Strategic information systems

Introduced in 1982 by Dr. Charles Wiseman and primarily used within the field of information systems, strategic information systems are created in response to business initiatives to provide a competitive advantage.

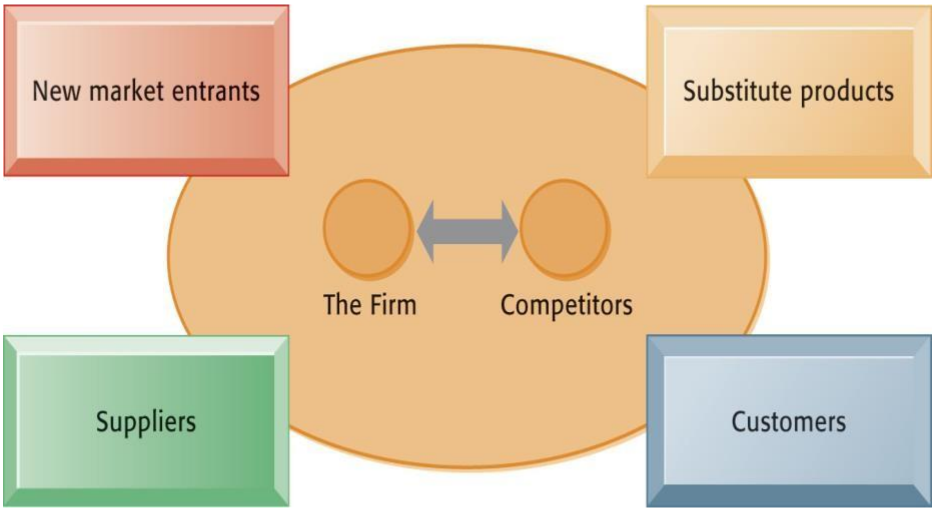
Strategic information systems are the information systems that companies use to help achieve their goals and become more efficient. Businesses use these systems to achieve a competitive advantage on their competitors as they seek to provide a good or service in a way that is better than that of their competition. For example, a strategic information system can be used to provide a product at a lower cost than competing organizations.

The strategic role of information systems involves using information technology to develop products, services, and capabilities that give a company strategic advantages over the competitive forces it faces in the global marketplace. This creates ***strategic information systems,*** information systems that support or shape the competitive position and strategies of an enterprise. So a strategic information system can be any kind of information system (TPS, MIS, DSS, etc.) that helps an organization:

1. Gain a competitive advantage
2. Reduce a competitive disadvantage
3. Meet other strategic enterprise objectives

According to Michael Porter, a firm can survive and succeed in the long run if it successfully develops strategies to confront five ***competitive forces*** that shape the structure of competition in its industry. These include:

1. Rivalry of competitors within its industry
2. Threat of new entrants
3. Threat of substitutes
4. Bargaining power of customers
5. Bargaining power of suppliers



Factors That Lead Firms to Seek Competitive Advantage

A number of factors can lead to attaining a competitive advantage. Michael Porter, a prominent management theorist, suggested a now widely accepted competitive forces model, also called the **five-forces model**.

Rivalry Among Existing Competitors
Typically, highly competitive industries are characterized by high fixed costs of entering or leaving the industry, low degrees of product differentiation, and many competitors. Although all firms are rivals with their competitors, industries with stronger rivalries tend to have more firms seeking competitive advantage. To gain an advantage over

competitors, companies constantly analyze how they use their resources and assets. This *resource-based view* is an approach to acquiring and controlling assets or resources that can help the company achieve a competitive advantage. For example, a transportation company might decide to invest in radio-frequency technology to tag and trace products as they move from one location to another.

Threat of New Entrants

A threat appears when entry and exit costs to an industry are low and the technology needed to start and maintain a business is commonly available. For example, a small restaurant is threatened by new competitors. Owners of small restaurants do not require millions of dollars to start the business, food costs do not decline substantially for large volumes, and food processing and preparation equipment is easily available. When the threat of new market entrants is high, the desire to seek and maintain competitive advantage to dissuade new entrants is also usually high.

Threat of Substitute Products and Services

Companies that offer one type of goods or services are threatened by other companies that offer similar goods or services. The more consumers can obtain similar products and services that satisfy their needs, the more likely firms are to try to establish competitive advantage. For example, consider the photographic industry. When digital cameras became popular, traditional film companies had to respond to stay competitive and profitable. Traditional film companies, such as Kodak and others, started to offer additional products and enhanced services, including digital cameras, the ability to produce digital images from traditional film cameras, and Web sites that could be used to store and view pictures.

Bargaining Power of Customers and Suppliers

Large customers tend to influence a firm, and this influence can increase significantly if the customers can threaten to switch to rival companies. When customers have a lot of bargaining power, companies increase their competitive advantage to retain their customers. Similarly, when the bargaining power of suppliers is strong, companies need to improve their competitive advantage to maintain their bargaining position. Suppliers can also help an organization gain a competitive advantage. Some suppliers enter into strategic alliances with firms and eventually act as a part of the company. Suppliers and companies can use telecommunications to link their computers and personnel to react quickly and provide parts or supplies as necessary to satisfy customers. Government agencies are also using strategic alliances. The investigative units of the U.S. Customs and Immigration and Naturalization Service entered into a strategic alliance to streamline investigations.

Response Strategies

The purpose of identifying competitive forces is to enable an organization to develop a *strategy* aimed at establishing a profitable and sustainable position *against* these five forces. To do so, a company needs to develop a strategy of performing activities differently from its competitors. Porter proposed the following three response strategies to competitive forces.

1. ***Cost leadership strategy:*** Producing products and/or services at the lowest cost in the industry. An example is Wal-Mart, which through business alliances supported by

computers and by computerized purchasing and inventory management is able to provide low-cost products at its stores.

2. ***Differentiation strategy:*** Being unique in the industry, such as providing high quality products at a competitive price. For example, using an extranet and a computerized inventory system, Caterpillar provides its customers with a product maintenance service that no other competitor can match.
3. ***Focus strategy:*** Selecting a narrow-scope segment (*niche market*) and achieving either a cost leadership or a differentiation strategy in this segment. For example, several computer chip manufacturers make customized chips for specific industries or companies. Another example is frequent flyer programs that allow airlines to identify frequent travelers and offer them special incentives. Some airlines have several million customers registered in the programs, which can be managed efficiently only with the help of computers.

Over the years, Porter and others have added to the list of response strategies. The major extensions are the following.

- ***Growth strategy:*** Increasing market share, acquiring more customers, or selling more products by using electronic commerce to strengthen a company and increase profitability in the long run.
- ***Alliances strategy:*** Working with business partners. Facilitated by EDI, extranets, and groupware, this strategy creates synergy, allows companies to concentrate on their core business, and provides opportunities for growth.
- ***Innovation strategy:*** Developing new products and services, new features in existing products and services, and new ways to produce or sell them (for example, via the Internet). Also included are innovative information systems applications.
- ***Internal efficiency strategy:*** Improving the manner in which business processes are executed (for example, by using CAD/CAM). 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-oriented strategy:*** Concentrating on making customers happy. Strong competition and the realization that the customer is king/queen is the basis of this approach. IT contributions to this strategy include improved customer service facilitated by e-mail or computerized catalogs, for example.

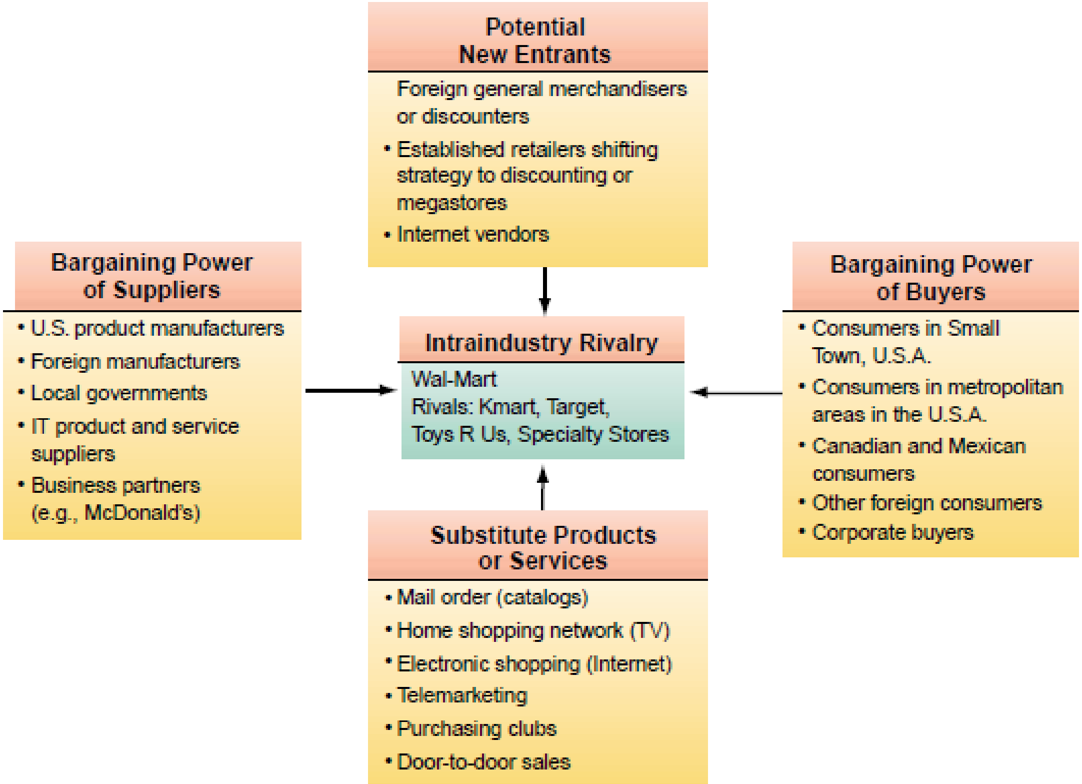
These strategies may be interrelated. For example, some innovations are achieved through alliances that reduce cost and increase growth. Cost leadership improves customer satisfaction and may lead to growth.

How the Model is used

Porter’s model is industry related, assessing the position of a company relative to competitors in its industry. The specific actions suggested by use of the model do not necessarily relate to IT. However, in most cases, response strategies these days do involve the use of IT. We’ll use Wal-Mart (see Figure 13.2) as an example to demonstrate the four steps involved in using Porter’s model.

Step 1: List the players in each competitive force. An illustration of a competitive threat, for example, is electronic shopping via the Internet, which may be a substitute for going shopping at a Wal-Mart store.

Step 2: Relate the major determinants of each force to each player listed in Figure below. For example, with respect to electronic shopping, we can check the switching cost of the buyers, the buyers' propensity to substitute, the price advantage of electronic shopping, and so forth.



Step 3: Devise a strategy with which Wal-Mart can defend itself against these forces, based on the specific players and the determinants. For example, to counter electronic shopping, Wal-Mart could provide playgrounds for children, hand out free samples of products, and recognize frequent shoppers personally. Wal-Mart could also respond by imitating the competition; the company actually did just that by introducing Wal-Mart Online.

Step 4: Look for supportive information technologies. An illustration of this step for Wal-Mart's online shopping is a technology for managing frequent shoppers. It will be necessary to use a gigantic database and an online processing system with a good database management system and analytical capability to assess shoppers' activities accurately.

Of course, a similar process using Porter's model can be employed by Wal-Mart's competitors. A competitor can portray all the determinants and then look for response strategies and information technologies to increase the competitive pressure on Wal- Mart.

COMPETITIVE ADVANTAGE

A **competitive strategy** is a broad-based formula for how a business is going to compete, what its goals should be, and what plans and policies will be required to carry out those goals (Porter, 1985). Through its competitive strategy an organization seeks a **competitive advantage** in an industry—an advantage over competitors in some measure such as cost, quality, or speed.

Competitive advantage is at the core of a firm's success or failure (Porter and Millar, 1985, and Porter, 1996); such advantage seeks to lead to control of the market and to larger-than-average profits. A strategic information system helps an organization gain a competitive advantage through its contribution to the strategic goals of an organization and/or its ability to significantly increase performance and productivity. An SIS enables companies to gain competitive advantage and to benefit greatly at the expense of those that are subject to competitive disadvantage.

Competitive advantage in the digital economy is even more important than in the old economy, as will be demonstrated throughout this chapter. For some businesses the impact of the digital economy is revolutionary. Frequent changes in technologies and markets and the appearance of new business models can introduce radical changes in industry structure (Deise et al., 2000) and the nature of competition can shift rapidly (Afuah and Tucci, 2003, and Choi and Whinston, 2000).

At the same time, the digital economy has not changed the *core business* of most firms. For most businesses, Internet technologies simply offer the tools, sometimes very powerful tools that can increase their success through their traditional sources of competitive advantage — be that low cost, excellent customer service, or superior supply chain management. For the overwhelming majority of businesses, the first step to competitive advantage in the digital economy is to ask and answer the question, "Where, given my industry and position, does my competitive advantage come from?" Then the follow-up question, "How can information technology, especially the Internet, help my business?" will be easier to answer (Bithos, 2001).

Strategic Planning for Competitive Advantage

To be competitive, a company must be fast, nimble, flexible, innovative, productive, economical, and customer oriented. It must also align it IS strategy with general business strategies and objectives. Given the five market forces previously mentioned, Porter and others have proposed a number of strategies to attain competitive advantage, including cost leadership, differentiation, niche strategy, altering the industry structure, creating new products and services, and improving existing product lines and services.37 In some cases, one of these strategies becomes dominant. For example, with a cost leadership strategy, cost can be the key consideration, at the expense of other factors if need be.

- **Cost leadership.** Deliver the lowest possible cost for products and services. Wal-Mart and other discount retailers have used this strategy for years. Cost leadership is often achieved by reducing the costs of raw materials through aggressive negotiations with suppliers, becoming more efficient with production and manufacturing processes, and reducing warehousing and shipping costs. Some companies use outsourcing to cut costs when making products or completing services.
- **Differentiation.** Deliver different products and services. This strategy can involve producing a variety of products, giving customers more choices, or delivering higher quality products and services. Many car companies make different models that use the

same basic parts and components, giving customers more options. Other car companies attempt to increase perceived quality and safety to differentiate their products and appeal to consumers who are willing to pay higher prices for these features. Companies that try to differentiate their products often strive to uncover and eliminate counterfeit products produced and delivered by others. Some believe counterfeit products cost companies about $600 billion annually. To distinguish their products from fakes, microscopic particles or other markers are inserted to allow companies, government regulators, and law enforcement agencies to distinguish genuine products from bogus ones. • **Niche strategy.** Deliver to only a small, niche market. Porsche, for example, doesn't produce inexpensive station wagons or large sedans. It makes high-performance sports cars and SUVs. Rolex only makes high-quality, expensive watches. It doesn't make inexpensive, plastic watches that can be purchased for $20 or less

- **Altering the industry structure.** Change the industry to become more favorable to the company or organization. The introduction of low-fare airline carriers, such as Southwest Airlines, has forever changed the airline industry, making it difficult for traditional airlines to make high profit margins. To fight back, airlines such as United launched their own low-fare flights. Creating strategic alliances can also alter the industry structure. A **strategic alliance**, also called a **strategic partnership**, is an agreement between two or more companies that involves the joint production and distribution of goods and services.

- **Creating new products and services.** Introduce new products and services periodically or frequently. This strategy always helps a firm gain a competitive advantage, especially for the computer industry and other high-tech businesses. If an organization does not introduce new products and services every few months, the company can quickly stagnate, lose market share, and decline. Companies that stay on top are constantly developing new products and services. A large U.S. credit-reporting agency, for example, can use its information system to help it explore new products and services in different markets.

- **Improving existing product lines and services.** Make real or perceived improvements to existing product lines and services. Manufacturers of household products are always advertising new and improved products. In some cases, the improvements are more perceived than actual refinements; usually, only minor changes are made to the existing product, such as to reduce the amount of sugar in breakfast cereal. Some direct-order companies are improving their service by using Radio Frequency Identification (RFID) tags to identify and track the location of their products as they are shipped from one location to another. Customers and managers can instantly locate products as they are shipped from suppliers to the company, to warehouses, and finally to customers.

- **Other strategies.** Some companies seek strong g*rowth* in sales, hoping that it can increase profits in the long run due to increased sales. Being the *first to market* is another competitive strategy. Apple Computer was one of the first companies to offer complete and ready-to-use personal computers. Some companies offer *customized* products and services to achieve a competitive advantage. Dell, for example, builds custom PCs for consumers. *Hire the best people* is another example of a competitive strategy. The assumption is that the best people will determine the best products and services to deliver to the market and the best approach to deliver these products and services. Companies can also combine one or more of these strategies. In addition to customization, Dell attempts to offer low-cost computers (cost leadership) and top-notch service (differentiation).

How do the organizations use their strategic information systems for gaining competitive advantage

A Strategic Information System can offer competitive advantage to an organization in the following ways:

1) **Creating barriers to competitor's entry**: In this strategy, an organization uses information systems to provide products or services that are difficult to duplicate or that are used to serve highly specialized markets. This prevents the entry of competitors as they find the cost for adopting a similar strategy very high.

2) **Generating databases to improve marketing**: An information system also provides companies an edge over their competition by generating databases to improve their sales and marketing strategies. Such systems treat existing information as a resource. For example, an organization may use its databases to monitor the purchase made by its customers, to identify different segments of the market, etc.

3) **'Locking in' customers and suppliers**: Another way of gaining competitive advantage is by locking in customers and suppliers. In this concept, information systems are used to provide such advantages to a customer or a supplier that it becomes difficult for them to switch over to a competitor. For example, an organization may develop its information system and give many benefits to its customers, like reliable order filling, reduced transaction costs, increased management support and faster delivery service.

4) **Lowering the costs of the products**: strategic information systems may also help organizations lower their internal costs, allowing them to deliver products and services at a lower price than their competitors can provide. Thus such information systems can contribute to the survival and growth of the organization. For example, airlines use information systems strategically to lower costs so that they may counter competitor's discount fares.

5) **Leveraging technology in the value chain**: This approach pinpoints specific activities in the business where competitive strategies can be best applied and where information systems are likely to have a greater strategic impact. This model advocates that information technology can best be used to gain competitive advantages by identifying specific, critical leverage points.

The Role of IT in Strategic Systems

Information technology contributes to strategic systems in several ways. Consider these four:

1. Information technology creates *applications* that provide direct strategic advantage to organizations. For example, Federal Express was the first company in its industry to use information technology for tracking the location of every package in its system.
2. IT supports strategic changes such as *reengineering*. For example, IT allows efficient decentralization by providing high-speed communication lines, and it streamlines and shortens product design time with computer-aided engineering tools.
3. IT provides for technological *innovations* or acts as an enabler of innovation. These can be incorporated in the firm's goods or services, or affect how those are provided.
4. IT provides *competitive intelligence* by collecting and analyzing information about innovations, markets, competitors, and environmental changes. Such information provides strategic advantage: If a company knows something important before its competitors, or if it can make the correct interpretation of information before its competitors, then it can introduce changes first and benefit from them.

Competitive Intelligence

Information about the competition can mean the difference between winning and losing a business battle. Many companies continuously monitor the activities of their competitors. For example, Hertz monitors car rental prices of its competitors on a daily basis, and Kraft, the giant food maker, closely monitors the performance of its competitors. Such activities to gather information on competitors are part of competitive intelligence. Information about markets, technologies, and government's actions is also collected by competitive intelligence. Competitive intelligence drives business performance by increasing market knowledge and raising the quality of strategic planning.

Competitive intelligence can be enhanced by several information technologies, including intelligent agents. Research indicates that the percentage of companies using IT to support competitive intelligence increased from 31 percent in 1993 to about 50 percent in 1999. This increase is due primarily to the use of the Internet. The Internet plays an increasingly important role in supporting competitive intelligence. Using Internet tools, a company can implement specific search strategies to gather competitive intelligence easily, quickly, and relatively inexpensively.

There is another aspect to competitive intelligence: industrial espionage. Corporate spies are looking for marketing plans, cost analyses, new products/services, and strategic plans. Such espionage can sometimes be unethical or illegal. Another problem is the theft of portable computers at conferences, which is spreading all over the world. Many of the thieves are interested in the information stored in the computers, not in the computers themselves.

What is organizational communication?

Organizational communication is difficult to define. Richmond and McCroskey (2009) describe it as 'the process by which individuals stimulate meaning in the minds of other individuals, by means of verbal and nonverbal messages in the context of a formal organization'. Pace and Faules (1994, p. 20) suggest it is 'the display and interpretation of messages among communication units who are part of a particular organization. An organization is comprised of communication units in hierarchical relations to each other and functioning in an environment'.

Communication flows

In understanding organizations and the patterns of communication within them, one of the critical concepts is directionality. **Vertical** communication refers to sending and receiving messages between the levels of a hierarchy, whether downward or upward. **Horizontal** communication refers to sending and receiving messages between individuals at the same level of a hierarchy.

Downward communication, used mainly to communicate messages from the more powerful to the less powerful, is perhaps the most common form of communication in organizations. Such communication involves instructions, budget approvals or non-approvals, policy statements, variations in standard operating procedures and notification of other changes, general announcements, briefings, and expression of goals, objectives and mission statements. These messages may be transmitted via memos, email, notices and other individual-to-group or individual-to-individual channels; or they may be conveyed indirectly, passed on by others in the hierarchy. During the transfer, the original message may be edited, augmented, reduced, explained or distorted.

Time and again, however, top-down communication attempts fail, and that failure is often not grasped by those at the top of the hierarchy.

Upward communication may in some circumstances be even more important than downward communication. Upward communication channels convey data about and from customers, data about production of goods and services, and the intelligence that is needed in the day-to-day operation of an organization.

This intelligence can be gathered if those at upper levels of an organization are skilled in listening and gathering feedback, and are committed to 'strategic listening' to customers and to organizational transparency. If there is no commitment to such approaches, then a 'culture of silence' and/or a 'culture of silos' will probably prevail, which may well have serious consequences for the organization: with no early warnings of impending disaster, it may even result in large-scale crisis. In such situations, no news is definitely bad news, and bad news is no news: staff at lower levels will be loath to give bad news — which may be vital to the organization's survival. If it will not be listened to, or worse, will attract criticism — a 'shoot-the-messenger' culture or ethos in which those who point out truths are punished for their efforts will develop.

Upward communication can also be a fertile source of new ideas and creative problem solving, primarily because people in the lower parts of a hierarchy are closer to specific problems and may be more aware of practical solutions than people further up the hierarchy.

Lateral or horizontal communication takes place primarily at one level of the organization — for example, within teams, among heads of department, among others in coordination and liaison roles, or among virtually everyone at the lower levels of the pyramid (Adams 2007).

It is sometimes quicker and more effective for messages to travel horizontally than upward, downward or across an organization. Nevertheless, good horizontal communication is often impaired by rivalry, territorial behavior and over-specialization of job functions, which erects barriers leading to ingroup/out-group exclusion, the use of jargon and other excluding codes, and a reluctance to share information.

Diagonal communication cuts across vertical and horizontal dimensions. For example, a junior staff member may 'go over the head' of his or her immediate superior and telephone, email or visit a senior technical expert in another area to get information (note in particular these interactions in the informal organization). Wilson (1992) found that in low-performing organizations, staff used diagonal communication to seek information on the proper application of existing job procedures, while in high-performing organizations; staff used diagonal communication to seek information needed to solve complex and difficult work-related problems. While diagonal communication may be a sign of flexibility — for example, in organic organizations — it will obviously cause problems and perhaps chaos if taken to extremes.