National-Level R&D Programs/Movements in the Software Technology Field

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The experience of the United States in the second half of the 20th century has clearly shown that focused and concerted efforts in national basic research and development (R&D) programs can have transformational impacts on a nation, as well as the broader international community. The formation of agencies such as the Defense Advanced Research Projects Agency (DARPA), National Science Foundation (NSF), National Aeronautics and Space Administration (NASA), and National Institutes of Health (NIH) provided an unprecedented focal point for coordinating the efforts of basic and applied research across various disciplines. In addition to accelerating the rate of scientific progress, this also led to a significant betterment of the quality of life of the people of the United States. This example has been followed in other parts of the world, e.g. the efforts of the Japanese Ministry of Internal Trade & Industry (MITI) and the ESPRIT effort of the European Union.

Today it is clearly recognized by advanced nations that the industrial competitiveness and the quality of life of their citizens depend on a proactive attitude towards technological progress and the swift transformation of basic research results into innovative products and services. Since Information and Communication Technologies (ICT) in general, and software technology in particular, are considered to be vital enabling technologies for maintaining the high standard of living in the industrial nations, a number of governments have designed national research programs that cover basic research, applied research, and technology transfer activities in the ICT Sector.

In the field of basic research, where the results of the research are documented in publicly available documents recording fundamental insights and principles, there is a tendency towards more cooperation, both on the national and international scale. This is not the case in the fields of applied research and product development, where advanced know-how is considered to provide a technological edge that helps to improve the industrial competitiveness. While this approach does maintain confidentiality of proprietary information, it also creates a ‘skunk-works’ culture where teams of product development engineers work in isolation. They often end up reinventing the wheel many times over, oblivious to the developments outside their boiler room. This can lead to lower quality products, and long-term competitive disadvantage. These opposing considerations create an interesting, and often difficult-to-handle tension.

In this panel discussion we will hear about the goals and structure of a number specific research programs. The discussion will also address the tension described above. The following prominent people will present an exciting array of program outlines and plans.

Jean Pierre Banatre, Director at INRIA, Rocquencourt, France, will present the French National Research Program in the field of information technology with special emphasis on software.

Frederica Darema, a program manager at NSF, USA, will present the Next-Generation Software program and other NSF’s advanced basic research programs in the software area.

Helen Gill, a program manager at NSF, USA, will present the Embedded and Hybrid Systems program and other NSF’s advanced basic research programs in the software area.

Hermann Kopetz, Director of the Institute for Computer Engineering at the Technische Universität Wien, will outline, on behalf of Alkis Constantellos for the European Commission, the objectives and the structure of the upcoming Framework VI European Research Program.
Vijay Raghavan, a program manager at DARPA, USA will outline the Networked Embedded Software Technology program and other DARPA ITO's research programs in the software area.

Dieter Rombach, Director of the Fraunhofer Institute at University of Kaiserslautern and an advisor to the Federal Ministry of R&D in Germany, will outline the current software technology research programs run by the German equivalent to the NSF in USA (partly on behalf of Jurgen Nehmer in DFG, Germany) and the draft plan by the German Government for the Next Generation Software Technology program (IT 2006).