El kistas Review of Management-Economic and Finance

Volume: 4 / N° 2
(December 2022) p 142 - 159
ISSN : 2773- 3203/EISSN: 2830-8131

# Suggested Standards for the Evaluation of the AIS of Banks in an Information Technology Environment

# معايير مقترحة لتقييم نظم المعلومات المحاسبية للمصارف في بيئة تقنيات المعلومات

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**Received: 9/9/2022** **Accepted: 22/11/2022** **Published: 31/ 12/2022**

**Abstract:** The problem of the study was represented in a main question: How can the accounting information systems operating in the information technology environment be evaluated? In order to answer this, the study dealt with a set of criteria through which the accounting information systems that operate in banks and use information technologies in their accounting and administrative work can be evaluated. Accordingly, a set of criteria that can be used for evaluation purposes in banks operating in an information technology environment has been reached, which is related to how to meet users' needs for accounting information, internal control, and AIS security and how to reduce risks associated with AIS in banks.

**Keywords: Evolution AIS, Effectiveness and Efficiency, Information Technology.**
**Jel Classification Codes: F15; F40; F13.**

**ملخص:** تمثلت مشكلة الدراسة في سؤال رئيس هو: كيف يمكن تقييم نظم المعلومات المحاسبية التي تعمل في بيئة تقنيات المعلومات؟ وللاجابة على ذلك، تناولت الدراسة مجموعة من المعايير التي يمكن من خلالها تقييم نظم المعلومات المحاسبية التي تعمل في المصارف وتستخدم تقنيات المعلومات في أعمالها المحاسبية والادارية، وبناءً عليه تم التوصل الى مجموعة من المعايير التي يمكن أن تستخدم لأغراض تقييم في البنوك العاملة في بيئة تقنية المعلومات، والتي تتعلق بكيفية تلبية احتياجات المستخدمين للمعلومات المحاسبية والرقابة الداخلية وأمن AIS وكيفية تقليل المخاطر المرتبطة بـ AIS في البنوك.

**الكلمات المفتاحية :** تقييمAIS،الفعالية والكفاءة، تقنيات المعلومات
**تصنيفاتJEL : F15؛ F40؛ F13**

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## 1.Introduction:

The rapid technological progress that the world is witnessing and the successive developments in computer hardware, software, applications, communication devices, and their various means, as well as the huge amount of information that grows and moves easily between countries of the world require banking units to keep pace with this tremendous technical progress if their goal is to survive and continue in their business.

Therefore, organizations as well as banking units tend to design their information systems using information technology in order to control the huge amount of information necessary for the management of the organization and ensure access to reliable, correct, and accurate information at all administrative levels in order to use it in making rational decisions.

The study of evaluating AIS is one of the more important matters in light of working in the information technology environment, due to the fact that information has a distinguished position in light of the technical developments taking place. On the other hand, the information systems facilitate effective communication between the various decision centers and the exchange of information among them. Hence, the provision of information is effective and can contribute to a large extent to achieving the banking units' objectives and carrying out their various activities.

## 2. The importance of evaluating AIS for banks in the information technology environment

Any information system seeks to achieve many of the goals that it was established to achieve, and therefore the performance of this system is evaluated, and its success is judged by tracking its performance in the different stages of its tasks to reach those goals (Khaled, 2004, 30). Evaluation of results related to the adoption of the use of a particular system or the dispensation of another system, and the evaluation process is the last control in the life of AIS whose failure results in the failure of information systems (Abu Khadra and Ashish, 2008, 97), and the views on the evaluation of information systems differ according to the goal the evaluation, its method, and its beneficiaries, so it is possible to classify these points of view into: (Khaled, 2004, 35)

- The technical view of the performance of information systems: It refers to focusing on issues related to the characteristics of the information system itself and the tasks that it must accomplish.

- The humanistic view of the performance of information systems: It refers to the focus on issues related to the behavior and characteristics of the members of the system and those who deal with it within the social environment.

Based on the previous division of evaluation and the measures used, the process of evaluating the performance of AIS can be divided into two types:

### 2.1. Technical evaluation of accounting information systems :

This evaluation focuses on the system itself in terms of system quality, technical capacity and other characteristics that may characterize the system and that are reflected in its performance. It is represented in several aspects, the most important of which are:

#### 2.1.1. Technical support side :

In this aspect, the focus is on knowing the development and technical support enjoyed by the system and the extent to which this development has contributed to improving the performance of the system, which will benefit the beneficiaries of the system's services and outputs from the technical support of the system.

Among the most important measures used to evaluate information systems related to a set of technical or technical characteristics are: system capabilities, flexibility of the report writer, hierarchical cohesion, ability to reach goals, predictive capabilities, database use, risk analysis, linear programming, and statistical analysis.

#### 2.1.2. As well as the functions performed by the information system :

In this aspect, the performance of the system is judged by its ability to perform the tasks for which it was established, including its ability to provide the information necessary for decision-making at the right time, in the right quantity, and of the right size, making these decisions effective and rational, contributing to reducing project costs and developing their revenues, and evaluating the performance of the system Information from this aspect is efficient and effective

### 2.2. Human evaluation of accounting information systems :

In this type of evaluation, the focus is on the workers on the system, the users of its outputs, and their needs, desires, and expectations from this system, Through the compatibility of the system and its outputs with the needs, capabilities, and expectations of users, the performance of the system is judged. Khaled, 2004, 46) Information system users are divided into: (Motee et al, 2007, 188)

#### 2.2.1. The direct user of the system:

Is the user who has a direct relationship with the system's inputs and processing method, and can control the content and quality of the outputs. The efficiency of the direct user can be measured through the following points:

- ✓ Changes in the decision-making process as a result of using system outputs.
- ✓ Evaluate the validity of data processing operations.
- ✓ The ability to produce the required reports and information in a timely manner.

#### 2.2.2. The indirect user of the system:

The user who relies on the use of what the reports provide without having any control over the inputs, processing, and outputs, and whose efficiency is measured through changes in the performance of the decision-making process as a result of his use of the system's outputs, their interpretation, and his degree of dependence on them.

The evaluation used in the human evaluation, whether the user is direct or indirect, is user satisfaction, and the user satisfaction method is a person's measure of the degree of success of the information system, and that the system's ability to meet the user's needs will lead to his satisfaction with the information system, and if the system is unable to meet the user's needs, this will lead to his feeling of frustration and dissatisfaction, as the user has a minimum level of satisfaction to continue using the system. If the user does not reach this level, he will stop using the system (Abu Khadra and Ashish, 2008, 106).

## 3. Suggested criteria for evaluating ais in banks :

In order to evaluate the AIS in banks, the researchers review the most important criteria that can be used for this purpose:

### 3.1. The standard for meeting the needs of users :

The accounting information system aims to provide the necessary accounting information for the needs of users. The users may be internal users working at all administrative levels in the economic unit, or external, such as customers, other entities, and others.

The use of information technology in AIS has contributed to increasing its ability to adapt and quickly adapt to the administrative work environment in banking units, by providing effective and economical means to store, retrieve, and process data and present it to decision makers in a timely manner. The efficiency of AIS gave them great flexibility to deal with rapid changes and respond to them (Burhan, 1999, 8).

Accounting information, regardless of its source, which may stem from the manual system, or from the computerized system (ie, in light of the use of information technology), must have several qualitative characteristics in order for the information to be useful to the decision-maker (Al-Qishi, 2003, 44).

In order for accounting information to achieve the desired benefit for its users, there is a set of characteristics (features or qualities) that must be characterized by accounting information. Financial Accounting (FASB) issued a list of concepts No. (2) in 1980 entitled Qualitative characteristics of accounting informationQualitative Characteristic of Accounting Information, through which he explained a set of main and subsidiary characteristics of accounting information in addition to restrictions or limitations on the production of accounting information, then these characteristics were updated during the years 2010 to 2018 by the International Accounting Standards Board (IASB) to take into account the changes that occurred in the business environment In general, which were identified as follows: (Al-Saqa, 2022, 41-42).

#### 3.1.1.Fundamental qualitative characteristics :

It includes the following two features:

**3.1.1.1.**Relevance

It is achieved by having the following characteristics:

- ✓ predictive value.
- ✓ Confirmatory Value
- ✓ Materiality

**3.1.1.2.**Faithful representation.

It is achieved by having the following characteristics:

- ✓ Completeness
- ✓ Neutrality
- ✓ Free from error

**3.1.1.3.**The qualitative characteristics that enhance (supporting). Enhancing Qualitative Characteristics

It includes the following characteristics:

- Comparability
- Verifiability
- Understandability
- Timeliness

The researchers believe that the availability of the mentioned qualitative characteristics can judge the quality of accounting information (the quality of financial reports), which contributes to deciding the effectiveness of AIS in the units in which it operates, and it has been proven through research and studies that the use of information technology in the work of AIS represents an important factor and a necessary requirement to determine the effectiveness of AIS in units that use information technology in their accounting work.

### 3.2. Standard for the integration of sub-systems of accounting information systems :

Information technology have brought about radical changes in various aspects of contemporary life, and the banking system is the most benefiting from these rapid changes and developments, as a result of the high intensity of competition between the vocabulary and components of the banking system, which calls for keeping pace with this development and expanding the use of modern tools and increasing the volume of its investment in systems technology

and technology. Information and communications and the employment of these investments to serve their operations, as modern technical developments in the field of hardware, software, and communication systems in banks have contributed to the diversification of their banking services (Al-Qatani, 2004, 20), and with the multiplicity of tasks and functions performed by the banking unit, and the diversity of services and products provided by these financial institutions, appropriate information that ensures integration and coordination between the functions of the various departments of the bank (Al-Shehadeh and Al-Assi, 2009, 8).

Integration must be achieved between the various departments and departments in the bank in order to ensure the completion of work and avoid conflict between the activities of the different departments, and based on the concept of information systems as an open system, it must be built and developed to efficiently reflect all interactions and information communications that ensure the flow of information within the channels and lines of entry. As well as the vertical integration between the top of the information pyramid and its bases to the decision-making centers in a timely manner (Al-Qatani, 2004, 21), the importance of having a broad and unified central base (central) as a result of the need for banking units to integrate and integrate their functions according to the contemporary view (Yahya, 2006 114) and that building a unified central base for all systems within the facility (the bank) will reduce measurement costs, and also reduce the attrition and difference between the stored data, and it will enable the processing and exchange of different information automatically, and this integration leads to r AIS ing the effectiveness of information systems (Qa`ud, 2007, 80).

Information technology has helped create new communication channels through computer and communication networks, whether at the bank level or at the national or global level. (EDI) has led to an increase in the efficiency of AIS in banks in terms of its ability to deal with variously generated data, exchange and update it on a timely basis, as well as provide all parties and other systems with the required data and information (Al-Saqa, 2006, 103).

The extent of the integration of the sub-systems of the accounting information systems, that is, the integration of the departments of the bank to perform the various functions, as each department in the bank can be considered as a sub-system of the information system because each department has its documents, books and records. The existence of a central database at the level of the bank, which led to reducing the costs of producing information and not

producing repetitive information, as well as reducing the time and effort required, are all dependent on the existence of effective accounting information systems.

### 3.3. The Standard of internal control in light of the use of information technology :

The use of automatic and electronic means to ensure the correctness of the recorded accounting data and the preservation of assets from any manipulation or embezzlement. A guide can also be developed that allows for identifying the causes of errors and how to address them quickly and in a manner that gives control information that leads to the detection of errors at an early stage. This time matching allows a quick reaction, and therefore it affects the processing process and the structure of internal control, In terms of the internal control link to the accounting information system and its components in light of the electronic operation of data, it is known as one of the components of the administrative organization that is concerned with collecting, classifying, processing, analyzing, and communicating information to the beneficiaries And that the electronic accounting information system will consist of a group of individuals, procedures and information technology to accomplish the main functions in the unit and deals with a complex economic and social environment located on the input side, and in this aspect requires defining the scientific principles that govern the process of selecting events and operations that must be addressed accounting, because it is natural That not all economic and social phenomena can be considered accounting, and when processing data, the accounting principles, assumptions, standards and accounting measurement needed to be applied in order to convert data into information, but in terms of outputs, the accounting system deals with a multi-party environment as it fills the needs of those parties (Haldani and Al-Ghabban, 2010,12), and these users depend on the accuracy of the Arabic language The accounting system reports, and in order for the facility to maintain the accuracy of the information and the reliable operation of the system, the application of control policies and procedures on the system, whether it is manual or in light of the use of information technology, is necessary. The internal control objectives then remain the same, unless the control policies and procedures differ between both types of systems Because of changes in the organizational structure and the different method of data processing (Khaled, 2004, 24), internal control procedures have been divided in light of the use of information technology (of which the computer is one of its types) into two main groups:

### 3.3.1. General Controls:

It is "represented in the set of procedures related to the computer center, its management, the structure of its work and the method of collecting its information, and that its strength or weakness is directly reflected on the automated information system that uses the computer" (Arens & Loebbecke, 2000, 333). Among the following procedures (Al-Saqa and Rajab, 2008, 12-13):

- Oversight of organization and management, including:

  - ✓ Policies and procedures related to oversight functions.
  - ✓ Appropriate separation of opposing functions.

  Monitoring the development and maintenance of systems, whichis specifically designed to monitor:

  - ✓ Test, convert, and implement new or modified systems.
  - ✓ Changes in accounting application systems.
  - ✓ Access to system documentation.
  - ✓ Obtaining accounting application systems from third parties.

- Monitoring the operation of the computer, which is designed to monitor the operation of the systems and to provide reassurance that:

  - ✓ Systems to be used for approved purposes only.
  - ✓ Access to computer operations, and this is limited to authorized personnel.
  - ✓ Only approved programs are used.
  - ✓ Operational errors are discovered and corrected.

- Oversight of systems programs, including:
  - ✓ Adopt, test, implement and document new systems software and modifications to ,existing software.
  - ✓ Restricting access to systems and documentation software to authorized individuals.
  - ✓ Data entry and program control, are designed to provide reassurance on the following:
  - ✓ Existence of a system for approving the operations that are entered into the system.
  - ✓ Restrict access to data and software to authorized individuals.

- ✓ There are other measures to protect the electronic operation of data, including the following:
- ✓ A copy of the data and computer programs is available outside the site.
- ✓ Procedures for data recovery and software to be applied in case of theft, loss, or damage.
- ✓ Provide off-site operating capabilities in the event of a disaster.

**2. Application Controls:**

It means the methods of control that are related to computer applications and programs used to operate the accounting systems. It includes methods of control over all of the inputs, operations, and outputs.

The researchers believe that the methods of controlling the inputs, data processing processes, and outputs lead to reducing and limiting errors and manipulation, as well as leading to the correct functioning of the data, as the computer rejects any errors when entering data through the procedures, standards, and methods established for correcting errors in data entry, and this leads to producing appropriate information that is accurate and objective in the least amount of time, possible. They also believe that the effectiveness of AIS depends on the existence of a sound and effective control system.

The importance of supervision in banks is increasing in order to reduce the impact of the multiple financial threats to which the bank is exposed. So that the AIS in banks has the necessary effectiveness, these systems must ensure adequate protection of the bank's assets from these threats and contribute to the efficient use of the bank's available resources.

In order to achieve the required effectiveness in the bank's activities and operations, a control system must be in place, and this matter will only be available with the presence of AIS capable of helping in creating a solid, effective and efficient control system capable of following up on operational processes and reporting on their efficiency and effectiveness, as AIS in banks Oversight of operational processes is closely related to each other, in addition to securing the control system for the degree of confidence required in the prepared financial reports that represent the outputs of these systems (Al-Shehadeh and Al-Assi, 2009, 11).

### 3.4. The AIS security Standard :

System security is defined as a set of policies and procedures that must be adhered to mainly to reduce the possibility of undesirable things happening, such as tampering with the system or destroying parts of it (Abu Khadra and Ashish, 2008, 108). Or the failure of any administration to achieve its target efficiently and effectively, so all facilities plan to have good information systems based on the use of computers, as computer-based information technology have become the main means of transfer and circulation of data processing within most organizations regardless of the nature of the activity, This led to the discovery of the importance of information security as being one of the main components of a computer system (Debian and Abdel Latif, 2004, 548).

Information security is related to researching how to maintain information and its confidentiality through several areas of communication that take place between its sources and the entities that use it, as well as preserving the physical components of the information systems that produce them (Al-Saqa, 2006, 87).

As the security of information systems (information security) includes three elements (Al-Saqa and Rajab, 2008, 15).

1. Confidentiality of data: It means ensuring that the information is only seen by authorized persons. Thus, it is required to work to avoid the disclosure of sensitive work elements (information and operations) only to authorized persons, and control and control are two basic requirements to achieve this.
2. Data integrity and integrity: Ensuring that the data is correct and has not been modified or tampered with, by protecting it from expected dangers, whether from inside or outside the work environment, which ensures its reliability and reliability, including the need to control and control the processes of modifying sensitive elements or Change them (information and operations).
3. Continuity of information availability/readiness: (Availability) to ensure the continuity of the availability of information to the beneficiaries when they need it, in all circumstances, which enables the beneficiaries of the information to deal with it directly.

Hence, it can be said that the need to provide the necessary methods to protect information and achieve its security and confidentiality has become increasingly necessary.

As a result of the importance of information security in light of the use of information technology, ISO Standard No. (17799) was issued, which includes a set of standards through which information security can be achieved. The standard contains two parts: the first (ISO/IEC 17799:2000) is for general principles, and the second (BS 7799-2:1999 for Information Security Management System, ISMS) (Al-Saqa and Rajab, 2008, 16)

In order to achieve the security and protection of AIS (information security), banks must follow several protection measures, namely:

- Physical protection measures for information systems, including physical protection for devices that contain information systems.

- Selecting workers in the information systems so that they are experienced, trustworthy, and honest and work for the benefit of the facility, and r AIS e their security awareness to maintain information security.

- The protection procedures for the data operating systems and the necessary application programs for this, and to set the powers of the operating systems.

- Security measures for information networks and prevention of their intrusion

- Encrypting the information that is stored and transmitted so that it is not known what it is if it is obtained from unauthorized persons.

- Procedures for saving data in general and keeping copies of it in secure locations that can be referenced when needed.

- Procedures to ensure the continuity of work and the readiness of information systems in various circumstances that may face the systems, such as the disruption or stopping of information systems from working (Al-Sharif, 2006, 89)

- Applying control restrictions to making changes or modifications to AIS and providing oversight for computer systems.

The researchers believe that providing protection for the security of AIS in banks is one of the most important, necessary, and extremely dangerous issues, the most important of which is information security in relation to the services provided to customers, for example the ATM card, through which the customer can know the balance of his account and be able to withdraw the amount he wants, but he must in At the same time, some banks also provide the service of dealing

with the bank's website through the Internet, which provides the customer with identifying the balance of his account and transferring a certain amount from his balance to the balance of another customer. The customer who wants to carry out the transfer process must determine the account number and its password, in addition to other information that may be necessary to carry out the task. Therefore, banks must set specific restrictions to maintain the security of their information that is accessed through services implemented by customers themselves. For example, setting a specific ceiling for the withdrawal or transfer process.

Through information system security procedures, banking units can protect and secure their accounting information systems, which leads to the protection of the resources used in data processing. The bank itself, as well as the physical components of information technology and information security, are insured. Timely decisions.

### 3.5. The Standard for reducing risks associated with accounting information systems

Risk is the situation that includes the possibility of deviation from the path that leads to an expected or hoped-for result, and is used to measure the uncertainties in the operations that affect the organization's ability to achieve its goals. The impact can be positive, so it is called an opportunity, or it may be negative, so it is called a danger. or a threat (Darwish, 2007, 6)

AIS include a number of components that can be located in different and distant locations, which makes these systems invulnerable, and exposed to many risks that could be unintended such as human errors or natural disasters, or be intentional errors such as information theft or introduction of viruses or others. Intentional errors are more harmful to AIS due to the increasing number of computerized crimes that can be sourced from inside and outside the organization (Juma et al., 2003, 345).

The risks facing electronic AIS are generally classified into four main categories:

#### 3.5.1.Input risks :

They are the risks related to the first stage of the system, which is the stage of data entry into the automated system. The risks are represented in the following items: (Al-Sharif, 2006, 82)

- Unintentional (unintended) data entry by employees.
- Deliberate (intended) data entry by employees.
- Unintentional destruction of data by employees.
- Deliberate destruction of data by employees.

### 3.5.2.The risks of operating data :

They are the risks related to the second stage of the system, the stage of operating on or processing the data stored in the computer's memory. The risks are represented by the following items: (Al-Sharif, 2006, 82)

- Illegal (unauthorized) access to data and systems by employees.
- Unauthorized passage of data and systems by persons outside the facility.
- Several employees have the same password.
- Introducing a computer virus into the accounting system and affecting the process of operating the system's data.
- Interception of data from servers to users' devices.

### 3.5.3. Output risks :

These risks are related to the stage of outputs of data processing and operation operations, and the lists of accounts or reports and magnetic files tapes issued by this stage, and how to receive those outputs. These risks are represented in the following items: (Al-Sharif, 2006, 83)

- Obliterating or destroying certain items from the outputs.
- Creating false (incorrect) outputs.
- Making unauthorized (licensed) copies of the outputs.
- Unauthorized disclosure of data by displaying it on display screens or printing it on paper.
- Data and information theft.
- Printing and distributing information by unauthorized persons.

### 3.5.4. Environmental risks :

Such as the dangers caused by earthquakes, storms, floods, hurricanes, problems related to electrical failures, fires, and problems resulting from the disruption of air conditioning and refrigeration systems, etc., and these notifications lead to the disruption of the work of equipment and stopping them for relatively long periods of time to carry out crisis repairs, and recover software and databases, which has a clear impact on the security and safety of accounting information systems, as well as problems caused by delays in operations and the attendant increase in costs (Juma et al., 2003, 347).

Risk management to automated AIS includes procedures that reduce risks and threats and help avoid losses resulting from penetrations of automated information systems. These procedures are described in Shtiwi (Shtiwi, 2006).

– Retentive preventive measures: They include the use of advanced control and protection mechanisms, from the use of advanced programs to control access to the system, and programs to detect attempts to penetrate the networks through the use of firewalls, to the provision of physical protection for information system assets.

– Deterrent measures: These include developing policies to protect information security, determining the position of senior management regarding accounting information security, training workers on the authorized uses of assets, and training experienced auditors to review operations and use information system assets.

The concept of risk analysis includes the process of identifying the risk elements related to achieving the objectives and setting the foundations and procedures that will be followed to address the negative effects of these risks and their expected threats. The Basel Committee on Banking Supervision has defined a set of risks to which banking systems are exposed, such as capital risks, credit risks, and operational risks. These risks are reflected on all applications and processors in the information system, which leads to an increase in the amount of expected risks.

The process of analyzing, evaluating, and managing these risks is one of the direct responsibilities of the banking administration, which seeks to ensure that the bank's activities and operations do not cause unacceptable losses and early detection of any deviations or abuses of specific regulations and instructions (Al-Qatani, 2007, 24).

The researchers see that through the preventive and deterrent measures, this leads to a substantial reduction (reducing) the risks associated with AIS in banks and leads to avoiding losses resulting from risks or stopping work, and this leads to the work of AIS continuously without interruption. With the continuity of providing information in a timely manner, this makes AIS effective by reducing and managing risks.

## 4.Conclusions and Suggestions :

Since the great developments that took place in economic life with the large number of operations and their repetition carried out by banks led to the generation of a huge amount of different data, there was a need to use information technology in order to be able to operate that data, produce information, and take advantage of the huge and multiple capabilities that characterize information technology. Which have importance in the work of AIS and the need to judge the work of AIS and determine their effectiveness in the light of a set of standards that can be used for this purpose, hence the need for the need for standards that can guide the auditor in evaluationAIS in use of information technology in banks continued.

Accordingly, the study suggested a set of standards that can guide the auditor for the purposes of evaluating AIS in banks operating in an information technology environment, which relate to how to meet the needs of users for accounting information, internal control, and security of AIS and how to reduce the risks associated with AIS in banks.

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