

## UNIT-IV

### **STRATEGIC INFORMATION SYSTEMS (SIS) An Understanding of Strategic Information System – Benefits of SIS (Strategic Grid) – Components of Strategic Information Planning – Business Intelligence System – Computing System for Strategic Planning – The Value Chain Model**

#### **An understanding of Strategic Information System (SIS)**

**Strategic information systems (SIS)** are information systems that are developed in response to corporate business initiative. They are intended to give competitive advantage to the organization. They may deliver a product or service that is at a lower cost, that is differentiated, that focuses on a particular market segment, or is innovative.

Strategic information management (SIM) is a salient feature in the world of information technology (IT). In a nutshell, SIM helps businesses and organizations categorize, store, process and transfer the information they create and receive. It also offers tools for helping companies apply metrics and analytical tools to their information repositories, allowing them to recognize opportunities for growth and pinpoint ways to improve operational efficiency.

#### **DEFINITION**

A SIS is a computer system that implements business strategies; They are those systems where information services resources are applied to strategic business opportunities in such a way that the computer systems affect the organization's products and business operations. Strategic information systems are always systems that are developed in response to corporate business initiative. The ideas in several well-known cases came from information Services people, but they were directed at specific corporate business thrusts. In other cases, the ideas came from business operational people, and Information Services supplied the technological capabilities to realize profitable results.

Most information systems are looked on as support activities to the business. They mechanize operations for better efficiency, control, and effectiveness, but they do not, in themselves, increase corporate profitability. They are simply used to provide management with sufficient dependable information to keep the business running smoothly, and they are used for analysis to plan new directions. Strategic information systems, on the other hand, become an integral and necessary part of the business, and they affect the profitability and growth of a company.

They open up new markets and new businesses. They directly affect the competitive stance of the organization, giving it an advantage against the competitors.

### **Characteristics of Strategic Management Information System (SMIS)**

The key characteristics of strategic management information system (SMIS) are as follows –

#### **An organized occurrence**

The strategy includes a set of action plans that are not contrary to each other because they are covered by a common theme. It's not just a great idea; it lets the idea happen as well. The strategy is a unified, systematic, and integrated action plan.

#### **Goal-oriented approach**

SMIS is a goal-oriented process. The process is carried out with the aim and objective of evaluating the different elements through SWOT analysis and other methods and designs a plan or strategy that enables the organization to manoeuvre it around every hurdle and make use of its strength.

#### **Involvement of top executives**

Strategic management applies to many aspects of the activities of an organization. So, it needs the participation of top management. In general, the broad consequences of its decisions and the power to approve the required resource allocations are only understood by top management.

#### **Multidisciplinary approach**

The strategy includes marketing, financing, human resources, and strategy development & execution tasks. A strategy is an integrated view of its activities. It is multidisciplinary and an approach that affects all the functional fields, i.e., marketing, financial, human resources, and operations.

#### **Prosperity in the long term**

If an organization has committed to a specific strategy, then the strategy is related to its objectives and in a competitive way; its prosperity depends for a long time on such a strategy.

#### **Multidimensional technique**

A strategy is not only about vision and ambitions, but also about how to accomplish them. It, therefore, means that, with transparent accountability and performance-related rewards, the company should possess the resources and competencies necessary for the execution of the plan as well as a strong performance.

### **Future-orientated**

Strategic management requires projections, which are expected by the executives. The focus in such decisions is on the creation of forecasts that will enable the company to choose the most promising strategic options. An organization can only thrive in a volatile world if it takes a constructive approach to change.

### **Multi-functional or multi-business ramifications**

For other aspects of the firm, strategic management has complex ramifications. In particular, they affect different strategic business units in areas related to customer mix, competitive emphasis, organizational structure, etc. Allocations or reallocations of roles and resources arising from these decisions can impact all of these areas.

### **Hierarchical methodology**

Corporate strategies come on top; these are the strategies for the business unit, and finally practical methods. The top management plans business-level strategies, individual strategic business units determine organizational strategies, and the functional strategies are determined by the functional heads.

### **Dynamic in nature**

SMIS is to build a balance between the atmosphere and the activities of the organization. As the world itself is subject to rapid change, the approach must also be dynamic to shift in step with the environment.

### **Decisions that are non-self-generative**

Although strategic management can entail making decisions, at any point in time, the company must be prepared to make strategic choices.

## **BENEFITS OF STRATEGIC INFORMATION SYSTEM**

- Establishing entry barriers.
- To gain competitive advantage.
- To improve productivity and performance.
- To enable new ways of managing and organizing.
- To develop new businesses.
- Affecting the cost of switching operations.
- Differentiating products/services.
- Limiting access to distribution channels.
- Ensuring competitive pricing.
- Decreasing supply costs.
- Increasing cost efficiency.
- Using information as a product.
- Building closer relationships with suppliers and customers.
- Linking the organisation to customers or suppliers,
- Creating effective integration of the use of information in a value-adding process, eg data mining, data warehousing, ERP.
- Enabling the organisation to develop, produce, market and distribute new products or services, eg CAD, CRM.
- Giving senior management information to help to develop and implement strategy, eg knowledge management.

### **Components of Strategic Information Planning-**

#### **The Strategic Information Systems Planning Process**

SISP planners have to consider the preparatory steps that ensure that business, organizational and information strategies are aligned in a complementary fashion. The overall role of technology and information systems within the organization must be determined, and the internal and external assessments need to be addressed. The most important point to remember is that the SISP process must be part of the overall organization plan.

SISP has been described in terms of phases and the specific tasks within them. The phases and tasks represent the components of the planning process, with each having its own objectives, participants, preconditions, products, and techniques. The phases and tasks can be

used to describe an organization's attempts to be comprehensive in its strategic planning process. SISP unfolds in five phases. The overall five phase breakdown is as follows:

**Strategic Business Planning:** Prerequisite to systems planning:

- It outlines an organization's overall direction, philosophy, and purpose.
- It examines its current status in terms of its strengths, weakness, opportunities, and threats.
- It sets long-term objectives.
- It formulates short-term tactics to reach them.

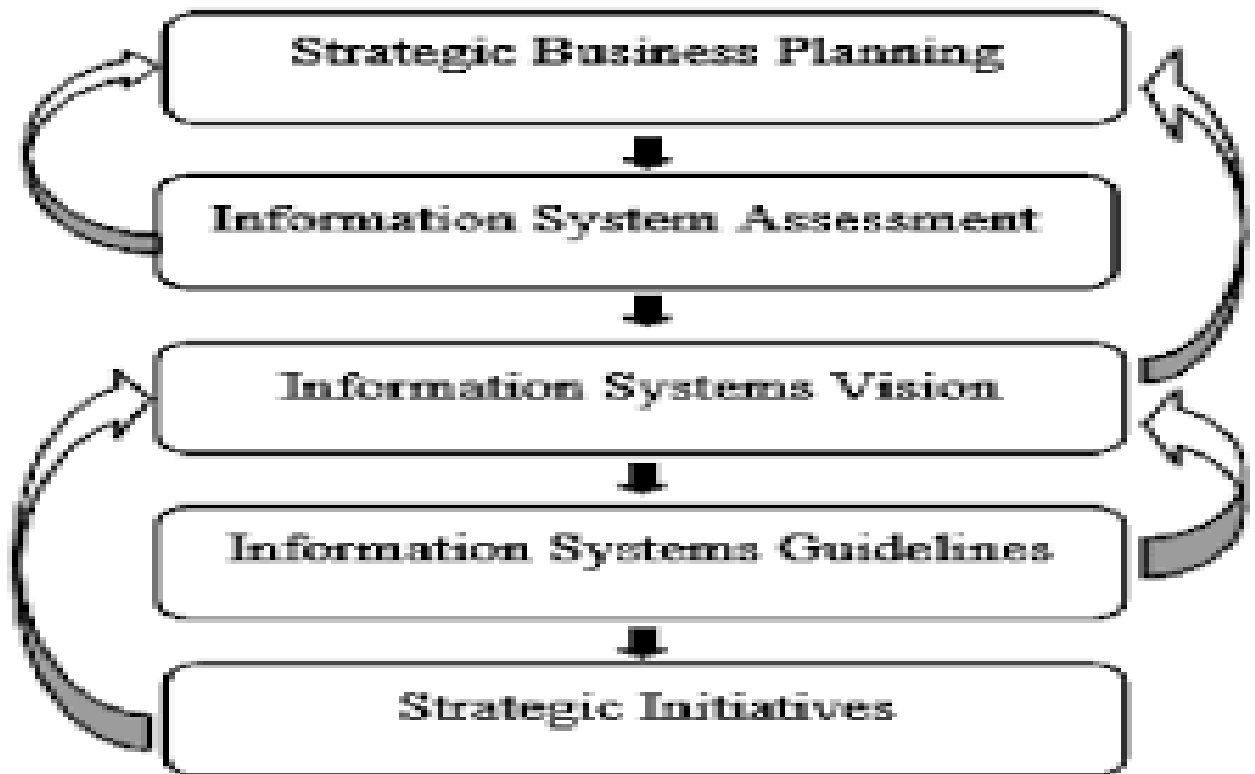
**Information Systems Assessment:** Evaluation of the system to assess its status (current information systems resources) in terms of original or current expectations and how they are serving the organization.

**Information Systems Vision:** Ideal role that should be pursued for use of information systems resources.

**Information Systems Guidelines:** Set of statements that clarify use of organization's technical and information systems resources.

**Strategic Initiatives:** Three to five-year long-term proposals that specify new initiatives for information systems organization.

*Figure 1 The Strategic Information Systems Planning Process*



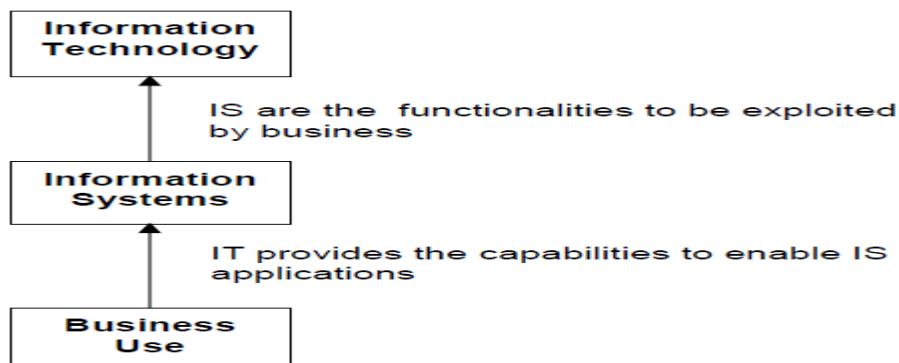
## **COMPUTING SYSTEM FOR STRATEGIC PLANNING**

In order for information to flow from its source to an individual who can use it, some type of system, physical or otherwise, is required to collect, to store and then to move the information within an organization. Thus, an information system (IS) can be defined as a set of procedures that collects or retrieves, processes, stores and disseminates information to support organizational decision making and control.

Many organizations have information systems which are entirely manual. Other systems are computer-based information systems that rely on information technology as well as humans for their operations. Information systems need not be necessarily computer-based, but often they are. The determining factor is whether an information system can be improved by including IT-based processing capability. If a manual system can perform a task efficiently and without error, there may be little reason to use IT. Often, however, as the volume of work grows, procedures increase in complexity or activities become more inter-related and/or dispersed geographically, information systems can improve their efficiency and effectiveness by obtaining IT to assist them. Therefore, all subsequent references to information systems in this course refer to these computer-based systems.

**Information technology (IT)** refers to a powerful collection of elements, which include computer hardware, software, telecommunication networks, and related technologies. As IT is the basis of any information system, there is often confusion between IS and IT. To clarify, information systems are Applications having functionalities that can be exploited by the business, and information technology provides capabilities that enable these applications

*Figure 2 The role of IS and IT*



### **Information System and Information Technology Strategies**

Because of the wide possibilities opened up by today's IT capabilities, IS functionalities and information use, business organizations are given every chance to determine what and how they wish to accomplish through IT. Organizations need to choose the appropriate IS and IT strategies to justify their IT investments and, at the same time, increase their competitive advantages.

Like business strategy, IS and IT strategies refer to the direction in which the organization develops its IS and IT. However, you should understand that the issue of what an organization should do with the technology is termed IS strategy while the question of how it does it is termed IT strategy; or

- **IS strategy** is concerned primarily with aligning IS development with business needs and with seeking strategic advantage from it.
- **IT strategy** is concerned primarily with technology policies, and tackles questions of architecture, including risk attitudes, vendor policies and technical standards. In this context, IT architecture refers to the technology framework, which guides the organization in satisfying its business and management information system's needs.

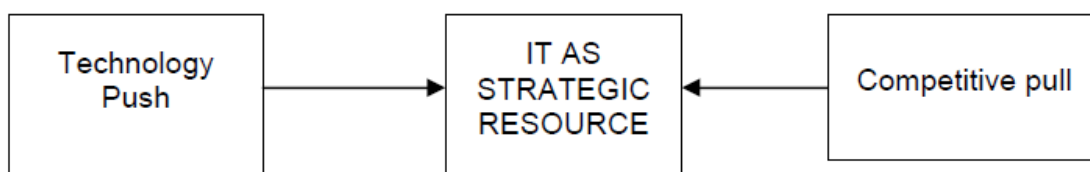
You can see that IT architecture is the physical implementation of the IT strategy. It is the blueprint that defines the technical computing, information management and communications platform of the organization, the structures and controls that define how that platform can be used, and the categories of applications that can be created upon the platform. The IT architecture provides an overall picture of the range of technical options available to an organization, and as such, it also implies the range of business options. With such a definition, it is not surprising to find people referring to IT architecture as IS architecture. Both of the two terms imply the composite structure of:

- hardware and software that are used to manage information and communication;
- the tools used to access, package, deliver and communicate information;
- the standards, models and control framework; and
- the overall configuration that integrates the various components.

### **Information Technology as A Strategic Resource**

In the last decade or so, the role of IT within organizations has changed significantly as more and more organizations have built and used SISs. Many organizations have recognized that IT offers the capability to redefine the boundaries of markets and structural characteristics, alter the fundamental rules and basis of competition, redefine business scope, and provide a new set of competitive weapons. It is, therefore, imperative that the traditional role definition of IT needs to be changed to reflect a more central, strategic role for IT within management. This emerging new role of IT within organizations is the result of two concurrent and perhaps equally powerful forces - technology push and competitive pull

*Figure 3 The forces on IT as a strategic resource*



The Technology push force has emerged partly due to significant improvement in the price-performance ratio of IT and partly due to increased connectivity capabilities over time. The other force, Competitive pull has emerged because markets are becoming highly competitive and the traditional sources of competitive advantages are diminishing as competitors strive to attain parity with one another.



Often there is a need to distinguish between strategic use of Information and strategic use of Information technology. Some organizations have used IT to achieve strategic objectives taking advantage of technological advances. For example, suppose an organization determines that relations with its customers could be strengthened by placing computer terminals in each customer location facilitating order placement, as well as providing a means of advance price and availability checking. While this information was previously made available to customers by phone on request, it is now provided instantly via telecommunication

links. Customers are thereby “Tied into” the firm in a way that makes it more difficult for them to change suppliers. In this case, it is the information technology and not the information itself (since the same information was available previously), which is the key factor in achieving improved customer relations (and thus meeting the firms strategic objective).

On the other hand, many organizations use information itself, rather than IT, as a strategic resource. For instance, an organization might have a strategy of expansion through acquisition of related businesses. Having identified criteria for evaluating potential acquisition, the organization now scans a commercial database to identify acquisition prospects that meet the criteria. In doing so, they are using new information or using available information in new ways to widen the range of firms that are considered and to make better strategic acquisition choices. In this case, therefore, it is the use of important new information or of available information in new ways that is the key to success. Although IT facilitates the processing of this information, it is not the technology itself (as in the earlier case) that provides the strategic advantage.

The primary distinction between these two approaches lies in the source of the value added. In the first example, the introduction of IT increased the value of existing information by providing easier and faster access. In the second, the information itself provided a strategic advantage through the new uses to which it is put.

In some situations, both IT and information can be used as a strategic resource. For example, an airline (such as American Airlines) had already pursued the use of IT by putting computer reservation terminals into travel agencies. Then it began to use the detailed information that it thereby obtained on supply and demand for various routes to manage optimally the availability of low-price seats on each of its flights. This ensures that it will capture much of

the business travellers demand for high priced unrestricted tickets as well as fill otherwise-empty seats with low-priced tickets that are sold with restrictions of timing, penalties for changing reservations and so on. (Airlines now call this strategy Yield management.) Thus, the airline used both IT and information for getting strategic advantage.

## **MIS - BUSINESS INTELLIGENCE SYSTEM**

The term 'Business Intelligence' has evolved from the decision support systems and gained strength with the technology and applications like data warehouses, Executive Information Systems and Online Analytical Processing (OLAP).

Business Intelligence System is basically a system used for finding patterns from existing data from operations.

### **Characteristics of BIS**

- It is created by procuring data and information for use in decision-making.
- It is a combination of skills, processes, technologies, applications and practices.
- It contains background data along with the reporting tools.
- It is a combination of a set of concepts and methods strengthened by fact-based support systems.
- It is an extension of Executive Support System or Executive Information System.
- It collects, integrates, stores, analyzes, and provides access to business information
- It is an environment in which business users get reliable, secure, consistent, comprehensible, easily manipulated and timely information.
- It provides business insights that lead to better, faster, more relevant decisions.

### **Benefits of BIS**

- Improved Management Processes.
- Planning, controlling, measuring and/or applying changes that results in increased revenues and reduced costs.
- Improved business operations.

- Fraud detection, order processing, purchasing that results in increased revenues and reduced costs.
- Intelligent prediction of future.

### **Approaches of BIS**

For most companies, it is not possible to implement a proactive business intelligence system at one go. The following techniques and methodologies could be taken as approaches to BIS:

- Improving reporting and analytical capabilities
- Using scorecards and dashboards
- Enterprise Reporting
- On-line Analytical Processing (OLAP) Analysis
- Advanced and Predictive Analysis
- Alerts and Proactive Notification
- Automated generation of reports with user subscriptions and "alerts" to problems and/or opportunities.

### **Capabilities of BIS**

- Data Storage and Management:
  - Data ware house
  - Ad hoc analysis
  - Data quality
  - Data mining
- Information Delivery
  - Dashboard
  - Collaboration /search
  - Managed reporting
  - Visualization

- Scorecard
- Query, Reporting and Analysis
  - Ad hoc Analysis
  - Production reporting
  - OLAP analysis

## **MODELS FOR STRATEGIC INFORMATION SYSTEM**

A company is said to have a competitive advantage over its rivals when it is able to sustain profits that exceed average for the industry. According to Porter, there are two primary methods for obtaining competitive advantage: cost advantage and differentiation advantage. So, the question becomes:

How can information technology be a factor in one or both of these methods?

In the sections below, we will explore this question using two of Porter's analysis tools: the value chain and the five forces model.

### **Strategic Grid**

As information technology becomes a bigger part of everyday business functions, many businesses find it increasingly difficult to assess the relationship between IT projects, business operations and business functions. The strategic grid offers a way to simplify the assessment.

#### **The Strategic Grid**

Strategic grid is a contingency approach that can be used to determine the strategic relevance of IT/IS to the organization. This grid is based on the current and future impact of IT/IS. The axes of the IT strategic grid portray the current (shown as the Y-axis) and future (X-axis) strategic importance of information systems activities to a firm. As shown in the figure, four quadrants are identified as "Strategic", "Turnaround", "Factory" and "Support".

McFarlan, in his 'strategic grid', identifies four types of information systems based on the role they play in an organization.

#### **Strategic systems:**

These systems involve applications that are critical for future competitive success of the enterprise. The typical example would be applications for customer services and resource management in banking and insurance sector. For a reasonably large sized manufacturing company, the strategic systems may have applications such as order management system, product profitability systems, sales forecast and market intelligence systems, manufacturing resource planning system (MRP II), etc. These systems offer benefits in the long run and involve large investments in IT infrastructure.

#### **Turnaround systems:**

These are high potential, high risk systems and are essentially experimental in nature. The proposals for such systems generally emanate from new business idea or opportunity that needs to be explored. The purpose of such applications, generally, is to give a test run and if found cost effective and feasible, it may be used for a variety of applications.

The typical applications in this class could be capacity planning system, data exchange link between the company and customers, suppliers etc. The typical cases of such systems would be in manufacturing enterprises.

#### **Factory systems:**

Automation of existing operations with the objective of improving performance in terms of speed, accuracy and cost savings by reduction of manpower or other resource requirements is the key feature of factory systems. These systems are low return; low risk applications and the likely benefits can be easily identified and estimated with a reasonable degree of accuracy. The application portfolio of factory systems is dominated by maintenance work.

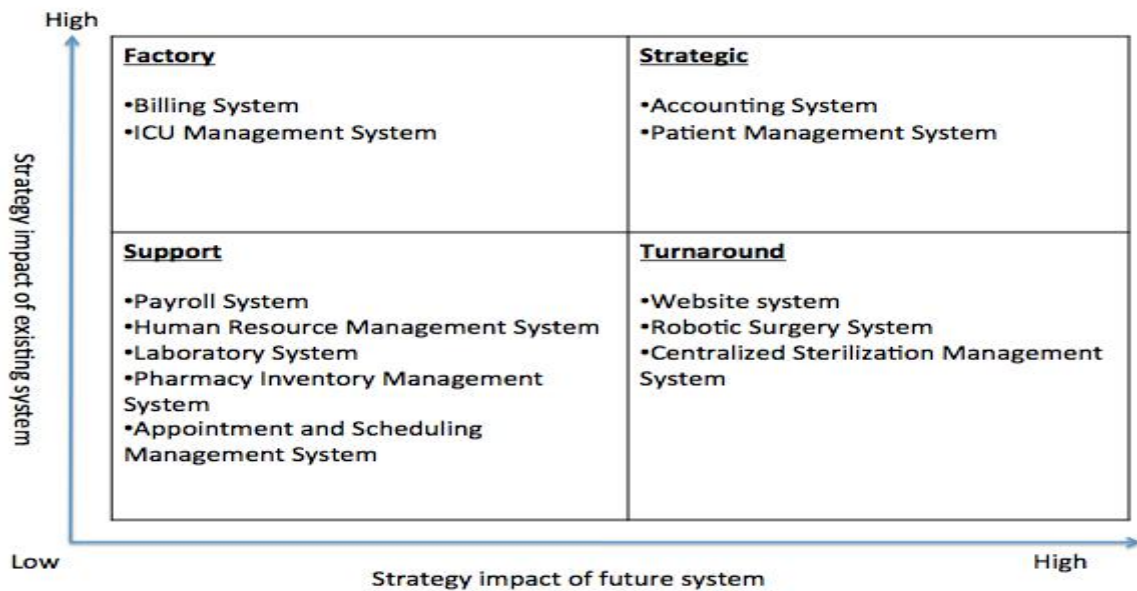
These applications are important as the operations are highly dependent on them and influence day-to-day functioning of the enterprise. They help in smooth operations and need to be totally reliable and cost effective as well. The billing and inventory management applications in a retail store would be a typical factory system. In a manufacturing enterprise, factory systems may also include applications such as shop-floor control, maintenance scheduling and product costing.

Incidentally, this has also been the traditional domain of IT applications. Benefits from such systems are easily identifiable and thus, find easy acceptability among managers responsible for operations.

## Support systems:

These systems relate to routine applications such as payroll, financial accounting, etc. Generally, the driving force behind the development of these applications is likely improvement in efficiency of the specific tasks and the statutory obligation of generating accurate and timely information for reporting to various external users. Such systems, therefore, need to work with lowest possible budget and serve the purpose.

*Figure 4 Strategic Grid*



The four IT/IS environments defined by the IT strategic grid framework suggest that each environment does require a different IT/IS management approach. IT/IS is of great strategic importance in some organizations, while it has minimal importance in others. Therefore, it is inappropriate to expect both types of organizations to place the same amount of emphasis on IT cost-cutting activities.

## Uses

The strategic grid provides both IT management and upper management an easy way to gauge the importance of any given IT project. This allows them to make better decisions, such as whether it is more cost efficient to outsource a particular IT function or keep it in-house. For example, a business might find it can save money by outsourcing upkeep on its customer forum, which probably falls in the support quadrant, rather than keeping it in-house.

## Value Chain Model

A series of activities undertaken by the company to produce a product or service. Each step in the value chain contributes to the overall value of a product or service. While the value chain may not be a perfect model for every type of company, it does provide a way to analyze just how a company is producing value. The value chain is made up of two sets of activities: primary activities and support activities.

The primary activities are the functions that directly impact the creation of a product or service. The goal of the primary activities is to add more value than they cost. The primary activities are:

- **Inbound logistics:** These are the functions performed to bring in raw materials and other needed inputs. Information technology can be used here to make these processes more efficient, such as with supply-chain management systems, which allow the suppliers to manage their own inventory.
- **Operations:** Any part of a business that is involved in converting the raw materials into the final products or services is part of operations. From manufacturing to business process management, information technology can be used to provide more efficient processes and increase innovation through flows of information.
- **Outbound logistics:** These are the functions required to get the product out to the customer. As with inbound logistics, IT can be used here to improve processes, such as allowing for real-time inventory checks. IT can also be a delivery mechanism itself.
- **Sales/Marketing:** The functions that will entice buyers to purchase the products are part of sales and marketing. Information technology is used in almost all aspects of this activity. From online advertising to online surveys, IT can be used to innovate product design and reach customers like never before. The company website can be a sales channel itself.
- **Service:** The functions a business performs after the product has been purchased to maintain and enhance the product's value are part of the service activity. Service can be enhanced via technology as well, including support services through websites and knowledge bases.

The support activities are the functions in an organization that support, and cut across, all of the primary activities. The support activities are:

- **Firm infrastructure:** This includes organizational functions such as finance, accounting, and quality control, all of which depend on information technology; the use of ERP systems is a good example of the impact that IT can have on these functions.
- **Human resource management:** This activity consists of recruiting, hiring, and other services needed to attract and retain employees. Using the Internet, HR departments can increase their reach when looking for candidates. There is also the possibility of allowing employees to use technology for a more flexible work environment.
- **Technology development:** Here we have the technological advances and innovations that support the primary activities. These advances are then integrated across the firm or within one of the primary activities to add value. Information technology would fall specifically under this activity.
- **Procurement:** The activities involved in acquiring the raw materials used in the creation of products and services are called procurement. Business-to-business e-commerce can be used to improve the acquisition of materials.

This analysis of the value chain provides some insight into how information technology can lead to competitive advantage.

Figure 5 value Chain Model

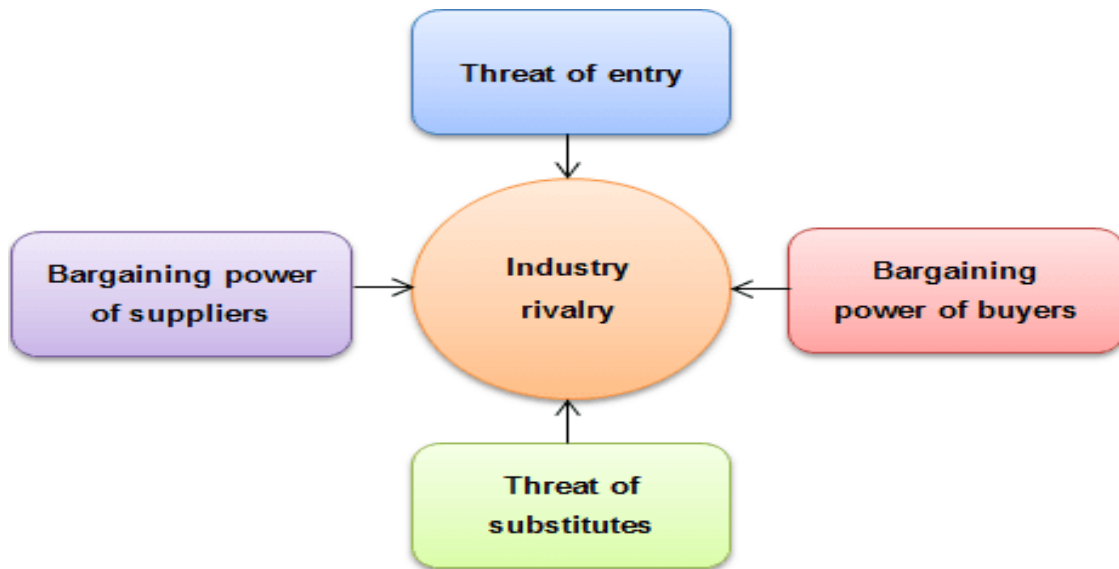




## PORTER'S FIVE FORCES

Porter developed the “five forces” model as a framework for industry analysis. This model can be used to help understand just how competitive an industry is and to analyze its strengths and weaknesses. The model consists of five elements, each of which plays a role in determining the average profitability of an industry

*Figure 6 PORTER'S FIVE FORCES*



- **Threat of substitute products or services:** How easily can a product or service be replaced with something else? The more types of products or services there are that can meet a particular need, the less profitability there will be in an industry. For example, the advent of the mobile phone has replaced the need for pagers. The Internet has made people more aware of substitute products, driving down industry profits in those industries being substituted.
- **Bargaining power of suppliers:** When a company has several suppliers to choose from, it can demand a lower price. When a sole supplier exists, then the company is at the mercy of the supplier. For example, if only one company makes the controller chip for a car engine, that company can control the price, at least to some extent. The Internet has given companies access to more suppliers, driving down prices. On the other hand, suppliers now also have the ability to sell directly to customers.

- **Bargaining power of customers:** A company that is the sole provider of a unique product has the ability to control pricing. But the Internet has given customers many more options to choose from.
- **Barriers to entry:** The easier it is to enter an industry, the tougher it will be to make a profit in that industry. The Internet has an overall effect of making it easier to enter industries. It is also very easy to copy technology, so new innovations will not last that long.
- **Rivalry among existing competitors:** The more competitors there are in an industry, the bigger a factor price becomes. The advent of the Internet has increased competition by widening the geographic market and lowering the costs of doing business. For example, a manufacturer in Southern California may now have to compete against a manufacturer in the South, where wages are lower.

Porter's five forces are used to analyze an industry to determine the average profitability of a company within that industry. Adding in Porter's analysis of the Internet, we can see that the Internet (and by extension, information technology in general) has the effect of lowering overall profitability. While the Internet has certainly produced many companies that are big winners, the overall winners have been the consumers, who have been given an ever-increasing market of products and services and lower prices.

### **Using Information Systems for Competitive Advantage**

Now that we have an understanding of competitive advantage and some of the ways that IT may be used to help organizations gain it, we will turn our attention to some specific examples. A strategic information system is an information system that is designed specifically to implement an organizational strategy meant to provide a competitive advantage. These sorts of systems began popping up in the 1980s, as noted in a paper by Charles Wiseman entitled "Creating Competitive Weapons from Information Systems."

Specifically, a strategic information system is one that attempts to do one or more of the followings:

- deliver a product or a service at a lower cost;
- deliver a product or service that is differentiated;
- help an organization focus on a specific market segment;

- enable innovation.

Following are some examples of information systems that fall into this category.

1. Business Process Management Systems
2. Electronic Data Interchange
3. Collaborative Systems
4. Decision Support Systems

## **STRATEGIES FOR COMPETITIVE ADVANTAGE**

**Cost leadership strategy:** Produce products and/or services at the lowest cost in the industry. A firm achieves cost leadership in its industry by thrifty buying practices, efficient business processes, forcing up the prices paid by competitors, and helping customers or suppliers reduce their costs.

**Differentiation strategy:** Offer different products, services, or product features. By offering different, “better” products companies can charge higher prices, sell more products, or both.

**Niche strategy:** Select a narrow-scope segment (niche market) and be the best in quality, speed, or cost in that market.

**Growth strategy:** Increase market share, acquire more customers, or sell more products. Such a strategy strengthens a company and increases profitability in the long run.

**Alliance strategy:** Work with business partners in partnerships, alliances, joint ventures, or virtual companies.

**Innovation strategy:** Introduce new products and services, put new features in existing products and services, or develop new ways to produce them. Innovation is similar to differentiation except that the impact is much more dramatic.

**Operational effectiveness strategy:** Improve the manner in which internal business processes are executed so that a firm performs similar activities better than rivals. Such improvements increase employee and customer satisfaction, quality, and productivity while decreasing time to market. Improved decision making and management activities also contribute to improved efficiency.

**Customer-orientation strategy:** Concentrate on making customers happy, as is the case with RadioShack Online. Strong competition and the realization that the customer is king (queen) is the basis of this strategy.

**Time strategy:** Treat time as a resource, then manage it and use it to the firm's advantage. "Time is money," "Internet time" (i.e., three months on the Internet is like a year in real time), first-mover advantage, just-in-time delivery or manufacturing, competing in time, and other time-based competitive concepts emphasize the importance of time as an asset and a source of competitive advantage. One of the driving forces behind time as a competitive strategy is the need for firms to be immediately responsive to customers, markets, and changing market conditions.

**Entry-barriers strategy:** Create barriers to entry. By introducing innovative products or using IT to provide exceptional service, companies can create barriers to entry from new entrants.

**Lock in customers or suppliers strategy:** Encourage customers or suppliers to stay with you rather than going to competitors. Locking in customers has the effect of reducing their bargaining power.

**Increase switching costs strategy:** Discourage customers or suppliers from going to competitors for economic reasons.