Chapter 7: Computer-Assisted Audit Tools and Techniques

ting, Hall, 4e

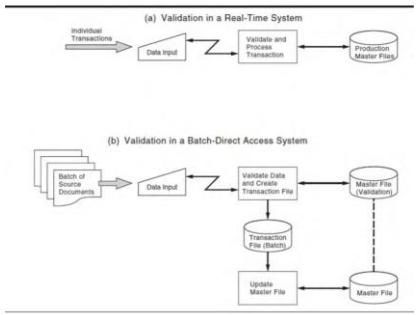
Learning Objectives

- Be familiar with the classes of transaction input controls used by accounting applications.
- Understand the objectives and techniques used to implement processing controls, including run-to-run, operator inventions, and audit trail controls.
- Understand the methods used to establish effective output controls for both batch and real-time systems.
- Know the difference between black-box and white-box auditing.
- Be familiar with the key features if the five CAATTs discussed in the chapter.

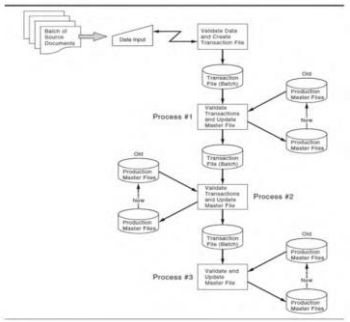
Input Controls

- Programmed procedures also known as edits or validation controls.
- Perform tests on transaction data to ensure they are error free before processing. Three categories:
- Field interrogation involves programmed procedures to examine the characteristics of the data in the field:
  - Common data input errors are (1) transcription (addition truncation or substitution) and (2) transposition errors. These problems are controlled with Check digits.
  - Missing data checks are used to check for blank spaces.
  - Numeric-alphabetic check identify data in the wrong form.
  - Limit checks test for amounts that exceed authorized limits.
  - Range checks for upper & lower limits of acceptable values.
  - Validity checks compare actual against acceptable values.

Validation During Data Input



Validation in Batch Sequential File System



Input Controls

- **Record interrogation** procedures valid records by examining the interrelationship of its field values.
  - **Reasonableness check** determines if a value is reasonable when considered alone with other data fields.
  - **Sign check** verifies the sign of the field is correct.
  - **Sequence check** use to determine if a record is out of order.
- **File interrogation** is to ensure the correct file is being processed:
  - **Internal and external label checks** verify the file being processed is the one being called for.
  - **Version checks** are used to verify the correct version is being processed.

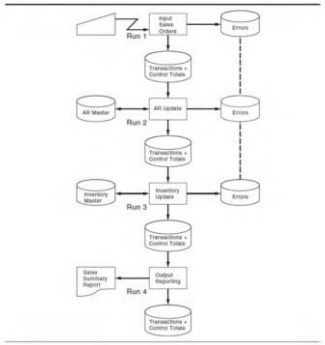
Processing Controls

- **Run-to-run controls** monitor a batch as it moves from one run to another and ensures:
  - All records are processed, no record processed more than once.
  - A transaction audit trail is created.
  - Accomplished through **batch control** data that includes: unique batch number, date, **transaction code**, record count, total dollar value (control total), and a hash total.

Processing Controls

- Common error handling techniques:
  - **Correct immediately**: With the direct data validation approach, error detection and correction can take place during data entry.
  - **Create an error file**: Individual errors are flagged to prevent them from being processed, corrected and resubmitted as a separate batch for reprocessing.
  - **Reject the batch**: Some errors are associated with the entire batch making the best solution to cease processing.

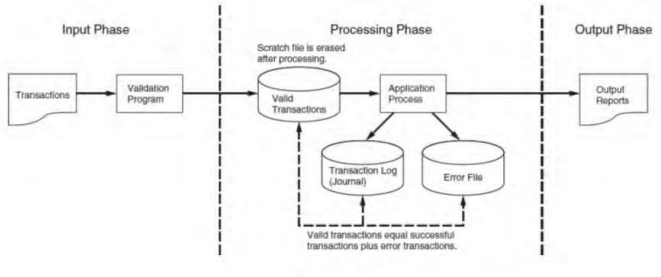
Run-to-Run Controls



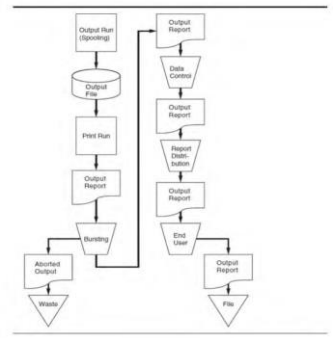
Processing Controls

- Operator intervention increases potential for human error. Systems with **operator intervention controls** less prone to processing errors.
- Preservation of audit trail important objective of process control.
  - **Transaction logs** should record every transaction successfully processed by the system.
  - All automatically generated transactions should be included in the log with the responsible end user receiving a detailed listing.
  - Each transaction processed must have a unique identifier.
  - A listing of all error records should go to the appropriate user to support error correction and resubmission.

Transaction Log to Preserve the Audit Trail



Stages in the Output Process



Output Controls

- Ensure system output is not lost, misplaced or corrupted and that privacy policy not violated. Controls for batch system output include:
- **Output spooling** directs output to a magnetic disk rather than to the printer. When resources become available output files are printed.
  - Creation of the output file presents an added exposure for a computer criminal to access, copy or destroy the file.

Output Controls

- **Print program** requires operator interventions to print, monitor and remove the output. Program controls are designed to:
  - Prevent unauthorized copies and unauthorized browsing of sensitive data by employees.
- Printed output reports go through the bursting stage to have pages separated and collated.
  - Primary control is supervision.
- Computer waste represents a potential risk.
  - Should be shredded before disposal.

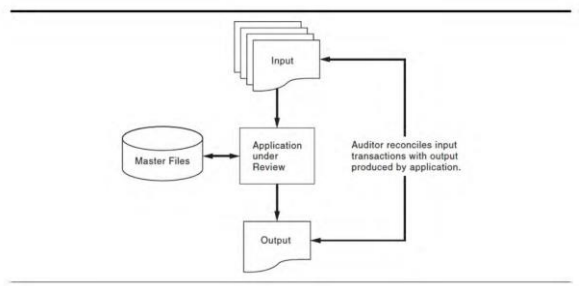
Output Controls

- Data control group sometimes responsible for verifying accuracy of output before distribution.
- Report distribution risks include reports being lost, stolen or misdirected.
  - Secure mailboxes, in person pickup or secured delivery.
- End user control include error checking and secure storage until report's expiration period has expired.
- Real-time output threats include interception, disruption, destruction or corruption of output.

Testing Computer Application Controls

- **Black-box approach** (auditing around the computer) does not require a detailed knowledge of internal logic. of application.
- Uses flowchart analysis and interviews of knowledgeable personnel to understand characteristics of application.
- Advantage is that application doesn't need to be removed from service and tested directly.
- Appropriate for simple applications but more complex applications require through-the-computer review.

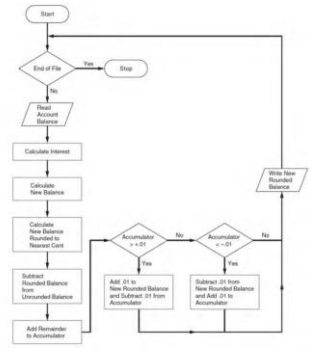
Black-Box Approach



Testing Computer Application Controls

- **White-box approach** (auditing through computer) requires in-depth understanding of internal logic. Tests of controls:
  - Access tests include verification of IDs and passwords.
  - Validity tests include range, field, limit and reasonableness.
  - Accuracy tests include recalculations and reconciliations.
  - Completeness tests include field, record sequence and hash and financial control total recalculation.
  - Redundancy tests include reviewing record counts and recalculation of hash totals and financial control tests.
  - Audit trail tests include obtaining evidence that an adequate audit trail is created.
  - Rounding error tests verify rounding procedures.
  - Susceptible to salami fraud.

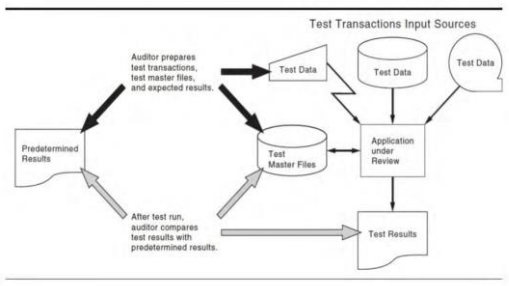
Rounding Error Algorithm



Computer Aided Audit Tools & Techniques for Testing Controls

- **Test data method** used to establish the application processing integrity.
  - Results from test run compared to predetermined expectations to evaluate application logic and controls.
  - Test data includes both valid and invalid transactions.
- **Base case system evaluation (BCSE)** is a variant of test data method in which comprehensive test data goes through repetitive testing until a valid base case is obtained.
  - When application is modified, subsequent test (new) results can be compared with previous results (base).

Test Data Technique



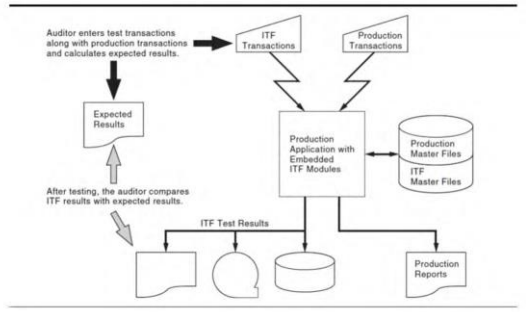
Computer Aided Audit Tools & Techniques for Testing Controls

- **Tracing** takes step-by-step walk of application's internal logic.
- Advantages of test data technique:
  - Provide explicit evidence concerning application function.
  - Can be employed with only minimal disruption.
  - Require only minimal auditor computer expertise.
- Disadvantages of test data technique:
  - Auditors must rely on computer services personnel to obtain a copy of the application for testing.
  - Provides static picture of application integrity and not a convenient means of gathering evidence about ongoing application functionality.
  - Relatively high cost to implement, auditing inefficiency.

The Integrated Test Facility (ITF)

- Automated technique allows auditors to test logic and controls during normal operations by setting up a dummy entity within the application system.
  - System discriminates between ITF and routine transactions.
  - Auditor analyzes ITF results against expected results.
- Advantages of ITF:
  - Supports ongoing monitoring of controls as specified by COSO control framework.
  - Applications can be economically tested without disrupting user operations and without the intervention of computer service personnel, improving efficiency and reliability.
- Primary disadvantage of ITF is potential for corrupting data files.

ITF Technique



Parallel Simulation

- Requires auditor to write program that simulates key features or processes of application under review.
  - Auditor gains a thorough understanding of application under review and identifies critical processes and controls.
  - Auditor creates the simulation using program or Generalized Audit Software (GAS).
  - Auditor runs the simulated program using selected data and files.
  - Auditor evaluates results and reconciles differences.
- Auditor must carefully evaluate differences between test results and production results.

Parallel Simulation Technique