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Abstract

The ubiquitousness of Information Technology requires that leaders of organizations in almost all industries have a good deal of knowledge of what Information Technology (IT) can do for their organizations. In every industry IT is making its presence felt in a big way. For organizational leaders the knowledge of how IT is impacting the industry and, in turn, their organizations would allow them to incorporate IT into their organizational DNA. Doing this the right way may, in fact, be the central requirement for the continued existence of organizations into the future. For the sake of focus, our discussion in this chapter will concentrate on business organizations. The arguments we present could, with minor modifications, apply to other types of organizations too. In this chapter, first, we discuss how IT can augment and help various kinds of businesses within their competitive landscape. Two, we will discuss how IT is increasingly getting inextricably woven into business processes and its implications on organizational dynamics. Third, we will discuss deployment of IT and the questions to consider while making the decision on internal expertise versus externally hired services. Fourth, we will discuss how to implement IT systems. Following implementation, in the fifth section, we will discuss how day-to-day operational issues should be taken care of in a manner that delivers expected results. Sixth, we will end the chapter with a discussion on how leaders should be thinking of IT in the current times.

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Introduction

Information Technology has entered into almost all aspects of our lives. Many of us get up in the morning hearing the favorite morning music we set our smart phones to. There are now smart kitchens and smart bathrooms. Our cars are programmed. We buy a whole lot of things online, we book our travel needs online, we read books online and have much of our news obtained through the Internet. We drive cars that have as much as 30–40% electronics and IT industry value-adds. What all these add up to is that every industry has been “invaded” by IT. Correspondingly, leadership in every organization now has to be aware of the implications of IT on the industry or ecosystem in which it operates and the way in which they cascade down to the company itself. The quest of companies is to introduce innovations in a manner that enhances their competitive positioning vis-a-vis competitors. Because of the risks involved and the time it takes for dominant technologies to emerge, often a short wait and watch approach may be more prudent. IT being a crucial aspect of any business, leaders in all industries understand that IT can quite literally make or break companies.

Decades ago Porter (1979) presented a hugely influential analysis of competitive forces in an industry. The insight he provided is applicable even today. These forces are supplier power, buyer power, threat of substitutes, industry rivalry, and threat from new entrants. IT can impact all these forces. Let us think of some examples where the industry dynamics are being altered by the developments in the IT domain (Table 22.1).

What we can see is that the entire ecosystem of any company (that includes its competitive environment) can go through cataclysmic change when the IT wave hits it. It is better to be proactive and rise with the tide rather than have to swim against the tide.

Table 22.1 Examples of IT instigated industry changes

Serial No.	Competitive force	Examples
1	Supplier power	IT has redefined the relationship between auto companies and its suppliers. The Japanese invention of Just-in-Time (JIT), or its new avatars, practiced by all major Auto companies, now require close IT connectedness between auto companies and their vendors
2	Buyer power	The bargaining power of traditional retailers have been seriously eroded by the buyers' access to Internet shopping
3	Threat of substitutes	Large hotel chains now are being challenged by smaller properties and homesteads which users can choose effortlessly from far-away locations. Rather than economies of scale what is important is to be wired into the influential travel portals with high ratings from recent customers
4	Industry rivalry	On account of the choice that customers can exercise in choosing vendors to suit specific consumer requirements, there is intense rivalry in service industries such as communications, transport, insurance, and most others service industries
5	Threat of new entrants	Firms in the publishing industry has been seriously challenged by the Internet firms that now have unprecedented access to readers, their reading habits and search habits on the net. This enables publishers to be not just sell books, but be helpful “neighborhood librarians”

Enhancing the Business Through IT

At all points on the value chain there are possibilities of enhancing value or reduce costs through the use of Information Technology. Let us take the case of sourcing. From enhancing access to information, IT allows for closer coupling of vendor sales with the firm's material planning. The IT system can help calculate the ideal reorder size and quantity and have the system provide orders with least human intervention and minimal costs of stock-outs, etc. Of course, what we want to point here is not merely about the savings in cost, but the changes in the entire architecture of the business vis-a-vis the suppliers and buyers. From being a closed organization the firm will be forced to be more open with much interaction between the Materials department of the firm and the Sales and Marketing team from the vendor side. Closer coupling with the vendor will have implications on how the Design department operates. The Design department will have to share some of the "confidential" information with the vendor so that there is timely knowledge of the cost implications and credible promise of on-time delivery from the vendor. Of course some of the information has to be necessarily confidential. The very definition of what is confidential and what can and should be shared undergoes a change in the new business ecosystem.

Impact of IT on the Organizational Dynamics

To illustrate the far-reaching impact of the changes described above, let us see what happens to the rest of the organization when the company's Material department is closely coupled with the Sales department of the vendor. As we can see there are organization-wide implications. Higher coupling with the vendor will have to be "endorsed" by other departments and all the functional departments will have to operate in tandem. For instance, the Finance department may have to release money on development of the product that is actually being incurred by the vendor. Going by the previous practices and what SOP dictates, the auditors may have objections. They have to understand what is happening! Such ripple effects may be enormous. Unless taken care of in a timely manner (with the right support of top leadership) the old SOPs may currently be dysfunctional. Temporary organizational devices such as financing vehicles may have to be resorted to. There may be higher costs associated with such arrangements.

Inter-Organizational Networks/Supply Chain Networks

Long ago the economist Ronald Course established that the rationale for the existence of commercial organizations is lower internal transactional costs when compared to costs of market transactions. If we go by the same logic in the IT era, with lowering of transaction costs there will be a tendency to resort to market mechanism in place of intra-organizational transactions. Perhaps this

is what is exactly happening in the industry. Outsourcing is a classic case in point. IT allows for lessening of market transactional costs. Besides outsourcing, there have been other implications too. IT revolution has also resulted in one-on-one bargain driven competitive supplier–buyer relationships to be replaced by value-chain driven ecosystems competing among themselves (Mangal & Karmarkar, 2012).

IT Resources Deployment

IT resources deployment takes place in phases. From our experience we have found the following:

- (a) Deployment of hardware and Operating Systems (OS)
- (b) Deployment of application software
- (c) Development of the programs using the application software
- (d) Maintenance of the programs
- (e) Use of the program (for example, to enroll new users in the system, generate reports for decision making)
- (f) Storage and backup
- (g) Access and compliance with security issues
- (h) Review of new technology and compatibility tests

The above phases may not strictly be linear. For instance, hardware decisions (item “a” above) cannot be made independent of the software decisions (item “b” above). Development of IT systems or major modifications in IT systems is a complex issue and all the phases listed above have to be considered holistically.

In each of these deployment areas there are big changes taking place. For instance, there are different types of OS competing with each other. Earlier the choice of OS was restricted to a few well-known platform providers such as Microsoft. However, that has changed dramatically over the last few years. Today there are many Linux based systems and open softwares. There are also exclusive systems such as Apple’s iOS. In line with these choices the application software too are available from diverse vendors. The very business model of these companies keeps changing. From outright sale of software with yearly updates, etc. the trend was towards hiring system on a periodic basis (say, yearly). It may now be on a pay-per-use basis. In other words, billing by the vendor in many cases would be done on the basis of actual use. The ubiquitous use of cloud computing and the portability of information across different platforms have made availability of information and data as and when (and where) required. There are also advanced analytical tools that are used to do analytics on information residing in different locations/ different formats. This has translated to vendors providing not only traditional applications-ready systems but also data analysis (big data).

The use of such systems greatly enhances the competitiveness of the user firms. But this comes at a cost. It is very important that the user companies and their leadership understand the importance of these developments and the way their own competitiveness can be enhanced.

Own Versus Hire decisions

After having decided to implement an IT solution, one of the main hurdles to cross is the dilemma of whether to buy the resources outright or to hire the services. In most subsectors within the IT sector the trend is towards the latter. Take for instance storage of data. Storage involves several key issues such as security and multiple points of data storage; confidentiality and legal issues related to holding sensitive information on customers and vendors; operational issues such as backup and retrieval; encryption and varying access rights to different organizational members; and compatibility of systems issues. All these issues require the attention of highly specialized experts and often it is less expensive to simply outsource the entire work. A firm such as Amazon Web Services can do the job better than in-house efforts. But own versus outsource decisions can be difficult due to the high variable costs associated with outsourcing decisions. There are many other such areas that are emerging. Take the case of Zenpayroll, Zenefits, or Xero. The traditional payroll management firms have now metamorphosed into complete manpower management providers.

Implementation of IT Systems in the Company

Implementation of IT systems is the complicated activity. While introducing a system or scaling up an existing system there are major issues to be covered. To ensure that the IT system indeed helps the organization to achieve better results it is first important to study the existing business processes. This is suggested so that modifications can be made in the business processes in line with the IT systems that are implemented. Thinking of IT systems just for the firm is a dated view. Today everyone is talking of the IT ecosystem. The firm's IT would extend to that of the suppliers and the buyers. In such cases there are important access rights to be given selectively. The major steps in implementation are as follows:

- (a) Overall mapping of the existing organizational processes
- (b) Requirements Analysis
- (c) Choice of hardware and vendors
- (d) Choice of software and vendors
- (e) Overall planning of hardware and software (own-rent decision)
- (f) Cost of implementation
- (g) Time line for Implementation
- (h) Security analysis

Here too the steps are not linear. All these factors have to be holistically leveraged.

Choosing the Right Vendor

It is useful to understand how the IT sector operates. This will help evaluate the IT vendors better and find out how they operate. Different vendors have different strengths. Evaluation and choice of vendors is indeed an important task. Some of

the vendors may be more experienced than others on one particular platform (such as, say, on Windows, iOS, or Open Systems). Some others may have experience in developing inter-system operability. Of course, the extent of external help that is required will depend upon the in-house expertise that companies possess. It is always good to complement the strength of the in-house team with external help. It is also important for each other to see the other as complementary and mutually synergistic. While the internal team will be able to bring together diverse departmental requirements and expectations into the system and help coordinate the inter-departmental activities, the external team should be able to bring in new ideas, new technologies, new knowledge and intelligence on what pioneers in the host's industry are doing vis-a-vis IT implementation and how the new system can help achieve greater process efficiencies, speed and accuracy.

Current times generally require inter-system operability. Most users within the client organizations today demand mobile applications. The vendors have to come up with solutions that meet these demands. Cloud applications and use of applications software on a pay-for-use basis are common. Portability across different platforms and flexibility of use under different situations (online as well as off-line conditions) is common place.

While security is extremely important, the general trend is towards employees working from multiple locations including from their homes. This requires not just assistance from technology, but an open attitude towards employee activities. In a company like Google much of the confidentiality is achieved not by technology but by creating a culture of confidentiality. However, where the vendor is privy to the host company's details, it is important to ensure that the vendor signs a contract to retain confidentiality and even insists on not working for key competitors for a certain length of time after the implementation.

These days even "standard" products are so highly industry-specific that it is important to check the experience of the vendor in the industry in which the client company is located. It will be a good idea to seek references from the company's previous clients. There is virtue in taking up the offer of the vendor to visit its previous clients so that the internal team is acquainted with the system that is being offered.

One important decision that will have to be made is the extent of standardization and customization. Higher customization would mean higher costs. Many companies now prefer standardized products and customization is done at the down-stream user level. This will allow for updates to be readily made use of. Excessive customization at a higher level would render readily receiving updates difficult, if not impossible. So it is better to use standard products and use the outputs from these systems as inputs for customization at a disaggregated level in the organization. Where the firms are "coupled with" their own suppliers and buyers it is always good to look for inter-system operability so that the firm is seamlessly connected to others on the value-chain.

Important Pointers in Implementation

It is important to make sure that internally the leadership of the company has provided a favorable ecosystem in the firm. This applies to new implementations as well as major upgrades or platform changes. The internal readiness refers to three broad areas:

- (a) Technical readiness
- (b) Financial readiness
- (c) Organizational readiness

For the first two forms of readiness we can apply rational means to get readied for IT systems. People and emotions are involved in the third type of readiness, and adequate importance has to be given to “softer” issues.

Technical readiness would consist of both availability of hardware and software, and deployment of knowledgeable and trained manpower to work with the vendor team. Financial readiness, as the term suggests, means provisioning adequate funds at timely intervals. Organizational readiness consists of not only creating the right team but also getting a buy-in from the organizational members who will be affected by the change. Here, often a change-management approach with adequate communication on the benefits of change and training of personnel to operate the new system has to be put in place. The internal team has to take responsibility for implementation. It is important to designate for each location a champion who is given a team of “good” people who are not only technically skilled but also socially accepted.

It is important for the leadership to review the progress of system implementation. It is important to ask whether the set terms of the contract are being fulfilled and milestones met. During implementation one of the key aspects to be emphasized is the security of the system. Detailed plans of how access is provided and at what levels access limitations are exercised have to be carefully monitored.

The implementation phase is one where adequate learning by the host team is achieved. The internal customers can often be very demanding and it is up to the internal team to live up to the expectations of the internal clients. There has to be adequate training and user workshops conducted right from the beginning.

Common Organizational Issues in IT Implementation

Research shows that some of the common issues that produce inadequate results are (a) lack of top management sponsorship, (b) inadequate buy-in from the employees and lack of training, (c) inadequate groundwork for change and poorly defined goals, and (d) scope creep.

Top management support and supervision is cited in many studies as one of the most important requirements for the success of IT implementation. This translates

to availability of finance, deployment of a capable team, identification of project teams for different locations and different departments, before the overlaying of IT systems insistence of internal processes to be in place, provisioning adequate time and resources from the members of the top management team/functional heads for the purpose, identification of champions for the cause and fixing of milestones for presentation of the work done and demonstration of implementation results at different phases of the project.

Another issue again cited in various studies is the buy-in from employees. IT implementation should be preceded by an understanding of not just the added benefits of having information but also benefits of time that can be reduced and the efforts saved on the part of all the organizational members.

There is much preparation at the organizational level that is required before implementation of systems. It is important to clearly define the goal of the entire exercise. There is need to convey to the organizational members the kind of information and decision support that will be made available with the new system. If all these are not clearly articulated there would be inadequate buy-in which will create problems later in implementation. Often, our experience shows that many of the formats for reporting and even the business processes are modified at the time of implementation on prompting by the IT vendors. If ad hoc changes, additions and deletions are made thus, the implications of such changes on all the departments of the organization may be lost sight of. The result could often be disastrous. Some of the departments may perceive such changes as arbitrary which may cause implementation roadblocks. There has to be adequate investment of time and effort on overall conceptualization, attention to detail and buy-in from all the departments and organizational units that will be affected. Needless to say the implementation teams should consist of influential members, both in terms of formal hierarchy and informal networks. Understanding the overall organizational dynamics is an important aspect of developing the implementation team.

Everyone should be constantly aware of the goals that are set for the IT system. This can become the point around which people would come together even if they represent different departments and different informal networks. When goals become important and turn out to be the capstone for all the implementation activities to cohere to, automatically there will be harmony. To ensure seamless working between diverse groups it is important to avoid scope creep. After all, the scope of the IT project is nothing but a detailing of the objectives. It is a way to draw the boundaries of what can be expected as outcomes. The limits set by the scope of the project need to be kept in mind constantly to avoid scope creep.

On-Going IT Systems in the Company

Having implemented an IT project the next task is to maintain the system and get the system to deliver what it is expected. At this stage it is important to make sure of the following:

- (a) Maintenance of the system efficiently and getting the expected results
- (b) Being aware of the developments in the IT domain that would further help the company and act on them
- (c) Being aware of what competitors and associates (suppliers and customers) are doing with respect to IT for their businesses and how these are shaping the competitive landscape

All these tasks are not easily accomplished. Traditionally the role of the IT department has been one of partnering the vendor for implementation, and subsequently, as maintainers of IT systems. The role of keeping track of information on new developments in IT, and how these are impacting the host firm, was largely left to chance encounters of the business heads with suppliers from the IT industry. But lately IT portfolios have been elevated to a higher level. Symptomatic of this is the emergence of Chief Information Officer (CIO) playing a key role in the organization. These days often the CIO is a member on the Company's Board of Directors.

The CIO has to also scan the IT developments in the entire industry, and not just the firm alone. The strong coupling that takes place between organizations along the supply chain also necessitates the referent company to be alive to what is happening to the entire value chain as well as the industry. The task of the CIO therefore goes beyond managing IT systems and initiating changes as technology changes. The task also involves scanning the environment and responding proactively to the competitive moves by the company's competitors and those who are in its ecosystem consisting of supplier and customer industries. Leadership in every firm has to be aware of these developments and have to proactively initiate changes whether through a COO or others in leadership positions.

Responding to IT Challenges and Concluding Comments

Here we will discuss the choices that leaders have in thinking about and dealing with technology. One way is to think of IT as merely a form of assistance to the primary business processes. The other way is to think of IT fundamentally altering the way we see things.

The first view is predicated on an atomistic view of the world. This kind of thinking is rooted in functional application of different tools to get what the organization has set out to do. According to this view, different functions of management (whether marketing, finance, or IT) have certain roles to play in helping the main business function of buying materials, processing them, and delivering them to customers. Of course, in the service industry the inputs may be intangible such as information, and processing will differ from conventional production processes and the output too may be intangible. The thinking is still one of input-process-output. The point of view is that, IT will only play a "subsidiary role" in helping the main business process. This is a very "rational" view according to which the assessment of what IT can do can be logically understood, predicted, and applied that will enhance the efficiency and time savings afforded by IT support.

This view is insufficient for current times. What the famous Harvard academic Zuboff (1988) showed decades back is applicable even today. Through six case studies she showed how IT can have opposite effects on any company. The technology could, at one extreme, increase centralization and keep its employees under surveillance and generate an atmosphere of distrust. At the other extreme it can be used to encourage responsible autonomy of the individual and a spirit of cooperation. Leadership today has to understand that IT is a double-edged weapon that can be used constructively and holistically at one end but also in dysfunctional ways.

The myth of the avowed objectivity of information is questioned by many social scientists. In a book provocatively called "The Social Life of Information," Brown and Duguid (2000) show how through processes like information brokering and selective use of information and its dissemination create "half-truths" which often are worse than "no truths" at all. In other words, information during its travel from person to person, or department to department, may get processed in a manner that would hide reality rather than reveal it. Leadership has to be aware of such phenomena and treat information circumspectly. Multiple viewpoints have to be appreciated and taken cognizance of and official information combined with the "grape-wine," etc. It is always good to have an experimental approach to what changes in IT systems can do. Pilot projects have a place where there is uncertainty and where the potential investments are huge.

Another area where leaders have to show awareness is big data. A couple of decades ago the IT systems provided decision support systems and expert systems. Those times have changed now. The world is too interconnected. The process of globalization and the huge amount of information available on the net today have made the traditional decision support systems dated and out of sync with reality. What we have today is "big data." It is about figuring out the connections between various events, places and institutions and making connections between each other and developing a sense of how things change. This area is still developing and this is not a place to discuss big data. Suffice it to say that there are no more closed systems. Everything seems connected to everything else and the best way to face new challenges is to figure out how events and people and organizations are connected to each other and figure out new categories (for instance, segment the market differently). The insights provided by big data would allow creativity and innovations to take hold that would provide companies with competitive edge.

There are other new technologies that leaders should be aware of such as cloud computing and also privacy issues. Through cloud computing companies can save on servers, related software and manpower costs. There are also advantages in leaving the decisions on storage and other issues to experts. There is always some risks, though, in such centralized systems that are fully under the control of the vendor. Here vendor selection becomes very important. Privacy is also important. Cloud storage has to be properly secured. Care has to be taken in the right selection of the vendor, training of the company's personnel, and creating secure regular backup with well-defined standard operating procedures.

Discussion Questions

1. Consider three industries of your choice that are in the engineering, FMCG and services sectors. For each of these industries
 - (a) Discuss how IT is impacting the way business is done?
 - (b) How does IT impact globalization/localization of activities in a typical firm in each of the three industries you have chosen?
 - (c) Discuss how the customer is benefiting on account of the above.
 - (d) What are the changes that need to be brought about in the companies in the chosen industries to survive the “disruption” that is being created by IT? Discuss the firms in the three industries separately.
 - (e) Which are the pioneering companies in the three industries in IT adoption? How are the companies in the same industry similar or dissimilar in their approach to IT. Discuss each industry separately.

Case Study

Shoppers' Friend is a super market chain that is popular in the Midwest and North Eastern states of United States. It has been effectively competing with supermarkets like Walmart by catering to a niche market.

Traditionally there are three main strategic groups in the retail format.

1. Hypermarkets: These are huge supermarkets that stock full line groceries and full merchandise with huge floor area with often as many as 100 checkout counters.
2. Discount stores: Here the prices are low but choices are limited. The focus is on mass merchandising.
3. Neighborhood Grocery Stores: These carry a mix of factory produced grocery items and local produce.

Shoppers' Friend had found a niche wherein it could not be defined as any of the above. While it provided a wide variety of merchandise, it also provided groceries produced locally. Overall the groceries had a local “farmer market” feel. It did local delivery in some areas with high population density for a small charge. The philosophy was that if Pizzas could be delivered home, it should also be possible to deliver groceries. To create large order sizes, it advised its clients on what and how to store groceries. To further consumer education, it created its own proprietary smart-phone app to help customers in buying, stocking, and reordering.

While Shoppers' Friend had been closely watching its competitors like Walmart and other merchandisers and grocery stores, there has been a steady

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threat to it from e-retailers. A recent survey in the local area found that as much as 30% of potential market share has been lost to e-retailers like Amazon and Ebay. There were also talks of home delivery of non-perishable groceries through orders made on the net.

The CEO of the company Mary Thomas clearly knew something had to be done. Though the company pioneered an App for advising the local residents that provided support to the local store, the company was far from being considered as an e-retailer. The next board meeting was an occasion to present a new road map to Shoppers' Friend that would make it not only compete with Hypermarkets and other local retailers, but also e-commerce upstarts whose growth rates are threatening everyone in the retail space.

Thomas decided to task the Chief Information Officer, Steve Smith, with an overall responsibility of mapping the threats and the response Shoppers' Friends could possibly come up with. Smith has 2 weeks to do the job. You are to advise Smith.

1. Come up with Shoppers' Friends' strengths and weaknesses in the IT sector.
2. In a related discussion with Thomas, Smith was told that she would like Shoppers' Friends to consider as an option to go in for a full-fledged e-commerce business. Assuming that the management was inclined toward such a suggestion, outline the new skills that the company has to develop in order to offer full-scale e-commerce services.
3. What are the threats and opportunities that the company would face in case it decides to go for a green-field e-commerce business?

Chapter Summary

- At all points in the value chain there are possibilities of enhancing value or reduce costs through the use of Information Technology.
- IT has a high impact on organizational dynamics.
- IT allows for lessening of market transactional costs. In addition, the IT revolution has also resulted in one-on-one bargain driven competitive supplier-buyer relationships to be replaced by value-chain driven ecosystems competing among themselves.
- After having decided to implement an IT solution, one of the main hurdles to cross is the dilemma of whether to buy the resources outright or to hire the services.
- Implementation of IT systems is a complicated activity. While introducing a system or scaling up an existing system there are major issues to be covered.

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- It is useful to understand how the IT sector operates. This will help evaluate the IT vendors better and find out how they operate.
- An important decision that will have to be made is the extent of standardization and customization.
- It is important for the leadership to review the progress of system implementation. It is also important to ask whether the set terms of the contract are being fulfilled and milestones met.
- Leaders have several choices in thinking about and dealing with technology.

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