Flow Charts - Origin of Procedures Manuals

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Flow charts are hated by some consultants, overdone by others. But there are times when they are indispensable. The author particularly recommends a type that can serve easily as the basis for a manual —

FLOW CHARTS—
ORIGIN OF PROCEDURES MANUALS

by Frank Ilett, Jr.

Ernst & Ernst

THIS ARTICLE discusses how flow charts can be used to document, study, and design systems. It considers three separate methods of flow charting and the relative pros and cons of each method. The discussion also explains how flow charting can bridge the gap between designing a system and writing a procedures manual.

A flow chart pictorially represents the flow of data within an organization. It explains the sequence of operations, movements, suspenses, and delays.

Different methods of flow charting utilize various symbols. The oldest method, and probably the least known, is recommended by the American Society of Mechanical Engineers. The A.S.M.E. process-type chart depicts the flow by circles, squares, and triangles. Industrial engineers originally developed the method to document, study, and improve the flow of materials and products through a

manufacturing operation. However, in recent years it has been widely applied to document paper flows. An example appears in Illustration I on pages 32-33.[1]

Many systems and procedures analysts advocate the A.S.M.E. approach. However, the method has disadvantages. It adapts poorly to paper flow, and the charts are difficult to read. Also, readers are more likely to understand the electronic data processing symbols because they resemble the items being charted.

Illustration II on page 34 displays a second set of symbols frequently used in flow charting assignments. Systems analysts developed the symbols to document computer applications.[2] Not all of these symbols are required to chart

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[1] H. B. Maynard, *Industrial Engineering Handbook*, McGraw-Hill Book Company, Inc., New York, 1963, pp. 2.20-2.41.
[2] *Business Systems*, Systems and Procedures Association, 1966, pp. 4.1-4.16.

an accounting or financial system. Many have special meanings that pertain only to computer programing.

This article demonstrates a third method of flow charting. It utilizes only a small number of the electronic data processing symbols. This technique uses only four descriptive characters—the rectangle, adder tape, file, and document symbols. The action or word description appears inside the symbol and is thereby identified with the respective procedural step. If a computer device, such as a remote input/output terminal, needs to be shown, EDP symbols are utilized to specifically identify the equipment. Likewise, these symbols are compatible with those used to explain the document flow.

Design of an accounting, budgeting, or cost system should include three steps. First, document the present system. Second, evaluate the current procedures and make improvements. Third, revise

MULTI-COLUMN
FLOW PROCESS CHART

NO. _____
PAGE _1_ OF _2_

SUMMARY

	PRESENT		PROPOSED		DIFFERENCE	
	NO.	TIME	NO.	TIME	NO.	TIME
◎ ORIGINAL WRITING						
◐ ADD TO WRITING						
○ OTHER OPERATIONS						
⇨ TRANSPORTATIONS						
☐ INSPECTIONS						
D DELAY ▽ STORAGE						
DISTANCE TRAVELED		FT.		FT.		FT.

JOB RECEIVING RETURNED GOODS
☐ MAN OR ☒ MATERIAL   DATE 5-21-69
CHART BEGINS IN RECEIVING DEPARTMENT
CHART ENDS IN GENERAL ACCOUNTING DEPT.
CHARTED BY F. ILETT

DESCRIPTION	EAGLE PENCIL NUMBER
STOREROOM COPY #3	744
	740½
LABORATORY COPY #7	738½
	740½
GEN. ACCOUNTING COPY #1	737
	740½
PURCHASING COPY #2	742½
	740½
TRAFFIC COPY #5	736
	740½
RECEIVING COPY #8	744
	740½
RECEIVING COPY #6	738½
	740½
	737
	740½

MONDAY

A — RECEIVING REPORT ON STD. REGISTER — TO LAB — TRANS # ENTERED IF SENT TO FIN. STORES — DISP. SHOWN IF NG. — TO STORES — FILED

B

C — TO ACC.

D

E — TO ACC.

F — MATCHED WITH CORRES.

G — TO CREDIT DEPT. POST IN REC. REPORT BOOK — CUSTOMER'S NAME INDICATED — TO COLLECTION CLERK

H

I — TO TRAFFIC DEPT. — HELD — FILED

J — MATCHED WITH FREIGHT BILL
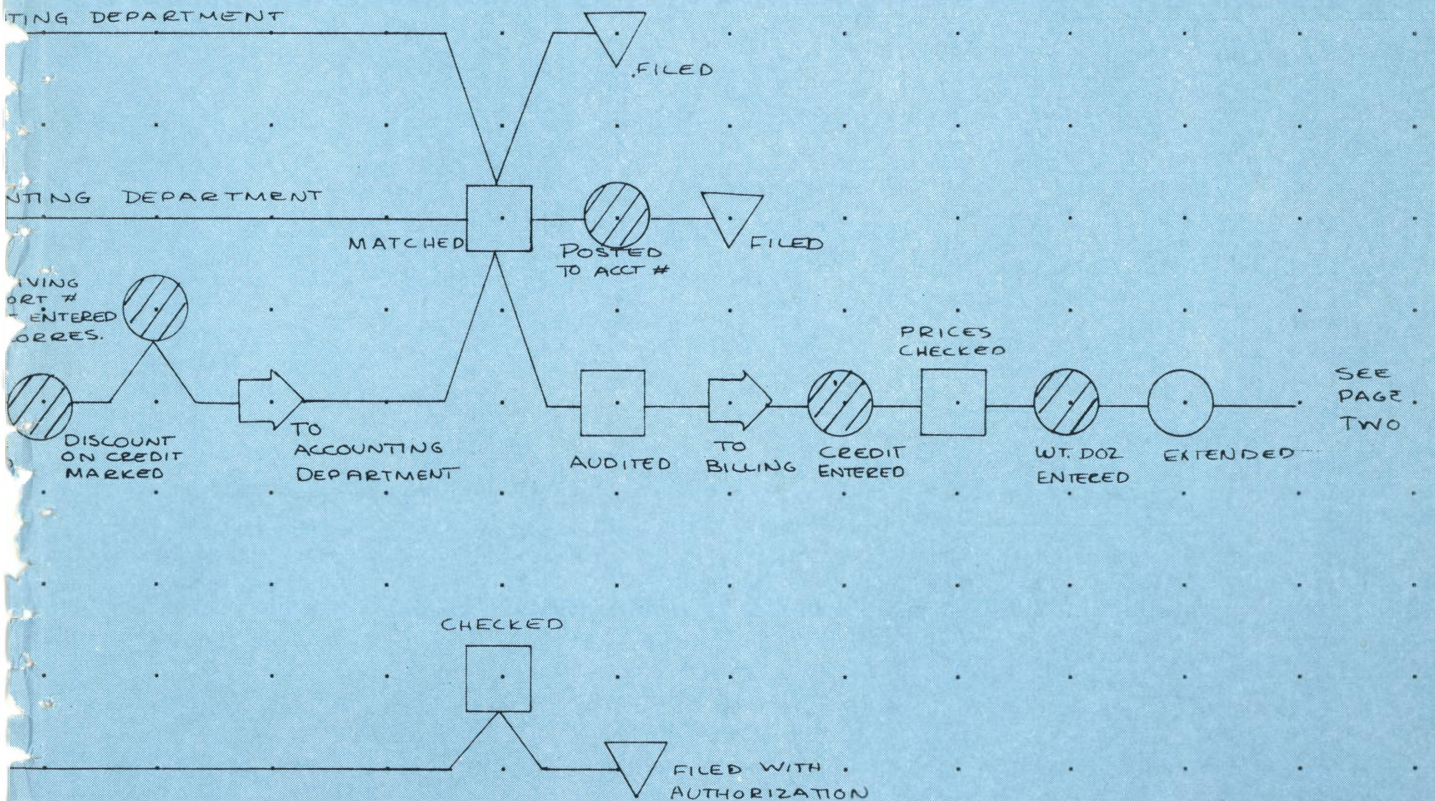
K

L

M — FILED NUMERICALLY

N

O

P

Q
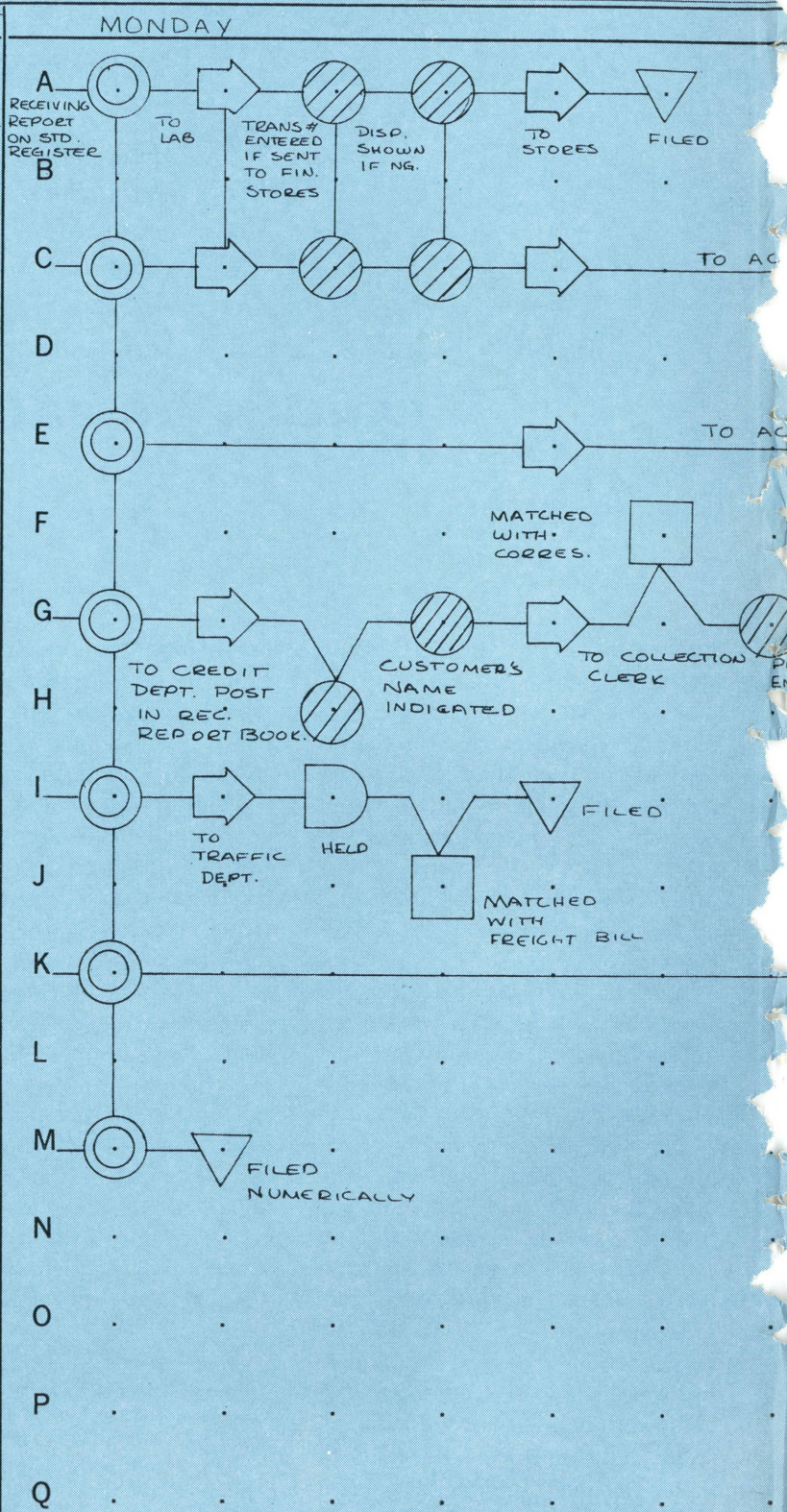
PURPOSE: For a bird's-eye view of a number of events and their chronological relationships. To develop a better product or procedure at a lower cost.

CONSTRUCTION: Use A.S.M.E. symbols ◯▷▢D▽   (MODIFICATIONS:◎ORIGIN OF RECORD ⊘ADD TO RECORD)

    1-Material Type Chart (use passive voice, i.e., Typed, Data entered, Checked, etc.)
        a-Multicopy or Multiproduct: Chart each on a separate line. Use the major item as line no. 8.
        b-Single Copy or product: Use a separate line for each station and indicate movement from station to station.
    2-Man Type (use active voice, i.e., Types, Enters data, Checks, etc.)
        a-Multi-Person: Use a separate line for each person, and chart like a chronological series of snap shots.
        b-Single Person: Chart from station to station to show travel.

IDENTIFICATION: To dramatize different items, fill out symbols with colors shown.

ANALYSIS: Steam shovel approach. Use 6 questions (why, what, where, when, who, how) to get the actions (eliminate, combine change sequence, simplify). If detailed analysis is required, prepare a regular Flow Process Chart for each paper, material, or man.

. ILLUSTRATION I.

ELECTRONIC DATA PROCESSING SYMBOLS

PROGRAM MODIFIER	INPUT/OUTPUT	PROCESSING	DOCUMENT	AUXILIARY OPERATION

DISC, DRUM, RANDOM ACCESS FILE	KEYING OPERATION	PREDEFINED PROCESS	OFFPAGE / ON PAGE CONNECTORS	DECISION

DIRECTION FLOW	PUNCHED CARD	TRANSMITTAL TAPE	PERFORATED TAPE	ON-LINE KEYBOARD

TERMINAL	COMMUNICATIONS LINK	OFF LINE STORAGE	MAG. TAPE, SORTING, COLLATING	CLERICAL OPERATION

DISPLAY

INDICATES SYMBOLS
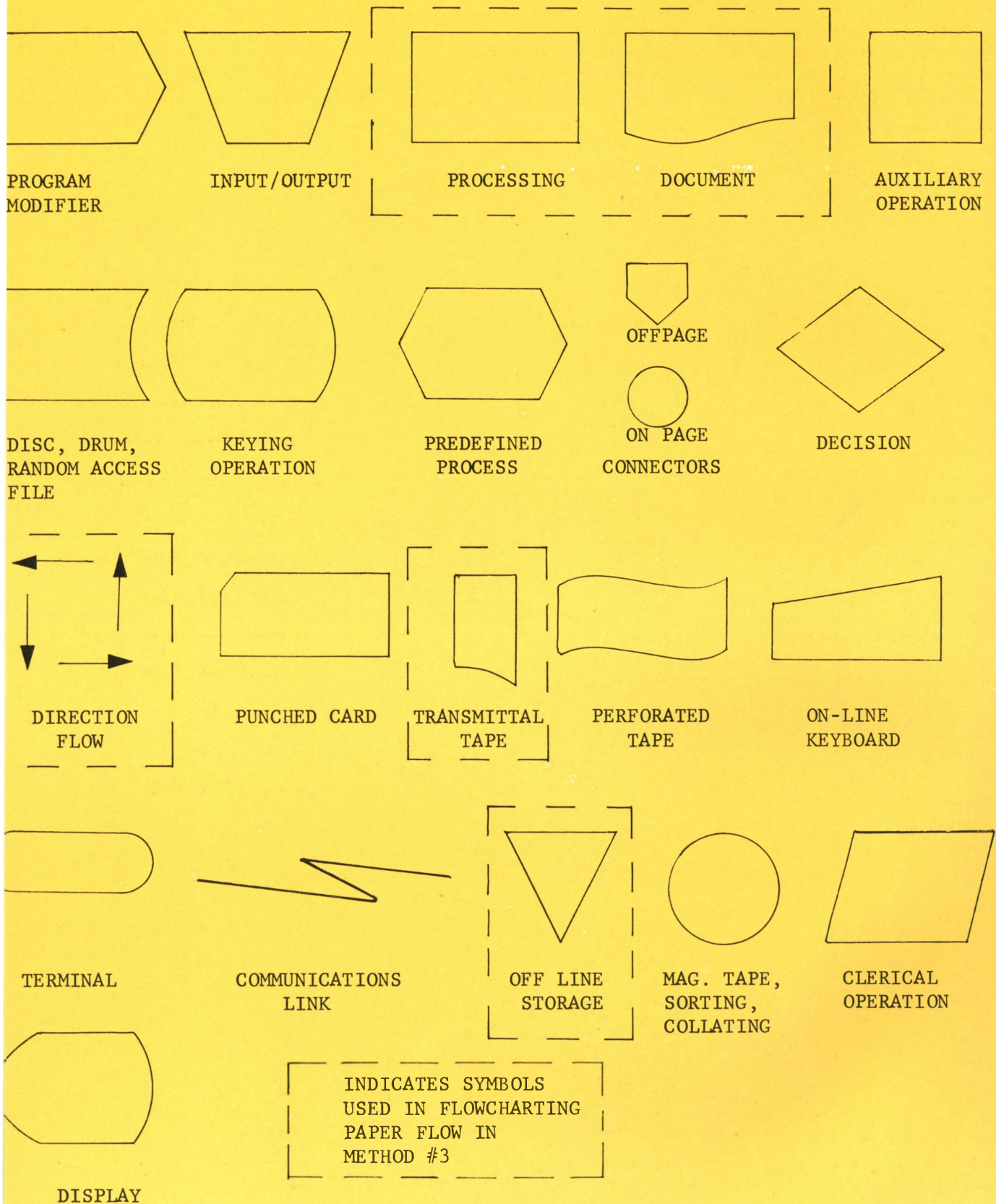USED IN FLOWCHARTING
PAPER FLOW IN
METHOD #3

ILLUSTRATION II

the system or design a new one if it is justified.

The flow chart is prepared in the following manner. The designer heads up the columns with the names of the departments. Determination of the amount of space for each department is flexible and depends upon the procedures to be documented. The flow usually moves from upper left to lower right; however, this is not a rigid rule. A rectangle represents each distinct step. A description of each step commences with an active verb—prepare, review, file, etc. The purpose for this action word format will be explained later. Normally, document copies are numbered and code colors can be assigned where appropriate.

Illustration III on pages 36-37 is a flow chart of the present purchasing procedures used by the Spokane Company and was prepared in the following manner. First, the analyst defined the procedures to be documented. This required assistance from the operating personnel. In addition, he studied related procedures and indexed the relationships on the chart. For example, purchasing includes the procedures for handling vendor back orders and partial receipts.

Second, the analyst met with the individual(s) performing the procedure. As the person explained the process, he drew a diagram of the activities, collected copies of each document, and labeled them for future reference. The emphasis in preparing this chart is to describe the present procedures, not the ideal system. Lengthy explanations can be coded in a description column. Sample documents and related comments are indexed to the chart. To verify its accuracy, a supervisor in the purchasing department reviewed the flow chart. It should have been compared to the written procedures manual, if available.

Once a system is documented it can be evaluated. This includes deciding where, when, how, and by whom the procedure should be handled. Illustration III also reflects the evaluation notes in the lower right-hand corner of the page. These notes form the basis for making procedural changes or designing a new system.

Designing a new system through flow charts is analogous to an artist's sketching on canvas before painting a picture. It allows the designer to see the entire procedure on one sheet of paper. The departments or people are prominently displayed, and the analyst can view the interaction between them.

After the new system or procedure is charted, it should be analyzed for problem areas or possible simplification. The overview effect of the flow chart highlights these problems very well. Before making the flow chart final and writing the procedures manual, the chart should be reviewed with the respective operating personnel to get their ideas. Final documentation consists of two parts—the finished flow chart and a written description of the procedure.

A written description of the procedure may be prepared by the person who designed the system or another individual. In either case, the flow chart forms the basis for writing the procedure.

The "playscript" type of procedures manual appears to be the most useful format. "Playscript" is a method of writing procedures that tells the reader how to proceed. It should cover one definite, single cycle of action. The action steps are written in a logical time sequence. It should be read like a play with the actors listed on the

The "playscript" type of presentation, which appears to be the most useful format, is a method of writing procedures that instructs readers in step-by-step actions to follow. It should cover one definite, single cycle of action. It should be read like a play with the actors listed on the left-hand side of the page and their duties in the right-hand column.
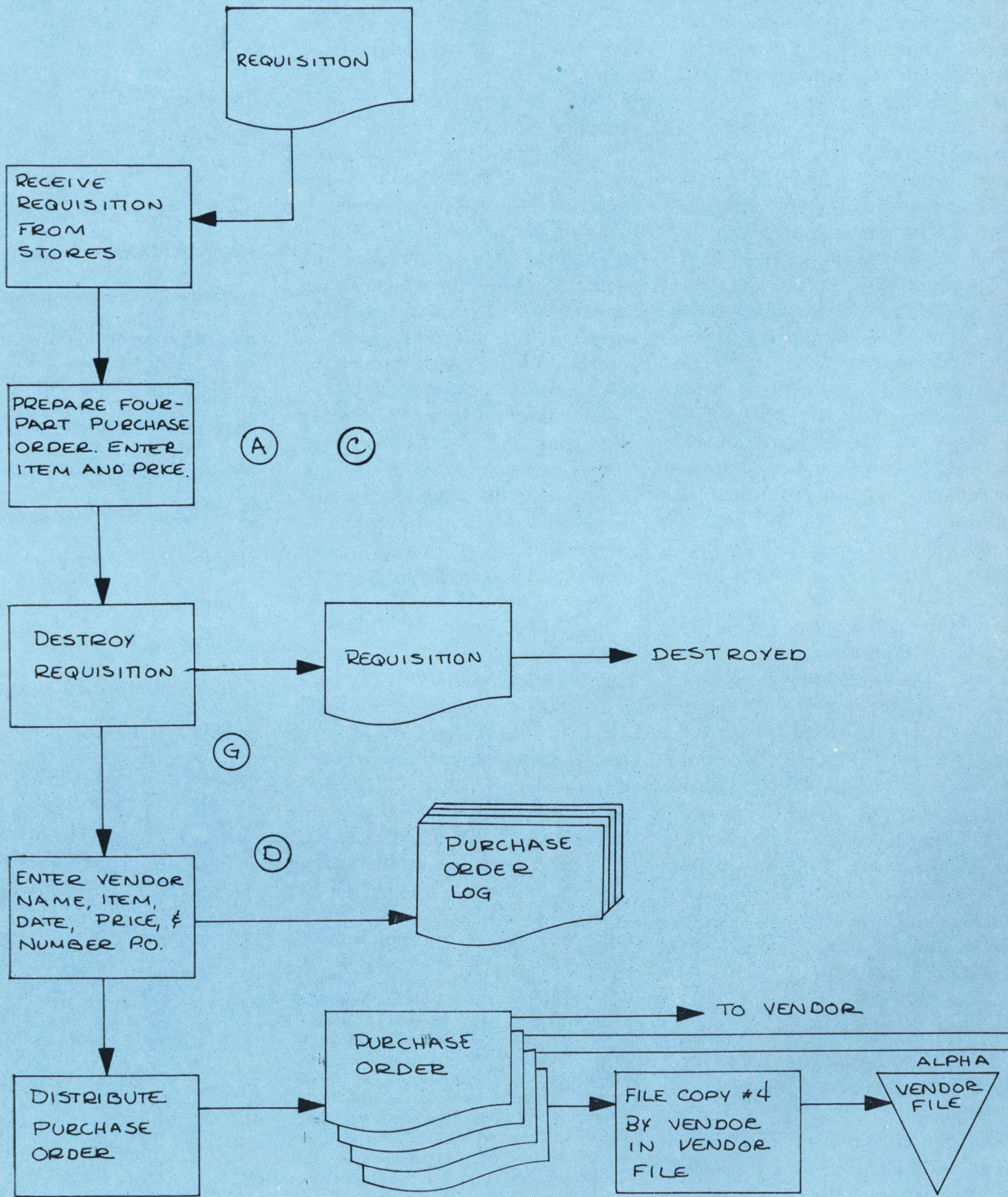
FRANK ILETT, Jr., CPA, is supervisor of the management consulting services department in the Spokane, Washington, office of Ernst & Ernst. He has also worked in the firm's Boise, Idaho, and Cleveland offices. Mr. Ilett has served as the educational director and the program director for the National Association of Accountants. He also holds membership in the AICPA and The Institute of Management Sciences. Mr. Ilett received his A.B. from the University of Washington and his M.B.A. from the University of Chicago.

November-December, 1970

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FIRM: UNITED PLANT

LOCATION: SPOKANE, WASHINGTON   CHART NO: A

PROCEDURE: PREPARATION OF PURCHASE ORDERS

PREPARED BY: FRANK ILETT   DATE: 21 JUNE 1969

REVIEWED BY: W. K. JONES, PURCH. AGENT   DATE: 21 JUNE 1969

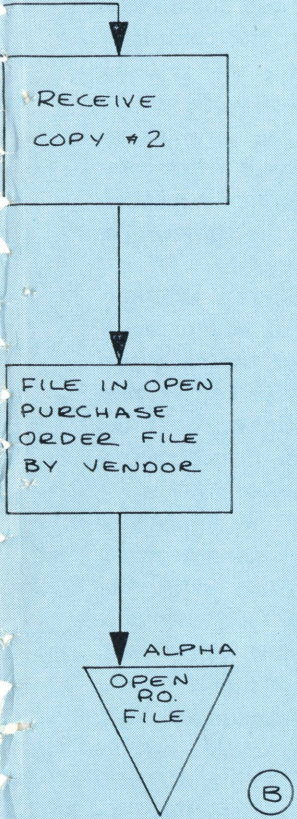TOM SMITH, PLANT MGR.   DATE: 28 JUNE 1969
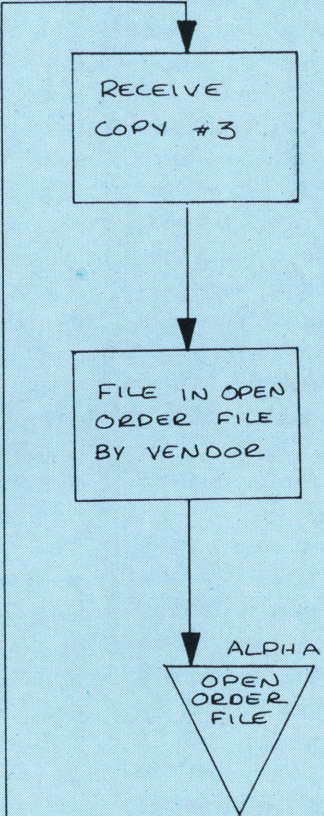

PURCHASING AGENT

...UNTING DEPT	RECEIVING DEPT	EXPLANATIONS

RECEIVE COPY #2

↓

FILE IN OPEN PURCHASE ORDER FILE BY VENDOR

↓

▽ ALPHA OPEN P.O. FILE Ⓑ

RECEIVE COPY #3   Ⓔ

↓

FILE IN OPEN ORDER FILE BY VENDOR

↓

▽ ALPHA OPEN ORDER FILE

EXPLANATIONS

Ⓐ FOUR COPIES ARE SEPARATE SHEETS AND ARE NOT PRE-NUMBERED.

Ⓑ SEE CHART 3, PREPARATION OF A RECEIVING REPORT.

EVALUATIONS

Ⓒ USE OF PACKET THAT IS PRE-NUMBERED INCREASES CONTROL AND EFFICIENCY.

Ⓓ ADD COPY #5 FOR NUMERICAL CONTROL. ELIMINATE COPYING OF DATA IN BOOK.

Ⓔ DO NOT HAVE PRICES ON RECEIVING COPY #3. THIS INFORMATION DOES NOT HAVE TO BE IN THIS DEPARTMENT.

Ⓕ INVESTIGATE USE OF PURCHASE ORDERS OR PACKING SLIP AS RECEIVING REPORT.

Ⓖ RETAIN REQUISITION IN NUMERICAL CONTROL.

ILLUSTRATION III

Sometimes a project may be undertaken on a piecemeal basis. This could, for example, involve documenting and writing one procedure a month. With this approach, a complete and detailed procedures manual can be written over a period of 12 to 18 months.

their duties in the right-hand column.[3] The procedure always involves an active verb—prepares, writes, enters, etc. A procedures manual prepared in this form becomes a script for the clerical worker, not a dust catcher in the supervisor's office.

Illustration IV on page 39 represents the first page of the purchasing procedure for the Spokane Company and gives the steps to be followed in processing the documents. It utilizes the "playscript" approach.

The advantages and usefulness of flow charting are obvious. First, it presents a logical flow of the documents. Second, each department or actor is designated at the top of a column. Third, and most important, the action to be taken by each person is set forth in the various boxes or rectangles. These steps can be easily translated into written procedures. In fact, the procedures manual can be dictated from the flow chart.

The completed procedures manual should include three items for each procedure—a written description of the procedure, a flow chart, and copies of all the documents. These three elements should be cross-indexed.

The "playscript" procedures can be used to develop detailed task schedules for each job or employee. A schedule is headed with the captions—daily, weekly, monthly, and once a year. The analyst lists the tasks for each job or employee and classifies the item by frequency of occurence. For example, "file part #2 of purchase order" would be listed as a daily task on the accounts payable clerk's schedule. "Total and cross-foot the voucher register" is a monthly task. The task outline summarizes all the procedures performed at a work station.

This approach to documenting, evaluating, and designing a sys-

tem has several advantages. It attacks problems in a logical fashion utilizing acceptable, easy to learn, systems analysis tools. The method allows several people to work on the project at one time.

It also has another advantage for small or medium-size firms. These companies seldom have systems specialists on their staffs. However, they can flow chart their present systems and retain a consultant to evaluate the documentation. Subsequently, the consultant can design or alter the systems. Hopefully, his design work will be on flow charts. The flow charts then can be reviewed with operating personnel. Company personnel can prepare the procedures manuals from the charts.

This approach offers a company the advantages of a system study at a lower cost. Also, company personnel become involved by performing part of the work. It becomes *their* system rather than a consultant's recommendation.

In another case, accounting or other operating personnel might possess the analytical skills but have only limited time available to devote to systems work. Consequently, a project might be undertaken on a piecemeal basis. This could, for example, involve documenting and writing one procedure a month. With this approach, a complete and detailed procedures manual can be written over a period of 12 to 18 months.

Summary

This article describes the use of flow charts in documenting, evaluating, and designing systems. The method involves the following process. First, flow chart the present system. Second, evaluate the flow chart to isolate areas for system improvement. Third, use a flow chart to design the new system or alterations. Fourth, write the "playscript" procedures from the flow chart. Fifth, prepare a task listing by function. The key words are document, evaluate, design, and document again.

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[3] Leslie H. Matthies, *The Playscript Procedure: A New Tool of Administration,* Office Publications, Inc., New York, 1961, pp. 79-107.

THE SPOKANE COMPANY
SPOKANE, WASHINGTON

ACCOUNTING PROCEDURES MANUAL

PROCEDURE NO	I
PAGE 1 OF 1	
EFFECTIVE DATE 1 Aug 70	
ORIGINAL ☒	
REVISION ☐	

TITLE OF PROCEDURE	PREPARATION OF PURCHASE ORDERS

POLICY

All purchases are made by the purchasing agent. A purchase order is prepared for each order except vendors who are issued a monthly purchase order. Purchase orders are initiated by a requisition.

FLOWCHART

Chart A - Preparation of purchase orders.

DOCUMENTS

Exhibit 1 - Requisition
Exhibit 2 - Purchase order packet

PROCEDURE

Purchasing
Agent

1. Receives requisition from stores.

2. Enters item description price, and vendor name on purchase order packet.

3. Separates and distributes parts of purchase order as follows:

        Part #1 - to Vendor
        Part #2 - to Accounting Department
        Part #3 - to Receiving Department
        Part #4 - to Purchasing Department
        Part #5 - to Purchasing Department

4. Attaches requisition to part #4 of purchase order and files numerically in purchase order file.

5. Files part #5 of purchase order in alphabetical order in vendor's file.

Accounting
Department

1. Receives part #2 of purchase order.

2. Files in open purchase order file by vendor.

Receiving
Department

1. Receives part #3 of purchase order.

2. Files in open vendor file by vendor.

ILLUSTRATION IV