ECONOMIC VISIONS

Paul Gray

- Jason Dedrick and Kenneth L. Kraemer, *Asia's Computer Challenge: Threat or Opportunity for the United States and the World?* New York: Oxford University Press (1998) 364 pp. ISBN 0-19-512201-1
- Bill Gates with Collins Hemingway, *Business @ the Speed of Thought*, New York: Warner Books (1999) 470 pp. ISBN 0-446-52568-5
- Henry C. Lucas, Jr., *Information Technology and the Productivity Paradox: Assessing the Value of Investing in IT*, New York: Oxford University Press (1999) 225 pp. ISBN 0-19-512159-7
- Carl Shapiro and Hal R. Varian, *Information Rules: A Strategic Guide to the Network Economy*, Boston, MA: Harvard Business School Press (1999) 384 pp. ISBN 0-87584-863-X

Economics plays a central role in information systems. At the firm level, projects are not undertaken unless some kind of net benefit is anticipated. At the national level, the United States is in competition with manufacturers from abroad, particularly in Asia. The books reviewed here all are grounded in economics. They range from Hank Lucas's analysis of the productivity paradox and how it affects project selection to Shapiro and Varian looking at the economics of the networked era and to Dedrick and Kraemer's analysis of the extent of the economic challenge to U.S. computer products from East Asia. Bill Gates's book, while never mentioning economics per se, is really a visionary view of the economic changes that digital systems bring. Even though these four books take very different approaches, each of the authors has a personal, optimistic vision about how the economics affects the future.

PAUL GRAY *is a professor in the Programs in Information Science Department at the Claremont Graduate University, Claremont, CA.*

THINKING ABOUT THE NETWORKED ECONOMY

In *Information Rules: A Strategic Guide to the Network Economy*, Shapiro and Varian, both professors at the University of California at Berkeley, view information systems for the network economy through the principles of conventional economics. They argue that much is known from the concepts of the past and hence we do not need a new economics to understand the situation in a networked world.

They start with the idea that information is costly to produce but cheap to reproduce. They recommend that information be priced based on its value, not its cost. They also recommend that "versions" of information be created that appeal to different market segments. Next they point out that information is an experience good (consumers must experience it to value it) every time it is consumed. Unfortunately, in many cases consumers must purchase information before they can experience it. Reputation and branding then become surrogates in making the purchase decision. An inherent tension exists between giving information away (to let people know what is being offered) and charging for information to recover its cost.

Another important concept is attention. Shapiro and Varian quote Herb Simon who said "a wealth of information creates a poverty of attention." To overcome the overload, information providers locate, filter, and communicate what is useful to the user. That is, they provide an information portal. Advertising on the Web is another way of gaining attention. But perhaps the ultimate way to gain attention is through one-to-one marketing where the database is used to make offers of direct interest to the consumer. This advice is being taken to heart currently in IS by the rapid expansion of customer relationship marketing (CRM).

Shapiro and Varian treat a number of other important issues: intellectual property rights, lock-in, network effects, and standards wars. Digital technology affects intellectual property rights in that it reduces the costs of making copies and simplifies distribution. However, it reduces the owner's advertising costs, making samples cheap to give away while, at the same time, forcing bootleggers to advertise, exposing them to capture.

More liberal terms and conditions for users tends to raise the value of the product to consumers but may increase the number copied.

Lock-in refers to the idea that consumers will buy the same product on each cycle if the cost of switching (e.g., from a Mac to a PC) is sufficiently high. Switching costs are everywhere in the digital world. It can come from contractual commitments or brand-specific training, or converting data to new formats, to name just a few. Shapiro and Varian give advice to both buyers (e.g., second sourcing) and sellers (e.g., cultivate influential buyers and buyers with high switching costs; use the installed base for cross-selling).

Economies of scale have been replaced by the economies of networks. Networks tend to drive the market to a dominating solution. Thus, as market share grows, there is positive feedback that attracts more and more people to the dominant solution simply because they feel the need to be able to communicate with others who have that solution. The idea is not new, having been visible in the transportation and communications fields for over a century. This dominance is reinforced by such factors as training and personnel, where it becomes easier to find people who know the dominant technology and more difficult to find those who know alternative technologies. The growth of Micrrosoft and Intel and the decline of Apple are an example. In the limit, network markets are winner-take-all.

To compete in network markets, it is necessary to achieve cooperation and compatibility. This is usually done with standards. Standards are a double-edged sword in that many companies will claim being for standards when they really prefer a proprietary answer that will let them stay in business longer with their current product. Nonetheless, standards reduce the consumer's risk, reduce lock-in, increase market competition, and shift competition from features toward price or toward extensions.

Although standards are desirable, they are often not achieved. The question then is what happens if there is a standards war between two or more incompatible technologies such as the recent fight over 56K modems. Shapiro and Varian list seven assets (from control over an installed base of customers and intellectual property rights to reputation and brand name) which help both in waging such a war and improving negotiating position. Unfortunately, firms rarely have all seven. They believe that preemption and managing expectations are the tactics required to win.

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Like *The Economics of Electronic Commerce* by Choi, Stahl, and Whinston reviewed in the Winter 1999 issue, this book translates the often abstract ideas of economics into a form that is easy to understand and to apply to one's own business. It is not as deep or sophisticated a treatment than Choi et al. Yet, it is an easy read and it is an important book.

THE NETWORKED ECONOMY ON THE WORLD STAGE

Dedrick and Kraemer examine the economic rise of five East Asian countries (Japan, Korea, Taiwan, Singapore, and Hong Kong) as factors in the computer industry. Their book, *Asia's Computer Challenge* is subtitled with the question *Threat or Opportunity for the United States and the World?* I won't hold you in suspense. The answer is both.

Dedrick and Kraemer examine each of the countries in detail. They look at such issues as the role of industrial policy, coordination between government and industry, economies and diseconomies of scale, and the global production system. They find that when industrial policy is linked with market forces (e.g., Singapore and Taiwan) they succeed; when they are not (e.g., Japan and Korea), they fail. They find that success is helped by tight government industry strategic cooperation. In some areas, such as the production of commodity items (e.g., boards or chips), there are diseconomies of scale, whereas in standards-based competitions there is a tendency to winner-take-all. Most important, there is now a global production system where companies in different parts of the world specialize in components or assemblies. This system is controlled by U.S. multinationals and includes a large number of East Asian firms who had gained experience in producing components for consumer electronics.

Following chapters dealing with the individual countries and a summing up based on detailed data for the 1985 to 1995 period, Dedrick and Kraemer turn to the future. However, the old data becomes indicative rather than the start of a forecast because the game has changed. Rather than the dominance of the stand-alone PC, the system now is built around networked computers. The U.S. companies still dominate in this market and promise to do so for another decade or so through its multinationals and through the much greater computerization of this country compared with the rest of the world. However, there are opportunities for the East Asian firms. The authors use two scenarios, one for Japan and the other for the "China circle," to illustrate the opportunities for the future.

For Japan, the strengths of Japan's companies in manufacturing through mass production and vertical integration may be a weakness because the biggest payoff is not from hardware and prowess but from software. Japan's internal market is constrained by high Internet and telecommunications cost. Companies that know only the PC (including Compaq in the United States), have an inherent weakness. However, if product life

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The China circle (China plus overseas Chinese in Hong Kong, Taiwan, and throughout Asia) has the advantage that China had only 5 million PCs in 1995. Hence, its switching cost to a network platform for its internal market is low. China also has human capital in a million programmers, a pool of low-cost labor, and the skills of dealing with the West in the outlying countries. However, China is restricted by its political stance; the centralization and high level of control of its central economy and its history of pirating software combine to make it a less desirable trading partner.

Changes in either Japan or the China circle can, however, turn things around. To do so, they should encourage greater internal use of computers, encourage competition in domestic markets to increase innovation, lower telecommunications costs, and lower nontariff and other barriers. If they do so, they can become a threat for the United States and the rest of the world.

From the U.S. point of view, Dedrick and Kraemer see opportunity. The Asian market promises to be the largest market in the twenty-first century. However, there must be differentiation among the countries within the region, since some are better markets than others. Firms must be patient (but not too patient) in looking for profits in the region. Lowering the cost of telecommunications is also needed.

Overall, none of the East Asian countries has risen to being a major competitor to the U.S. computer industry. None appears to be a threat in the short term, largely because they do not have architectural control of major technology standards and because they are not leaders in software or services outside their own market. They continue to be a reliable production base and cost-efficient supplier of components and OEM systems.

Despite the good news, Dedrick and Kraemer believe it would be a serious mistake for the United States to assume that the Asian countries will not be a source of competition, particularly in the hardware industry. They also see danger in the trend of bypassing Japan to concentrate on the rest of Asia. Nonetheless, they conclude that, "Without more radical change, much of Asia faces the prospect of missing out on the vast potential of the network era."

This book is a thoughtful, carefully researched, well-documented study of an important part of the computer world. The authors spent considerable time in the region talking with the important players. For companies seeking to get into the Asian market and companies that can be affected by what happens in the region, it is a must read.

THE PRODUCTIVITY PARADOX

Hank Lucas is a research professor of information systems at New York University who always comes up with interesting ways of looking at problems. In his new book, *Information Technology and the Productivity Paradox: Assessing the Value of Investing in IT*, he deals with one of the great problems posed to our profession: the claim, oft repeated, that the national economic statistics do not show gains in productivity that can be attributed to investments in computing. Because the very rationale of computerization is improved productivity, this paradox needs to be resolved.

Most information productivity studies pick a particular, relatively narrow problem (e.g., productivity of valve manufacturers, gains from a specific application) and analyze it, mostly from an economic point of view. Lucas's book is the first I found that tries to integrate the individual studies and see the big picture. His focus is on individual investments made at the level of the firm and its subunits.

Lucas starts from the almost heretical premise that all investments in IT are not alike. Some are justified by direct benefits (reduced cost, increased profits), but many others achieve value through indirect returns, strategic applications where strategy and technology are intertwined, and still others are designed to transform the organization. Often, the investment is made simply to remain competitive. He begins by classifying IT investments into eight categories (with an example of each listed in parenthesis)

- infrastructure (wide area network)
- required control (OSHA reporting system)
- no other way to do the job (computerized reservation system)
- direct return from IT (just-in-time inventory)
- indirect returns (computerized reservation system put into a travel agency)
- competitive necessity (electronic data interchange)
- strategic application (pharmacy order systems)
- transformational IT (creating a virtual organization)

He then estimates two probabilities: (1) the probability of return from a project and (2) the probability of conversion success. The former comes with the type of the project; the latter measures the effectiveness with which investments are converted to useful outputs by the firm. Multiplying these two probabilities leads to the overall probability of a return from a project. Lucas shows examples of overall probabilities ranging from 0 to 73 percent. His model is relatively simple and direct. However, I have not previously seen anyone trying to apply simple decision analysis ideas to estimating value. The method is a useful way of evaluating alternative projects.

Lucas shows the returns that were observed from 32 projects and studies, describing three to five cases in each

of the eight categories defined above. Getting exact data often turns out to be difficult and has to be done by inference because companies often describe benefits and savings, but more rarely tell about the size of the investment.

Having shown that each category has led to positive results, Lucas turns to ways of increasing the chances for successful investment. Here conversion effectiveness, the successful implementation of IT, is the key concept. To achieve this goal requires shared responsibilities among managers, users, and IT staff in a range of activities from generating the idea and evaluating the investment to changing the organization and evaluating the results. Lucas describes the quantitative methods that can be used for investment evaluation including net present value and the options pricing framework adapted to IT. He describes which method is most applicable for each of the eight categories of return. He also gives prescriptive advice on how to go about making investment decisions and achieving conversion effectiveness.

The basic message of the book is that the productivity paradox is not a simple phenomenon, derived from macroeconomic statistics. Investments have to be judged individually in terms of the opportunities they provide. Lucas provides the quantitative and qualitative tools needed to make these judgments.

THE DIGITAL OPPORTUNITY

Bill Gates's second book, *Business @ the Speed of Thought*, looks at the change in the velocity of business brought about by the flow of digital information. It is Gates's contention that this change in velocity is sufficient to cause a qualitative change in the way business is done. He names the concept the "digital nervous system." In his terminology, this system includes the digital processes that link all aspects of a company's thoughts and actions. He includes both internal factors (finance, production) and external factors (customer feedback). He sees this system as input to the company's knowledge workers that allows them to respond and adapt quickly. He also believes that the existence of this system makes strategy an ongoing rather than a standalone activity.

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To me, the most interesting part of the book is the two chapters dealing with bad news. Gates contends, rightly, that senior managers must be able to receive bad news as well as good news and that holding the bearer of bad tidings responsible for the bad tidings leads to such news being suppressed and management proceeding as though it does not exist. He gives a number of examples of such events at Microsoft, each time indicating how the bad news (e.g., the Web is here) was converted to good (Microsoft is a player on the Web).

Two themes that run through the book are focus on the customer and the role of knowledge and knowledge sharing. Each is improved by the digital nervous system. Of course, there are continual references to Microsoft.

The book is a collection of straightforward thoughts wrapped into a large number of (favorable) case studies from Microsoft and others. Among the thoughts are the following:

- The Web changes the role of the middleman.
- The majority of customer interactions on the Web will be service rather than sales.
- The Web lifestyle puts the consumer in charge of the relationship.
- Time to market is shrinking.
- A number on a piece of paper is a dead end; a number in digital form starts meaningful thought and action.
- Knowledge sharing should be fostered.
- Teams should be able to act with the same unity as individuals.
- Business leaders, not IT alone, must own decisions about processes involving technology.

I could go on. The thoughts individually are not exceptional. The value comes from having them all in the same place.

Overall, Gates's book is an easy read, written in a journalistic style. It is not terribly deep and it is fairly self-serving, but makes good reading on an airplane trip. ▲

Note

1. These books are: Stephen Flowers, *Software Failure: Management Failure*, Chichester, U.K.: Wiley (1996); Robert L. Glass, *Computing Calamities: Lessons Learned from Products, Projects, and Companies that Failed*, Upper Saddle River, NJ: Prentice-Hall PTR (1999); Chris Sauer, *Why Information Systems Fail: A Case Study Approach*, Henley-on-Thames, U.K.: Alfred Waller (1993).