

2012 PCAST Review of NITRD

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The 2012 NITRD Review

A follow-up to
the 2010 PCAST
report on NITRD

Assess response to recommendations
Propose additional recommendations
Identify emerging research challenges

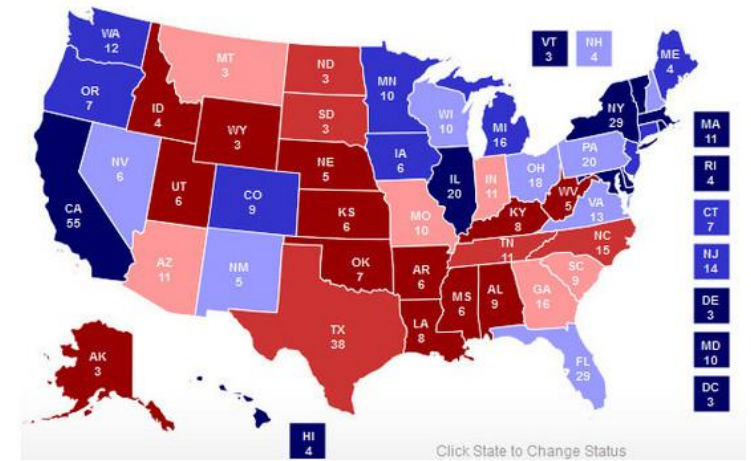
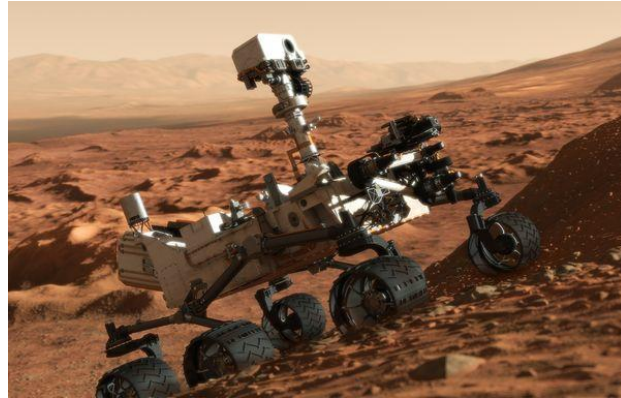
Three-person committee

Weekly teleconferences

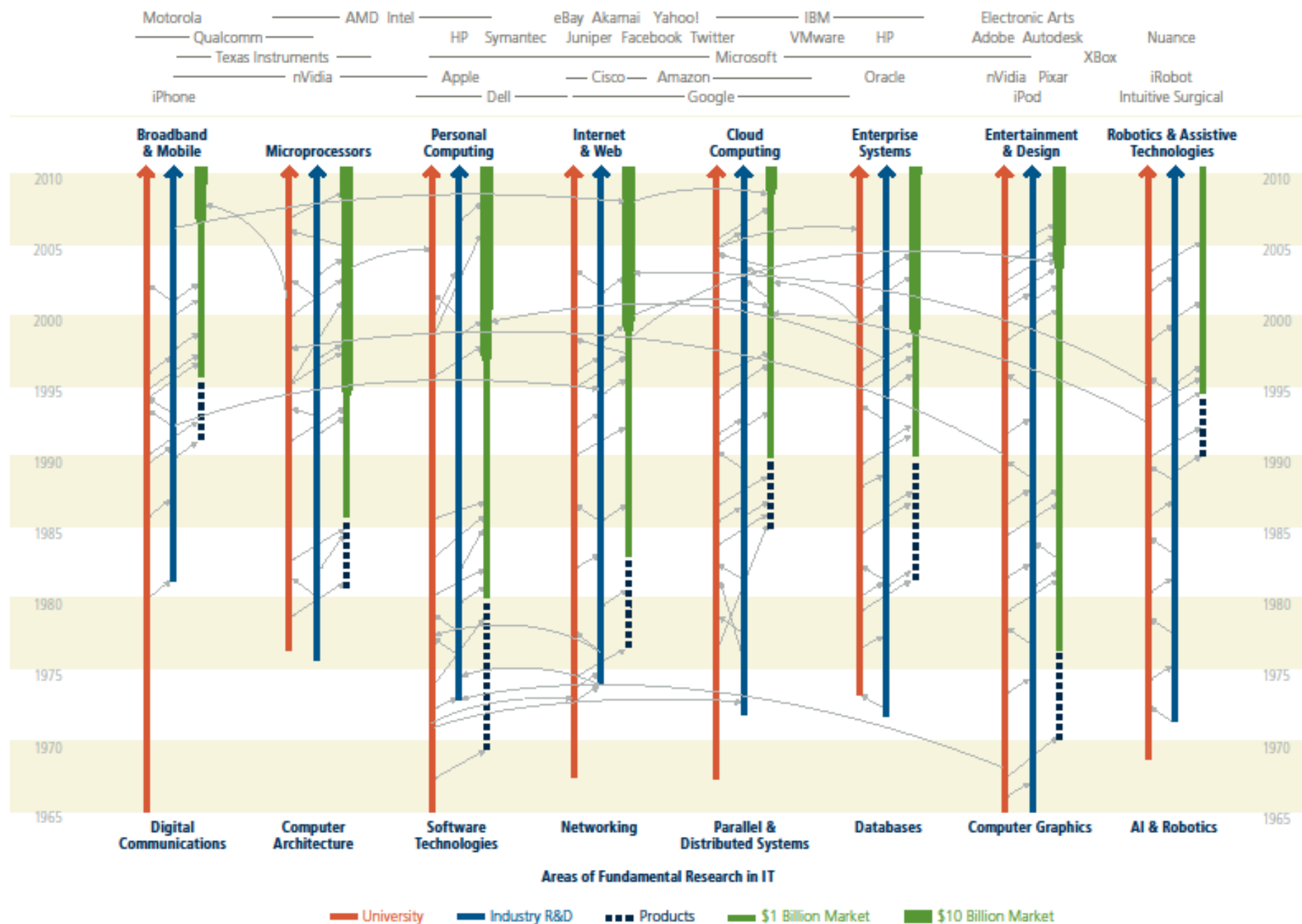
Interviews and information gathering by
Science and Technology Policy Institute
(STPI)

Committee interviews and reading/review

The broad impact of NIT



IT Sectors With Large Economic Impact



Research areas from the 2010 report where Federal agencies have made significant progress in sponsoring R&D

Big Data - *data collection, storage, management, and automated large-scale analysis.*

NIT interaction with the physical world - *robotics and new programs in cyber-physical systems.*

Health IT - *including increased inter-agency collaboration.*

Cybersecurity - *reducing the risks of cyber-attack, though much remains to be done.*

These areas remain as critical focal points in 2012 and beyond. Continued emphasis and even greater coordination is recommended.

Areas where
responsiveness to
2010
recommendations
is harder to find

Social computing –multi-person collaboration and problem-solving in a networked, online environment are a reality but not well understood

Privacy - a science of privacy based on NIT is needed to inform policy decisions and to enable appropriate use of personal data while protecting its source.

Software - remains a huge problem, including security, sustainability, development and maintenance.

All need multi-agency coordination and foundational research coupled with effective deployment

Additional important application areas where responsiveness to 2010 report lags

Educational technology – *need innovative educational technologies for learning from pre-school to life-long learning, and effective NIT-enabled learning assessment methods*

Energy and transportation – *need both basic and mission-related research on the use of NIT for dynamic power management, for achieving low-power systems and devices, and for improving surface and air transportation.*

Both need multi-agency coordination, greater agency participation, foundational research , and methods for effective deployment

Additional important enabling areas where responsiveness lags

Scalable systems and networking – *progress on research infrastructure and for spectrum management research should be augmented by research in other kinds of system scaling, such as robustness and resource management.*

High-performance computing – *need a coordinated, inter-agency plan for a substantial and sustained program of long-term, fundamental research on architectures, algorithms and software for future generations of high performance computing systems.*

Both need multi-agency coordination and foundational research to complement near-term deployment

Effectiveness of NITRD coordination - NITRD Senior Steering Groups

Finding: *The Senior Steering Groups introduced in recent years have strengthened the NITRD coordination function.*

Recommendation: *NSTC and OSTP should continue the use of Senior Steering Groups, decouple the Interagency Working Groups and Coordinating Groups from the budget reporting structure, and regularly review the Group portfolio.*

Effectiveness of
NITRD
coordination -
Budget matters

Finding: *Transparent reporting of government investment in NIT R&D is inhibited by longstanding agency reporting practices and by structuring of digital data that is inadequate for this task. Other means of evaluating the government's investment are needed.*

Recommendation: *OMB should continue its effort to digitize funding information and to enhance capabilities to create meaningful summary reports that cross agency boundaries.*

Recommendation: *OSTP, with guidance from PCAST, should develop a combination of quantitative and qualitative methods to assess the adequacy and appropriateness of government investments in NIT R&D.*

Government leadership – Education and Training

Finding: *Both discovery and use of NIT advances requires an NIT-education community of innovators, workers, and citizens. The states have been slow to introduce concepts of computer fluency in K-12; higher education is not keeping up with the increasing demand for employees in computing occupations.*

Recommendation: *The NSTC must continue to lead in bringing about the education of more children and adults in NIT, both through the efforts of its Committee on STEM Education in multi-agency programs to provide workers with skills in topics of importance to national priorities and in the creation of opportunities for high-quality continuing education in NIT.*

Government leadership – Expert Strategic Guidance and Advice

Finding: *In light of the broad impact of NIT and of its profound importance for the United States, the 2010 NITRD report recommended the creation of a sustained high-level standing committee to advise the Federal Government on both long-term and shorter-term strategy for NIT. There is still a pressing need for such a group.*

Recommendation: *The Federal Government must lead in continuing to ensure that strong multi-agency R&D investments are made in NIT to address important national priorities. PCAST should establish a high-level standing PCAST NIT subcommittee and associated high-level PCAST NIT working group, composed of expert academic scientists, engineers, and industry leaders who can provide sustained strategic advice.*