DATA PROCESSING SYSTEMS

Presentation Outline

I. Paper-Based Input Systems
II. Paperless Input Systems
III. Paper-Based Processing Systems
IV. Paperless Processing Systems
V. The Output System

Paper-Based Input Systems

- Preparation and Completion of the Source Document.
- Transfer of Source Documents to Data Processing
- Data Entry
- Program Data Editing

Preparation and Completion of the Source Document

Source documents such as sales orders are filled in manually. Errors are minimized if source documents are well designed and easy to understand.

Transfer of Source Documents to Data Processing

1. Input Document Control Form

Provides batch control totals for batches of input data transmitted between user and data processing departments. Monitors completeness of processing.

2. Data Transfer Log

Provides control over the disposition and use of transferred data.

Data Entry

Key verification takes place to ensure accurate data entry. This involves typing in the data twice. As the data is typed in a second time, key verification software verifies that the second keying matches the previous input already on the disk file. A process of visual verification is less effective.

Program Data Editing

Program data editing is a software technique used to screen data for errors prior to processing. Examples include:

1. Table Lookup – Entry must match values in a table. (Example: valid customer number)
2. Limit Test – Entry must not exceed an extreme value. (Example: number of payroll hours)
3. Continuous operations auditing – Unacceptable entries are separated and held in suspense until verified or corrected.
4. Check digit – Redundant digit determined by a mathematical calculation.

Paperless Input Systems

- Loss of Internal Controls
- Paperless Input Systems Requiring Human Intervention
- Paperless Input Systems Requiring No Human Intervention

Loss of Internal Controls

In on-line input systems, the need for keying in source documents may be eliminated. The loss of paper-based internal controls can be compensated for by:

1. Transaction logs (registers) – Logs all inputs to a special file that automatically contains tags to identify transactions.
2. Tagging – Provides an audit trail by including additional audit-type information with transaction data. Audit-type information might include dates and user authorization codes.

Paperless Input Systems Requiring Human Intervention

1. On-line manual data-entry systems

Users manually type transactions into the computer system.

2. Automatic Identification System

Merchandise and other items such as credit cards are tagged with machine-readable codes.

Paperless Input Systems Requiring No Human Intervention

In some systems, transactions are processed from beginning to end without any human intervention.

An example would be a system that monitors inventory levels and places an order directly with a supplier's system that automatically initiates shipment of the needed goods.

Paper-Based Processing Systems

Virtually all paper-based systems for processing transactions are batch oriented.

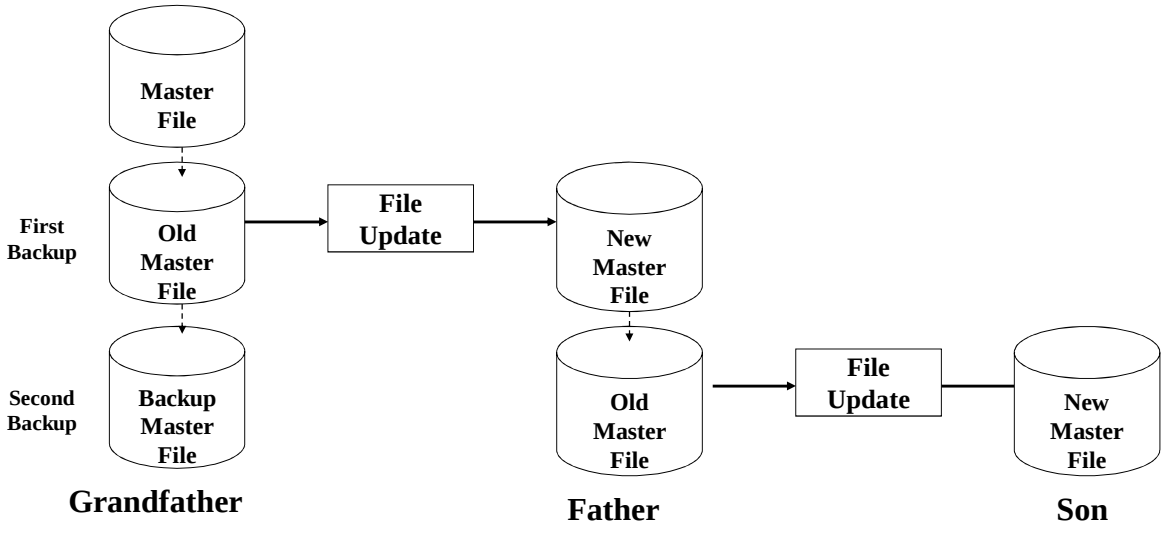
- Batch Processing with Sequential File Updating
- Son-Father-Grandfather Master Files
- Batch Processing with Random-Access File Updating

Batch Processing with Sequential File Updating

Four steps include:

1. Preparing the transaction file – Data is edited, validated, and sorted in the same sequence as the master file.
2. Updating the master file (subsidiary records) – Transaction file records are matched with master file records, and a new master file is created with updated data.
3. Updating the general ledger – Master file changes are updated in the general ledger. Documented with journal vouchers.
4. Preparing general ledger reports – Trial balances and other reports are produced.

Son-Father-Grandfather Master Files



Batch-Processing with Random-Access File Updating

Individual records are read one by one from the transaction file and used to update the related records in the master file. It is not necessary to:

1. Sort the transaction file in the same order as the master file.
2. Generate a new master file.

Paperless Processing Systems

- Characteristics of Paperless Processing Systems
- Batch Processing in Paperless Processing Systems
- Methods of Real-time Processing in Paperless Processing Systems
- Components of Real-Time Sales Systems

Characteristics of Paperless Processing Systems

Two primary characteristics include:

1. Either batch or real-time processing is possible.
2. With most types of on-line real-time processing, individual transactions are processed as they are input into the system. Under such a system master files are always up to date.

Batch Processing in Paperless Processing Systems

Batch processing in paperless processing systems is similar to batch processing in paper-based systems except that:

1. Journal vouchers are replaced by electronic equivalents.
2. Periodic batch runs automatically update the general ledger.

Methods of On-Line, Real-time Processing in Paperless Processing Systems

1. Inquiry/response systems – Users request information but do not input data for processing.
2. Data entry systems – Users interactively input data that is processed periodically in batches.
3. File processing systems – Users interactively input data that is immediately processed against relevant master files.
4. Full or transaction processing systems – Similar to file processing systems except that the entire transaction is completed when input. For example, an invoice is generated in addition to updating accounts receivable.

Summary

- Paper-based input systems maintain the traditional audit trail.
- Paperless input systems lose some internal controls that can be accomplished through transaction logs and tagging.
- Paper-based processing systems are usually batch oriented.
- Paperless processing systems may be batch or real time.
- Output systems should ensure valid output and proper distribution of information.