped with a percentage of 30%, and the acquisition of an apparatus for direct shift with a cell, a digital ring floating device, a digital laboratory furnace, a device for line automatic compression, an ultrasonic examiner for non-destructive tests on building materials and accessories are in the procurement plan. According to the amount of equipment that is in procurement, it will be necessary to adapt at least one more room in which the equipment will be located and in which there will be enough space for research. The equipment for business economics with a computer and software kit for econometrics, statistics and forecasting is also in the procurement plan. Given the fact that there is no laboratory in which the equipment can be placed, it will be necessary to ensure adequate laboratory space and equip it appropriately.

*Key capital scientific-research equipment with purchase value exceeding HRK 200,000 - in short:*

- CISCO network equipment (2 servers of the model 2801, four routers 2801, 6 Catalyst 2960 switches, and additional CISCO equipment) used for the needs of maintaining the CISCO Academy and the research in the field of computer networks.
- For the purposes of research in the field of electronic elements, electronic circuits and digital electronics, there are six Tektronix TDS 2014 B oscilloscopes, device TEK-084, wattmeter Ganz 30, 2 soldering iron devices Weller WS81 and 4 multimeters.
- For the purposes of research in the field of electric drives, power electronics and electrical machines, there are the PLC Simatic S 7 device, a dry thermal block 9141-A and 25C 9103-A, 2 HPS thyristor rectifiers, precision meter MOST-1529 A and MOST-1502 A, voltage converter Micromaster, 6 Tektronix TDS 2014 B oscilloscopes, a device for measuring ground resistance, digital TES-3600 wattmeter, standard sensor 5626-15-D, digital multimeter-189, Fluke 787 loop simulator, teslameter, precision resistive sensor 5614-D and three-phase transformers.
- For the purposes of research in the field of process instrumentation, machinery and equipment automation, and monitoring and visualization of process, there are the Endress + Hauser flow meter, PCB Box with an appropriate software and tools, Hart communicator model 275, pressure scale TTI Inc-9250, Progmag 50, valves DN 25 PN 16, programme for visualization in the laboratory, transducers Progmag 50W DN 100/4 and DN 80, software packages Smit-Siemens and Simatic S 7, transducer Deltabar S PMD75, pressure module Fluke 700PO07 and differential pressure module Fluke 700PO3 .
- For the purposes of research in the field of the basics of electrical engineering, measurements in electrical engineering, switching devices and distribution systems of electrical energy, there are a PC-based recorder signal Datq instruments, Commuwin II, various types of oscilloscopes, milliammeter, three-phase transformers and a specialized tutor for testing the electromagnetic field.
- For the purposes of research in the field of mechanical engineering, two laboratories are equipped with a universal hydraulic machine for testing materials, lathe CM6241X1000, milling cutter and drill XZX7550CW, welding machine Vartig 2005, band saw Thomas 210S, welding machine VARMIG 230 SUPERMIG, temperature chamber, TMDS 9/1- kit for the demonstration of different models of assembly and disassembly of the bearing SKF TMDS, a device for testing the hardness of materials, a printer image prograf iPF 600, a system for laser alignment axis TKSA 20, GMIN 400-K ultrasound probe with a simple headset, an endoscope with a steered probe TKES 10A,

Vibropen-MCA-CMAS 100-SL and a model for the centring of the axis TMDR 2 with a set of shims TMAS 50-005 to 50-30 TMAS

- The audio-visual laboratory is equipped with a Palmhead camcorder AVGHD, a video prism, Sonarscope and Yamaha audio equipment, various microphones of the brand Sennheiser, and three Sony DCR-HC 96 E cameras.
- The computer laboratory for graphics and multimedia research is equipped with 13 iMac computers, 9 Apple iPad 2 tablet computers, two spectrophotometers and three colorimetre.
- The computer lab with the equipment for research in the field of photography has DSLR Canon EOS 5D Mark II, Canon EOS 30D and Canon EOS 6 1100 digital cameras, Bowens Gemini 400/400-UM / UM, Metz MB 50 and MB 58 and Nikon SB 800 lenses and bodies for lighting, with two X-Rite I1 Publish PRO spectrophotometers and an Image prograf IPF printer of A2 format.
- For research in the field of civil engineering, there are the ZENITH GeoMax RTK GPS rover, GeoMax ZDL700 digital dumpy level, three FOCUS 8 5" stations with the appropriate tripods and two NL28 dumpy levels.
- For research in the field of biomedical sciences, there are HBM digital measuring electronics Quantum X MX840a with a SW Catman Easy software, simulators of vital signs Sim Pad, a doll to connect to the Sim Pad, dolls for various simulation and models of different parts of the human body.

Note: For all laboratories and departments, there is an on-going procurement of additional equipment according to the procurement plan of the University North.