

Note: Vicki Sauter & I presented this essay to our graduate studies committee. The committee asked the question, "Why do general managers need to study MIS?" while redesigning our MBA program.



Why General Managers Need to Understand Information Systems

General managers need to be involved in information systems (IS)--the amalgamation of hardware, software, data, people, and procedures--because:

- The sheer magnitude of the dollars spent on IS must be managed to ensure business-value.
- Research has consistently shown that when general managers are involved in IS, IS enables a number of business initiatives, such as business process re-engineering, total quality management, global expansion, even downsizing.
- Research has consistently shown that when general managers are not involved in IS, dollars are wasted on automating ineffective processes--or at the extreme, companies can fail as a result of poorly managed IS.

Thus, IS enables or inhibits business objectives depending on management's involvement in IS. The big challenge IS managers face is: how do we get general managers involved? Research has shown that involvement is highly correlated with personal experience with IS and IS education, including university classes and IS executive seminars . Once general managers understand IS through experience and education, they are more likely to be involved in IS, and more likely to lead their organizations in achieving business success through IS. (See Jarvenpaa & Ives, 1991, Feeny et al., 1992; Lederer & Mendelow, 1988)

I. MAGNITUDE OF DOLLARS SPENT ON IS

- On average, companies' annual IS budgets represent about 5% of revenues.
- Capital investments in information technology are typically twice the amount of the IT operating budget.
- IS capital investments represent 40% of most large companies' capital expenditures
- The information technology and telecommunications markets represent \$380 billion of annual GNP .
- The service sector spent over \$750 billion on IS hardware in the 1980s

(Note: See Minoli, 1994 and Quinn and Baily, 1994)

General managers must manage these IS expenditures to ensure they are getting value for money. In particular, general managers must develop the following IS competencies:

- align their IS strategy with a business strategy to ensure that current investments lead to business-

value

- develop processes for scanning the environment for new technologies to ensure that future investments add to business-value
- set IS priorities (this is critical because user requests for new systems have an average backlog of 4 years)
- develop an internal balanced-score card to assess IS performance in terms of costs and service
- benchmark IS performance with high performers to determine best IS practices
- develop a sourcing strategy to minimize production and transaction costs while still maintaining excellent service levels.

“Some CEOs consider themselves unqualified to participate directly in decisions regarding IT. They express personal frustration at being unable to evaluate IT proposals.” Jarvenpaa & Ives, 1991, p. 219

Research shows, however, that many senior executives fail to develop these IS competencies. Instead, they typically set the IS budget based on either historical trends (such as increasing last year’s IS budget by 4%), or by simply matching the IS budgets of competitors. But these methods are totally ineffective at ensuring that IS expenditures lead to business-value--they focus on cost rather than value. (See Lacity & Hirschheim, 1993)

II. GENERAL MANAGEMENT’S INVOLVEMENT LEADS TO IS-ENABLED BUSINESS SUCCESS.

A large body of research has found that general management involvement in IS a critical factor to achieving IS-enabled business success. Examples of current IS enabled success include:

A. IS’s contribution to business process re-engineering

“A company that cannot change the way it thinks about information technology cannot re-engineer”--Hammer & Champy, Re-Engineering the Corporation, 1993, p. 83

Most of the BPR exemplars--Walmart, IBM Credit, and Kodak to name a few, used IS to achieve significant improvements in performance, such as cost, quality, service, and speed:

- Walmart re-engineered inventory management by giving suppliers access to its inventory system. Suppliers monitor the database and automatically send another shipment when stocks are low, thus eliminating the need for purchase orders which speeds delivery time, lowers Walmart’s inventory carrying costs and stockout costs.
- IBM Credit re-engineered its credit application and approval process by automating the approval process. Before IS-enabled re-engineering, it took 25 days to approve a credit application. Today it takes less than 5 days.
- Kodak re-engineered its product development process through the innovative use of computer-aided design and computer-aided manufacturing. This technology is credited with reducing product development time in half.

The main IS competency general managers need to use IS as a BPR enabler: the ability to think inductively--that is, to the ability to recognize IS as a powerful solution . (Note: See Hammer & Champey, 1993 for details on these examples)

“The fundamental error that most companies commit when they look at technology is to view it through

the lens of their existing processes. They ask, 'How can we use these new technological capabilities to enhance or streamline or improve what we are already doing?' Instead they should be asking, 'How can we use technology to allow us to do things that we are not already doing?'--Hammer & Champy, 1993, p. 85

B. IS's contribution to global expansion

"Firms operating in new world markets will increasingly be at a serious disadvantage if they are unable to firmly control their worldwide operations and manage them in a globally co-ordinated manner. Investments in information technology can give firms a basis for increased coordination and control or can provide direct competitive advantage in world markets." Ives & Jarvenpaa, 1991, p. 33.

Global information systems--which directly support global business strategies--are used to:

- serve traveling customers (such as Marriot's global customer database)
- support global products (like Coca Cola)
- create centers of core competency (computer chips may be designed in California, manufactured in Taiwan, and sold worldwide)
- create flexible manufacturing operations (Compaq can move production between facilities)
- share resources (petroleum companies share tankers)
- reduce risks associated with currency conversions (investment bankers can trade in several global markets, 24 hours a day).

To use IS to enable global expansion, general managers need to:

- link global applications to corporate strategy
- address transborder data flow issues
- understand the host country's technological infrastructure
- prepare IS implementers for the cultural/political issues associated with global IS.

(Note: List & lessons extracted from Ives & Jarvenpaa, 1991)

C. IS's contribution to downsizing

On the one hand--companies are expanding into global markets, while on the other hand they are downsizing domestic headcounts. Downsizing is a result of several trends, such as returning to core competencies (reduces headcount in sold-off businesses), flattening of organizations (reduces management layers), employee empowerment (reduces middle management), cross-training to replace specialists with generalists (reduces the number of specialists needed). IS has been a critical enabler in downsizing:

- IS has helped reduce headcounts through automation. For example, Ford automated its accounts payable function by electronically matching receipts with purchase orders, thus eliminating the need for invoices. The accounts payable staff was reduced from 500 to 200. (See Hammer & Champy)
- IS provides decentralized and scaleable platforms in which end-users access information from anywhere in the company to meet the demands of their new generalist positions. For example, Cigna reduced staff by 25% while increasing the business by 14% by using client-server based

systems that price products considering local needs and local losses.

To use IS to enable organizational changes in structures and processes, general managers must develop the following IS competencies:

- Implement IS so that information can appear simultaneously in as many places as it is needed
- Through use of expert systems, a generalist can replace specialists
- Use IS to simultaneously reap the benefits of centralization and decentralization

Although the demonstration of IS's contribution to BPR, global expansion, and downsizing, captures a general manager's attention due to the "hotness" of such topics, more generally, we describe IS as an enabler/facilitator of competitive advantage, organizational effectiveness, and organizational efficiency. As a competitive tool, IS can differentiate a company's products, services, and prices from its competitors by improving product quality, shortening product development or delivery time, creating new IS-based products and services, improving customer service before, during, and after the sale. Companies that have achieved a competitive advantage through IS include :

Air Products--vehicle scheduling system
 American Airlines--reservation system
 American Express--Preferential travel services system
 Banc One--transaction processing systems
 Baxter (American Hospital Supply)--order entry system
 Bergen--order entry system
 Chase Manhattan Bank--credit card processing system
 Chemical Bank--credit card processing system
 Cigna--risk assessment system
 Citicorp--ATM networking
 Deere--parts and inventory system
 DEC--expert system for computer configuration
 Dow Jones--Satellite page transmission
 Federal Express--tracking and sorting system
 First National Bank--asset management system
 General Electric--CAD/CAM
 IBM--marketing management system
 Manufacturer's Hanover--global networking
 McGraw Hill--marketing system
 Mellon Bank--transaction processing
 Merrill Lynch--cash management system
 Owens-Corning--Materials selection system
 Philadelphia National Bank--ATM networking
 Proctor & Gamble--customer response system
 United Airlines--reservation system
 Xerox--CAD/CAM application

(Note: The list represents half the companies identified by Kettinger, W., Grover, V., Guha, S., and Segars, A., "Strategic Information Systems Revisited": *MISQ*, 1994, pp. 31-55.)

IS contributes to organizational effectiveness by providing decision support at every managerial level through the development of executive information systems, decision support systems for both

individuals and groups, and expert systems for domain-specific tasks. IS contributes to organizational efficiency by lowering internal costs through automation, task support, and communication support. Like the list generated for companies achieving a competitive advantage with IS, numerous examples could be given to demonstrate how IS contributes to organizational effectiveness and efficiency.

III. LACK OF GENERAL MANAGEMENT INVOLVEMENT CAN LEAD TO BUSINESS FAILURE.

Despite the previous evidence and arguments outlined above, many general managers still question why they need to bother to understand IS. Senior executives often misperceive IS as is merely a utility--much like electricity. But IS is distinctive from "utilities" because information systems are not homogeneous, but require customization. The problem with the "utility" metaphor is that it ignores the idiosyncratic nature of an organization's information needs. Close communication between the business units and IS must occur to accurately meet requirements. As utility users, we typically do not call the power company to communicate our complicated changing business needs. As IS users, we do. (see Lacity & Hirschheim)

Treating IS as a utility--something than can be plugged and unplugged--can lead to business failure. For example, Banca di Roma's disastrous merger was largely blamed on management's failure to plan for integrating IS systems from the three merged banks. Senior executives who made the deal assumed that the systems could merely be unplugged from one bank and plugged into another. Branson Airlines outsourced its airline reservation system to British Airways because they considered this a "utility". After mysteriously losing millions of dollars worth of sales, Branson discovered that BA was assessing their data and offering their customers a lower ticket price is they would cancel their Branson reservation and book with BA. This has lead to a billion dollar lawsuit.

While Banca di Roma and Branson highlight the extreme consequences of management's ignorance of IS, less severe--but far more frequent--are the dollars wasted on systems development. Research has shown that up to 80% of system development efforts fail--not because the technology failed, but because the system development process was poorly managed. General managers need to develop the following competencies:

- Develop a process for evaluating the feasibility of IS projects
- Implement system development methodologies based on the nature of the system
- Develop IS project management skills, including user participation, approval methods, TQM principles.

IV. SUMMARY

General managers need to understand the actual--as well as the potential--role that IS assumes within organizations. To realize this potential, general managers must create an IS infrastructure, including IS management, IS staff, hardware, software, data, and processes.

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