Title: Strategic and Policy Issues on "Information Technology"

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Author(s): D. Helms, A. Elanzami, S. man Roh and A. Al-Khamis

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Abstract: The role of information technology organization and the way it is structured and managed is changing rapidly as information technology takes an ever increasing role in the competitive position of the company. This paper briefly discuss the critical issues and strategic implications facing information technology organizations as it enters into the new millennium.

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Abstract:

The role of Information Technology organization (Network Technologies and its applications, Wireless technologies, etc.) and the way it is structured and managed is changing rapidly as Information Technology takes an ever increasing role in the competitive position of the company. With the exponential growth of computer network users throughout the world for the past decade, many companies are coming to enjoy never before imagined connectivity, information gathering/sharing, and even sales. However, with this expansion come a lot of problems ranging from security issues to strategic business implications.

In this paper we barely scratched the surface trying to briefly discuss, some off what we believe to be, the critical issues and strategic implications facing Information Technology organizations as we enter into the new millennium.

Introduction:

Information Technology has significantly impacted the operations and strategies of many companies during the last two decades. The impact of computers, telecommunications and computer based information systems has left few organizations untouched, with the future looking even more turbulent, especially for companies who are not ready for change. Information Technology has profound and important effects within organizations on the dimensions of strategy, finance, and organizational change. Information Technology has become more and more important as the accuracy and timely distribution of information has become more critical. The literature shows that success or failure of an Information Technology organization or investment is highly determined by "people problems." (Galliers, 1998; Autor, Katz and Krueger, 1997). People using IT inappropriately, poor customer service performance, and the new markets, such as electronic commerce brought in by the big explosion of the internet and its impact on our daily life, are just a few of the challenges facing Information Technology organizations and businesses in general as we enter the new millennium. Today Information Technology is one of the most important aspects in a company's business plan, its widespread functions and applications throughout the company's workgroups and business units makes it hard and complicated to manage. The challenge is to harness all the technologies involved (Networks Technologies, Wireless Technologies, Internet/Intranet, Software Applications, etc.), and to build a good supporting infrastructure for the Information Technology organization to take a full advantage of its potential growth, and give the business a competitive advantage in the market place.

Information Technology overview:

Network Technologies:

It is a huge market continuing to grow by leaps and bounds. Numerous compelling innovations which yielding many opportunities to create attractive venture businesses. The continuous deregulation of the telecommunications industry with the explosive demands for high-speed telecommunication services has pushed the growth of

networking, distributed computing, the Internet and the World Wide Web. Also, the rapid growth and proliferation of the next generation digital/satellite networks is bringing us new possibilities of the multimedia communications. Home banking (ATM, and On-line banking) is a good example of a networking technology use. There is a growing interest in building networks that unite ATM and Ethernet switching technologies so that people can access their bank account more conveniently, safely, and faster [2]. These new network technologies, especially telecommunications and teleconferencing equipment, are changing the way business and commerce is managed in order to increase customer satisfaction.

Wireless Technologies:

Wireless Technologies are supporting not only local but also nation wide area using broadband networks such as PCS. Broadband Internet access is gaining momentum with the increase in the number of users. Such dramatic innovations of millimeter and microwave communications technologies are enabling new bypass, mobile and personal communications alternatives. The rapid growths and the changes of the innovative wireless technology bring us another convenience in communication. The big wireless market leading companies such as Aironet Wireless Communications, Lucent Technologies, Proxim, RadioLAN, and Xircom, have been working to develop a product which would boost up the market with more speed, and the recent products introductions such as the 10-Mbps products, show that wireless technology is moving towards the convenience, and speed offered by wired LANs [3]. The constant investment and development by the leading market companies, is setting the scene for a faster Wireless Technologies opening new avenues in the Information Technology world.

Internet/Intranet software and the Enterprise:

The modern Internet/Intranet software have been introduced to meet the requirements and needs of the major industry trends. The widespread adoption of the Internet and the World Wide Web has been contributing a great deal to the information distribution (sharing or gathering) among users with different social and economic backgrounds.

Many companies investment focus is to develop software applications that supports office processes and activities including all aspects of customer interactions such as marketing, sales, and customer support. Internet/Intranet software has been contributing to the hard cost saving and customer value enhancement by providing tools to improve manufacturing, distributions, and scheduling processes.

However, using the internet/intranet has raised some security issues with companies, which pushed them to look into Internet firewall technology to protect their network resources [4]. We will talk about some Firewall related issues in the next section.

Critical Issues in Information Technology:

Information Technology is one of the most convenient technologies bringing connectivity, speed and intangible improvements to the communication performance. IT is influenced by changes in networks technologies, telecommunication, teleconferencing, and Internet software. Most large or small corporations certainly use complex internal networking systems and make extensive use of telecommunication networks and satellite to exchange information or to interact with their customers to better serve them. However, many IT technologies, unexpectedly, bring forward some critical issues, because of the huge interconnected networks crossing not only domestically but also globally and the exponential growth in both usage and numbers of users. There are seventy-two million Internet users globally, over 130 countries are accessing from all directions, and 150,000 new users log on every month [5]. In this environment, privacy and data security remain as the major concerns in the IT business today.

Data Security:

Maintaining secure and safe data information system might be one of the most important aspects in an Information Technology organization. Lack of security makes the company's network the perfect target for hackers, competitors and even industrial or technology spies. As long as data information is stored and maintained by computers, it always going to be the target of attacks by criminals seeking financial gain illegally, by spies chasing governmental or industrial secrets, or by hackers looking for a challenge to break a networking system. These attempts have increased using many sophisticated

software tools, requiring IT organizations to use better security tools. The situation can become worse when primarily important systems, such as national power grids, air traffic control systems, international banking systems, and military and national security systems or satellites, are hacked and fully controlled by criminals, hackers, or spies. These kinds of dangers must be reduced to an absolute minimum, so business and governmental network users can be confident that their information assets are secure internally and externally. Also, individual users should feel conformable that information they supply will not fall into the hands of criminals or snoops, when doing business over the Internet.

The data security polices in many companies are emphasized typically on the confidential documentation, assets related controls, and network restrictions. Password protection while using networking systems and access permission is mainly educated. Telephone and telecommunications networks are protected installing the Firewall as safeguard for information systems.

Firewall:

It is often called, "Gatekeeper", since its role is to protect the network resources from being stolen by hackers or spies. It is like a door; when a company wants to connect to the Internet, they have to put in a door that opens up their network to the rest of the world. Firewalls served initially as those doors.

"Many companies look to the Internet firewall technology to protect their network resources [6]. " Why? Since it is not a secret that data information has been hacked, cracked while using the network systems.

However, many companies, when searching for solutions, are finding that they are puzzled by a lack of common definitions for key firewall functions. This makes it difficult to tell what functions you are paying for and makes comparisons shopping of similar products almost impossible [6].

The biggest fear and limits of using Firewall would be attacks from insiders who by lack of knowing or misguided security policy [6]. Generally employees lack of accurate information or education regarding the use of data transfer and access on the network can lead to some leaks.

Privacy Issue (Internet Technology Specific):

Privacy and Data Security have been issues since the advent of a needle and a thread. Many companies store and maintain their employees' information on the computer systems. Individual information is also transferred through the Internet via the registration of installing new software, using Internet products, or ordering a product from the web.

Privacy issue on the Internet is a very hot issue for an employee in a company or an individual user at home since the vast users need to be protected. According to the Internet society as of Jan. 1996, there were 10 million servers on the Internet, with growth expected to reach 100 million by the year 2000. It implies that there will be more servers to support the constantly increasing Internet users. More over, the web of connections that create modern global information systems raises the possibility of electronic theft, fraud, and sabotage, and that is highly unnerving to both service providers and users.

Reporting Failures by Cyber Abusers or Criminals:

Due to the appearance of the innovative software applications, it becomes truly an easy and a short process to gather or to store information. For instances, bank transactions are used to develop profiles of customers buying preferences or for assembling other personal databases that individual regard as private.

"*An investigation revealed in 1992 that at just one IRS regional office hundreds of employees made unauthorized inquiries into taxpayer records. Or this: employees of the Social Security Administration were charged not long ago with selling records to Nationwide Electronic Tracking, who advertised that it could provide confidential data*" [10]

Suppose while using on-line banking the signal between you and the bank is intercepted by a hacker or a criminal. Or suppose this is the bank transaction for the company you work for. The result of the failing report while doing bank transaction is fatal not only for an individual but for a company. Reporting errors or misused information could cost the credit rating, the health insurance or, even, the revenue of a company.

A database containing consumer information or governmental and commercial databases,

credit reports, news stories, informant tips, property records, DMV records, insurance records, medical records etc., should be protected for the privacy.

Privacy rights in Information Technology:

The OECD[1] (the Organization for Economic Cooperation and Development) claims, "Data must be fairly and lawfully collected for specified purposes", "Individuals have the right to know who is collecting the data, for what purpose, where the data originated if that information is available, and who will receive it" [8]. Privacy protections must keep pace with changes in technology and society's use of technology, which will best be achieved through a combination of legislation, self-regulation and technology [9].

Potential Solution for Privacy Issue:

It may not be possible to make the Privacy Issues disappear on the Internet. However, the efforts and results should reach the point where loss, fear, or threat of the invasion of privacy while using Internet is minimized.

One of the potential solutions is to pass comprehensive privacy legislation for the Internet users and companies. Many regulations and privacy related electronic Acts have been introduced last decade. However, it is true that the rapid technological and cultural change and the current political realities make new privacy laws unlikely.

Strategic Issues in Information Technology:

Workers skills, and Appropriate use of IT:

The distribution of wages and earnings has been spreading out in the United States, leading to increases in income inequality. Employers' demand has shifted from low-and middle-wage occupations and skills towards highly rewarded jobs and tasks, those requiring exceptional talent, training, autonomy, or management ability. An important contributing factor to this shift is Information Technology. Organizations adopt IT based production processes to improve product quality or increase efficiencies.

[1] Economic Cooperation and Development, which is primarily, industrialized countries, including Austria, Canada, Western European nations, Japan, and US.

In either case, effective use of IT involves changes in the organization. It is difficult to take full advantage of the benefit offered by IT by only improving computers and telecommunications hardware/software. To take full advantage of the benefits offered by IT, organization must replace low-skilled human work by automation and highly skilled employees. Investment in IT should be complementary to changes in other aspects of the organization. A complementary situation exists when increasing the amount of one factor raises the marginal benefit of another factor (i.e.: the example above).

Electronics Business:

Information technology is changing the way companies do business. IT enables electronic business. Enterprises use electronic commerce, both to reinvent the business and to enable new business. IT opens up new network-based sales and distribution channels and supports the creation and delivery of customized products and services to ever more-specific market niches. Customer data analysis reaches new heights of sophistication and effectiveness. IT driven business process re-engineering brings dramatic productivity gains and cycle time improvements and the IT organization is seen as the central enabler. Electronic commerce is an area where obviously IT is an investment widely recognized as paying off; in most companies it makes a significant contribution to the bottom line while building competitive advantage. One very successful example of electronic commerce is 'Amazon.com'. An entirely on-line bookseller, offering access to over 2.5 million titles deliverable by overnight mail (Caruso 1998). In addition to enhancing the customer experience with reviews, search capability and opportunities for customer to discuss books electronically among themselves. Customers can track orders, view their purchase histories, and communicate by email with Amazon.com representatives.

Competitive advantage:

In spite of the growing importance of Information Technology as a competitive factor, many companies have not yet achieved sustained competitive advantage from strategic information technology systems. The question is how to determine the appropriate Information Technology investment in accordance with the company's goals

and business strategies.

The Information Technology organization has many customers (workgroups, business units, outside customers, etc.…). Each customer has full market power, they can choose to purchase from the IT support organization or go outside the organization to a third party supplier or integrator in the open market. As a result, IT organizations have to be lean, mean, and totally customer centered. Using IT to improve customer service is just the first step in building a competitive business. The high level of information flow in the case of Amazon.com would lead to an overload in a traditional organization. While establishing a web site and email address is relatively inexpensive, substantial organizational investments would be required to take a full advantage of the new "cyberspace" market. IT organizations should anticipate changes in the external environment, prepare business groups for change by developing a strategic business plan, and provide the infrastructure and the productivity tools to meet the business plan.

Implementation of IT Strategy:

After defining the IT strategy, effective implementation is crucial to its success. The IT strategic plan provides the platform on which to build competitive uses of information technology. The strategic IT infrastructure is designed, to include the definition of a data and technology platform, the design of an effective development capability, and a plan to ensure that the core applications are up to date.

The IT Strategy Alignment is meant to facilitate discussions about management beliefs and industry practices by:

- Asking the relevant questions and helping individuals structure their thoughts and beliefs.
- Considering a range of answers to the questions posed based on company experience and the experience of other firms.
- Developing consensus around the principles that seem best in addressing the demands of the competitive environment.
- Developing an ongoing review program to ensure implementation is tracking the strategy developed, and modifying principles and methods as market conditions change.

Conclusion:

In order to stay competitive, businesses must take advantage of innovative Information Technology solutions. Unfortunately many of these solutions spawn new issues and challenges for an Information Technology organization. Today's Information Technology covers a wide variety of environments, some of which did not exist couple of years ago. Consequently, as businesses aggressively pursue competitive advantages through technology, the complexity of managing an Information Technology organization increases considerably. Not only do Information Technology organization need the appropriate technical skills to implement new and innovative solutions, they also need a full spectrum of program management skills to successfully deliver high quality products that satisfy their driving business objectives.

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