FLOWCHARTING
GUIDELINES

For Accountants and Auditors

By
Dr. David R. Fordham
School of Accounting
James Madison University

Supplement for

Accounting Information Systems
INTRODUCTION

“A Picture is Worth a Thousand Words.”

Flowcharting is a communications tool widely used in today’s accounting and auditing environments.

The idea of flowcharts started with computer systems developers back in the 1950’s. They needed a way of communicating the design of complex computer programs from systems analysts, program designers, and code writers (programmers). They found that by using symbols, they could illustrate the flow of data, documents, and processes in a way that was much more efficient than writing a narrative or using words to explain the flows.

Modern auditors and other accounting professionals have found flowcharting to be a very quick way of describing complex business processes. For example, the handling cash received from customers by a major corporation is very complicated: the control principle of “segregation of duties” requires that several different people be involved. This segregation allows tight internal control, reduces the chances of defalcation and fraud by employees, and increases the chances of catching innocent errors and mistakes. But the involvement of several people now makes for a rather complicated business process as the money, documents, and information are passed from one employee to another. A flowchart can quickly depict the flow. By looking at the chart, an auditor can get a general picture of the entire process, and at the same time see the details of who is doing what at each stage of the process.

By using a complete and accurate flowchart, an auditor can often assess the quality of internal controls, discover places where fraud or mistakes can occur, and otherwise judge the effectiveness and efficiency of the processes being audited. Flowcharts can be descriptive (that is, they can be drawn to depict a process the way it is actually being performed), or they can be normative (that is, they can be drawn to depict a process the way it is supposed to be performed, regardless of how it is actually being performed). An auditor will often prepare a normative flowchart, then have an assistant prepare a descriptive flowchart of how the process is actually taking place, and compare the two to discover potential problems.

In addition to auditors, flowcharts are used by accountants for training purposes, and as systems analysis aids and organizational improvement tools.

As you create flowcharts, you must remember that you are creating a pictorial diagram to communicate a set of ideas to another person. Your communication must be clear. Your communication must be complete. And your communication must be easy for your audience to understand. Ideally, your communication should also be in a form that cannot be misinterpreted or misunderstood. This means your flowchart cannot be ambiguous. It must clearly, concisely, and accurately portray every step of the process you are charting.

While you are flowcharting, you must actively think not only of the details of the process you are illustrating, but just as importantly, you must be thinking of your audience. Ask yourself, “what use will the reader be making of this flowchart?” The answer to that question will determine the level of detail which you should use in preparing your chart.

Flowcharts use standardized symbols, in a standardized way. The use of standardized symbols enhances clarity and eliminates the need to describe the essential nature of the item being depicted. For example, by using a standard symbol to represent a document, we eliminate the need to explain that we are talking about a piece of paper. We must still label the symbol to indicate exactly which document or piece of paper is being illustrated, but we don’t have to explicitly state that it is a paper form.

By using arrows and decision branches, we can clearly show the direction of information flows. By using commonly-accepted practices in locating symbols, repeating symbols, labeling symbols and describing the processes, we can complete a quality chart which minimizes the chances for misinterpretation, is brief and concise, but still clearly and completely describes the process being communicated.

By David R. Fordham
James Madison University
In the pages which follow, you will learn the major symbols used in flowcharting used by accountants and auditors. You will also see some simple samples of how those symbols are used to create a flowchart. These are simplified, and for illustrative purposes only. The flowcharts you encounter in the real world may be much more complex. But the symbols and usage will remain the same.

This manual is intended to get you started in creating general-purpose accounting and auditing flowcharts, such as those found in most auditing firms. There is an entire field of study on flowcharting, symbol theory, and semantic modeling. If you plan to enter the field of systems development, be advised there is a complex set of flowcharting and data flow diagramming standards which go far beyond the introductory material in this manual. The rigorous adherence to those standards is essential if your flowcharts will be used for systems development purposes, especially if you are designing a system for input to CASE development tools. But for most applications encountered by auditors and general accountants, the guidelines in this manual will be sufficient to get you started. Your employer may have additional guidelines and standards for your flowcharts on the job.

“A good flowchart is never drawn, only redrawn.” Once you have completed your flowchart, go back and read it yourself. At every step in the process you illustrated, look for errors and ambiguities. Ask yourself, “how can this step of the process be misinterpreted? How can I make this step more clear?”

Then, go back a second time and at each step, ask yourself, “Can this be abbreviated or shown in a simpler manner without sacrificing completeness and accuracy?”

Once you have simplified your chart, go back a third time, and once again ask yourself, “Is this still complete and accurate? Can it be misinterpreted in any manner?”

If the chart is really important and you have the time, sleep on it, and read the chart the next day. Often, seeing the chart after a night’s sleep will allow your mind to recognize errors and problems that aren’t apparent at first. A good professional flowchart will let a colleague review the chart, looking for problems and ambiguities.

Flowcharting is a creative exercise. If ten people flowchart the same complex process, there might be several different flowcharts, each differing slightly from the others. However, all ten will accurately, completely, and efficiently portray the major parts of the process. As long as your chart accurately and concisely illustrates the process, your flowchart will be “correct”.

Be alert. And always remember the audience.
FLOWCHARTING SYMBOLS USED IN ACCOUNTING AND AUDITING

- Terminator
- Manual operation
- Input/Output
- Manual input
- Process
- Predefined process
- Document
- Transmit Tape
- Display
- Stored data
- Direct access storage
- Sequential access storage
- On-Page Connector
- Decision
- Off-Line Storage
- Off-Page Connector
The terminator symbol is used to start a flowchart. In accounting and auditing, it is used to identify a department, a job title, or other entity which is doing the work. It is also used to denote a change in department, job title, or entity within a process flow.

The terminator symbol can also be used to end a flowchart. But be careful not to confuse the terminator (which denotes the completion of the entire flowchart) with an off-page connector (which denotes that the flow picks up somewhere else)!
The manual operation symbol is used to denote any type of operation or work which does not involve a computer. Examples would be opening the mail, filling out paper forms, packing merchandise, labeling boxes, and so forth.
The input/output symbol denotes any type of input to a computer and/or output from a computer. Examples of input include swiping a magnetic card, scanning with a laser wand, using a touch-tone telephone keypad, or any other type of computer input. While it is used for input alone, as well as input with simultaneous feedback (output), it is not typically used for output alone.

Most often, the input/output symbol is used to denote data entry at a computer terminal or workstation, where the operator keys the data into the computer and immediately sees it on the screen. A single input/output symbol can indicate the printing of report as well as data entry.
This symbol is generally obsolete, but you may occasionally find it on older flowcharts. It has been replaced with the input/output symbol.

The manual input symbol used to denote keyboard entry, such as a computer terminal or touch-tone keypad, usually with a minimum of feedback to the operator.

Unlike the more versatile input/output symbol, the manual input symbol can not be used to denote the printing of a batch report or summary report; it denotes input only.
The Process symbol is used to denote a fairly complex process whose details are not relevant to the purpose of the flowchart. Use the process symbol to represent a complicated set of operations when it is not necessary for the reader to know what all the details of those operations.

For example, a credit manager determines whether a customer's order should be approved. The process the manager uses is very complex, but if the reader needs to know only that the credit manager approves the orders (or rejects them) you can let the process symbol represent the credit approval operation.

Do not use the process symbol if one of the other symbols will accurately portray the activity. For example, do not use the process symbol for input/output, or simple manual operations such as filling out a document or packing merchandise.
The Pre-Defined Process is used for a complex process which is defined, described, or even drawn at some other place within the flowchart or its documentation. The symbol text should give the name of the process and clearly state where the details can be found.

Diagram:

- **Plant Managers**
  - **Budget Worksheets**
  - **Cost Clerk**
    - Prepares Budget (see Pages 34-36)
    - **Budget Drafts**
      - **Vice-President**
The document symbol is used to represent almost any kind of paper, including order forms, reports, budget books, purchase orders, invoices, checks, work orders, receipts, etc. The only kinds of paper not represented by the document symbol are currency, and transmittal tapes (adding machine tapes created to total a batch of transactions).

Documents must originate somewhere, and their origination point must be specified. Also, documents must ultimately go somewhere, even if in the trash bin, and their final destination must be specified somewhere within the flowchart.

A document which enters a process (manual, complex, or predefined) must emerge from that process. It is a good idea to repeat the document symbol after every branch in the flow so the reader can tell where the document is at all times in the flow. Document symbols must be repeated any time you change pages or entities.

Duplicate copies of a document are designated by multiple document symbols stacked on each other.

Different documents all following the same path in the flow are designated by overlapping document symbols.

A batch of identical documents (stack of sales orders, for examples) can be denoted by a single document symbol. Be sure to identify what the symbol represents.
EXAMPLES OF PROPER USE OF THE DOCUMENT SYMBOL

Clerk
- Creates Work Order in Triplicate
  - Work Order (3 copies)
  - Supervisor
    - Initials Work Order (all 3 copies)
      - Work Order (copy 3)
      - Tickler File
Scheduler
- Assigns Work Order to Maintenance Team
  - Work Order (copies 1 & 2)
    - Team Leader
      - Work Order Copy 1
      - Work Order Copy 2
        - Active WO File
        - Lead Foreman

by David R. Fordham,
James Madison University
EXAMPLES OF PROPER USE OF THE DOCUMENT SYMBOL

Sales Dept

Takes Phone Order, Creates Sales Order Form

Sales Order Form

Credit Dept

Obtains Dun & Bradstreet Credit Rating

Sales Order Form

D&B Rating Report

Credit Manager

Credit Approved?

Yes

Sales Order Form

D&B Rating Report

Factory

No

Sales Order Form

D&B Rating Report

Sales Service

by David R. Fordham,
James Madison University
A document cannot simply appear out of thin air. It must either come from another entity (such as a customer, sales rep, etc.) or must be created by a process.

The Sales Order document went into the “Enters Data to Sales Screen” process, but never emerged. The flowchart must show what happened to the document. If it went into a file, then show the document going into a file. If it was discarded (unlikely), then show it going into ”File 13”.

The Daily Sale Summary report must be generated by a process. Reports don’t just appear instantaneously from computer files. If the sales summary report is printed by the Sales Department as the last step in the process of “Enter Data to Sales Screen”, then the report should be shown coming out of the “Enter Data” manual process symbol rather than the computer file. If printing the report is an entirely different process, there should be an additional process symbol for “Print Daily Sales Summary Report”.

by David R. Fordham,
James Madison University
The transmittal tape represents a thin paper tape generated by a printing calculator, adding machine, cash register, or other mechanical device. A transmittal tape is generally used to verify, substantiate, or support a total of some kind. Thus, the transmittal tape generally accompanies a set of documents, or comes from a process totalling or analyzing documents.

For example, the daily collection of checks received from customer will be totalled by a clerk on a printing calculator. The stack of checks will be sent, together with the tape listing, to a second clerk, who will key the amounts into a computer. The computer will add the amounts keyed, and the total from the computer will be compared to the total on the transmittal tape. This will make sure that (a) the clerk originally added the checks correctly, and (b) the entry clerk entered the correct amounts into the computer. If the totals do not match, one of the clerks apparently made a keying error and an investigation should be conducted.
The display symbol is primarily used by information systems designers to denote data displayed on a screen rather than printed on a printer. It is rarely used in accounting and auditing. However, you may encounter it on some technical flowcharts. Usually it will denote an inquiry rather than update operation.
The stored symbol is used to denote an electronic data file or database. Generally, it is used for on-line storage which can be accessed by the computer without intervention by a human (such as having to mount a tape, load a disk platter into a drive, etc.).

The symbol is used for both batch files and on-line update files. The name of the file or database should be displayed in the symbol. If the file is a batch file, the word "Batch" should be used in the file name.

The symbol can have arrows leading into and out of it to denote reads from the file and writes to the file. If a process is merely adding records, an arrow should go into the file. If a process is merely reading from the file, the arrow should come out of the file.

Since it is assumed that files and databases reside on the computer, a file can appear without having to be explicitly created on the flowchart. It is assumed that some other computer process created the file. Likewise, a file can does not have to go somewhere – it is assumed the file will reside on the computer unless some other process erases it, clears it, or archives it.
When a work flow involves on-line data files as well as data files on diskettes or other media which can (and at some point will) be taken offline, the Direct Access Storage symbol is used to denote those files which are on-line permanently while the Stored Data Symbol is used to denote those files which may be taken offline at some later time in the flow.

Typically, however, you will see only the Stored Data symbol.
SEQUENTIAL ACCESS STORAGE

This symbol, which looks like a tape reel, is used to denote an electronic data file which cannot be accessed randomly, but must be read through sequentially to find a particular record.

Historically, these type of files were stored on magnetic tape, like you see in old movies. Organizations which process huge amounts of data (such as the IRS, Social Security Administration, and credit card companies) still use tapes to hold their daily log files and other large transaction files.

However, in these days of cheap direct-access media such as gigabyte hard drives, sequential access storage is becoming less common. You still need to recognize the symbol since it frequently found on legacy systems.
The On-Page connector is used to avoid convoluted lines on a page. Traditionally, on-page connectors use single letters of the alphabet, starting over with "A" on each page. These connectors must be used in pairs. The flow enters one connector with a letter, and exits another connector with the same letter.
OFF-PAGE CONNECTOR

The Off-Page Connector is used to show a flow moving from one page to another. When the flow leaves a page, the symbol must show the page number where the flow is continued. If the target page contains more than one off-page connector (coming onto the target page), then the connector on the source page must also contain a letter showing which connector on the target page continues the flow.

On the target page, the off-page connector must contain the word “From”, and the source page number. No letters need be shown on the target page connectors unless more than one off-page connector originates from the same source page.
The decision symbol is used for branching. Decisions are always binary, phrased as simple "Yes" or "No" questions. The question must appear in the symbol. If the question is too long to appear in the symbol, the name of the decision should appear in the symbol, and the question should be listed somewhere on the page in a text box.

Remember, all decisions on flowcharts must be binary. A non-yes-or-no question must be portrayed as a series of binary decisions.
OFF-LINE STORAGE

This symbol originally stood for electronic data files which were not accessible by the computer without human intervention, such as disk files where the disk was dismounted from the computer.

However, in most auditing and accounting flowcharts, the symbol is used to denote a non-electronic file, such as a filing cabinet, a binder, a file folder, or some other storage location. It is often used to denote pending files, ticker files, and other holding areas.

Another use for the symbol is to denote "File 13", the trash can, denoting the discarding of a document.
FINAL NOTES AND REMINDERS

Flowcharts should be clean and neat. If your flowchart is too complicated, break it into two or more pages.

Flowcharts should be simple to follow.

Flowcharts should be drawn with the intended audience in mind. Do not include unnecessary details, but be sure to include sufficient details for the intended audience to achieve the objective.

Don't clutter up the chart repeating symbols unnecessarily, but be sure to repeat symbols wherever necessary for clarity.

The flow should always move chronologically, down the page. Use "columns" to denote different job functions or different departments. Be sure it is completely clear exactly who is doing the process.

The flow is assumed to move down. You must use arrowheads on any connecting line which moves any direction but straight down. But it is a good habit to always use arrowheads, even on connecting lines which do go straight down.

Don't make your reader have to flip back and forth between pages to follow a simple flow. Put sufficient symbols on each page so that each page is a stand-alone depiction.

Always start with a terminator showing who or what is doing the activity. Repeat the terminator anytime it is unclear who is performing the process.

Be sure your decisions are binary, and have one flow going in, and two flows (one "yes" and one "no) coming out.

Be sure it is clear where every document is located at every point in the process. If there is some ambiguity, repeat the document symbol to show exactly where a document is located in the flow.

Be sure all documents end up somewhere and don't just disappear.

Check your flowchart for consistency in naming. If you call a document a "Sales Order" in one place, be sure to call the document "Sales Order" on all other places. Don't call it "Sales Order" on one page, and "Order Form" on another page. Always use the formal name for the document (the one printed at the top of the actual form or report).

The same with file names. If you call the electronic file "Sales Batch" one place, be sure you call it "Sales Batch" in all other places.

The same with off-line storage symbols. A file should not be called "Order File" on a page if you have referred to it as "Sales File" on another page.

If necessary for clarity, don't hesitate to add explanatory text to your flowchart. Many professional flowcharts have a text narrative beside the flowchart giving details of what is going on in the processes being illustrated.

And don't ever create a flowchart without making sure it has the author's name, date of creation, company name and title of the process being illustrated. Every page should be labeled with a short description of the activity being portrayed.

by David R. Fordham,
James Madison University
EXAMPLE OF A FLOWCHART

Mail Clerk

Vendor Invoices

Add totals

Tape

Vendor Invoices

Get Invoices from Daily Payables batch File

Enter Invoices

Accounts Payable Data Entry Clerk

Invoices with Batch Report

Totals Match?

NO

To Page 104

YES

Invoices with Batch Report

Tape

Payables Daily Batch File

Update Payables Transaction File

Invoices with Batch Report

Tape

Payables File

Drawer by Batch#