

# **Using Information Technology for Competitive Advantage**

**(Lecture 3)**

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## THE FIRM IN ITS ENVIRONMENT

As discussed before, a firm is a physical system, which is managed through the use of a conceptual system. The physical system of the firm is a closed-loop system because it is controlled by management, using feedback information to ensure that objectives are met. The firm is also an open system, since it interfaces with its environment.

### Importance of Environment

- The environment is the very reason for the firm's existence.
- A firm takes resources from its environment, transforms the resources into products and services, and returns the transformed resources to its environment.

### The Eight Environmental Elements

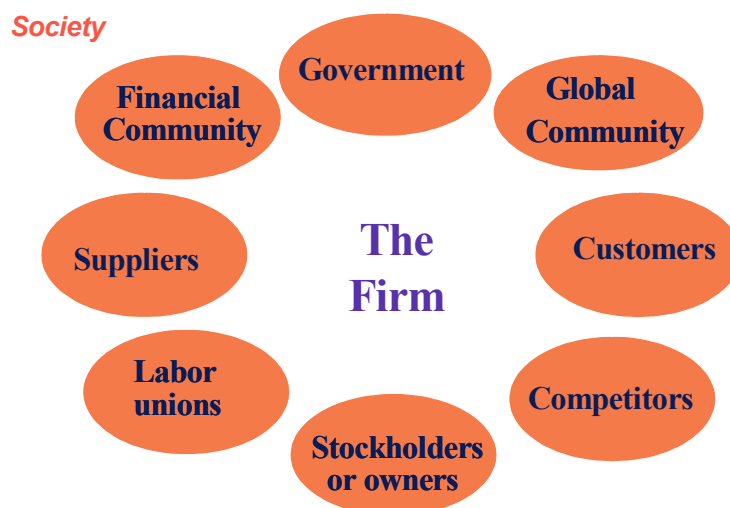


Figure 3.1 The Eight Environment Elements

We can identify eight major types of elements that exist in the environment of all firms:

1. **Suppliers**, are also called vendors, supply the materials, machines, services, and information that are used by the firm to produce its products and services.
2. **Customers**, include both current and prospective users.
3. **Labor Unions** are the organizations of both skilled and unskilled workers.

4. **Financial Community** consists of institutions that influence the money resources that are available to the firm. (e.g., banks, savings and loan associations, credit unions ..etc)
5. **Stockholders** or owners are those wh
6. o invest money in the firm and represent the highest level of management.
7. **Competitors** include all of the organizations that compete with the firm in its marketplace.
8. **Government**, on the national, state or provincial, and local levels, provides constraints in the form of laws and regulations. It also assists in purchases, information and funds provision.
9. **Global Community** is the geographic area where the firm performs its operations.

### **Environmental Resource Flows**

The firm is connected to its environment by resource flows.

Resources include personnel, material, machines, money and information.

They flow to the firm from the elements, through the firm, and back to the elements. All resources that enter the firm from the environment eventually return to the environment.

- o Some of the resources flow more frequently than others. (e.g., information flow from customers, material flow to customers, money flow to stockholders..)
- o Other resources flow less frequently (e.g., money flow form government, personnel flow to competitors, material flow/returned merchandise )
- o Not all resources flow between the firm and all environmental elements. (e.g., machines normally do not flow from the firm to stockholders.)

### **COMPETITIVE ADVANTAGE**

In the computer field competitive advantage refers to the use of information to gain leverage in the marketplace. The firm's managers use conceptual as well as physical resources in meeting the strategic objectives of the firm.

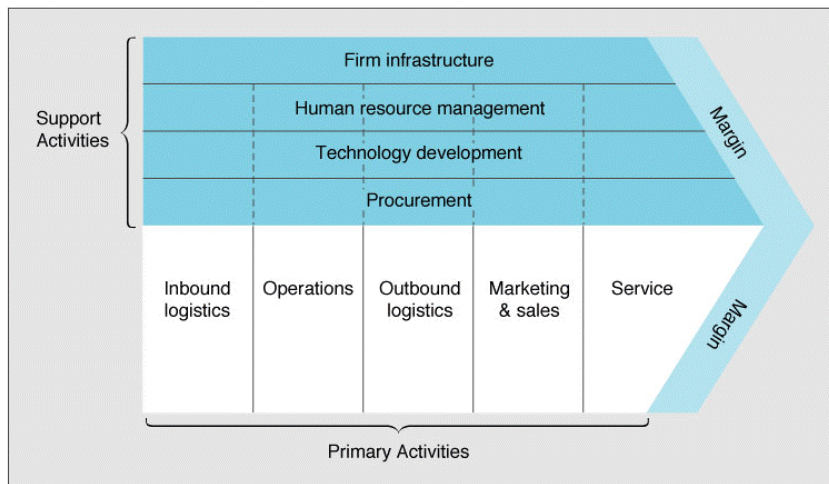


Figure 3.2: Porter's Value Chain

According to Michael E. Porter, competitive advantage can be achieved through the value chain.

- Margin is the value of the firm's products and services, as perceived by the firm's customers, less the costs.
- Firms create value by performing activities, which Porter calls value activities. Value activities fall into two categories:
  1. **Primary value activities** are those associated with firms producing and offering greater value to their customers than do their competitors.
  2. **Support value activities** provide the inputs and infrastructure that allow the primary activities to take place. (e.g., marketing research group, accounting dept.)

The primary and support value activities are integrated by linkages to form a value chain.

The primary activities include

- Inbound logistics that obtain raw materials and supplies from suppliers
- The firm's operations that transform the raw materials into finished goods
- Outbound logistics that transport the goods to customers
- Marketing and sales operations that identify customer needs and obtain orders
- Service activities that maintain good customer relationship after the sale.

The support activities appear on the upper layer and include

- Firm infrastructure, which is the organizational setting that influences all of the primary activities.
- Human resource management, which consists of all those activities related to managing the firm's personnel, including those functions that managers perform and the roles that they play.
- Technology development includes all activities that involve technology and the applications of that technology in an effective manner.
- Procurement which is concerned with obtaining such resources as material and machines used by the primary activities.

Each value activity, whether primary or support, contains three essential ingredients:

- Purchased inputs
- Human resources
- Technology

### **Expanding the Scope of the Value Chain**

Nowadays, management is alert to additional advantages that can be achieved by linking the firm's value chain to those of other organizations. Such a linkage is called the

**Interorganizational System (IOS), or the Interorganizational Information System (ISS).**

Porter considered such linkages when he focused on the use of information to create competitive advantage and called the network a **value system**

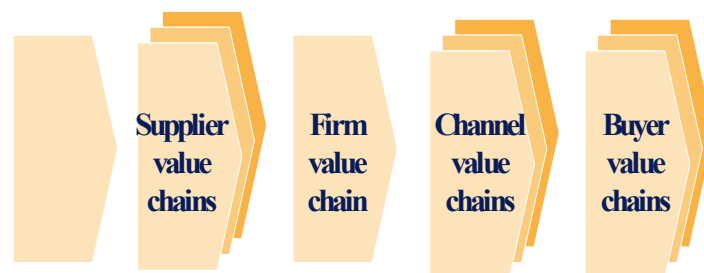


Figure 3.3: Value System

- A firm can link its value chain to those of its suppliers by implementing systems that can make input resources available when needed.(e.g., Just in Time Inventory)
- A firm can also link its value chain with those of its distribution channel members. (e.g., airline computerized reservation by customers)

- When the buyers of the firm's products are also organizations, their value chains can be linked to those of the firm and its channel members.

## **WHATE ARE THE INFORAMTION RESOURCES?**

There are two views for information management:

- Manage data by implementing computer-based database management systems (DBMS)
- Manage resources that produce the information. Thus, rather than concentrating on the input(the data) and the output (the information), attention should also be given to the information processor that transforms the input into output.

### **Types of Information Resources:**

A firm's information resources therefore consist of:

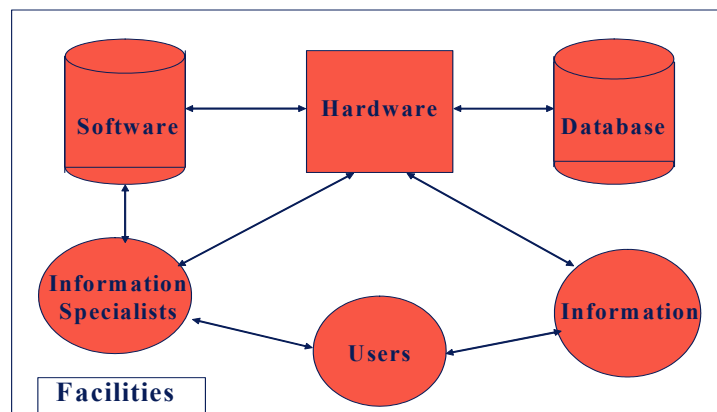


Figure 3.4: Information Resources

## **WHO MANAGES THE INFORMATION RESOURCES?**

### **The Chief Information Officer**

The CIO is the manager of information services who contributes managerial skills to solving problems relating not only to the information resources but also to other areas of the firm's operations.

An information services manager can perform as a chief information officer by taking the following advice:

- Spend time with the business and in business training. Learn the business, not just the technology

- Build partnerships with business units and line management
- Focus on improving basic business processes
- Explain IS costs in business terms
- Build credibility by delivering reliable IS services.
- Be non-defensive.

### **THE INCREASING COMPLEXITY OF INFORMATION MANAGEMENT**

As firms acquire more information resources and as those resources are dispersed throughout the organization, the task of information resource management becomes more complex. The management responsibility falls not only on the CIO but on all managers in the firm.

### **STRATEGIC PLANNING**

Strategic Planning is long-range planning that

- identifies objectives that aim at giving the firm the most favorable position in its environment
- specifies strategies for achieving those objectives.

Each business should have its strategic plan that supports the enterprise in achieving its strategic objectives. The following figure shows how all business areas should cooperate in their strategic planning process. The arrows represent flows of information and influence.



Figure 3.5: Strategic Planning for Information Resources

## STRATEGIC PLANNING FOR INFORMATION RESOURCES

### Strategy Set Transformation

When information services began to develop strategic plans, the recommended approach was to base those plans entirely on the firm's strategic objectives. Taken as a whole, these were termed as the **organizational strategy set**. As a second separate step, an information services plan was devised to support the firm's objectives. The information services plan was called the **MIS strategy set**, and it consisted of objectives, constraints, and strategies. This strategy set transformation is illustrated in the figure below:

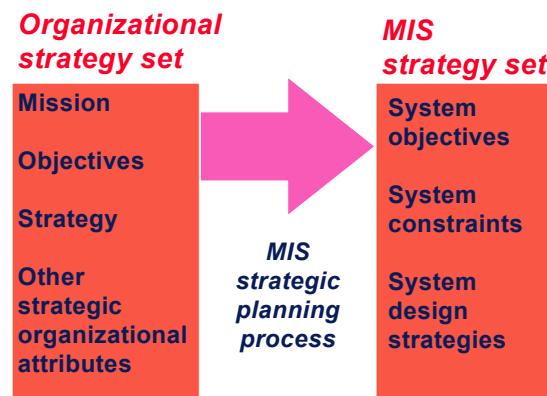


Figure 3.6: Strategy Set Transformation

### The SPIR Approach

Strategic planning for information resources (SPIR) is a solution to the problem of inadequate information resources. When a firm embraces SPIR, the strategic plans for information services and the firm are developed concurrently. The firm's plan reflects the support that can be provided by information services, and the information services plan reflects the future demands for systems support.



Figure 3.7: SPIR Approach

## Content of a Strategic Plan for Information Resources

The plan should specify:

- The objectives to be achieved by each CBIS subsystem during the time period covered by the plan
- The information resources necessary to meet the objectives.

This content is illustrated in the figure below:

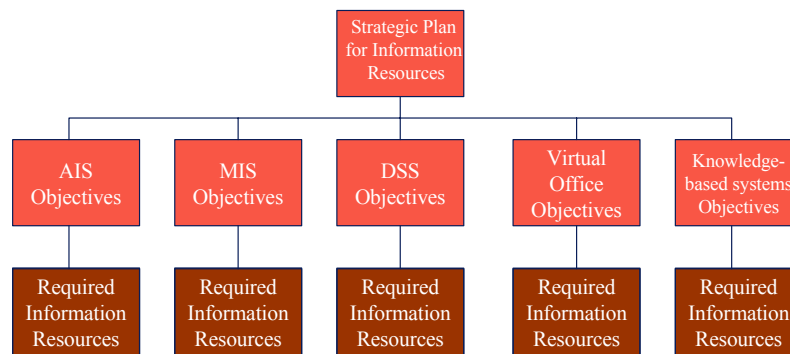


Figure 3.8: Information Resources Strategic Plan

## END-USER COMPUTING AS A STRATEGIC ISSUE

### Levels of End-User Capability

- **Menu-level end users:** Some end users are unable to create their own software, but they can communicate with prewritten software by means of menus.
- **Command-level end users:** Some end users have capabilities for using prewritten software that go beyond menu selection. These end users can use the command language of the software to perform arithmetic and logical operations on the data.
- **End-user programmers:** Some end users can use computer languages as HTML, Visual Basic, or JavaScript, and they can develop custom computer code to meet their own needs.
- **Functional support personnel:** These are information specialists who are members of business units rather than information services.

### Benefits of End User Computing

- **Matches capabilities and challenges**

The shift in the workload for systems development to user areas frees up the specialists to concentrate on organizational and complex systems, enabling the specialists to do a better job in these areas. The specialists also have more time to devote to maintaining existing systems.

- **Reduces Communication Gap**

Letting users develop their own applications would reduce the usual communication problems between users and IT specialists.

### **Risk of End User Computing**

The benefits of EUC have a price. When end users develop their own systems, they expose the firm to a number of risks.

- **Poorly Aimed Systems.** End users may apply the computer to applications that should be performed some other way, such as manually.
- **Poorly Designed and Documented Systems.** End users cannot match the professionalism of information specialists when designing systems. In addition, end users tend to overlook the need to document their designs to be able to maintain their systems
- **Inefficient Use of Information Resources.** When there is no central control over acquisition of hardware and software, the firm can end up with incompatible hardware and redundant software.
- **Loss of Data Integrity.** End users may not exercise the necessary care in entering data into the firm's database. Other users may use erroneous data, assuming its accuracy.
- **Loss of Security.** End users may not safeguard their data and software.
- **Loss of Control.** Users develop systems to meet their own needs without conforming to a plan that ensures computer support for the firm.

### **THE INFORMATION RESOURCES MANAGEMENT CONCEPT**

**IRM** is an activity that is pursued by managers on all levels of the firm for the purpose of identifying, acquiring, and managing the information resources needed to satisfy information needs.

## Required IRM Elements

- **A recognition that competitive advantage can be achieved by means of superior information resources.** The firm's executives and other managers who engage in strategic planning appreciate that the firm can achieve superiority over competitors by managing information flows.
- **A recognition that information services are a major business area.** The firm's organizational structure reflects the fact that information services have an importance equal to other major business areas.
- **A recognition that the CIO is a top-level executive.** The CIO contributes to decision making that affects all of the firm's operations, not just those of information services.
- **A consideration of the firm's information resources when engaging in strategic planning.** When executives engage in strategic planning for the firm, they consider the information resources necessary to achieve the ataractic objectives.
- **A formal strategic plan for information resources.** A formal plan exists for acquiring and managing information resources. The resources should include those in user areas as well as information services.
- **A strategy for stimulating and managing end –user computing.** The strategic plan for information addresses the issue of making information resources available to end users, while at the same time maintaining control over those resources.

## The IRM Model

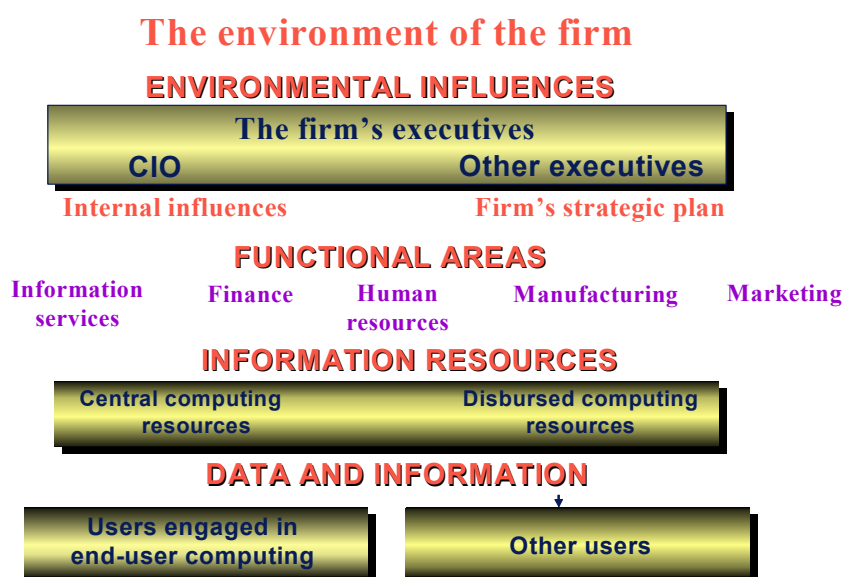


Figure 3.9: The IRM Model

- **The environment of the firm**

Eight environmental elements provide the setting for achieving competitive advantage. Executives are aware of the need to manage resource flows to meet the needs of the environmental elements in a competitive market.

- **The firm's executives**

The CIO is included among the group of executives who guide the firm toward its objectives.

- **Business areas**

Information services is included as a major business area, and each of these areas jointly develops strategic plans that support the strategic plan of the firm.

- **Information resources**

The strategic plan for information resources describes how all information resources will be acquired and managed. Some of these resources are centralized in information services, and some are dispersed throughout the firm in user areas.

- **Users**

Data and information flow between the information resources and the users. Some users engage in end user computing.