SHOE DATA PROCESSING COMES OF AGE

By

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A few years ago a handful of shoe manufacturers, led by Genesco, was pioneering in the use of computers. Today, modern data processing is a competitive necessity for all but the smallest firms in the industry. This report summarizes the present situation and gives some concrete guidance to the manufacturer considering or beginning his investment in this field.

Up to about 1962 three conditions prevented a general, effective spread of computer technology in this industry, problems identical with or closely parallelling those in other fields of business data processing. The first condition was a problem of the computer manufacturer: the lack of a proven machine-system of large capacity, high speed and low price; this problem was solved by the marketing of the IBM 1401-family and comparable other-make equipment. Second, most firms were misled to regard the computer as a tool of "clerical cost reduction," and therefore treated it as just another office machine in the controller's department; only recently has the computer become properly recognized as a tool of marketing, inventory and production control. Third, few managements in any industry were willing to face the explosive corporate "political" issues raised by the computer. The computer means a turn back to centralized management, away from decentralized management and

the growing bureaucracies seen in the past two decades.

The Technological Problem

To understand the technological problem, the reader will first want to know the three basic elements of a computer. These are input-output devices, a central processing unit and auxilary storage. An input device is a typewriter, a punched card reader or some other mechanism through which the operator can get data into the machine. An output device is either, again, a high-speed printer, a card-punching mechanism or some other means of reporting the results of computations back to human beings. The central processing unit is the part of the system that carries a set of instructions, which does the adding, subtracting, etc., and also stores data for immediate use by the computing mechanisms themselves. Auxiliary storage is provided by magnetic tape , revolving magnetic disks (like phonograph records, except that data is recorded magnetically instead of by a stylus), magnetic drums or similar accessory equipment.

How To Use The Computer?

The computer system pays off in sales analysis, inventory management and production control; the results to be had in

these applications dwarf the sometimes questionable benefits found in the accounting department. The place for the manufacturer to start is in sales analysis, expanding into inventory management and production control once sales analysis is on a firm footing.

The benefits of such computer applications are increased on-time shipments, reduced back- rders, reduced inventory obsolescence and fewer production and materials tieups. It means the possibility of more effective merchandizing programs, feasible balancing of lines, improved programs of substitution. Such benefits are converted to cash through doubly-increased sales and fewer markdowns: not only on initial shipments, but through the recovered repeat season business and better retail account shelf position established by getting the first order out to the market on time. It means better detection of the problems that can only be caught in the first four to eight weeks of the selling season by thorough analysis of customer bookings trends: not getting caught short of what is "taking off" while the shipping floor is flooded with slow-moving future markdowns.

Unfortunately, a few years back, most managements in U. S. industry tended to discount such benefits as "intangibles." On such premises, they regarded computers as merely another

"office machine," whose purchases must be justified by "clerical cost savings" mainly in the accounting department. Unfortunately, the choice of what road to follow in data processing was left solely to the controller and the outside accounting firm rather than seeking additional advice from the marketing and production executives.

Even in those cases where marketing and production applications were studied, executives and outside experts tended to be too tied to the way things were being done by clerks to even look seriously at the opportunity for replacing old clerk-bound policies and procedures by fundamental imporvements in market analysis, production control, made possible by the computer. Since clean, low-cost and effective data processing can only follow basic improvements in management reports and procedures, even those who looked into marketing and production applications failed to see the enormous benefits data processing could provide.

Back to The "Tycoon"

One of the outstanding sales executives in the industry some time back stated to me, "Business has got to get back to management by tycoons." By the time clerks can produce reports on essential facts and trends, it is all too often far too late for the executive to take effective corrective action.

A two-to-three-week lag in key reports in the industry can be disastrous at certain critical planning and expediting points in the seasonal marketing-production cycle. One firm suffered a miserable decline in one recent season for just this principle reason; serious mistakes in planning were made which would not have been made if the facts had not been perpetually two weeks later than necessary to correct cutting schedules. In this industry, provided that styling and quality is right, the profit or loss of a selling season depends on effective, knowledgable coordination of marketing, inventory and production. These are decisions that must be made by the man who oversees all three, marketing, finance and manufacturing. Unless he gets the necessary facts on time, and unless his key subordinates' reports and policy objectives are in step, the right coordinating decisions and policies can not be forthcoming. If these happy conditions are met, the chief operating and financial executives can function as they should function -- as "tycoons."

The computer, properly ;used, makes the chief officers "tycoons" -- at least gives them the necessary tools for that role.

The "tycoon" must manage the business as a whole. He has the task of converting cash and assets into production,

inventories and sales, and back into cash and new assets to replace
the original expenditures. The "tycoon" can not permit himself to
look at the business as a collection of semi-autonomous parts, such
as marketing and production; he must view it as an integrated whole,
in which events in one "part" affect all "parts" and the whole.
Production schedules are properly determined by marketing con-
ditions, and marketing programs, merchandising programs must
be geared to what production can do. Effective management really
begins with a business that has just one system instead of a
collection of semi-autonomous departmental systems. What the
basic reports and systems in each department shall be must be
determined, in effect, by the firm's chief operating officer, and
not by the different department heads.

If a manufacturer has a complete specification for
each style available to his computer, there is no principled reason
why he can not regularly translate current and projected marketing
trends into production, inventory, and financial requirements.
However, it is ABC that before the computer can produce such
reports, all departments must speak the same language, all use
the same basic system.

It happens that such a system applied to a data process-
ing installation results in enormous cutbacks in the number of clerks

and clerical supervisors required to run a firm -- it means
streamlining and centralizing management and administration.
That point is taken up in an August, 1964 FORTUNE ARTICLE,
"Management Will Never Be The Same Again." Too many middle
and top level managers are simply paper-shufflers, being made
redundant by the growing and constantly improved use of
computers.

With the number of styles tending to multiply in an
environment of growing style obsolescence, productive capacities
are being strained to the point that it becomes increasingly
difficult to get a full line out on the shelves in time. The same
factors tend to lower the productivity of plants and to multiply the
investment dollars required to handle materials and finished stock
inventories. Getting a strong shelf position early in the season,
getting old styles sold before the new season starts, responding
quickly to early season trends in demand -- these are becoming
matters of corporate survival. The old ways of management are
becoming as bad an investment in manufacturing as obsolete plants
or patterns. The computer, of course, is absolutely no guarantee
of success in itself, but it is the foundation of successful manage-
ment in the months ahead.

HOW TO START

The remainder of this report is devoted to suggestions on how to get started in data processing. This is divided into two main parts. The first portion outlines and explains a basic computer system which would be recommended for most shoe manufacturers. The second portion explains the steps by which management would put such a system into operation.

The Suggested System

A data processing system should begin, in almost all cases, with a marketing and sales analysis report. If this marketing report is properly designed and developed, it becomes the foundation for adding production control, inventory control, cost control and other necessary and useful data processing reports.

The first thing to do is to set up regular data processing reporting and control of customer orders and shipments. This will provide all of the regular reports and controls over orders and shipments and will also make possible a very important weekly sales report to be used for determining style trends, expediting production orders, and establishing all-important cut-off points for a season's line. Properly used, such a report enables management to improve its delivery performance, reduce back-

orders, reduce shipping charges (fewer shipments per dollar of shipments) and also reduce returns and obsolete inventories.

To accomplish this we shall employ a special kind of electric typewriter which simultaneously produces a clean copy of orders and shipments and also produces a punched tape or card or magnetic tape record of those same orders and shipments. The typewritten copy will be used for the ordinary purposes; the punched tape, etc., will be sent to a computer facility -- one's own or a service bureau's, to produce the required weekly reports. When this is properly done, the typewriting requires no extra operation by the firm's clerical employees; data processing information is produced as a by-product of the regular, most essential clerical operations.

In order to do this economically, we shall prepare the way for this typewriting operation by reducing certain basic information to carefully standardized codes; wherever possible these will be number codes. We shall require such codes for customer numbers, style numbers, salesman's numbers, terms codes; we shall also standardize the way in which dates are to be written and some other matters.

The essential information about a customer order that

we shall wish to transmit to the computer is as follows: First, we wish to identify the date the order is booked. We shall also wish to give each order some unique serial number which distinguishes it easily from every other order. We shall include the date of requested delivery. Then, we have to identify the customer by his unique customer number. We shall require a sales code which identifies the kind of sale involved: e.g. make-up, instock, regular, closeouts, etc., and a terms code to identify cash, prepaid, etc., terms. Then, in the body of the order, we need to identify the style number, size, quantity, unit price of each line-order-item. When we record the shipment, we shall also need to identify the invoice number, date of shipment or invoicing and the amount actually shipped.

Briefly examining each of these codes will help to make data processing less mysterious and will also indicate the nature and importance of preparatory systems work.

Dates: any date can be more than adequately coded in five digits. For example, Dec. 20, 1964: 12 20 4. The last digit, in this case '4', to identify year is actually unnecessary, but most firms using data processing feel more comfortable with the extra information.

Serial Number: The best way to construct a serial number to identify individual customer orders is to combine the code for the bookings date with a serial number given to each order booked that day. For example, if less than 99 orders are processed on the busiest day, two digits are sufficient to give each dated customer order its own serial number; if more than 99 but less than 999, three digits suffices; etc. Serial numbers by days has an additional advantage. It is important to be sure that we are getting all of the information into the computer correctly; it is much easier to check a day's work at a time than a weeks. In fact, daily control tallies are the recommended procedure for ensuring accurate weekly reports.

Customer Number: At least four digits should be used for a customer number. The first, or left-hand digit of this number should always stand for the kind of customer, such as Mail Order, Major Chain, Minor Chain, Major Department Store, Department Store, Wholesaler, Misc. Then, 1100, 1200, etc., would identify Sears, Mon. Ward, etc., and 1101, 1102, would identify particular Sears Stores or warehouses. The same device would be used for Major Chains. By coding customer numbers in this way, the computer can easily produce sales analysis reports which show sales by salesman's territory and type of account, or similar statistical breakdowns which can be distinguished from the

nature of the customer number code combined with some other code.
For example, sales by class of account by date, sales by class of
account by date and salesman's territory.

A sales code or terms code is obvious enough.

Style number codes again present us with a challenge.
First, it is desirable to make style numbers as meaningful as
possible. The first two numbers should identify type of product
and gender. The secceeding numbers should identify particular
style and color within that type and gender. In all, six digits should
suffice for most firms' needs; two for type and gender, two for
particular style, one for color and a check digit. Some firms would
require seven digits.

The definition of style number presents a problem. Which
is the style number, the customer's style number or the number
assigned to the style by the firm which manufactures it? Obviously,
there must be provision for two style numbers. In one position, we
shall always write the style number of the customer or the firm's,
whichever number occurs on the customer's order. In the second
position we must always have a number which identifies the
manufacturing firm's current style master specification under which
the shoe is manufactured. This is important for data-processing
analysis of customer orders, in which we have important reasons

for sorting sales'statistics by type and gender; it becomes extremely important when we attempt to translate style orders and shipments information, actual and forecast, into anticipated inventory and production demands. The firm must have a logical style number of its own for every style produced. This second style number we shall hereafter term a spec number , to identify the number of the style specification turned over by sales to manufacturing. Every style must be assigned its own spec number.

Invoice Number: the invoice numbers should run consecutively for a year or fiscal period -- contrary to the recommendation made for customer bookings numbers.

It is recommended for numerous reasons, that the following definitions and procedures be established.

First, that a customer booking shall mean an accepted, credit department approved for shipment and edited customer order turned over by the credit department to sales for processing. The bookings date should be the date on which the order is rewritten as an edited booking. This avoids all kinds of otherwise probably slop in keeping track of orders through intake.

Secondly, that the dating of the accounting shipment document shall be the date of invoicing or pre-invoicing, for the same reasons.

There are several obvious controls which can be used to prevent an order from slipping through without proper credit-check and editing. The best example of this is the terms code, which should be put on the incoming order document by the credit department; the omission of this number on a data processing record means -- to the computer, a questionable booking to be thrown back for check. Another aid in controlling editing is the assignment of the customer number. If the editing clerks pull the customer number record, only edited orders -- orders processed by editing clerks, will show customer numbers.

The first action of the data processing center will probably be, then, to run each deck of cards through to check these tallies. Once the tallies are proved or errors corrected, these checked decks of punched cards go to a sorter, another accessory machine in the computer plant. These cards are sorted by spec number.

If the bookings cards and invoice cards are of the same design, they can be mixed at the sorter and fed into the computer together after being sorted in such a way that all bookings on a style precede shipments on the same style.

The computer will total the following by style, by type and gender, and grand totals.

(1) Bookings -- Total, Season To Date.

(2) Net Bookings -- (Total Bookings less Season

to Date Total Shipments)

(3) Net Bookings by Future Week -- the net bookings

to be shipped in each of the

next eight to ten future weeks,

based on customer requested

delivery dates.
(4) Shipments -- Season To Date

The same cards can be resorted and used to produce

reports by customer class, by customer, by salesman, etc., to

produce salesmen's commission statements, or any other report

implicit in the combinations provided by the various coded elements

of information.

The basic report discussed above would obviously be

compared with manual records of production schedules to coordi-

nate sales and production. We also see, immediately, an

additional operation that can be performed by the computer which

is of enormous value. Since bookings by each of the opening fourth

through eighth first selling weeks of each season represent a fairly

consistent percentage of total bookings to be taken during the whole

season, in addition to our projected net bookings by future week, we

can also show the expected total season bookings for the whole
season and for each of the future weeks of the remaining season.
This is fairly accurate by style for some lines, but is always very
useful information by type and gender. Expanding the report to
contain this form of analysis make the marketing report a very
valuable merchandizing tool.

Once this part of the system is operating, the firm
should immediat ely add production data in the same way. A good
system provides for writing up each production order as it is
issued to the plant. This order, like a customer booking, shows
the desired completion date and/or cutting date. When this
production order is first processed through the computer room,
cards can be produced to be sent down to manufacturing so that
there is one such card for each case for each definite stage of
production and completion. The foreman of each department then
turns in at the end of each day the cards for each case which has
passed through his department. With this information, the computer
can provide an up-to-date weekly accounting of projected and actual
performance on cutting and completion of production orders for
each style. By deleting factory rejects and shrinkage from these
tallies, the computer also has control of inventory:

Inventory - (starting inventory at beginning of the

season)+(production receipts)-(shipments).

By combining this information into the basic marketing report, top management has a complete, consolidated control of merchandizing and production. Management can compare actual and projected requirements by style with current on hand and in process by future weeks. Experience shows that a reliable picture of this sort six to ten weeks ahead is exactly what is required to maintain reasonable shipping, production and inventory performance.

Once production is in the system, we can add control of the most essential materials. By keeping track of materials inventory, and by projecting purchasing dates to the lead-time necessary to get materials ordered and in before the cutting date, the system can provide an excellent control of materials expenditures and inventories.

In a similar way, starting from sales and shipments information, the same basic system can be expanded without any fundamental change to include any feature which the firm may require. One of the more important such expansions is that of putting costs on the computer. With standard costs per style in the computer system, very tight control and very accurate reports of profits and plant economic performance can be provided as a part of the basic system.

HOW TO GET STARTED

The first thing to plant firmly in one's mind is that

data processing is a highly specialized form of "production," in

which raw materials, information, are processed to produce a

product, reports. Getting into data-processing is therefore like

setting up a process line for a new type of product.

Where to Begin?

Begin exactly as you would, in principle, in setting

up a new plant for a new kind of product. First, put your best

available executive for the job in charge of getting the job done and

build the necessary skeleton force around him.

The key man for all data processing is the Systems

Manager. He is a specialized talent with experience in data process-

ing and heavy experience in designing and administering corporate

systems. This employee will be a key executive of your firm,

reporting directly to either the president or a person functioning

in the capacity of executive vice-president. He will be the final

authority, subject only to the ruling of his superior, on every

clerical and related procedure in the company. He will sit in, as a

key executive, on sales planning, budjetary, production and oper-

ating financial decisions -- he will be at least as important to the

firm as an executive as the controller.

If the firm is a smaller firm, which can use a service bureau, the programming and operations work is done on a part-time basis as a part of the services performed for a package price. In that case, the Systems Manager has a small staff which designs forms, clerical procedures, and controls the details of work-flow between the firm and the service bureau. Despite the smaller department under him in this case -- sometimes only one or two people -- the Systems Manager is just as important to the job as he is with a large operation to supervise; in all cases he is the person with the headaches of getting the job done.

Developing a Plan

These two key people, your key executive and your Systems Manager, draw up the basic system and call in representatives of computer equipment companies and service bureaus. Together with these representatives, an estimate of what is required is made up. Statistics on the number of orders per day, number of styles, etc., all determine the capacity and type of computer system required.

Once you have a general estimate of what the requirements will be, obtain the consulting services of the best systems

consulting group recommended to you for your type of application.

The kind of systems manager you will find sufficient for your

regular needs will not be qualified to develop the whole system

from scratch. Together with this consultant -- begin to work

out the kind of codes which at the same time best suit the needs of

the company and will be most economical and foolproof for the

type of equipment you may purchase or use.

Once this is done, the top officers of the company must

be brought in to approve a general plan for establishing customer

number, spec number, etc. codes and necessary forms and proc-

edures changes. Until that is done, actual work on getting ready for

the computer or service bureau can not begin.

It will require from three months to a year from the

time that you are in agreement on these tasks before you can expect

to produce your first regular marketing or combined marketing-

inventory-manufacturing report. This allows for working-out

clerical procedures changes, developing new codes, designing

forms, for setting up the details of the changeover, for developing

computer programs, proving those programs and receiving the

machines you will require to produce bookings, shipments and

production order information for the computer. The tightest sched-

ule you should adopt for your first regular reports is the point of

beginning the new selling season not less than six months ahead.

This assumes that your firm is going to begin with a service bureau.

Make your decisions on this in collaboration with your service bureau, equipment company representatives and your systems consultant. On the basis of these decisions which you must get every affected top executive in the company to agree to, set up a project progress schedule for each task to be completed. This is what every executive involved is going to have to live up to.

Outside Consultants?

The ideal consultant would be a systems consulting firm with access to service bureau facilities in your neighborhood. Such a firm can do the whole job, from soup to nuts, at a packaged price. There are a handful of consulting firms which meet that specification. There are a number of systems managers who can be hired away from their present operations for the right price and who could do at least a competent job of developing a system.

The best concrete advice that can be given on this subject is negative: people to stay away from. First, avoid like the plague those experts who promise to put your existing manual or semi-mechanized equipment on a computer. Second, avoid any "expert" who makes any committment without a prior thorough

survey of your operations. Third, avoid as if he were a thief any person who proposes to solve your problems with a collection of separate "proven" systems.

CONCLUSION

Any data processing application of any value will be based on a complete system for identifying all of the data in your firm and for processing all of that data -- whether manually or by machine -- into an overall, inclusive system of producing all necessary corporate reports: marketing, inventory, cost, profit, production, purchasing, etc., as by-products of the operation of of the system as a whole. Any good such system, presented to you, will make sense. Any such system can be effectively put, in entirety or in major parts, on a computer with good results. Don't buy anything else.

Finally, your firm may have made a mint "stealing" styles, but it will lose money if it tries to get data processing systems cheap by copying a competitor's system. There is no system being used by any firm in the industry which can be safely copied, as is, by any other firm. Don't steal it yourself and don't contract to pay anyone anything for stealing it for you. The work of overhauling such a system to meet your particular needs will cost more than building your own system right from the start.