

Assessment of Control Over Electronic Systems Used in the Financial Affairs of Diyala Education Directorate

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Abstract: Technological advancement in the modern world has significantly impacted financial specialties, including accounting in government departments. Consequently, many have begun adopting electronic programs in their operations, including the Diyala Education Directorate. Through the self-initiated efforts of accountants in the Financial Affairs Department, advanced accounting programs were developed, adding value to work outputs by providing faster completion, accuracy in results, and eliminating the need for additional human resources. This also aligns with the Council of Ministers' decisions to transition work from manual to electronic processes. However, this progress necessarily requires effective control measures that align with it and enable the detection of errors.

Keywords: Electronic Accounting Systems, Internal Control, Electronic Data Processing, Audit Procedures, Financial Affairs, Diyala Education Directorate, Information Systems, Technological Advancements, Electronic Auditing, Control Mechanisms, Accounting Software.



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Introduction

Accounting, financial, and economic scholars, as well as legal and administrative experts, have often emphasized the importance of internal control. Internal control works to protect public funds and helps optimize the use of available economic resources, thereby achieving growth, stability, and ensuring that financial activities meet their objectives.

Supporting and developing internal control is essential to achieve management's control objectives, which include the efficiency and effectiveness of operational activities, the reliability of financial reports, and compliance with laws and regulatory rules.

In response to the emergence of electronic systems, which have revolutionized data processing, it has become difficult for large organizations to face challenges in information systems without relying on computerized electronic systems. Several factors have driven the use of computers in accounting and control fields, including the tremendous growth in control capabilities needed to oversee financial institutions that rely on modern methods and tools of production, resulting in increased volumes of accurate data and information necessary for decision-making. Since information is considered a source of strength for an organization's continuity, it is regarded as one of its main assets. This necessitates focusing on the quality of information produced by these systems by studying their components and mechanisms of operation using auditing tools to assess their quality.

Research Problem

Electronic accounting programs are among the outputs of technological accounting development. Due to their advantages in adding value to work, most financial departments (including the Financial Affairs Department in Diyala Education Directorate) have resorted to using electronic accounting software. These programs require effective control to ensure the accuracy of results. The research problem, therefore, revolves around the following question:

Is the control (represented by the Internal Control and Audit Unit in the directorate) capable of detecting errors in electronic programs? Are electronic controls used in the work? And is control capable of continuously developing operations in line with electronic advances in accounting software?

Research Objective

This research aims to identify the relationship between electronic accounting systems and internal control, and to determine the impact of electronic data and information processing on the internal control system. The research also seeks to study the role of electronic auditing in improving the efficiency of the internal control system. Furthermore, it aims to examine the extent of using electronic auditing tools and methods in the Diyala Education Directorate and to assess their level of efficiency.

Significance of the Research

The importance of the study can be summarized as follows:

- The study addresses a modern topic by examining the concept of internal control within an electronic operational environment and its impact on quality and performance.
- The significance of the electronic accounting information system in economic units stems from the necessity of accurate and relevant information.
- The importance of internal control accompanying electronic operating systems.
- There is a technological significance represented by the speed and accuracy of data processing, along with superior capabilities in data storage and retrieval speed.
- Implementing good control and expanding the size of examined samples may reach more than 90% of the data used.

Research Hypothesis

The research is based on a primary hypothesis: the control (represented by the Internal Control and Audit Unit in the directorate) is not fully capable (100%) of detecting errors in electronic programs; electronic control is not used in practice; and control is unable to continuously develop work in line with electronic advances in accounting software.

Research Scope:**Time Scope:**

The study relied on the latest updates to electronic control tools reached by the Internal Control and Audit Division at the Diyala Education Directorate in the year 2023.

Spatial Scope:

The study was conducted in the Republic of Iraq, specifically at the Diyala Education Directorate, Financial Affairs Department, and the Internal Control and Audit Division.

Subject Scope:

The study focused on the electronic systems used in the Diyala Education Directorate and the methods applied for their control.

Research Methodology:

The current study relied on both inductive and deductive approaches. The inductive method was used to observe the actual accounting and control practices at the Diyala Education Directorate, alongside reviewing literature, books, and references related to the study topic. Subsequently, the deductive method was applied to infer the points of weakness in internal control.

Previous Studies:

Below are some of the studies reviewed by the researchers:

The Study	Researcher Names	Study Titles
Arab Studies	Mohsen and Hashem, 2022	The Role of E- Internal Auditing in Increasing the Effectiveness of internal Control System: An applied Study in The Nineveh Sewerage Directorate
	Abdul Basit Bouhaik, 2015	The Role of Accounting Information System in Achieving the Effectiveness of Internal Control: An Applied Study for a Petroleum Refining Institution in Adrar Soralchin
	Yaqub and Naeem, 2014	A Proposed Guide for Auditing Automated Accounting Systems According to the COBIT Framework: An Applied Study in the General Company for Petrochemical Industries
An Arab Study in English	Hassan et al., 2021	Alignment Between Internal Control Systems and Electronic Data Processing and Their Role in Rationalizing Administrative Decisions: An Analytical Study of a Sample of Iraqi Banks Listed on the Iraq Stock Exchange
Foreign Studies	Tan et al.	"The Current Impact of Information Technology on Internal "Auditing

After reviewing a range of previous studies, the researchers were able to identify the following points:

- Previous studies addressed the role of computer networks in accounting and auditing, which resulted in new tasks for the internal auditing profession and the necessity to equip auditors with all the requirements to keep pace with modern technology. Information technology is a double-edged sword: on one hand, it is a tool for auditing; on the other, it poses risks to the auditing process.

- Management must implement control measures at an appropriate level to ensure the production of reliable financial information. Additionally, accountants, system analysts, and management should report any risks arising from threats facing the company's information systems.
- Previous studies recommended the importance of developing an internal control system compatible with the electronic accounting data system to impose restrictions and limit fraud and manipulation in data or information, delivering it to users with the highest possible quality.
- The researchers believe that the use of computers and electronic systems in processing accounting data does not change the objectives of internal control but requires the use of different tools and the application of distinct procedures to achieve those objectives.
- Most previous studies focused practically on case studies in banks and petroleum institutions and the electronic systems within them. This highlights the importance of the current study in examining the impact of electronic control across various sectors commercial, service, or governmental.

Key distinctions of the current study compared to previous research:

1. The current study relied on previous studies to formulate the general framework and employed the descriptive method.
2. This study is among those aiming to investigate the integration between electronic accounting systems and electronic auditing systems to achieve reliable and trustworthy information.
3. What distinguishes this study is its application to governmental institutions specifically the Ministry of Education, Diyala Directorate of Education and its focus on studying strengths and weaknesses in the auditing system concerning electronic accounting systems, proposing appropriate procedures to develop the existing control system.
4. Modern trends in most institutions call for technological advancement across all sectors. E-governance has led the Diyala Directorate of Education to adopt the latest electronic systems for organizing accounting operations electronically, and this research aims to examine the extent to which auditing systems in the directorate keep pace with this development.

Axis One: Electronic Accounting Information Systems

Introduction

The world is witnessing numerous developments across various fields, including economic ones. Among the most significant is the emergence and growth of information systems due to the conveniences and services they offer their users. Electronic accounting information systems are among these systems that produce accounting information, which in turn contributes to guiding decision-making within economic institutions. It is noteworthy that accounting information is not valuable or beneficial unless it clarifies the future expectations of the institution and helps evaluate its performance during the period covered by the financial statements. It also assists decision-makers in making sound decisions.

Recently, electronic accounting programs have evolved significantly; their use is no longer limited to recording transactions and preparing financial statements only. They have become essential for obtaining accurate information about costs, payroll and wage listings, resource planning, quality control, inventory management, and meeting customer demands. This has led international accounting bodies to require economic companies to use advanced accounting software compatible with international accounting standards (Fardous, 2019, p. 3).

Theoretical Framework of the Study

All institutions seek to maximize their returns by making quick decisions and utilizing available resources based on reliable, accurate, and timely information. This has increased the importance of accounting information systems. These institutions vary in their awareness and application of accounting information systems. The rapid technological development, widespread use of software and systems, and the increase in the volume of data that must be processed, stored, and presented as relevant, high-quality information in a timely manner have made controlling and managing data and information using traditional methods difficult.

The spread and advancement of information technology applications at all levels, coupled with institutions' desire to keep pace with these technological developments and use the latest electronic systems and software, have been fundamental motives for employing technological systems and communication tools to perform accounting functions more accurately and quickly. This has driven institutions to adopt accounting information systems tailored to their specific needs and specifications to control the vast amount of data and information within these companies and ensure its reliability.

Electronic Accounting Information Systems

Section One: The Concept of Electronic Accounting Information Systems

Electronic accounting information systems are fundamental elements within an institution, relied upon in various fields to support its activities in achieving its objectives. These systems are implemented through computers using different software to process data within the system or between system elements and the external environment. This processing transforms data into information for delivery to users (Mustafa, 2008, p. 5).

An electronic accounting information system is a subsystem of information composed of human and mechanical capabilities responsible for providing operational data to contribute to control, planning, and decision-making processes. It can be defined as the accounting system that uses computer technology to process financial data in institutions, commonly referred to in accounting studies as electronic accounting (Amidu et al., 2011, p. 146).

It can be described as the use of electronic computers in accounting information systems, which has helped resolve many problems associated with manual systems, reducing time and effort and creating self-control over data entry processes (Khadr, 2021, p. 31). It is also referred to as the integration of accounting information systems with electronic systems, resulting in what is called the electronic accounting system.

The American Accounting Association defines it as an automated system that collects, organizes, and delivers information to users for the purposes of control, planning, and decision-making. It can be considered a group of individuals, system operations, and electronic devices working within the institution aiming to prepare information for management and other entities to make decisions (Elias, 2019, p. 9).

Starting Work on Electronic Accounting Programs and Support

To launch an institution towards implementing electronic accounting information systems, the following must be provided (Yaqub & Naeem, 2014, p. 99):

1. Determining the levels of service to be provided by automated accounting information systems to align with business requirements within the institution.
2. Adequate scientific and practical qualification of electronic system users.
3. Procedures ensuring accurate and correct data entry.
4. Controls to operate data processing in ways that reduce errors or guarantee no repetition of errors.

5. Controls enabling the institution to obtain accurate and complete outputs in a timely manner.
6. Continuous activation of technical and procedural controls to protect information.
7. Ensuring unauthorized personnel are not allowed access to device and software locations.
8. Strengthening the system with adequate protection to prevent hacking or unauthorized breaches aimed at stealing or damaging computer hardware and software.
9. Providing a suitable environment for data storage and preservation.
10. Conducting regular checks of data backup copies by the institution.
11. Providing an appropriate environment for devices and software to protect them from damage, fire, dust, and environmental hazards.
12. Forming committees to inspect and review software programs composed of employees other than those who operate or prepare backup copies of the programs.
13. Encouraging external parties to support the electronic accounting information systems used within the institution.

Elements of Accounting Information Systems

These elements can be summarized as follows: (Firdous & Mardiya, 2019, p. 3) (Elias, 2019, p. 91):

1. **Hardware:** This includes the computer devices and their accessories such as the central processing unit (CPU).
2. **Data Storage Media:** This includes all magnetic tapes, disks, and other storage devices.
3. **Software:** Divided into two types:
 - **System Software:** Programs dedicated to operating the computer device.
 - **Application Software:** Programs designed for specific functions such as payroll, inventory management, etc. Accountants may develop these programs themselves or with the help of specialized companies.
1. **Database:** A container that holds the institution's data to be processed, which must be available as raw material that is operated on through application software to obtain information.
2. **Operating Procedures:** These are part of the physical components of the system.
3. **Human Element:** This includes the personnel operating the electronic computing system, such as system analysts and designers, and is considered the most important part. It also includes system operators and end-users who utilize the information produced by the system.

From another perspective, Elias (2019, p. 88) states that the elements of electronic accounting information systems consist of four components: **Input, Processing, Output, and Feedback.**

- **Input:** Events or raw data entered into the system for processing.
- **Processing:** Computational operations on inputs to prepare them for the next phase, which is output.
- **Output:** Information produced by the system after processing the input data.
- **Feedback:** The process of evaluating and properly directing data and information through control mechanisms.

Characteristics of Accounting Software

Accounting software must have a set of characteristics that make it dynamic and useful. These characteristics are: (Al-Hayyari, 2022, p. 452)

1. Defining the objectives of the software to design it appropriately.
2. The software should be suitable and flexible to adapt to changes and the activities of the institution.
3. The software should be stable to maintain its consistency and variables.
4. The software should have interconnected programming relationships.
5. The software should be fast and accurate in processing.
6. It should provide users with timely and relevant information to enable informed decision-making.

Meanwhile, Elias (2019, p. 12) identifies the characteristics of electronic accounting software as: speed, accuracy, efficiency and effectiveness, flexibility, reliability, suitability, comprehensiveness, security of information and data, maintenance and service, software cost, self-control, meeting users' needs, excellence, privacy, and keeping up with technological developments. Additionally, Firdous and Mardiya (2019, p. 3) add other characteristics such as scalability, speed of decision-making, and reliability.

Advantages of Electronic Accounting Systems

Electronic accounting has several features that make it more efficient and effective than traditional accounting. However, technological development is a double-edged sword, and it is necessary to understand both advantages and disadvantages to choose the best approach manual or electronic accounting.

These features are as follows: (Thabet, 2014, p. 5)

1. Easy access to data by users.
2. Access to data from multiple locations, not only from the record-keeping site as in traditional accounting.
3. Decentralization in managing the institution's data.
4. Providing services without the need for physical items and for a large number of users, making it economical and easily accessible.
5. Continuous system improvement by service providers.

Disadvantages of Electronic Accounting

Despite the advantages of electronic accounting information systems, there are some drawbacks due to issues arising from the use of computers, problems during system operation, or environmental factors. For example, data or information loss may occur due to power outages before saving, or due to viruses reaching the system. The following are some of these disadvantages: (Al-Hayyari, 2022, p. 454)

1. High costs of computer hardware and software systems, especially since they are consumable and need to be updated over time to keep up with technological advances and provide better services. Training employees on new versions is also costly.
2. Work disruptions, especially employees' fears of being replaced by computers, and during the initial use of electronic systems, there may be a loss of working time.

3. System failures: the system may stop working due to malfunction or power outages, causing the institution to lose data or information, especially if no backup exists.
4. Unexpected system errors: errors may occur within the system or the programs used, such as the inability to save backup copies of data and information.

Role of the Accountant in Electronic Accounting Information Systems

When implementing a new electronic accounting system, the accountant plays an important role in examining the system, defining user permissions, and establishing operating procedures. The accountant may also be responsible for training system users and deciding whether the electronic system meets users' needs. Therefore, the accountant has a vital role in the development of the accounting system throughout all its stages. The accountant must understand the importance of information technology, keep up with modern technological developments, and actively participate in developing modern accounting information systems within their institution. The accountant is involved in all system phases (planning, analysis, design, implementation, and evaluation), except the programming phase, which is technical and complementary to the accountant's role (Khidr, 2021, p. 37).

User Needs for Accounting Software (Source)

Selecting the appropriate ready-made accounting software for an institution is one of the most important decisions and challenges faced by organizations transitioning from manual to electronic accounting systems or upgrading their electronic systems. User needs, along with the size and nature of the institution's work, are among the main factors determining software selection. These needs include: (Foda & Said, 2019, p. 375; Elias, 2019, p. 39)

1. **Current Needs of the End User:** The nature, characteristics, and volume of the institution's operations are primary determinants of the services and functions required from the electronic accounting software. For example, a trading institution (selling goods and services) requires an accounting system that records activities, prepares financial statements related to accounts receivable and payable, inventory monitoring, payroll, cash management, and provides users with information for informed decision-making.
2. **Future Needs of the End User:** Precisely and comprehensively defining the institution's future expectations for the functions and tasks the accounting software will perform is challenging, especially in a rapidly evolving information technology environment. These expectations are closely linked to the institution's strategic plan and future outlook.
3. **Nature of the Institution's Work:** The type of institution is a fundamental determinant of the kind of electronic accounting system and software to be applied. Industrial institutions require different software from commercial institutions, governmental organizations, or others.

Axis Two: Internal Control in Light of Electronic Processing of Accounting Data

Nature of Internal Auditing

The concept of electronic auditing is closely linked to the rapid development of information technology. Several definitions have been proposed to define electronic auditing. It is defined as the process of collecting and evaluating evidence to obtain reasonable assurance about the efficiency of electronic systems that rely on information technology for data processing, and the effectiveness of control measures to protect databases and software and mitigate risks (Muthukrishnan, 2014, p. 1).

It is also defined as conducting auditing processes using information technology to assist the auditor throughout different audit stages, including control, planning, and risk assessment (Huriya, 2017, p. 15). Another definition describes it as the process of obtaining and evaluating objective

evidence to ensure the role of information technology in aiding the auditor during control and planning activities (Safia, 2020, p. 768).

Moreover, Thuwaib (2021, p. 18) defines electronic auditing as the ability to employ various tools provided by information technology to perform internal auditing tasks while reducing the time required to complete audits and achieving the highest quality.

The researchers conclude that electronic auditing is the systematic execution of auditing procedures through the use of information technology to examine and evaluate evidence by leveraging IT concepts, to determine its contribution to achieving the entity's objectives and assisting the auditor in planning and control processes.

Internal Auditing of Electronic Accounting Systems:

1. Administrative Auditing:

To achieve the objectives of administrative auditing under the electronic processing of accounting data and to obtain the best results from the audit process, the following must be ensured:

The electronic processing of accounting data necessitates the implementation of new control procedures and review methods compatible with it. Internal control is divided into three subsystems, each aiming to achieve specific goals through a series of appropriate procedures. These subsystems are divided as follows (Mohammed, 2017: 17-18):

A. Organizational Control:

This involves the division of tasks inside and outside the electronic data processing department to reduce errors and violations when using these systems. Organizational control under electronic processing of accounting data includes the following procedures:

- Separation of the electronic data processing department from the departments benefiting from computer services. The processing department is responsible for everything related to data operation, while the benefiting departments are responsible for errors or violations occurring outside the processing department.
- Complete separation of duties among workers in the electronic data processing sections, such as programmers, system analysts, and system operation control and maintenance personnel.
- Separation of duties within the benefiting departments.
- Scheduling regular working hours for system employees, including during holidays and sick leaves.

B. Auditing the Design and Documentation of the System:

Good design and documentation of the electronic data processing system facilitate the auditing process by providing the auditor with sufficient supporting documents and evidence. Auditing the system's design and documentation includes:

- **Control over System Design:** Building a system that contains sufficient control procedures for computer applications, operates according to standard operating specifications, and can be inspected, tested, and audited appropriately.
- **Control over System Documentation:** This includes documentation of records, reports, working papers, a complete description of the system and its programs, data flow charts, and operating instructions that help describe the system and its procedures used for data processing and operation tasks.

C. **Control over Output Distribution:**

➤ **Administrative Control over System Security** includes:

- ✓ Defining the objectives of system security.
- ✓ Identifying probabilities and costs associated with data operation security risks.
- ✓ Preparing a plan to ensure an acceptable level of security at an acceptable cost.
- ✓ Assigning responsible personnel for system security.
- ✓ Testing and inspecting the quality of security control procedures.

2. **Operational Control:**

To achieve the objectives of operational control under electronic data processing systems, the following should be incorporated (Abdel-Majid, 2019: 22-23):

➤ **Control through Automated Units and Software:**

It is essential for software designers to play a positive role in auditing the electronic processing of data by evaluating the automated components and software that fulfill this role. This is done through a set of control tools that can be applied to the electronic data processing via both the automated components and the software:

1. **Control through Automated Components:**

These procedures include:

- Checking for redundant characters.
- Double performance checks.
- Backward verification.
- Validity checks.
- Hardware inspection.
- Access control procedures to the system.

2. **Control through Software:**

Software control can be divided to cover the following aspects:

- Error handling.
- Self-protection mechanisms.

3. **Accounting Control:**

Despite the use of computers in processing accounting data, the objective of control procedures over accounting operations remains unchanged. Therefore, a set of control procedures must exist, including:

a) **Control Procedures for Data Preparation:**

Data preparation refers to the preparation, examination, and certification of all original documents related to transactions. This is the responsibility of the benefiting departments. Accounting control over data preparation aims to verify the accuracy of data before entering it into the computer system by preventing or detecting errors and violations, ensuring correction to the appropriate form, and minimizing losses as follows:

➤ **Procedures to Prevent Errors and Violations:**

Accounting control procedures aimed at preventing errors and violations during data preparation include:

- Written procedures to be implemented by the benefiting departments.
- Good design of original documents.
- Numbering of original documents, which reduces the likelihood of losing or forgetting documents.
- Dual signatures on original documents, which reduce the possibility of unauthorized transactions.

2- **Procedures for Detecting Errors and Violations** include the following: Use of control procedures for totals, such as controlling the totals of numbers and quantities of transactions, aimed at detecting any alteration in data during preparation, entry, and processing. This is done by performing random manual checks of the data.

3- **Procedures for Correcting Errors and Violations** include the following: Error correction steps begin with designing a well-structured audit voucher that allows tracing and correcting errors and violations in the original documents.

B - Control Procedures on Data Input

There are two commonly recognized methods for data entry: batch input and real-time input. Under the first method, data from original documents is collected, sorted, corrected, and transferred onto media readable by the computer, then entered into the system in batches. In real-time input, terminal units are directly connected to the computer, and transactions are entered immediately upon completion. Accounting control procedures differ between batch input and real-time input as follows (Wahab, 2011: 81-82):

1. Control Procedures for Batch Data Entry

Control procedures for batch data entry play a crucial role in preventing, detecting, and correcting computer errors and violations, thereby minimizing losses. Batch control involves random sampling checks of the accounting transactions entered into the system due to the impracticality of reviewing all transactions.

2. Control Procedures for Real-Time Data Entry

Real-time input systems enter data directly into the computer through terminals without preparing data in batches. This requires control procedures that differ from those used in batch input. The audit procedures for real-time data entry aim to achieve three objectives: minimizing errors and violations, detecting them, and auditing them for correction and loss reduction. Real-time controls allow examination of a larger number or possibly all transactions.

C - Audit Procedures on Data Processing:

Processing is an internal function executed by the computer via pre-prepared operating program commands. Processing involves operations such as performing calculations, applying comparisons, summarizing, maintaining and updating files, querying, validating data, and correcting errors.

D - Audit Procedures on Outputs:

System outputs are of two types: either saved in a computer-readable format or presented as printed reports. To mitigate risks related to outputs, a set of control procedures can be implemented including:

(Please provide the continuation or specify if you want the output controls part translated as well.)

1- Procedures on Control Applications:

- Examining outputs generated from all applications.
- Comparing processing operations with input transaction records.
- Verifying the consistency of batch audit procedures related to processing with those prepared before processing, and following up on any discrepancies if found.

2- Procedures for Beneficiaries:

The beneficiary departments must verify all received outputs by conducting necessary tests to ensure their conformity with planned expectations.

3- Procedures for Correcting Errors or Violations and Re-delivery:

Correct errors or violations identified and reissue the corrected outputs accordingly.

Third: Evaluation of the Internal Control System under Electronic Processing of Accounting Data:

When the auditor studies and evaluates the internal control system under the electronic processing of accounting data, they must choose the appropriate method to study and assess the control system as follows:

The overall system is divided into a number of basic sections so that the auditor is familiar with the flow of operations within the accounting system, which are referred to as operational cycles. A cycle is a sequence of events that form a complete process. Therefore, the operational cycles approach is based on classifying economic events into a limited number of groups or cycles that represent the different business activities of the entity, with each cycle consisting of a set of interrelated operations that follow a single path.

Although operational cycles vary depending on the nature of the audited entity's activity, there are three general cycles that include all operations of any entity: the cost of sales cycle, the financing cycle, and the revenue cycle (Sijini, 2016: 28).

Third Axis: The Practical Aspect

After addressing the concept of both traditional and electronic accounting systems as well as their control mechanisms in both traditional and electronic forms, these concepts will be applied to the Iraqi Ministry of Education, specifically the Diyala Education Directorate, as it is one of the institutions that uses electronic accounting systems.

1. Research Tools:

Observation and interviews were the primary tools used for research. Records, documents, and both paper and electronic accounting statements were examined. The required documents were monitored over a period of eight months. Monthly documents were reviewed to collect the necessary information and data to complete the research, taking into account the scientific principles followed in academic research. A group of employees from the Financial Affairs Department, the Internal Audit and Control Department, and those responsible for the electronic system in the Financial Affairs Department were interviewed to practically apply the theoretical part of the study and investigate the obtained results.

2. Institution Definition and Work Mechanism:

The Diyala Education Directorate is one of the formations affiliated with the Iraqi Ministry of Education. It is responsible for managing educational institutions in Diyala Governorate, which consists of 1718 schools. The total number of teaching and administrative staff is 65,106. The Financial Affairs Department staff responsible for organizing salaries consists of 75 employees

working with 75 computers. Additionally, there are 6 employees responsible for sub-branch system control in the districts, 3 employees responsible for the central system control and the electronic payment system. Their work is coordinated with 58 employees in the Internal Audit Division.

3. Work Mechanism within the Institution:

The payment process for the directorate's financial entitlements is performed through successive steps in different departments, as shown in the following figure:

Source: Prepared by the researchers.

Steps are as follows:

1. Issuing administrative orders from the Human Resources Department regarding payment of financial entitlements such as bonuses, promotions, certificate calculations, and other allocations. The Planning Department handles the entitlements and allocations for holders of higher certificates, and the General Education and Staffing Department manages appointment, transfer, and nomination orders. All processes comply with the applicable laws and regulations and require the necessary approvals. The Federal Audit Bureau oversees compliance with laws and instructions. Notably, in September 2023, the Financial Affairs Department issued a circular requiring serial numbers to be written for each employee in all relevant departmental orders to facilitate their electronic input into the system.
2. The second step involves salary accountants receiving the paper administrative orders, serving as data entry personnel. They translate the paper orders into digital information (such as amounts or dates), which the system processes to calculate monthly salaries. For example, inputting the number of absent days or the date of entitlement to bonuses and promotions allows the system to calculate all financial entitlements and deductions for the employee. The system outputs, after issuing a print command, take the form of printed lists sent to the Audit Division.
3. Upon receiving the financial lists, the Audit Division manually reconciles the system outputs with the original administrative orders (data sources) and verifies the correctness of the calculations and the administrative order procedures. Once the financial information is verified, final reports required by various external entities such as different trust accounts (implementation, retirement, taxes, bank advances, and others) are issued, as shown in the following figure:



Source (Prepared by the Researchers)

In light of the foregoing and after reviewing the work procedures, the researchers raised a set of questions presented through the distribution of a questionnaire to collect the necessary information to complete the research study. After gathering the required data, the results and responses to each question, along with the statistical analysis outcomes, are as follows:

Question Number	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	Sample Size	Mean	Standard Deviation	Percentage	Sample Trend	t-Test	Question Rank
19	60	7	3	0	0	70	4.81	0.49	96.2	Strongly agree	30.90297959	1
14	52	14	1	2	1	70	4.63	0.78	92.6	Strongly agree	17.48279487	2
17	44	15	3	6	2	70	4.33	1.08	86.6	Strongly agree	10.30257407	3
7	38	22	1	7	2	70	4.24	1.07	84.8	Strongly agree	9.69517757	4
13	35	19	0	11	5	70	3.97	1.33	79.4	Agree	6.101518797	5

20	8	55	1	6	0	70	3.93	0.68	78.6	Agree	11.44173529	6
12	28	24	2	12	4	70	3.86	1.27	77.2	Agree	5.665165354	7
1	13	41	7	7	2	70	3.8	0.95	76	Agree	7.045052632	8
18	7	52	1	7	3	70	3.76	0.92	75.2	Agree	6.911043478	9
15	3	51	8	7	1	70	3.69	0.77	73.8	Agree	7.496805195	10
8	2	38	22	7	1	70	3.47	0.77	69.4	Agree	5.106519481	11
5	7	35	17	6	5	70	3.47	1.02	69.4	Agree	3.854921569	12
6	9	35	8	14	4	70	3.44	1.12	68.8	Agree	3.286642857	13
16	6	40	6	14	4	70	3.43	1.08	68.6	Agree	3.330907407	14
11	9	32	11	13	5	70	3.39	1.14	67.8	Agree	2.862052632	15
2	4	10	5	44	7	70	2.43	1.04	48.6	Disagree	- 4.585211538	16
9	2	13	8	31	16	70	2.34	1.11	46.8	Disagree	- 4.974378378	17
10	4	11	7	29	19	70	2.31	1.19	46.2	Disagree	- 4.85087395	18
4	1	5	9	33	23	71	1.99	0.93	39.8	Disagree	- 9.085655914	19
3	0	11	4	13	42	70	1.77	1.11	35.4	Strongly disagree	- 9.270432432	20

Table No. (1) prepared by the researchers based on the results of the statistical analysis program (SPSS)

For the entire study			
Mean	Standard deviation	Percentage	Sample trend
3.45	1.32	69	Agree

Table (2) prepared by the researchers based on the results of the statistical analysis program (SPSS)

Qualitative Analysis of the Practical Aspect:

The response rates according to question rank are as follows:

Rank 1 – Question 19: There is no involvement of the programmers in the Control Division in designing accounting systems, electronic control systems, and programming codes for the processing phase.

The researchers believe that designing accounting or control systems requires the participation of specialists in accounting or auditing with programming expertise. Naturally, understanding how programming works allows proposing ideas and designs that serve the work, which are eventually developed into software by the programmers. This is because programmers do not fully comprehend the needs of accounting or auditing tasks. For question 19, 96.2% of respondents strongly agreed, indicating the absence of control personnel with programming experience in the design of the electronic accounting or auditing system, meaning there is no control over the fundamental design phase of the implemented system.

Rank 2 – Question 14: There is a gap in control procedures, as the electronic accounting system does not lock data to prevent modification before sending it for auditing. The result shows that 92.6% strongly agreed on the issue of data not being locked or encrypted before being transferred to auditing, which may expose the data to deliberate or accidental alteration at any stage, requiring a solution to this problem.

Rank 3 – Question 17: From a control perspective, traditional paper outputs can be dispensed with, relying solely on electronically protected outputs.

This question received 86.6% agreement, indicating the possibility of relying exclusively on electronic outputs. This aligns with government trends regarding governance and the use of electronic systems, as all administrative orders, documents, and financial lists are currently archived electronically.

Rank 4 – Question 7: Accounting software simplifies the work.

Results show 84.8% strongly agree, confirming that working with electronic systems and computers undoubtedly simplifies tasks, saves time and effort, and improves accuracy.

Rank 5 – Question 13: Discovery of discrepancies in financial information between the electronic system and paper outputs indicates a need for electronic auditing. With 79.4% agreement, there is a gap between electronic and paper systems. The study found differences between final summary reports after certain adjustments without reprinting partial reports, which is an unintended error by system operators. The researchers proposed generating a final net salary check report to address this issue.

Rank 6 – Question 20: Using electronic control systems on accounting systems provides greater accuracy, time savings, and less effort compared to traditional auditing. This question had the highest agreement at 78.6%, indicating a majority agree that electronic systems enhance auditing accuracy, reduce time and effort, and allow auditing of data and processes impossible without electronic systems.

Rank 7 – Question 12: There are gaps between electronic accounting systems and traditional manual auditing.

Responses showed 77.2% agreement, indicating a clear gap between electronic and manual systems. This is logical because electronic systems emerged to address the inability of traditional manual systems to handle increasing data volumes.

Rank 8 – Question 1: Traditional auditing does not keep pace with electronic accounting systems.

With 76% agreement, the current auditing unit in Diyala's General Directorate of Education does not match the electronic accounting systems used due to continuous departmental updates and the auditing unit's inability to keep up.

Rank 9 – Question 18: Lack of electronic control systems allows manipulation within electronic accounting systems that cannot be detected manually.

At 75.2% agreement, given the data volume for Diyala's approximately 65,000 employees, manual final aggregate checking is difficult, showing urgent need for an electronic control system that matches the growing financial data handled.

Rank 10 – Question 15: There are electronic outputs from the accounting system not subject to control.

At 73.8% agreement, some electronic data issued to external users is uncontrolled, which needs attention and corrective action by the control unit.

Rank 11 – Question 8: Are the electronic accounting programs suitable for work? At 69.4% agreement, the programs meet all accounting work requirements.

Rank 12 – Question 5: Auditing can transition to electronic programs.

Also 69.4% agree, reflecting a willingness to adopt electronic control systems due to time savings and increased accuracy.

Rank 13 – Question 6: Electronic accounting programs are reliable.

At 79.4% agreement, users have high confidence in system outputs and reports, which provide greater benefits especially when supported by electronic control systems enhancing report reliability.

Rank 14 – Question 16: There is a need to add modifications to accounting programs due to control procedures.

With 68.6% agreement, there is an ongoing need for system updates to keep pace with work basis changes, new instructions, and issues encountered by users or external reporting demands.

Rank 15 – Question 11: Electronic auditing of accounting outputs is possible.

At 67.8% agreement, electronic auditing of outputs (viewable on screen or printable) is feasible.

Rank 16 – Question 2: Human resources for auditing electronic programs are available.

48% disagreed (mean 2.43), indicating a lack of current human capabilities for electronic auditing, highlighting the need to train control unit staff on electronic systems.

Rank 17 – Question 9: Electronic auditing of accounting inputs is possible.

46.8% disagreed. Researchers found input auditing difficult due to inputs being subject to change based on directives from departments. Control focuses on outputs and final results matching administrative input approvals.

Rank 18 – Question 10: Electronic auditing of the accounting processing stage is possible. 46.2% disagreed, indicating difficulty in controlling processing, which uses programming codes requiring auditors with additional certifications and programming expertise.

Rank 19 – Question 4: Electronic auditing is used on electronic programs.

39.8% strongly disagreed, indicating the absence of electronic auditing on accounting systems. Researchers stress the urgent need to start electronic auditing given the doubling of staff and data volume.

Rank 20 – Question 3: Physical resources (space, devices) for auditing electronic programs are available.

35.4% disagreed, indicating the need to purchase additional computers, update existing devices, provide suitable workspace, and equip the control unit with internet and local network connectivity.

Conclusion:

The researchers confirmed the study hypothesis that the internal control and auditing unit in the directorate cannot fully (100%) detect errors in electronic programs. Electronic control is not currently utilized, and the control unit cannot continuously develop to keep pace with electronic advancements in accounting software.

Axis Four: Conclusions and Recommendations

Conclusions:

Through the exploration and understanding of the study's axes, the researchers reached the following conclusions:

1. The control division lacks the material and human resources with sufficient expertise to use electronic control systems that keep pace with the accounting systems used in the financial affairs department.
2. There are insufficient devices (computers, internet, servers) in the control division to operate the electronic system and link it properly.
3. There is a delay in work completion by the control division due to the absence of electronic auditing systems, resulting in additional time wasted by relying on traditional methods.
4. Employees in the control division are motivated to adopt electronic systems in auditing.
5. Users of financial reports have higher trust in reports generated by electronic systems due to the accuracy and transparency these systems provide in the presented data.
6. Diyala Directorate of Education designed electronic systems for accounting work according to departmental needs, simplifying processes and reducing errors through shortcuts and reports.
7. The processing steps and program shortcuts follow programming codes tailored to work requirements, which complicates auditing the accounting data processing.
8. There is a gap between the electronic accounting system and traditional auditing practices.
9. Discrepancies exist between paper and electronic outputs, indicating that traditional auditing does not keep up with electronic systems.
10. The absence of electronic auditing allows for deliberate or accidental accounting errors that cannot be detected relying only on printed reports.

Recommendations:

1. Implement an electronic auditing system that keeps pace with current work developments.
2. Involve control division employees in training courses on using modern electronic auditing systems to enhance their skills.
3. Provide appropriate electronic devices for operating electronic systems, including reliable data storage devices to prevent data loss.
4. Establish linkage between electronic accounting and control systems, ensuring electronic handling and file transfers to reduce employee effort and save time.
5. Strengthen both paper and digital reports generated from electronic accounting systems by applying electronic control systems to increase security levels.
6. Link and coordinate the newly established financial technologies and electronic payment systems with the electronic control system, as the manual traditional auditing system cannot effectively oversee the new department's work.

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