



New Technologies for Information, Communication, and Security

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New technologies, largely based upon the progress of information processing and worldwide spreading of digital information sharing, have greatly contributed to the economic growth of the USA during the last two decades, and still do even after the financial downturn of 2008-09.

The information technology market is large by itself, from biggest corporate customers to almost every individual, and is large also because it is part of many other industrial domains, from cars, aeronautics, to biotechnologies and food processing.

The US leadership in information technologies (computers, telecommunications, multimedia) and in microtechnologies (microsystems, nano-chips) is still strong in many different ways:

- scientific and technological breakthroughs, e.g. due to the development of the Internet, of social networks, of software, of electronic components etc.;
- major industrial actors based in the US, whose position is dominant if not monopolistic: Google, Intel, AMD, Apple, Microsoft, IBM, Cisco, Oracle etc.;
- some of, if not the best research centers in the world;
- high concentration of venture capital and highly dynamic start-ups ecosystem, not only in California and Massachussets, but also in great Washington area, Illinois, Texas, even after the 2008-09 downturn;
- the largest IT consumer in the world: the federal government, including the military (\$80 billions a year);
- high attractiveness of foreign specialists in hi-technologies, even if the return to their home countries is a new element (e.g. China, India);
- good penetration of the Internet in homes, companies, educational institutions, though the US are no longer #1 in hi-broadband connection rate, lagging behind Korea, Finland, etc.

The R&D share of the federal budget for IT, after a very high increase at the turn of the XXIst century, under the initiative of the PITAC (President's Information Technology Advisory Committee), followed by some slowdown in the 2005-2008, is increasing again. Some new sectors are causing this increase: Health IT, Security, High-End Computing as applied to Energy (nuclear, climate models), Biology (molecular modelling, DNA), and now for virtualizing computing systems (Internet services, Cloud).

The federal administration, through the America Competes Act, the American Recovery and Reinvestment Act (ARRA stimulus), is committed to support the research in IT, and more recently, the research in cyber-security. This IT R&D budget is coordinated by the Networking and Information Technology Research and Development (NITRD), and has increased, during fiscal years 2007, 2008, 2009, from \$2 b. to more than \$3 billions. Private investment in IT R&D is probably around \$100 billions a year, with several actors above \$5 b. (Microsoft, IBM, Intel, ..) or at least above \$1b. (Google, now Facebook). We can notice many concentrations and restructurations, probably accelerated by the 2008-9 financial downturn, and the emergence of Cloud

computing: more than \$20 billions during the last quarter Q4-2009, and again \$100b. in 2010.

In this context, it is important to develop partnerships between French labs and companies (e.g. Pôles de Compétitivité), and US centres of excellence in IT, nanotechnologies, in order to take advantages of the opportunities on this rapidly evolving market.

NTICS priorities

The strategic directions of the OST in NTICS are:

- Simulation and modelization (high-end computing);
- Security in computers and computers for security;
- Health and IT, Internet and social use, Data engineering.

These trends encompass: imagery, bio-computing, massively parallel systems, logics and proofs, data bases and information fusion, complexity and analytics, etc.

Some actions of the OST/NTICS sector

- Organisation of science breakfasts (ex. [Vint Cerf](#), Rob Atkinson, and more) with the Science Diplomats Club;
- Imager, Sensors: [symposium for young engineers and scientists \(YESS 2007\)](#); and support to NIH-INRIA actions in biocomputing (2007 to 2009);
- Identity Management: [symposium for young engineers and scientists \(YESS 2009\)](#), with support from DHS, NSF and ANR (security and privacy);
- Conference on [Health-IT, Electronic Personal Records](#) (Paris. Oct 2008);
- Super Computing : [symposium for young scientists in super computing \(Oak Ridge 2008\)](#), with support of DOE and NSF; support to UIUC-INRIA actions in petascale computing (2009 to 2011); yearly bilateral visits since 2007 involving NSF and DOE (e.g. [New Orleans meeting](#));
- participation to the Internet Society, Internet Governance Forum USA, contacts with ICANN, with the sector of innovation in IT;
- participation to regular meetings in bio-security, synthetic biology, etc.

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