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Some Methodological Aspects of the Development of an ICT Research and Technology Development and Innovation Strategy for a Faculty of Mathematics and Informatics

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The aim of this paper is to share the experience gained at the Faculty of Mathematics and Informatics (FMI), Sofia University “St. Kliment Ohridski” (SU), in the up to now work within the scope of a project funded by the Capacities Specific Programme of FP7. At the first call for proposals of this Programme in 2007 the EC provided a grant to the project SISTER of SU, aimed at strengthening the research capacity of FMI in the area of Information and Communication Technologies (ICT). The **main goal** of SISTER project is to develop FMI as a Leading Centre in South-East Europe (SEE) in research, innovation and training in the area of ICT. An **overall goal** of the project is to foster the integration of FMI in the ICT European Research Area (ERA) and to contribute to competitiveness and growth of the SEE region and Europe as a whole.

The definition of an ICT Research, Technology, Development and Innovation (RTDI) strategy of FMI is among the main goals within the project SISTER. The RTDI Strategy would be used as the bases of research, training and dissemination activities of the whole project. The most considerable feature of this strategy is its scope – there exist a lot of successful ICT RTDI strategies for whole universities but the FMI team did not find any RTDI strategy for a particular faculty.

The work is being carried out in **three phases**:

- identification of research competencies of FMI, technology trends and ICT research needs;
- preparation and validation of ICT RTDI strategy for FMI;
- development of scenarios and elaboration of a detailed action plan for ICT research and training within SISTER.

The **first phase** has already been completed. It focuses on analysis of the state-of-the-art in ICT, the needs and available resources. The methodology for carrying out this analysis includes the following:

- **Environmental scanning:** Analysis of European and national reports, web sites, scientific literature, media publications, etc. A particular emphasis is paid on ISTAG, ERCIM and FISTERA actions, DG JRC (especially IPTS) and other EU activities in research and higher education in ICT. The Bulgarian related policy and available instruments and practices are considered as well.
- **SWOT analysis:** A special attention is paid to the research competences of FMI, the FMI positioning in the area of ICT in Bulgaria and the region, and the opportunities and threats for its further development and integration into ERA and European Higher education area.
- **Issue survey:** A web-based survey has been conducted in a significant number of enterprises, policy makers and local authorities in Bulgaria, among FMI researchers and ICT end-users in order to determine the large societal and economic needs for research and training in ICT.

The first outcomes of the conducted survey show that FMI has a leading position among Bulgarian research organizations working in the field of ICT. The ICT research staff of FMI has a strong potential, great experience and a lot of high-quality publications in a wide spectrum of areas including a considerable part of the strategic areas for ICT research and education in EU. A good number of talented young researchers have been involved during the last 2-3 years. FMI has well-established contacts with leading research organizations in Europe and a significant experience in international project activities. Meanwhile Sofia University feels serious difficulties in its research activities caused by the insufficient

funding both by the government and industry. The main specific challenges for FMI related to research in Computer Science and ICT may be summarized as follows:

- FMI has to overcome the lack of experience and aspiration to interdisciplinary research and education.
- FMI should initiate a debate aimed at considerable improvement of the existing heavy administrative procedures and financial rules at Sofia University.
- The organization of the educational process at FMI should be rearranged and optimized.

The studies that were carried out during the first phase would serve as the basic input to the **second phase**, i.e. the preparation of a RTDI strategy. At this phase, external expertise has been used as well. An **Expert panel** was composed of experienced EU researchers in ICT, representatives of EU partners, industry and public authorities, and FMI researchers. Two meeting sessions of this Expert panel are planned in order to support SISTER consortium for preparing the RTDI Strategy and the Action plan.

The first Expert panel meeting aimed to help identification of the strategic priorities and the related actions for RTDI in ICT at FMI. It was carried out in several sessions. The first session was devoted to *‘European Policy for RTD and in the field of ICT’*. During this session the invited EU experts and researchers from partner organizations focused on issues of the research and innovation policy and practice in Europe. The second session was devoted to *‘Challenges for ICT research, innovation and education for FMI’*. FMI researchers presented the main challenges found during the desk research and SWOT analysis of FMI as well as the results of survey of Bulgarian stakeholders regarding the FMI training and research activities. Having in mind the results of the carried out analysis, the FMI team identified the following areas of priority for ICT research at FMI: Fundamentals of Computer science, Intelligent systems, Information systems, IT services, Information security, Software intensive systems, Bioinformatics, Computer graphics, e-Learning.

The third session was devoted to the research challenges among the specific priority areas of SISTER..

A special session of the meeting was devoted to brainstorming in order to collect different points of view on the FMI strategic priorities for research, innovation, education and the framework conditions. A great number of ideas and suggestions came up during the brainstorming. We divided them in 5 sections: funding opportunities; collaboration and networking; research and technology challenges and priorities; human capacity building; governance issues. After the brainstorming session the FMI team prepared a summary of the issues raised, and proposed a structure of the document to be prepared as a follow-up:

- Environmental Analysis (User-Oriented ICT Requirements; Strategic ICT Requirements)
- FMI Objectives (Main Long-term Goals for FMI in the Area of ICT; Short-term Goals for ICT RTDI and Education)
- Definition of Metrics and Indicators of Success
- Priorities (Priority Areas for ICT Research in FMI; Focuses of ICT Education and Training in FMI; Priority Areas for ICT Innovations in FMI)
- Tools (Organizational Framework; Technological Environment and Infrastructure; Human Resources Capacity Building; Collaboration and Networking)
- Financing of ICT Activities at FMI

The next task of the FMI team is the definition of a draft ICT RTDI Strategy for FMI. It will be discussed at the second Expert panel meeting which will have two main tasks – to validate the RTDI Strategy and to support the Action plan definition with **building scenarios** for ICT development at FMI. The **last phase** will ensure a **framework for implementation** of SISTER activities, networking, as well as the detailed schedule and allocation of resources. The strategy and the action plan will provide guidelines for capacity strengthening in research and innovation. They will also streamline the education activities of FMI team in ICT in accordance with the industry, economic and societal needs and the best practices.

A more complete outline of the results obtained so far will be presented at the ECSS in Zurich. A preliminary version of the ICT RTDI Strategy for FMI will be presented at the Summit as well.