CHAPTER TWO

LITERATURE REVIEW - INFORMATION TECHNOLOGY STRATEGY IN BUSINESS
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2.1 INTRODUCTION

IT has developed dramatically during the last decade and there is widespread acceptance that IT has evolved from a traditional administrative, back-office supporting orientation towards a more strategic, central role within organizations. An increasingly competitive market and a constantly changing environment have made the management realizes the strategy importance of IT towards the survival and growth potential of the organization as IT enable business organization to be more responsive, flexible and innovative.

Many companies have used IT as a strategic weapon to improve their competitive position against their rivals in the industry. The following are the example of two major organization which have used the advances in IT to gain competitive in their respective industry:

1. **Procter & Gamble** (P&G) has embraced micro marketing and developed information technologies in the late 1980s to support a traditional create sell business strategy. Firstly, P&G's strategy was creating more product choices, developing marketing programs to push the products through retail channel to customers and supported by IT in tracking of manufacturing, warehousing, shipping, and price promotion. For instance, by analyzing scanner-based sales data in relationship to regional weather patterns, P&G measured the effects of the cough and flu season on sales of its Vicks and Nyquil cold products. It then developed customer response programs such as promotion in cold region. However, it didn't work out profitable and efficiency due to retailer kept on storing the promotion products and manufacturer had over produce.
Then, P&G re-modified the IT by trigger shipments only when customers actually bought product and direct linked to retailers to monitor the sales by then controlling the manufacturing and warehousing. By developed such program of sharing data with retail customers, P&G had increased their profits in 1990s.

Source: (Raju Nariesetti, 1997)

2. **British Airways** (BA) has used IT to add value and to improve their overall service and effectiveness in the competitive Airlines industry. Their computerized reservation systems can link travel agencies directly with the airlines and provide instantaneous information on availability followed by reservations and tickets. IT also enabled BA used for aircraft scheduling and spares control and for crew roistering; new ticketing machines at airports enable passengers on domestic shuttle flights to buy their ticket within 40 seconds. Hand-held computers are available to speed up checking-up and reduce queuing. ACARS (Aircraft Communications Addressing and Reporting System) allows fast transfers of information by radio waves between computers on the ground and computers on board aircraft.

Source: (Thompson, 1993)

However, as we mentioned earlier, implementing IT no longer means automating a manual task to make more efficient but rather taking a strategic perspective to ensure that investment in IT is contributing to an organization’s business strategy (Peppard [1], 1993).

The size and continuing growth in IT investments, coupled with a recessionary climate and concerns over cost containment from early 1990s, have served to place IT issues “above the parapet” in most organization, perhaps forever. Understandably, senior managers need to question the returns from such
investments has been, or can be, a wise decision. This is reinforced in those organizations where IT investment has been a high risk, hidden cost process, often producing disappointed expectations. Therefore, it is crucial for management to understand the process whereby new technology is introduced and utilized as for companies who had abandoned projects the disappointment at failure to achieve an objective that was obviously both costly and time consuming.

The reasons for failure to develop IT potential can be complex. There are various findings from many case studies that have been carried out during the last few years, the most common problems are: the technical and organization problems of managing technological innovation at a strategic level; dislocation of the decisions and strategies with project management structure (Benghozi 1990); lack of alignment between IT strategies and business strategies of the organizations that are making the investments (Peppard 1993); lacks of awareness from top management of the competitive impact of the IT development (Peppard 1993); and inefficiency in strategic management (Currie1994). From the above findings, it could be argued that IT no longer a technical problems but a business issue as the failure of IT projects is mainly due to ineffective in managing the process of developing and implementing of IT strategies.

The role of information technology (IT) in business and its potential for significant impacts on businesses' competitive advantages have led many companies invested heavily in IT. Even though many companies did gain competitive advantage from IT, there are also many who have failed to secure the potential benefits available. There are still many organizations treated IT as their administrative expenses instead of as a strategic resource. The authorities to make decision on IT is placed on the top management by the implementation have often been delegated to relatively junior managers who lack sufficient knowledge, experience and authority.
A survey carried out by the Malaysia Institute of Management, reports that the education and training of mid- and upper-level management on IT is less than adequate. This has further supported by recent IT survey conducted by the Price Waterhouse which indicated that a cultural gap still exists between IT professionals and the rest of the organization. It also suggested that most of the top management do not appreciate Information Technology's potential for improving business performance (Price Waterhouse, 1991/92).

It has been argued that lack of awareness of the IT development and its potential role in business has become one of the main factors that contribute to the failure of IT project. The word "awareness" is refer to the need of the manager to understand how to identify potential IT opportunities that can contribute effectively to achieve business objective in their organization and it does not mean that the manager should have a great depth knowledge of computers or telecommunications in order to identify the IT opportunities or to manage IT investment effectively. Manager needs to acquire necessary knowledge that will enable them to devise strategies for introducing new technologies, and to understand the necessity to recognize work and to initiate appropriate training programme.

2.2 WHAT IS INFORMATION TECHNOLOGY

A useful starting point for a review of IT is to begin with its definition. There is no single and precise definition that adequate enough to explain the whole concept of IT and its functions. Furthermore, the development in IT is too fast to have any fixed description on IT, as any description of its elements will be likely to be quickly outdated.

For a layman or non-academic person, the phrase of IT will immediately give them an idea of computers and communication i.e. the emphasis is focused on the technical aspect. The industry had defined IT as:
"The acquisition processing, storage and dissemination of vocal, pictorial, textual and numeric information by a micro-electronics-based combination of computing and telecommunication"

In practice IT is much more than a combination of hardware and software, it involved all discipline to process data into useful information for manager to make solid decision. In other words, IT is a means, which enable the interaction between human and machine to deliver the right information, to the right information, to the right person, at the right place and time, in the right form. The British Advisory Council has further supported this in their report by defining IT as:

"The scientific, technological and engineering disciplines and the management techniques used in information handling and processing; they're application; computers and their interaction with men and machines; and associated social, economic and cultural matters."
Sources: Tam, 1992

The terms “Information System (IS)” and “Information Technology (IT)” are both used interchangeably in many books & articles. This can be very confusing because IS can be formulated manually i.e. without the computer support. In fact, IS has been long existed before the computer has invented. To “clean the air”, the author has decided to apply definitions from Peppard [1] (1993) who has made a clearer distinction between these two terms:

"IS refers to the flow of information in an organization and between organizations, encompassing the information the business creates, uses and stores.

While IT represents the mechanism which facilitates the processing and flow of this information, as well as the technologies used in the physical processing to produce a product or provide a service."
2.3 DEVELOPMENT IN IT

In just a few decades, the enormous power of silicon chips has transported much of the world from the industrial revolution to the information age. The changes in IT revolution have dramatically changed the way we live and do business.

The development of IT was first the big, expensive mainframe computers introduced by some large companies in the 1960s to handle large-scale operations such as payroll and stock, production and inventory control. Some years later the development if integrated circuits led to the production of smaller, less costly but powerful minicomputers which were connected with "dumb" terminals for inputting data, and various output devices, such as printers.

In the 1980s, the computing power available for a given price continued to increase rapidly as computer manufacturers took advantage of the availability of cheap microprocessors to produce microcomputers and personnel computers (PCs). It is much smaller in size and more powerful in some respects than mainframe and minicomputers. PCs can run their own software programs or form part of a distributed system when connected to central computer and used as "intelligent" terminals. Intelligent terminals can download data from a central computer, and manipulate it. Another advantage of PCs is that the configuration of PCs can be designed to suit the need of each individual organization.

Due to the low price of PCs and their flexibility in addition with the development of a wide range of user-friendly software packages for word processing, database, graphics or spreadsheet applications, PCs has become popular in business application and are widely adopted throughout organization.
As PCs have spread throughout their organization, companies have seen the advantages of connecting them through distribution and linking technologies. Computers and associated peripherals linked together for data and text transmission systems within a limited geographic area are known as local area networks (LANs). In addition, wide area networks (WANs) permit links between more remote systems. They are accessed through telephone lines, using a modem to connect the computer to the telephone line.

The most recent development in IT is the introduction of a more superior performance networking system known as Client/Server architecture – a form of distributed computing in which tasks and computing power split between servers (networked microprocessor-based host) and clients (workstations & PCs). The Client/Server architecture evolved in response to performance bottlenecks prevalent in conventional PCLAN application.

2.4 APPLICATION OF IT

Within the above basic framework many specialist applications have been developed and applied in manufacturing and service sector. These applications make different contributions to the business. Some application represents an area of great strategic importance, while for others they will play a cost-effective and useful but distinctively supporting role.

In manufacturing, new technology is used in computer-aided design, in computer-aided manufacturing, in flexible manufacturing systems and in robotics. The integration of these systems could eventually make fully automated manufacturing processes commonplace.

In the office, the impact of the new technologies is already very evident in the form of word processor. Its flexibility, storage capacity and instant recall make it ideal for the storage of vast quantities of information and its immediate replication in paper form.
In retailing, bar code sales control systems and electronic checkout systems, or electronic point-of-sale system (EPOS) have already revolutionized selling and merchandising in large chain stores. These systems permit greater control over stock levels and the labor-intensive task of pricing individual items is eliminated.

In last five (5) years, growth in the use of IT in financial services sector has been more rapid than in manufacturing, where applications are often more complicated. The financial and business services environment demands more effective and efficient service delivery to customers and from suppliers. Therefore IT is playing a critical role to streamline the process and support this customer-service orientation. Some businesses came to realize that they could change their ways quite substantially using new computer technologies and that in so doing they could gain significant competitive advantage. On the other hand other organizations were beginning to find that the way in which they used technology was a factor in the image of the company and one of the criteria by which clients would evaluate their services.

In financial services, such as banks, insurance companies and building societies have rapidly introduced computer controlled accounts systems, direct data transmission between branches and head office, and word processors to standardize customer communications.

Centralized computing facilities are used to hold central database for distributed computing and communications networks. This has enabled the headquarters to control all their branches in the remote distance.

The on-line system allow direct entry and amendment of databases from decentralized intelligent terminals, and could enable branch managers to access information on which they could base local decision.

In the financial service sector, the organization of work are more decentralized and with the central control of head office. In the insurance industry, the
application of expert system has enabled unskilled clerks to do jobs formerly undertaken by scarce, overworked, expert underwriters. With the advances in IT, bank can now provide many facilities to their customer. Automated Teller Machines (ATM) technology has promised competitive and marketing benefits. It provides 24 hours cash dispense to customer up to RM5, 000.00 recently and able to answer some basic financial queries. The design of the ATM is user-friendly and therefore easy to be operated.

However, there is the disadvantage aspects of banking that are being made more impersonal, and the personal service aspect is being reduced. Most of the staff is continue to carry out deskilld routine, monotonous, fragmented keyboarding tasks.

Decision making on IT is the most challenging task for IT manager because on one hand, the success will bring a great competitive advantage to the company, however, on the other hand, failure will cost the company million Ringgit and time consuming. The major negative impact is the hidden consequences of the failure to the company such as image of the company; create awareness of competitor, resistance to change from the staff because of lack of confidence to the top management etc.

2.5 IT & COMPETITIVE ADVANTAGE

The rapid development in computer technology and the need to response to the dramatically changes of the environment has made IT shifted from an original support function to the present competitive weapon. In other words, IT is no longer limit to the use of improving performance of the company but rather to achieve competitive advantage against other rivals in the industry. Competitive advantage is gained when an organization moves into a position where it has an edge in coping with competitive forces and in attracting buyers for its products and services (Peppard [2], 1993).
Porter’s (1980) early work recognized that competition not only arises within an industrial sector, but also may involve buyers, suppliers of similar substitute products or new entrants to the industry. Subsequently he suggested that technology as a strategic variable can change the competitive “rules of the game” by impacting on all the forces driving competition (Senker, 1990). He later combined with Millar (1985) contend that IT is affecting the nature of business competition in three different ways (Thompson, 1993):

First of all, IT can influence the structure of an industry which can be analyzed in terms of five competitive forces: the threat of new entrants; the bargaining power of buyers; the bargaining power of suppliers; the threat of substitute products and services; and rivalry amongst existing competitors. IT can significantly affect the supplier’s power in an industry’s potential profit, for example, in applying Computer aided manufacturing, a manufacturing firm can reduce its labor costs; IT makes buyers more difficult and costly to switch supplier when they have familiar with one system and reluctant to change to other system; Huge investment in IT equipment and sophisticated software will increase the barrier for competitors to enter the industry; Flexible manufacturing system can influence the threat of substitution by making it more easier, quicker and cheaper to incorporate enhanced features into product; Overall, IT has created opportunities for firm to deal with their rivals by offering buyer something that competitors cannot duplicate easily or cheaply and thus give a firm not only a marketing edge but also a unique competitive capability.

Secondly, IT allows companies to create competitive advantage by deliver the customer satisfaction more efficiently and effectively than their rivals. According to Porter (1985) competitive advantage are results from lower costs or differentiation. IT permits major reduction in cost through less clerical and supporting staff required and betters utilization of available resources. Advance Manufacturing Technologies enable a firm enhance differentiation with more flexible in its production and more responsive to customer needs.

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Thirdly, IT can create new business within the company’s existing activities in three ways. Firstly, it makes new businesses technologically feasible. For example, the development of image processing and telecommunication technology has enable fax service to be provided. Secondly, create derived demand for new product. Finally, creating new businesses within established ones.

Porter recommended that firms should identify all the technologies in their value chain, and then determine which technologies and potential technological changes have the most significance for reinforcing competitive advantage. In choosing among technologies to invest in, a firm must base its decision on a through understanding of each important technology in its value chain (Senker, 1990). But it takes time and effort for firms to understand new technologies and to accumulate technological expertise. This in turn may require investment in new competence, in training and retraining.

2.6 IT AND STRATEGY

Gaining competitive advantage from IT demands through understanding of the technology and its implications for company strategy. As Porter suggests, firms need to have a through understanding of the technologies they choose to invest in. However, the research evidence has shown that many firms in both manufacturing and service sectors often introduce new IT equipment and system without the necessary “through understanding” of the technology. As a result, companies often fail to secure the full potential of competitive advantage from their investment of IT.

Tracing the trend in IT development is useful as it reveal the close connection between advances in computer technology and the real world. After outlining recent technological development in IT, the author continued review its application in manufacturing and service sector in general, and in financial service sector in particular. IT has change the way company competes in the industry; it changes the structure of the industry; create sustainable
competitive advantage and develop new business opportunities within the company's existing operation.

In order to sustain the competitive advantage, IT needs to be treated as strategic resources and incorporate it into company's overall corporate strategy. It requires changes in management attitudes and organization. The changes needed are not determined exclusively by the nature of the technology, but also in the way that is implemented.

Therefore, the connection between technology and strategy is another dimension to concern.

Information Technology (IT) is a technology that allows a company to adjust to a new business situation, in many cases enabling it to do previously impossible things. While strategy is a course of action or means an organization uses to achieve its objectives. IT can be fitted into different level of strategy and the role of IT in each level is different, as well as their objectives.

In order to achieve competitive advantage through IT, the company needs to treat IT as their strategic resource and incorporate into company's overall corporate strategy. The emphasis must be transferred from functional issues, to an understanding of how information technology can both simplify and enhance a company's competitive position.

The strategic importance of IT and their competitive application is becoming increasingly recognized while is their importance to the organization as a whole (Hayward, 1987). Company without a coherent policy linking technological development to corporate goals, tend to surrender responsibility for IT to technocrats, who may indulge their fascination to irrelevant technology, without considering the wider needs of the organization (Angell & Smithsom, 1990). A large percentage of technically successful projects that have turned out to be commercial failures are because not relating
technological considerations to the strategic concerns of business. For example, the collapse of the city’s biggest computer project, TAURUS, which cost hundreds of millions of pounds, on March 1993, is the failure of strategic management (Currie, 1994).

One way to incorporate technology into business issue is for the manager to begin to think about technology in strategic terms and integrate it as part of their business strategy before transform it into company's overall corporate strategy.

2.7 PUTTING TECHNOLOGY INTO STRATEGY

In the early work of Richard S. Rosenbloom’s (1978) “Technological Innovation in Firms and Industries” has made a powerful case for strategy as the necessary basis for any interpretative “policy-oriented synthesis” on technological matters. According to him, the idea of a technological strategy brings together significant aspects of the organizational and environmental context of innovation, thus directing attention toward the interaction of all relevant factors – including goals, structure, and leadership.

The literature reviewed on the strategic implications of technological decisions that have been highlighted by several authors (Schoen, 1969; Kantrow, 1980; Donaldson and Lorsch, 1983). Schoen’s diagnosis was that company often did not explore the linkages between technological innovation and corporate strategy systematically; a decade later, Kantrow endorsed Schoen’s position, claiming that managers has now increase their awareness of the need to incorporate technological issues within strategic thinking and decision making. Donaldson and Lorsh further illustrated that most of the top management believed that technology has played two important roles i.e. as a driving force in innovation and creating sustainable competitive advantage (Loveridge & Pitt, 1990).
The above research findings have shown that technological innovation has slowly moved from an unknown aspect to a significant aspect in the strategic decision-making. Managers have become increasingly recognized the importance of the linkages between technologies and strategies and there has been substantial attempt to include technological considerations within the framework of strategy.

2.8 STRATEGIC NATURE OF IT

Today, in many industries, the rate of change in business climate and conditions, and increased competition combined with reduced margins has meant that corporate planning had to become more flexible and responsive.

The competitive pressure and the need to response quickly to market changes have sufficient to make management feel that they cannot afford to ignore the importance of IT. Sometimes, if a company tries something in advance of the competition, the competitor will have no choice but to match that investment as the price that had to be paid to stay in the market. For the reasons set out above, it is essential that the IT development approach be geared closely to the business plans and priorities. Without strategic assessment of information technology opportunities in the light of business needs, significant opportunities will be lost.

Blennerhassett and Galvin have noted that IT become increasingly strategic and important to organizations for a number of reasons (Peppard [3], 1993):

- The cost of maintaining existing systems and the significant investment in time and money required to develop new systems have demand organizations strategically plan their requirements.
- The role of IT plays in corporate strategy as it significantly impacts the company's option and effectiveness in implementing corporate strategy.
- IT affects the process of strategy development as it provides more information to managers through the use of advanced information system.
IT enables information to be effectively distributed from top management to middle management and between departments, have influence the way organizations structured and managed.

IT also impacts the organization’s interfaces with the external environment. This is having an affect on the organizations long-term relationship with customers and suppliers.

IT also involves making a significant investment in people and in the way they do their work.

Strategic thinking is a point-of-view rather than a set of theories. Business strategists simply see the world differently than other people. The strategist sees the activities of business as they are actually played out in competitive marketplace rather than as they intended by management (Gerstein, 1987).

The ways information technology can be applied to enterprises today are virtually endless, ranging from the most trivial (a mailing list application to automate a holiday season greeting card list) to the most significant (an automated teller machine which has change the way people live and do business). However, the critical element here is neither the application area itself (personal productivity, manufacturing automation, geological analysis) nor its underlying technology (personal computers, robotics, expert systems) that makes IT strategically important. Rather, it is the specific role of a particular technology application to a given industry or company at a point in time that makes the difference (Gerstein, 1987).

IT is only strategically important to a company if it used to improve the performance of the company significantly by improving a product that is difficult to use or maintain in perfect working order. On the other hand, if technology is used to add value in a less central way, this may have very little impact on the customer or the company.

Since it is possible to find both trivial and significant uses of IT within the same organization, it is necessary to understand the business in strategic
terms if one is to select applications wisely. If one organization invests strategically while competitor invests merely to achieve operational or cost gains, the marketplace consequences of these contrasting approaches can be shown quite different. The different between these investment strategies is rarely a matter of the amount of money available, rather the overall priority given to IT and selection of the specific areas in which to invest that is usually critically.

Changing one's point of view is essential to the development of strategic thinking. Perhaps the most logical place to start is with the definition of strategy itself.

2.9 THE CONCEPT OF STRATEGY

Strategy is a term used to refer to an integrated, coordinated set of actions, including resource allocating decisions, that span long periods of time (Hofer & Schendel, 1978). The central concept of this early work was the notion of fit between the unique capabilities of a company and the competitive requirements of an industry that distinguished it from others (Montgomery, 1991).

There are many different kinds of definition for the concept of strategy. The author has decided to apply definitions from a few writers with respect to their views and interest in this controversial subject (Hax & Majluf, 1988).

One of the earlier definitions was proposed by Chandler (1962) who defined strategy as "the determination of the basic long-term goals of an enterprise and the adoption of courses of actions and the allocation of resources necessary to carry out these goals."

Ansoff further defines strategy as "the general concept of the firm's business which provides a unifying theme for all its activities. The most successful firms
pursue their business in a coherent and consistent manner." This definition has further extended by Andrew (1965) by explaining, "strategy is the pattern of objective, purposes, or goals and major policies and plans for achieving these goals, stated in such a way as to define what business the company is in or should be in and the kind of company it is or will be".

In examining the above writers one realizes that the key dimension of strategy is as a means of establishing the organizational purpose, that is, in terms of its long-term objectives, action programs, and resource allocation priorities, but has no mention about the environment context. Yet many are belief that environment is the main theme of strategy formulation. Without a careful and thorough analysis of the environment, the direction, planning, and implementation of strategy would be carried out in isolation.

As stated by Argyris (1985), "strategy formulation and implementation are included identifying opportunities and threats in the organization's environment, evaluating the strengths and weaknesses of the organization, designing structures, defining roles, hiring appropriate people, and developing appropriate rewards to keep those people motivated to make contributions".

Strategy is a response to external opportunities and threats and internal strengths and weaknesses that affect the organization. Mintzberg (1979) has noted strategy is a mediating force between the organization and its environment; there are consistent patterns of streams of organizational decision to deal with the environment.

Strategy is also a central vehicle for achieving competitive advantage, and this has been agreed by Porter (1985) that strategy (competitive) is the search for a favorable competitive position in an industry, the fundamental arena in which competition occurs. Competitive strategy involves positioning a business to maximize the value of the capabilities that distinguish it from its competitors.
With the above analysis of different kinds of definition that have put forward by various authors, we can conclude that strategy involves efforts directed at creating the best possible use of the resources possessed by the firm. Emphasis is placed on the utilization of the organization's relative advantages vis-à-vis the competitors in its efforts to serve the market.

The challenge for today management is to create an environmental context where using company's distinctive competence and resources to produce competitive advantage. For a firm to achieve a sustainable competitive advantage, a capability (distinctive competence) must be unique to the firm. However, as competitors may use imitation strategies, it is difficult to create sustained competitive advantages.

2.10 STRATEGY LEVEL

Strategies can be developed at multiple levels within the organization. Here, Hofer & Schendel model is selected as a framework for understanding the link between IT and strategy.

According to Hofer & Schendel (1978), there are three major levels of organizational strategy, namely (1) corporate strategy, (2) business strategy, and (3) functional strategy. In addition to these three levels, another level of strategy, that is enterprise strategy, is introduced to complete the overall level of strategic in an organization.

Enterprise Strategy

Enterprise strategy is an integration of total organization with society. It focuses on social legitimacy, and interfaces with the socio-political environment. IT strategy in this level has a significant impact on the industry structure.
In this level, IT strategy is articulated in terms of an external orientation. The emergence of IT has changed the way business competes. There has automated many task that previously manually carried out, thus significantly reduce the labor costs. The huge investment in IT also increases the barrier for competitors to enter the industry. IT has created opportunities for firms to compete more efficiently and effectively over their contemporary rivals in their respective industry.

**Corporate Strategy**

Corporate strategy describes a company's overall direction in terms of its general attitude towards growth and the management of its various businesses and product lines to achieve a balanced portfolio of products and services. It focuses resources to convert distinctive competence into competitive advantage. Hence, corporate-level strategy is concerned primarily with answering the question what set of businesses should we be in?

In order to be succeeding in implementing IT strategies, one needs to incorporate IT strategy into company's overall corporate strategy. It needs to create a strategic climate in which IT investments can be related to organizational direction. A corporate objective or plan is, in some respects, a statement of how the company intends to deploy its resources and capitalize on its assets. These resources are commonly seen as money, people and equipment. Information should treat as part of the company's assets, i.e. including information in the corporate planning process. The recognition of information as a company resource can even create new business opportunities and consequently derive the corporate business plan. This plan however, will be influenced by financial considerations, market considerations and, perhaps, product considerations. Changes are therefore inevitable. Plan needs to be re-evaluated to adapt the changes. This is where the Information and IT strategy come into consideration. IT strategy should be developed as a corporate concept to ensure the IT strategy is consistent with the company's overall corporate strategy.
Business Strategy

Business strategy is integration of functions within a business unit. It focuses on a specific product-market and determines how a company will compete in a given business and position itself among its competitors. There are three important dimensions of IT strategy in the business level (Venkatraman, Henderson & Oldach, 1993).

1. Information Technology Scope: those specific information technologies (examples: expert systems, database system, electronic imaging, local and wide area networks and robotics) that support current business strategy initiatives or could shape new business strategy initiatives for the firm; this is analogous to business scope which deals with choices pertaining to product-market offerings in the output market.

2. Systematic Competence: those attributes of IT strategy (examples: system reliability, cost-performance levels, interconnectivity, flexibility) that could contribute positively to the creation of new business strategies or better support existing business strategy; this is analogous to the concept of business distinctive competence which deal with those attributes of strategy (e.g. pricing, quality, value-added service, superior distribution channels) that contribute to a distinctive, competitive advantage to a firm over its competitors.

3. IT Governance: selection and use of mechanisms (examples: joint ventures with vendors, strategic alliances, joint R&D for new IT capabilities) for obtaining the required IT competence; this is analogous to business governance which involves "make-versus-buy" choices in business strategy.
Functional Strategy

Functional strategy is integration of sub-functions within functions. It relates functional policies to changes in environment.

Although there is widespread acceptance that IT is a powerful and under exploited source of strategic advantage, many managers, both business and IS managers alike continue to view IT strategy as a functional strategy that responds to the chosen business strategy. In other words, the management focus is still on the activities and skill within the internal IS function dealing with the following (Venkatraman, Henderson & Oldach, 1993).

1. IS architecture – choices that define the portfolio of applications, the configuration of hardware, software and communication, and the data architecture that collectively define the technical infrastructure; this is analogous to the choices within the internal business strategy arena to articulate the administrative structure of the firm dealing with roles, responsibilities and authority;

2. IS processes – choices that define the work processes central to the operations of the IS infrastructure, such as : systems development, maintenance, upgrading and migration, capital allocation, as well as monitoring and control systems; this is analogous to the need for designing the business processes that support and shape the firm’s ability to execute business strategies; and

3. IS skills – choices pertaining to the acquisition, training and development of the knowledge and capabilities of the individuals required to effectively manage and operate the IS infrastructure within the organization; this is analogous to the organizational skills required within the business domain to execute a given strategy.

In today highly competitive and rapid changes environment, company has often used IT as a competitive weapon to win over their contemporary rivals.
That is, IT is more emphasized in business level among all the strategy level in the organization. Moreover, it is argued that the inability to realize value from IT investments is first due to the lack of alignment between business and IT strategies of the organizations that are making the investments (Venkatraman, Henderson & Oldach, 1993). Further, it is asserted that the organization's ability to leverage IT functionality to obtain differential advantage in the marketplace requires a dynamic administrative process to ensure continuous alignment between the business and IT domains.

2.11 STRATEGY FORMULATION

How do strategies form in organization? Since strategy has been perceived by management, as a "plan" to do in future, strategy formation has, not surprisingly, tended to be treated as an analytic process for establishing long-range goals and action plans for an organization, i.e. as one of formulation followed by implementation.

2.11.1 Strategy: deliberate or emerge?

Mintzberg (1985) has defined the process of strategy formation based on the definition of strategy as "a pattern in a stream of decisions". By this definition, the strategy formation is explained in a more widely descriptive context rather than as a deliberate plans conceived in advance of making of specific decisions. He argued that strategy formation is walks on two feet, one deliberate, and the other emergent. Management requires to light deft touch – to direct in order to realize intentions while at the same time responding to an unfolding pattern of action. The relative emphasis may shift from time to time but not the requirement to attend to both sides of this phenomenon.

The emergent strategy (figure 2.1) is a strategy as a result of individuals or groups learning from past mistakes or developing new ideas independently. If successful, these are used as part of the process of the decision-making, which is similar to Quinn's (1980) logical incremental.
Figure 2.1 Mintzberg’s emergent strategy

Source: Gore et al 1992, pg 1-5

According to Kenyon & Mathur (1993), Mintzberg’s meaning of “strategy” is defined in terms of ex post observations of managerial actions, not ex ante intentions. They argued that something definable only ex post is not a strategy and further suggested that strategy is essentially an ex ante concept as managers should plan for the future. It is not enough to just observe the past records and assume that the future will be the same as before. It is especially untrue in the present period of rapid technological change. Strategies tend to change to match the evolution of technology.

IT Strategy formulation is, therefore, a learning process in which the strategist has to constantly reacts to the environment, which he or she may have imperfectly understood before, or which has in the meantime undergone change. In addition, IT investment usually in a large scale in term of time and money, and people are involved. Therefore, IT strategy should be deliberate instead of emerge. Although there is widespread evidence of unsuccessful IT strategies, organization still need to plan ahead for the IT investment and adjustment should be made whenever appropriate.

2.11.2 Strategy: the pattern of resource allocation

From another point of view, strategy may be viewed into two related but somewhat different ways (Gertein, 1987). First, it can be viewed as a set of “intentions”, often expressed as a strategic plan. The strategic plan is
developed as a statement of the vision of the firm, the scope of its operations, its goals and objectives, and the programs and other actions required to achieve success in the context of the anticipated competitive environment.

The second view of strategy is more "behavioral". Specifically, strategy can be thought of as a pattern of resource allocations. When examined in this way, two facts become clear:

1. Every firm has an implicit strategy that can be constructed from the manner in which allocates capital, facilities, and human, and from the opportunities its management seizes and the ones it tends to ignore.
2. Successful translation of strategic intentions into reality is required before management can state that the firm actually has a new strategy. Stating one's intentions – that is, writing a strategic plan – is only half of the strategy creation process.

If strategy can be viewed as a pattern of resource deployments, it follows that strategy formulation can be viewed as a series of resource allocation decisions. These decisions might include:

1. Choosing the geographic regions in which to market a firm's products.
2. Selecting the appropriate technology to employ in products.
3. Selecting distribution channels, and perhaps deciding to let them compete with one another.
4. Deciding whether specific products should be manufactured or sourced externally.

Each of these strategic decisions can be directly translated into the allocation of capital, facilities, and people. When aggregated, the pattern of these decisions should be congruent with the firm's strategic intentions. Even if they are not, however, it is the firm's resource allocation decisions rather than its written plans that determine its success in the market place. The strategy that counts is the pattern of behavior, not the pattern on the paper.
Strategy formulation implies a strong emphasis on top-down planning whereas research into successful innovation indicates the need for a bottom-up orientation. These two requirements can be reconciled if an innovative management consciously attempts to weld together these two streams of communication (Twiss, 1992).

In strategy formulation an analysis is made of the trends taking place in the social, economic, political and technological environments. This analysis leads to an identification of the business threats or opportunities they are likely to give rise to. There are usually a number of alternative strategies, which might be feasible, but the optimum will only emerge by comparing what might be possible with the organization’s ability either to meet the threats or exploit the opportunities.

The strategy instills a sense of purpose in senior management decision-making and should be a major consideration in deciding the level of investment in IT. It also facilitates the formulation of coherent and consistent guidelines for operational management. But failure to translate the corporate plan into decision-making at all levels will nullify its purpose. Yet there is a great deal of evidence to suggest that this occurs frequently, particularly in relation to investment in technological innovation.

2.12 STRATEGY DECISION-MAKING PROCESSES

Decision-making involves more than just to decide which alternatives to be selected. It encompasses everything from the initial stimulus of a need for a decision through to the feedback from surveying events as a result of the decision taken. If the process can be improved and appropriate methods can be used during the process then decision-making itself will improve (Gore, Murray, Kate & Richardson, 1992).

Strategic decisions is a fundamental decisions that will affect the organization's nature and direction and is concerned with objectives and long-
term strategic plan. It is important in terms of the actions taken, the resources committed, or the precedents set. That is, we focus on those infrequent decisions made by the top leaders of an organization that critically affect organizational health and survival.

The decision as to where the emphasis should be placed on the use of technology will have a major influence on the future success of the company. It cannot be left to the ad hoc decisions of operational managers but must be addressed at the strategic level with the active involvement of top management in order to most benefit the long and short-term objectives of the business. This strategic choice is concerned with making choices to exploit the IT opportunities and to meet the company's overall objectives in the light of the evolving external environment and the company's capabilities.

There are number of decision models that associated with strategic decision-making. The rational normative model is the most common decision making process used in theory and practice. The underlying assumption of this model is it treats the decision maker as a rational individual who wishes to avoid uncertainty and searches for new solutions only when confronted with new problems. Managers have used these basic premises to model risk taking, decision-making and learning in organization.

2.12.1 Rational normative model

Early development of the strategic management literature advanced a rational, normative model of strategic choice (Andrews, 1971; Ansoff, 1965; Hofer and Schendel, 1978). As a result, the normative model of strategy formulation and implementation remains dominant in the teaching and practice of strategic management.

The term "a rational decision" as it relates to a business organization has its roots in neo-classical economics, and refers to a decision based on a logical process of adopting means to achieve a particular end or objective (Gore,
Murray, Kate & Richardson, 1992). The objectives may include the firm's desire to maximize its profits or minimise its costs. It's based on a normative and positive approaches of decision-making.

According to this model, actors enter decision situations with known objectives. These objectives determine the value of the possible consequences of an action. The actors gather appropriate information, and develop a set of alternative actions. They then select the optimal alternative. For example, the model of Hofer and Schendel (as show in figure 2.2) and Minzberg (as show in figure 2.3) are the simplified version of this rational model.

![Goal Formulation](image)

**Figure 2.2 Hofer and Schendel’s strategic decision-making process**
Source: Gore et al 1992, pg 13 - 18

![Identification](image)

**Figure 2.3 Mintzberg’s strategic decision-making process**
Source: Gore et al 1992, pg 13 - 18

A model of strategic change that builds on this rational normative model by emphasizing the effects that executives can have on strategic decisions, has been labeled strategic choice. The strategic choice is the result of both the objectives situations and the characteristic of the top executives of the organization.
It has been argued that rational decision-making provides a useful model to improve business decision-making. The adoption of a rational framework enables the management to develop an efficient approach to decision-making and to be aware of both the limitations that work against rationality and the methods that can be used in these constrained circumstances.

In the context of strategy formulation for IT, top management are seen responding rationally to the impact of IT by formulating a coherent technology strategy for their firm, bringing consideration of technological factors into the strategic planning process, and making the kind of changes in the management process to enhance overall performance and achieve competitive advantage.

However, the rationality of this model has been brought into question by many strategy scholars in terms of its applicability in the "real world" and to what extent the managers use such models for strategic decision-making. In practice, studies show that there are many factors that will restrict managers to act rationally.

2.13 IMPLEMENTATION

More often the success and failures of business can be trace back to their origins to management’s performance in respect of making decision on investment in technology or a technological innovation. Of course, it is desirable that all decisions should be sound. But the effect of one poor decision will affect the whole business.

Recognition of this problem has led to the development of the concepts of strategic management and their incorporation in formal planning procedures. A conscious effort is needed to define a corporate identity, which manifests itself in the formulation of strategies, objectives and policies. IT strategy is basically a deliberate process, although sometimes sub-strategies do emerged. Another point of view on strategy is strategy may be viewed as a
set of "intentions" i.e. a strategic plan and also as a pattern of resource allocation.

A rational normative model is the most common strategic decision-making process used by managers to formulate a strategy. However, the underlying assumption of rationality has been challenged by many strategist. The synthesis have portrayed that strategic decision makers have partially conflicting interest and limited cognitive capability.

Further, strategic decision-making is best described by an interweaving of both bounded rational and political processes. It is bounded rational in that strategic decision makers are cognitively limited and engage in a cycling among rational decision-making steps. It is political in that strategic decision makers also engage in politics and ultimately the most powerful personal will determine the decisions.

Finally, the fundamental importance of appropriate information to sound strategic decision-making must be explicitly recognized in the design and implementation of planning systems. Implementation an IT strategy involves change, and this change needs to be managed if the IT strategy is to be successfully implemented.

The new possibilities offered by IT has brought a great changes and opportunities to organization. However, the process of connecting IT and successful company strategies is always difficult for the company to do well. Most of the failure IT project tends to be in the implementation stage (Peppard & Steward, 1993).

Strategies are formulated to be implemented i.e. turn ideas into action. But if anything goes wrong, the automatic reaction is that the strategy is poor and has to be changed. However, an equally valid possibility is that the strategy is good, but the implementation is poor; therefore attention should be placed on implementation (Hussey, 1988).
These changes can manifest themselves in many ways from how the employees perform their jobs to a compete redefinition of the way in which a company conduct business. Further, information is a resource, which is closely linked with status, power and authority. By redefining or redistributing information in an organization both positive and negative consequences can be expected for all parties involved.

The ultimate success of the IT strategy implementation process is governed by how well the accompanying change is managed as it is fruitless to develop a superior strategy which fails to be realized.

2.14 IT EVALUATION

Taking a management perspective, evaluation is about establishing by quantitative and/or qualitative means the worth of IT to the organization. Evaluation brings into play notions of costs, benefits, risk and value. It also implies an organizational process by which these factors are assessed, whether formally or informally (Willcocks, 1992).

For competitive reasons, company cannot afford not to invest in IT, but economically they cannot find sufficient justification, and evaluation practice cannot provide enough underpinning for making the investment.

2.15 SUMMARY

The purpose of this chapter is to explore the connection among business, strategy and technology. By linking technology choices directly to a firm's external environment and by invoking the concept of "fit", the framework places technology and strategy in a reciprocal relationship.
It is going to continue to become more important strategically and spending is unlikely to decline. IT has become too important to the survival and competitiveness of organization for this to change. The nature of the investment in IT should however reflect the business environment and challenges.

There are basically four strategy levels in the organization, namely enterprise, corporate, business and functional. IT has played different role in each strategy level.

A business strategy is necessary for any firm's success. Increasingly, IT is becoming major component of business strategies. Management realizes that if they are to gain the advantages that IT offers, they must incorporate the plans for using this technology in their overall business strategy. IT can become a major product or service of the organization or they can become a major factor in support of a firm's service to customers.

The long-term nature of IT investment and the time it takes to develop require company to see IT in strategic term and manage strategically.

In the strategic management literature, a distinction is drawn between the formulation and implementation of corporate strategy. Strategy formulation is analyses of external factors and internal capabilities, then a strategy (solution) is sought which aims to best utilize the available resources to achieve the objectives. While the strategy implementation is involves executing the strategy that has been formulated.

The potential of IT will only be achieved when the IT project is successfully implemented. However, implementing an IT plan involves change. It is important that the change is managed successfully to ensure the benefit of IT is maximized.
Organization is social structures that involve people and IT has a direct effect on their role in the organization. Employees are given new roles and responsibilities; there is change in the way tasks are performed and how people work with each other. Changes bring uncertainty and uncertainty means certain risk is involved. Therefore, people usually perceived change as a threat and automatically they will try to protect themselves by resisting the change.

After implemented IT strategy, the company need to evaluate it whether the benefits of IT are justified by the cost. There are major problems in evaluation. The evaluation should consider all factors relevant to the technology investment decision. That is not just the quantitative and objective factors but also the qualitative and subjective factors.