

## **Lecture 4: System Concepts and Accounting**

### **Learning Objectives**

1. To learn selected concepts from the theory of systems.
2. To apply these selected concepts to the processing of accounting transactions.
3. To learn about those systems that include accounting information systems.
4. To review the systems approach to problem solving.

### **System**

System is a set of parts coordinated to accomplish a set of goals. Any system has three characteristics:

- **component parts** or the tangible features than can be seen, heard or felt
- **a process**, whereby the parts are coordinated in a defined way
- **goals** or those objectives toward which the component parts are coordinated

The parts of a system may themselves constitute different systems with all of a system's characteristics. Lower-level systems are called *subsystems*. Although a subsystem's goals are different from those of the higher-level system, they should be consistent with them. A subsystem is a part of a higher-level *supersystem* or a system of systems.

Systems are also characterized by the *boundaries* separating them from other systems. The boundaries of subsystems help to identify the system's component parts. Whenever subsystem boundaries meet, system *interfaces* are created. An interface occurs where system or component parts connect.

Systems theory recognizes four basic types of systems:

1. **Closed system** – it is totally isolated from its environment. There are no external interfaces, the system has no effects outside of its boundaries and the environment has no effect on the processes within the system.
2. **Relatively closed system** – it reacts with its environment in a known and controlled way. The interactions consist of system inputs and outputs.
3. **Open system** – its interactions with environment is not controlled. Besides having inputs and outputs, the open system has disturbances (uncontrolled inputs), that effect the processes within the system.
4. **Feedback control system** – a portion of system output is returned as an input to the system to help the system attain its goals.

### **Accounting as a System**

A well-designed accounting system is a relatively closed system. This system has processes that convert inputs to outputs and utilizes internal control to limit the effects of its environment on the system. The inputs are the economic events (e.g. selling goods for cash/ on credit, incurring an expense). The processes in an accounting system record an event as a transaction; journalize post and summarize transactions in various reports. The outputs of this system are accounting documents and reports (financial statements, responsibility reports).

The accounting system has component parts that are themselves systems. It is composed of *application systems* (processing personnel's view) or it is a set of *transaction cycles* (auditor's view).

**An application system** is a set of procedures and computer programs that perform a specific accounting objective – e.g. the process of calculating amounts owed to suppliers and then printing checks for those amounts is a cash disbursements application.

**Transaction cycle** describes economic events that normally follow each other in a cyclical way. There are four transaction cycles:

1. **Revenue cycle** - accounting transactions resulting from economic events that produce revenue.
2. **Expenditure cycle** - accounting transactions caused by the economic events necessary to acquire material and suppliers for the accounting entity.
3. **Conversion cycle** - accounting transactions recorded when converting purchased inventory into salable finished products.
4. **Financial cycle** - accounting transactions that record the acquisition of capital from owners and creditors, and the use of that capital to acquire property necessary for generating income.

### **Accounting as a Subsystem**

Accounting information systems are subsystems of the management information system (MIS). MIS can be defined as a set of organized procedures that provides information to support decision making and control in the organization.

### ***Decision-Making activities***

There are three basic levels of managerial activities:

- **Strategic planning** – these activities are primary concern of a top management (e.g. identification of major markets and product lines).
- **Management control** – these activities are primarily concern of middle management. Their aim is to operate their segments efficiently while achieving the objectives identified by top management.
- **Operational control** – these activities are implemented by department heads and supervisors, the lowest-level managers in an organization. Their aim is to achieve those specific tasks assigned to them by middle management.

### ***Decision Problems and the Activity Level***

The managers at each level face different decisions. This fact creates differences in the kinds of information systems that are needed.

- **Unstructured problems**

The problems faced by top management are usually unstructured with many alternatives. But there is a little guidance concerning the best one to pursue. The decisions of top management impact the long-term success of the organization. An information system that provides

information at higher organizational level to aid decisions is called **decision support system**. It is ordinarily not an accounting information system. This system process data that are largely predictive and it obtains data mostly from external sources.

- **Structured problems**

The decisions that managers face at the operational level are significantly different. At this level, managers are assigned specific task by middle management and are often given clear directions about how to carry out each task. Information systems needed for structured problems are different because they concentrate on processing historical data from within the organization.

- **Semistructured problems**

Many decisions management faces cannot easily be classified as structured or unstructured. Information systems used for these decisions tend to combine the characteristics of systems used for structured and unstructured decision.

**Illustration 4.1:** Decision Problems and Managerial Activity Level

Decisions Problems	Activity Level		
	Operational control	Management Control	Strategic planning
<b>Structured</b>	Accounts payable Cash disbursements	Responsibility accounting	Tanker fleet mix  Warehouse and factory location
<b>Semistructured</b>	Inventory control  Production scheduling	Budget preparation	Mergers and acquisition
<b>Unstructured</b>	Cash management	Personnel management	New products  R & D planning

**Main accounting information systems as components of MIS**

1. **The transaction processing system** – the most structured component of the MIS. It provides information used by clerical and managerial personnel at the operational level.
2. **The budgeting system** – it allows top management to communicate corporate objectives to all managers in the organization. This system provides top-down information flows, utilizes both internal and external data, is predictive in nature and involves estimates that are frequently imprecise. It is used in semistructured decision processes involving management control activities.
3. **The responsibility reporting system** – it summarizes historical data on a periodic basis and provides bottom-up information flows. It is a example of highly structured information system that is useful for management control.

**Lecture 4 - Questions and exercises**

**E 4-1: Management activities and decision-making levels**

Classify each of the following management activities by decision-making level. Identify each as either strategic planning, management or operational control.

- a) Assign worker to factory task.
- b) Develop production schedule.
- c) Authorize construction of new factory.
- d) Hire factory personnel.
- e) Acquire manufacturing subsidiary.
- f) Select new product for development.
- g) Bill customer for product.

**E 4-2: Accounting entries and transactions**

For each following accounting transaction identify the transaction cycle of which it is a part:

- a) Cash sale.
- b) Credit sale.
- c) Obtain long-term bank loan.
- d) Purchase material.
- e) Pay debt.
- f) Sell stock.
- g) Manufacture product to inventory.
- h) Pay employees.

**The main source:**

BOCKHOLDT, J. L. *Accounting Information Systems: transaction processing and controls*. 5th edition, Boston: McGraw Hill Education 1999, ISBN 0-07-116098-1

**The supplementary sources:**

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HALL, J. A. *Accounting Information Systems*. 7th edition, Mason: Cengage Learning, 2010, ISBN 978-1-4390-7857-0