APPLIED INTELLIGENCE

Businesses Must Prepare Now for Future Technology

This column begins a three-part series on the strategic implications of future computer technology and the effect of these changes on business and society.

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With the swift changes occurring in the computer industry, the world of business has increasingly become a technology battlefield.

Companies are competing with high-tech systems, and corporations that are the first to use powerful new technology are often the ones to emerge victorious on this battleground. Corporations that lose the technology battle, on the other hand, often can't catch up because they've been deliberately locked out of the technology.

High-tech computer systems are increasingly being employed to build strategic systems. Strategic systems are large-scale computer applications that automate the critical operations of a corporation and enable it to become much more efficient, so that it can attack its competition more vigorously.

It's therefore vital for business people to ask three questions: Where is technology going? What are the next opportunities for us? And how can we implement strategic systems?

Strategic Systems Analysis

Before a business can implement strategic systems, of course, it must first undergo a strategic systems analysis, a technique highly relevant to corporate executives. Strategic systems analysis is often based on a model of the future, a model of technology. The model should predict at what points in time various technologies will become available and what business opportunities will result from that technology.

These opportunities need to be assessed by a high-level workshop that can present to top executives the new types of technology likely to affect their business. New technology may either enable them to attack their competition more effectively or else put them in danger of being attacked by the other side.

Every managing director is concerned about who could take away his or her business. Often that business is vulnerable to attack by other people who are using better technology. And sometimes those attacks come from overseas.

The world of industry is feeling intense, international competitive pressures. The Chinese are building television sets at half the price of the Japanese, for example. And that's just the beginning. The manufacturing export activity in China is going to grow enormously. Just as the Japanese are taking our industry away from us with high technology, the Chinese will try to do the same with cheap labor.

To protect ourselves from these competitive pressures, we must use our intelligence more efficiently than our competitors do. We must build better high-productivity facilities and use technology in a better way. We need to use strategic systems analysis to identify the changes in technology that are likely to occur in the near future. We need to translate these changes in technology into actions that business people and, in some cases, governments should take.

For strategic systems analysis, I use a computer model of future technology coupled to a model of potential business opportunities. By linking these models together, it's possible to build the connections that enable a manager to understand the applications likely to be of strategic importance. These models allow an analysis of how technology is changing and how technology may be used to exploit new business opportunities.

The model of future technology is a personal tool that I find very useful in understanding the interactions among a wide range of developing technologies. Scarcely a week goes by that I don't add something to the model.

The basic layer of the model is concerned with components of technology, such as the growth in processing speed and complexity of microcomputers, the expansion in storage capacity of optical disks, the increase in transmission speed of optical fibers, the introduction of neurocomputers and so on.

If you understand how the basic components will evolve in the future, then you can ask: "Given these components, what types of powerful machines or different types of machines can we build?"

The second part of the model relates to new kinds of applications made possible by more powerful computers and new types of hardware. Other parts of the model evaluate how new technology and applications will change workers' jobs and also examine the major social implications of the changes that are described in the model.

Better Use of More Technology

Building a Strategic Applications Model

■ Social Change

■ New Applications

■ Base Components
Intelligent PCs
Microprocessors
Optical disks
Optical fibers
Neurocomputers
ISDN
Artificial Intelligence
Relational DBMS
I-CASE
Expert Systems
Standards
Parallel Processors

Maryellen Zawatski

Businesses should ask: Where is technology going? What are the next opportunities for us? How can we implement strategic systems?

The model is expanded by means of interactions with major industry groups to get their views of how they think their businesses are likely to evolve. Industry groups include financial, manufacturing, information systems, government, petrochemicals, pharmaceuticals, automotive, broadcasting, publishing, telecommunications and so on. Joint-partnership studies with different industry groups will evaluate how future technology will change their business.

As technology evolves, some corporations will seize the opportunity to build strategic applications before their competitors. If we look at the airline business, most people know that the American Airlines Sabre system was an enormous strategic success that took advantage of new computer technology. In 1975, Max Hopper, the information-services executive at American Airlines proposed: "Let's build a system in which we can put terminals into every travel agent's office."

It turned out to be exceedingly difficult to build such a system, but the net result of the implementation of the Sabre system was a major increase in bookings for American Airlines relative to its competition and substantial increases in profit. The system has had a significant effect on the operation of the airline, and it has enabled American Airlines to become America's most profitable airline.

The return on investment from the Sabre system is much higher than the return from flying airplanes. United Airlines pursued a similar strategy and was also successful.

What was the difference between American Airlines or United and the other airlines that went bankrupt or were driven to the edge of bankruptcy?

The difference was that the successful airlines used technology better. They were using technology before other corporations realized its strategic implications. When the other airlines recognized the strategic threat, they often found that they had been locked out. Travel agents already had reservation terminals from American Airlines or United on their desks and they didn't need additional systems.

Eyes on Europe

Following its success with the Sabre system, American Airlines started to look to Europe where there are numerous small airlines and large numbers of travel agents. American Airlines set out to give European travel agents terminals that could be put on-line to Dallas, providing the same service in Europe as in America. That caused a great commotion in the travel business in Europe.
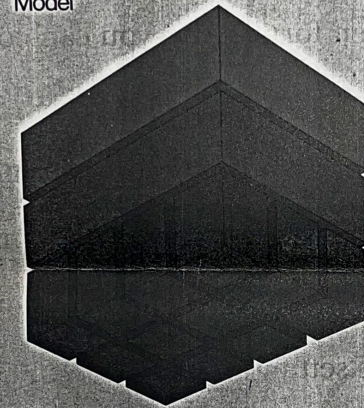
Some of the airlines chose to compete with this same technology. Others chose to hitch themselves to American's star. Still others decided to ask their governments to intervene.

What eventually happened was that two consortia were initiated, each building a very difficult and complex system, one called Amadeus and the other, Galileo. Both systems are high-technology attempts to fight off the attack from the other side of the Atlantic. And both underscore the growing intensity of the technology battle.

Next week, we'll look at new computer technologies that will have great strategic importance in the future. ∎