CHAPTER 11

**AUDITING COMPUTER-BASED INFORMATION SYSTEMS**

**SUGGESTED ANSWERS TO DISCUSSION QUESTIONS**

* 1. **Auditing an AIS effectively requires that an auditor have some knowledge of computers and their accounting applications. However, it may not be feasible for every auditor to be a computer expert. Discuss the extent to which auditors should possess computer expertise to be effective auditors.**

Since most organizations make extensive use of computer-based systems in processing data, it is essential that computer expertise be available in the organization's audit group. Such expertise should include:

* Extensive knowledge of computer hardware, software, data communications, and accounting applications
* A detailed understanding of appropriate control policies and procedures in computer systems
* An ability to read and understand system documentation
* Experience in planning computer audits and in using modern computer assisted auditing tools and techniques (CAATTs).

Not all auditors need to possess expertise in all of these areas. However, there is certainly some minimum level of computer expertise that is appropriate for all auditors to have. This would include:

* An understanding of computer hardware, software, accounting applications, and controls.
* The ability to examine all elements of the computerized AIS
* The ability to use the computer as a tool to accomplish these auditing objectives.

**11.2** **Should internal auditors be members of systems development teams that design and implement an AIS? Why or why not?**

Many people believe that internal auditors should be involved in systems development projects in order to ensure that newly developed systems are auditable and have effective controls. However, if the auditor's involvement is too great, then his or her independence may be impaired with respect to subsequent review and evaluation of the system. Accordingly, the auditor should not be a member of a systems development team, or be otherwise directly involved in designing or implementing new systems.

There are indirect forms of auditor involvement that are appropriate. The auditor can

1. Recommend a series of control and audit guidelines that all new systems should meet.
2. Independently review the work of the systems development team, evaluate both the quality of the systems development effort and its adherence to control and audit guidelines, and report the findings to management.

In both cases, the auditor is working through management rather than with the systems development team.

**11.3** **<para>At present, no Berwick employees have auditing experience. To staff its new internal audit function, Berwick could (a) train some of its computer specialists in auditing, (b) hire experienced auditors and train them to understand Berwick’s information system, (c) use a combination of the first two approaches, or (d) try a different approach. Which approach would you support, and why?**

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The most effective auditor is a person who has training and experience as an auditor and training and experience as a computer specialist. However, few people have such an extensive background, and personnel training and development are both expensive and time consuming.

Berwick may find it necessary to accept some tradeoffs in staffing its audit function. Since auditors generally work in teams, Berwick should probably begin by using a combination of the first two approaches. Then, as audit teams are created for specific purposes, care should be taken to ensure that the members of each audit team have an appropriate mix of skills and experience.

**11.4** **The assistant finance director for the city of Tustin, California, was fired after city officials discovered that she had used her access to city computers to cancel her daughter’s $300 water bill. An investigation revealed that she had embezzled a large sum of money from Tustin in this manner over a long period. She was able to conceal the embezzlement for so long because the amount embezzled always fell within a 2% error factor used by the city’s internal auditors. What weaknesses existed in the audit approach? How could the audit plan be improved? What internal control weaknesses were present in the system? Should Tustin’s internal auditors have discovered this fraud earlier?**

Audit approach weaknesses

1. The question implies Tustin's internal auditors never bothered to investigate transactions below a certain dollar amount, and/or shortages of less than a certain percent. This is not good audit practice.
2. While auditors generally examine transaction samples that are selected to include a high percentage of items having a high dollar value, their sampling procedures should not ignore transactions with lower dollar values. There must have been hundreds of falsified transactions, and an effective sampling plan might have uncovered a few of them.
3. An internal control audit should have detected inadequacies in Tustin's computer access controls, as well as a lack of transaction documentation.

Audit plan improvements

1. Audit software could be used to fully reconcile collections with billings, and list any discrepancies for further investigation.

Internal control weaknesses

1. An assistant finance director should not have the authority to enter credits to customer accounts. Certainly, there should have been documentation to support such transactions.
2. The assistant finance director should not have been granted rights to cancel water or other utility bills

Should the auditors have detected the audit earlier?

The easy answer here is yes, they should have uncovered the fraud earlier. While she was able to embezzle a large sum of money from Tustin, it was over a long period. One of the keys to her success was that she did not get greedy and the amounts taken in any one year was probably immaterial to the city. These kinds of frauds are very hard to detect.

**11.5** **Lou Goble, an internal auditor for a large manufacturing enterprise, received an anonymous note from an assembly-line operator who has worked at the company’s West Coast factory for the past 15 years. The note indicated that there are some fictitious employees on the payroll as well as some employees who have left the company. He offers no proof or names. What computer-assisted audit technique could Lou use to help him substantiate or refute the employee’s claim?**  (CIA Examination, adapted)

Computer-assisted audit tools and techniques (CAATTs) could have been used to identify employees who have no deductions. Experience has shown that fictitious or terminated employees will generally not have deductions. This happens because the fraud perpetrator wants as much money from each fraudulent or terminated employee paycheck as possible. Another reason for this is that they fear that a deduction payment sent to a third party might cause an investigation and uncover their fraud.

**11.6. Explain the four steps of the risk-based audit approach, and discuss how they apply to the overall security of a company.**

The risk-based audit approach provides a framework for conducting information system audits. It consists of the following 4 steps:

1. Determine the threats (fraud and errors) facing the company. This is a list of the accidental or intentional abuse and damage to which the system is exposed.

2. Identify the control procedures that prevent, detect, or correct the threats. These are all the controls that management has put into place and that auditors should review and test, to minimize the threats.

3. Evaluate control procedures. Controls are evaluated two ways. First, a systems review determines whether control procedures are actually in place. Second, a tests of controls are conducted to determine whether existing controls work as intended.

4. Evaluate control weaknesses to determine their effect on the nature, timing, or extent of auditing procedures. If the auditor determines that control risk is too high because the control system is inadequate, the auditor may have to gather more evidence, better evidence, or more timely evidence. Control weaknesses in one area may be acceptable if there are compensating controls in other areas.

The risk-based approach provides auditors with a clearer understanding of the overall security of a company, including the fraud and errors that can occur in the company. It also helps them understand the related risks and exposures. In addition, it helps them plan how to test and evaluate internal controls, as well as how to plan subsequent audit procedures. The result is a sound basis for developing recommendations to management on how the AIS control system should be improved.

**11.7.** Compare and contrast the frameworks for auditing program development/acquisition and for auditing program modification.

The two are similar in that:

* They both deal with the review of software.
* They both are exposed to the same types of errors and fraud.
* They use many of the same control procedures, audit procedures (both systems review and tests of controls), and compensating controls, except that one set applies to program development and acquisition and the other set is tailored to address program modifications. These include management and user authorization and approval; thorough testing; review of the policies, procedures, and standards; and proper documentation. (Compare Tables 2 and 3 in the chapter.)

The two are dissimilar in that:

* The auditor’s role in systems development is to perform an independent review of systems development and acquisition activities. The auditor’s role in program modification is to perform an independent review of the procedures and controls used to modify software programs.
* There are some control procedures, audit procedures (both systems review and tests of controls), and compensating controls that are unique to program development and acquisition and others that are unique to program modifications. (Compare Tables 2 and 3 in the chapter.)
* Auditors test for unauthorized program changes, often on a surprise basis, is several ways that they do not have to test program development and acquisition. These include:
  + Using a source code comparison program to compare the current version of the program with the source code.
  + Reprocessing data using the source code and comparing the output with the company’s output.
  + Parallel simulation, where the auditor writes a program instead of using the source code to compare the outputs.

**SUGGESTED SOLUTIONS TO THE PROBLEMS**

**11.1** **You are the director of internal auditing at a university. Recently, you met with Issa Arnita, the manager of administrative data processing, and expressed the desire to establish a more effective interface between the two departments. Issa wants your help with a new computerized accounts payable system currently in development. He recommends that your department assume line responsibility for auditing suppliers’ invoices prior to payment. He also wants internal auditing to make suggestions during system development, assist in its installation, and approve the completed system after making a final review.**

**<para>Would you accept or reject each of the following? Why?**~~</para>~~

**a. The recommendation that your department be responsible for the pre-audit of supplier's invoices.**

Internal auditing should not assume responsibility for pre-audit of disbursements. Objectivity is essential to the audit function, and internal auditors should be independent of the activities they must review. They should not prepare records or engage in any activity that could compromise their objectivity and independence. Furthermore, because internal auditing is a staff function, involvement in such a line function would be inconsistent with the proper role of an internal auditor.

**b. The request that you make suggestions during system development.**

It would be advantageous for internal auditing to make specific suggestions during the design phase concerning controls and audit trails to be built into a system. Internal auditing should build an appropriate interface with the Data Processing Department to help achieve this goal. Neither objectivity nor independence is compromised if the auditor makes recommendations for controls in the system under review. For example, internal auditing may:

* + Provide a list of control requirements.
  + Review testing plans.
  + Determine that there are documentation standards and that they are being followed.
  + Determine that the project itself is under control and that there is a system for gauging design progress.

Internal auditing must refrain, however, from actual participation in system design.

**c. The request that you assist in the installation of the system and approve the system after making a final review.**

The auditor must remain independent of any system they will subsequently audit. Therefore, the auditor must refrain from giving overall approval of the system in final review. The auditor may help in the installation or conversion of the system by continuing to offer suggestions for controls, particularly during the implementation period. In this situation, the auditor may review for missing segments, results of testing, and adequacy of documentation of program and procedures in order to determine readiness of the system for installation or conversion. After installation or conversion, the auditor may participate in a post-installation audit, either alone or as part of a team. (CIA Examination, adapted)

**11.2 As an internal auditor for the Quick Manufacturing Company, you are participating in the audit of the company’s AIS. You have been reviewing the internal controls of the computer system that processes most of its accounting applications. You have studied the company’s extensive systems documentation. You have interviewed the information system manager, operations supervisor, and other employees to complete your standardized computer internal control questionnaire. You report to your supervisor that the company has designed a successful set of comprehensive internal controls into its computer systems. He thanks you for your efforts and asks for a summary report of your findings for inclusion in a final overall report on accounting internal controls.**

**<para>Have you forgotten an important audit step? Explain. List five examples of specific audit procedures that you might recommend before reaching a conclusion.**

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The important audit step that has not been performed is tests of controls (sometimes called compliance tests). A system review only tells the auditor what controls are prescribed. Tests of controls allow the auditor to determine whether the prescribed controls are being adhered to and they are operating effectively.

Examples of audit procedures that would be considered tests of controls are:

* Observe computer operations, data control procedures, and file library control procedures.
* Inquiry of key systems personnel with respect to the way in which prescribed control procedures are interpreted and implemented. A questionnaire or checklist often facilitates such inquiry.
* Review a sample of source documents for proper authorization.
* Review a sample of on-line data entries for authorization.
* Review the data control log, computer operations log, file librarian's log, and error log for evidence that prescribed policies are adhered to.
* Test data processing by submitting a set of hypothetical transactions and comparing system outputs with expected results.
* Trace selected transactions through the system and check their processing accuracy.
* Check the accuracy of a sample of batch totals.
* Review system operating statistics.
* Use a computer audit software package to edit data on selected master files and databases.

**11.3 As an internal auditor, you have been assigned to evaluate the controls and operation of a computer payroll system. To test the computer systems and programs, you submit independently created test transactions with regular data in a normal production run.**

**<orderedlist numeration="loweralpha" inheritnum="ignore" type="ll" continuation="restarts"><listitem><para><inst></inst>List four advantages and two disadvantages of this technique.</para></listitem>**

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| --- | --- |
| **a. Advantages** | **b. Disadvantages** |
| * Does not require extensive programming knowledge * Approach and results are easy to understand. * The complete system may be reviewed. * Results are often easily checked. * An opinion may be formed as to the system's data processing accuracy. * A regular computer program may be used. * It may save time. * The auditor gains experience. * The auditor maintains control over the test. * Invalid data can be submitted to test for rejections. | * Impractical to test all error possibilities. * May be unable to relate input data to output reports in a complex system. * If independent files are not used, it may be difficult to reverse or back out test data. * Preparation of satisfactory test transactions may be time consuming. |

(CIA Examination, adapted)

**11.4** **You are involved in the audit of accounts receivable, which represent a significant portion of the assets of a large retail corporation. Your audit plan requires the use of the computer, but you encounter the following reactions:**

**<para><para>For each situation, state how the auditor should proceed with the accounts receivable audit.</para>**

1. **The computer operations manager says the company’s computer is running at full capacity for the foreseeable future and the auditor will not be able to use the system for audit tests.</para></listitem>**
   * The auditor should not accept this explanation and should arrange with company executives for access to the computer system.
   * The auditor should recommend that the procedures manual spell out computer use and access for audits.
2. **The computer scheduling manager suggests that your computer program be stored in the computer program library so that it can be run when computer time becomes available.**

* The auditor should not permit the computer program to be stored because it could then be changed without the auditor's knowledge.

1. **You are refused admission to the computer room.</para></listitem>**
   * The auditor's charter should clearly provide for access to all areas and records of the organization.
2. **The systems manager tells you that it will take too much time to adapt the auditor’s computer audit program to the computer’s operating system and that company programmers will write the programs needed for the audit.**
   * Auditors should insist on using their own computer audit program, since someone at the company may wish to conceal falsified data or records.
   * Auditors should insist on using their own computer audit program to expedite the audit, simplify the application, and avoid misunderstanding.

(CIA Examination, adapted)

**11.5** **You are a manager for the CPA firm of Dewey, Cheatem, and Howe (DC&H). While reviewing your staff’s audit work papers for the state welfare agency, you find that the test data approach was used to test the agency’s accounting software. A duplicate program copy, the welfare accounting data file obtained from the computer operations manager, and the test transaction data file that the welfare agency’s programmers used when the program was written were processed on DC&H’s home office computer. The edit summary report listing no errors was included in the working papers, with a notation by the senior auditor that the test indicates good application controls. You note that the quality of the audit conclusions obtained from this test is flawed in several respects, and you decide to ask your subordinates to repeat the test.**

**Identify three existing or potential problems with the way this test was performed. For each problem, suggest one or more procedures that might be performed during the revised test to avoid flaws in the audit conclusions.**

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|  |  |
| --- | --- |
| Problems | Suggested Solutions |
| Duplicate copy of the program may not be a true duplicate of the current version. | * Source code comparison. * Reprocessing (use previously valid program). * Process test transactions concurrently with live ones, on a concealed basis. |
| Duplicate copy of the file may not be a true duplicate of the current version. | * Obtain the live file and duplicate it under audit control. * Process test transactions concurrently with live ones, on a concealed basis. |
| Programmer's test data file  a. was not independently prepared, and  b. may not have contained any erroneous transactions to test the program’s ability to detect errors. | * Auditor must devise their own test transactions, either (a) manually, or (b) using a test data generator. Erroneous transactions should deliberately be included. |
| The test only checks the programs, not the source data controls, error procedures, etc. | * Process test transactions concurrently with live ones, on a concealed basis. * Use mini-company test (Integrated Test Facility). |
| Audit senior's conclusion has no basis (no supporting evidence). | * Must predetermine the result of test data processing, and then compare these to actual results. |

**11.6 You are performing an information system audit to evaluate internal controls in Aardvark Wholesalers’ (AW) computer system. From an AW manual, you have obtained the following job descriptions for key personnel:**

***Director of information systems:* Responsible for defining the mission of the information systems division and for planning, staffing, and managing the IS department.**

***Manager of systems development and programming:* Reports to director of informationsystems. Responsible for managing the systems analysts and programmerswho design, program, test, implement, and maintain the data processing systems.Also responsible for establishing and monitoring documentation standards.**

***Manager of operations:* Reports to director of information systems. Responsible for management of computer center operations, enforcement of processing standards, and systems programming, including implementation of operating system upgrades.**

***Data entry supervisor:* Reports to manager of operations. Responsible for supervisionof data entry operations and monitoring data preparation standards.**

***Operations supervisor:* Reports to manager of operations. Responsible for supervisionof computer operations staff and monitoring processing standards.**

* 1. **Prepare an organizational chart for AW’s information systems division.**

Manager of Systems Development and Programming

Data Control

Clerk

Operations Supervisor

Data Entry Supervision

Manager of Operations

Director of Information Systems

***Data control clerk:* Reports to manager of operations. Responsible for logging and distributing computer input and output, monitoring source data control procedures, and custody of programs and data files.**

**b. Name two positive and two negative aspects (from an internal control standpoint) of this organizational structure.**

1. What is good about this organization structure:
   * Systems development and programming are organizationally independent of the operations functions.
   * Computer operations organizationally independent of data entry and data control.
2. What is bad about this organization structure:
   * The manager of operations is responsible for systems programming, which is a violation of segregation of systems duties.
   * The data control clerk is responsible for the file library, which is a violation of segregation of systems duties.

c. **What additional information would you require before making a final judgment on the adequacy of AW’s separation of functions in the information systems division?**

* + Is access to equipment, files, and documentation restricted and documented?
  + Are activity logs for operating functions maintained and reviewed?
  + Is there rotation of operations personnel and mandatory vacations?
  + Is source data authorized?

**11.7 Robinson’s Plastic Pipe Corporation uses a data processing system for inventory. The input to this system is shown in Table 11-7. You are using an input controls matrix to help audit the source data controls.**

|  |  |
| --- | --- |
| **Table 11-7 Parts Inventory Transaction File** | |
| **Field Name** | **Field Type** |
| Item number | Numeric |
| Description | Alphanumeric |
| Transaction date | Date |
| Transaction type | Alphanumeric |
| Document number | Alphanumeric |
| Quantity | Numeric |
| Unit cost | Monetary |

**<para>Prepare an input controls matrix using the format and input controls shown in <link linkend="ch09fig03" preference="0">Figure 11-3<xref linkend="ch09fig03" label="9-3"/></link>; however, replace the field names shown in <link linkend="ch09fig03" preference="0">Figure 11-3<xref linkend="ch09fig03" label="9-3"/></link> with those shown in <link linkend="ch09table08" preference="0">Table 11-7<xref linkend="ch09table08" label="9-8"/></link>. Place checks in the matrix cells that represent input controls you might expect to find for each field.**

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**Inventory transactions input control matrix**:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| RECORD NAME:  Parts inventory  transactions | FIELD NAMES | | | | | | | |
| Item number | Description | Transaction date | Transaction type | Document number | Quantity | Unit cost | Comments |
| INPUT CONTROLS: |  |  |  |  |  |  |  |  |
| Financial totals |  |  |  |  |  |  | X | Compute Total cost if possible |
| Hash totals | X |  |  |  |  | X |  |  |
| Record counts |  |  |  |  |  |  |  | Yes |
| Cross-footing  balance |  |  |  |  |  |  |  | No |
| Visual inspection | X | X | X | X | X | X | X | All fields |
| Check digit  verification | X |  |  |  |  |  |  |  |
| Prenumbered forms |  |  |  |  | X |  |  | Use prenumbered form |
| Turnaround  document |  |  |  |  |  |  |  | No |
| Edit program |  |  |  |  |  |  |  | Yes |
| Sequence check |  |  |  |  | X |  |  |  |
| Field check | X |  | X |  |  | X | X |  |
| Sign check |  |  |  |  |  | X | X | Also for balance on hand |
| Validity check | X |  | X | X |  |  |  |  |
| Limit check |  |  |  |  |  |  |  |  |
| Reasonableness test | X |  |  |  |  | X |  | Compare quantity with item number |
| Completeness test  Completeness Test  Completeness Test | X | X | X | X | X | X | X | All fields |
| Size check | X | X | X | X | X | X | X | All fields |
| Other: |  |  |  |  |  |  |  |  |

**11.8** **As an internal auditor for the state auditor’s office, you are assigned to review the implementation of a new computer system in the state welfare agency. The agency is installing an online computer system to maintain the state’s database of welfare recipients. Under the old system, applicants for welfare assistance completed a form giving their name, address, and other personal data, plus details about their income, assets, dependents, and other data needed to establish eligibility. The data are checked by welfare examiners to verify their authenticity, certify the applicant’s eligibility for assistance, and determine the form and amount of aid.**

**Under the new system, welfare applicants enter data on the agency’s Web site or give their data to clerks, who enter it using online terminals. Each applicant record has a “pending” status until a welfare examiner can verify the authenticity of the data used to determine eligibility. When the verification is completed, the examiner changes the status code to “approved,” and the system calculates the aid amount.**

**Periodically, recipient circumstances (income, assets, dependents, etc.) change, and the database is updated. Examiners enter these changes as soon as their accuracy is verified, and the system recalculates the recipient’s new welfare benefit. At the end of each month, payments are electronically deposited in the recipient’s bank accounts.**

**Welfare assistance amounts to several hundred million dollars annually. You are concerned about the possibilities of fraud and abuse.**

**a. Describe how to employ concurrent audit techniques to reduce the risks of fraud and abuse.**

Audits should be concerned about a dishonest welfare examiner or unauthorized person submitting fictitious transactions into the system. Fictitious transactions could cause excessive welfare benefits to be paid to a valid welfare recipient, or payments made to an ineligible or fictitious recipient.

The concurrent audit techniques needed most deal with submitting changes in record status from "pending" to "approved" and modifying welfare records to reflect changes in the recipient's circumstances. The auditor should verify that the system is set up to:

* + check the password of every person who uses the system
  + permit applicant records to be entered only by persons classified as "welfare clerks"
  + permit transaction update records to be entered only by persons classified as "welfare examiners"
  + capture and store the identity of the person entering every applicant record and transaction update record

The most useful concurrent audit technique to minimize the risk of fraudulent update transactions would be audit hooks. These program subroutines would review every record entered into the system, capture all data relating to any record that is suspicious and possibly fraudulent, write these records on an audit log or file, and report these records to the audit staff on a real-time basis. Some examples of questionable records that audit hooks might be designed to flag would be:

* + Any welfare application record that is entered into the system by someone other than one of the authorized welfare clerks, and especially if entered by a welfare examiner.
  + Any welfare record status change or modification that is entered into the system by someone other than one of the authorized welfare examiners.
  + Assuming that it takes a minimum of *n* days for a welfare examiner to verify the authenticity of the data provided by a welfare applicant, any record update transaction entered in less than *n* days of the original applicant record entry.
  + Any welfare record modification transaction that causes a welfare recipient's benefits to increase by a significant amount (say, 20%), or to exceed some upper limit that is close to the maximum amount a recipient can collect.
  + Any welfare record that is modified more than two or three times within a short period, such as two or three months.
  + Any record modification transaction that involves a change in the recipient's address.
  + Any welfare record where the recipient's address is a post office box.
  + Any welfare record that is not modified within a five-year period.
  + Any attempt to access the system by someone not able to supply a valid welfare clerk or welfare examiner password.
  + Any record entered into the system at a time of day other than during the agency's normal business hours, or one that is entered during a weekend or holiday period.

Undoubtedly, other useful audit hooks could be identified. The audit staff should "brainstorm" about methods that a fraud perpetrator could use to defraud the system, and develop audit hooks to counteract plausible fraud schemes.

As the audit staff receives the data captured by these audit hooks, they must promptly follow up to verify the validity of the data in each questionable record.

The auditor should verify that the program code that calculates welfare recipient's benefits is thoroughly tested during the implementation process. She should copy the program code so it can be compared with the code that is in use at subsequent intervals. To supplement this procedure, as well as to provide additional protection against a possible fraud perpetrator, the auditor could add another audit hook that captures relevant data relating to any attempt to access and modify the welfare processing program itself.

b. **Describe how to use computer audit software to review the work welfare examiners do to verify applicant eligibility data. Assume that the state auditor’s office has access to other state and local government agency databases.</para></listitem></orderedlist></problem>**

Computer audit software can process the welfare recipient database against other databases that contain data about welfare recipients, identify any discrepancies in the data items used to determine eligibility for benefits and/or calculate the amount of benefits, and report these discrepancies to the audit staff. Other possible databases that might be used for this purpose would include:

* + State income tax records, which contain data on the income and dependents of welfare recipients.
  + State unemployment and/or disability compensation records, which contain data on other sources of income for welfare recipients.
  + State motor vehicle registration records, which might contain data about valuable assets owned by welfare recipients.
  + Property tax records, which might contain data about valuable assets owned.
  + Death records, which would reflect changes in eligibility for benefits. The reason it is important to review these is that a very common fraud scheme involves failure to enter a death record, followed by the diversion of subsequent benefit checks.

If a welfare recipient does not appear in any of the first four databases listed above, it would raise the issue of whether the person exists at all (e.g., is the welfare recipient a fictitious person?). To investigate this, driver license registration records and voter registration records could also be checked. If the recipient does not show up there, the audit staff should probably insist that a Welfare Agency employee (other than a welfare examiner) verify the recipient's existence. If a recipient appears in the death records database, it represents either deliberate fraud or failure to update the welfare records properly.

The use of computer audit software serves two purposes. First, it helps reduce the risk of system abuse by welfare applicants who provide inaccurate or incomplete data about the factors on which benefit calculations are based. Welfare examiners are responsible for identifying such cases, but may not always do so effectively, so audit reviews of this kind provide a second line of defense against this form of abuse.

Second, it should increase the chance that the audit staff will identify cases where a welfare examiner attempts to perpetrate fraud by entering false records into the system.

Combined with the audit hooks described in part (a), the use of computer audit software should provide strong assurance that the risks of fraud and abuse have been minimized.

**11.9 Melinda Robinson, the director of internal auditing at Sachem Manufacturing Company, believes the company should purchase software to assist in the financial and procedural audits her department conducts. Robinson is considering the following software packages:**

* **A generalized audit software package to assist in basic audit work, such as the retrieval of live data from large computer files. The department would review this information using conventional audit investigation techniques. The department could perform criteria selection, sampling, basic computations for quantitative analysis, record handling, graphical analysis, and print output (i.e., confirmations).**
* **An ITF package that uses, monitors, and controls dummy test data processed by existing programs. It also checks the existence and adequacy of data entry and processing controls.**
* **A flowcharting package that graphically presents the flow of information through a system and pinpoints control strengths and weaknesses.**
* **A parallel simulation and modeling package that uses actual data to conduct the same tests using a logic program developed by the auditor. The package can also be used to seek answers to difficult audit problems (involving many comparisons) within statistically acceptable confidence limits.**

(CMA Examination, adapted)

**a. Without regard to any specific computer audit software, identify the general advantages of using computer audit software to assist with audits.**

Audits can be more efficient, saving labor time spent on routine calculations. The routine operations of footing extensions, transcription between reports, report generation, etc., are performed by the computer.

The auditor's time spent on the audit is more analytical than clerical.

The auditor can examine more records and extract data more readily through ad hoc reporting.

Computer-generated reports and schedules are more objective and professional, improving data communication.

Audit sampling is improved. Any bias in sample selection is eliminated because of assured randomness. This has a direct effect on sampling precision, reliability, and audit accuracy.

Possible to check 100% of all records in a file or database

**b. Describe the audit purpose facilitated and the procedural steps to be followed by the internal auditor in using the following:</para>**

**<itemizedlist mark="bull" type="bl"><listitem><inst><listitem><inst> </inst><para>Generalized audit software package.** The purpose of generalized audit software programs is to perform a variety of auditing operations on the computer files used to store the information. The steps to be followed by the internal auditor to use generalized computer audit software would include things such as planning and designing the audit application.

**Integrated test facility package**. An integrated test facility (ITF) can be used to test both source data controls and processing controls as follows:

* + Select and prepare the test transactions to be passed through the ITF. These transactions must be representative of all of the transactions the dummy unit emulates. All types of valid and invalid transactions must be used and blended with regular transactions over time to test the system properly under normal conditions.

Review all output and processing routines including a comparison of actual results to predetermined results.

**Flowcharting package** The purpose of a control flowcharting package is to interpret the program source code and generate a program flowchart corresponding to it in order to facilitate the review of internal controls. To use a control flowcharting package, the internal auditor should:

Establish the audit objective by identifying the systems and programs to be tested.

Review manuals and documentation of the system and interview involved personnel to get an overview of the operations to be tested.

**Parallel simulation and modeling package** The purpose of a parallel simulation package is to ensure that organizational objectives are being met, ensure compliance to technical standards, and detect unauthorized program changes. To use a parallel simulation package:

Run the same data used in the company's current application program using the "simulated" application program.

Compare the results from the "simulated" application with the results from the company's current application program to verify that objectives are being met.

**11.10 The fixed-asset master file at Thermo-Bond includes the following data items: <para>**

|  |  |
| --- | --- |
| **Asset number** | **Date of retirement (99/99/2099 for assets still in service)** |
| **Description** | **Depreciation method code** |
| **Type code** | **Depreciation rate** |
| **Location code** | **Useful life (years)** |
| **Date of acquisition** | **Accumulated depreciation at beginning of year** |
| **Original cost** | **Year-to-date depreciation** |

**E<para>xplain several ways auditors can use computer audit software in performing a financial audit of Thermo-Bond’s fixed assets.</para></problem>**

* Edit the file for obvious errors or inconsistencies such as:
  + Retired assets that have a non-zero net value.
  + Retirement date that precedes acquisition date.
  + Accumulated depreciation that exceeds original cost.
  + Useful life that exceeds a reasonable limit (such as 40 years).
  + Invalid type code, location code, or depreciation method code.
  + Numeric fields that contain non-numeric data.
* Recalculate year-to-date depreciation for each asset record, compare to the amount in the record, and list all asset records for which a discrepancy exists.
* Prepare a list of all assets retired during the current year for comparison to supporting documents.
* Prepare a list of all assets acquired during the current year, by location, for possible physical examination by the auditor.
* Select a sample of assets, stratified by net dollar value, and sorted and listed by location, for possible physical examination by the auditor.
* Foot the entire file to obtain file totals for total original cost, total accumulated depreciation, total current year depreciation, and total cost of current year acquisitions, for comparison to externally maintained records.

**11.11** **You are auditing the financial statements of a cosmetics distributor that sells thousands of individual items. The distributor keeps its inventory in its distribution center and in two public warehouses. At the end of each business day, it updates its inventory file, whose records contain the following data:**

|  |  |
| --- | --- |
| **Item number** | **Cost per item** |
| **Item description** | **Date of last purchase** |
| **Quantity-on-hand** | **Date of last sale** |
| **Item location** | **Quantity sold during year** |

**You will use audit software to examine inventory data as of the date of the distributor’s physical inventory count. You will perform the following audit procedures:**

1. **Observe the distributor’s physical inventory count at year-end and test a sample for accuracy.**
2. **Compare the auditor’s test counts with the inventory records.**
3. **Compare the company’s physical count data with the inventory records.**
4. **Test the mathematical accuracy of the distributor’s final inventory valuation.**
5. **Test inventory pricing by obtaining item costs from buyers, vendors, or other sources.**
6. **Examine inventory purchase and sale transactions on or near the year-end date to verify that all transactions were recorded in the proper accounting period.**
7. **Ascertain the propriety of inventory items located in public warehouses.**
8. **Analyze inventory for evidence of possible obsolescence.**
9. **Analyze inventory for evidence of possible overstocking or slow-moving items.**
10. **Test the accuracy of individual data items listed in the distributor’s inventory master file.**

**<para>Describe how the use of the audit software package and a copy of the inventory file data might be helpful to the auditor in performing each of these auditing procedures.**</para>

(CPA Examination, adapted)

|  |  |
| --- | --- |
| **Audit Procedure** | **How Audit Software Can Help** |
| 1. Observe the distributor’s physical count of inventories as of a given date, and test a sample of the distributor’s inventory counts for accuracy. | Determine which items are to be test counted by taking a random sample of a representative number of items from the inventory file as of the date of the physical count. |
| 2. Compare the auditor’s test counts to the inventory records. | Arrange test counts in a format identical to the inventory file, and then match the counts. |
| 3. Compare physical count data to the inventory records. | Compare the total of the extended values of all inventory items counted, and the extended values of each inventory item counted, to the inventory records. |
| 4. Test the mathematical accuracy of the distributors’ final inventory valuation. | Calculate the dollar value of each inventory item counted by multiplying the quantity on hand by the cost per unit, and then verify the addition of the extended dollar values. |
| 5. Test the pricing of the inventory by obtaining a list of costs per item from buyers, vendors, or other sources. | Compare the unit costs on the auditor’s price test to those on the inventory file. |
| 6. Examine inventory purchase and sale transactions on or near the year-end date to verify that all such transactions were recorded in the proper accounting period. | Take a sample of inventory file items for which the date of last purchase and date of the last sale are on or immediately prior to the date of the physical count, which is usually at fiscal year end. |
| 7. Ascertain the propriety of items of inventory located in public warehouses. | Prepare a list of items located in public warehouses. |
| 8. Analyze inventory for evidence of possible obsolescence. | Prepare a list of items on the inventory file for which the date of last sale indicates a lack of recent transactions. |
| 9. Analyze inventory for evidence of possible overstocking or slow-moving items. | Prepare a list of items on the inventory file for which the quantity on hand is excessive in relation to the quantity sold during the year. |
| 10.Test the accuracy of individual data items listed in distributor’s inventory master file. | Prepare a list of items, if any, with negative quantities or costs. |

**11.12 Which of the following should have the primary responsibility to detect and correct data processing errors? Explain why that function should have primary responsibility and why the others should not.** (CPA Examination, adapted)

1. **The data processing manager** – The data processing manager should have primary responsibility to detect and correct data processing errors. The data processing manager has primary responsibility for the four stages of the data processing cycle, which are data input, data processing, data storage, and information output. Setting up a system that will detect and correct data processing errors falls squarely into the data processing cycle.
2. **The computer operator** – Although the computer operator is responsible for the operation of the hardware and software of the organization, he is not responsible for detecting and correcting data processing errors. Being able to both process data and correct data processing errors would allow the operator to “fix” non-existent errors in a way that would benefit the operator personally; that is, it would allow the perpetrator to commit and conceal fraud.
3. **The corporate controller** – The corporate controller has overall responsibility for the operation of the accounting function, but would not have primary responsibility to detect and correct data processing errors.
4. **The independent public accountant** – The independent auditor has no responsibility to detect and correct a client’s data processing errors. The independent auditor’s responsibility is to attest to fairness of the financial statements.

# SUGGESTED SOLUTIONS TO THE CASES

**11.1** **You are performing a financial audit of the general ledger accounts of Preston Manufacturing. As transactions are processed, summary journal entries are added to the general ledger file at the end of the day. At the end of each day, the general journal file is processed against the general ledger control file to compute a new current balance for each account and to print a trial balance.**

**The following resources are available as you complete the audit:**

* **Your firm’s generalized computer audit software**
* **A copy of the general journal file for the entire year**
* **A copy of the general ledger file as of fiscal year-end**

**(current balance = year-end balance)**

* **A printout of Preston’s year-end trial balance listing the account number, account name, and balance of each account on the general ledger control file**

**Create an audit program for Preston Manufacturing. For each audit step, list the audit objectives and the procedures you would use to accomplish the audit program step.**

|  |  |  |
| --- | --- | --- |
|  | | **General Journal** |
| **Field Name** | **Field Type** | |
| Account number | Numeric | |
| Amount | Monetary | |
| Debit/credit code | Alphanumeric | |
| Date (MM/DD/YY) | Date | |
| Reference document type | Alphanumeric | |
| Reference document number | Numeric | |
|  | **General Ledger**  **Control** | |
| **Field Name** | **Field Type** | |
| Account number | Numeric | |
| Account name | Alphanumeric | |
| Beginning balance/year | Monetary | |
| Beg-bal-debit/credit code | Alphanumeric | |
| Current balance | Monetary | |
| Cur-bal-debit/credit code | Alphanumeric | |

|  |  |
| --- | --- |
| **AUDIT PROGRAM** | **AUDIT OBJECTIVES AND PROCEDURES** |
| a. Edit the general journal file for errors and inconsistencies such as:   * Invalid debit/credit code or document type. * Date not within current fiscal year. * Missing data values. * Non-numeric data in account number, amount, or document number fields. | Objective: Evaluate the quality of the file data.  Procedures: Review error listing for common error patterns; initiate correction of the errors; trace cause of errors if possible. |
| b. Edit the general ledger file for errors and exceptions such as:   * Invalid debit/credit codes. * Missing data values. * Non-numeric data in account number or balance fields. | Objective: Evaluate the quality of the file data  Procedures: Review errors listing for common error patterns; initiate error correction; trace cause of errors. |
| c. Select a sample of general journal transactions, stratified by dollar value. Sort and list by document type. | Objective: Test the transaction data entry accuracy.  Procedures: Compare transaction data values to source documents and identify discrepancies. Initiate correction of all errors discovered. |
| d. Merge the general journal and general ledger files by account number, and list all unmatched general journal entries. (or look them up in the appropriate tables) | Objective: Test transaction data entry accuracy.  Procedures: Compare unmatched transaction data values to source documents; initiate errors correction. |
| e. Recalculate each ledger account’s current balance from the beginning balance and the general journal amounts, and list any discrepancies between the recalculated balance and the file balance. | Objective: Test current ledger balance accuracy.  Procedures: Review discrepancies to see if the transaction amounts or ledger balances are erroneous; initiate appropriate corrections. |
| f. Prepare comparative financial statements for the current and prior year, including selected liquidity, profitability, and capital structure ratios. | Objective: Identify accounts to be investigated in detail.  Procedures: Analytical review of ratios and trends to search for unusual account balances. |
| g. Analyze selected accounts, listing the beginning balance, all transaction, and the current balance for the allowance for bad debts, notes receivable from officers, capital stock, etc. | Objective: Provide reference data for accounts the auditor wishes to investigate in detail.  Procedures: Review, analysis and investigation of specific account as appropriate. |