David P. Reed, Ph.D.

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Background

I've had a diverse career in research and development, in settings ranging from academic/industrial research, to corporate R&D management, to advising corporate management on technology and technology strategy. My roles have been centered around innovation and new product development, especially in software and communications systems architectures. My contributions have ranged from developing ideas, architectures, and inventions to open new markets, to management of product development efforts involving teams of up to 200 people, to corporate strategy development in assembling the technical elements of strategic deals, alliances and partnerships.

My current interests are focused on research, invention, technology development and business strategy related to decentralized, mobile information systems and applications.

The core of my technology interests builds from my experience in designing and delivering decentralized information systems, including the Internet protocols, personal computer productivity software, and groupware. Active research areas include scalable wireless networking protocols and physical layer architectures based on software defined radio and adaptive signal processing, replicated computing and communications platforms for collaboration, and viral communications.

The core of my business interests builds from my experience and participation in corporate technology strategy, including formulation, product development, partnerships, and acquisitions. I've been expressing these interests in working with established and startup companies to develop new ventures based on technology innovations and new business models. Particular interests involve "Real Options" based management of research and "open source" business models.

Employment History

SAP Labs (2010-present), Cambridge, Massachusetts and Palo Alto, California
Senior Vice President, Chief Scientist Group

Massachusetts Institute of Technology (2003-2010), Cambridge, Massachusetts
Adjunct Professor of Media Arts and Sciences, MIT Media Laboratory
Co-leader, Viral Communications Research Group
Co-leader, Communications Futures Program

Hewlett-Packard Corporation (2003-2009) Palo Alto, California
HP Fellow, HP Labs

Independent Researcher and Consultant (1996-2003) Dover and Needham, Massachusetts

Interval Research Corporation (1992-1996), Palo Alto, California

Lotus Development Corporation (1985-1992), Cambridge, Massachusetts
Vice President, Research and Development (1985-1992)
Chief Scientist (1989-1992)

Software Arts Products Corporation (1983-1985), Wellesley, Massachusetts
Vice President, Research and Exploratory Development; Chief Scientist

Massachusetts Institute of Technology (1978-1985), Cambridge, Massachusetts
Assistant Professor of Computer Science and Engineering (1978-1984)
Head of Computer Systems Structure Group, Laboratory for Computer Science

IBM San Jose Research Laboratory (1975), San Jose, California
Summer Research Staff

Massachusetts Institute of Technology (1968-1978), Cambridge, Massachusetts
Teaching and Research Assistant, Dept. of EE & CS (1973-1978)
Research Staff Member, Laboratory for Computer Science (1970-1973, 1976)
Programmer, Dept. of Ocean Engineering (1968-1970)

Consulting and Advisory Board Experience

Member, Technological Advisory Council, Federal Communications Commission, 2003-2005.
Fellow, **Diamond Technology Partners**, Diamond Exchange Program (1996-2010)
Advisory Board Member, **Vanguard** Program (1991- ;originally run by **CSC Index,** sold to TTI in 1997**)**
Board of Directors, Croquet Consortium (2004-present)
Board Member, Charles River School (2003-2006)
Consulting to senior management on technology & innovation (various computer, communications, and software companies); technology strategy advisor for various venture startups & large (technology user) companies
Member of Technology Advisory Boards for several startup companies, notably Bluestreak.com, Jabber.com, X-Collaboration.com, Metacarta, Inc.
Advisory board of Viewpoints Research, Inc. - a research collaboratory (2002-present)

Professional Contributions

ACM Grace Murray Hopper Award committee chair (1996) and member (1992-1998).

Program Committee chair and member for major technical conferences in computer systems design and computer communications.

Early member of the original committees that created the standards for the Internet TCP/IP protocols in the mid-‘70’s.

Occasionally invited to advise National Academy of Sciences, Office of Technology Assessment, Office of Science and Technology Policy, and other policy bodies on issues of intellectual property in software, privacy of computer records, and computer science curricula.

Inventions and Commercialized Products

- Croquet, an architecture, platform, and distributed application for real-time collaboration.
- Patent on software radio-based scalable radio cooperation.
- Patent applications focused on cooperative radio repeaters for efficient spectrum use.
- Patents and applications assigned to Interval Research Corporation in conjunction with research on mobile, personal media capture and use.
- Several patented inventions assigned to Lotus in conjunction with spreadsheet implementation technology.
- Lotus 1-2-3: Overall architecture and code base of all versions of Lotus 1-2-3 introduced since 1989.
- Lotus DataLens architecture for integrating database management systems into 1-2-3.
- Lotus Signal - real-time recalculation features in 1-2-3 coupled with software/hardware system for FM SCA transmission of real-time financial quotes.
- Lotus Express for MCI Mail - jointly with Bob Frankston.
- Core technology/architecture for cross-platform portable implementation used in Software Arts's TK!Solver and VisiCalc, Advanced Version for IBM and Apple computers.
- "Spotlight" product developed at Software Arts, sold to Lotus, then used as the Personal Information Management tools incorporated into the Hewlett Packard 95 LX Palmtop developed jointly with Lotus. The 95LX and its successors were widely viewed as the first PIM device, inspiration of the Palm Personal Organizer.
- Multics MACLISP, Multics Macsyma versions licensed to Honeywell Information Systems.
- Portions of MIT Token Ring network hardware and protocol designs licensed and incorporated by Proteon, and also licensed to IBM.
- Portions of TCP/IP protocol standards (UDP, source routing options, link header compression, signaling in IP).
- Scalable, highly integrated associative memory architecture implemented in magnetic bubble memory form.
- High performance software DES encryption implementation licensed to Sperry Univac, and also used by BBN Communications in certain products.

Some Significant Publications

End-to-end arguments in computer systems design (with J.H. Saltzer and D.D. Clark), **ACM Transactions in Computer Systems 2**, 4 (November 1984), pp. 277-288. Articulated core design principle of the Internet protocol architecture.

An introduction to local area networks (Invited Paper, with D.D. Clark and K.T. Pogran), **Proceedings of the IEEE 66**, 11 (November 1978), pp. 1497-1517. I wrote the protocol section of this paper, which articulated the issues of computer-computer protocol design driven by local area network architectures.

The law of the pack, **Harvard Business Review** (February 2000). A short note explaining the economic impact of group forming networks as networking scales.

Comments on ET Docket 02-135, FCC Spectrum Policy Task Force filed by me on July 8, 2002

(available through the FCC website, or at http://www.reed.com/OpenSpectrum/docs/FCC02-135Reed.html). A position paper explaining how RF spectrum information capacity can be made to scale proportionally to the number of radio devices using it, which has profound, disruptive implications for all radio communications applications, and calls for radical change in FCC Spectrum policy.

Croquet – a collaboration system architecture(with D.A. Smith, A. Raab, A. Kay). **First Conference on Creating, Connecting, and Collaborating Through Computing** (January 2003).

Viral radio (with A. Lippman), **BT Technology Journal, 22**,4 (October 2004). Argues that we can make energy- and spectrum-efficient radio communications systems that scale (almost) without bound. We do this by treating the RF signals in a given space as a distributed optimization process whereby each radio uses the presence of other radios to assist and co-operate in the delivery of messages .

Awards

ACM SIGOPS 2007 Hall of Fame Award.

The Knowledge Trust^{SM} Wilson Prize for Lifetime Achievement, 2007, U of NC School of Information and Library Sciences.

IP3 Award, 2005, Public Knowledge.

World Technology Award, Communications Technology, 2004, World Technology Network.

Education

Ph.D. (September, 1978) Massachusetts Institute of Technology

E.E. (February, 1977) Massachusetts Institute of Technology

S.M. (June, 1976) Massachusetts Institute of Technology

B.S. (June, 1973) Massachusetts Institute of Technology