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Instrumente Structurale
2014-2020

Academic research in the sequence of transforming a real problem into an effective solution



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Overview

- What is our purpose?
- What is our role?
- What is our competence?
- What are our resources?
- What could be our achievements

CLOUDUT Project



- **Title:** Cloud Cercetare UTCN – CLOUDUT
(<http://cloudut.utcluj.ro/en/>)
- **MySMIS ID:** 124493
- **Contract no.:** 235/ 21.04.2020
- **Project type:** Operational Program “Competitivitate 2014-2020” (POC)
- **Priority axis 1:** Research, technological development and innovation in support of economic competitiveness and business development
- **Action:** 1.1.2 Development R&D Centers networks, coordinated at national level and connected to European and international networks, ensuring researchers’ access to European and international scientific publications and databases
- **Financing:** European Fund of Regional Development, total project value: 4.955.000 RON out of which 4.950.000 RON from European funding.



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CloudUT computing infrastructure

- 10 computing nodes (320 cores), RAM 5120 GB, storage capacity 72TB, RAID 5
- 2 GPU nodes. Each node has 2 CPU processors by 20 cores, RAM 512 GB, SSD 1TB, 2 GPU Tesla V100 with 640 tensor cores and 5120 CUDA cores, 32GB dedicated memory, support for virtualization
- 25 Gbps internal connectivity, and 10 Gbps external connectivity
- VMware with support for management, virtualization, orchestration and automation, with vcloud features

Operational solutions

- CloudUT Center

organizational structure that ensures the efficient and simple use of the CloudUT infrastructure by all research teams in UTCN

- Usage policies

set of rules, procedures and recommendations for using the resources available in the CloudUT infrastructure

- Procedures

- Resource allocation

- Resource management

- Cost evaluation

Challenges in academic research

- Interdisciplinary research domains, groups, projects
- Diversity of research topics and computing solutions
- Scientific and technical consultancy
- Research project migration into cloud
- Applications and services development over the cloud
- Computing resource management
- Standardization, Interoperability, Resource sharing, European policy on open data, FAIR data, DMP (Data Management Plan)
- Computing resource integration and scalability
- Administration in implementation and sustainability phases

Mission

- Transform a real problem into an effective solution

Actors

- University
- Research Institute
- Company
- Integrator
- Producer, service provider

Technology readiness levels (TRL)

- TRL 1 – basic principles observed
- TRL 2 – technology concept formulated
- TRL 3 – experimental proof of concept
- TRL 4 – technology validated in lab
- TRL 5 – technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)
- TRL 6 – technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)
- TRL 7 – system prototype demonstration in operational environment
- TRL 8 – system complete and qualified
- TRL 9 – actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)

Academic research

- The CloudUT infrastructure is an important step forward for the UTCN scientific community
- The results (human, scientific, publications, services, applications, etc.) are much more important than the computing infrastructure itself
- Universities have the human resources (i.e., PhD students, young researchers, competences, creativity, innovation, etc) to explore and experiment the solution space
- The exploratory research involves high costs (i.e., human resources, time, funds, technology, etc) and risks
- Academic research can result in theses, publications, demonstrators of the concepts, or pilot experiments

Collaborative pipeline

- Academic research is the first step in a sequence of stages that transforms an idea into a final commercial or industrial product at national or European level
- Academic research is not in competition but in full collaboration and complementation with research from institutes, companies or government organizations
- Research institutes apply the result in a broader specific context with experimental results from the real and concrete economic, regional, national environment
- Companies use the results of academia and research institutes to develop, scale and then exploit a commercial or industrial final product

Conclusions

- CloudUT infrastructure supports mainly the academic research
- CloudUT infrastructure highlights the creativity and innovation capacity of young researchers
- CloudUT infrastructure supports collaboration and complementation with research from institutes, companies or government organizations
- Academic research is the first phase of the exploratory research within the collaborative pipeline
- University cloud does not have the goal and enough resources to support the production phase



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Many thanks for your attention!



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