

A Harvard Business Review Book

CREATING
VALUE IN THE
NETWORK
ECONOMY

Edited with an Introduction by

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Executive Summaries

The Coming of Knowledge-Based Business

Stan Davis and Jim Botkin

The next wave of economic growth is going to come from knowledge-based businesses. What will those businesses and their products look like?

A tire that notifies the driver of its air pressure and a garment that heats or cools in response to temperature changes are early versions of knowledge-based, or "smart," products already on the market. They are smart because they filter and interpret information to enable the user to act more effectively.

Consumers become learners when they use smart products, which both oblige them to learn and assist them in learning. And businesses become educators when they make products that promote the learning experience. In the years ahead, Davis and Botkin argue, people's use of knowledge-based products will be critical to their economic success. And businesses that know how to convert information into knowledge will be more successful than those that do not. The authors identify six basic elements of knowledge-based business to help companies get started.

The development of knowledge-based business reflects an even larger transformation occurring in our society. Education is no longer focused on the student years but is considered a life-long pursuit. In knowledge economies, the rapid pace of technological change means that learning must be constant and that education must be updated throughout one's working life.

Business, more than government, is instituting the changes that are required for the emerging knowledge-based economy. And over the next few decades, the private sector will come to eclipse the public sector as our predominant educational institution.

Strategy and the New Economics of Information

Philip B. Evans and Thomas S. Wurster

We are in the midst of a fundamental shift in the economics of information—a shift that will precipitate changes in the structure of entire industries and in the ways companies compete. This shift is made possible by the widespread adoption of Internet technologies, but it is less about technology than about the fact that a new behavior is reaching critical mass. Millions of people are communicating at home and at work in an explosion of connectivity that threatens to undermine the established value chains for businesses in many sectors of the economy.

What will happen, for instance, to dominant retailers such as Toys “R” Us and Home Depot when a search through the Internet gives consumers more choice than any store? What will be the point of cultivating a long-standing supplier relationship with General Electric when it posts its purchasing requirements on an Internet bulletin board and entertains bids from anybody inclined to respond?

The authors present a conceptual framework for approaching such questions—for understanding the relationship of information to the physical components of the value chain and how the Internet’s ability to separate the two will lead to the reconfiguration of the value proposition in many industries. In any business where the physical value chain has been compromised for the sake of delivering information, there will be an opportunity to create a separate information business and a need to streamline the physical one. Executives must mentally deconstruct their businesses to see the real value of what they have. If they don’t, the authors warn, someone else will.

Exploiting the Virtual Value Chain

Jeffrey F. Rayport and John J. Sviokla

Every business today competes in two worlds: a physical world of resources that managers can see and touch and a virtual world made of information. Executives must pay attention to how their companies create value in both arenas—the *marketplace* and the *marketspace*. But the pro-

cesses for accomplishing this are not the same in the two worlds. Managers who understand how to master both can create and extract value in the most efficient and effective manner.

The stages involved in creating value in the physical world are often referred to as links in a value chain. The value chain is a model that describes a series of value-adding activities connecting a company's supply side with its demand side. By analyzing the stages of a value chain, managers have been able to redesign their internal and external processes to improve efficiency and effectiveness. However, the value chain model treats information as a supporting element of the value-adding process, not as a source of value itself.

To create value with information, managers must look to the market-space. The value-adding processes that companies must employ to turn raw information into new market-space services and products are unique to the information world. In other words, the value-adding steps are *virtual* in that they are performed through and with information. Creating value in any stage of a virtual value chain involves a sequence of five activities: gathering, organizing, selecting, synthesizing, and distributing information. Just as someone takes raw material and refines it into something useful, so a manager today collects raw information and adds value through these five steps.

The Dawn of the E-Lance Economy

Thomas W. Malone and Robert J. Laubacher

Will the large industrial corporation dominate the twenty-first century as it did the twentieth?

Maybe not. Drawing on their research at MIT's Initiative on Inventing the Organizations of the 21st Century, Thomas Malone and Robert Laubacher postulate a world in which business is not controlled through a stable chain of management in a large, permanent company. Rather, it is carried out autonomously by independent contractors connected through personal computers and electronic networks.

These electronically connected freelancers—*e-lancers*—would join together into fluid and temporary networks to produce and sell goods and services. When the job is done—after a day, a month, a year—the

network would dissolve and its members would again become independent agents.

Far from being a wild hypothesis, the e-lance economy is, in many ways, already upon us. We see it in the rise of outsourcing and telecommuting, in the increasing importance within corporations of ad hoc project teams, and in the evolution of the Internet.

Most of the necessary building blocks of this type of business organization—efficient networks, data interchange standards, groupware, electronic currency, venture capital micromarkets—are either in place or under development. What is lagging behind is our imagination. But, the authors contend, it is important to consider sooner rather than later the profound implications of how such an e-lance economy might work. They examine the opportunities, and the problems, that may arise and anticipate how the role of managers may change fundamentally—or possibly even disappear altogether.

The Real Virtual Factory

David M. Upton and Andrew McAfee

By now, the monolithic factory was supposed to have given way to the virtual factory: a community linked by an electronic network that would enable numerous partners to operate as one. But for most companies, that promise has been elusive. The traditional technologies—electronic data interchange, proprietary groupware, and wide-area networks—are proving inadequate.

Traditional systems cannot meet the three basic requirements of a large-scale virtual factory. First, an internet-work must be able to accommodate members whose IT sophistication varies enormously. Second, it must, while maintaining tight security, cope with partners in both transient and long-term relationships. Finally, it must provide a high level of functionality, including letting partners operate programs on one another's computers.

The confluence of several trends, however, now makes it possible to build a more flexible and cost-effective manufacturing community. These are the emergence of widely accepted and open computing standards, ever cheaper computing power, increasingly abundant bandwidth, the de-

velopment of essentially unbreakable computer security, and accumulated expertise.

McDonnell Douglas Aerospace and a spin-off named AeroTech have created a real virtual factory. AeroTech acts as an information broker for the community. It signs up new partners, tracks network memberships, oversees security, and serves as a converter that permits partners with different formats to communicate. A flexible, low-cost network, it is a model for a new era in manufacturing. In this new era, those that choose to go it alone or that cling to closed, proprietary systems will find it tough to survive.

Developing Products on Internet Time

Marco Iansiti and Alan MacCormack

The rise of the World Wide Web has provided one of the most challenging environments for product development in recent history. The market needs that a product is meant to satisfy and the technologies required to satisfy them can change radically—even as the product is under development. In response to such factors, companies have had to modify the traditional product-development process, in which design implementation begins only once a product's concept has been determined in its entirety. In place of the traditional approach, they have pioneered a *flexible* product-development process that allows designers to continue to define and shape products even after implementation has begun. This innovation enables Internet companies to incorporate rapidly evolving customer requirements and changing technologies into their designs until the last possible moment before a product is introduced to the market.

Flexible product development has been most fully realized in the Internet environment because of the turbulence found there, but the foundations for it exist in a wide range of industries where the need for responsiveness is paramount. When technology, product features, and competitive conditions are predictable or evolve slowly, a traditional development process works well. But when new competitors and technologies appear overnight, when standards and regulations are in flux, and when a company's entire customer base can easily switch to other suppliers, businesses don't need a development process that resists change—they need one that embraces it.

Trust and the Virtual Organization

Charles Handy

The technological possibilities of the virtual organization are seductive. But its managerial and personal implications require rethinking old notions of control. As it becomes possible for more work to be done outside the traditional office, trust will become more important to organizations. Managers need to move beyond fear of losing efficiency, which makes some cling to expensive and deadening "audit mania."

Handy proposes seven rules of trust. Trust is not blind: It needs fairly small groupings in which people can know each other well. Trust needs boundaries: Define a goal, then leave the worker to get on with it. Trust demands learning and openness to change. Trust is tough: When it turns out to be misplaced, people have to go. Trust needs bonding: The goals of small units must gel with the larger group's. Trust needs touch: Workers must sometimes meet in person. Trust requires leaders.

Virtual organizations call for new forms of belonging. A desk of one's own has been a security blanket for generations; a sense of place is important to people. What happens when that disappears? If workers get membership rights in an organization, a sense of belonging to a *community* can substitute for the sense of belonging to a *place*.

Virtuality's Three I's (information, ideas, intelligence) can improve quality of life. The question Handy asks is, Will they be for everyone? He believes the potential exists for the Three I's to benefit not just organizations but also those with whom they do business and society as a whole.

If businesses let virtuality turn them into mere brokers or boxes of contracts, then they will have failed society. Their search for wealth in the end will have destroyed wealth.

Predators and Prey: A New Ecology of Competition

James F. Moore

Much has been written about networks, strategic alliances, and virtual organizations. Yet these currently popular frameworks provide little sys-

tematic assistance when it comes to out-innovating the competition. That's because most managers still view the problem in the old way: companies go head-to-head in an industry, battling for market share.

James Moore sets up a new metaphor for competition drawn from the study of biology and social systems. He suggests that a company be viewed not as a member of a single industry but as a part of a *business ecosystem* that crosses a variety of industries. In a business ecosystem, companies "co-evolve" around a new innovation, working cooperatively and competitively to support new products and satisfy customer needs. Apple Computer, for example, leads an ecosystem that covers personal computers, consumer electronics, information, and communications.

In any larger business environment, several ecosystems may vie for survival and dominance, such as the IBM and Apple ecosystems in personal computers or Wal-Mart and Kmart in discount retailing. In fact, it's largely competition among business ecosystems, not individual companies, that's fueling today's industrial transformation. Managers can't afford to ignore the birth of new ecosystems or the competition among those that already exist.

Whether that means investing in the right new technology, signing on suppliers to expand a growing business, developing crucial elements of value to maintain leadership, or incorporating new innovations to fend off obsolescence, executives must understand the evolutionary stages all business ecosystems go through and, more important, how to direct those changes.

Real-Time Marketing

Regis McKenna

It's no secret that managing a brand in today's chaotic marketplace is a daunting task. Consumers are bombarded with messages from broadcast and narrow-cast television, radio, on-line computer networks, the Internet, faxes, telemarketing, and niche magazines. But by harnessing new and emerging technologies, companies can start real-time dialogues with their customers and provide interactive services with valuable side effects.

Netherlands-based Philips NV, for example, used a research team to brainstorm with children and adults to develop a new product; in the end,

its enthusiastic young product developers became potential loyal customers. Using today's technology, companies can involve broader numbers of customers in new product development and thus speed up the time it takes to get the market to accept a new product. Although most companies strive to reduce time to market, it's time to acceptance that determines success.

Marketing managers must take responsibility for systems that link companies with customers, suppliers, and distributors. They must give consumers access and learn to think of feedback as part of product development. They need to provide customers with support and information. Finally, they need to become personally competent in information technology and to expand the role of marketing within the organization.

Senior managers might consider shifting portions of marketing units into product design. Marketers might get involved in guiding the efforts to shape brand-building systems. It's even possible that marketing will no longer be one group but will become every employee's responsibility. One thing is certain: Marketing will change, and managers must be prepared to change with it.

The Coming Battle for Customer Information

John Hagel III and Jeffrey F. Rayport

Companies collect information about customers to target valuable prospects more effectively, tailor their offerings to individual needs, improve customer satisfaction, and identify opportunities for new products or services. But managers' efforts to capture such information may soon be thwarted. The authors believe that consumers are going to take ownership of information about themselves and start demanding value in exchange for it. As a result, negotiating with customers for information will become costly and complex.

How will that happen? Consumers are realizing that they get very little in exchange for the information they divulge so freely through their commercial transactions and survey responses. Now new technologies such as smart cards, World Wide Web browsers, and personal financial management software are allowing consumers to view comprehensive profiles of their commercial activities—and to choose whether or not to release that

information to companies. Their decision will hinge, in large part, on what vendors offer them in return for the data.

Consumers will be unlikely to bargain with vendors on their own, however. The authors anticipate that companies they call *informediaries* will broker information to businesses on consumers' behalf. In essence, informediaries will be the catalyst for people to start demanding value in exchange for information about themselves. And most other companies will need to rethink how they obtain information and what they do with it if they want to find new customers and serve them better.

The Real Value of On-Line Communities

Arthur Armstrong and John Hagel III

The notion of community has been at the heart of the Internet since its early days, when scientists used it to share data, collaborate on research, and exchange messages. But how can businesses best use its community-building capabilities? Not merely by putting their products or services online, the authors contend. Real value will come from providing people with the ability to interact with one another—from satisfying their multiple social needs as well as their commercial needs. Companies that create strong on-line communities will command customer loyalty to a degree hitherto undreamed of and, consequently, will generate strong economic returns.

The authors present four different types of community: communities of transaction, interest, fantasy, and relationship. Examples of each type already can be found on the Internet or through on-line services, but the successful community of the future will incorporate all four—or as many as possible. As for economic value, the authors see four ways for a company to generate returns: through usage fees, content fees, transactions and advertising, and synergies with other parts of its business.

In the near future, new business definitions may emerge around the notion of owning a specific customer segment across the full range of its interests and needs; owning specific products and services may no longer be so important. The authors urge businesses marketing to consumers to make the small investment required to “buy an option” on electronic communities in order to understand both their potential value and the radical changes they may cause.

Making Business Sense of the Internet

Shikhar Ghosh

For managers in large, well-established businesses, the Internet is a tough nut to crack. It is very simple to set up a Web presence and very difficult to create a Web-based business model. Established businesses that over decades have carefully built brands and physical distribution relationships risk damaging all they have created when they pursue commerce through the Net. Still, managers can't avoid the impact of electronic commerce on their businesses. They need to understand the opportunities available to them and recognize how their companies may be vulnerable if rivals seize those opportunities first.

Broadly speaking, the Internet presents four distinct types of opportunities. First, it links companies directly to customers, suppliers, and other interested parties. Second, it lets companies bypass other players in an industry's value chain. Third, it is a tool for developing and delivering new products and services to new customers. Fourth, it will enable certain companies to dominate the electronic channel of an entire industry or segment, control access to customers, and set business rules.

As he elaborates on these four points, the author gives established companies a systematic way to sort through the risks and rewards of doing business in cyberspace.