“Aurel Vlaicu” University of Arad

Romania

Scientific Research and Innovation

Outline of this presentation

General presentation of AVU's structures
- Faculties
- Research Institutes and Centers

What is the institution trying to do?
- Mission, goals, objectives

How is the institution trying to do it?
- Governance and activities

How does the institution know it works?
- Monitoring the research

How does the institution change in order to improve?
- Strategic management and capacity for change

An inner insight on AVU's research activity

- "Aurel Vlaicu" University of Arad – who got its name from the great Romanian engineer, inventor and pioneer of the aviation – is an accredited higher-education public institution, continuing the tradition of university education in Arad area, which started with the Theology Institute (1822), the Livestock and Veterinary Medicine Faculty (1947) and the Engineering Institute (1972);
- Then, in 1990, it became a higher-education institution and in 1991 its new denomination became officially "Aurel Vlaicu" University of Arad (AVU);
- Year after year, AVU has developed new faculties, new study programs, which meet the terms of quality standards, currently being one of the best reputed and most comprehensive universities, not only in the region, but also in Romania, consisting of 9 faculties, over 6000 students and 250 academic and research staff members.

Faculties

- Faculty of Exact Sciences
- Faculty of Engineering
- Faculty of Food Engineering, Tourism and Environmental Protection
- Faculty of Economics
- Faculty of Educational Sciences, Psychology and Social Work
- Faculty of Humanities and Social Sciences
- Faculty of Design
- Faculty of Physical Education and Sports
- Faculty of Orthodox Theology

Interdisciplinary Doctoral School

- ❑ Environmental Engineering
- ❑ Philology
- ❑ Theology (Orthodox and Pentecostal)

Research Institutes

- Institute for Research, Development and Innovation in Technical and Natural Sciences
- Institute for Research in Humanistic and Social Sciences
- European Institute
- Business and Technology Incubator

Research Centers

- Research Center in Technical and Natural Sciences
- Research Center “Intelligent Systems”
- Research Center “Mathematical Models and Informatics Systems”
- Center for Chemical and Technological Researches
- Research Center in Mechanical Engineering
- Research Center in Textile Engineering
- Center for Socio-Psycho-Pedagogical Researches
- Research Center in Design and Innovation Management

Research Centers

- Research Center in Marketing
- Research Center for Consultancy in Economics
- Research Center for Physical Activities
- Center for Intercultural and Interconfesional Researches
- Center for Modern Languages
- Center for Theological-Historical Studies and Pastoral-Missionary Prognosis.

What is the institution trying to do?
Mission, goals, objectives

- The university`s research mission is defined in AVU`s scientific research strategy for 2016-2020;
- At the moment, AVU hosts 3 research institutes, a business incubator and 14 research centers at faculty level, which have achieved notable results over the last two years;
- Each faculty/research institute/research center has prepared a research strategy/research plan for 2016-2020, in accord with the university`s research strategy;

What is the institution trying to do?
Mission, goals, objectives

- Through the large number of national and international projects carried out, AVU promotes:
  - a diversification of national and international partners,
  - an important increase in the number of agreements, conventions and protocols signed with public, private, regional, national or international entities;
- A significant increase in AVU's international visibility;
- Active and responsible academic participation on national and international levels;

What is the institution trying to do?
Mission, goals, objectives

- The role of these partnerships is to access strategic projects and to implement and capitalize upon the results of projects conducted by AVU so that the strategic objectives of the university may increase the added value of the services provided;
- Consolidation of the educational, research-development-innovation capacity and its elevation to international standards through a modern, human resources oriented management.

How is the institution trying to do it? Governance and activities

- The university has emerging international activities in the field of research and education;
- AVU's partners for international collaborations are universities and research institutes from all over the world;
- AVU is involved in prestigious international projects: PHARE, NATO, COST, JEAN MONET, FAO/ ESCORENA, with emphasis on FP7 Specific targeted research projects and Specific support actions;

How is the institution trying to do it? Governance and activities

- Stimulation, guidance, assistance and consultancy measures are taken in order to achieve new partnerships between AVU and other research universities and/or institutes;
- European countries eligible for EU and NATO projects represent a priority, however the USA, Canada, Middle East countries (Israel, Arab Emirates, Iraq) and Far East countries (China, Japan) are also considered.

How does the institution know it works?
Monitoring the scientific research activity

- AVU's scientific production has registered in 2017 an increase of 31.44% as compared to 2016 and in 2018 an increase of 17.24% as compared to 2017;
- The scientific research activity is monitored through participations at national and international symposiums/conferences/sport competitions/art exhibitions;
- Between 2016 and 2018, members of AVU`s teaching and research staff have cumulated over 2000 such participations;

How does the institution know it works?
Monitoring the scientific research activity

- A special interest is given to good practices in knowledge transfer. Between 2016-2018, a number of 14 national and international patents were registered, as well as 400 works with intellectual property status;
- Between 2016 and 2018, 77 projects have been conducted in our university, out of which 16 won through international competitions and 61 in national competitions;

How does the institution know it works?
Monitoring the scientific research activity

- Between 2016 and 2018, AVU has hosted a number of over 200 national and international scientific events/sport competitions/artistic events;
- All events have enjoyed not only the participation of the teaching and research staff of AVU, but also of numerous guests from Romania and abroad;

How does the institution know it works?
Monitoring the scientific research activity

- The number of scientific events, sport competitions and artistic events organized by AVU has registered in 2016 an increase of 20.57% as compared to 2015, in 2017 an increase of 206.67% as compared to 2016 and in 2018 an increase of 31.88% as compared to 2017;
- Each of the 9 faculties of AVU organizes every year scientific conferences for students, a tradition in the scientific activity of the faculties, as well as competitions for high school students.

How does the institution change in order to improve?

Strategic management and capacity for change

- The development of coherent scientific research stimulation policies;
- A permanent concern for AVU is to organize courses, conferences, summer schools, fairs, exhibitions, workshops that focus on:
  - research topics of high national and international interest,
  - educating PhD, master and undergraduate students in the spirit of the development of research activity;

How does the institution change in order to improve?

Strategic management and capacity for change

- A publication strategy is useful for every academic. A well-considered publication strategy will help:
  - maximize the academic impact,
  - support career development,
  - aid the production of an optimal portfolio of research outputs;

How does the institution change in order to improve?

Strategic management and capacity for change

- A publication strategy can also help resolve some common conflicts in the direction of academic enquiries, such as how to square personal research interests, with local research strategies and with funding drivers;
- It will also enable more focused conversations with local research leads and ensure individually-tailored support;

How does the institution change in order to improve?

Strategic management and capacity for change

- Developing highly relevant interdisciplinary, fundamental and applied scientific research;
- Promoting research-development-innovation centers at university and faculty levels alike in order to:
  - centralize efforts for obtaining valuable research results,
  - highlighting the institutional ability to cooperate with the scientific and socio-economic environment,
  - develop a functional partnership with national and international research institutes.

How does the institution change in order to improve?

Strategic management and capacity for change

- AVU is a founding member of the Association of Universities, Research-Development Institutes and Central University Libraries "ANELiS PLUS" through which all teaching and research staff and students have access to specialized international databases;

How does the institution change in order to improve?

Strategic management and capacity for change

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How does the institution change in order to improve?

Strategic management and capacity for change

- Many members of the Romanian academic diaspora were willing to continue their research activity in AVU's modern labs and facilities;
- In this way, the university has been able to gain valuable experience in internationalization at home, through those Romanian scholars who have studied or worked in institutions outside Romania for extended periods of time.

An inner insight on AVU's research activity

Domains of excellence:

- Industrial Engineering: Making and testing of advanced materials
- Environmental Engineering: Ecofriendly methods in obtaining natural fibers and volatile organic compounds
- Systems Engineering: Mathematics and Computer Science

Journals published by AVU's faculties and indexed in International Databases:

ARENA - JOURNAL OF PHYSICAL ACTIVITIES

http://www.uav.ro/jour/index.php/ajpa

DOAJ, Index Copernicus, EBSCO, WorldCat, SCIPIO, GIGA Information Center, AJD, Google Scholar, GFMER, OA Forum, ROAD, Journal TOCs, Libraries of Stanford, Gent, Hamburg, Hong Kong, Sydney Universities

AGORA PSYCHO - PRAGMATICA

http://www.uav.ro/jour/index.php/app

Ulrich's, DOAJ, EBSCO, Directory of Research Journals Indexing, Index Copernicus

CONTUR - INTERNATIONAL JOURNAL OF ART AND DESIGN

http://www.uav.ro/jour/index.php/ijad

Google Academic

JOURNAL OF ECONOMICS AND BUSINESS RESEARCH

http://www.uav.ro/jour/index.php/jhss

Academic Keys, BASE, CABI Abstracts, CEEOL, CiteFactor, DOAJ, DRJI, EBSCO, EconBiz, EconBib, ERIH Plus, ResearchGate, Scipio, SIS Index, Index Copernicus, International Institute of Organized Research, New Jour-Georgetown University Library, WorldCat

JOURNAL OF HUMANISTIC AND SOCIAL STUDIES

http://www.uav.ro/jour/index.php/jhss

DOAJ, Index Copernicus, WorldCat, SCIPIO, KVK, CEEOL, Friedrich-Schiller Universitaet Jena, University Libraries/University of Washington

JOURNAL PLUS EDUCATION

http://www.uav.ro/jour/index.php/jpe

Directory of Research Journals Indexing, Ulrich's, DOAJ, EBSCO, Index Copernicus, CEEOL, CrossReff, WorldCat, Cabell Publishing, ERIH Plus

SCIENTIFIC AND TECHNICAL BULLETIN, SERIES: CHEMISTRY, FOOD SCIENCE AND ENGINEERING

http://www.uav.ro/jour/index.php/stb-cfse

Google Academic

SCIENTIFIC AND TECHNICAL BULLETIN, SERIES: ELECTROTECHNICS, ELECTRONICS, AUTOMATIC CONTROL AND COMPUTER SCIENCE

http://www.uav.ro/jour/index.php/stb-eeaccs

Google Academic

SOCIETAL AND POLITICAL PSYCHOLOGY INTERNATIONAL REVIEW

http://www.uav.ro/jour/index.php/sppir

Google Academic

TEOLOGIA

http://www.uav.ro/jour/index.php/teologia

WorldCat, Index Copernicus, Religious and Theological Abstracts, ERIH Plus

THEORY AND APPLICATIONS IN MATHEMATICS AND COMPUTER SCIENCE

http://www.uav.ro/jour/index.php/tamcs

Mathematical Reviews, Zentralblatt Math, ProQuest Central, EBSCO, Citefactor, Index Copernicus, Google Scholar, Ulrich's, DOAJ, WorldCat, Academic Keys for Sciences

The Institute for Research, Development and Innovation in Technical and Natural Sciences – ICDISTN

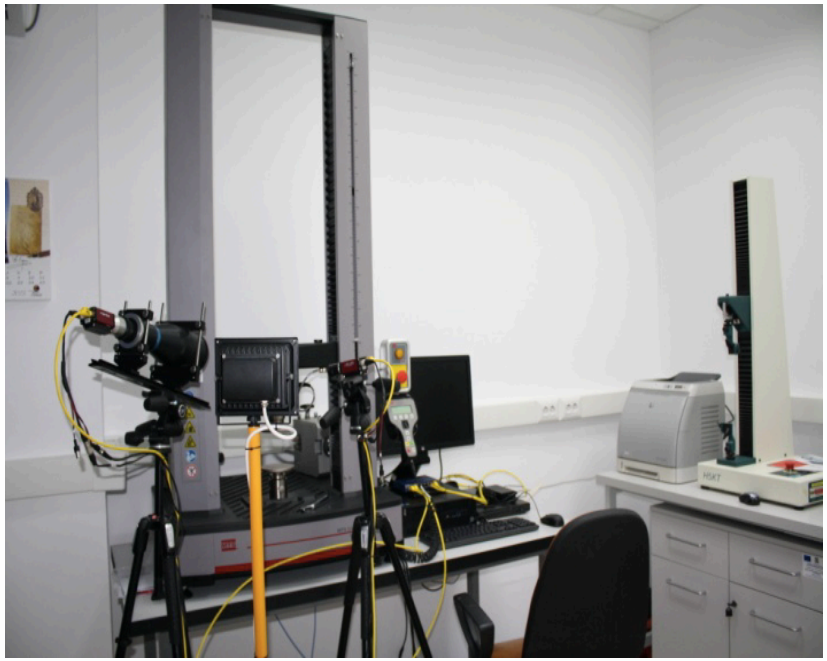
- was created to address several **priority areas:** advanced materials, industrial products and processes, textile engineering, mathematical modeling, health, environment, agriculture, food safety and security;
- it was founded on two research centers: the **Research Center in Technical and Natural Sciences** and the **Research Center "Intelligent Systems";**
- was developed with **financial support** of the **European Union** - Project POSCCE 621/2014;

- other research centers from the **Faculty of Exact Sciences**, the **Faculty of Engineering** and the **Faculty of Food Engineering, Tourism and Environmental Protection** are also associated within ICDISTN;
- the main **objective** of ICDISTN is to promote research in the natural sciences such as: advanced materials, environmental science, mathematics and statistics, artificial intelligence, biology, biochemistry, analytical chemistry, and food technology;
- ICDISTN's **strategy** for research-development-innovation includes the support of the human resource to apply to national and international projects, consultancy services for industry, participation in congresses, conferences and innovation fairs and

and last but not least the application and implementation of patents for different technologies or products;

- ICDISTN's **infrastructure** is one of the most modern in Romania, even in Eastern Europe, and includes **14 research laboratories**, where the following function:
  - a QTOF MS with ionic mobility system, unique in Europe
  - GCGCMSMS with thermodesorption system and a UHPLC-MSMS system - configurations unique in Romania
  - an amazing microscopy lab with AFM-RAMAN, optical microscope with fluorescence system, SEM and TEM
  - other laboratories for sample preparation and extraction;

- among ICDISTN's **laboratories,** the most significant are:
  - the advanced materials lab



- the chromatography lab

- the microscopy labs [1]

- the microscopy labs [2]

- the natural products lab

- the biochemical lab

- the thermo-analysis lab

- the microbiology lab

- the lab for analysis and modeling of biological systems

- the optomechatronics and biomedical photonics lab

- the lab for natural sciences

- the lab for statistical processing, simulation and mathematical modeling of processes.

Relevant patents/innovations obtained within ICDISTN:

- Sustainable method of ecological packaging of traditional bread without additives;
- Blocstart catapult for the low start in survival mode;
- Process for melting bast fiber plants, such as: flax, hemp, jute, etc.;
- Process for the functionalization of cellulose textile materials;
- Functional food product designed to control body weight;
- Process for peroxo-polyoxomethalates whitening of textile materials (yarns, cloths and knitted fabrics) from cellulosic fiber mixtures;
- Optical modulator with a rotational disk;
- Optical modulator with shafts with holes;
- Bleaching process with peroxo-polyoxometalates of textile materials (yarns, fabrics and knits) of cellulose fiber mixtures such as: flax-cotton, hemp-cotton;
- Multifunctional modulated device for jumps;
- Environmental friendly process for bleaching natural fibres by catalytic oxidation with polyoxometalates.

Important research projects/grants won by research teams of AVU within ICDISTN:

- "BioCell-NanoART = Novel Bio-inspired Cellular Nano-Architectures -- For Digital Integrated Circuits", a 4-year 2M Euro project supported by the European Union through the European Regional Development Fund (ERDF) under the Competitiveness Operational Program POC-A1-A1.1.4-E-2015 nr. 30/01.09.2016;
- Intelligent Techniques for Medical Applications using Sensors's Networks - PN3-P3-554/16.07.2018;
- Towards Understanding and Modeling Intense Electronic Excitation - COST Action CA17126/2018;
- Application of Flower Pollination Algorithm in Load Frequency Control of Multi-area Interconnected Power System with Nonlinearity - PN-III-P1-1.1-PRECISI-2018-21933;
- Optimization of Non-rigid Demons Registration Using Cuckoo Search Algorithm - PN-III-P1-1.1- PRECISI-2018-22298;
- Chemistry and Molecular Sciences and Technologies - COST Action CM1405/2016;

Important research projects/grants won by research teams of AVU within ICDISTN:

- Micro-Electro-Mechanical Systems (MEMS)-based Handheld Scanning Probes for Distortion-free Biomedical Imaging with Optical Coherence Tomography (OCT) (MEMSHH-OCT) - Grant PN-III-P2-2.1- PED-2016-1937;
- Optomechatronic Choppers with Rotational Discs and Shafts for Metrological, Biomedical and Laser Manufacturing Applications - Bridge Grant PN-IIIP2-2.1-BG-2016-0297;
- Handheld Scanning Probes with 1D and 2D Galvoscanners for Biomedical and Industrial Investigations using Optical Coherence Tomography (OCT) (1D2D-GS-OCT) - Grant PN-III-P2-2.1-PTE-2016-0181;
- Modeling, Simulation, Experimentation and Validation of Some Advanced Methods of Soft Computing in the Field of Smart Buildings' Control - 9542/22.12.2017;
- Software Quality for a Better Future - POCU/626/6/13;
- Research Center in Sustainable Bio-Eco-Economy - POC/448/1/1;

Important research projects/grants won by research teams of AVU within ICDISTN:

- Eco Friendly Processes for Cellulosic and Lignocellulosic Fabrics using Smart Biocatalyst - TE-2019;
- Nanoparticles with Possible Medical Applications from Natural Waste Materials - PD-2019;
- The Influence of Abiotic Stress Factors on Physiological Characteristics and Secondary Metabolites from Aromatic Plants - PD-2019;
- Interactomics of Galactosaminoglycans in Extracellular Matrix by Advanced Mass Spectrometry - PN-II-PT-PCCA-2013-4-0191.

Conclusions

- We can emphasize the fact that the scientific research activity of AVU is at an **appreciable rate of development;**

- **Thinking globally, acting locally** - we are proposing **high targets** to accomplish, but **achievable** by:

  - adopting a **proactive approach** in terms of sharping **devoted, articulate** and **ambitious** professionals
  - the **judicious use** of the **exceptional material base.**

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