CHAPTER 2:

THEORETICAL FRAMEWORK OF ACCOUNTING

INFORMATION SYSTEMS (AIS)

This chapter is discussed in two sections; the first section is the system concepts, the classifying of the system according to the circumferential environment and information system concepts which the researcher will show the different discussions about system and information definitions. The researcher has approached gradual approach to the second section which will discuss the AIS nature, for example, the AIS concept, components, objectives…..etc.

2.1. INFORMATION SYSTEM CONCEPTS:

The researcher will explain the system as the first step in this study, and information system. The discussion will be as follow:

2.1.1. System:

(Schoderbek et al., 1980) have defined the system by using the following words:

“It is a set of parts that connected with each other and with circumferential environment, which those parts working as one group, to achieve the system goals”\(^1\).

In (Pincus, 2000) view “System is a combination of parts to form a complex whole”\(^2\).

2.1.2. Classification of Systems According to the Environmental Circumstances:

All the authors have suggested the classification of the systems according to the interaction with its environment up to four types:

1. Opened system: is the interaction with external environment which can influence and be influenced by it, which takes its inputs from the circumference environment, and the outputs influence in the environment, the opened system outputs represent environment inputs. For example; human, bank, management, market... etc. The opened system is always the effective parts by the other components outside the system (bounder) boundaries. The figure No 2.1 illustrates the opened system.

2. Closed system: is the uninteresting with external environment, does not influence, and remains unaffected by the external environment; consequently, there are no outputs from or inputs to the external environment. Existence of the closed system is not seen in real life. The closed system does not influence by the circumference environment; its work limitative in the system boundary. The closed system is considered as a theoretical case more than practical case, the example of closed system is: systems of transportation by air and overland effects by the weather and climate circumstances. The Figure No 2.2 illustrates the closed systems.
Figure No 2.1 Illustrates the Opened System

Figure No 2.2 Illustrates the Closed System

3. Relatively closed system: The system is considered relatively closed if it interacts with its circumference environment by specific, identified, methods and applicable to control, and considered the results of environment interaction with the system as the system’s inputs. The results affected on the circumference environment as the system’s outputs. For example; the airlines companies use the radars and other techniques to work in frame of the bad weather to avoid the incidents which can be resulted of that circumstances.

4. Feedback control systems: the system is considered to be one of the set of the feedback control systems, if it happened return some of outputs to the system in form inputs to the system. Always, design the multi accounting systems to provide the possibility of feedback system for controlling purposes.

2.1.3. The Difference between Data and Information:

Different authors presented their opinions about information, the researcher viewpoint agrees with the following definitions:

“Information: is a data evaluated for a specific purpose4.

“Information: is created by an information system that manipulates data into a form useful for decision-making”5.

(Pincus, 2000) further makes it clear which defined data as raw facts and figures; raw facts and figures are the starting point (the input) for creating information6.

The transformation of data into information, which is referred to as data processing or information processing, may involve many different activities. These activities include

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3Dobian, Alsaeed Abdulkasood "Introduction to Accounting Information Systems" Aldar Aljamieea, 1997, Pp.120-122.
5Pincus, Karen.V.Op.Cit. p.20..
6Ibid.
recording, classifying, merging, sorting, summarizing, analyzing, and verifying data, as well as retrieving, reporting, and transmitting information.

2.1.4. Information System:

Various studies and searches explain information system; the researcher will present some of those explanations as below;

Information system is a combination of people, equipment, policies, and procedures that work together to capture data and transform it into useful information.

(Husain, 1997) explained his definition as that system which contains a group of harmonized and interrelated of business, components, and resources which grouping, processing, managing, and controlling the data for producing and carrying the useful information for decision makers through network of the channels and communication lines. The author has explained his definition through the Figure No 2.3.
Figure No 2.3 Illustrates Information System Definition and Contents

Controlling
(feedback)

-Performance evaluation
-correcting proceedings
-financial controlling

-Collecting
-Recording
-coding
-documenting
-converting

Classifying-
Sorting
Arithmetic process
Comparing-
Summarizing
Reporting

-Generating
-Retrieving
-Transferring
-Reporting

Inputs
Processing
Outputs

Storing-retrieving
Reproducing
Updating-maintaining

Data Management

Information system is a connected and homogeneous set of the resources and components (human, equipments, finance, records… etc) interact simultaneously inside specific framework (the system boundaries) and working as one entity toward achievement of goal or set of general goals under the prevailing environment and circumstances. The following Figure No 2.4 illustrates the above definition.

**Figure No 2.4 Illustrates the Information Systems Definition**

2.2. AIS NATURE:

No system can be perfectly functioned unless it is based on certain required principles, in the case of AIS the same fact is applied for better results.

All the definitions suggested by different researchers speak on the same essential requirements. Now let us discuss the views pointed out by these people. In order to fully understand the complete concept of the AIS, it is quietly essential to look into its nature functions, characteristics, components, and objectives in detail.

2.2.1. Accounting as Information:

Viewing accounting as an information system focuses attention on the information accounting provides the users of the information, and the support for financial decisions that is provided by the information. External users of accounting information are individuals and other enterprises that have a financial interest in the reporting enterprise. External users of the financial information as owners, creditors, labors unions, governmental agencies, suppliers, customers, trade associations and public.

Each of these groups of external decision makers have unique information needs to be able to make their decisions about the reporting enterprise. Providing information that meets the needs of such a large set of diverse users is difficult, if not impossible, in a single set of financial information. These relationships are depicted in the Figure No. 2.5.
Viewing the accounting as information system means; a group of systems, methods, and process, governed and controlled by following the fair principles and rules, in order to operate the data about the financial process occurred in the entity to produce financial information. Then, there are three main parts of accounting information system, INPUTS ---- PROCESSES ---- OUTPUTS. As it is shown in the Figure No 2.6.
Figure No 2.6 Illustrates Accounting as Information

- Numbers not ready to use, term as data about exchange processes which happen in the entity input to the system carrying in vouchers
- Governing processed by scientific principles followed to process the data and converting to information.
- Recording, classifying, analyzing, reporting. That recording in books and records.
- Income St., Balance sheet.
- Changes in financial position St.

2.2.2. AIS Definition:

The definition of AIS has evolved over the years from one focusing on the provision of more formal, financially quantifiable information to assist in decision-making processes to one that embraces a much broader scope of information. The dimensions used to reflect the design of AIS include focus, orientation, time horizon, aggregation, integration, timeliness, financial and non-financial, and quantitative and qualitative\(^7\).

Defining AIS has been difficult to day and research in this area is quite diverse. It includes behavioral studies of audit decision-making tools, field studies of organizational systems, design, development of general ledger systems, and development of accounting models that effectively utilize advancement in computer technology, application of different technology solutions to AIS situations, and many other types of studies.

In general, an information system is used to represent the real world phenomena with a set of symbols which are captured and implemented within a computerized environment (McCarthy, 1979).\(^8\)

Therefore, an accounting information system is one that translates representations of economic activities into a format that is valuable to accountants and to their customers i.e., business decision makers, who need information about economic activities.

Accountants are being pressured to redefine their contribution to organizations and to expand the scope of their activities beyond financial statement preparation and analysis.

They are being called upon to become active enterprise-wide team members who provide information and guidance in strategic decision-making salutations. Similarly, day-to-day operations managers demand a wide range of financial and non-financial performance measures.

Therefore, if AIS is going to allow today’s accountants to provide the information, business decision makers need, should meet the following definition:

An accounting information system is one that captures, stores, manipulates, and presents data about an organization’s value-adding activities to aid decision makers in planning, monitoring, and controlling the organization.

This definition certainly includes financial accounting systems, which have the primary purpose of generating financial statements in accordance with Generally Accepted Accounting Principles (GAAP). However; this definition recognizes that businesses must perform a wide range of value-adding activities (such as production, distribution, sales, etc.) to be successful, and that the types of information needed to manage such activities will be extensive.

Therefore, the scope of corporate systems that are included under the AIS umbrella is much broader than the general ledger system and the programs that prepare journal entries to feed it. Actually, AIS is a system that aids in processing transactions and in tracking the data that result from such transactions.

These systems also must provide performance measurements (financial and non-financial) and help to enforce management control objectives. They include transaction processing systems (such as billing systems for sales processes), interorganizational systems that share data with upstream and downstream partners (such as web-based
order systems and electronic data interchange cash receipt processing), and support systems. This enables economic exchanges (such as order processing, customer market analysis, and inventory control systems)\(^9\).

This definition has strong integrative implication. For example, the impact of Enterprise Resource Planning (ERP) systems on the market has been dramatic. These systems were initially designed around core functions such as manufacturing or human resources. As they matured, their breadth expanded to include much more of the organization’s activities. The key characteristic they embraced was developing an integrated data repository which was accessible by users throughout the organization. ERP systems provide massive amounts of data that is updated in real time, and they are able to provide greater planning support and a wider range of performance measurements that did previous manufacturing or management planning systems.

Using the definition of AIS provided here, research on ERP systems would be characterized as falling under the AIS research umbrella.

Accounting information system (AIS) is the information subsystem within an organization that accumulates information from the entity’s various subsystems and communicates it to the organization’s information processing subsystem. The AIS has traditionally focused on collecting, processing, and communicating financial-oriented information to a company’s external parties (e.g. investors, creditors, and tax agencies) and internal parties (mainly management)\(^10\).

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Under the traditional view of AIS, each organization’s functional areas, such as marketing, production, finance, and human resources, maintain a separate information system. However, organizations have found the need to integrate these separate systems into one seamless database or to enterprise-wide information system\textsuperscript{11}.

Today, the AIS is concerned with non-financial information as well as financial data and information.

Accounting information system (AIS) is based on value accounting theory which are designed to store and summarize financial transactions used to produce financial statements in accordance with generally accepted accounting principles (GAAP) and to account to the owners of the business in this way.

The Figure No 2.7 has shown accounting information system as logical part of MIS. Management Information System (MIS) is defined as an organized method of providing each manager with all the data and only those data which he needs for his decisions when he needs them and in a form, which aids to understand and stimulate his action\textsuperscript{12}.

\textsuperscript{11}Huuhtanen, Juha. Op. Cit.
\textsuperscript{12}Patakar, M.G, Op.Cit. P. 24
In short, the researcher agrees with the definition by (Remney; Steinbort, 2000): An Accounting information system (AIS) consists of people, procedures and information technology.

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2.2.3. Accounting Information Systems Functions:

(Meigs et al. 1999)\textsuperscript{14} specified the basic functions of accounting systems, in developing information about the financial position of a business and the results of its operations; every accounting system performs the following basic functions:

1. Interpret and record the effects of business transactions.
2. Classify the effects of similar transactions in a manner that permits determination of the various totals and subtotals useful to management and used in accounting reports.
3. Summarize and communicate the information contained in the system to decision makers.

The differences in accounting systems arise primarily in the manner and speed with which these functions are performed.

Ensure the fully control, which confirm accuracy recording and manipulating the data related to business activity. Also, protect those data and organizations assets.

2.2.4. Characteristics of Accounting Information:

(Stambaugh ; Carpenter, 1992)\textsuperscript{15} counted in briefly the Information characteristics as follow:

1- Provided on timely basis.

2- Presented in an aesthetically appealing format.

3- Relevant to the decisions at hand.

4- Concise yet sufficient in scope to allow” what-if” analysis.

5- flexible to interface with information from other functional units.

\textsuperscript{15}Stambaugh, Clyde t.; Carpenter, Floyd W. “The roles of Accounting and accountants in executive information systems” Accounting Horizons, September 1992. p. 56.
There is also a several characteristics determine the qualities that make information valuable:

1. Costs-versus-benefits: sometimes information costs more to get additional information than the information is worth. Thus, cost-benefit considers provide an overall constraint on the amount of information a decision-maker will get\textsuperscript{16}.

2. Understandability/Granularity/Aggregation: Many factors can contribute to the understandability of information, including user knowledge, skill, training, and motivation. In addition, information design choices such as its level of aggregation (or granularity) will affect its understandability, hence, its usefulness for controlling information integrity. For some purposes, highly aggregated information may be called for; whereas for other purposes, very detailed information may be required. Thus, appropriately tailored levels of granularity/aggregation can be enablers of information integrity. A proxy for the understandability of information is its conformity with user-specified requirements\textsuperscript{17}.

3. Reliability: the information must be reliable, you must be able to count on its being what its purpose to be (this is known, more formally, as representational faithfulness), and on its being reasonably free from error and bias (this is known, more formally, as neutrality). Additionally, for information to be reliable, it ought to be true if several different people(or systems)set out to derive the information from the data, they would all come to the same conclusion (this know, more formally, as verifiability).

Information that is not verifiable, or not neutral, or not representationally faithful can’t be relied on for decision-making.\textsuperscript{18}

4. Currency/Timeliness: It must be accepted that absolute completeness and accuracy are impossible or impractical to achieve. Information Currency is affected by real world changes over time (as well as by information processing delays) with a commensurate impact on information accuracy. Since time is continuous, completeness and accuracy must be understood in a context that defines acceptable limits for information currency, hence accuracy. For example, if certain information, such as cash receipts is only updated on a weekly basis to accounts receivable, then accounts receivable could be considered accurate if it was missing a day’s worth of transactions. However, if information such as airline reservation transactions updates available seat inventory in real time, then seat inventory would be considered unacceptably inaccurate if a day’s worth of transactions were omitted.

As presented here, processing timeliness and information currency are really aspects of information completeness, which in turn, determines the degree of accuracy that information possesses; however, because of their unique relationship to the dimension of time and the change that time engenders, it is useful to identify currency/timeliness as separate attributes of information integrity\textsuperscript{19}.

5. Validity/Authorization: Representational faithfulness of information about intangible objects implies that the information is valid in ways other than correspondence with an original physical condition. The concept of validity means that information represents real conditions, rules or relationships rather than characteristics of physical objects. In a

general context, conditions, rules or relationships are valid if what they purport is true. In a business context, conditions, business rules or relationships are established or approved by parties with the delegated authority to do so. Thus, transactions are valid if they were initiated and executed by personnel or systems that have been granted the authority to do so and if approvals are authentic and within the scope of the authority granted to the approver(s). For example, if the credit limit assigned to a customer reconciles to the company’s rules and procedures used to set credit limits, the credit limit would be “valid.” Thus, the concept of validity includes elements of both accuracy and authorization. A validation process may therefore require an investigation of an individual item, a relationship between one item and another item, or a relationship between an item and a business rule, policy or standard.

6. Completeness: Accuracy by itself is insufficient to convey the full dimensionality of the requirements for representational faithfulness which requires completeness of information in both space and time. Thus, there is a fundamental trade-off between completeness and accuracy because measurement and processing limitations of information processing systems will prevent 100% real-time completeness, especially for subject matter that changes frequently. This, in turn, prevents 100% accuracy. In other words, every discussion of accuracy is also a discussion of completeness, and vice versa.

The amount of information is measured by the reduction of ignorance and uncertainty and not by the addition of knowledge. The Figure No. 2.8 illustrates the AIS characteristics according to Financial Accounting Standards Board (FASB) in 1980:

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21 Ibid. P.8.
Figure No 2.8 Illustrates AIS Characteristics According to FASB

Accounting information users

Pervasive Constraint

User Specific Qualitative

Primary Decision Specific Qualities

Ingredients of Primary Qualities

Threshold for Recognition

Decision Makers and their Characteristics

Benefits > Costs

Understandability

Decision Usefulness

Relevance

Reliability

Predictive Value

Feedback Value

Timeliness

Verifiability

Representation Faithfulness

Comparability (including Consistency)

Neutrality

Materiality

2.2.5. Accounting Information Systems Components:

An accounting system consists of the personnel, producers, devices, and records used by an organization to develop accounting information and to communicate this information to decision makers. The design and capabilities of these systems vary greatly from one organization to the next.

In very small business, the accounting system may consist of little more than a cash register, a check book, and an annual trip to an income tax prepared. In large business, on accounting system includes computers, highly trained personnel, and accounting reports that affect the daily operations of every department\(^2\).

But in every case the basic purpose of the accounting system remains the same to meet the organization’s needs for accounting information as efficiently as possible.

Many factors affect the structure of the accounting system within a particular organization. The most important are: the company’s needs for accounting information and the resources available for operation of the system.

2.2.6. Accounting Information System Objectives:

Naturally, there is no system without goal, we should differ between stated objectives and the real objectives, which the entity declares its objectives are consumes satisfaction while the real objectives is gaining a maximum profits.

Each enterprise has implicit and explicit goals and objectives, May enterprises have a mission statement that describes their goals. These goals can vary widely among enterprises ranging from nonprofit organizations, where goals are aimed at serving specified constituents, to for – profit organizations, where goals are directed toward maximizing the owner’s objectives.

It may seem at first sight to be an easy thing to do, but it can be seen as a complex problem, the absence of stated objectives. It means that the firm has no criterion against which to evaluate its success or failure or to use in the process of choosing between alternative activities.

One of the problems in stating objectives for a firm is that only people involved with the firm can have objectives, not the firm itself. If this is accepted, then it is obviously possible that there is more than one relevant objective.

Accounting is purely human invention, having no independent existence in nature. Hence, it can not in any true sense have been discovered, but it must have been constructed by human minds to serve human needs. Accounting information system objectives as follows:

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1. Internal control, including the safeguarding of organization money and other property, the regular collection and payment of sums of money owed to and by it, and the prevention and detection of inefficiency, waste, and dishonesty by employees of the organization.

2. Measurement of financial data, by means of the recording of transactions and events affecting the financial state of the organization, and their processing in accordance with consistent rules.

3. Provision of information for planning and decision making to management.

4. Reporting of financial information to properties, investors, and other interested persons.

Another author also gives his contribution in accounting system objectives, such as (Ijiri, 1975) in addressing the question of what an accounting system should do. He identifies 'accountability' and 'information usefulness' as the two main broad objectives that any accounting system should achieve. He states that accountability has clearly been the social and organizational backbone of accounting for centuries. In this sense to account for he takes to explain a consequence by providing a set of causes that have collectively produced the result. To provide accountability is thus an essential feature of an accounting system. However, in the modern business world, information usefulness is also an important, albeit secondary, requirement. Thus, the core of any accounting system is to provide accountability with 'information usefulness a necessary adjunct.

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All accounting information systems seek five basic results\textsuperscript{27}:

1. To record an actual, valid transaction;
2. To accurately classify the nature of the transaction;
3. To record the correct value of the transaction;
4. To place the transaction in the proper accounting period; and
5. To generate financial statements containing information about the transaction.

\textsuperscript{27}Henry, Lauri. Op.Cit.