Gaining competitive advantage, or how to succeed as the vice-president of information systems

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ABSTRACT
Most vice-presidents of information systems do not succeed or fail because of technical factors. Rather, their careers rise or fall according to how they meet the organization’s overall business objectives.

This paper discusses in detail a methodology that can be applied to any business and/or industry. The approach has helped organizations, and their information executives in particular, to focus on the factors that must go right for information systems to be a critical component of the overall business strategies.

The paper discusses competitive strategies and the five forces that give them impetus: the relative bargaining power of buyers/consumers, the relative bargaining power of suppliers, the rivalry among existing firms, the threat of new entrants, and the threat of substitute products and/or services. The challenge of the information systems executive is to apply technology to help the organization gain a competitive advantage in these areas.

The methodology goes through five steps, including assessment of the industry’s information systems technology component, how to measure and plot the risk/change relationship for the organization, how to develop a probability-of-success factor for the organization, how to measure the organization’s specific risks, and last, how to develop organizational action steps.
BACKGROUND

An executive of a large western bank described his dilemma to us recently: "Every time I turn around our Vice-President of Information Systems is coming into my office with another proposal—a million dollars for some new word processing and computer equipment, $85,000 for an updated software package, or as I have sitting on my desk now, a multi-million-dollar proposal for installing an advanced worldwide telecommunications network. I am inclined to look favorably on these proposals, since our past ventures into information services have generally been successful. Interestingly, however, virtually every department in the bank also has some complaint about our current systems. What bothers me is that my intuition is not as sharp in computers and communications as it is in lending, borrowing, site location, and other traditional banking areas.

"Today electronics is a necessary part of our business. The fine line between products and services has disappeared as our bank has become more computer based. In this age of deregulation and advancing technology, I can not imagine running our bank without office automation, computers, and communication networks. In addition, we must continue to advance in these areas if we want to stay even with or get ahead of our competitors. It is damned if you do—damned if you don't."

RECENT HISTORY

Integrating information services technology involves risk. Many managers today feel that risk is something to be avoided. They are satisfied with the low rates of return they receive because they assume minimal risk. The questions the business executive wants answered are: (1)—Why should our organization take the risks associated with integrating information services? and (2)—What is an acceptable level of risk? The answer is that you do it to gain a competitive advantage consistent with the level of risk you can successfully manage. The challenge, then, is to develop a strategic plan for achieving this objective. Competitive strategy rests on 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
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. The Wizard System, for example, helped Avis improve the product and service they delivered to their customer; and it provided them with knowledge about the location, cost, and performance of its fleet. This helped Avis to bargain more effectively with its suppliers by giving them 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. Additionally, 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.

To expand on this topic, there are several distinct categories of information services organizations, which can be grouped into three generic sets. Each organization typically has some characteristics of each set, but for the most part it favors only one. They are:

1. **Strategic technology directed**—Information services are an integral part of the organization's unique strategy. This type of organization has an experience base allowing it to be involved with most leading-edge technology and spend significantly more than its non-strategic-technology-directed competitors on data processing. One of its interesting characteristics is the long tenure of the senior management team, including the information services organization. Some industries are technology directed (airlines in the 1960's, national hotel and car rental industries in the 1970's, and the retail and financial services industries in the 1980's).

2. **Business directed**—Information services are used to provide the necessary information support for its key strategic business units. This type of organization has an experience base that will allow it 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, they want to be sure the organization can do anything their competition can do within a reasonable period of time. This organization typically goes through the standard sets of confrontations within its structure in establishing priorities. In addition, multiple centers of power and expertise compete for authority in establishing, implementing, and controlling technological direction in the organization.

3. **Manager Directed**—Information services are used to provide information for basic management functions such as production, accounting, finance, and marketing. This type of organization has a very limited experience base and only takes on new technology when it is forced to. Typically there is one key decision maker who is not
Assess the Technological Absorption Rate and Status of the
Industry

One of the factors that many information system managers
tend to overlook is the current level of and dependence on
information services technology in their industry. This industry
absorption rate dictates the overall risk the organization
faces from changes caused by information services tech-
nology. The absorption rate is based on two factors: (1)
dependence—the depth to which technology is an essential
component of the industry, and (2) maturity—the extent and
 sophistication with which the industry has adopted the
technology.

The combined effect of these two factors reveals the breath
and depth of technology absorption in the industry. A high
absorption rate generally implies that the information services
in the industry are strategic technology directed (see Figure
1).

The steps to develop such a chart are (1) identify the indus-
try’s major information and communication functions, (2)
rate them on maturity and dependence, (3) plot the organiza-
tion’s position relative to the industry. Then pose the follow-
ing questions:

1. What are the applications of computers and communica-
tion in the industry today and in the future?
2. What is the combined absorption rate for the industry?
3. What is the direction, pace, and momentum of technol-
ogical change within the industry and the organization?
4. Is the organization behind or ahead of the industry in its
application of technology?
5. Are there opportunities to gain a meaningful competi-
tive advantage by leading the industry in information
services applications?
6. Can we employ the technology to support a unique stra-
tegic thrust of the organization?

The result is a list of potential technological directions which
will provide the organization a leadership position or enable
it to gain parity within the industry. Either of these results will
entail changes in the organization and increase its exposure
to risk. To assist in managing this process the next action step is
executed.

Measure and Plot the Risk/Change Ratio for the
Organization

A successful strategy must achieve a proper balance be-
tween growth, control, and technological innovation. Execu-
tives need to know: “What is the potential bottom line impact
of the application of information services technology?” The
following questions are useful in this regard:

1. What is the current strategy for information services?
2. Have the technologies we are using paid off?
3. Do they support the business or drain its resources?
4. How do we compare with our competition?
5. Are we spending the right amount (too much or too
little)?

Many factors affect the answers to these questions. Included
are the technological dependence and maturity (ab-
sorption rate) of the industry and the organization; the focus
of the organization’s application systems—operational con-
trol, management control, strategic planning, or decision
support systems; the organizational maturity of the com-
puter, communications, user, and management team; the
internal performance measurement systems of the organiza-
tion; and the existing direction, pace, and momentum of
implementation.

Figure 2 shows the plot of a Fortune 500 company at the
point when a new information systems (IS) management team
was put in place (time x) and the same organization 24 months
later (time y). In that twenty four month period the organiza-
tion went through significant change. The Vice President
of information systems started to implement a new communica-
tions systems within his company’s field operations, converted
from an early 1970’s based computer operation to a 1980’s
approach, revised the major business and information reporting
systems, and developed a new charter and role direction
for the information services groups within the organization.

Develop the Organizational PSR Profile Factors and
Measures

An initial analysis, utilizing the Critical Success Factors
approach, can identify four to eight items which have to go	right for the organization to be successful. Let us review a
case.
A billion-dollar organization had undergone a number of significant organization changes. A new chief executive officer was installed and several new strategic decisions were made. Among these was the decision to utilize information services technology to provide the corporation with a meaningful competitive advantage. The successful IS executive immediately started to change the way the organization related to the information services group and the MIS budget increased by over 45%. However, new concerns were identified by the IS executive, including:

- Senior management did not understand nor support the MIS plans for computer hardware, operating systems, data bases, communications network and facilities
- The status of four major development projects, which accounted for over 35% of the salaries in the current budget, was not known

LEGEND: MIS Application areas—areas of focus of the MIS organization. POS—Point of Sale. DDP—Distributed Data Processing. DBMS—Data Base Management Systems. OFFICE—Office of the future and personal computers. SA/PGM—Number of systems analysts and programmers doing development work for new MIS applications. Type computer—Type of Computer. MIS $—MIS budget in absolute dollars. % Revenue—MIS budget as a percentage of total revenue.

Figure 1—Absorption rate of 3 industries

Figure 2—Risk/change relationship
The decision to utilize outside contractors, to modify existing software, resulted in a substantial expense during the prior four months.

Several key weaknesses of the MIS organization and key user organizations were revealed. The main concern was the high turnover rate of key specialists. With this information the IS executive was able to identify six profile factors. They were (1) a strong information services management and delivery team, (2) a high independence from external contractors, (3) a measured growth of MIS technology, (4) a successful modification of the user organizations operational characteristics, (5) a well implemented system development, implementation, and operational methodology, and (6) a new capital prioritization, budgeting, and monitoring system.

Figure 3 demonstrates where his efforts had to be placed in order to minimize risk and to increase the probability of success. For example, the information services team, though experienced, had not been with the organization long enough to absorb its culture fully. This resulted in an overall rating that was negative. The need for independence from the outside was the greatest problem. On the other hand, technological growth was normal and the rate of change was within the overall optimal band (see Measure and Plot the Risk/Change Relationship discussion). Overall change management was low risk for the organization because a number of positive action steps had been taken. The development methodology was at a normal level of risk, as was the capital budgeting because of the control systems which had been put in place by the new IS Executive. These factors were then measured across all of the activities involved with the organization.

Measure and Plot the Organizational Risk/Probability of Success Ratio

The IS executive can develop a probability of success profile for his organization. Looking at the risk curve in Figure 4 for time x (manager directed) the relative risk (horizontal line) at point A is the same as the risk a point B (business directed) and point C (strategic technology directed). The area of difference is the probability of success. For the same level of risk the probability of success is greater for the strategic directed organization than for the manager directed one.

In Figure 4 the organization was initially manager directed. You can see the direction that this organization took. With its previous management team (manager directed), the information services group did not acquire the experience base needed to accomplish the company's objectives. For example, they had three failures in two years trying to implement a relatively simple distribution inventory control system. They improved their position by adopting a business directed strategy to help them relate inventory control problems more closely to strategic business units. The difficulty they currently face is that their corporate objectives require them to become a strategic technology directed organization and to use infor-
tion technology to gain customer service advantage over their competitors. This shift in organization strategy should also improve their probability of success.

**Develop the Organizational Risk Management Action Steps**

With all these factors considered, it is a reasonable task for an IS executive to define the set of action steps required to gain competitive advantage for his organization. First, the IS executive needs to look at the absorption rate and review the systems that are the focus of the “future leading competitors”. This data can identify the new services that a financial services organization is going to provide, or the new products that an office automation company is going to implement, or the new directions that a manufacturing or distribution organization can take to improve productivity. From these new services, a plan for the information services function can be created. Second, the IS executive can identify his organization’s 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 IS executive can identify specific action steps required to change its PSR profile and to meet its objectives.

**CONCLUSION**

Vice Presidents of Information Systems can succeed and help their organizations achieve a meaningful competitive advantage by developing a business strategy that is 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 IS executive who looks only at a “simple” application of office automation and does not see potential new ways for linking this to the business strategy or his basic business units functions, 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 a competitive advantage in the information services area.

The process presented here is straight-forward. The ideas are little more than a new application of good management practices. If you are to succeed in the next decade, you will need to manage risk, reward, and probability of success more carefully. Five steps to accomplish this are; (1) assess the technological absorption rate and status of the industry, (2) measure and plot the risk/change relationship for the organization, (3) develop the organizational probability of success ratio (PSR) profiles, (4) measure and plot the organizational risk/probability of success ratio, and (5) develop the organizational risk management action steps.

**REFERENCES**

Database management

Darrell Ward, Track Chair

The database track is exciting and timely for the 1984 NCC. We are pleased to present database panels and papers that are current and practical as well as indicative of new developments in the database area.

Two sessions are devoted to relational databases, which are fast becoming the standard in modern database technology. "Current Status of the Relational Database Model" develops the current status of the relational database approach and should prove invaluable for those who use a relational database or contemplate its use. The session entitled "SQL Database Language" inspects this important language and evaluates its impact on the end user community. Additionally, the session addresses the notation of a standard language for the relational model.

For the microcomputer enthusiast, "Fourth-Generation Languages (4 GL) and Personal Computers" is devoted to these application tools and their use in the ever expanding area of personal computer applications. This session provides valuable insight into future databases and application development systems for the microcomputer environment.

The "Entity Relationship Approach to Database Design" session focuses on the initial modeling of the database environment and the database design process. The need for guidelines and specifications for database design and implementation is quite apparent to experts who are required to develop such database applications. This session is clearly timely and pertinent for database developers.

Finally, the track features two refereed paper sessions. One of these, "Database Workstations," will address the general area of database environments, including the database workbench and the end user interface. The other paper session, "Database Applications and Interfaces," is intended for specialists who are interested in detailed technical aspects of current database systems.

We feel that the sessions in the database track provide a stimulating environment for continued productivity in the database world.