A MICROCOMPUTER MEAT MANAGER SYSTEM

by

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Defining the Need

Early in 1981, Toledo Scale began a requirements research study to determine if there was a need for a new or improved management information system for the meat department of a supermarket. First, we did a qualitative research survey to determine broad market needs. We wanted to find out what information was being received from the meat department and what was wrong with the information that was being received. Was there a need for a better management information system for the meat department?

The methods we used for the survey were personal interviews and focus group interviews with people who represented the functions of meat operations, data processing, engineering, productivity, equipment and maintenance. We talked to about 25 companies, ranging in size from an independent operator of a single store to a chain with 250 stores. The Marketing Department of Central Michigan University helped us in our research work. The focus group interviews were conducted with the help of two professional research companies in Toledo, Ohio and Los Angeles, California.

Based on this research, it became apparent that there is a serious information problem in the meat department of nearly every supermarket and a new management system is badly needed.

Defining the Problem

In our analysis of the problem, it became obvious that the meat department is more than just a display area in a grocery store. The meat department is, in fact, a manufacturing production operation. Incoming products are received at the back door and put in the cooler. Products are taken out of the cooler and into the cutting room as needed. They are converted into retail cuts, which are wrapped, weighed, labeled and put in the meat case for customer self-service. Trimmings from the cutting operations become raw materials for various ground meat commodities. Fat and bone are shipped out as waste products. All these processes require close attention to labor resources, scheduling and productivity.

At every point of the process, there is the chance for meat department losses to occur. The department may not have received all products which were paid for. The meat cutters may be getting the wrong yield of retail cuts out of the primals, reducing profit margins. Losses may be occurring because of pricing errors at the prepack scales. If they are not modern scales, they are subject to operator errors in manually setting prices. If they are modern scales with memory, they may have incorrect prices in their memories. Unsold packages must be pulled back from the case to be rewrapped, converted to other items or thrown away, all of which contribute to manufacturing loss. The difference between net products received and the sum of retail items packaged is department shrink loss. The difference between items packaged and items sold at the checkstand is in-store shrink loss, or theft. Managing this complex operation to maximize profits and minimize losses in today's economic and competitive environment is a tough challenge for the meat department manager, who in reality is the general manager for a small manufacturing plant.

Proposed Solution

Our proposed solution to the problem is a total closed loop, microcomputer based, inventory management system. In this concept, a dedicated microcomputer is connected to an electronic receiving scale and data station for capturing data on all incoming meat products. It is connected to the prepackaging scales for controlling the pricing to the scales and for capturing data on all retail cuts produced. It is connected to a data station, and perhaps to a second scale, for capturing data on various activities going on in the meat room, such as cutting tests and normal production functions.

A wand scanner may be attached to the receiving station for scanning the new Uniform Container Symbol on cartons of meat. In a scanning system, a programmable hand-held data terminal may be connected to the system for entering case inventory and case pull data on rewrap and rework packages.

As a future development, the microcomputer will communicate with the Point-of-Sale controller or the in-store computer to compare actual meat sales with meat room production to determine in-store shrink. It will communicate with the host computer to receive price changes for the prepack scales and to send summary data from the store's meat department. The primary output of the system is a series of management reports which help the meat manager do a better job of managing his department.

Defining the Product

The next step was to convert our proposed solution to a preliminary system design with specified hardware. We then did a quantitative research survey to determine specific requirements. How many management reports were required? What exact information should be on the reports? Was our proposed solution to the problem acceptable to our customer in terms of functional hardware, operator and manager interaction with the system, and interface compatibility with the other elements of his total information system?

The methods we used for this purpose were personal interviews, telephone interviews and prototype equipment demonstrations. A graduate marketing class of Ohio State University did the telephone interviews. We did the personal interviews and the equipment demonstrations. The demonstrations were made primarily to customers whom we had interviewed during the preliminary research phase of the project. It's a good feeling to show a new product to a customer who had helped you define the product and hear him say, "It does everything we talked about! When can I have one?"

We then finalized the system design. The hardware consists of a microcomputer with 64K memory, a CRT display and operator keyboard, three floppy disk drives, a 132 column matrix printer, a data station and an I/O communications bridge. The CRT is menu driven, allowing the manager to easily select from the choices on the display screen the function he wishes to perform, such as, printing a report, editing a file, or sending prices to the prepack scale. The data station has an alphanumeric display and is operator interactive. It also contains the electronics for one or two scales. The entire system is available in a basic non-scanning version or a scanning version. For a customer who is not yet scanning, the non-scanning system provides many of the benefits of scanning, such as item movement out of the meat department, and can be upgraded to scanning.

The system has some innovative features, as far as we know, not available elsewhere on a microcomputer. The software operating system operates in foreground/background modes. This means the system is doing two things at once. The scales are on-line and communicate with the microcomputer in the background in a

polling mode of operation. The micro-computer sequentially addresses the scales, asking each in turn if it has data to transmit. At the same time, without affecting productivity in the meat room, the manager may print a re-port at the manager's station in the foreground. This means you can work at the manager's station without affecting the automatic collection of scale and inventory data. You don't have to shut the system down or wait until the end of the day to print a report.

The new I/O communications bridge is a software controlled switching de-vice which allows all the scales and data devices in the meat room to be connected to a single I/O port on the microcomputer. This saves money in hardware.

The system has a real-time clock which allows time measurement of labor activities in the meat room, as well as showing the date and time on every re-port.

We have spent a great deal of time on product definition because we want to provide a standard product at the lowest possible cost. As in all computer sys-tems today, the cost of hardware is coming down, but the cost of software, especially custom software, is very high. Our objective is to provide standard applications software in a turnkey sys-tem to solve the meat management problem for the majority of our customers. Our applications software provides eleven standard management information reports.

Management Reports

Receiving

The Receiving report shows, for each product received, the date code, the serial number, the product number which was entered by the receiving person, the description, the source or vendor code, the total cost, the cost/lb., and the number of pieces in the carton. The receiving scale provides the gross weight

and net weight for comparison with the invoice or billing weight. This report may be printed on demand by the manager and shows an inventory listing of all products by serial number which are in the cooler as of the time and date printed. The serial number is assigned by the microcomputer at the time the product was received and marked on the carton by the receiving person, and is used for inventory tracing in the meat room. With this report, the meat mana-ger can tell what is in his cooler with-out having to go into the cooler with a pad and pencil and count boxes.

Inventory

The inventory report shows a sum-mary, by product, of the total weight of product which is in the cooler. It also shows work-in-process inventory and the total product inventory which has been processed into finished goods and moved to the case.

Work-In-Process

The work-in-process report shows a listing of all products which have been removed from the cooler and not yet trans-ferred to the meat case. It shows the serial number, what operation it is in and the operation starting time. The manager can tell from his office what work is going on in the meat room at any time. The report is also used at the end of the day to make sure the operators have closed out the serial numbers of all pro-ducts processed that day before genera-ting tonnage report.

Pre-packaged Commodity Summary

The pre-pack report is a summary, by item number, of all production across the pre-packaging scales. For each retail item, the following information is printed: Item Number, Description, Unit Price, Total Dollars, Total Pounds, Num-ber of Packages, Average Package Dollar Value, Average Package Weight and the Number of Runs. The report is divided into four sections. The first section

contains all packages which were priced manually by the scale's Price-Rite memory, which is the normal automatic operating mode. This section provides the basic item movement information from the department. The second section contains all packages which were priced manually by the scale operator. Information on manual pricing lets you closely monitor and check for pilferage and sweethearting. The third section contains all packages which were rewrapped. Information on rewraps provides an indication of how much unproductive time is spent rewrapping packages. The fourth section contains all packages which were rewrapped and marked down. This usually results from those case pull items which were not converted or thrown away.

In the scanning system, case pull data is summarized in a fifth section, entitled "REWORKS." This is a list, by item number, of all packages which were pulled back from the case for some kind of reprocessing. It shows Item Number, Total Dollars and Number of Packages, taken from the portable data terminal, along with the unit price taken from the microcomputer, and the calculated total weight. It tells the manager which items are being over-produced in the meat room.

Cutting Test

One of the system's major features is that it provides an automatic cutting test. This is the first automatic cutting test in the industry, which fully uses the power of the moders prepack scale. A cutting test may be performed at any time of the day, under normal production conditions, while other products are being cut and wrapped at the same time. The only difference is that the fat, bone and trimmings which result from the cutting test must be weighed on the prepack scale. At the completion of the test, all cutting test calculations are automatically performed and the complete cutting test report may be printed. In addition to printing the standard cutting test format, the report shows the

elapsed cutting time and the elapsed wrapping and labelling time. These times become the department labor standards.

The standard cutting test is the main data base of the system. The accumulation of cutting tests provides the proper product mix and pricing for the department. In order to keep close control of department profits and do a good job of meat merchandising, cutting tests must be done very frequently. In the past, they have been time-consuming, subject to human errors in calculating the numbers and difficult to do. The Toledo Meat Manager System finally makes a cutting test easy to do! This will facilitate incorporating the cutting test into the routines of meat room operations.

The cutting test may also be displayed on the CRT, where the retail prices may be changed in a "what if?" mode. This may be done, for example, to adjust the gross margin back to an acceptable value after the wholesale cost has changed. The manager can easily see the effect of sale prices on his gross margin.

After all retail prices have been changed as desired, the new prices may be downloaded to the scales. Downloading means it is no longer necessary to spend time entering price changes manually at the scale.

Yield Variance

The yield variance report compares the results of a cutting test against the standard cutting test in the system data base. For each retail cut it prints the variance between what was cut and what should have been cut. It also prints the variances on the gross margin dollars, the gross margin percent and the labor times. This report may be used to compare products from different vendors, or it may be used as a productivity measurement tool. Thus, you can optimize profit by the selection of products from vendors, or use the report as a "report card" for each meat cutter.

Tonnage

The tonnage report is a summary of production by product number. For each product, it shows the number of pounds received, the number of pounds packaged and the actual yield in percent. The standard, or expected, yield is shown for reference. The total retail dollar value of the packaged retail cuts, the total cost, the receiving cost per pound and the gross profit percent are printed for each product. The trimmings, or raw material for ground meat, are also printed on the tonnage report, as well as the fat and bone, which are shipped out of the department.

For those retail cuts which can come from more than one primal, such as stew beef or cubed steaks, an allocation scheme is used. As soon as the primal is taken out of the cooler, a quantity of that item is allocated to the primal product according to its percentage of total weight in the standard cutting test. At the same time, the same amount is debited to the item on a separate line on the tonnage report. When the item begins moving across the prepack scale, the item line gets credited or subtracted by the amount which is actually packaged. The item line becomes a variance between what was allocated fully to the primals and what was actually packaged.

There are two tonnage reports in the system. Today's tonnage is available as a daily production report. The summary tonnage report is a cumulative report which is also available each day, but is intended to be the weekly production report. It is the tonnage report which tells the manager how his department is doing on a product by product basis.

Labor Reports

There are three labor reports in the system, which are designed to help the manager match his labor scheduling against his production requirements and improve productivity in the meat department. The labor standards report is a listing, by product, of the standard hours per hundredweight required to cut the product into retail cuts and the standard hours per hundredweight required to wrap, weigh and label the retail cuts. These labor standards are developed as part of the cutting test and are part of the system data base.

The manager enters his daily production requirements, by product, for next week. The microcomputer then calculates the total number of man-hours of each labor type required to process his planned production. This information, printed on a daily labor requirements report, is used by the manager in scheduling his people to match the production schedule.

Then at the end of each day next week, a labor productivity report is printed. This report compares the actual labor performance against the expected standard. For each product processed, the report shows the actual labor hours of each labor type used and the standard labor hours, with the variance on each. The totals for the day are also given, along with the variances on the totals.

The labor reports provide the manager with a very valuable tool to help him manage his direct labor, which represents the highest portion of his non-product costs.

Conclusion

Toledo Scale has a continuing commitment to the food distribution industry. Our new product development process is geared to providing equipment and systems which meet the needs of our customers and our industry. Our microcomputer meat manager system is an example of the results of combined food industry research and new product development. We look forward to working with you on the challenges of the 1980's.