MANAGEMENT INFORMATION SYSTEMS

Chapter Four: Information Systems Management & Strategy

Learning Objectives

By the end of this chapter the learner shall be able to;

1. Identify and describe important features of organizations that managers need to know about in order to build and use information systems successfully.
2. Evaluate the impact of information systems on organizations.
3. Assess how information systems support the activities of managers in organizations.
4. Analyze how information systems support various business strategies for competitive advantage.
5. Assess the challenges posed by strategic information systems and management solutions.

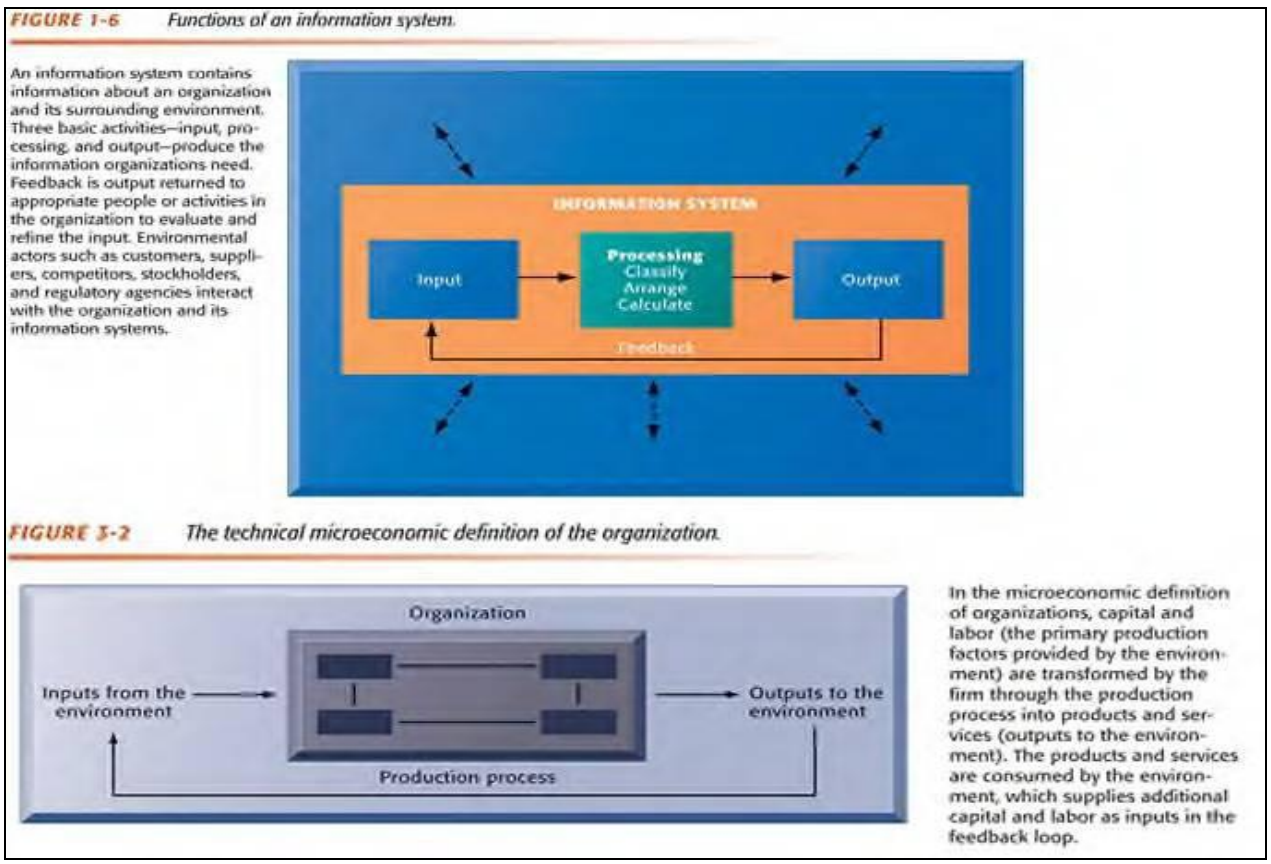
4.1. Organizations and Information Systems

Information systems and organizations influences each other. IS are built by managers to serve the interests of the business firm.

The interaction between IT and organization is complex and is influenced by many mediating factors including the organization's structure, business processes politics, culture, surrounding environment and management decisions

4.2 What Is an Organization?

An organization is a stable, formal social structure that takes resources from the environment and processes them to produce outputs. This technical definition focuses on three elements of an organization. Capital and labor are primary production factors provided by the environment. The organization (the firm) transforms these inputs into products " and services in a production function. The products and services are consumed by environments in as shown in the diagram next.



An organization is more stable than an informal group (such as a group of friends that meets every Friday for lunch) in terms of longevity and routineness. Organizations are formal legal entities with internal rules and procedures,

which must abide by laws. Organizations are also social structures because they are a collection of social elements, much as a machine has a structure a particular arrangement of valves, cams, shafts, and other parts.

This definition of organizations is powerful and simple, but it is not very descriptive or even predictive of real-world organizations. A more realistic behavioral definition of an, organization is that it is a collection of rights, privileges, obligations, and responsibilities that is delicately balanced over a period of time through conflict and conflict resolution. In this behavioral view of the firm, people who work in organizations develop customary ways of working; they gain attachments to existing relationships; and they make arrangements with subordinates and superiors about how work will be done, the amount of work that will be done, and under what conditions work will be done.

4.3 Common Features of Organizations

All modern organizations have certain characteristics;

- They are bureaucracies with clear-cut divisions of labour and specialization.
- They arrange specialists in a hierarchy of authority in which everyone is accountable to someone and authority is limited to specific actions governed by abstract rules or procedures.
- Rules and procedures create a system of impartial and universal decision making.
- Organizations try to hire and promote employees on the basis of technical qualifications and professionalism.
- Organizations are devoted to the principle of efficiency; maximizing output using limited inputs.
- Others include; business processes organizational culture organizational politics, surrounding environments structure, goals, constituencies and leadership styles.

TABLE 3-1 Structural Characteristics of All Organizations

Clear division of labor
Hierarchy
Explicit rules and procedures
Impartial judgments
Technical qualifications for positions
Maximum organizational efficiency

4.4. Information Systems Strategy

- IS strategy is the plan an organization uses in providing information services. IS allows a company to implement its business strategy

- An information systems strategy brings together the business aims of the company, an understanding of the information needed to support those aims, and the implementation of computer systems to provide that information. It is a plan for the development of systems towards some future vision of the role of information systems in the organizations

IS strategy has four distinct components: the information strategy, the information technology strategy, the information management strategy and the change management/ implementation strategy.

The Information Strategy

An information strategy describes the overall direction and general framework in which the organization's information resources and processes should be managed so that the organization would achieve its most important goals.

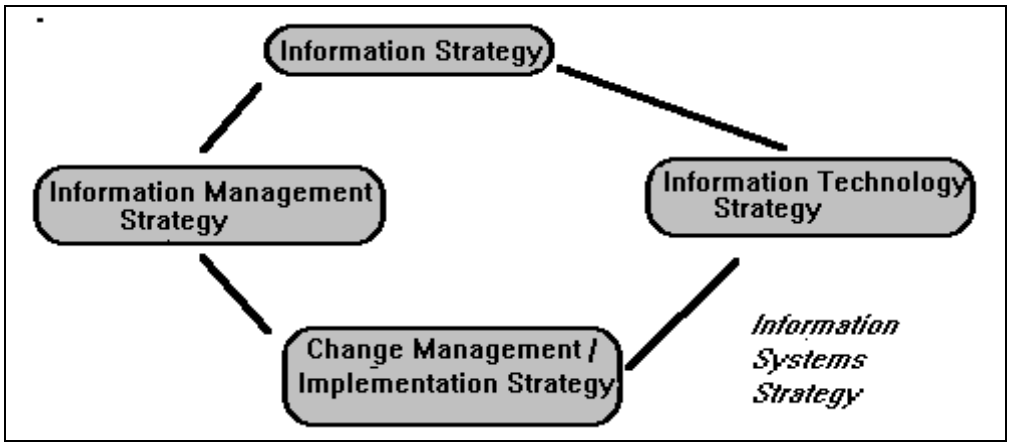
It answers the questions: what information is required? and where is the information required to support the primary tasks, or key goals, of the business strategy.

The Information Technology Strategy
The IT strategy is concerned with the technological infrastructure necessary to fulfil the requirements of the information strategy. The I.T. strategy is concerned with the planning, introduction and use of IT resources for the benefit of the whole organisation. It is thus concerned with applications and platforms, the 'nuts and bolts' of how to provide the information.

The Information Systems Strategy is one part of the business strategy. It will inevitably require resources and it may require a change in working practices within the organisation.

The Information Management Strategy
The Information Management Strategy is concerned with how the information services are organised for the different facets of the organization (i.e., centralised, distributed, out-sourced) and policy issues such as who gets access and what level of access they receive.

The Change Management/ Implementation Strategy
The Change Management/ Implementation Strategy will identify what organisational change will be needed for the information systems strategy to be successful and when it will be implemented and by whom. Importantly, those who will implement the strategy should be involved in its formulation and specific plans and budgets should be drawn into the process here.



Business Strategy?

- A **business strategy** is a well-articulated vision of where a business seeks to go and how it expects to get there. It is the form by which a business communicates its goals.
- Every business should have a business strategy - this is a long-term plan which shows the direction the business is taking. The business strategy provides an agreed set of objectives for the business.
- A business strategy is important because it allows resources to be targeted and also because it allows the shareholders, customers, banks and employees (the "stakeholders" of the business) to see that the business is taking account of their interests.

Factors the influence IS Strategy

- Management organisation and functions.
- Planning and decision-making methods.
- General organisational structure. Hierarchical structure in most organisations, meaning the communication of data must be up and down the different levels.
- Responsibility for Information Systems within an organisation. Done by the IT department, best done by coordination throughout the organisation than by individual management responsibility areas.
  Networked centrally held data is the most efficient system.
  Individual managers who set up their own systems within the organisation may be compromising data security, and the data protection act. They will probably duplicate much of the data held centrally making it an inefficient system.

- Hardware and Software. Many organisations use the existing hardware and software and adapt as change is necessary. This usually means a compromise system. New developments communicate with older systems i.e. a new MIS system and an existing data processing system.
- Standards.
- Behavioural factors. Staff attitude and cooperation when change is necessary, especially senior managers.
  Staff motivation for new systems must be good, a factor will be how good the 'man management' is of the individual managers.
  Cooperation between managers of different departments essential, not one department getting a system that is good for them but poor for the rest of the organisation.
- The efficiency of information flows.

Factors that affect the flow of information and data within an organisation:

- Organisational structure, - *staff levels*.
- Geographical structure, - *branches, network.*
- Validity of the data, - *correct data, checks*.
- Volume of data to be collected and input, - *seasonal, weekend increases affect flow.*
- The processing cycle, - *weekly reports*.
- The specification of the reports, - *technical*
- The report timing cycle, - *periodically, interim*.
- The report distribution cycle, - *senior first, time delay*.
- Compatibility of software across departments,
- Data collection and input of data, - *auto entry, or input.*
- Formal or informal requests, - *auto, or requested.*
- Review of information flow, - *interview, questionnaire, inspection, tracking, examination.*

4.5 Strategic advantages of Information Technology

Three major roles of the business applications of information systems include:

- Support Business Processes – involves dealing with information systems that support the business processes and operations in a business.
- Support Decision Making – help decision makers to make better decisions and attempt to gain a competitive advantage.
- Support Competitive Advantage – help decision makers to gain a strategic advantage over competitors requires innovative use of information technology.

Competitive Strategy Concepts:

Information technology can change the way businesses compete. For this reason, you should view information systems strategically, that is, as vital competitive networks, as a means of organizational renewal, and as a necessary investment in technologies that help an enterprise achieve its strategic objectives

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

A variety of ***competitive strategies*** can be developed to help a firm confront these competitive forces. These include

Cost Leadership Strategy

- Become a low-cost producer of products and services
- Find ways to help suppliers or customers reduce their costs
- Increase the costs of competitors.

Differentiation Strategy

- Develop ways to differentiate products and services from competitors.
- Reduce the differentiation advantages of competitors.

Innovation Strategy

Find new ways of doing business:

- develop new products & services
- enter new markets or marketing segments.
- establish new business alliances
- find new ways of producing products/services
- find new ways of distributing products/services

Growth Strategies

- Significantly expand the company=s capacity to produce goods and services.
- Expand into global markets
- Diversify into new products and services
- Integrate into related products and services.

Alliance Strategies

Establish new business linkages and alliances with customers, suppliers, competitors, consultants and other companies (mergers, acquisitions, joint ventures, forming virtual companies, etc.).

4.6. Strategic Roles for Information Systems:

Information technology can be used to implement a variety of competitive strategies. These include the five basic competitive strategies (differentiation, cost, innovation, growth, alliance), as well as other ways that companies can use information systems strategically to gain a competitive edge. For example:

1. Lower Costs
2. Differentiate
3. Innovate
4. Promote Growth
5. Develop Alliances
6. Improve quality and efficiency
7. Build an IT platform
8. Other strategies
   - use inter-organizational information systems to create switching costs that lock in customers and suppliers.
   - use investments in IT to build barriers to entry against industry outsiders.
   - use IT components to make substitution of competing products unattractive

Improving Business Processes:

Investments in information technology can help make a firm's operational processes substantially more efficient, and its managerial processes much more effective. By making such improvements to its business processes a firm may be able to:

1. Dramatically cut costs
2. Improve the quality and customer service
3. Develop innovative products for new markets

Promoting Business Innovation

Investments in information systems technology can result in the development of new products, services, and processes. This can:

1. Create new business opportunities
2. Enable a firm to enter new markets
3. Enable a firm to enter into new market segments of existing markets.

Lock In Customers & Suppliers

Investments in information technology can also allow a business to ***lock in customers and suppliers*** (and lock out competitors) by building valuable new relationships with them. This can be accomplished by:

1. Deters both customers and suppliers from abandoning a firm for its competitors or intimidating a firm into accepting less profitable relationships.
2. Offer better-quality service to customers allows a company to differentiate themselves from their competitors.
3. Create ***inter-organizational information systems*** in which telecommunications networks electronically link the terminals and computers of businesses with their customers and suppliers, resulting in new business alliances and partnerships.

Creating Switching Costs

A major emphasis in strategic information systems is to build ***switching costs*** into the relationships between a firm and its customers or suppliers. That is, investments in information systems technology can make customers or suppliers dependent on the continued use of innovative, mutually beneficial inter-organizational information systems. Then, they become reluctant to pay the cost in time, money, effort, and inconvenience that it would take to change to a firm's competitors.

Raising Barriers to Entry

Investment in information technologies that increase operational efficiency can erect ***barriers to entry*** for new players in the industry, and can discourage firms already in the market. This can be accomplished by:

1. Increasing the amount of investment or the complexity of the technology required to compete in a market segment.
2. Discourage firms already in the industry and deter external firms from entering the industry.

Leveraging a Strategic IT Platform

Information technology enables a firm to build a ***strategic IT platform*** that allows it to take advantage of strategic opportunities. Typically, this means acquiring hardware and software, developing telecommunications networks, hiring information system specialists, and training end users. A firm can then ***leverage investment in information technology*** by developing new products and services.

Developing a Strategic Information Base

Information systems allow a firm to develop a ***strategic information base*** that can provide information to support the firm's competitive strategies. A firms' database is considered a strategic resource which is used to support strategic planning, marketing, and other strategic initiatives. These resources are being used by firms in such areas as:

1. Strategic planning
2. Marketing campaigns
3. Erecting barriers to entry for competitors
4. Finding better ways to lock in customers and suppliers

Breaking Business Barriers:

Several vital capabilities of information technology that break traditional barriers to strategic business success include:

1. Break time barriers.
2. Break geographic barriers.
3. Break cost barriers.
4. Break structural barriers.

Breaking Time Barriers

Information technology is used to shorten the intervals between the various critical steps in a business process. Telecommunications is a lot faster than most other forms of communications, thus, it provides information to remote locations immediately after it is requested.

Breaking Geographic Barriers

Telecommunications networks enable you to communicate with people almost anywhere in the world. Telecommunications and computing technologies make it possible to distribute key business activities to where they are needed, where they are best performed, or where they best support the competitive advantage of a business.

Breaking Cost Barriers

Computers and telecommunications can often significantly reduce the cost of business operations when compared with other means of information processing and communications. For example, they can reduce costs in such areas as production, inventory, distribution, or communications. Information technologies have also helped companies cut labour costs, minimize inventory levels, reduce the number of distribution centres, and lower communications costs.

The New Economies of Information:

The internetworking of businesses and consumers via the Internet, intranets, and extranets is breaking the cost barriers raised by traditional economic trade-offs in information content and delivery. In communicating with each other and consumers, businesses have had to make trade-offs between:

Reach: The number of people receiving or exchanging information.

Richness: The bandwidth, customization, and interactivity of information.

- *Bandwidth* is the amount of information content delivered within a given time period.
- *Customization* is the degree to which information content is customized for its recipient.
- *Interactivity* is the amount of dialogue between the information provider and the recipient.

Breaking Structural Barriers

Computers and telecommunications networks can help a business develop strategic relationships by establishing new electronic linkages with customers, suppliers, and other business entities. For example, telecommunications networks can support innovations in the delivery of services, increase the scope and penetration of markets, and create strategic alliances with customers, suppliers, and even a firm's competitors.

4.7. The Value Chain and Strategic IS:

An important concept that can help a manager identify opportunities for strategic information systems is the ***value chain*** concept as developed by Michael Porter. This concept:

1. Views a firm as a series or "chain," of basic activities that add value to its products and services and thus, add a margin of value to the firm.
2. Some business activities are viewed as primary activities, and others are support activities. This framework can highlight where competitive strategies can best be applied in a business.
3. Managerial end users should try to develop strategic information systems for those activities that add the most value to a company's product or services, and thus to the overall business value of the firm.

Strategic Applications and Issues in Information Technology:

Way in which organizations view and use information technology includes;

1. Strategic
2. Offensive
3. Defensive
4. Cost-justified
5. Controlled

4.8. Reengineering Business Processes

One of the most popular competitive strategies today is ***business process reengineering*** (BPR), most often simply called reengineering. Reengineering is the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in cost, quality, speed, and service. BPR combines a strategy of promoting business innovation with a strategy of making major improvements to business processes so that a company can become a much stronger and more successful competitor in the marketplace.

The potential payback of reengineering is high, but also is its level of risk and disruption to the organizational environment.

The Role of Information Technology

Information technology plays a major role in reengineering business processes. The speed, information processing power, and ease-of-use of modern computer hardware, software, and networks can dramatically increase the efficiency of business processes, and communications and collaboration among the people responsible for their operation and management.

Improving Business Quality

No single approach to organizational change is appropriate for all circumstances. One important strategic thrust is continuous quality improvement, popularly called ***total quality management*** (TQM). Previous to TQM, quality was defined as meeting established standards or specifications for a product or service. Statistical *quality control* programs were used to measure and correct any deviations from standards.

Total Quality Management:

Quality is defined as meeting or exceeding the requirements and expectations of customers for a product or service. This may involve many features and attributes such as:

1. Performance
2. Reliability
3. Durability
4. Responsiveness
5. Aesthetics
6. Reputation

Total quality management uses a variety of tools and methods to seek continuous improvement of quality, productivity, flexibility, timeliness, and customer responsiveness.

4.9. Becoming an Agile Competitor

Agility in competitive performance is the ability of a business to prosper in rapidly changing, continually fragmenting global markets for high-quality, high-performance, customer-configured products and services. An agile company can:

1. Make a profit in markets with broad product ranges and short model lifetimes
2. Process orders in arbitrary lot sizes
3. Offer individualized products while maintaining high volumes of production.

Agile companies depend heavily on information technology to:

- Enriched its customers with customized solutions to their needs.
- Cooperate with other businesses to bring products to market as rapidly and cost-efficient as possible.
- Combine the flexible, multiple organizational structures it uses.
- Leverage the competitive impact of its people and information resources.

The Role of Information Technology

IT is a strategic requirement for agile product development and delivery. Information systems provide the information people need to support agile operations, as well as the information built into products and services.

Creating a Virtual Company:

A ***virtual company*** is an organization that uses information technology to link people, assets, and ideas. Six basic characteristics of successful virtual companies include:

1. Adaptability
2. Opportunism (opportunity-exploiting organization)
3. Excellence
4. Technology
5. Borderless
6. Trust-based

Virtual Company Strategies:

Forming virtual companies have become an important competitive strategy in today's dynamic global markets. Information technology plays an important role in providing computing and telecommunications resources to support the communications, coordination, and information flows needed. Managers of a virtual company depend on IT to help them manage a network of people, knowledge, financial, and physical resources provided by many business partners to quickly take advantage of rapidly changing model opportunities.

Business strategies of virtual companies include:

1. Share infrastructure and risk
2. Link complementary core competencies
3. Reduce concept to cash time through sharing
4. Increase facilities and market coverage.
5. Gain access to new markets and share market or customer loyalty
6. Migrate from selling products to selling solutions.

4.10. Building the Knowledge-Creating Company

To many companies today, lasting competitive advantage can only be theirs if they become ***knowledge-creating companies*** or *learning organizations.* That means consistently creating new business knowledge, disseminating it widely throughout the company, and quickly building the new knowledge into their products and services.

Knowledge-creating companies exploit two kinds of technology:

- Explicit Knowledge - data, documents, things written down or stored on computers.
- Tacit Knowledge - "how-tos" of knowledge, which reside in workers.

Successful ***knowledge management*** creates techniques, technologies, and rewards for getting employees to share what they know and to make better use of accumulated workplace knowledge.

Knowledge Management Systems

Knowledge management has become one of the major strategic uses of information technology. Many companies are building ***knowledge management systems*** to manage organizational learning and business know-how. The goal of KMS's is to help knowledge workers create, organize, and make available important business knowledge, wherever and whenever it's needed in an organization. This includes processes, procedures, patterns, reference works, formulas, "best practices," forecasts, and fixes. Internet and intranet web sites, groupware, data mining, knowledge bases, discussion forums, and videoconferencing are some of the key information technologies for gathering, storing, and distributing this knowledge.

Characteristics of KMS's:

1. KMS's are information systems that facilitate organizational learning and knowledge creation.
2. KMS's use a variety of information technologies to collect and edit information, assess its value, disseminate it within the organization, and apply it as knowledge to the processes of a business.
3. KMS's are sometimes called *adaptive learning* systems. That's because they create cycles of organizational learning called *learning loops*, where the creation, dissemination, and application of knowledge produces an adaptive learning process within a company.
4. KMS's can provide rapid feedback to knowledge workers, encourage behaviour changes by employees, and significantly improve business performance.
5. As an organizational learning process continues and its knowledge base expands, the knowledge-creating company integrates its knowledge into its business processes, products, and services. This makes it a highly innovative and agile provider of high quality products and customer services, and a formidable competitor in the marketplace.

The Challenges of Strategic IS

The IS function can help managers develop competitive weapons that use information technology to implement a variety of competitive strategies to meet the challenges of the competitive forces that confront any organization.

Successful strategic information systems are not easy to develop and implement. They may require major changes in the way a business operates, and in their relationships with customers, suppliers, competitors, internal and external stakeholders, and others.

Sustaining Strategic Success

Success and sustain ability depends on many environmental and fundamental business factors, and especially on the actions and strategies of a company's management team. Sustained success in using information technology strategically seems to depend on three sets of factors:

- **The Environment**
  a major environmental factor is the structure of an industry.
- **Foundation Factors**
  unique industry position, alliance, assets, technological resources, and expertise are foundation factors that give a company a competitive edge in the market.
- **Management Actions and Strategies**
  A company's management must develop and initiate successful actions and strategies that shape how information technology is actually applied in the marketplace.
  Examples include:
  i. Preempting the market by being first and way ahead of competitors in a strategic business use of IT.
  ii. Creating switching costs and barriers to entry
  iii. Developing strategies to respond to the catch-up moves of competitors
  iv. Managing the business risks inherent in any strategic IT initiatives

Management Opportunities, Challenges, and Solutions

For managerial end users, the information systems function represents:

- A major functional area of business that is important to a business' success
- An important factor affecting operational efficiency, employee productivity and morale, and customer service and satisfaction.
- A major source of information and support needed to promote effective decision making by managers.
- An important ingredient in developing competitive products and services that give an organization a strategic advantage in the marketplace.
- A major part of the resources of an organization and its cost of doing business
- A vital, dynamic, and challenging career opportunity for many men and women.

Opportunities

- Lower transaction and agency costs
- Harness information technologies to develop unique products, services, and processes
- Create new strategic competitive advantages

Management Challenges

Using information systems to beat the competition and increase the value of a product is not easy. It requires changing processes and methods that probably have been in the organization since time began. The responsibility for successfully developing and then using an integrated information system will usually fall to the managers throughout the organization. Managers simply cannot rest on their laurels with today's fast paced, fast changing technological advances. Technology changes much faster than organizations can adapt. As soon as employees and managers become comfortable with a particular system, it's almost time to make some more changes.

Key Issues in Information Systems Management

- Building a Responsive IT Infrastructure
- Facilitating and Managing Business Process Redesign
- Developing and Managing Distributed Systems
- Developing and Implementing an Information Architecture
- Planning and Managing Communication Networks
- Improving the Effectiveness of Software Development
- Making Effective Use of the Data Resource
- Recruiting and Developing IS Human Resources

- Aligning the IS Organization within the Enterprise
- Improving IS Strategic Planning
- Implementing and Managing Collaborative Support Systems
- Measuring IS Effectiveness and Productivity
- Increasing Understanding of IS Role and Contribution
- Facilitating Organizational Learning
- Managing the Existing Portfolio of Legacy Applications
- Facilitating and Managing End-User Computing
- Using Information Systems for Competitive Advantage
- Planning and Integrating MultiVendor Open Systems
- Developing and Managing Electronic Data Interchange
- Outsourcing Selected Information Services
- Implementing Decision and Executive Support Systems dropped
- Improving Information Security and Control

Solution Guidelines

- Performing a Strategic Systems Analysis
- Completing a strategic systems analysis is one of the first steps managers should take to help determine how they can use information systems to gain a competitive advantage. Ask yourself these questions about your own firm:

Reference

Laudon K, Laudon J, Management Information Systems, Managing the digital firm (Ninth Edition) page 71-103.

Chapter Review Questions ?

1. What features do organizations have in common?
2. What is the role of I.T. in strategic management?
3. Describe the management challenges posed by the role of information systems and suggest some solutions.