Information systems and competitive advantage

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ABSTRACT

The dilemma of the last quarter of the twentieth century is integrating information systems technology with a constantly changing business environment. This involves risk, and managers who are measured on a quarterly basis feel that risk is something to be avoided.

Recent history has shown us several cases in which information services technology can play a very important role in a corporation’s competitive strategy. The Wizard System, for example helped Avis improve the product and service it delivers to its customers and provide with knowledge about the location, costs, and performance of this fleet. This helped Avis to bargain more effectively with the supplier, and it provided an advantage over Hertz, National, and other rental car firms.

Several distinct types of organizations exist: There are the exploiters of information technology, who change the way their industries do business; the competitors, who use information technology to support their business; and the participants, who only view information technology as a necessary tool.
BACKGROUND

The dilemma of the last quarter of the twentieth century is integrating information services technology with a constantly changing business environment. This involves risk, and managers who are measured on quarter to quarter results feel that risk is something to be avoided.

The questions the Executive poses to us are: “Why should our organization take the risks associated with integrating information services while we are facing critical business issues such as new competition and replacement products and services?” and “What is an acceptable level of risk?” Our response is, “You do it in order to gain competitive advantage through the exploitation of technology.” The challenge executives face the last quarter of this century are in meeting this objective.

A competitive advantage exploiting technology rests on developing an information strategy which rests on an understanding of the following five forces:

1. The relative bargaining power of buyers/customers
2. The relative bargaining power of suppliers
3. The rivalry among existing firms
4. The threat of new entrants and
5. The threat of substitute products or services.

Information services technology has helped some organizations to gain competitive advantage in each of these five dimensions.

RECENT HISTORY

Failure to take appropriate risks in exploiting technology can have disastrous results. Take the case of Addressograph Multiphigraph (most recently AM International). It had a dominant market position in the addressing machine business. During the 1960’s however, it did not utilize the new, risk adopting, computer storage and label printing technologies. While AM waited, their competitors, called “List Houses,” developed information services techniques to create, store, and print addresses and labels. List houses served the customer better and the market passed AM by. The same thing may be happening today in the financial services industry as companies like Merrill Lynch enter the market and compete with sophisticated information services based cash management systems.

By contrast, there are a number of companies which have expanded their horizons by understanding what the new technology can do for them. We are aware of at least three examples: Avis, American Hospital Supply Corporation, and Whittaker.

Avis

Several years ago Avis, while pursuing a customer service based strategy with a theme “We Try Harder,” developed a system which would allow a customer, anywhere in the country, to make an advanced reservation for a car in any city the traveler desired. It was called the Wizard system. To reserve a car with the Wizard system the traveler had only to call a toll free number and was instantly tied into the complete Avis rental network. The traveler mentioned the day, time, and place of the reservation and the computer did the rest. In order to implement this new approach, Avis had to be at the leading edge of information services technology including: remote/high usage/high speed terminals; telecommunications based real time applications code; and, real time operating systems. The risks and costs associated with the Wizard were high. If the system did not work as anticipated, the damage done to the company would be considerable. But the reward of success was a meaningful competitive advantage, so they “bet” their company.

As a result Avis changed the way the travel industry did business. Not only was the development of the Wizard successful, the system allowed Avis to significantly improve its market share. Avis’ competition was forced to respond and develop comparable systems. And, while their competition was developing these systems, Avis was able to establish a foothold in an industry in which it previously had no real identity. The Wizard became the standard for entry into the industry.

American Hospital Supply Corporation

In the 1960’s executives at American Hospital Supply Corporation (AHSC) developed a strategic plan. They reviewed the distribution function in the health care field and were amazed to discover that there was no single distributor in the field who could service all the supply functions of a hospital. Hospital purchasing agents faced a frustrating multiplicity of products and suppliers. AHSC decided on a full line distribution strategy. Its objective was to make it possible for any hospital or other health care facility to obtain all of their necessary supplies easily from AHSC. However, this strategy could not be implemented effectively with existing manual systems. Consequently they developed a new information services based distribution system called ASAP. A key feature of ASAP was the placement of terminals in each customer’s
office. Any time the customer needed to order hospital supplies he had merely to key his order into his terminal. AHSC’s system accepted it and the material was shipped.

This was not a risk-free strategy. The cost was several millions of dollars. As with Avis this major decision to utilize new technology had a great payback. The success of the system was beyond AHSC’s greatest expectations. The company literally drove its competition out of business. Ultimately AHSC expanded this system to support all the organizations under its corporate umbrella. This included manufacturing functions as well as distribution. Today, for example, a hospital in Chicago can place an order for a i.v. solution, a manufacturing order is generated at American McGaw’s manufacturing facility in Irvine, California, and the shipping and billing functions are all accomplished automatically while volume discounts are being calculated for this hospital’s “buying group.”

Whittaker

A few years ago, Whittaker Corporation, a holding company, scanned its environment for opportunities for growth in United States markets. It found the hospital supply field potentially highly profitable but highly concentrated. The major barrier to entry was the design of an information-services-based-distribution system to compete with AHSC’s. First, a distribution organization was required, so Whittaker acquired a company called General Medical. Second, a computer and communication system like AHSC’s was required, which Whittaker had to build. It is apparent that if any company is to compete with AHSC it must do so with an advanced information services system.

These three cases illustrate the central role that information services technology can play in competitive strategy. Information services technology played an important role for each of the firms described above by helping them improve their power position in each of these five dimensions. The Wizard, for example, helped Avis improve the product and service it delivered to its customers and provided it with knowledge about the location, cost, and performance of its fleet. This helped Avis to bargain more effectively with its suppliers. It provided an advantage over Hertz, National, and the other car rental firms. The national network and the service levels it established upped the ante for getting into the business and served as a barrier to entry. In addition to this, the Wizard improved the cost/performance ratios and forestalled the development of substitutes. On the other hand, AM International failed by several of these criteria—especially the inability to forestall substitution.

Technology Exploitation

Distinct categories of organizations exist, some have the ability to exploit technology, others do not.

**Exploiters:** Information services are an integral part of the organization’s unique strategy. These types of organizations have an experience base which allows them to be involved with most leading edge technology and spend significantly more than their nonstrategic technology directed competitors on data processing. One of the interesting characteristics of these types of organizations is the long tenure of the senior management team, including the information services organization. Some industries are technology directed (airlines in the 1960s; national hotel and car rental industries in the 1970s; and the retail and financial services industries in the 1980s).

**Competitors:** Information services are used to provide the necessary information support for their key strategic business units. These types of organizations have an experience base which will allow them to be involved with one new technology, such as database, at a time. The senior management team does not push its information services group to be first in the application of technology. Rather, it wants to be sure the organization can do anything the competition can do within a reasonable period of time. These organizations typically go through the standard sets of confrontations within their structure establishing priorities. In addition, multiple centers of power and expertise compete for authority in establishing, implementing, and controlling technological direction in the organization.

**Participants:** Information services are used to provide information for basic management functions such as production, accounting, finance, and marketing. These types of organizations have a very limited experience base and only undertake new technology when forced to. Typically there is one key decision maker who is not in favor of computer or communication technology. One such organization had a president who was proud of the fact that he had “unplugged” all the computers in the organization and it was still profitable. (Given the financial condition of the rest of his industry, he deserved to be proud. He had avoided the technical misadventures which everyone else fell into.) In these types of organizations, if a manager can justify an application of computer technology he is the one who goes to bat for it. The typical application portfolio for this type of organization is focused on operational control types of applications and moving towards the implementation of management control applications. We estimate that between 15% and 20% of corporations fall into this category.

**APPROACH TO UNDERSTAND COMPETITIVE ADVANTAGE**

How can an organization gain a competitive advantage through information services? We have found that the following five-step process works:

1. Assess the competitive potential of technology within the industry.
2. Measure the risk/change relationship for the organization.
3. Develop the organizational Probability of Success Ratio (PSR) profile.
4. Measure the risk/probability of success ratio for the MIS function.
5. Develop the risk management action steps.

One of the factors which many managers tend to overlook is the current level and dependence on information services
technology in their industry. This competitive potential dictates the overall risk any organization in the industry faces from changes caused by technology. The potential is based on two factors:

1. Dependence: the depth to which technology is an essential component of the industry. What would happen if the plug was pulled on all information technology in the industry today?
2. Maturity: the extent and sophistication with which the industry has adopted the technology. How close to the leading edge of information services technology is the industry?

The combined effect of these two factors reveals the breadth and depth of technology within the industry. A high rating generally implies that the information services in the industry are strategic technology directed. (See Figure 1.)

The three steps to develop an understanding of your industry and organization posture, as depicted in Figure 1, are:

1. Identify the industry's major information and communication functions.
2. Rate them as to maturity and dependence.
3. Relate your organization's position relative to the industry.

Then pose questions such as the following:

1. What are the applications of data processing and communication in the industry today and in the future?
2. What is the direction, pace, and momentum of technological change within the industry? The organization?
3. Are there opportunities to gain a meaningful competitive advantage by leading the industry in information services applications?
4. Can we exploit the technology to support a unique strategic thrust of the organization?
5. What is the current strategy for information services?
6. Have the technologies we are using paid off?
7. Do they support the business or drain its resources?
8. How do we compare with our competition?
9. Are we spending the right amount (too much or too little)?

Many factors effect the answers to these questions. Included are: the technological dependence and maturity of the industry and the organization; the focus of the organization's application systems—operational control, management control, or decision support systems; the organizational maturity of the computer, communications, user, and management team; the internal performance measurement systems of the organization; and the existing direction, pace, and momentum of implementation.

With all these factors considered, it is a reasonable task to define the set of action steps required for any organization to gain competitive advantage. First, the organization needs to look at the absorption rate and review the systems which are the focus of the future leading competitors. This data can identify the new services a financial services organization is going to provide, or the new products which an office automation company is going to implement, or the new directions which a manufacturing or distribution organization can take to improve productivity. From this, a plan for the information services function can be created. Second, the organization can specify its Risk/Change function and identify the direction, pace and momentum necessary to achieve its plan. Third, by reviewing the individual activities of the information services function, the management team can identify specific action steps required to change its PSR profile and to meet its objectives.

CONCLUSION

Many organizations can achieve a meaningful competitive advantage by developing a strategy based on information services technology. This advantage can be translated into new market opportunities as well as the traditional cost reduction systems. For example, any organization that looks only at a "simple" application of office automation and does not see potential new ways for linking it to its strategy or its basic business units may be missing an opportunity. Companies that have prospered in these difficult times, for the most part, have been innovators. Many of them have innovated in the information services area.

The process presented here is straightforward. The ideas are little more than a new application of good management practices. If your organization is to succeed in the next decade, you will need to manage risk, reward, and probability of success more carefully. These five steps are a way to accomplish this:
1. Assess the technological absorption rate and status of the industry.
2. Measure and plot the risk/change relationship.
3. Develop the organizational Probability of Success Ratio (PSR) profiles.
4. Measure and plot the risk/probability of success ratio.
5. Develop the risk management action steps.

SUGGESTED READINGS