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Technology: Mere 'improvements' to the Internet occupy the talent, while innovation runs out of gas.

By MAX NIKIAS

As Congress contemplates the National Science Foundation's budget, it would be prudent to look at what drives Internet progress. Explosive growth in Internet usage and strong e-commerce play a role, but it is innovation that fuels the high-tech industry, and many reliable gauges show technical innovation rapidly dropping to "empty."

Anyone who sits at a desktop computer can sense that. Viewing video clips still is difficult, and audio doesn't really measure up. Our interaction with the computer through mouse-clicking and the keyboard is unnatural and redundant. Searching is unwieldy; we sometimes are presented with thousands of hits on a given subject, and we can only search for words--not content inside pictures or audio.

Most of today's advances--faster computer chips, better sound technology and new versions of software--rank as improvements, not innovation. And if the high-tech industry runs out of that fuel, the U.S. economy could be in big trouble.

The Internet economy now grows by means of a development process in which each high-tech company focuses on its own narrow area of hardware and software expertise. Computer chip-makers concentrate mainly on increasing the speed of chips, and leading software companies develop products with only slight variations to improve functionality. These minor gains are being made quickly--almost too quickly--but there are no systematic breakthroughs today in Internet technology.

"The Web's frenetic pace has exhausted everyone," Forrester Research in Cambridge, Mass., recently reported. "The last five years of living on Internet time have worn out the top creative minds. . . . They're on intellectual autopilot."

That does not bode well for innovation.

Meanwhile, Internet service providers develop content under the constraints of currently available technology. Government R&D spending, especially to universities, has followed this same path of limited integration.

We need a new paradigm, a comprehensive, tightly integrated development approach, as opposed to the existing patchwork arrangement. We need more of what is known in the Internet world as an "integrated media system"--technology that allows the creation of sophisticated multimedia information. This would include integrated sound, video and graphics that appear three-dimensional, all engineered for easy and quick delivery over Internet networks linked by powerful computers.

Such "immersive environments" can be the wave of the future. They would offer rich sensory experiences as people interact cooperatively, such as in a teleconference in which, instead of watching your colleagues on a screen and listening to them through speakers, you could see and talk to them almost as if they were sitting at the same table.

Imagine the possibilities. On the job site, an expert will "materialize" in front of a worker who needs to solve a problem. In educational settings where students and teachers gather via computer to see and talk with each other, there can be almost the intimacy of having everyone in the same room.

Such "virtual," visionary applications can be reached in the next decade--if Congress takes a number of dramatic steps:

- * Signal a strong commitment to the National Science Foundation by fully funding the agency.
- * Provide tax incentives to innovative small companies for partnering with university research centers that focus on integrated media system research.
- * Expand the Small Business Administration's Small Business Innovation Research program by increasing funding and adding areas of integrated media development topics. Under the program, 10 major federal agencies and departments are required to reserve a portion of their R&D funds for awards to small businesses each year.
- * Increase funding of the SBA's Small Business Technology Transfer program to support integrated media research. This program expands funding opportunities to foster innovation in federal R&D.

* Encourage federal agencies to incorporate the integrated media system paradigm into their own information management systems as they carry out their mandate to streamline the bureaucracy.


With this kind of boost from the federal government, we could see new energy for Internet innovation. Corporations could work in more collaborative arrangements; innovators could be free to think more creatively, and R&D at universities would become more coordinated and interdisciplinary.

The Internet itself would become the quintessential integrated media system, a much more flexible and powerful engine of economic expansion, one that would make both Congress and Wall Street proud.

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