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Establishing Modern Master-level Studies in Information Systems

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1. MASTIS overview

MASTIS methodology is based on innovative education technologies that provide 1) Degree Profile & curriculum based on IS competence profile & learning outcome; 2) students' professional-social development within training process; 3) involving students into professional environment by organizing multidisciplinary project teamwork using e-learning tools. Methodology is developing by PC team using best EU universities practices & advances in target field.

Each university adapts the curriculum to the region and the HEI features.

The MASTIS project website page <https://mastis.pro/project-results/> presents the handbook and the main results for each Work Package.

Of the eight universities in Ukraine and Montenegro, four were participating for the first time in an Erasmus project, "Capacity Building in the field of Higher Education". This was an excellent opportunity for them to work on building an innovative Master program in partnership with more experienced PC universities and universities in eight EU countries.

For external evaluation we organized a group of experts which includes 2 representatives of IT companies and 1 from academic environment: Professor of the University as well as a member of National Methodical Commission in Information Systems and Technologies of Ukraine.

Evaluation was done during the project implementation after each stage of Master programme development. All those stages are presented in the Content of evaluation report.

2. Definition of subject area and competences of Master students in Information Systems

Each university held real working meetings with company representatives, then surveys among many them. The reports show that a fundamental difficulty has been highlighted: all IT students have full-time job, and the companies organize their own training program. This underlined the importance of thinking about the specific type of training that a Master's degree in IT should provide using the experiences of EU universities and the Curricula recommendations for IS from the "Joint AIS (Association for Information Systems) & ACM (Association for Computing Machinery) MSIS 2016 Task Force study", conducted at the global level.

One of the results was learning to work with companies to design or improve a teaching program. At the beginning of the meetings, we have to explain representatives of business: -a. MASTIS objectives and outcomes; -b. what is Master's degree according to National Qualification framework; -c. discuss with them the working place of Master in Information Systems: IT company; IT department in company, bank, etc; Start-up or Entrepreneur; -d. discuss existing ICT competences frameworks (e-CF, SFIA, ...); -e. ask representatives of business about requirements from employers (competences).

3. Modernize Teaching Approaches; Competencies and learning outcomes

This Package provides information on learning and teaching strategies, pedagogical philosophy, assessment methods, learning approaches. Each workshop was an opportunity to discover new active teaching methods through presentations and practical situations of the teachers present, whether for face-to-face or distance learning.

MASTIS training methodology is based on multidisciplinary project teamwork supported by e-learning tools. Training process is orientated to students' self-development. Courses were designed on bases of learning outcomes. Trainings are combining lectures, practical exercises or experiments, case works, simulations, modelling field trips, project work, business games, internship, thesis research.

Two e-learning planforms are available for supporting of the educational process.

Teaching strategies and methods will include modern approaches like:

- self directed study,
- problem based learning,
- task based learning,
- research based learning,
- learning through laboratory practice,
- reflective learning,
- work placements,
- group work,
- individual study and
- autonomous learning.

4. Master in Information Systems degree profile

Information systems (IS) have been the main contributor to productivity growth over the past decades and are pivotal to contemporary organizations in a global, rapidly changing economy. Business organizations manage their processes through enterprise systems; our private and professional communication has changed dramatically due to emergent mobile technologies and social media platforms; and countless complementary IS enabled innovations affect our life and work daily.

Managers and professionals in all industries therefore need new skills to make strategic decisions about the introduction and development of information systems, to identify innovations can bring new IT technologies, and understand how to improve process productivity, quality and stability through wise Information System choices

The main achievements of this work package are: The program has been developed based on industry demands in terms of required knowledge, understanding, and methodological skills. It is aimed particularly at fostering professional careers in international settings through collaboration with international corporations as well as seminars with international partner universities. Rigorous scientific training also provides a foundation for careers in academia.

In a student-centred context the learning process has to be transparent. Students must know clearly beforehand what each degree program entails and what results they can expect from it. Graduates need to be able to show to others what competences they have gained during the learning experience.

The Degree Profile should be concise and it needs to be very clear, which means that each word counts, and should be carefully considered. The degree profile is made up of seven entries including a general entry and the following sub-entries:

- Purpose
- Characteristics
- Employability & further education
- Education style
- Programme competences
- List of Programme Learning Outcomes

5. Competencies and learning outcomes

Nine areas of expertise are needed for IS: System Development and Deployment, Data, Information and Content Management Innovation, Organizational Change and Entrepreneurship, IS Strategy and Governance, Enterprise Architecture, IS Management and Operations.

The aim is to develop both professional and social skills. MASTIS used the method of crossing the skills sought and the different courses.

Elective courses developed by each partner will be open at distance for the students of the network. The assessment will be done by partner university proposing the course. These elective courses will be included in the Master Degree accreditation.

6. Reviews of the profile of the educational program, courses, learning outcomes, teaching methods

The 2016 ACM & AIS Global IT Association's study of Master's Degree Programs in Information Systems <http://www.acm.org/binaries/content/assets/education/msis2016.pdf> has been examined and its findings taken into account in the development of professional competencies across 9 areas of expertise and the most important overall competencies of an MSc in IS.

MASTIS adhere to a student-centered approach in the formation of the structure and educational components of the program, the involvement of real business professionals in teaching, professional training, presenting internship opportunities. A block of ~~sample~~ optional disciplines is provided. This will allow students to flexibly shape the individual trajectory of students' learning according to their preferences and regional contexts.

Each PC university oversaw one new course and sent his first course description draft to PC colleagues for comment and improvement, then presented it for discussion during a general workshop.

After this first PC step, reviews of the profile of the educational program, courses, learning outcomes, teaching methods were conducted by leading experts of the European Research Center for Information Systems (ERCIS) <https://www.ercis.org/>

7. Suggestions for improvement

Better give students a strategic understanding of information systems in company & organization management; foster cooperation between Computer Science and Management Departments.

Include mobility of professor and students. Try to place all optional courses in the 3rd semester to facilitate student mobility during this period.

A long internship into curriculum could become the fourth semester of the Master's degree and the Master thesis could include a critical reflection on the internship experience. For students already working in IT, the internship could be replaced by an agreement between the student, the company and the university department, so that the student's mission during a semester is considered an internship and be the subject of a part of Master's thesis.

Web lectures from EU professors, using mobility grants or distance learning tools, possibly pooling these courses between several universities in Ukraine or Montenegro.

Systematically expand and organize the alumni network for 1) obtain reliable statistics on their actual professions and opinions on university education and how to improve it, 2) have a pool of business contacts who can enrich teaching through vocational courses and expand practical cases; it is also a way to find internships.

Provide specific training (at least as an option) for e-government, in its strategic, technical, economic, psycho-sociological and legal aspects.

More case-studies and active teaching methods.

Increase skills in technic writing.

Increase communication and presentation skills.

Involve some students into research activities.

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