Information Technology and Information Systems: Its Use as a Competitive and Strategic Weapon

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ABSTRACT

Most companies today are finding a new dimension for use of their information systems and information technologies. That added dimension is its use as a competitive and strategic weapon. Information systems (IS) and information technologies (IT) had their origins as a data processing aid. Now companies are increasingly finding out that it is not the data that matters, but how that data is managed and utilized.

Common themes such as: a clear corporate mission, the utilization of IT as a corporate resource, and a marketing position that advocates IT usage have been identified by successful companies as the foundation for IT use as a competitive and strategic weapon. Three main assets have been identified by successful IT companies as the main reason for their success:

• There must be a strong IT staff,
• A reusable technology base, and
• A partnership between the IT staff and business management

Firms must identify their target group correctly and focus their efforts intensely. These target groups may be any or all of their customers, suppliers or competition. In addition, analysis must be done at the firm, industry, and strategy level to best determine the maximum benefits of its IT potential.

Use of IT as a competitive and strategic weapon could differentiate a company in today’s global competitive environment. At a time when companies can no longer separate themselves strictly by cost and product differentiation, IT must be the new differentiation tool.

Keywords: Information Systems, Information Technology, Strategy.

INTRODUCTION

Most companies today are finding a new dimension for information technologies (IT). That new dimension is its use as a competitive and strategic weapon.

Previously, information systems (IS) and IT were used mainly as data processing aids. However, that will soon become a minor feature of any IS. With the rapid growth of the global economy and of the Internet, specifically in the field of electronic commerce, the way a company utilizes and manages its information technology will be key to its success.

The most successful companies at present are those that have a firm grasp of their IT potential and are leveraging that potential as much as possible. Companies can no longer differentiate themselves strictly by products and price as was the age-old practice, but now have to be more creative. The use of IT as a competitive weapon and also as a strategic weapon will be that new differentiation tool.

However, for IT to be a strategic weapon it must demonstrate its potential to provide a sustainable competitive advantage. Merely providing an advantage would be insufficient and that advantage could be easily duplicated, thereby making it no longer an advantage.

This paper intends to demonstrate what must be done for a company to leverage its IT potential to achieve and sustain that competitive advantage. It provides a clear-cut path for IT use as a strategic weapon. It will also provide some examples of companies that are using IT as a competitive and strategic weapon and the means by which they have
accomplished this.

Some common themes have been identified by successful companies as key to using IT as a competitive and strategic weapon. These include a clear corporate mission, the use of IT as a corporate resource and a marketing position that includes use of IT directly or indirectly as a competitive weapon (Wightman, 1987).

The classical or age old way of thinking was that IT cannot change the way a company does business but it merely provides a tool for the implementation of the business strategy. It does not define or shape the strategy (Ferguson, 1996). If companies continue to maintain that archaic viewpoint, they would have sadly damaged their business reputation and stakeholders’ interests. With the rapid explosion and power of computing technologies; communication, computing and knowledge technologies are becoming seamless.

The boundaries between businesses and where their products are obtainable will no longer be an issue. With the expansion of electronic commerce, every service will become more virtual than physical. We no longer have to leave the comfort of our home to go shopping or to conduct our business transactions. The way to keep up with this technological evolution is to use IT as a competitive and strategic weapon.

One major way that companies are now differentiating their products is by means of making them smarter. For example, “smart” vacuum cleaners that can adjust to the height of the carpet, built in maintenance schedules in cars which tell their owners when the next service is required, and a telephone box that automatically selects the cheapest carrier whenever you dial a number are all means by which companies can lock in their customers by leveraging their technology (Ferguson, 1996).

If products are differentiated in this manner then customers will be satisfied and would tend to be more loyal to that particular technology. However the main disadvantage here might be the loss of privacy. While some customers may appreciate the thoughtfulness of the move, others may view it as revealing too much personal information. Thus companies need to exercise cautious judgment when leveraging their IT.

**Information Systems and Technologies as a Competitive Weapon**

Three main assets have been identified by successful IT companies as the main reason for their success:

- There must be a strong IT staff,
- A reusable technology base, and
- A partnership between the IT staff and business management (Ross, 1996; Mata, 1995).

Organizations can maximize the potential benefits of their IT by applying 2 technology development cycles: the assessment cycle, and the planning, development and implementation cycle (Fried, 1992). Of these two cycles, the implementation phase of the second cycle is the phase where the benefits are becoming a reality. This phase must be properly handled and should be very dynamic as no amount of planning could cater for unforeseen pitfalls or benefits. Companies should realize that these are monumental tasks and should appropriate the necessary resources.

A resource such as information technology (IT) becomes a source of competitive advantage when it is both strategically valuable and difficult for competitors to imitate (Ross, 1996). Initially, such a resource is an advantage but it may be easily copied or imitated by competitors. Thus, it will no longer serve as a differentiation tool. Proprietary technologies, staff, and equipment may all be imitated, whether by legal or illegal means. Therefore, it becomes imperative not only for an organization to produce an advantage but to sustain that advantage.

The most crucial asset then becomes the human asset, as this maybe imitated to some extent but the intrinsic business knowledge gained can never be duplicated. For example, a large trucking company recognized the importance of leveraging its IT potential much earlier than its competitors and when the industry changed they became the front-runners. However, this IT soon became the industry standard and thus was no longer a source of competitive advantage.

Management recognizing the need to continuously improve its position shifted its focus to another aspect of the IT and thus created a new source of competitive advantage. Once again, this technology became the de facto standard and the advantage gained evaporated. It was not sustainable, so it really was not a true competitive advantage. But management again with long range foresight and planning had already been pursuing another direction. Here, the true sustainable competitive advantage was the IT staff itself who were able to make constant adjustments. Top management completely supported the IS department which in turn demonstrated its capability in providing quick and effective solutions.
Traditional research has focused on emphasizing the description of the how rather than systematically why IT can lead to a sustained competitive advantage (Mata, 1995). While the assertion that IT might be able to create sustained competitive advantage for firms is provocative, work in this area is relatively underdeveloped both empirically and theoretically (Jarvenpaa and Ives, 1990). Many researchers have focused on the use of IT to obtain a competitive advantage but few have examined its sustainability.

What previous researchers have failed to realize is that the technology may provide the advantage but it the human asset that provides the longevity. Previous literature has focused on the value of IT and the advantage of IT was measured by its return on investment (ROI). When Walmart introduced its now famous inventory distribution system and network of suppliers, its main focus at that time was to reduce its inventory costs. Now IT must be seen not only as reducing costs but also instead as a value adding feature to any organization. Of the top 100 firms that are viewed as the most outstanding users of information technology, only about one quarter of them used the traditional method of ROI or cost/benefit analysis to justify their use of information technology (Rayner, 1995).

These companies spend more than an average of $10,000 per employee with spending ranging from as little as $4,500 to $27,442 per employee. Industries such as financial, insurance, and telecommunications led the way in spending per employee. All of this spending would be to no avail if there were no competent IT staff. With a combination of formal training, on-the-job experience and focused leadership, these IT staffs accumulate firm relevant IT knowledge and competence (Mata, 1995). One major area of concern however to IT managers was the challenge to keep people interested in supporting old technologies and not in readily embracing new technologies. The challenge in accepting a new technology was viewed by the staffs as the primary motivating factor and there existed working relationships between the IT staff, upper level management and clients.

The technology asset is the second most important asset of IT use as a competitive weapon. The technology asset consists of the shared technical platforms and databases. A technology is only valuable when it can integrate systems and make IT applications cost effective in their use. There are two main components of any IT application are its architecture, and its data and platform standards.

The architecture of any IT application dictates where the various hardware, software and support characteristics are necessary. Firms without well defined IT architecture often find themselves in the position that many of their strategic business units are acting independently and do not contribute to the overall well being of the company. For example at one firm, an external supplier was deemed the best choice for a client because his prices were very low and they could deliver a system much faster than the in-house provider. But, that was not usually the standard method. Usually, the in house technicians are the ones developing the new applications. However, it was justifiable for this case in seeking outside help because the client needed the IT immediately and the firm chose an external supplier who had the right previous experiences. As a result, the company was able to deliver the product on time and even make a profit for itself in the process. Here once again the competence and judgment of the IT staff provided the advantage even though it was the technology asset that was desired.

Proprietary technology has also been seen as a source of competitive advantage but although it can be protected through patents or secrecy, IT applications are difficult to patent. The main reason for this once again is the human aspect. Staff turnover, disgruntled employees, corporate espionage all contribute to sources of loss and imitation. Obviously if a firm can maintain its valuable proprietary technology then it will have a sustainable competitive advantage.

However, most research has shown that it is very difficult to use a firm’s proprietary technology as a source of sustainable competitive advantage (Diebold, 1986, Mata, 1995). In the recent years there has been a marked increase in the diffusion of IT and as the rate of diffusion increases the sustainable competitive advantage decreases in an inversely proportional manner.

The third asset that has been identified by almost all the top IT users and practitioners is the relationship or partnership between the IT staff and top management. Senior management must supply the discipline necessary for ensuring that IT and IS are used effectively throughout an organization. If top management is seen as weak then there is usually less incentive to adopt any policies proposed or implemented by an IS department (Liebs, 1998).

The IS department and the business unit management must also share the risks and the rewards for the effective...
application and implementation of IT in the firm. It is this relationship that most often dictates the success or failure of any IT project. For example, at Gillette, a global consumer products manufacturing company, most IT applications are inter-divisional and require effective communication, coordination and negotiation. If top management does not effectively convey their goals there is bound to be imminent resistance and ultimate failure. It is for this reason that the IT unit only undertakes applications which have been chosen by a senior business manager.

Observable commitment on the part of senior or top level management also ensures that limited resources are invested wisely and their direct involvement very often breaks down the walls of resistance. Even if a company has the requisite technical skills, this is not sufficient for a company to have a sustainable competitive advantage. Managerial skills are a necessary addition to ensure a sustainable competitive advantage. IT managerial skills includes management’s ability to conceive of, develop, and exploit IT applications to support and enhance other business functions (Mata, 1995, Ross, 1996). Examples of these skills include the ability of IT managers to functionally support and coordinate with their managers, suppliers and customers. Additionally, and most importantly they must be able to anticipate the future IT needs of their firm and its customers.

A company could hire all the technical assets it can to imitate another company’s advantage but if it does not possess that company’s managerial competence and skills then that advantage if not easily imitated. This is truly a source of sustainable competitive advantage.

However, if such managerial skill can be quantified or even written out then the advantage is lost. Characteristics and skills such as friendships, trust and interpersonal communication often take years to build and develop and are not easily imitated. Once again the human factor is shown to be to true source of sustainable competitive advantage. A perfect example to demonstrate the importance of IT managerial skills as a source of sustainable competitive advantage is in the case of the WalMart chain of stores. WalMart is famous for its purchase/inventory/distribution system but this is not the source of their true competitive advantage. At the time it was developed it was an advantage but it was easily imitated by their competitors and any advantage gained was soon lost. But, WalMart still maintained a competitive advantage due to their superior management skills.

These complex interrelationships are demonstrated in Fig. 1. Obtaining a source of competitive advantage by using IT is only the beginning process, the next and most difficult phase is sustaining that advantage and turning it into your business strategy.

**Information Systems and Information Technologies as a Strategic Weapon**

When an advantage is truly sustainable then it crosses the domain from merely functional to strategic and it must be utilized properly by top level management. This section examines what enables IS and IT to make the transformation from a competitive weapon to a strategic weapon.

In order for a firm to achieve a sustainable competitive advantage it must endure 3 challenges:

- It must focus its IS efforts to support business strategies and use IT innovations to develop new, superior strategies,
- It must devise and manage effective strategies for the delivery of low-cost, high quality IS services, and
- It must choose the correct technical platform on which to mount its IS services (Feeny and Willcocks, 1998)

Some essential capabilities such as business system thinking, architecture planning, and informed buying are the core requirement to address these challenges. These capabilities along with technical, business and interpersonal skills are necessary for a company to sustain a competitive advantage by means of its IT.

IT has changed the competitive environment in six basic ways:

- Products and services enhanced with computer capability,
- Cost displacement,
- Enhanced decision support,
- Revision of the mission or objectives of the enterprise,
- Business interrelationships, and
- Creation of new products and services (Diebold, 1986).

Of these 6 ways the creation of new products and services along with the revision of the mission or objectives of the firm represent the long term focus and ultimately leads to the use of IT as a strategic weapon.
Companies such as United Airlines Inc. and American Hospital Supply Corp. (AHS) are very successful because they have recognized the need, power and usage of IT to achieve and sustain a competitive advantage. Efficient and effective planning systems are also essential for a company to maximize its IT potential. One of the ways that this is best accomplished is by means of value added to current goods and services. For example, additional features at the same cost, better guarantee of quality and service and superior customer service. Japanese companies such as Sony and Honda are very famous for this type of value adding. The customer is not only satisfied but will not hesitate to purchase again and even recommend purchasing to their friends.

Global competition, shorter product life cycles, stricter performance standards and demands by customers for better service and quality have all contributed to increase pressure on the marketplace. Therefore, in order for a firm to be competitive and to remain competitive, it must use IT as its differentiation tool. No longer can companies compete on the 3 P’s of price, product and process. As was demonstrated in the previous section, all of these attributes are easily imitated and cannot serve as differentiation tools. However, the resource that will provide the sustainable competitive advantage will be the human resource.

The increasing trend towards outsourcing has more companies concentrating on their core IS and IT capabilities. Some companies are divesting their activities to world class suppliers and partners in order to focus more narrowly on their core competencies. It is not advantageous or even possible in some cases for manager to focus their attention across many diverse and far-flung markets but rather to concentrate on a narrow domain (Feeny, 1998).

The three challenges in exploiting IT to create a sustainable advantage must have a general long-term focus in mind. Firms should be able to be dynamic and respond rapidly to changes in their business and in the global environment. If this involves a readjustment of the firms chosen business strategy then the firm must be confident that its IT department and senior management are competent enough to whether the storm.

IT has transformed the entire corporate strategy of some firms and as a consequence, their business and functional strategies have had to be revised. While this maybe disastrous for some companies, if a company excels at this then it would have dramatically positioned itself as a leader in the 21st century. IT along with electronic commerce has transformed the common market space to the boundary less world of cyberspace. This rapid response to change has put more pressure on IS departments to develop new systems faster and to demonstrate superior existing systems.

The other challenge that IT developers face is the choice of platforms. Would an Intranet be better than a client server platform? Or is Groupware a better choice than individual workstations? The platform must have extensive capabilities and should also be very dynamic in order to respond to the changing global environment. As has been demonstrated on numerous occasions by many case studies and research, the choice of platform often plays the most deterministic role in the diffusion of the IT process and this in turn affects the strategy of the company. If its own employees are unhappy with their IS and IT then this in turn will be transferred onto their customers. Therefore, a company should carefully consider its strategic choices.

Once again factors such as leadership, business systems thinking, relationship building, architecture planning, making the technology work, informed buying and vendor development all contribute to the long term definition of the corporate strategy. All of these factors are in some way associated with the human asset that will provide the sustainability of the competitive advantage.

Leaders determine the values and cultures of any organization and they are personally responsible for the exploitation of IT applications. For example, the incoming CEO of East Midlands Electricity Company found out that his predecessor had outsourced the IS functions of the company and he felt that this was an in-house necessity to achieve his business goals. He hired a new CIO to re-implement the department to safeguard the company’s future business direction (Feeny and Willcocks, 1998). If the top management is decisive and proactive, then this trickles down to middle management and to all departments. This results in renewed and increased confidence and could also serve as a strategic boost to the company.

Relationship building, communication and vendor development are all long-term objectives and all contribute to the strategic advantage that arises from using IT. It is once again it is the human factor that it the reason for sustainability. If a firm pursues IS and IT as a short-term concept, then the potential use of IT as a strategic weapon will never be realized. Interpersonal skills are not usually the strongpoint of system developers and IT personnel and CIO’s,
leaders and informed buyers have the responsibility to ensure that there is effective communication between the IS department and all other departments.

The main question under scrutiny here is: how does the business create value, and how might it create more by utilizing its IT potential?

With the rapid expansion of electronic commerce, companies are now more pressured than ever to find additional ways to leverage their IT and create more value-added features. Customers are no longer locked in by high switching costs or customer loyalty but are now looking for more and more value. Companies could pursue this strategy, but research has shown that long term relationships are much more effective and offer a better strategic plan.

Planning for the Future

As computers and technology play an expanded role in everyday processes, IS and IT will be pushed to the forefront as the competitive weapon of the future.

This will become evident as companies tend towards virtualization and Web based businesses dominate. While there will always exists a need for real physical firms, companies should plan for the future where there competition does not exists in a single fixed location, but is far flung all over the globe.

A company like this would have access to the best resources, and would have no difficulties competing on the traditional fronts such as price, product and flexibility. However, if they do not leverage their IS and IT potential to the maximum, then they will not be able to compete and survive.

Although, leveraging their IS and IT potential is of primary importance as is demonstrated throughout this paper, it ultimately rests on the human asset to envision this sustained competitive advantage.

Unresolved and Under-researched Areas of Research

Few papers have addressed the importance of developing long term relationships with customers and suppliers. While these types of relationships are more emphasized from a supply chain management perspective, it has not been considered from an IS and IT position.

Additionally, even the recognizable users of IT have only recently begun to use IT as a strategic planning weapon. It had primarily been used as a competitive weapon but its sustainability was never questioned. Companies were forced to develop new methods of exploiting their IT competence as soon as it was imitated or became the industry standard. They failed to realize that the main factor for the sustainability was the technology itself or how it was used but, the people behind the technology. To date, there has been no study evidencing the human factor importance on IS and IT systems.

CONCLUSION

Information systems and information technologies are the backbone of any organization doing business regardless of their size. It is therefore imperative that these technologies be leveraged to their fullest so a company can compete in today’s global environment.

Of the three assets that have been identified: a strong IT staff, a reusable technology base, and a partnership between the IT staff and business management; the strong IT staff has been shown as the asset that will provide the sustainability factor. This in combination with the partnership between the IT staff and top management would enable IT to be used effectively as a sustainable competitive weapon.

While it maybe easy to obtain staff with the same level of expertise; their informal on the job training and experience can never be duplicated or imitated. There are thousands of intrinsic business decisions made everyday and even if it was somehow possible to catalogue them for repetition, the same results could not be obtained. The total is indeed greater than the sum of its parts.
Fig. 1. The interdependence between the three assets of Information Technologies.

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