Development Platform for the University for Information Science and Technology (UIST) in Ohrid, Macedonia for 2012- 2015

Danco Davcev, November 2011

I. The basic elements of UIST established in 2009

UIST Ohrid, **officially called University for Information Science and Technology "St. Paul the Apostle"**, was registered in the Central Registry of the Republic of Macedonia in July 2009. UIST Ohrid is a State University legally established by the Parliament of the Republic of Macedonia in 2008, with subsequent legal amendments in 2009 and 2010. The Statute of UIST Ohrid was approved by the Republic of Macedonia Parliament in August 2010.

The main objectives for establishing UIST is to meet the increasing demand, both locally and globally, for well-qualified and competent IT technicians, innovative engineers and scientists for Research and Development positions in industry and also to provide students with a solid foundation for pursuing advanced degrees at top international graduate schools in the fields of Information Science and Technology.

In order to achieve these objective, UIST offers an eclectic tripartite undergraduate curriculum with flexible exit options, which applies to each of five (5) faculties, as follows:

- 2-year program towards an IT Certificate and a degree of "Associate in Information Science and Technology". Upon completion, one retains the option of enrolling in further programs.
- 3-year program in Information Science and Technology towards a degree of "Bachelor of Engineering in Information Science and Technology". Upon completion, one retains the option of enrolling in the 4-year program.
- 4-year program in Information Science and Technology towards a "Bachelor of Science in Information Science and Technology" degree in the respective study field. Upon graduation, one is able to continue studies in postgraduate programs.

The programs in Information Sciences and Technology include a wide range of Minor Electives in linguistics, languages and literatures, critical theories, history, philosophy, modern and classical social sciences and almost all the arts.

UIST offers the following Faculties:

1. **Faculty of Information Systems, Visualization, Multimedia and Animation (ISVMA)**

2. **Faculty of Machine Intelligence and Robotics (MIR)**

3 **Faculty of Computer Science and Engineering (CSE)**

4. **Faculty of Computer Networks and Security (CNS)**

5. **Faculty of Information Theory and Analysis (ITA)**

From 2009-2011, the first 2-years study program was successfully completed. We plan to continue with the approved best practices at UIST, such as selection of international experts as professors in different fields for different courses, admission of international students and international collaboration with foreign Universities, institutions and companies.

For more information please see www.uist.edu.mk.

II. Updated Development Platform for UIST (2012- 2015)

This document was mainly inspired by School of Electronic Engineering at Dublin City University (http://www.dcu.ie/electronic_engineering/index.shtml) as well as Nanyang Technological University, Singapore, http://www.ntu.edu.sg/sci/.

It is also inspired by the document for establishing the Macedonian University for Information Technology prepared in February 2008 for the Government of R. of Macedonia by D. Davcev, M.Gusev, A. Kulakov, S. Markovski, V. Trajkovik, A. Misev and Lj. Kocarev.

1. Introduction

UIST organizes academic and professional study programs based on accredited study programs for acquiring higher education according the rules for studying based on the European Credit Transfer and Accumulation System (ECTS). The academic studies enable the students to perform scientific and educational activities in the business world, the public sector and in the society, by development and use of the scientific and professional knowledge. The professional studies provide the students with necessary skills and knowledge for entering the working process. The study programs are divided into three cycles:

- first cycle of university studies (undergraduate studies)
- second cycle of university studies (postgraduate studies)
- third cycle (doctoral studies)

Postgraduate and doctoral studies will start no later than 2012/13 (see www.uist.edu.mk).

2. Undergraduate study

For more details about our approach, please see the similar one at:
http://www.ntu.edu.sg/sci/, http://www.dcu.ie,
as well as:
http://www.city.ac.uk/study/professional-development/computing

Please see on the link below some of the careers possibilities for computing graduates:

http://computingcareers.acm.org

3. Postgraduate study

For details about our approach to the postgraduate studies, please see the similar programs at:

http://www.caltech.edu/about-caltech, http://www.media.mit.edu.

http://www.city.ac.uk/study/professional-development/computing

4. Doctoral study

For more information, please see http://www.caltech.edu/about-caltech and
http://www.media.mit.edu.

5. Research program

In principle, all research activities in all fields of ICT will be performed within international research project, especially financially supported by EU, such as FP projects and other similar EU programs. For more details please see http://www.caltech.edu/about-caltech as well as http://www.media.mit.edu.

Research activities of special interest for the Ohrid region

Starting from the fact that the Future internet will bring economic and social benefits not only to research communities but also to cites, it is very important to consider the City of Ohrid as a complex ecosystem with two main objectives: to provide sustainable development and quality of life (such as healthcare, education, energy and environment, public services and safety).
Smart Cities (concept enabled by inclusion of modern ICTs) has to develop strategies for usage of Internet infrastructures, test -bed facilities and applications for private public partnership (PPP). Common assets include **Living Labs** [1], Future Internet and testing facilities, methodologies, tools etc. We plan to stimulate research, development, experimentation and innovations and in such a way to contribute to ecosystem of Ohrid and other neighborhood cities as Smart Cities.
In addition, the transport sector can reduce environmental problems and energy consumption. Intelligent Transport System (ITS) includes ICT infrastructures and services supporting travel and traffic information for energy –efficient, safe, co-operative mobility services. As a key converging areas, we would like to emphasize SOAs, ITS and geo- spatial contents.

[1] According to "MIT Living Labs" *The convergence of globalization, changing demographics, and urbanization is transforming almost every aspect of our lives. We face new choices about where and how we work, live, travel, communicate, and maintain health. Ultimately, our societies are being transformed. MIT Living Labs brings together interdisciplinary experts to develop, deploy, and test - in actual living environments - new technologies and strategies for design that respond to this changing world. Our work spans in scale from the personal to the urban, and addresses challenges related to health, energy, and creativity.*

6. International program

International Collaborations in research and teaching is very important for UIST.
An agreement for collaboration with Gorge Washington University (USA), NORWICH University (USA) and many EU Universities have been already done. We expect many similar agreements (MoU), joint studies and/or diplomas with many other universities from USA, Europe, Asia etc. We have already established a research council to conduct all research activities (see www.uist.edu.mk).

7. Collaboration with industry

The UIST would develop successful relations with industry. The UIST has about 20 academics, 20 research assistants and about 100 research graduate students.

EU projects

EU projects are usually larger scale collaborative projects of 2-3 years including academic and industrial organizations from Europe. Industrial partners typically receive 50% of their full costs, including overheads.

Our main objective is to participate and/or co-ordinate EU projects under FP7 ICT 2011/12 scheme and later within Horizon 2020. We plan to include small medium enterprises (SMEs) as very important components of these projects.

8. Laboratory support

Although, the so called Macedonian Supercomputing Laboratory (MSL) for Massive Parallel Processing was established in 2010 (which is very important as a support for all other laboratories), one of the main objectives in the next period will be to establish several new laboratories such as:

- **Laboratory for information systems, multimedia technologies and visualization**
- **Laboratory for Cognitive Systems and Robotics**
- **Laboratory for pervasive and mobile computing, embedded systems and Internet of Things (IoT)**
- **Laboratory for Digital Content Technologies and Languages (it ia of special interest for Ohrid region)**
- **Laboratory for wireless technologies. Security**
- **Laboratory for Trusted Network and Services, Web and Cloud computing, Future Internet and computer networks**
- **Laboratory for environmental sciences (it ia of special interest for Ohrid region) and ICT for a low carbon economy**
- **Laboratory for ICT for Health, Ageing Well, Inclusion and Governance**

- **Laboratory for ICT for Learning and Access to Cultural Resources (it ia of special interest for Ohrid region)**

- **Laboratory for ICT for the Enterprise and Manufacturing**

In addition, we plan to establish so called Living Labs on international level as environments for research, experimentation and innovations.

For more details please see the working program of FP7 ICT 2011/12 at http://cordis.europa.eu/fp7/home_en.html

9. Distance Learning program

We plan to introduce a Distance learning program by starting the postgraduate and doctoral study. The usage of teleconferencing system will help the realization of this program. In fact, it is found that blended instruction was more effective at improving student achievement than purely online or face-to-face instruction. We have a good experience in Macedonia with life- long learning.

10. Space premises for lectures, laboratory work and student work

We plan to provide additional space for lecture and especially for new laboratories, Students' Residence as well as for all student study and other activities (libraries, clubs, etc). The best solution is to establish the integrated university campus, but it must be financially supported by both the Government and ICT companies.

11. Publishing activities

The publishing activities of the UIST are one of the most important activities which enable the complete functioning of the University. They help the academic public to be in touch with the events referring to the development of the teaching and scientific processes on UIST. Only with developed publishing activities, the University could promote itself not only in our country but also abroad.

The publishing activities of the UIST include University Bulletin and the Web site (http://www.uist.edu.mk/).

III. CONCLUSION

As a long –term objectives, we would like to emphasize the following processes at UIST:

- Complete integration of UIST in national and international environment;
- Continuous process of Europeanization and internationalization with relations to international universities;
- Performing teaching-educational and scientific-researching activities according modern world – wide standards;
- Integrating teaching, research, via Living Labs on international level;
- Providing mechanisms for permanent care for the students and quality service offered in function of their needs and professional projects;
- Enabling large University decentralized campus for UIST (Ohrid and Skopje) as a pre-request for all activities.

By achieving the above objective, we believe that UIST can become a respectable center of excellent for teaching and research in Europe.