

books

The Internet— a spontaneous technology

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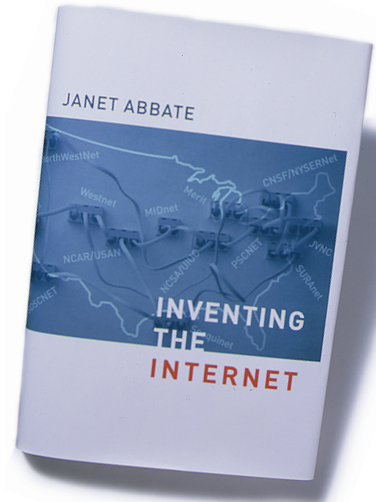
Janet Abbate's account of the Internet's origins ranks with the best of the other books on the subject, notably *Where Wizards Stay Up Late* (Simon and Schuster, 1996) and *Nerds 2.01: (TV Books, 1998)*. Most narratives are muddied with inaccuracies and exaggerations as to who really was the Net's father or, for that matter, the godfather. All the more welcome, then, are studies that approach the subject with precision—and before the memories of all those involved begin to get fuzzy and essential documents are lost.

"The Internet is not... a story of a few heroic inventors; it is a tale of collaboration and conflict among a remarkable variety of players," writes Abbate in the

introduction. And she amply validates that perspective throughout her work.

Abbate guides her readers through the evolution of networking, starting with the earliest work on packet switching, which was done independently by Paul Baran in the United States and Donald Davies in Britain. Although in the main the focus is technical throughout, she does not neglect the human side of the story. Examples of both interpersonal cooperation and conflicts and rivalries among the network researchers are reminiscent of the collaboration and competition that led to the discovery of the double helix, as described in the book of that name by James Watson, the co-discoverer of DNA's structure.

Along the way, Abbate traces the history of the word "protocol" and many other terms that are equally taken for



Inventing the Internet.

Abbate, Janet, MIT Press, Cambridge, Mass., 1999, ISBN 0-262-01172, 264 pp., \$27.50.

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granted today. Providing a window on how standards are formulated and established, she compares the networking scheme promoted by the Defense Department's Advanced Research Projects Agency (ARPA), Washington, D.C., with that favored by the International Telegraph and Telephone Consultative Committee (CCITT), now the International Telecommunication Union (ITU), in Geneva.

Included is a short description of the workings of X.25 networks, the ITU's standard and protocol for packet-switched networks (not to be confused with frame relay, a newer counterpart). There are also discussions on the two- and three-layer models used in the Arpanet (the system that evolved by way of NSFnet into the Internet), and the seven-layer Open Systems Interconnection (OSI) reference model.

The OSI model for networking, first proposed at the International Organization for Standardization (ISO), is used as a common reference against which networking protocols are stacked

up to demonstrate their hierarchies.

The author is able to write about Unix programming language, TCP/IP and HDLC protocols (transmission control protocol/Internet protocol and high-level data link control), and browsers for the Net or the World Wide Web with an ease that can only be derived from working familiarity with the subject. She mentions that she got interested in computer networking through her job as a computer programmer in the mid-1980s, when the concept was known only to research scientists.

Since those heady days, evidently, she, too, has been a part of the evolution leading to the Internet of today. She certainly shows her familiarity with many practical underpinnings of the Internet, and is therefore able to punctuate her story with many relevant technical details, which are what make her tale so interesting and delightful to read.

The book includes some engaging illustrations, notably Paul Baran's design for highly connected switching nodes and Donald Davies's proposed network for the UK. The maps of Arpanet and NSFnet as they were at different times show the gradual evolution of the Internet.

Inventing the Internet does not merely chronicle the Net's history. At every opportunity, but especially in the last two chapters, the book analyzes the social, economic, and political impact of a system that is inherently decentralized and does not belong to any corporation or a government.

Abbate strives to show how networking in general and the Internet in particular have come to be regarded not just as a bunch of computers connected together for the use of specialists but as a vehicle of communications for all. She asserts that the users are no longer passive on-lookers but active participants in the evolution. This characteristic, she says, makes the Internet different from other notable technologies developed in the last century, and she expects its distinctive evolution to continue in this century. This makes for an interesting perspective on the Internet, and one that distinguishes this book from others.

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