AN INTEGRATED INVENTORY - MERCHANDISING PROGRAM FOR THE CONFECTIONS VENDING INDUSTRY

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ABSTRACT

AN INTEGRATED INVENTORY-MERCHANDISING
PROGRAM FOR THE CONFECTIONS
VENDING INDUSTRY

By

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The scope of the dissertation is the development of a technique for combining inventory management with the selling function in the automatic merchandising (vending) industry. The state of the art in the industry at present is to offset cost increases by price increases rather than improvements in routeman productivity. It is also evident that routeman productivity is a function of the number of stock-outs and selection switching among columns in a candy vending machine. Two additional factors that may have an effect on product movement at the machine level is the positioning of product in the machine and the duration that a product is in a given position. Industry practice does not admit that position or duration has any effect on movement. If it can be demonstrated that it does, the possibility for reducing stock-outs, inventory cost, as well as labor costs--all are feasible. In effect pre-positioning substitutes certainty for random selection of

what ever is in the machine. In addition, the development of purchase patterns arising from measurement of movement from a known and constant array of merchandise should make possible more intelligent inventory control in response to known demand.

This study is designed to determine if a pre-determined positioning of product in a machine for a given period of time will enable inventory control to reduce safety stock required, reduce the stock-outs, and reduce the service effort per machine--all without a decrease in sales.

An experimental design called the Integrated Inventory-Merchandising Program was developed to study the problem. The design used is a combination of pre-test post test design on one measurement, sales, and post test only design on four additional measurements--stock-outs, level of inventory, column switching and breadth of assortment.

A local service company offered an industrial location with two candy vending routes for the test. The test route operated with the pre-determined selection and pre-determined positioning and duration in position. The control route employed normal procedures, that is, a broader line, and random positioning and duration in position. Measurements of beginning and ending inventories were recorded by brand and by column in machines and storage locker.

Stock-outs by brand and columns as well as column changes were measured each service. The resultant comparative data were analyzed for significance using the "z" and "t" test.

Several limitations were presented along with their future design revisions, and proposals for future research.

The objective of the study was substantiated, that is, it was possible to integrate the selling activity with unit inventory management and get positive results. The positive results were in the form of operating with a lower level of inventory, fewer sold-out situations, fewer column changes and fewer kinds of candy in the storage locker. The rate of increase in sales in the test route was greater than that of the control route, however, this result cannot be attributed to the Integrated Inventory-Merchandising Program, but to other unknown factors.

This research should encourage new concepts of inventory management and selling to emerge in the vending industry. These innovative systems offer the key to renewed future expansion and growth that the industry has experienced in the past.

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Besides the thesis committee, I am appreciative for the Professors in the Doctoral Program who taught me the necessary fundamentals and background to pursue this topic.

The cooperation of friends in the automatic merchandising industry enabled the experimental design to be researched under realistic conditions.

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CHAPTER I

INTRODUCTION

Introduction

The automatic merchandising industry has had an impressive growth over the last twenty years. Sales have increased from 1.4 billion dollars in 1952 to 6.9 billion dollars in 1972.[1] This growth has not been without problems for the operators. The origin of this industry was based on the promise that through the use of vending machines a limited line of products could be made available on a twenty-four hour basis with an increase in locational convenience to the consumer.[2] In its earliest years, the operators were small with the owner manager securing locations and stocking the machines. With the exception of the location choice decision and limited attention to

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[1] "Annual Census of the Industry, 1972," VEND, Vol. XXVI (May, 1972), pp. 40-44; Also "Industry Fact Book," VEND, Vol. XXVI (January, 1972), p. 190; "Census of the Industry, 1973," VEND, Vol. XXVI (May, 1973), pp. 62-63.

[2] Martin V. Marshall, Automatic Merchandising, A Study of the Problems and Limitations of Vending (Boston: Division of Research, Graduate School of Business Administration, Harvard University, 1954); George R. Schreiber, Automatic Selling (New York: John Wiley & Sons, Inc. 1954). Comprehensive analytical manuscripts about vending have not materialized since 1954. Charles R. Gouldner, Automatic Merchandising, A Selected and Annotated Bibliography (Chicago: American Marketing Association, 1963).

positioning items in the machines, marchandising was non-existent. With an increase in sales volume for many operators they found it necessary to specialize by function. The first specialization was the division of sales with respect to location of machines from the physical flow function as it affects stocking the machine. A later division was the specialization of inventory control through the addition of specialized warehouse operations. By the mid 1960's one group was responsible for machine location, and a second group responsible for product line choice, procurement and warehousing. A third group selected from the available warehouse stock and was responsible for stocking the machines.

As inventory investment costs and labor costs increased because of larger machines and broader lines, the industry began to pay more attention to sales increasing techniques per machine in addition to generating growth through increasing the number of machines.

The scope of the dissertation is the development of a technique for combining inventory management with the selling function in the automatic merchandising industry.

Conceptual Framework

A major management control technique is unit inventory control at the warehouse level.[3] These control

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[3]Donald J. Bowersox, Edward W. Smykay and Bernard J. LaLonde, Physical Distribution Management (New York: The Macmillan Co., 1968), p. 223.

methods record merchandise turnover, amount of stock on hand and purchase requirements. Once the product leaves the warehouse, machine location, machine appearance and package display are the only selling elements in the marketing plan. More specifically as the industry grew through larger capacity and larger selection machines the routeman serviced each machine fewer times per period without a reduction in sales per period. The actual time to service the larger machine is about the same as several smaller machines with a slight reduction in travel time. However, the cost of the machine has increased, yet the actual efficiency in servicing the machine has not changed in twenty years. Given the fact that machines cannot be increased much more in size because of physical and cost constraints, the only alternative for improving profitability is to make the routeman more efficient.

The rate of ten to twenty percent of sold-out columns is acceptable within the industry. To avoid this level of stock-outs, the machine must be restocked more frequently, thus reducing the revenue per service call, increasing the overall operating cost. If a method could be devised which would reduce the number of sold-out columns without increasing the frequency of service, profitability should improve.

A similar problem begins at the warehouse level. For example, when a machine is serviced, it is not prudent

to mix bars in a column. Therefore, if the warehouse is out-of-stock on a given bar, the routeman must remove that bar from a column and refill it to capacity with another bar. He is forced to change the selection in that column because the warehouse did not adjust its inventory to known demand. This in turn increases operating costs. If a way could be found to reduce to a minimum the changes in selection, profits could be improved. It is hypothesized that a reduction in the number of brands may reduce the cost of switching of selections in columns, without reducing sales volume.

In summary, the state of the art in the industry at present is to offset cost increases by price increases rather than improvements in routeman productivity. It is also evident that the routeman productivity is a function of the number of stock-outs and selection switching among columns, both of which are inventory controllable. That is, inventory controllable if something is known about the demand per machine. Two additional factors could conceivably have an affect on product movement at the machine level. First, the positioning of product in the machine may have an influence on its sales. The position of the product in the machine has a relationship to the coin slot and to the columns in the machine. Second, is the duration a product is in a given position. Industry practice today favors rotating the positions of products or leaves the

decision to the whim of the person refilling the machine. Consequently, industry practice does not admit that position or duration has any effect on movement. If it can be demonstrated that it does, the possibility for reducing stock-outs, inventory costs, as well as labor costs, because of the ability to inventory a narrower line, are all feasible. However, it can be hypothesized that if a preferred item is in the same position each time a customer approaches the machine he has confidence that the item will continue to be there for as long as the aggregate demand exists for the product. In effect pre-positioning substitutes certainty for random selection of what ever is in the machine. In addition, the development of purchase patterns arising from measurement of movement from a known and constant array of merchandise should make possible more intelligent inventory control in response to known demand.

Statement of the Problem

Given the above conceptual framework this study is designed to determine if a predetermined positioning of product in a machine for a given period of time will enable inventory control to reduce safety stock required, reduce the service frequency and service time involved per machine, and reduce the number of stock-outs without a decrease in sales.

For purposes of studying the problem we have developed an experimental design called an integrated

inventory-merchandising program (hereafter called the IIMP). In this program, the test routeman is told what product to put where and for how long. There is no longer any discretion used by the serviceman, but a heuristic decision made by inventory management based on the data gathered by the routeman as to the ending inventory of each column in the machine.[4]

Problematic Hypotheses of Fact

The problem statement must be transposed into hypotheses of fact to facilitate statistical verification. It is hypothesized that the level of inventory, stock-outs, and service time for the machines using the IIMP (test sample) in servicing demand is going to be less than those for the machines for which the IIMP was not used (control sample). In addition, it is hypothesized that sales from the machines using the IIMP (test sample) are greater than those from the machines not using the IIMP (control sample). These hypotheses will be tested in Chapter IV for their statistical validity.

Methodology

The research design used is a combination of pre-test post test design on one measurement, sales, and a

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[4]Several different meanings for the term "heuristics" are found in the article by Alfred A. Kuehn and Michael J. Hamburger, entitled "A Heuristic Program for Locating Warehouses," Management Science (July, 1963), pp. 643-66. It is used here as a device that contributes to the reduction in the average search to a solution.

post test only design on four additional measurements--level of inventory, stock-outs, and service time which includes column switching and breadth of assortment.

Given the past records of the company, sales was the only measurement available for pre-test comparison. In order to get a pre-test comparison on the other four measurements, the researcher would have had to follow the other routeman and record the data necessary to make the measurements. The routemen would not record this information without additional compensation. They also would not service the two routes on a different schedule required for the test. Furthermore, to insure available inventory to maintain selection through the test the routeman on the test route had to carry inventory for three or four weeks of some brands at the plant storage locker as the Detroit warehouse was not willing to insure consistency of selection. They do not have a unit inventory system to the machine. The routeman on the control route simply had to take whatever selection was available. Admittedly the absence of a pre-test on these four variables is a limitation to the design. On the other hand, the absence of a pre-test does not distort relative differences between the test and control providing there is an assumption of comparability between the two routes.

Uniformity of product, quality, size, weight, ingredients, and package of a "vend size" candy bar have a

special significance in vending, for they are uniform wherever sold by the manufacturers or through their suppliers. In addition to being uniform, the candy is substitutable in that consumers purchase candy by type of candy rather than brand, although the latter has some influence. The customer has been presold that several manufacturers provide similar quality so that brand switching to remain with a preferred type of candy bar is chosen over changing to another type of candy bar whose manufacturer may be the same. For example, Peter Paul makes a Power House nut bar similar to the Curtiss Baby Ruth nut bar. Nestles makes a Calypso coconut bar which is similar to Peter Paul's Mounds bar. The first two and the last two are substitutable, since they are the same type of candy bars. The two Peter Paul bars are not alike.

In summary, the primary components of vending machines and candy as a product provide the best conditions for researching the integrated inventory-merchandising program.

Although more detail is provided in Chapter III Research Design, the test route operates with the IIMP, that is predetermined selection and predetermined positioning and duration in position. The control route employed normal procedures, that is a broader line, and random positioning and duration in position. Measurements of beginning and ending inventories were recorded by brand

and by column in machine per service and storage locker on inventory days. Stock-outs by brand and column as well as column changes were measured each service. The resulting comparative data were analyzed for significance using the "z" and "t" tests.

Implications for the Future

The long-run implication of this study has some interesting ramifications, several of which will be illustrated.

The need for on-location help can be reduced or eliminated if the merchandising features can be effectively integrated in the inventory management operation. This integration could lead to fully automated loading or replacement of inventory, and/or reducing the human element in the unskilled task of a delivery man. This action, in turn, could provide for rehabilitation of mentally ill persons, for drop-outs, for the hard-core, and for the unskilled.

Because labor is one of the most expensive problem areas in vending, shifting services to an unskilled task opens the way for future innovations and growth in the vending industry.

Vending is no longer growing at the annual rate of ten percent as in past years.[5] Increase labor costs have

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[5] A. W. Brown, "Vending, Evolution of an Industry," Journal of Commercial Bank Lending (June, 1969), pp. 52-57.

been offset in part by larger capacity vending machines bringing more revenue per machine. The loading time per candy bar has not changed because the present single bar loading method still exists even with large machines. The increased cost of the larger machines handling more unit sales kept the investment cost the same relative to the smaller machines. So service efficiency has not kept pace with labor costs.

To introduce automated loading at a central warehouse requires pre-loading a candy compartment that could be replaced in the vending machine, and the IIMP would set the stage for such an innovation.

Future research could answer questions about candy merchandising and vending. For example, the length of time a candy bar is in a given position is important because candy bars have different life cycles. It is imperative that the bar be removed before it begins to slow down, but also keep it in the column as long as the consumption rate increases or stays the same. Some bars are continuous in type such as Peanut Butter Cheese Cracker and Bagged Nuts (e.g., Planter's Virginia Peanuts). These two have a never ending life cycle. By keeping other bars in the same position in the machine for a period of time, it is possible to record the consumption pattern and analyze any changes in the other candy bars' sales when one of the ten bars is replaced with another similar candy bar.

The potential impact of this research is illustrated by four examples of common everyday practice in the vending firms and the IIMP's effect on each example.

a. Routemen tend to under-merchandise by doubling up on bars (positioning the same bar in more than one column in the same machine). This causes a lack of balance, and usually results from the serviceman running low on merchandise at the end of the day. The IIMP could overcome this.

b. Servicemen tend to under-merchandise by leaving slow movers (called PV's for poor volume) in the machine, causing confusion in the determination of how much inventory of each candy bar to have for machine servicing. With the lack of balance, sales could decline or stock-outs would increase in the other selection or a combination of both. The IIMP could also overcome this.

c. Vending managers tend to under-order because they have been told to hold inventory levels down, increasing stock-outs. The IIMP should reduce the number of stock-outs, holding inventory down also.

d. Vending managers tend to order product based on lowest price causing frequent changes of items in the machines. Buy orders would consider additional variables, with the resultant better balance of emphasis than strictly price purchasing. The IIMP enables the integrated or systems approach to be used in seeking balance.

In summary, the study sets the stage for progress in integration of other merchandising techniques with present inventory management practices.

Overview of the Thesis

Various interrelationships of marketing functions (unit inventory control and merchandising) and the candy vending machine in the automatic merchandising industry provide a background for the study. After providing a conceptual framework, the need for some device to improve operating efficiency was evident. The problem statement and hypotheses of fact are structured to fit into this background. For additional justification of the research topic, the IIMP is applied to resolve problems in the future.

The next chapter reviews the literature. After examining the conceptual framework of the thesis relative to existing marketing thought, concepts related to inventory management are then reviewed in terms of the hypotheses of fact. An examination of several inventory management systems in retailing assess the extent to which integration between the two major functions of marketing exist, and brings the art of inventory control to the stage at which the study embarks.

The third chapter describes the test and control samples in detail, followed by the hypotheses to be tested and the kinds of tests to be used. In the next chapter,

each of the null hypotheses will be tested using the appropriate kind of test.

In Chapter V, the hypotheses are restated, and further interpretation of the results are presented. The last chapter summarizes the results, outlines the limitations of the study, and suggests several future design revisions. In addition to concluding remarks, several implications for future research are offered to improve research techniques involving tighter control on the variables and to expand the range of the study.

CHAPTER II

REVIEW OF THE LITERATURE

This chapter presents a literature review for the study. The conceptual framework of the study is examined relative to existing marketing thought. Concepts related to inventory management are then reviewed in terms of the hypotheses presented for study. A review of existing inventory management programs in retailing follows to assess the extent to which integration between the two major functions of marketing has been achieved.

In the literature review, it became evident that very little past research existed that was relevant to the proposed experimental design in unit inventory management in the vending industry. It was also recognized that the state of the art in inventory management in retailing has little resemblance to the IIMP in this study. Nonetheless, the experimental design, if feasible, could be adapted to these inventory systems. Therefore, the literature reviews operational inventory systems with the purpose of analyzing to what degree various inventory management methods assist the selling function. In this manner, one may determine what inventory methods may adapt the IIMP with the least reorganization.

Relationship to Marketing Thought

Figure 2.1 delineates the major functions and activities generally associated with marketing. The servicing of demand function is encompassed within the area of physical distribution and the obtaining demand function, a major part of the contemporary marketing discipline.[1]

The literature is extensive in each functional area, including their sub-categories. Although it has been common practice to consider the activities under each function as interactive, the historical separation of the two major functions has been sustained and there has not been substantial functional integration.

It is the purpose of this study to inquire into the possibility of utilizing one aspect of the servicing demand function, inventory management, in such a way as to assist the obtaining demand function in the vending industry.

Related Concepts

Within the function of servicing demand a number of concepts related to inventory management have emerged. The following four concepts specifically are related to this study:

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[1]Richard J. Lewis and Leo G. Erickson, "Marketing Functions and Marketing Systems: A Synthesis," Journal of Marketing, Vol.XXXIII (July, 1969), pp. 10-14. Figure 2.1 is adapted from Figure 1 in the article. Assumes type of firm in which no form change exists.

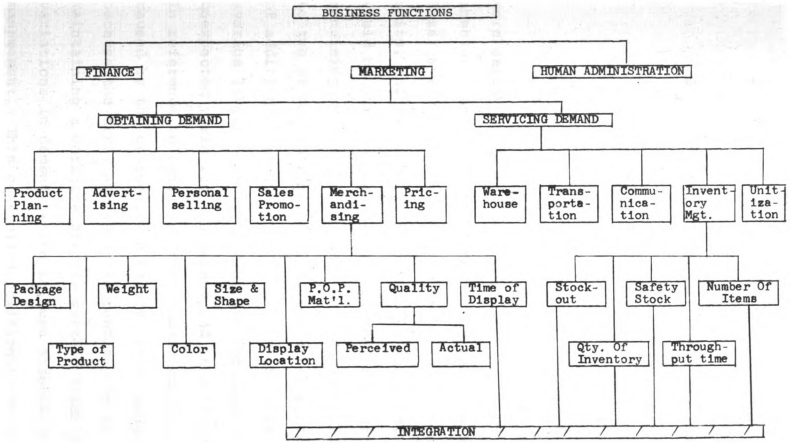

Figure 2.1

MARKETING FUNCTION AND ACTIVITY CENTERS

1. The more predictable the demand, the lower the safety stocks.
2. The channel is used as a buffer, safety stocks are used likewise.
3. The greater the safety stocks, the higher the service reliability.
4. The more intensive the selling activity, the greater the sales.

A brief explanation of each follows:

The more that demand is known and predictable, the more safety stock can be reduced. An optimum solution is absolute certain demand such as one unit (no more and no less) every day. Assume purchasing is in lots of ten units, and no wait nor lead time is required, ten more units would be purchased and delivered the same day that the last remaining unit was sold. But when demand varies from zero to two or more units a day, safety stock provides a cushion of additional inventory to cover demand variations above average levels. Safety stocks are required to absorb unexpected variations in demand and in systems operations. In reference to candy vending, demand variations are caused by the consumer who selects in a random fashion because the array available is random. It is assumed that maintaining a definite display pattern tends to reduce variations in demand, which in turn affects inventory management. This controlled positioning of product purposely

influences demand so it will be more predictable and require fewer safety stocks. In this manner, lowering the cost of carrying inventory achieves a cost improvement in servicing demand, without affecting the exposure level of product available to the consumer, that is, the consumer continued to rely on the product being available regardless of changes in inventory carrying cost. In reference to the candy machine, the IIMP should make the variations in demand more predictable and reduce the safety stock level. This lowers the cost of inventory without any change in service reliability in keeping the machines stocked.[2]

Another traditional concept is for the distribution channel to serve as elements in the process of servicing demand. "Inventories serve to 'decouple' the production distribution system from the costs and difficulties imposed by customer variation."[3] The channel, a stage between the ultimate consumer and the manufacturer, acts as a buffer, absorbing the combined variations in inventory levels due to inability to perfectly predict demand and/or supply.[4] Thus safety stocks and the channel have the same purpose. Some manufacturers are moving to forward integration to obtain demand servicing economies and better forecasting

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[2]John F. Magee, Physical-Distributions Systems (New York: McGraw-Hill Book Co., 1967), pp. 52-55.

[3]Magee, Physical-Distribution Systems, p. 48.

[4]Magee, Physical-Distribution Systems, p. 53.

through improved knowledge of customer demand.[5] In this study, the concern is with forward integration in control of position of product, and not backward integration into supply reliability. Attempting to reduce uncertainty of demand with the IIMP reduced the reliance on the channel or inventory buffer. The IIMP is a form of forward integration, but within the retailing channel itself.

A third concept is that "service reliability is usually gained by carrying safety stocks; the more the safety stocks, the higher the reliability level."[6] The number of sold-out columns in the machine measured the reliability level. The higher the reliability, the fewer out-of-stock conditions exist. This study assumes that the IIMP will maintain high reliability with a lower level of safety stocks, contrary to the above mentioned generalization.

Last, intensive merchandising is believed to be a "must" to maximize sales, because much of the candy vending business has a captive audience. The captive customer cannot easily visit another store with different merchandise, so the consumer is dependent on the serviceman's changing the selection for him. And it may appear that variety is not important, for the consumer could also elect to refrain from purchasing anything. There is little agreement in

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[5]Magee, Physical-Distribution Systems, pp. 29-30.

[6]Magee, Physical-Distribution Systems, p. 22.

the vending industry as to how much is optimal, as the firm's goals do vary. For example, if sales maximization is the objective, frequent changes of selection may be the order of the day, especially if the purchasing agent takes advantage of special price concessions. On the other hand, the goal may be to reduce service cost, and have the same candy in the machines all the time with no changes.[7] Or the goal may be to reduce inventory costs, using the IIMP and changing selection according to some pattern. The latter objective is not easy as it is difficult to find the correct balance in "change." It is important to make changes gradually, on the belief that the customer does not like sudden or radical change, or no change at all. The IIMP attempts to provide the proper balance of change or merchandising to maintain sales, reducing inventory and decreasing throughput time to increase efficiency. This, in turn, should decrease the overall cost of servicing demand, which in turn, increases profits, holding sales and other costs constant. The question of the trade-off of lower product cost for frequent changes of merchandise resulting in frequent changes in the position of the product in the machine, and their affect on sales is not being researched. This could be studied in the

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[7]Interview with a manager of a national vending company, Detroit, Michigan (May, 1972). Reference was made of a large industrial account which required the same candy bar selection to be carried all year with no changes, unless negotiated with the account.

future, using this research as a beginning. Thus the state of the system indicates that it is not possible to state positively that increased switching of candy in columns produces increased sales.

In summary, the vending machine industry differs from other industries in these respects. Logic indicates the more predictable the demand, the lower the safety stock and that both the channel and safety stocks act as a buffer. However, in the vending industry, logic does not indicate that the greater the safety stocks, the higher the service reliability, and that the selling activity must be intense to increase sales.

Operational Inventory Systems

Since automatic merchandising is a form of retailing, literature in the field of retailing was searched for inventory systems which resembled those in the vending industry, especially those systems that combine the selling function with unit inventory management. Although certain key components, (such as item, price, classification, department, size, counter, rack, or machine), exist in the vending unit inventory control operations as well as in the retailing inventory systems, most inventory control systems are classified as manual and computerized.

No manual inventory control systems completely integrate the servicing demand function of large firms, although some manual inventory control systems approach

integration for medium-sized and smaller companies with limited product lines. As for computerized programs, several completely integrate the physical fulfillment aspect of marketing and even coordinate selling with inventory control.[8]

Manual and computerized inventory control systems lead to but do not cross over into the selling activity. That is, coordination and cooperation exist between inventory systems and selling departments and activities, but inventory models do not attempt to establish predetermined positioning of product for a given period of time with the express purpose of influencing demand. A sampling of these systems which have some similarity to the unit inventory control systems in vending and which coordinate the selling activity follow.

Manual Inventory Control Systems

Most inventory systems in this country use manual control methods.[9] Ample literature exists in manual inventory control systems in retail pharmacies,[10] department

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[8]Charles F. Phillips and Delbert J. Duncan, Marketing, Principles and Methods (Homewood, Illinois: Richard D. Irwin, Inc., 1968), p. 603; Also, "Computer Simplifies Inventory Control," Purchasing (Marcy 23, 1967), pp. 74-75.

[9]Steffy, Buer and Schultz, Inventory Controls, p. 51; Also, Phillips and Duncan, Marketing, Principles and Methods, p. 603. Inventory is Physically counted most of the time.

[10]Richard J. Hampton, Merchandise Control in Retail Pharmacy (Pullman, Washington: Bureau of Economic and Business Research, January, 1957), no. 30.

stores,[11] and grocery stores.[12] All respond to demand and none try to integrate selling with inventory management.

The basic performance criteria for any system whether manual or automated are listed as follows:[13]

1. The system should provide information on the physical location of each item.
2. The system should be accurate.
3. The system should minimize the number of emergency and rush orders.
4. The system should provide for recording frequently used items before they run out.
5. The system should have a cost per transaction which is acceptable to management.
6. The ideal system is the minimum cost solution to criteria 1 through 5.

The manual system satisfies these criteria and possesses these characteristics:[14]

1. All processing of inventory records is done manually. (No up-dating the inventory records or check balances.)
2. Interpretation performed without machine assistance.
3. All kinds of inventory storage location assigned by a clerk.

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[11]Carl Fast, Carl Fast's System of Unit Merchandising (New York: 1927); Also, Lazarus, Stock Control in Department Stores (New York: Dry Goods Economists, 1925); Walter M. Loeb, The Retail Inventory Method in Practical Operation (New York: Controller's Congress of National Retail Dry Goods Association, 1946).

[12]Edgar A. Pessemier, The Management of Grocery Inventories in Supermarkets (Pullman, Washington: Bureau of Economic and Business Research, April, 1960), no. 32.

[13]Steffy, Buer and Schultz, Inventory Controls, pp. 9-10.

[14]Steffy, Buer and Schultz, Inventory Controls, p. 27.

4. Written reports concerning inventory performance statistics held to a minimum, not because of importance, but because of cost.

Manual inventory control systems involve one or two departments in a channel or a few activities in servicing demand. The expansion necessary to provide integration has been prohibitive. Once Electronic Data Processing (EDP) arrived, attempts to completely integrate the servicing demand activities were successful.

Since the dividing line between merchandising and servicing demand is minimized in vending, attempts to integrate the two activities should be examined. The handling of perishable foods in vending is similar to an integrated program. However, the emphasis on the change from a decentralized order system to centralized ordering is closely related to unit inventory control. For example, when decentralized ordering became inefficient, management switched to centralized ordering because it could not be any worse. As an illustration, the attendant fills the food vending machines, displays the food where she feels like it, and orders her product from a menu form in a decentralized operation. The attendant soon orders her food requirements based on what she believes the customer likes as well as her own preferences, but makes no scientific analysis of sales by price, display column, position of product, and the type of food. In comparison, the centralized commissary bases the order on usage, and

assigns the placement of the order in a predetermined arrangement in the machine. The attendant must place the food in the machine as directed.

Four basic differences between the IIMP application in this study and either process of perishable food vending follows. First, the product is not uniform compared to the candy bar. Second, profitably speaking, it is not considered adviseable to operate both systems simultaneously in the same universe (firm or plant location) to perform adequate research. Third, attention is on centralized versus decentralized ordering and not on the creation of an IIMP to influence sales through controlled positioning of product for a given period of time. Last, time duration is prescribed by Health Department Regulations, restricting the selling activity to only positioning of the product.

No effort has been made to integrate inventory with controlling position of product for a stated time in vending, in general, on a manual basis.

Good manual inventory control systems are a prerequisite to the proper design of a computer system because of the flexibility and capacity to handle the unexpected.[15] The unexpected or management by exception concept becomes important because the rest of the manual system has not been destroyed. Gradually, portions of the manual system

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[15]Steffy, Buer and Schultz, Inventory Controls, p. 30.

are put on the computer, and eventually integrated subsystems constitute a total computerized system. This logical and successful approach to a computer aided information system can be conceptually organized in four stages:[16]

1. System evaluation
2. Data processing implementation
3. Programming and system testing
4. Operational implementation

Once in operation, it is possible for inventory theory to become part of an information system producing the resultant computer aided inventory control system for medium and small firms. This transformation is a recent event for smaller firms although large firms now have sophisticated computer integrated demand servicing systems.

Computerized Systems

Although many EDP systems are designed for inventory management, these programs contain only the physical flow elements. Some or all of the physical distribution elements are integrated, depending on the purpose and application of the program.

An example of an EDP system of unit inventory management is IBM's IMPACT (Inventory Management Program and Control Techniques). Some effects on the purchasing function follow:[17]

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[16]Steffy, Buer and Schultz, Inventory Controls, p. 34.

[17]John P. D'Anna, Inventory and Profit (New York: American Management Association, 1966), pp. 28-29.

1. Inventory levels once considered desirable are being lowered because inventory balances are reflected more quickly.

2. Stock control records are being maintained on an 'affected basis' thus reducing paperwork.

3. Back-orders are minimized because listing of products available for shipments are produced simultaneously with the shipment.

4. The routine preparation of purchase orders is no longer necessary, leaving buyers with more time for other management duties.

5. Order frequencies are increasing while the sizes of the orders are decreasing (without affecting shipping economies). This reduces the possibility of stock-outs from occurring.

6. Buying and merchandising functions are more closely coordinated where they were once highly specialized and separate groups. (Underline added for emphasis)

7. Direct machine order transmitting techniques--which reduce the order lead times, and thus the buyers inventory--are both used by buyer and supplier.

8. Action and policy decision by management are becoming less emotionally based because of the more scientifically developed analysis and trend information.

9. Increased responsibility and authority are being delegated down the line to the lowest level.

IMPACT has several system adaptations. Retail IMPACT Staple System gets daily sales at point of sale, but does not attempt to dictate position of product or length of time at that position to be maintained at the point of sale. The Retail IMPACT Fashion System responds to style, but does not state what style will be merchandised where and for how long. It does provide the manager with color and size information, but again not in any controlled or integrated operation of inventory management.

Several more variations of inventory EDP systems adaptations are cash register control, COSMOS and space allocation studies, Purchase Material Follow-Up Reporting System, and LREPS.

"Inventory control is revolutionized by having the cash register tied directly to the firm's data-processing systems, so that when a sale is rung up on the selling floor, all the relevant files are immediately updated. This coupled with effective means of inventory control (e.g., IBM's IMPACT) allows the retailer to maintain a specific level of customer service, while at the same time, keeping his inventory investment at a minimum."[18] The specific level of customer service could refer to the speed of service and/or the level of stock-outs permissable.[19] In this study, speed of service is not a factor, but both stock-outs and total cost measurement are factors.[20]

Certain fast food operations have their cash register integrated into inventory control, so that usage is currently subtracted from inventory and replacement product is ordered from the inventory distribution centers.

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[18]Louis W. Stern and C. Samuel Craig, "Inter-organizational Data Systems: The Computer and Distribution," Journal of Retailing, Vol. XLVII (Summer, 1971), no. 2, p. 77.

[19]Wendell M. Stewart, "Physical Distribution: Key to Improved Volume and Profits," Journal of Marketing (January, 1965), pp. 65-70.

[20]Marvin Flaks, "Total Cost Approach to Physical Distribution," Business Management, Vol. XXIV (August, 1963), pp. 55-61.

However, these fast food operations do not change or cycle their menu, but offer the same item all the time. Management does not order different items to be displayed in a prescribed manner, nor does management change brands or types of products throughout the system.

COSMOS (Computer Optimization and Simulation Modeling for Operating Supermarkets) employs the computer as a tool providing fast and reliable quantitative information on the fundamental economics of each store's operating environment. Manipulation of shelf space allocation is the key to the program, although price and promotion strategies are also simulated.[21] The computerized tool is a decision making aid to inform marketing management how to display merchandise to increase profits, but it does not allow inventory management to prescribe facings for efficient distribution of goods as is suggested in the IIMP. However, COSMOS does include servicing demand elements in the simulation, whose output assists marketing and promotional staff in their merchandising strategy.

Several space allocation studies show product profitability measurement, but none of these methods decide where to locate or position an item (e.g., at what level on the shelf), the quantity needed, and the

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[21]"COSMOS Plays No Favorites," Grocery Manufacturer (January, 1970), pp. 12-17.

days displayed.[22] The ability to construct some future programs with inventory allocations will depend on the speed in which store check-out procedures adopt scanning machines. The scanners immediately report sales informing systems of actual demand or consumption.

A. C. Spark Plug has an elaborate Purchase Material Follow-Up Reporting System. Demand is influenced by manufacturing requirements, possessing a high degree of certainty. The system consolidates data and improves control of inventory, but does not involve itself in the merchandising aspect of the completed product.[23]

LREPS (Long Range Environmental Planning Simulator) simulates the demand servicing system as an integrative field to help management evaluate which system design performs the best for the goals of the firm.[24] The

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[22]Robert D. Buzzell, Walter J. Salmon and Richard F. Vancil, Product Profitability Measurement and Merchandising Decisions (Boston, Mass.: Division of Research, Graduate School of Business Administration, Harvard University, 1965); see also, Progressive Grocer, The Super Value Study (New York: Progressive Grocer, 1958): "The Colonial Study," Progressive Grocer (May, 1960), pp. D36-46: U.S. Department of Agricultural Marketing Service, Control of Inventories in Retail Food Stores Through Use of Order Books, AMS-237 (Washington, D.C., May, 1958), p. 11; U.S. Department of Agricultural Marketing Service, Space Allocation for Grocery Items in Food Stores, Marketing Research Reports No. 80 (Washington, D.C., February, 1955), p. iv and pp. 5-6.

[23]"Purchase Material Follow-Up System" (Unpublished Report, A. C. Spark Plug Division, General Motors Corporation, Flint, Michigan, 1971).

[24]Donald J. Bowersox, "Planning Physical Distribution Operations with Dynamic Simulation," Vol. XXXVI, Journal of Marketing (January, 1972), no. 1, pp. 17-25.

integration process is restricted to the demand servicing function and does not involve the selling phase of marketing.

Summary

To review, inventory management is very operational with manual systems. Integration of physical distribution activities occurs where the cost of merging activities is less than the benefits gained.

The introduction of Electronic Data Processing (EDP) enables large firms to integrate physical fulfillment activities which are more subject to quantification than the obtaining demand marketing function.

The theoretical and practical separation of physical distribution and promotion or selling establish a framework from which to analyze the literature on intra-functional integration.[25] The framework also sets the stage for the study, that is to develop a technique for combining the selling activity (by predetermining the position of product for a specified time) with the demand servicing or physical exchange function (through unit inventory management activities). The vending of candy bars has the advantage of testing the integrative concept while holding variables that may influence the consumer under some control, at least more control than found in store retailing.

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[25] R. Clifton Anderson, William P. Dommermuth and Norton E. Marks, "An Interfunctional Approach in Promotion and Physical Distribution," Journal of Retailing (Fall, 1966), pp. 19-25.

A test should be designed to evaluate the hypotheses in the study, making the research design critical for proper verification of the results. The next chapter delineates the test and control samples, and discusses the kinds of tests to be used on the hypotheses of fact.

CHAPTER III

RESEARCH DESIGN

To test the effect of the integrated inventory--merchandising program (IIMP), two samples would be selected: control sample and test (IIMP) sample. In this chapter, the description of these two samples is made in detail. At the end of the chapter, the hypotheses to be tested as well as the kinds of tests to be used would be discussed briefly.

The Control and Test Samples

In an experimental design it is necessary to control as many external and internal variables as possible to insure that the results can be attributed to the hypotheses under test. For this reason the use of test and control routes servicing candy vending machines in a single plant are examined to assess the degree of internal and external validity between the test and control. The following conditions prevail:

a. The machines do not permit the consumer to change the arrangement or position of product so that every customer is confronted with the same positioning of merchandise as compared to an open counter.

b. The customer has no knowledge of prior sales of candy since he sees only the displayed bar and is not aware of the depletion of merchandise.

c. The machines of the two samples are located in two separate sections of a factory which is engaged in manufacturing parts for the automotive industry, and the same kind of consumer is using the machines in both groups.[1] (See Figure 3.2.)

d. The division of the plant is such that each test group does not overlap, that is, the workers using the IIMP machines are not aware that the other machines are serviced differently, and vice versa.

e. The same period of time will be used so that the effect of weather and holiday will be the same on each test group.

f. The product is substitutable and presold.

g. The product is not held constant between the two samples of machines.

This industrial location has a homogeneous population. The same internal environmental factors affect both samples. A few examples of internal factors are:

a. overtime

b. lay-off

c. down-time on the assembly line

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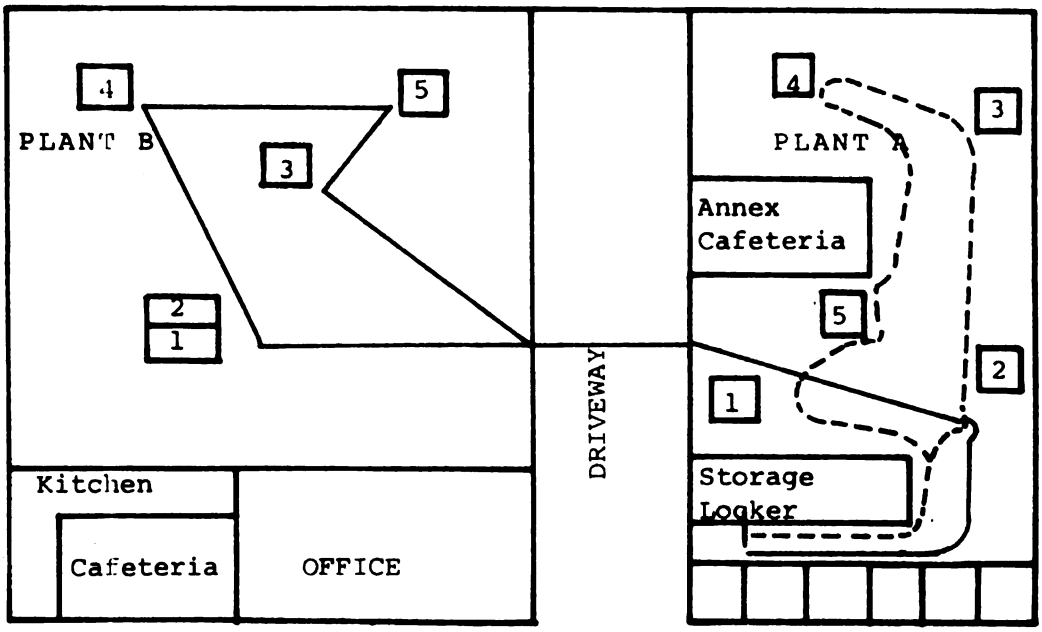
[1]The building area and plant location have been changed to protect the firm.



The test sample machines are in Plant B and numbered from 1 to 5. The control machines are in Plant A and are numbered from 1 to 5. Machines elsewhere are located in the office area.

The storage locker for both the test and control routemen is located inside the plant in the Plant A side. The servicemen must enter the plant through the kitchen area. The delivery man who delivers merchandise from the Detroit warehouse is permitted to use the driveway between the plants.

The data in the Appendix B refers to the test route as Route 1 and the control route as Route 2.

Figure 3.2.--Machine Locations in Southfield Plant.

d. departmental parties for retiring employees

e. weather

Some of the above factors would not always occur at the same time in the location of the control and the IIMP test vending machines, but the seven-week period has enough occurrences on each route to produce a counter-balancing effect.

Data for stock-outs, column switching, and sales were kept by machine, however, data for inventory were kept for the total number of machines in the sample. This required that the number of machines in each of these two samples to be equal.

The control sample involves five vending machines in Plant A, routinely serviced by an experienced serviceman. The test (IIMP) sample consists of five vending machines serviced by another serviceman, who was also servicing four other machines located in an office area.

Table 3.1 and Table 3.2 list the machine capacity, number of columns, type of machine, and related data. Although the capacities are not alike, the number of columns displayed are similar, as indicated in Table 3.1. Table 3.2 illustrated the different widths of the shelves of various machines. These variations present some limitations on freedom to position or display any bar in any column in all machines. Because freshness is a function of turnover of product, locations with low sales

TABLE 3.1.--Capacities of the Vending Machines.

Type	Capacity	Columns	Number of Machines	
			Test Route	Control Route
Lectrovend	510 bars	10	4	3
Rowe FIFO	440 bars	10	1	
Rowe #86	198 bars*	8		2
Total Vend Capacity (5 machines)			2480 bars	1910 bars
Total Columns Displayed (5 machines)			45	50

*Eight display bars are not vended.

TABLE 3.2.--Column Dimensions.

Type Machine*	Size**			
	Wide	Narrow	Standard	Thin
Lectrovend	1,2,3 8,9,10	4,5,6,7		
Rowe FIFO	1,2,3		4,5,6,7 8,9,10	
Rowe #86			1,2,3,4,5	6,7,8

*All machines return change for a quarter.

**The numbers in the Table indicate the column number moving from #1 on the left to #10 on the right when facing the macnine. Actual dimensions are: Three inches for the wide column in Lectrovend; 2-13/16 inches for the wide column in the Rowe FIFO. Two inches in the narrow column in Lectrovend; 2-3/8 inches in standard width in Rowe. 5/8th inch high (vertical) space in thin spaces. One inch space (vertical) for all other columns.

usually require smaller capacity machines with shelf design different from machines with larger capacities.

Having described some of the factors common to both samples, the differences between the control and test samples are presented next.

The Existing System as the Control Sample

The serviceman of this group of vending machines orders his replacement merchandise from an available product order list supplied by the warehouse in Detroit. This list is received by the serviceman on Thursday, and his order is turned in on Friday for delivery on Tuesday to the control routeman's storage locker in the Southfield plant. Since physical inventory is taken every Wednesday, most of Tuesday's delivery merchandise is added to the inventory count on Wednesday.

This routeman does not always receive what he orders, but has some items substituted by the Detroit warehouse manager. The serviceman's ability to plan is offset by facing this dilemma every week.

Having described how the product is ordered and delivered from the Detroit warehouse to the respective serviceman's lockers in the storage area provided for the routemen in the Southfield plant, the service activity follows.

The control routeman normally works from midnight to mid-morning to provide coverage in the plant for that shift.[2] The servicing of the five control candy vending machines is performed on Tuesday, Thursday, and Saturday between the hours of 4:00 A.M. and 8:00 A.M.

The control routeman pushes a cart (two wheeled bicycle cart) with boxes of candy, cookies, crackers, nuts, and other confections to his machines, performing the following activities:

1. unlock and open the vending machine. Special keys are used that cannot be duplicated except by the factory. Doors on these machine must be opened all the way to properly service the candy machine.

2. inventory the machine. This is done by counting the full shelves in the entire machine and subtracting the sum from the capacity of the machine, or the same sales may be recorded by adding only the empty shelves in the machine. The sales of candy from a machine are recorded with the date, the serial number of the machine, the fixed inventory, and the serviceman's initial. All machines have a fixed inventory, that is, the capacity of the machine is the fixed inventory. This means that the inventory of a given machine is known at all times and does not vary.

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[2] The researcher did accompany the control routeman on several occasions to familiarize himself with his service procedure, and provide a check on the accuracy of the recording of the data.

3. collect the money. The routeman empties the monies from a coin box in the machine into a separate bag labeled with the machine serial number.

4. refill the machine. Refilling the machine requires one or more of the following steps:

a. Add more of the same bar with no column change.

b. remove the balance of a bar and replace it with another bar.

c. change the position of the bar already in the machine and add more of the same item in that new column.

d. bars are not mixed in the same columns.

5. refill the changer fund. The changer fund refers to that tube of coins which provide change when you insert a quarter for a ten cent sale. The changer fund also has a fixed inventory and is refilled from the money collected in step #3.

6. clean the machine. This entails wiping the coin mechanism (that part that accepts or rejects the money placed in the coin slot), the display area where the candy is positioned, and the front and top of the machine when closed. On some days depending the degree of dirtiness in the machine location, cleaning fluids and/or waxes are used to clean and polish the machines.

7. lock the machine. This is important because of the product to be sold and because the machine is left unattended.

The control route regularly (that is, every Tuesday, Thursday and Saturday) refilled his machines in preference to adjusting the service pattern to a fluctuating sales volume in the machine. As a result, the sales turnover varied between twenty-five percent and eighty percent of inventory as compared to the accepted industry standard of fifty-five percent.

The control routeman would not record the brand or product carried in each column, but would only record the column which was empty on the service card provided for each individual machine. Total sales per machine and not column sales per machine were recorded. No effort is made to operate under unit inventory control. The candy cart being at the machine allows restocking from the inventory on the cart. Which bar is placed in the column depends on the ending inventory of the bar in a certain column and the quantity of that bar available on the cart. The cart's inventory has enough product consisting of at least ten or more kinds of candy to replace total sales of the five machines. Sales are anticipated from previous sales in the machine and from known changes affecting employment and attitudes in the plant. But no unit determination is made to formulate the cart's inventory.

As a result of the control routeman's actions, the machines in the control sample do not have the same candy bar in all five machines at the same time, nor in a

particular column, nor for any planned time. The control routeman does realize he wants to minimize candy changes in columns and even attempts to avoid two columns of the same bar in a machine. However, he also knows that he will not be penalized if he does not stay within the service policy, nor operate with unit inventory management.

As one can see, the vending operation is departmentalized, leaving each group to operate within the constraints of the vending service company and the location it services. The following section describes the service procedures and logic behind the routine for implementing the IIMP in the test machines.

IIMP The Test Sample

The IIMP programmer is aware of the Detroit warehouse's incoming orders and can plan the positioning of product beyond a weekly basis. Product is ordered on Friday for delivery on Tuesday to the storage locker in the Southfield plant, but the programmer instructs the warehouse to make no substitutions. If the Detroit warehouse is out of the product, nothing is sent in its place. This means that the order delivered for the test route may be less than the quantity ordered. To be assured of enough inventory of certain kinds of product, several weeks supply of certain kinds of candy are ordered. This merchandise for the future weeks is treated as part of the weekly test route locker inventory, although it is

kept (and identified as warehouse stock) in the test storage locker in the Southfield plant.

The warehouse cannot guarantee that some candy bars will be available for the second week to fill the routeman's order, therefore, this unusual, but necessary activity of shifting part of the Detroit warehouse to the locker area. Nor would the Detroit manager set aside any inventory for the test route to keep in the Detroit warehouse. The IIMP plans the duration of a given candy bar in a specified position (column) in the machine, and because the plan was to position a certain product in all test machines for a period longer than the Detroit warehouse would stock the certain product, some candy bars were ordered for the test locker as both current weekly inventory and displaced warehouse inventory.

After receiving the merchandise from the Detroit warehouse on Tuesday night, the test route refills his machines between 8:00 A.M. and 3:00 P.M. on Wednesdays, Fridays, and Mondays. The test routeman uses his own candy cart and follows this vending service procedure:

1. unlock and open the vending machine.

2. record sales by kind of candy and column on service card. The sales for each kind of candy is the sum of the empty shelves in each column.

3. record total sales for the machine. This entails adding the sales in each column.

4. check to see if any columns are empty, that is, no candy bars remain to be sold in that column.

5. check to see how many columns have more than half of their inventory sold: if six or more, go to step 7; if five or less, continue

6. refill empty columns and only those whose sales are greater than half the column inventory capacity. Remove only enough money to equal the quantity of candy used to restock columns. Go to step 11.

7. refill all columns as prescribed from the IIMP instructions. These instructions are to refill the machines according to the positioning of product similar to the example in Table 3.5.

8. make product changes as prescribed, that is, remove the product from the column and replace with the designated candy bar. Where column changes are not involved, refill with the same product as in the column which bar should be the same as prescribed on the daily IIMP.

9. refill the changer fund. This is the same as performed in the control route.

10. empty money in coin box in separate money bag.

11. clean machine. Same as control route.

12. lock the machine. Same as control route.

After each day of service, the programmer analyzes each machine's sales by bar and column, and sets up what

columns are to be changed and what bars go in its place for the test route's next service.[3]

The service pattern is influenced by Pareto's Principle of Maldistribution, which is expressed by Dr. F. G. Moore as follows: "Very often a small number of important items dominate the results while at the other end of the line are a large number of items whose volume is so small that they have little effect on the results."[4] The principle is important in the decision making process of how to stock the cart to avoid returning to the storage room to restock the cart to service the remaining machines.

The test route's service pattern has been delineated, with the routeman responding to the display arrangements prescribed by the programmer. A more complete description of column display and the strategy behind the test route's display arrangements follow.

All candy machines have the columns counted from left to right, or from one to ten respectively, as one faces the machine. This places a coin slot on the right side. In the far left column (number one column) is peanut butter cheese crackers, and in column two is the

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[3]The programmer and the test routeman are both the same person, namely the researcher. The regular serviceman continues to service other machines such as coffee, pastry and milk, while permitting the researcher to perform the test study on the candy machines.

[4]Franklin G. Moore, Manfacturing Management (Homewood, Illinois: Richard D. Irwin, Inc., 1969), p. 642.

bagged salted Virginia peanuts. These two items sell between thirty and forty percent of the entire sales, and are kept in their respective columns for the entire test period. Peter Paul's Mounds are in all the machines in column three (during the entire test period) except in the Rowe FIFO machine when Mounds is transferred to number ten column because Sun Flower Seeds are too wide for the number ten column in the Rowe FIFO, but not for the extra wide columns numbered one, two and three (see Table 3.2). Candy bars were not positioned farthest from the coin slot based only on popularity, but were subject to the dimensional constraints of the various kinds of vending machines. This situation is a good example in which the programmer found the size (width) of the bar as a very important constraint on the complete freedom to use all ten columns interchangeably on all machines.

Confections by category (see Table 3.6) are assigned to the remaining seven columns. Table 3.3 illustrates a typical display of confections used in the study. Table 3.4 describes the weekly IIMP for the display in the test sample, and Table 3.5 illustrates a daily program adapted from the weekly program.

These tables are examples of product display. The study emphasizes that some planned positioning of product is required to increase service efficiency. The strategy to reach this goal may vary from plant to a company wide

TABLE 3.3.--Typical Machine Positioning of Product.

Column	Category	Confection
1	Crackers	Peanut Butter Cheese
2	Bagged Nuts	Virginia Peanuts
3	Coconut	Mounds
4	Nut Roll	Baby Ruth
5	Creme Cookie	Oreo
6	Non-creme Cookie	Shortbread
7	Chocolate	Nestle Crunch
8	Crunch	Zagnut
9	Soft Center	Vanilla Bun
10	Brittle	Planters Jumbo Block

basis. In this study, the programmer knew from previous research that the two most popular or demanded items will be sought, and for that reason are positioned farthest from the coin slot.[5] National data ranks candy by type of bars, as well as by brands, so the positions were determined from the national preferences. These national rankings were modified by actual usage data of the two routes because several regional preferences were greater than the national standings. A minimum of change (both in kinds of candy and in the position of these candies) might influence the consumer to repeat their buying habits more often, permitting the programmer to predict demand with even more accuracy.

[5]From records at Canteen Corporation of Fort Wayne, Fort Wayne, Indiana, 1965 and 1966.

TABLE 3.4.--General IIMP Weekly Programs for the Test Route.

	Columns in Machine									
Week	1	2	3	4	5	6	7	8	9*	10*
1	PBC	BN	B	OH	VCR	SHB	NC	ZGT	LLCR	MKS
2	PBC	BN	B	OH	VCR	SHB	NC	ZGT	TR	MKS
3	PBC	BN	B	OH	VCR	SHB	NC	BF	TR	JB
4	PBC	BN	B	PHS	VCR	WM	NC	BF	TR	JB
5	PBC	BN	B	BR	TFCP	WM	NC	BF	7U	PDY
6	PBC	BN	B	BR	HDX	WM	HM	BF	7U	SS
7	PBC	BN	B	BR	HDX	TR	HM	5A	7U	SS
Category**	14	17	2	4	15	16	1	5	6 & 8	3,7,17

*Column 9 & 10 used for left over inventory of previous weeks.

**See Table 3.6.

Code for Table 3.4

B = Mounds	PBC = Peanut Butter Cheese
BF = Butterfinger	PDY = Pay Day
BN = Bagged Virginia Peanuts	PHS = Powerhouse
BR = Baby Ruth	7U = Seven Up
5A = Fifth Avenue	SHB = Shortbread Cookies
HDX = Hydrox Cookies	SS = Sun Flower Seeds
HM = Hershey Milk	TFCP = Toffie Crisp
JB = Jumbo Block	TR = Tootsie Rool
LLCR = Lemon-Lime Creme Cookie	VCR = Vanilla Creme Cookies
MKS = Milk Shake	WM = Windmill Cookies
NC = Nestle Crunch	ZGT = Zagnut
OH = Oh Henry	

TABLE 3.5.--Example of Daily IIMP for the Test Route.

Type Machine	Day	Columns in Machine									
		1	2	3	4	5	6	7	8	9	10
Lectrovend #1	Wed.	PBC*	BN	B	BR	TFCP	WM	NC	BF	TR	JB
Lectrovend #2	Wed.	PBC	BN	B	BR	TFCP	WM	NC	BF	TR	SMB
Lectrovend #3	Wed.	PBC	BN	B	BR	TFCP	WM	NC	BF	TR	JB
Lectrovend #4	Wed.	PBC	BN	B	BR	TFCP	WM	NC	BF	TR	VCR
FIFO #5	Wed.	PBC	BN	B	BR	BCR	WM	NC	BF	TR	JB
Lectrovend #1	Fri.	PBC	BN	B	BR	TFCP	WM	NC	BF	7U	JB
Lectrovend #2	Fri.	PBC	BN	B	BR	HDX	WM	HM	BF	7U	JB
Lectrovend #3	Fri.	PBC	BN	B	BR	HDX	WM	HM	BF	TR	JB
Lectrovend #4	Fri.	PBC	BN	B	BR	HDX	WM	NC	BF	7U	VCR
FIFO #5	Fri.	PBC	BN	B	BR	HDX	WM	NC	BF	7U	JB

*Refer to Code on Bottom of Table 3.4.

TABLE 3.6

CONFECTIONS: CLASSIFICATION AND ILLUSTRATIONS

Category	Example	
	Manufacturer	Brand Name
1. CHOCOLATE	Hershey Foods Nestle	Milk Crunch
2. COCONUT	Peter Paul	Mounds
3. NOUGAT	Mars Hollywood	Milky Way Milk Shake
4. NUT ROLL	Curtiss Williamson	Baby Ruth Oh Henry
5. CRUNCH	Clark Curtiss	Zagnut Butterfinger
6. SOFT CENTER	Pearson Wayne	Seven Up Maple Bun
7. BRITTLE	Planters	Jumbo Block
8. CHEW & CARAMELS	Tootsie Roll	Tootsie Roll
9. MARSHMELLOW	Beich	Whiz
10. MINT	Ludens	Mello Mint
11. FRUIT & JELLIES	Lucy Ellen	Jelly Bar
12. COATED ITEMS	Hershey	Hersheyetts
13. FUDGE	Welch	Nut Fudge
14. CRACKERS	Austin	Peanut Butter Cheese
15. CREMES COOKIES	Sunshine	Hydrox
16. NON-CREME COOKIES	Nabisco	Lorna Doone Shortbread
17. BAGGED NUTS	Planters	Virginia Peanuts

Vending industry practices dictate that proper merchandising offers ten different items. The industrial account as well as the vending service company both adhere to this policy of not offering two bars of the same type of confection or even two rows of the same bar. This policy is another constraint which limits the freedom of the programmer.

With the two routes comprising the control and test samples, the following data is recorded for seven weeks of service:[6]

a. number of units of each confection sold for each route

b. the total number of all bars sold each week per each route

c. the total of each bar sold per week or per entire period by sample

d. dollar sales by bar. All bars are ten cents.

e. number of stock-outs per bar, per vending machine per six day week and per test period (of seven weeks) by sample.

f. total number of stock-outs per test period

g. locker inventory by candy bar per week per sample route

h. machine or display inventory per machine per week (constant)

i. number of different kinds of bars in machine and locker

j. average weekly inventory in locker per sample

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[6]Tables of the relevant information and computer data are available for reference in Appendix B. Computations used are contained in Appendix A.

k. number of columns in machines (constant)

l. number of column changes per route, per week or per service

m. number of columns serviced per week, per test period by sample

n. number of machines serviced during test period

o. sales divided by columns serviced yields bars sold per column

p. stock-outs divided by columns serviced yields percentage stock-outs

q. sales divided by machine services yields bars sold per service

r. sales divided by inventory yields percentage replacement

s. sales divided by average inventory yields inventory turnover rate

Testing Hypotheses

The null hypotheses tested are that the level of inventory, stock-outs, the switching of columns, the number of kinds of candy in the storage locker, and sales are the same whether or not IIMP has been used. The alternate hypotheses are such that for the level of inventory, stock-outs, the switching of columns, and the number of kinds of candy in the storage locker, when using the IIMP, are less than the associated values when the IIMP is not used. On the other hand, sales when using the IIMP are larger than that when the IIMP is not used.

In testing these hypotheses, two kinds of tests are used: z-test and t-test. In both tests it is assumed

that the observed values for the two samples are taken from normal populations whose variances are unknown but equal in values. The use of the z-test or the t-test will depend on whether or not the total number of observations in the two samples minus two would be larger than or equal to thirty.[7] If this is the case, the samples dealt with would be called large samples, otherwise, they will be called small samples.

When dealing with large samples taken from these normal populations, the values of the variances of the two populations will be approximated with the variances computed from the data of the test and control samples. In these cases, the z-test will be used.[8] On the other hand, when the size of the two samples is small, the z-test cannot be used. In this case, the t-test could be used. The number of degrees of freedom would be equal to the total number of observations in the two samples minus two.[9]

In all tests, a level of significance of .05 was used. It was felt that with this level of significance, the probability of accepting the null hypothesis when the

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[7]John E. Freund, Mathematical Statistics (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1962), pp. 266-269.

[8]Freund, Mathematical Statistics, pp. 266-269.

[9]Freund, Mathematical Statistics, pp. 266-269; see also, Taro Yamane, Statistics, An Introductory Analysis (New York: Harper and Row Publishers, 1967) Second Edition, pp. 505-6.

alternate is true and the probability of rejecting the null hypothesis although it is true, (Type II and Type I errors) would be reasonably low.[10]

In Chapter IV, each of these null hypotheses will be tested using the appropriate kind of test. The interpretation of the results of these tests would be made in Chapter V.

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[10]Freund, Mathematical Statistics, pp. 239-245.

CHAPTER IV

THE STATISTICAL TESTS OF THE HYPOTHESES AND THEIR RESULTS

As was mentioned in the previous chapter, several tests will be conducted. The purpose of these tests is to measure the significance of using the IIMP on the level of inventory, stock-outs, column changes, the number of kinds of candy in the storage locker,[1] and sales volume.

In what follows, the effect of the IIMP on such factors will be examined in detail in the order given above. For each case, the null hypothesis (H_0) and the alternate hypothesis (H_1) will be stated. In addition, the z-test or t-test, depending on the size of the two samples, will be used with the appropriate data to find whether or not the null hypothesis should be accepted with .05 level of significance.

Level of Inventory

The level of inventory is composed of the desired (safety stock) and the undesired level of inventory, that results from having actual demand less than predicted

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[1] The column switching and the number of kinds of candy in the storage locker are the elements considered for service time.

demand. The null and alternate hypotheses could be stated as follows:

H_0: The level of inventory would be the same whether or not IIMP is used.

H_1: The level of inventory when using IIMP will be smaller than that when the IIMP is not used.

The data used are related to the beginning inventory of the first week and the ending inventory of the seven weeks. From the eight observed values for each of the two samples, the average weekly level of inventory was computed and found as 4346 bars of candy for the control route and 3295 units of confection for the test route. Thus, the average weekly level of inventory for the control route was 1051 bars more than that for the test route.

To find out whether or not that difference in the level of inventory could be explained by the effect of the IIMP, the value of the statistic-t was computed and found equal to 2.223 (see Appendix A, Section 2 a). The theoretical value of "t" at .05 level of significance with fourteen degrees of freedom[2] is 1.761. Thus, the null hypothesis should be rejected, and one may conclude, at ninety-five percent confidence level, that the test route has an inventory level which is significantly lower than that of the control route.

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[2]As mentioned in the previous chapter, it is equal to the number of elements in the two samples minus two.

Stock-outs

In the previous chapters, the term stock-outs was used to mean the number of empty columns in the machine at the time the machine is serviced and restocked. The null and alternate hypotheses are summarized as follows:

H_0: Stock-outs would be the same whether or not IIMP is used.

H_1: Stock-outs, when using the IIMP, will be smaller than that when IIMP is not used.

Although the number of machines in each sample is five, the number of serviced columns associated with the five machines of the control sample is different from the number of serviced columns associated with the five machines of the test sample. For that purpose, the proportion of stock-outs as related to the total number of columns serviced in each sample is used.

In the control sample, the number of serviced columns was 904 and the number of empty columns was 182. In the test sample, the number of serviced columns was 772, and the number of empty columns was 44. Thus, the proportion of stock-outs for the control sample was .2013 as compared to .0570 of the test sample.

By comparing these two proportions, one finds that the control sample's proportion is larger than that of the test sample by .1443. To test whether the computed difference between the two proportions could be explained by the use of the IIMP or not, the z-test was used. The

computed value of "z" was found to be 9.19108 (see Appendix A, Section 2 b). By comparing this computed value with the theoretical "z" value of 1.645, found from the Table of Normal Distributions at .05 level of significance,[3] one may conclude that the null hypothesis should be rejected. In other words, the use of the IIMP would lead to less stock-outs than if the IIMP is not used.

Column Changes

A column change is used to mean a change in the kind of candy in a given column from the kind which used to be in that column. Since the column change may require removing unsold bars that remain in the shelves of that column when the selection is changed, it is assumed that changing columns would take more service time than the time needed for filling the column with the same items. As was mentioned earlier, the routeman does not always receive what he orders from the Detroit warehouse, thus it is hypothesized that the use of the IIMP would lead to less column changes than if the IIMP is not used. Thus the null and the alternate hypotheses could be stated as follows:

H_o: Column changes made in the machines would be the same whether or not IIMP is used.

H_1: Column changes made in the machines, when using the IIMP, will be fewer than that when IIMP is not used.

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[3]The value of "z" is based on an one tail test.

Although the number of machines in each sample was five, the number of times each of these five machines was serviced, was not the same. For that purpose, the number of column changes per service, was used to test whether or not we should accept the null hypothesis.

For the test and control routes, data was collected for the seven week test period for the number of services and column changes. From such data, the average number of column changes per service was computed for both routes. It was found that the average number of column changes per service in the test route is .95 as compared to that of the control route of 2.82.

To find out whether or not the difference in the number of column changes per service could be explained by the effect of the IIMP, the student-t statistic was computed and found to be equal to 6.187 (see Appendix A, Section 2 c). By comparing this computed value with the theoretical "t" value of 1.782 (at .05 level of significance and the number of degrees of freedom equal to twelve), one may conclude that the null hypothesis should be rejected. In other words, the use of the IIMP would lead to fewer column changes when servicing the machines than when the IIMP is not used.

Number of Kinds of Candy

The other aspect of service time is the number of kinds of candy carried in the storage locker.[4] It is

[4]By kinds of candy, refer to Table 3.6 which has the kinds of candy listed in categories. The difference between manufacturer and kind of candy is discussed in Chapter I.

hypothesized that the routeman using the IIMP will have more control on the number of candies kept in the storage locker than the other routeman that is not using the IIMP. To test this hypothesis, the null and alternate hypotheses would be stated as follows:

H_0: The number of kinds of candy in the storage lockers would be the same whether or not IIMP is used.

H_1: The number of kinds of candy in the storage locker, when using the IIMP, will be less than that when IIMP is not used.

To test whether or not the null hypothesis should be rejected, data was collected at the end of each week for eight weeks for each of the two routes regarding the number of kinds of candy left in the storage locker. From such data, it was found that the average value for that parameter was 12.4 for the test routes as compared to 15.5 for the control route (see Table 4.7).

Thus, to find out whether or not that difference could be explained by the effect of the IIMP, the value of the statistic-t was computed and found equal to 4.96 (see Appendix A, Section 2 d). The theoretical value of "t" at .05 level of significance with fourteen degrees of freedom is 1.761. Therefore, the null hypothesis should be rejected, and one may conclude that with ninety-five percent confidence level that the test route has significantly fewer number of kinds of candy in its storage locker than that of the control route.

TABLE 4.7.--Number of Kinds of Candy in Storage Locker by Week.

Week of	Test Route	Control Route
5/17	13	16
5/24	12	17
5/31	13	18
6/07	12	15
6/14	13	14
6/21	12	15
6/28	12	16
7/05	12	13
Average	12.4	15.5

Sales

In this section, the term, sales, is used to mean the total number of bars of candy sold during the seven-week test period by means of the vending machines. For the purpose of testing the effect of the IIMP on sales, the null and alternate hypotheses would be stated as follows:

H_0: Sales would be the same whether or not IIMP is used.

H_1: Sales, when using the IIMP, would be greater than when the IIMP is not used.

To test the significance of the effect of the IIMP on this factor, sales data was collected for the five machines of each sample for the seven-week period. However, it was found that sales of the five machines of both samples were higher during the seven-week test period than the corresponding sales figures of the previous seven-week

period. Furthermore, total sales of the pretest period of the control route was found to be relatively higher than those of the test route for the same period.

To eliminate the effect of these two factors on growth of sales, the change in sales (between pretest and test periods) for each machine in the two samples was divided by its corresponding sales figure of the pretest seven-week period.[5] These ten new figures are the ones which are used for testing the hypothesis about the effect of the IIMP on sales (see Appendix A, Section 2 e).

For each two samples, the average rate of change of sales (as defined above) as well as the variance from that average value were computed. From those figures, the student-t statistic was computed and found equal to 1.306.

By comparing this computed value with the theoretical value of "t" which is equal to 1.860 (at .05 level of significance and eight degrees of freedom) one may conclude that the null hypothesis should be accepted. Specifically, the IIMP would not lead to more sales (as defined above) than if the IIMP is not used.

Summary

In this chapter, five statistical tests were conducted. The results of these tests indicated that with

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[5]The pretest sales figures for the different machines in the two samples were obtained from the first quarterly sales of the 1972 company records adjusted for the seven-week period.

ninety-five confidence level, one may say that the IIMP would lead to a significant decrease in inventory level, stock-outs, column changes and the number of kinds of candy in the storage locker. On the other hand, there is no reason to believe that sales would increase if the IIMP is used. The analysis of these results and the interpretation of what they mean is the subject of the next chapter.

CHAPTER V

ANALYSIS OF RESULTS

A brief statement about each hypothesis will form the basis for further interpretation and analysis of the results.

Review of the Findings

Investigation disclosed the following facts:

1. The control route had a level of inventory that was thirty-two percent greater than the test route; or the test route had a twenty-four percent smaller level of inventory than the control.

2. The test sample had definitely less stock-outs than the control sample. Comparing the five units located in the plant, it was found that the test route had less than one-fourth the stock-outs than the control experienced.

3. From the viewpoint of column changes, the test route had one-third the changes that the control route had.

4. As for the number of kinds of candy in the storage lockers, the test route had twenty percent less kinds of candy in the storage locker than the control route.

5. Additional features of service time may have been analyzed, but no statistical information could be used,

because the service time or any of its components could not be analyzed in a scientific manner, that is, to isolate and quantify the major or larger variables which comprise service time.

6. The increase in sales of the test group compared to the increases in sales of the control machines was greater even after subtracting the sales increase of the test period (May 17-July 5) based on the sales in the adjusted seven-week pretest period in the first quarter of the year. Greater sales increases were observed by using the integrated inventory-merchandising program, although no statistical verification was possible.

With this brief analysis of the results, the next sections will discuss in detail each hypothesis.

Detailed Analysis

Inventory

Inventory is a major part of any retailing function. In the vending industry, confections average slightly less than a fifty percent product cost. Because the total inventory necessary to service a machine requires about three times the machine capacity, a twenty-four percent reduction in the level of inventory is a significant amount. For example, the total machine capacity of candy for this plant is 5370 bars. Assuming inventory needed to supply the machines is tripled (machine plus locker and Detroit

warehouse inventory), 16,110 bars at an average cost of five cents a bar comes to $805.50. On the assumption that a twenty-four percent reduction in the level of inventory also will occur in the control route using the IIMP, it follows that the same reduction would apply to the plant's candy inventory at cost. One fourth of $805.50 is about two hundred dollars saved.

What does this mean as a contribution to profit? Annual sales of candy in this plant could be projected at $75,000. Two hundred dollars is .2685 or about one quarter of one percent of sales. Considering net profit in the industry at five percent before taxes, this inventory reduction adds five percent to the net profit figure. This saving does not appear to be much, but compare it to how many additional bars would have to be sold to generate this profit of two hundred dollars and it becomes a sizeable figure.

A sales increase of 5.3 percent ($4,000 or 40,000 bars) would be necessary to earn a net profit (before taxes) of two hundred dollars. One method to secure an increase of five percent in a captive location such as this test study would be to increase employment, which is not a variable under the control of the vending service company. Another method is to increase the prices of other snack items such as pastry, chips and ice cream, thus making candy a more attractive item to purchase. Again the

freedom to induce changes in customer preferences through changes in pricing of other snack items is not tolerated by the industrial account. Thus, the vending operator has no opportunity to increase marketing activity to increase sales.

The two hundred dollars as a cost reducing factor looms larger as an important contribution to profit when alternate methods of expanding profits through increased sales do not materialize. When one views this analysis as profit before taxes, twice the sales would be required to generate the two hundred dollars as a profit after taxes. In addition, since the trend is toward 15¢ candy bars, the percentage reduction in cost would result in a greater dollar savings.

In conclusion, the integrated inventory-merchandising program significantly reduced the level of inventory. Other benefits to inventory included carrying fewer kinds of candy in the storage locker and making fewer changes in the display of the machine, both operational procedures of the IIMP for operating at a lower level of service time which topics are discussed later in this chapter.

When inventory is reduced, with sales the same or greater, stock-outs should increase according to past observations.[1]

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[1]See Chapter II, Section on related theory.

Stock-outs

Stock-outs per column per service are an important measure. Naturally, the relatively few stock-outs for the test route may not have meant anything if the replacement of inventory in the machines had been twenty to thirty percent of capacity. With low sales, stock-outs are less likely when a regular service pattern of three times a week is followed. However, the test routeman had to service or refill at a fifty percent level, that is, refill a machine whose capacity is 510 bars with 255 bars or more. On the other hand, the control routeman filled his machines on an average of fifty-eight percent. The control route had 182 stock-outs or sold-out columns versus fourty-four sold out columns for the test route resulting in a significant difference when comparing the five plant machines of both routes.

Actually, the test route had six times fewer stock-outs when considering that the test machine #1 and #2 are located side by side in order to handle the demand from a large concentration of employees. Both machines maintained the same display and selection. Stock-outs were counted when a column became empty, even though available selection remained between the two machines.

An analysis of the two test machines indicated that #1 had seventeen empties and #2 had four empties. The #1 was on the right side, and #2 next to it on the left side

was the last in the bank of vending machines. As expected, the consumer purchased first from #1 on the right which action caused the seventeen empty columns in twenty services.

Upon closer evaluation of the unit sales in each machine, both columns of bagged nuts (that is, one column in each machine), were found empty on June 14th, and both columns of Sun Flower Seeds were empty June 23rd. On three other occasions an item sold out that was not in the other machine. The latter phenomenon resulted from using the ninth and tenth columns to merchandise other bars left over and removed from the other machines in the test route. So of the twenty-one stock-outs (nearly half of the forty-four involved in these five test units), only five of them really sold out, thus preventing the consumer from purchasing the product at this location. In effect, the total stock-outs, if adjusted to reflect the two machines in one location, would only be twenty-eight stock-outs that might prevent the customer's purchasing a desired bar at a given plant location. This low figure is compared to 182 stock-outs for the control route in five separate locations. If this low figure is used, it could be said that the test route resulted in six times less stock-outs than the control route.

The stable display in the test machines produced very even sales of each confection programmed to a particular column for an assigned period. This stability

allowed the customer to depend on a given confection to be in its respective column when making a purchase. Because sales were relatively stable, the demand for the various selections could be predetermined instead of accepting a random basis as with the control machines.

A sold-out column may have a tremendous effect on the other confections or other products sold through vending machines. For example, some employees (consumers) like Baby Ruth, a nut bar. This preference then stabilizes the demand for the nut bar in relation to the other bars in the machine. But with the nut bar sold out, the consumer desiring Baby Ruth has to make several decisions:

1. Go to the closest other location with a candy machine and buy a Baby Ruth, if it is in the machine. This would place additional demand on the nearby candy machine and increase the probability of Baby Ruth selling out faster than normal in other machines.

2. Select another bar from the machine in the first location which would create an additional demand on the other selections, causing them to sell out faster than if no sold out columns existed.

3. Choose pastry or chips, which is not a confection. Although this action would not increase candy sales, it would impose additional sales pressure on chips or pastry which also look for stability.

4. Refrain from buying anything.

5. Postpone his demand for the nut bar. Should this become pent-up demand, then when Baby Ruth is restocked, it could empty out very quickly, much faster than usual.

6. Choose another bar if it is a well known bar or a popular type of bar. Because these bars usually sell faster than others, the number of extra bars required for safety stock in the column would be calculated very closely. This diverted selection pattern places a greater strain on the other popular bars which may sell out more often because they have lower safety stocks than with slower selling bars.

More choices are available to the consumer, such as kicking the machines, cursing the machine, being nasty to the foreman or fellow worker, and any other expression which vents the consumer's frustration at not finding the Baby Ruth bar in the machines.

According to the previous explanation, a change from Baby Ruth to Powerhouse, also a nut bar, may be considered as a stock-out of Baby Ruth. After all, Baby Ruth is no longer in the column, and a difference may exist. On the other hand, a nut bar in the column although not a Baby Ruth does have the following features:

1. Most of the ingredients comprising a nut bar.
2. An accepted level of quality.
3. Similarity in weight and size.
4. The same cost to purchase.
5. Only a slight change within the nut category.

Because of the similarities, a change of candy in the same category is not considered a stock-out in the sense that the column is empty and the consumer is unable to purchase a nut bar.

Another related consideration involves the point at which a candy bar "dies." This term means that the popularity declines rapidly, and the consumer tires of it. Ideally, the bar would be changed just before the demand drops sharply. Then the time that the change is made becomes vital because fewer consumers are bothered if the change is made when many customers tire of Baby Ruth and welcome another nut bar in its place such as Powerhouse. The change of Baby Ruth to Powerhouse is not the same as being sold out of Baby Ruth, for changing the bar just before demand tapers off for it reduces the customer irritation.

One last major annoyance is that the sold out condition may frustrate the consumer, i.e., he may not know if this is the last of the Baby Ruth's or that the column will be refilled with more Baby Ruths when the machine is serviced. Previous studies have indicated that the consumer desires stability and does not prefer a store or counter which frequently changes locations of the merchandise.[2]

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[2]Consistency is a quite common characteristic of consumers. Perry Bliss, Marketing Management and the Behavioral Environment (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1970), p. 104.

It should not be any different here. The consumer should be confronted only with a "postpone" or "not to postpone" decision to buy before he makes the choices mentioned above.

Is it possible to place a cost on a sold-out column? It would be very difficult because sales might not be lost, and the cost determination of damage to the merchandising program would be difficult to evaluate. At best, the cost would be negative, but how much would be mere conjecture.

In summary, a sold-out condition could be very damaging to the entire merchandising program. The impact of the stock-out may create a highly unstable demand situation, producing a counter-balancing effect on the IIMP's effectiveness. Therefore, the reduction of sold-out columns is an important and significant objective of the IIMP.

So, the stability desirable in merchandising has created a stability in predicting sales allowing the test route to minimize both the level of inventory and sold-out conditions. A low stock-out position indicates a high reliability in inventory management. Inventory management invades the merchandising or selling area of positioning of product by establishing and controlling the position of candy with planned changes coincidental to changes in consumer preferences.

With both inventory level and stock-outs minimized in the test route by using the IIMP, what was the effect of the IIMP on service time?

Service Time

Of the many component parts of service time, the following are the most time consuming:

1. Stock room activities
    a. Average product inventory after the order is delivered.
    b. Load the bicycle cart with product, money bags, change funds, cleaning fluid, shop towels, and tools. The product, money bags, and change funds have been described earlier. The cleaning fluid and shop towels are used to clean the tops, sides and front, as well as the inside of the machine. The tools are mostly used to tighten loose nuts and bolts, which when loose, may cause the vending machine to break down. Naturally cleanliness always carries a high priority in the food field, and vending is no exception.
    c. Order next week's product.
    d. Take weekly inventory.
2. Travel activities
    a. Push the cart to locations.
    b. Wait for elevator.
    c. Wait for an aisle to open up. Forklift trucks sometimes occupy the aisles, and

other times, raw materials, in-process and finished parts are left in the aisles, temporarily blocking them. As for the aisle or area in front of the vending machines, it is nearly impossible to service the machines when people are on their break.

3. Service activities
   a. Open the machine.
   b. Count the empty shelves or remaining inventory to arrive at the sales.
   c. Empty the money from the machine into a separate money bag.
   d. Record sales, machine number and number on the money bag.
   e. When insufficient inventory of a kind of candy exists to fill the shelves with existing product, remove the remaining candy from the shelves in the column in order to restock with another variety.
   f. Refill the shelves of each column with existing product or change selection.
   g. Fill the change fund and take the money out of the coin box for the change that was replaced.
   h. Test machine, that is the act of placing a coin in the coinslot with the door closed,

selecting a candy bar, pressing the electric button or pull the manual lever, causing a bar to be dispensed, replace the bar on the empty shelf, remove the coin and place it in the money bag. The test procedure points out mechanical errors that may have taken place while restocking the machine, and better assures the customer that the machine is functioning properly.

i. Clean machine.

j. Close and lock machine.

k. Make change for dollar bills which is a continuous process.

l. Keep a watchful eye on the cart when servicing the machine. Shortages are caused by patrons helping themselves to a candy bar from an open candy box when the routeman's back is turned from the cart, usually as he is restocking the machine.

m. Pitch the empty candy boxes in waste bins.

n. Rearrange cart as empty boxes are discarded.

Separate movements are involved in most of these activities, and it would require a time and motion engineer to analyze and record the motions. Unfortunately, it is not possible to make a time study due to the cost of the time study engineer, the number of studies necessary, and

possible labor problems. Additional complications are the frequent and almost continuous interruptions to make change for dollar bills. Also, the machines are not serviced at the same time per location by either serviceman. Therefore, the more effective method available to do a time study is to break down service activities into cost components and make a time study of these smaller component actions which are critical to differences between both routes. Since the services of a time and motion engineer are required, the engineer's presence creates a potential labor grievance. Naturally, the test routeman does not have any objection, but the other regular servicemen in the plant strongly oppose the idea. Not wanting to create a union issue, the matter is dropped.

Thus, without a scientific system of measurement of each service activity and subordinate actions, it was impossible to precisely determine which route was more efficient.

In designing the IIMP, the purpose was to use fewer kinds of candy, and to make very few column changes, and, if needed, only as programmed. The IIMP was to save time for the serviceman so he would know what product went where, and could handle fewer kinds of candy. The gathered data did provide some information about the number of column changes and the number of kinds of candy in the storage locker of each route. How do each of these influence the service time?

Column Changes

The test route averaged nearly one column change per service but should have had one column change per machine per week according to ideal planned position of product. Had the Detroit warehouse also strived for one or two candy changes per week, the test routeman could have achieved one column change per week.

The control routeman had nearly three column changes per machine per service. This was a significant amount, and means that the IIMP reduced the number of column changes as planned. As mentioned before, the control route was not handicapped because there were 182 sold out columns which did not necessitate removing remaining candy bars from the shelves. This means that two-thirds of the column changes of the control sample were made without removing the other bars from the shelves, a time saving fact. But had the number of stock-outs been reduced, there would have been much more service time involved in the control route, even though the serviceman minimized changes by continuing to vend the same bar out of the same column as long as stock is available to refill the column.

The potentially greater service time involved in the control route without using an integrated inventory-merchandising program was produced from handling more kinds of candy with increased effort involved in column changes. The extra service time did contribute to a smaller increase

in the rate of sales growth than that of the test route, which observation supported the contention that the IIMP created an increase in revenues while attempting to reduce operating costs.

Number of Kinds of Candy

A residual gain for the IIMP was to be able to operate with fewer kinds of candy. This meant less paperwork and less time to inventory merchandise each week, that is, the time involved in counting the number of remaining bars in the open cases. The fewer kinds of candy the routeman handled, the less the time involved in counting inventory.

Table 4.7 illustrates the number of kinds of candy in the locker inventory of each serviceman. The test route had an average of 12.4 kinds of candy in the storage locker versus 15.5 kinds of candy for the control route. Not only did it take more time to count inventory, it also involved more material handling in a small storage space with more kinds of candy. So the fewer kinds of candy handled by the test route should make the route twenty percent more efficient than the control route.

Table 5.8 indicates how many kinds of candy had thirty exposures in the machines in a week's time. For example, five machines in the test route had Mounds in one column each day (based on a six day work week) and this would amount to thirty exposures (one column per machine

TABLE 5.8.--Kinds of Candy in Five Test Units with Thirty or More Exposures.

Week Ending	Test Route	Control Route
5/24*	6	2
5/31	5	0
6/07	5	2
6/14	4	3
6/21	5	2
6/28	6	0
7/05**	6	3

*Due to the first week adjustment, twenty-six or more exposures were used to determine the number of kinds of candy.

**Due to the three day holiday, ten or more exposures were used.

times five machines times six days).[3] The test route maintained the same candy display in five to six columns out of ten columns in each of the five plant machines while the control route with three more kinds of candy, spread the number of bars over the same number of columns, producing less exposures per bar of candy. From the service time concept, it takes the same time to restock the machines. The difference was involved in removing remaining bars to change to a new selection. The test route in the merchandising design had the position of at least four of the ten bars

[3]It was possible to have more than thirty exposures if one kind of candy were in two columns in the same machine.

in the same column for the seven week test period minimizing the changing of the bars. Theoretically, the test route should have been more efficient in service time because of the reduced number of bars and maintenance of the bars in the same columns for long periods of time.

All of the four hypotheses interact with each other, although the degree to which a factor influences another cannot be determined from this research. For example, the number of kinds of candy in the storage locker is directly related to the level of inventory as well as to the number of column changes and stock-outs. Next is the question of the effect of IIMP on sales, that is, while decreasing the above factors, does IIMP increase sales?

Sales

The sales figures used from the two samples were the percent change in sales (test compared to pretest) for each machine, the sum of which was divided by the number of machines to arrive at an average percentage change in sales (see Appendix A, Section 2 e). This change in control route sales was seventeen percent or an average of 3.4 percent, as compared to 86 percent or an average of 16.4 percent. Because the sum is positive, the percentage change indicates a gain in sales. Since the control routeman operated the route in the same manner during both the pretest and test periods, it could be assumed that any change is the result of factors such as employment,

overtime, changes in pay, and other factors. This means that these factors could have produced the 3.4 percent average increase in sales of the five control machines. Assuming the factors interact throughout the plant, it could be said that these same factors produced at least a 3.4 percent average increase in sales in the test route not using the IIMP. The difference between the two routes is a thirteen percent average increase, that is, the test machines averaged a thirteen percent increase in sales over the control route. However, the increase in sales of the test route was not statistically verified, and the increase cannot be said to be due to the use of the IIMP.

Some of the possibilities are that the kinds of candy offered in the test route were more appealing to the consumers than those in the control route. Because the two routes ordered independently, this was a definite factor. In line with this possibility, the substitutions made by the Detroit warehouse for the control route could have been kinds of candy that do not sell as well in this plant. Stock-outs surely should influence sales adversely, but again what factor caused the sales increase was unknown. Similarily, the other factors of level of inventory, column changes and the number of kinds of candy in the storage locker could influence sales in a manner to cause the average increase in sales of the test route to be thirteen percent greater than that of the control route. In

conclusion, many factors besides the IIMP could have influenced sales. It will be up to future research with changes in research design to control these variables which research would explore these unanswered questions.

An alternate analysis of the same information uses the sum of the increases in sales compared to the sum of the pretest sales of each group of machines. This analysis does not reflect the proportions or trends of the individual machine sales, but compares only the total sales of the test and control machines. The analysis that follows has the advantage of emphasizing the absolute incremental sales gain in bars of the test route compared to the control route, after eliminating the trend factor for both routes.

The base pretest period of seven weeks (averaged from the first quarter sales of 1972) was used to compare the data. The data shows that the first quarter sales were greater for the five machines in the control route than that of the five machines of the test route. Because the seven-week test period was from May 17 through July 5th, it was necessary to determine what, if any, change in sales was caused by the forces in effect during the test period, and by forces not in effect during the first quarter. These influences affected both routes in the same manner. The control route did not change the service procedure during either period and reported sales from the pretest seven

week period which were 20,552 bars compared to 21,882 bars from the test period, an increase of six percent or 1330 bars over the first quarter base period.[4] On the basis of this increase, one can assume that the test route also had a comparable increase of six percent in sales, if no tests were conducted with the IIMP.

The test route had 15,018 unit sales for the seven-week pretest period, as compared to 20,552 bars sold by the control route for the same period. Unit sales for the test route during the test period were 17,694 bars, an increase of 2676 bars (17,694-15,018) over the pretest period, on a gain of fifteen percent in sales. However, six percent of the increase in the test machines was due to factors such as the number of employees, the amount of overtime worked, pay increases, or other matters. Subtracting the 1061 figure (6 percent of 17,694), leaves a net gain of 1615 bars greater than the six percent gain of both the test and control routes.

These observations cannot be attributed only to the IIMP, but to various other factors, such as the fact that certain popular selections were offered more often in the test machines than those of the control, that less stock-outs could direct more attention to candy as an alternate energy source to pastry or ice cream, or factors unknown to the study.

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[4]This was discussed previously in Chapter IV in the section entitled Sales.

Analyzing the increase in sales of the five test machines, the increase would have been greater had the #5 candy unit been operating at capacity. The dust in the area caused a series of minor malfunctions, such as, only operating on nickels, then not working on quarters, and then working only on two nickels. Coin mechanism problems affected sales temporarily so that the machine sold 45 bars less in the IIMP test period compared to the pretest period. However, gains occurred in the other four machines in the plant area. This observation also ties in with the low number of stock-outs in the test machines, which factor may have caused an increase in sales because the consumer could depend on stability in display of the products and ability to secure the products.

Recalling the discussion about two machines side by side in the test route, it is interesting to note that although machine #1 had seventeen stock-outs and machine #2 had only four stock-outs, machine #1 had a greater increase in sales anyway. If stock-outs affected sales adversely, the left machine (#2) should have had greater sales than #1. So, one could say that stock-outs obviously in this example actually increased sales. Part of the explanation also could be that the stock-outs occurred very near to the time of service, and thus the negative effect of the stock-out was thus minimized. This latter observation was verified several times when the test routeman stopped by machine #1

and #2 before going to the stock room to load up and begin servicing. Empty columns, if any, were noted, and an hour or two later, additional empties were recorded. This one or two hour period was a fraction of the forty-eight hours between services, and probably accounted for the greater portion of the sales increase in machine #1 despite the seventeen stock-outs.

It is not possible to state that the sales increased solely because of the position of product which could be reflected by the inability to test independence of display and stock-out situations. All that can be stated is that certain forces along with or independent of the controlled position of products caused increase sales.

The study was designed to have enough occurrences of candy sales by kinds and brand in each route with no stock-outs to test if the increase in sales resulted from the IIMP and display control and not from other undetermined variables. Observing the data brought out two factors. The test and control routemen operated independently of each other, so the two routes did not have the same exposures per kind of candy, nor was the same candy handled by both routemen in all units during each week or the same week. Secondly, each route ordered products with no intention of handling the same merchandise during the same week or period. Whenever sales were large enough to have a large sample to make this comparison of position of

product and sales, one of the routes did not handle the product, or one of the routes had a different number of stock-outs.

To test for the direct relationship between the effect of the IIMP sales, holding the other variables constant, would have required six conditions:

1. No stock-outs of the bars being tested.
2. Equal exposure or at least enough exposure to form a viable sample.
3. exposures during the same week or weeks.
4. Cooperation of the ordering of the same product by both routes.
5. Cooperation in servicing some columns with the same product by both routes.
6. Either the control route would have to incorporate some IIMP concepts in his service pattern, or the test route would have to relinquish some IIMP features to produce a statistical comparison of product display with sales.

The design of the study was very explicit in keeping the control route as routine as possible, and this was necessary to provide a control route on which to base the results of using the IIMP on the test route. Any alteration of the control route's service procedures would have changed the design of the study.

Once the study began, several things with respect to the control route became known:

1. The warehouse would not keep a supply of most products for more than one week.
2. The warehouse made frequent substitutions for the product ordered.
3. The control routeman did nothing to overcome the above two conditions. The serviceman accepted them and used them as a reason for not being able to do a better job of merchandising.
4. Candy had the lowest incentive based on dollars generated per time spent, that is candy relative to other products handled by the control serviceman.

These factors could also be the cause of the sales increase for the control route being less relative to that of the test route.

To summarize, the level of inventory, stock-outs, column changes and the number of kinds of candy in the storage locker, all were less in the test route using the IIMP than that of the control route which was not using the IIMP. Sales did not decline, but increased, but the cause could not be identified with the use of the IIMP, mostly because of the nature of the research design and the problems in adjusting or changing the control sample to permit better comparisons with respect to sales.

The following section outlines the accomplishments that were performed, as well as those to be performed in the future.

Statement of Proposed Accomplishments

Performed

From the results, one may infer that the IIMP influences demand as follows:

a. In a controlled manner to reduce the need for safety stock.

b. In a controlled manner to decrease stock-outs.

c. In a controlled manner to reduce the need to change the position of products.

d. In a controlled manner to reduce the need for additional kinds of candy in the storage lockers.

The purpose of the study was to combine certain activities in the servicing and obtaining demand marketing functions and to test their feasibility and their effectiveness. So the objective was to involve inventory management in the merchandising activity of positioning of product for a controlled period of time. The results were obtained with the primary objective to test the effects of the IIMP on inventory, stock-outs, some aspects of service time and sales. The objective was not to test the effect of positioning of product alone or unit inventory control individually, but their combined effect. In this respect,

the overall study accomplishes its purpose to show that the IIMP can function in a positive direction.

To be Performed

It will be up to future research to design the study to discover the measure or degree that inventory management contributes to the results as well as measures the extent that display merchandising assists in accomplishing the results. Had some of the data coincidentally been coordinated, it may have been possible to test the degree to which each marketing activity influenced the results.

The program is to establish interrelationships among the positions of certain bars so that the programmer uses more quantitative information to form the decision as to what bar to replace with another bar and when. This may have been feasible had the programmer controlled the product mix in the warehouse which could have then partially controlled the product used by the servicemen. This design may have caused the two servicemen to use the same product at the same time, creating research conditions acceptable to test the effect of display on sales, holding other variables constant. With the sales hypothesis not significant, the likelihood was poor to finding a service company that would allow the study to change the merchandising program of the entire firm so that two routes out of some forty-five routes could be used to research the IIMP concept. Thus, the study had to be operational on

the intermediate level of an in-plant warehouse as locker inventory. Future research designed to apply the IIMP at the warehouse level, the intermediate locker level and the final consumer oriented vending machine level hopefully should find some service company willing to provide the environment for another study. This conclusion is based on the willingness of industry leaders to accept the results of this study as significant.

Something else that the IIMP should do is provide a record of how much a given change of a candy bar influences the sales of other bars given a predetermined position of product for a given period of time. A few such relationships were observed, but changes in positioning of two bars were not made to observe the effect of the change in the position on the other candy bars. Since the urgency does not exist, this aspect could be tried in the future once the IIMP is effective in most of its primary objectives. Future research should be able to use this format to establish product relationships according to given positions in candy machines.

Following a brief summary, the limitations on the research are reviewed, and suggested changes in research design follow. After the conclusion, several proposals are offered for future research.

CHAPTER VI

SUMMARY AND CONCLUSION

Summary

The servicing demand function of marketing, which is very dominant in the automatic merchandising industry, concentrates on unit inventory management in this study. Selling, as a part of obtaining demand, has never been a major factor in the industry. Because routemen's productivity has become important, the development of the IIMP is to increase productivity through more efficient product movement. The study concentrates on the position of a product and the duration a product is in a given position. The candy vending machine industry was chosen for the following reasons:

1. controllable positioning of product
2. stable and substitutable product
3. short inventory channel
4. very little research in this retailing method.

A local service company offered an industrial location with two candy routes for the test. The ideal design to apply the integrated inventory-merchandising program at the warehouse level was abandoned because it involved influencing the merchandising and inventory

practices of the entire firm for testing two routes which account for less than three percent of the firm's total dollars sales. The integrated program was implemented at the in-plant storage level and carried out to completion in the candy vending machines. The control sample had the routeman who continued as before and became the control. The test route controlled the positioning of candy coupled with the unit inventory management program or system to test the integrated effect of combining selling with inventory management. The key features tested were:

1. Inventory
2. Stock-outs
3. Service Time (Switching bars and number of kinds of candy)
4. Sales

These features were incorporated into hypotheses, comparing the test sample with the control. Inventory, stock-outs, column switching, and the number of kinds of candy in storage lockers had significant results; and sales, although greater in the test sample, did not prove significant.

Limitations

After a review of the literature, it was found that the number of firms utilizing unit inventory control were so few that the inventory management systems, as a whole, were examined. This was a definite restriction as the IIMP

incorporated the unit inventory control concept, and few systems existed on which this study could be built.

Another limitation was the lack of scientific research on the belief that intensive merchandising is necessary to stimulate the demands of the captive consumer. Unless the captive consumer is probed on this matter, many historical ideas will remain unchallenged.

The use of different machines in the test samples could limit the freedom to position the candy bar in any columns, because of the different widths. The original positioning of product took the variance of the column widths into account, overcoming this potential limitation. Expanding the research, however, to many machines with different designs could definitely restrict the selection and positioning freedom in candy vending machines. Slower selling locations in a plant maintain freshness by using lower capacity machines which have fewer columns and capacity per column. Only the office machines were of this type, and their product positions were the same as in the plant test machines.

Although this is a technicality, the control route-man serviced his machines on Tuesday, Thursday and Saturday in the early morning hours. This was treated as having been serviced or restocked on Monday, Wednesday and Friday, because the "night" shift (11:00 P.M.-7:30 A.M.) is an extension of the previous day. The account requirement

of the routeman coverage around the clock did not permit the machines to be restocked at the same time as the test machines were refilled. Because the customer is not affected by the service pattern (if anything, service is better with 24 hours coverage) this did not act as a limitation, especially since the two routes were separated in the plant. Should time and motion studies be conducted on routemen, the two routes would have to be serviced at the same time to provide the same conditions for service in the plant.

The attitude of the routeman toward time and motion studies or work standard studies limit what service efficiency could be derived from the study. An additional handicap is the lack of defined work methods and standards for routemen in the industry. The two limitations prevented implementation of good cost-benefit analyses between the routes.

The industrial account as well as the service company adhere to the policy of not offering two bars of the same type of confection or even two columns of the same bar. This is a good policy, but can prevent the programmer from reducing sold-out columns on an item that is not carried often, but sells extremely well when introduced, such as the Sun Flower Seeds in this study.

The control route was at the mercy of the warehouse, that is the warehouse would not keep a supply of

most products for more than one week, and the warehouse made frequent substitutions for the product ordered. The test route was permitted by the service company to circumvent these constraints. Another related limitation was that the candy relative to other products had the lowest incentive based on dollars generated per time spent for the control route.

The inability to operate from the warehouse to the consumer forced the study into a two-step distribution flow from storage locker or truck to candy vending machine. Had the warehouse purchases been tied into the positioning of product in the candy vending machines, the probability that the design could have tested dependence of sales on position of product is high for tighter results. At least equal exposures of certain bars and no stock-outs of these bars could have provided more significant results.

A minor limitation was the ten-cent sales price which is being replaced by the larger fifteen-cent confections. Although there should not be any difference in the results using fifteen-cent candy, actual research probably has to be performed to gain credance in the vending industry.

Lastly, the limitation caused by the vending operator to function as a specialized department or activity among other specialized departments does not lend itself to an integrated physical flow system, with support departments

programmed to act on the basis of consumption instead of the basis of departmental costs.

In spite of these limitations, the research had merit.

Future Design Revisions

Considering the above constraints, the purpose of the research design, and the inadequate statistics, there is a need for future research to secure statistical data to test sales dependence on display control holding stock-outs constant. It is not possible to test sales with display, without first testing the general effectiveness of the IIMP. Now that several hypotheses have been tested and analyzed, a future design could be established to make both routes handle the same merchandise each week and require certain bars to have equal exposures (be displayed and sold in at least four columns in each route). Each route could display at will, i.e., the control route in a random fashion and the test route with a programmed display plan. This, of course, means that the control route may have to coordinate ordering with the test route. This brings up the critical issue as to whether the serviceman will agree to this. From initial probing of the idea, any coordination that would require a change in service freedom would not be welcomed.

Why not have the test routeman service both routes, each in its own design? That would be feasible as the

other serviceman does not have to do the work, and yet receives credit for the sales. But it would be difficult to prevent the bias of the test routeman from entering in one of two ways:

1. That test servicemen would tend to use the IIMP in the control route's operation beyond the scope of the design.
2. That test servicemen would create a poorer merchandising pattern in the control route to force a greater contrast in the results.

In other words, a question of implementation of a future design exists. At present, the service company would have to institute major operational changes to create the operating climate conducive to this future design.

Another possibility is to have the service company permit someone other than the control or test routemen to revise the control route in cooperation with the test route. This would eliminate any bias of the test routeman and the objections of the regular control routeman. It would be part-time employment, and a potential research expense.

In line with this possibility, a time and motion study of service movements may be permitted by the union serviceman, and used as a basis of improving data to test the hypothesis involving service.

To summarize, the test route increased sales over the control route with less stock-outs and a lower average

inventory. It cannot be determined whether or not the planned merchandising program or fewer stock-outs or any other variables caused the increase sales. Isolating the IIMP's effect on sales is left to future research, if the proper design can be implemented into an on-going service company. The probability of this implementation taking place is proportional to the degree that the results of this study are accepted by the leaders in the vending industry, causing the implementation of the IIMP or some form of inventory management, coupled with some degree of positioning of product for a given time in their present operation.

Conclusion

The objective of the study was substantiated, i.e., it was possible to integrate the selling activity with unit inventory management and get positive results. The positive results were in the form of operating with less inventory, fewer sold out situations, fewer column changes and fewer kinds of candy required in the storage locker. Sales in the test route did increase more relative to the control route, although we cannot determine the cause. The cost of the program is negligible considering that the set-up cost can be spread over future years of operation. Moreover, there is very little change in the existing methods of operation, with the change involving a reduction of service movements.

Previous beliefs which stated that increased merchandising activity maximized sales, and continued operation of unit inventory control at the warehouse level maximized costs, were challenged with this scientific study.

This research should encourage new concepts of inventory management and selling to emerge in the vending industry. These innovative systems offer the key to renewed future expansion and growth that the industry has experienced in the past.

Proposals for Future Research

1. The application of the integrated program at the warehouse level of a major service company is necessary to test the concept beyond the two-route stage. This should test the program's flexibility to operate within different closed systems.

2. It is important to measure the contribution of positioning on sales as well as unit inventory management on sales. Which has the greater influence on demand is important to know in the allocation of future resources as well as assisting in the design of future innovations in the industry.

3. Positioning of product involves two concepts. The study changed brands of the same kind of candy although display or column arrangement was maintained as permanent as possible. It should be interesting for future research to maintain the same product by brand for a long period of

time, and change the position of product in the machine to test if the change in the position of the candy bar provides enough stimulation of sales without changing the product. Purchasing an open order for a year's supply of a given candy bar could be another step at lower costs and future orientation to automation.

4. More interrelationships of candy bar sales according to position in the machine should be researched and recorded to form a pool of predictable interactions beyond the ability of the human mind to retain, which information would maximize revenues and minimize costs for the vending industry.

5. The extension of the concept of an integrated inventory merchandising program into other product areas of snack, pastry, ice cream, perishable foods, and even cigarettes can be pursued using this research as a format for additional research. This study is the beginning to answering the question as to whether the integrated concept would apply universally to any products in automatic merchandising.

6. Service companies traditionally purchase the products with promotional pricing, i.e., the price is below the usual or normal price. This action causes an increase in the number of bars of candy handled and columns changed. There should be research to weigh the cost of increased handling of different candies against the

savings derived from purchasing product according to promotional pricing. The present study has the necessary information from which to design a scientific study on the trade-off of price versus activity, provided, of course, that the service company has such a policy to buy only promotional products.

7. Last, does IIMP apply to the grocery store, drug store, department store, discount or variety self-service store? Is the concept universal in the other retailing institutions? This area of research would be feasible in the near future as the new electronic cash registers permit the integration of unit inventory control with shelf display merchandising.

In conclusion, the greatest obstacle to future research is fear of the effect of change on the establishment or existing system. When the present operations refuse to look at change, innovative institutions will arise to replace the old institutions.[1] The vending industry should look at this future research as a necessary transfusion to nurture innovation to overcome the internal cost constraints so that the principle of automated merchandising may continue to expand and grow into a major method of retailing goods and services.

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[1]Joseph A. Schumpeter calls this the Process of Creative Distruction. Joseph A. Schumpeter, Capitalism, Socialism, and Democracy (New York: Harper & Brothers, 1942), pp. 81-86.

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APPENDICES

APPENDIX A

SYMBOLS AND COMPUTATIONS OF THE "t" AND "z" STATISTICS

1. Definition of Symbols

N_i = Size of sample i (i = 1,2)

X_{ij} = The j-th observation in the i-th sample

(j = 1,.....N_i and i = 1,2)

$\bar{X}_i$ = The computed mean of the i-th sample (i = 1,2)

S_i = Standard deviation of the i-th sample (i = 1,2)

P_i = The proportion of a particular phenomenon in sample i

(between 4% and 25% ; i = 1,2)

S_{pi} = The standard deviation of the proportion of that

phenomenon in sample i (i = 1,2)

z = The standardized normally distributed random variable.

t = Student-t statistic, Computed from the data

2. Computations for Testing Hypotheses

a. Level of Inventory

	Test Route			Control route		
(1) Week #	(2) Weekly ending inventory in units(X_1)	(3) $(X_1-\bar{X}_1)$	(4) $(X_1-\bar{X}_1)^2$	(2) Weekly ending inventory in units(X_2)	(3) $(X_2-\bar{X}_2)$	(4) $(X_2-\bar{X}_2)^2$
0	3527	232	53824	3808	-538	289444
1	3099	-106	38416	3326	-1020	1040400
2	3649	354	125316	3554	-792	627264
3	2710	-585	342225	5479	1133	1283689
4	2568	-727	528529	3555	-791	625681
5	3850	555	308025	4162	-184	33856
6	3233	-62	3844	3924	-422	178084
7	3726	431	185761	6962	2616	6843456
Totals	26362		1585940	34770		10921874

$N_1 = 8$

$\bar{X}_1 = \frac{1}{N_1}\sum X_1 = \frac{1}{8}(26362) = 3295.25$

$s_1^2 = \frac{1}{N_1-1}\sum (X_1-\bar{X}_1)^2 = \frac{1}{7}(1585940)$

$s_1^2 = 226562$

$N_2 = 8$

$\bar{X}_2 = \frac{1}{N_2}\sum X_2 = \frac{1}{8}(34770) = 4346.25$

$s_2^2 = \frac{1}{N_2-1}\sum (X_2-\bar{X}_2)^2 = \frac{1}{7}(10921874)$

$s_2^2 = 1560267.7$

$$t = \frac{\bar{X}_2 - \bar{X}_1}{\sqrt{\frac{(N_1-1)s_1^2 + (N_2-1)s_2^2}{N_1+N_2-2}}\sqrt{\frac{1}{N_1}+\frac{1}{N_2}}} = 2.2238$$

b. Stock-outs

Item	Test Route	Control Route
Stock-outs	44	182
Columns serviced	772	904

$N_1 = 772$ $\qquad$ $N_2 = 904$

$P_1 = 44/772$ $\qquad$ $P_2 = 182/904$

$P_1 = .0570$ $\qquad$ $P_2 = .2013$

$$S_{P1} = \sqrt{\frac{P_1(1-P_1)}{N_1}} \qquad S_{P2} = \sqrt{\frac{P_2(1-P_2)}{N_2}}$$

$$z = \frac{P_2 - P_1}{\sqrt{S_{P_1}^2 + S_{P_2}^2}} = 9.19108$$

c. Column changes

(i) Test Route

(1) Week #	(2) # of service / week	(3) # of column changes / week	(4) # of column changes/services (X_1) (3)÷(2)	(5) $(X_1-\bar{X}_1)$	(6) $(X_1-\bar{X}_1)^2$
1	14	8	.57	-.38	.144
2	11	10	.91	-.04	.002
3	13	15	1.15	.20	.040
4	15	16	1.07	.12	.014
5	14	24	1.71	.76	.578
6	13	8	.62	-.33	.109
7	5	3	.60	-.35	.123
Totals			6.63		1.010

$$N_1 = 7$$

$$\bar{X}_1 = \frac{1}{N_1}\sum X_1 = \frac{1}{7}(6.63) = .95$$

$$S_1^2 = \frac{1}{N_1-1}\sum (X_1-\bar{X}_1)^2 = \frac{1}{6}(1.01) = .168$$

c. Column changes - continued

(ii) Control Route

(1)	(2) # of service per week	(3) # of column changes / week	(4) # of column changes/services (X_2) (3)÷(2)	(5) $(X_2 - \bar{X}_2)$	(6) $(X_2 - \bar{X}_2)^2$
1	14	36	2.57	-.25	.063
2	15	48	3.20	.38	.144
3	15	32	2.13	-.69	.476
4	15	44	2.93	.11	.012
5	15	50	3.33	.51	.260
6	14	50	3.57	.75	.563
7	5	10	2.00	-.82	.672
			19.73		2.19

$$N_2 = 7$$

$$\bar{X}_2 = \frac{1}{N_2}\sum X_2 = \frac{1}{7}(19.73) = 2.82$$

$$s_2^2 = \frac{1}{N_2-1}\sum(X_2-\bar{X}_2)^2 = \frac{1}{6}(2.19) = .365$$

$$t = \frac{\bar{X}_2 - \bar{X}_1}{\sqrt{\frac{(N_1-1)S_1^2 + (N_2-1)S_2^2}{N_1+N_2-2}}\sqrt{\frac{1}{N_1}+\frac{1}{N_2}}} = 6.1867$$

d. Number of Kinds of Candy in the Storage Locker

	Test Route			Control Route		
(1) Week #	(2) Number of Kinds of Candy (X_1)	(3) $(X_1-\bar{X}_1)$	(4) $(X_1-\bar{X}_1)^2$	(2) Number of Kinds of Candy (X_2)	(3) $(X_2-\bar{X}_2)$	(4) $(X_2-\bar{X}_2)^2$
0	13	.6	.36	16	.5	.25
1	12	-.4	.16	17	1.5	2.25
2	13	.6	.36	18	2.5	6.25
3	12	-.4	.16	15	.5	.25
4	13	.6	.36	14	-1.5	2.25
5	12	-.4	.16	15	.5	.25
6	12	-.4	.16	16	1.5	2.25
7	12	-.4	.16	13	-2.5	6.25
Totals	99		1.88	124		20.00

$N_1 = 8$

$\bar{X}_1 = \frac{1}{N_1}\sum X_1 = \frac{1}{8}(99) = 12.4$

$S_1^2 = \frac{1}{N_1-1}\sum (X_1-\bar{X}_1)^2 = \frac{1}{7}(1.88) = .268$

$N_2 = 8$

$\bar{X}_2 = \frac{1}{N_2}\sum X_2 = \frac{1}{8}(124) = 15.5$

$S_2^2 = \frac{1}{N_2-1}\sum (X_2-\bar{X}_2)^2 = \frac{1}{7}(20.00) = 2.857$

$$t = \frac{\bar{X}_2 - \bar{X}_1}{\sqrt{\frac{(N_1-1)S_1^2 + (N_2-1)S_2^2}{N_1+N_2-2}}\sqrt{\frac{1}{N_1}+\frac{1}{N_2}}} = 4.96$$

e. Sales

(i) Derivation of Pretest Sales Data of Test and Control Samples

	Test Route			Control Route		
(1) Machine #	(2) Sales of first quarter of 1972	(3) Average weekly sales *	(4) Estimated sales of pretest 7 week period **	(2) Sales of first quarter of 1972	(3) Average weekly sales *	(4) Estimated sales of pretest 7 week period **
1	7380	568	3974	9129	702	4914
2	5807	447	3127	10233	787	5509
3	6274	482	3378	11297	857	6013
4	4807	369	2588	4444	342	2394
5	3624	279	1951	3193	246	1722
Totals	27892	2145	15018	38296	2948	20552

* Obtained by dividing the corresponding figure in column # 2 by 13.

** Obtained by multiplying the corresponding figure in column # 3 by 7.

e. Sales - continued

(ii) Computation of the Statistics for Test Sample

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Machine #	Estimated sales of pretest 7 week period	Sales of seven week test period	Change in sales between the two periods *	Change in sales divided by pretest sales**(X_1)	$(X_1-\bar{X}_1)$	$(X_1-\bar{X}_1)^2$
1	3974	5010	1036	.26	.096	.010
2	3127	3540	413	.13	-.034	.0
3	3378	3906	528	.16	-.004	.0
4	2588	3332	744	.29	1.26	.02
5	1951	1906	-45	-.02	-1.84	.03
Totals	15018	17694	2676	.82		.06

$$N_1 = 5$$

$$\bar{X}_1 = \frac{1}{N_1}\sum X_1 = \frac{1}{5}(.82) = .164$$

$$S_1^2 = \frac{1}{N_1 - 1}\sum (X_1-\bar{X}_1)^2 = \frac{1}{4}(.06) = .015$$

* Obtained by subtracting column # 2 from column #3.

** Obtained by dividing column #4 by the corresponding figures in column # 2

e. Sales - continued

(iii) Computation of the Statistics for the Control Sample

(1) Machine #	(2) Estimated sales of pretest 7 week period	(3) Sales of seven week test period	(4) Change in sales between the two periods *	(5) Change in sales divided by pretest sales** (X_2)	(6) ($X_2-\bar{X}_2$)	(7) $(X_2-\bar{X}_2)^2$
1	4914	6414	1500	.31	.276	.080
2	5509	6076	567	.10	.066	.0
3	6013	5755	-258	-.04	-.074	.01
4	2394	1956	-438	-.18	-.214	.05
5	1722	1681	-41	-.02	-.054	.0
Totals	20552	21882	1330	.17		.14

$$N_2 = 5$$

$$\bar{X}_2 = \frac{1}{N_2}\sum X_2 = \frac{1}{5}(.17) = .034$$

$$S_2^2 = \frac{1}{N_2-1}\sum (X_2-\bar{X}_2)^2 = \frac{1}{4}(.14) = .035$$

* Obtained by subtracting column # 2 from column # 3

** Obtained by dividing column # 4 by the corresponding figures in column # 2.

e. Sales - continued

(iv) Computation of the Student-t Statistic

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{(N_1-1)S_1^2 + (N_2-1)S_2^2}{N_1 + N_2 - 2}} \sqrt{\frac{1}{N_1} + \frac{1}{N_2}}}$$

$$t = \frac{.164 - .034}{\sqrt{\frac{(4)(.015) + (4)(.035)}{5+5-2}} \sqrt{\frac{1}{5} + \frac{1}{5}}}$$

$$t = \frac{.13}{.09954}$$

$$t = 1.306$$

APPENDIX B

DATA

DATA

The information in Appendix A is accurate from the research performed and is reflected in the same manner within the body of the thesis, although the data in Appendix B are not absolutely consistent with the thesis data and Appendix A. The information exists in an organized basis, for this mass of data had to be consolidated in some manner, and a running account of what was performed had to be maintained. This was necessary so that future research may have a system of maintaining data to permit expansion of the information, which would become impractical to analyze and follow in the case of twenty or more machines and more selection of confections.

Therefore, the information was programmed for the IBM 1130 computer at Eastern Michigan University in the Instructional Computer Services Department. The use of the 1130 required a program designed for a minimum of core and simple routines. This constraint caused some discrepencies, which in turn affected some of the summaries to be slightly different from the actual data. The figures are not sufficiently different to affect the statistical verification of the hypotheses.

To illustrate, the actual services were 85 and 93 for Route's One and Two respectively, but the computer totals indicate 90 and 98 respectively. Exceptions or special instances were ignored to keep the program simple, thus adding a few services which were not actually made.

The program is not included in the thesis, but may be available upon written request to the writer.

How to Read the Data in Appendix B

Each week has three tables with the totals having only two tables. The first table portrays the display pattern of both routes for the week listed. The machine number is the left column, and the day of service is to its right. Under each of the ten columns is the candy displayed or exposed to the consumer. The candy number has the name of each confection in the next two tables for each week. To illustrate, under week #1 look for display patterns Route 1 (test route), Machine #3, serviced on Monday. To find what kind of confection is in a particular column, follow the numbers to the right of the service date. In column three, the candy number is 12, which is Mounds in the following table where the candy number 12 lists the brands of candy as Mounds. This means that Mounds was in the third column of machine #3 in the test route (Route #1) from Friday's service to the time of service on Monday. Please note that Mounds are programmed to be in the third column in all Route One's machines in week one, while Mounds is found in columns 3,4,7 and 8 in Route Two's machines. A zero means that the column in the machine is either inoperative or non-existent.

Machine #5 in Route One was serviced only once that week, so the exposures were the same every day of the week.

The second table for each week contains quantitative inventory information. The column headings are:

(1) Old Bin Inventory = beginning storage locker (bin) inventory including merchandise on the cart on Wednesday, inventory day.

(2) Tot. Begin. Inventory = total beginning inventory which includes the storage locker inventory plus machine column capacity of that confection at the beginning of that week.

(3) New Bin Inventory = ending inventory in the storage locker (bin) only, including cart merchandise.

(4) Tot. Ending Inventory = total ending inventory which includes ending storage locker (bin) inventory plus machine column capacity of that confection at the end of that week (or beginning of next week).

(5) Orders Received = the quantity of the confection added to the storage locker (bin) inventory during the week.

(6) Unit Sales = the difference between total beginning inventory (plus orders received) and total ending inventory.

To illustrate this in action, look at #16 (Bagged Peanuts) for Route Two (control) in week 1. The formula is: total beginning inventory (2) plus orders received (5) minus total ending inventory (4) equals unit sales (6) or 584 + 400 - 505 = 479.

The third table for each week outlines the number of stock-outs and exposures for each confection in the five machines in each route. For example, O'Henry (#6 confection) in week one in Route Two (control sample) had two stock-outs (two columns were empty when the machine was serviced) and six exposures. Referring to the first table of week one and the display patterns of the control route (Route Two), candy #6 was in machine #3 in column #8 for four working days and in machine #5 in column #6 for two working days for a total of six days or exposures. Two stock-outs divided by six exposures equals 33 1/3 percent as shown in the column headed "stock-out/exposures (pct.)." Again referring to the previous table of the same week, unit sales for O'Henry in Route Two (control) were 112 bars. The unit sales of O'Henry when divided by six exposures is 18.66 sales per exposures or day in week one.

The summation of the first two columns of the third table in week one are totals. For example, Route One in week one has two stock-outs versus 23 for Route Two; or Route One had 260 versus 254 exposures for week one. Again, an exposure means a confection is exposed or displayed for the time of the last service day for that machine to the day of service indicated on the first table.

The last two columns are ratios of various totals. As an illustration, 2 stock-outs divided by 260 exposures (times 100) equal .76 percent or less than one percent of the daily selections were sold out in Route One (test sample), compared to nine percent in Route Two (control sample).

The average column sales in Route One is nine bars per column day. This is secured by dividing total unit sales for Route One by total exposures. For example, Route One total unit sales for week one was 2354 bars; total exposures was 260, so 2354 divided by 260 is 9.05 units per column day.

The average stock-outs per service is found by dividing the total of stock-outs for the respective week by the total number of services (provided on the last line of this table) for the same week for that route.

A brand is carried if it was in inventory or exposed any time during the week. The smaller of the two

inventories, that is, total beginning or ending inventory, is divided by the number of different brands or confections carried to give the average of a confection carried during the week.

A column change is defined as changing a confection in a column in the same machine. Referring to the first table in week one, Route One has no column changes in the last two services in machine's #1 and #2, while in the same week, Route Two (control) has one column change in machine #1, but 10 column changes in machine #2. Returning to the bottom of the third table, the sum of the column changes are divided by the number of services on the respective week to yield a percentage figure representing the column changes per service.

**********WEEK 1 **********

DISPLAY PATTERNS ROUTE 1

MACHINE	DAY OF SERVICE	COLUMN 1	2	3	4	5	6	7	8	9	10
1	FRI	18	16	12	6	20	21	2	9	22	25
	MON	18	16	12	6	20	21	2	9	22	25
	WEDS	18	16	12	6	20	21	2	9	22	25
2	FRI	18	16	12	6	20	21	2	9	13	4
	MON	18	16	12	6	20	21	2	9	13	4
	WEDS	18	16	12	6	20	21	2	9	13	4
3	FRI	18	16	12	6	20	21	1	9	13	4
	MON	18	16	12	6	20	21	2	9	13	31
	WEDS	18	16	12	6	20	21	2	9	13	10
4	FRI	18	16	12	6	20	21	5	9	13	4
	MON	18	16	12	6	20	21	5	9	13	10
	WEDS	18	16	12	6	20	21	5	9	13	10
5	WEDS	19	16	12	6	19	21	5	9	4	13

DISPLAY PATTERNS ROUTE 2

MACHINE	DAY OF SERVICE	COLUMN 1	2	3	4	5	6	7	8	9	10
1	FRI	26	30	16	12	20	8	18	19	2	7
	MON	26	30	16	12	20	8	18	19	2	7
	WEDS	26	30	16	12	20	8	18	28	2	7
2	FRI	9	8	1	22	0	7	12	20	16	7
	MON	18	8	1	22	0	30	5	27	7	32
	WEDS	28	8	1	20	0	30	12	16	7	32
3	FRI	18	20	16	22	8	19	12	9	2	13
	MON	16	20	18	22	8	19	12	6	2	13
	WEDS	16	20	18	30	8	19	12	6	2	13
4	MON	8	20	19	18	2	7	16	12	0	0
	WEDS	6	20	19	18	2	32	16	12	0	0
5	FRI	20	9	12	18	27	19	2	8	0	0
	MON	32	9	12	18	30	6	2	8	0	0
	WEDS	16	8	12	18	30	32	2	31	0	0

**********WEEK 1 **********

NO. CANDY	BRAND OF CANDY	ROUTE	OLD BIN INV.	TOT. BEGIN. INVENTORY	NEW BIN INVENTORY	TOT. ENDING INVENTORY	ORDERS RECEIVED	UNIT SALES	DOLLAR SALES
1	NESTLE ALMOND	1	0	44	0	0	0	44	4.40
1	NESTLE ALMOND	2	0	51	0	51	0	0	0.00
2	NESTLE CRUNCH	1	97	199	57	254	120	65	6.50
2	NESTLE CRUNCH	2	220	374	310	464	240	150	15.00
4	MILKSHAKE	1	0	197	0	51	0	146	14.60
4	MILKSHAKE	2	0	0	0	0	0	0	0.00
5	GIANT	1	0	102	0	51	0	51	5.10
5	GIANT	2	0	0	0	0	0	0	0.00
6	O'HENRY	1	460	706	466	714	240	234	23.40
6	O'HENRY	2	240	240	77	128	0	112	11.20
7	PAYDAY	1	0	0	0	51	0	-51	-5.10
7	PAYDAY	2	144	328	0	0	0	328	32.80
8	POWERHOUSE	1	0	0	0	0	0	0	0.00
8	POWERHOUSE	2	289	414	82	226	0	268	26.76
9	ZAGNUT	1	372	620	27	129	0	491	49.00
9	ZAGNUT	2	116	269	0	0	0	269	26.90
10	PLANTER JUMBO BLOCK	1	181	181	65	116	0	65	6.50
10	PLANTER JUMBO BLOCK	2	0	0	0	0	0	0	0.00
12	MOUNDS	1	460	708	476	744	240	204	20.40
12	MOUNDS	2	220	425	185	370	480	535	53.50
13	LUCY ELLEN VANILLA PEANUT CLUSTER	1	0	197	0	197	0	0	0.00
13	LUCY ELLEN VANILLA PEANUT CLUSTER	2	0	51	0	51	0	0	0.00
16	BAGGED PEANUTS	1	823	1076	638	1136	500	440	44.00
16	BAGGED PEANUTS	2	400	584	300	505	400	479	47.90
18	PEANUT BUTTER CHEESE CRACKER	1	678	926	552	800	300	426	42.59
18	PEANUT BUTTER CHEESE CRACKER	2	305	449	379	523	400	326	32.59
19	LEMON-LIME CREME COOKIE	1	0	51	0	51	0	0	0.00
19	LEMON-LIME CREME COOKIE	2	79	233	0	72	0	161	16.10
20	VANILLA CREME COOKIE	1	235	432	116	313	0	119	11.89
20	VANILLA CREME COOKIE	2	195	300	6	129	0	271	27.05
21	SHORTBREAD	1	173	421	108	656	100	173	17.30
21	SHORTBREAD	2	0	0	100	100	0	-100	-10.00
22	CHOCOLATE CREME COOKIE	1	43	94	0	51	0	43	4.30
22	CHOCOLATE CREME COOKIE	2	0	102	100	100	100	102	10.20
23	CHOCOLATE CHIP COOKIE	1	0	0	0	0	0	0	0.00
23	CHOCOLATE CHIP COOKIE	2	0	0	0	102	100	-2	-0.20

25	NECCO CHOCOLATE ROLL	1	0	51	0	51	0	0	0.00
25	NECCO CHOCOLATE ROLL	2	0	0	0	0	0	0	0.00
26	LUCY ELLEN NUT FUDGE	1	0	0	0	0	0	0	0.00
26	LUCY ELLEN NUT FUDGE	2	0	51	0	51	0	0	0.00
27	5TH AVENUE	1	0	0	0	0	0	0	0.00
27	5TH AVENUE	2	100	121	0	0	0	121	12.10
28	WINDMILL COOKIE	1	0	0	0	0	0	0	0.00
28	WINDMILL COOKIE	2	300	300	500	551	200	-51	-5.10
29	CARAVELLE	1	0	0	0	44	0	-44	-4.40
29	CARAVELLE	2	480	480	480	531	0	-51	-5.10
30	TOFFEE CRISP	1	0	0	0	0	0	0	0.00
30	TOFFEE CRISP	2	360	411	120	294	0	117	11.70
31	LUCY ELLEN JELLY BAR	1	0	0	0	0	0	0	0.00
31	LUCY ELLEN JELLY BAR	2	0	0	360	442	360	-82	-8.20
32	CHUNKY	1	0	0	0	0	0	0	0.00
32	CHUNKY	2	360	360	203	316	0	44	4.40
34	BUTTERFINGER	1	0	0	330	476	432	-44	-4.40
34	BUTTERFINGER	2	0	0	144	195	288	93	9.30
TOTALS-		1	3527	6007	3105	5585	1932	2354	235.39
TOTALS-		2	3808	5683	3326	5201	2568	3050	305.00

**********WEEK 1 **********

NO.	BRAND OF CANDY	ROUTE	STOCK-OUTS	EXPOSURES	STOCK-OUTS/EXPOSURES(PCT)	SALES/EXPOSURES
1	NESTLE ALMOND	1	0	2	0.00	22.00
1	NESTLE ALMOND	2	0	6	0.00	0.00
2	NESTLE CRUNCH	1	0	16	0.00	4.06
2	NESTLE CRUNCH	2	0	22	0.00	6.81
4	MILKSHAKE	1	0	12	0.00	12.16
4	MILKSHAKE	2	0	0	0.00	0.00
5	GIANT	1	0	8	0.00	5.37
5	GIANT	2	0	2	0.00	0.00
6	O'HENRY	1	0	26	0.00	9.00
6	O'HENRY	2	2	6	33.33	14.66
7	PAYDAY	1	0	0	0.00	0.00
7	PAYDAY	2	6	16	37.50	20.50
8	POWERHOUSE	1	0	0	0.00	0.00
8	POWERHOUSE	2	0	28	0.00	9.57
9	ZAGNUT	1	0	26	0.00	18.62
9	ZAGNUT	2	2	8	25.00	29.87
10	PLANTER JUMBO BLOCK	1	0	6	0.00	10.83
10	PLANTER JUMBO BLOCK	2	0	0	0.00	0.00
12	MOUNDS	1	0	26	0.00	7.84
12	MOUNDS	2	1	26	3.84	20.97
13	LUCY ELLEN VANILLA PEANUT CLUSTER	1	0	20	0.00	0.00
13	LUCY ELLEN VANILLA PEANUT CLUSTER	2	0	6	0.00	0.00
16	BAGGED PEANUTS	1	2	26	7.69	16.92
16	BAGGED PEANUTS	2	6	24	25.00	19.05
18	PEANUT BUTTER CHEESE CRACKER	1	0	26	0.00	10.38
18	PEANUT BUTTER CHEESE CRACKER	2	1	22	4.54	14.41
19	LEMON-LIME CREME COOKIE	1	0	2	0.00	0.00
19	LEMON-LIME CREME COOKIE	2	1	16	6.25	10.[illegible]
20	VANILLA CREME COOKIE	1	0	24	0.00	4.[illegible]
20	VANILLA CREME COOKIE	2	2	22	9.09	11.[illegible]
21	SHORTBREAD	1	0	26	0.00	6.[illegible]
21	SHORTBREAD	2	0	0	0.00	0.00
22	CHOCOLATE CREME COOKIE	1	0	6	0.00	7.[illegible]
22	CHOCOLATE CREME COOKIE	2	0	8	0.00	12.[illegible]
23	CHOCOLATE CHIP COOKIE	1	0	0	0.00	0.00
23	CHOCOLATE CHIP COOKIE	2	0	0	0.00	0.00
25	NECCO CHOCOLATE ROLL	1	0	6	0.00	0.00
25	NECCO CHOCOLATE ROLL	2	0	0	0.00	0.00

26 LUCY ELLEN NUT FUDGE	1	0	0	0.00	0.00
26 LUCY ELLEN NUT FUDGE	2	0	6	0.00	0.00
27 5TH AVENUE	1	0	0	0.00	0.00
27 5TH AVENUE	2	1	4	25.00	30.25
28 WINDMILL COOKIE	1	0	0	0.00	0.00
28 WINDMILL COOKIE	2	1	4	25.00	-12.75
29 CARAVELLE	1	0	0	0.00	0.00
29 CARAVELLE	2	0	0	0.00	0.00
30 TOFFEE CRISP	1	0	0	0.00	0.00
30 TOFFEE CRISP	2	0	16	0.00	7.31
31 LUCY ELLEN JELLY BAR	1	0	2	0.00	0.00
31 LUCY ELLEN JELLY BAR	2	0	2	0.00	-41.00
32 CHUNKY	1	0	0	0.00	0.00
32 CHUNKY	2	0	10	0.00	4.40
34 BUTTERFINGER	1	0	0	0.00	0.00
34 BUTTERFINGER	2	0	0	0.00	0.00
AVERAGES-TOTALS	1	2	260	0.76	9.05
AVERAGES-TOTALS	2	23	254	9.05	12.00

SERVICEMAN 1 AVERAGE STOCK-OUTS PER SERVICE 0.15
SERVICEMAN 2 AVERAGE STOCK-OUTS PER SERVICE 1.64

SERVICEMAN 1- 18 DIFFERENT BRANDS CARRIED. AVERAGE WEEKLY INVENTORY 310.27
SERVICEMAN 2- 23 DIFFERENT BRANDS CARRIED. AVERAGE WEEKLY INVENTORY 226.13

SERVICEMAN 1 MADE 11 COLUMN CHANGES IN 13 SERVICES, OR 0.84 CHANGES PER SERVICE.
SERVICEMAN 2 MADE 36 COLUMN CHANGES IN 14 SERVICES, OR 2.57 CHANGES PER SERVICE.

**********WEEK 2 **********

DISPLAY PATTERNS ROUTE 1

MACHINE	DAY OF SERVICE	COLUMN 1	2	3	4	5	6	7	8	9	10
1	FRI	18	16	12	6	20	21	2	9	22	25
	MON	18	16	12	6	20	21	2	34	22	25
	WEDS	18	16	12	6	20	21	2	34	35	7
2	FRI	18	16	12	6	20	21	2	34	13	7
	WEDS	18	16	12	6	20	21	2	34	35	7
3	FRI	18	16	12	6	20	21	2	34	13	29
	WEDS	18	16	12	6	20	21	2	34	13	10
4	FRI	18	16	12	6	20	21	2	34	13	10
	WEDS	18	16	12	6	20	21	2	34	19	10
5	FRI	18	16	12	6	19	21	5	9	4	13
	WEDS	18	16	12	6	19	21	2	9	4	13

DISPLAY PATTERNS ROUTE 2

MACHINE	DAY OF SERVICE	COLUMN 1	2	3	4	5	6	7	8	9	10
1	FRI	26	30	16	12	23	34	18	29	2	31
	MON	26	30	16	12	23	34	18	29	2	31
	WEDS	26	30	16	12	23	34	18	29	2	31
2	FRI	28	8	1	20	0	30	12	16	23	32
	MON	18	21	2	28	0	30	12	6	23	32
	WEDS	16	29	2	28	0	30	21	18	23	22
3	FRI	16	20	18	30	8	19	12	6	2	13
	MON	16	21	18	30	29	34	12	31	2	23
	WEDS	16	23	18	29	10	34	35	31	2	28
4	FRI	8	20	19	18	2	32	16	12	0	0
	MON	29	20	23	18	2	32	16	12	0	0
	WEDS	29	21	23	18	16	12	35	2	0	0
5	FRI	16	8	12	18	30	32	2	31	0	0
	MON	35	21	29	18	10	31	2	16	0	0
	WEDS	35	21	29	23	10	31	2	16	0	0

**********WEEK 2 **********

NO. CANDY	BRAND OF CANDY	ROUTE	OLD BIN INV.	TOT. BEGIN. INVENTORY	NEW BIN INVENTORY	TOT. ENDING INVENTORY	ORDERS RECEIVED	UNIT SALES	DOLLAR SALES
1	NESTLE ALMOND	1	0	0	0	0	0	0	0.00
1	NESTLE ALMOND	2	0	51	0	0	0	51	5.10
2	NESTLE CRUNCH	1	57	254	66	314	120	60	6.00
2	NESTLE CRUNCH	2	310	464	282	497	120	87	8.70
3	WAYNE MAPLE BUN	1	0	0	0	51	0	-51	-5.10
3	WAYNE MAPLE BUN	2	0	0	0	0	0	0	0.00
4	MILKSHAKE	1	0	51	0	51	0	0	0.00
4	MILKSHAKE	2	0	0	0	0	0	0	0.00
5	GIANT	1	0	51	0	0	0	51	5.10
5	GIANT	2	0	0	0	0	0	0	0.00
6	O'HENRY	1	466	714	292	540	240	414	41.40
6	O'HENRY	2	77	128	0	0	0	128	12.80
7	PAYDAY	1	0	51	184	266	432	197	19.70
7	PAYDAY	2	0	0	0	0	0	0	0.00
8	POWERHOUSE	1	0	0	0	0	0	0	0.00
8	POWERHOUSE	2	82	226	6	57	0	169	16.90
9	ZAGNUT	1	27	129	0	51	0	78	7.80
9	ZAGNUT	2	0	0	0	0	0	0	0.00
10	PLANTER JUMBO BLOCK	1	65	116	240	335	240	21	2.10
10	PLANTER JUMBO BLOCK	2	0	0	666	769	720	-49	-4.90
12	MOUNDS	1	496	744	576	824	240	160	16.00
12	MOUNDS	2	165	370	12	63	0	307	30.70
13	LUCY ELLEN VANILLA PEANUT CLUSTER	1	0	197	0	95	0	102	10.20
13	LUCY ELLEN VANILLA PEANUT CLUSTER	2	0	51	0	0	0	51	5.10
16	BAGGED PEANUTS	1	898	1136	791	1039	480	577	57.65
16	BAGGED PEANUTS	2	300	505	423	638	600	467	46.70
18	PEANUT BUTTER CHEESE CRACKER	1	552	800	708	956	500	344	34.40
18	PEANUT BUTTER CHEESE CRACKER	2	379	523	349	492	400	431	43.10
19	LEMON-LIME CREME COOKIE	1	0	51	0	51	0	0	0.00
19	LEMON-LIME CREME COOKIE	2	0	72	0	0	0	72	7.19
20	VANILLA CREME COOKIE	1	116	313	10	207	0	106	10.60
20	VANILLA CREME COOKIE	2	6	129	0	0	0	129	12.89
21	SHORTBREAD	1	108	356	154	402	0	-46	-4.60
21	SHORTBREAD	2	100	100	233	326	300	74	7.39
22	CHOCOLATE CREME COOKIE	1	0	51	0	0	200	251	25.10
22	CHOCOLATE CREME COOKIE	2	100	100	6	57	0	43	4.30
23	CHOCOLATE CHIP COOKIE	1	0	0	0	0	0	0	0.00
23	CHOCOLATE CHIP COOKIE	2	0	102	300	495	300	-93	-9.30

25	NECCO CHOCOLATE ROLL	1	0	51	0	0	0	51	5.10
25	NECCO CHOCOLATE ROLL	2	0	0	0	0	0	0	0.00
26	LUCY ELLEN NUT FUDGE	1	0	0	0	0	0	0	0.00
26	LUCY ELLEN NUT FUDGE	2	0	51	0	51	0	0	0.00
28	WINDMILL COOKIE	1	0	0	178	178	0	-178	-17.80
28	WINDMILL COOKIE	2	500	551	200	323	200	428	42.80
29	CARAVELLE	1	0	44	0	0	200	244	24.40
29	CARAVELLE	2	480	531	276	471	0	60	6.00
30	TOFFEE CRISP	1	0	0	0	0	0	0	0.00
30	TOFFEE CRISP	2	120	294	0	102	0	192	19.20
31	LUCY ELLEN JELLY BAR	1	0	0	0	0	0	0	0.00
31	LUCY ELLEN JELLY BAR	2	360	442	120	222	0	220	22.00
32	CHUNKY	1	0	0	0	0	0	0	0.00
32	CHUNKY	2	203	316	5	5	0	311	31.09
34	BUTTERFINGER	1	330	476	350	547	0	-71	-7.10
34	BUTTERFINGER	2	144	195	61	163	0	32	3.20
35	TOOTSIE ROLL	1	0	0	100	202	288	86	8.60
35	TOOTSIE ROLL	2	0	0	516	598	600	2	0.20
39	CHERRY RED LICORICE	1	0	0	0	0	0	0	0.00
39	CHERRY RED LICORICE	2	0	0	100	100	100	0	0.00
TOTALS-		1	3105	5585	3649	6129	2940	2396	239.60
TOTALS-		2	3326	5201	3554	5429	3340	3112	311.20

**********WEEK 2 **********

NO.	BRAND OF CANDY	ROUTE	STOCK-OUTS	EXPOSURES	STOCK-OUTS/EXPOSURES(PCT)	SALES/EXPOSURES
1	NESTLE ALMOND	1	0	0	0.00	0.00
1	NESTLE ALMOND	2	0	2	0.00	25.50
2	NESTLE CRUNCH	1	0	26	0.00	2.00
2	NESTLE CRUNCH	2	0	28	0.00	3.10
3	WAYNE MAPLE BUN	1	0	0	0.00	0.00
3	WAYNE MAPLE BUN	2	0	0	0.00	0.00
4	MILKSHAKE	1	0	6	0.00	0.00
4	MILKSHAKE	2	0	0	0.00	0.00
5	GIANT	1	0	4	0.00	12.75
5	GIANT	2	0	0	0.00	0.00
6	O'HENRY	1	0	30	0.00	13.80
6	O'HENRY	2	2	4	50.00	32.00
7	PAYDAY	1	2	8	25.00	24.62
7	PAYDAY	2	0	0	0.00	0.00
8	POWERHOUSE	1	0	0	0.00	0.00
8	POWERHOUSE	2	0	8	0.00	21.12
9	ZAGNUT	1	0	8	0.00	9.75
9	ZAGNUT	2	0	0	0.00	0.00
10	PLANTER JUMBO BLOCK	1	0	8	0.00	2.62
10	PLANTER JUMBO BLOCK	2	0	6	0.00	-8.16
12	MOUNDS	1	0	30	0.00	5.33
12	MOUNDS	2	0	22	0.00	13.95
13	LUCY ELLEN VANILLA PEANUT CLUSTER	1	0	20	0.00	5.10
13	LUCY ELLEN VANILLA PEANUT CLUSTER	2	0	2	0.00	25.50
16	BAGGED PEANUTS	1	2	30	6.66	19.23
16	BAGGED PEANUTS	2	5	28	17.85	16.67
18	PEANUT BUTTER CHEESE CRACKER	1	0	30	0.00	11.46
18	PEANUT BUTTER CHEESE CRACKER	2	4	26	15.38	16.57
19	LEMON-LIME CREME COOKIE	1	0	8	0.00	0.00
19	LEMON-LIME CREME COOKIE	2	0	4	0.00	18.00
20	VANILLA CREME COOKIE	1	0	24	0.00	4.41
20	VANILLA CREME COOKIE	2	1	8	12.50	16.12
21	SHORTBREAD	1	0	30	0.00	-1.53
21	SHORTBREAD	2	1	12	8.33	6.16
22	CHOCOLATE CREME COOKIE	1	0	4	0.00	62.75
22	CHOCOLATE CREME COOKIE	2	0	2	0.00	21.50
23	CHOCOLATE CHIP COOKIE	1	0	0	0.00	0.00
23	CHOCOLATE CHIP COOKIE	2	0	22	0.00	-4.27

25	NECCO CHOCOLATE ROLL	1	0	4	0.00	12.75
25	NECCO CHOCOLATE ROLL	2	0	0	0.00	0.00
26	LUCY ELLEN NUT FUDGE	1	0	0	0.00	0.00
26	LUCY ELLEN NUT FUDGE	2	0	0	0.00	0.00
28	WINDMILL COOKIE	1	0	0	0.00	0.00
28	WINDMILL COOKIE	2	1	8	12.50	53.50
29	CARAVELLE	1	0	4	0.00	61.00
29	CARAVELLE	2	0	20	0.00	3.00
30	TOFFEE CRISP	1	0	0	0.00	0.00
30	TOFFEE CRISP	2	0	18	0.00	10.66
31	LUCY ELLEN JELLY BAR	1	0	0	0.00	0.00
31	LUCY ELLEN JELLY BAR	2	0	16	0.00	13.75
32	CHUNKY	1	0	0	0.00	0.00
32	CHUNKY	2	2	10	20.00	31.10
34	BUTTERFINGER	1	1	22	4.54	-3.22
34	BUTTERFINGER	2	0	10	0.00	3.20
35	TOOTSIE ROLL	1	0	4	0.00	21.50
35	TOOTSIE ROLL	2	0	8	0.00	0.25
39	CHERRY RED LICORICE	1	0	0	0.00	0.00
39	CHERRY RED LICORICE	2	0	0	0.00	0.00
AVERAGES-TOTALS		1	5	300	1.66	7.98
AVERAGES-TOTALS		2	16	270	5.92	11.62

SERVICEMAN 1 AVERAGE STOCK-OUTS PER SERVICE 0.45
SERVICEMAN 2 AVERAGE STOCK-OUTS PER SERVICE 1.06

SERVICEMAN 1- 19 DIFFERENT BRANDS CARRIED. AVERAGE WEEKLY INVENTORY 293.94
SERVICEMAN 2- 23 DIFFERENT BRANDS CARRIED. AVERAGE WEEKLY INVENTORY 226.13

SERVICEMAN 1 MADE 9 COLUMN CHANGES IN 11 SERVICES, OR 0.81 CHANGES PER SERVICE.
SERVICEMAN 2 MADE 48 COLUMN CHANGES IN 15 SERVICES, OR 3.20 CHANGES PER SERVICE.

**********WEEK 3 **********

DISPLAY PATTERNS ROUTE 1

MACHINE	DAY OF SERVICE	COLUMN 1	2	3	4	5	6	7	8	9	10
1	FRI	18	16	12	6	20	21	2	34	35	7
	MON	18	16	12	6	20	21	2	34	35	10
	WEDS	18	16	12	6	20	21	2	34	35	10
2	FRI	18	16	12	6	20	21	2	34	35	7
	MON	18	16	12	6	28	21	2	34	35	7
	WEDS	18	16	12	6	28	21	2	34	35	10
3	FRI	18	16	12	6	20	21	2	34	13	10
	MON	18	16	12	8	28	21	2	34	13	10
	WEDS	18	16	12	8	28	21	2	34	13	10
4	FRI	18	16	12	6	20	21	2	34	3	10
	MON	18	16	12	8	29	21	2	34	35	10
	WEDS	18	16	12	8	28	21	2	34	7	10
5	FRI	18	16	12	6	19	21	2	9	4	13
	MON	18	16	12	6	20	21	2	34	4	13
	WEDS	18	16	12	6	20	21	2	34	4	13

DISPLAY PATTERNS ROUTE 2

MACHINE	DAY OF SERVICE	COLUMN 1	2	3	4	5	6	7	8	9	10
1	FRI	26	30	16	12	23	34	18	29	2	31
	MON	26	10	16	28	23	21	18	29	2	35
	WEDS	26	10	16	28	23	21	18	29	2	35
2	FRI	16	29	2	28	0	30	21	8	23	22
	MON	16	29	2	10	0	30	21	8	23	22
	WEDS	16	29	2	10	0	28	21	8	23	8
3	FRI	16	23	18	29	10	34	35	31	2	28
	MON	16	23	18	29	10	21	10	23	2	21
	WEDS	16	23	18	29	10	21	8	23	2	21
4	FRI	29	21	23	18	10	16	35	2	0	0
	MON	29	21	23	18	10	16	35	2	0	0
	WEDS	29	21	23	18	10	16	35	2	0	0
5	FRI	28	21	29	23	18	16	2	10	0	0
	MON	28	21	29	23	18	16	2	10	0	0
	WEDS	28	22	29	2	35	18	31	10	0	0

**********WEEK 3 **********

NO. CANDY	BRAND OF CANDY	ROUTE	OLD BIN INV.	TOT. BEGIN. INVENTORY	NEW BIN INVENTORY	TOT. ENDING INVENTORY	ORDERS RECEIVED	UNIT SALES	DOLLAR SALES
2	NESTLE CRUNCH	1	66	314	208	456	360	218	21.79
2	NESTLE CRUNCH	2	282	497	0	184	0	313	31.29
3	WAYNE MAPLE BUN	1	0	51	0	0	0	51	5.10
3	WAYNE MAPLE BUN	2	0	0	0	0	0	0	0.00
4	MILKSHAKE	1	0	51	0	51	0	0	0.00
4	MILKSHAKE	2	0	0	0	0	0	0	0.00
6	O'HENRY	1	292	540	243	396	0	144	14.39
6	O'HENRY	2	0	0	107	260	120	-140	-14.00
7	PAYDAY	1	184	286	0	0	0	286	28.59
7	PAYDAY	2	0	0	0	0	0	0	0.00
8	POWERHOUSE	1	0	0	57	152	360	205	20.49
8	POWERHOUSE	2	6	57	43	145	120	32	3.20
9	ZAGNUT	1	0	51	0	0	0	51	5.10
9	ZAGNUT	2	0	0	0	0	0	0	0.00
10	PLANTER JUMBO BLOCK	1	240	335	131	328	240	247	24.70
10	PLANTER JUMBO BLOCK	2	666	769	546	751	240	258	25.79
12	MOUNDS	1	576	824	449	697	240	367	36.70
12	MOUNDS	2	12	63	480	480	480	63	6.30
13	LUCY ELLEN VANILLA PEANUT CLUSTER	1	0	95	0	95	0	0	0.00
13	LUCY ELLEN VANILLA PEANUT CLUSTER	2	0	0	0	0	0	0	0.00
16	BAGGED PEANUTS	1	791	1039	499	747	380	672	67.19
16	BAGGED PEANUTS	2	423	638	772	977	820	481	48.09
18	PEANUT BUTTER CHEESE CRACKER	1	708	956	201	449	100	607	60.69
18	PEANUT BUTTER CHEESE CRACKER	2	348	492	889	993	900	400	40.00
19	LEMON-LIME CREME COOKIE	1	0	51	0	0	0	51	5.10
19	LEMON-LIME CREME COOKIE	2	0	0	0	0	0	0	0.00
20	VANILLA CREME COOKIE	1	10	207	0	102	0	105	10.50
20	VANILLA CREME COOKIE	2	0	0	0	0	0	0	0.00
21	SHORTBREAD	1	154	402	0	248	0	154	15.39
21	SHORTBREAD	2	233	326	0	225	0	101	10.10
22	CHOCOLATE CREME COOKIE	1	0	0	0	0	0	0	0.00
22	CHOCOLATE CREME COOKIE	2	6	57	600	621	600	36	3.59
23	CHOCOLATE CHIP COOKIE	1	0	0	0	0	0	0	0.00
23	CHOCOLATE CHIP COOKIE	2	300	495	378	552	300	243	24.29
26	LUCY ELLEN NUT FUDGE	1	0	0	0	0	0	0	0.00
26	LUCY ELLEN NUT FUDGE	2	0	51	0	0	0	51	5.10

27	5TH AVENUE	1	0	0	120	120	120	0	0.00
27	5TH AVENUE	2	0	0	480	501	480	-21	-2.09
28	WINDMILL COOKIE	1	178	178	180	300	300	178	17.80
28	WINDMILL COOKIE	2	200	323	100	253	100	170	17.00
29	CARAVELLE	1	0	0	0	0	0	0	0.00
29	CARAVELLE	2	276	471	114	309	0	162	16.20
30	TOFFEE CRISP	1	0	0	360	360	360	0	0.00
30	TOFFEE CRISP	2	0	102	0	0	0	102	10.20
31	LUCY ELLEN JELLY BAR	1	0	0	0	0	0	0	0.00
31	LUCY ELLEN JELLY BAR	2	120	222	360	391	360	191	19.10
32	CHUNKY	1	0	0	0	0	0	0	0.00
32	CHUNKY	2	5	5	0	0	0	5	0.50
34	BUTTERFINGER	1	350	547	234	482	288	353	35.30
34	BUTTERFINGER	2	61	163	0	0	0	163	16.29
35	TOOTSIE ROLL	1	100	202	48	201	200	201	20.10
35	TOOTSIE ROLL	2	516	598	322	425	100	273	27.34
37	HERSHEY MILK CHOCOLATE BAR	1	0	0	0	0	0	0	0.00
37	HERSHEY MILK CHOCOLATE BAR	2	0	0	288	288	288	0	0.00
39	CHERRY RED LICORICE	1	0	0	0	0	0	0	0.00
39	CHERRY RED LICORICE	2	100	100	0	0	0	100	10.00
TOTALS-		1	3649	6129	2710	5190	2948	3387	386.70
TOTALS-		2	3554	5429	5479	7354	4908	2983	298.29

**********WEEK 3 **********

NO.	BRAND OF CANDY	ROUTE	STOCK-OUTS	EXPOSURES	STOCK-OUTS/EXPOSURES(PCT)	SALES/EXPOSURES
2	NESTLE CRUNCH	1	0	31	0.00	[illegible]
2	NESTLE CRUNCH	2	1	30	3.33	10.43
3	WAYNE MAPLE BUN	1	0	2	0.00	25.50
3	WAYNE MAPLE BUN	2	0	0	0.00	0.00
4	MILKSHAKE	1	0	6	0.00	0.00
4	MILKSHAKE	2	0	0	0.00	0.00
6	O'HENRY	1	0	23	0.00	[illegible]
6	O'HENRY	2	0	0	0.00	0.00
7	PAYDAY	1	0	8	0.00	[illegible]
7	PAYDAY	2	0	0	0.00	0.00
8	POWERHOUSE	1	0	3	0.00	39.00
8	POWERHOUSE	2	1	10	10.00	[illegible]
9	ZAGNUT	1	0	2	0.00	25.50
9	ZAGNUT	2	0	0	0.00	0.00
10	PLANTER JUMBO BLOCK	1	0	19	0.00	15.00
10	PLANTER JUMBO BLOCK	2	3	28	10.71	[illegible]
12	MOUNDS	1	0	31	0.00	[illegible]
12	MOUNDS	2	0	2	0.00	[illegible]
13	LUCY ELLEN VANILLA PEANUT CLUSTER	1	0	12	0.00	0.00
13	LUCY ELLEN VANILLA PEANUT CLUSTER	2	0	0	0.00	0.00
16	BAGGED PEANUTS	1	3	31	9.67	[illegible]
16	BAGGED PEANUTS	2	9	28	32.14	[illegible]
16	PEANUT BUTTER CHEESE CRACKER	1	0	31	0.00	[illegible]
18	PEANUT BUTTER CHEESE CRACKER	2	6	24	25.00	[illegible]
19	LEMON-LIME CREME COOKIE	1	0	2	0.00	[illegible]
19	LEMON-LIME CREME COOKIE	2	0	0	0.00	0.00
20	VANILLA CREME COOKIE	1	0	17	0.00	[illegible]
20	VANILLA CREME COOKIE	2	0	0	0.00	[illegible]
21	SHORTBREAD	1	0	31	0.00	[illegible]
21	SHORTBREAD	2	3	28	10.71	[illegible]
22	CHOCOLATE CREME COOKIE	1	0	0	0.00	0.00
22	CHOCOLATE CREME COOKIE	2	0	6	0.00	0.00
23	CHOCOLATE CHIP COOKIE	1	0	0	0.00	[illegible]
23	CHOCOLATE CHIP COOKIE	2	0	28	0.00	[illegible]
26	LUCY ELLEN NUT FUDGE	1	0	0	0.00	0.00
26	LUCY ELLEN NUT FUDGE	2	0	6	0.00	[illegible]

27 5TH AVENUE	1	0	0	0.00	0.00
27 5TH AVENUE	2	0	0	0.00	0.00
28 WINDMILL COOKIE	1	0	12	0.00	14.33
28 WINDMILL COOKIE	2	1	20	5.00	8.50
29 CARAVELLE	1	0	0	0.00	0.00
29 CARAVELLE	2	0	30	0.00	5.40
30 TOFFEE CRISP	1	0	0	0.00	0.00
30 TOFFEE CRISP	2	0	6	0.00	17.00
31 LUCY ELLEN JELLY BAR	1	0	0	0.00	0.00
31 LUCY ELLEN JELLY BAR	2	1	6	16.66	31.83
32 CHUNKY	1	0	0	0.00	0.00
32 CHUNKY	2	0	0	0.00	0.00
34 BUTTERFINGER	1	0	29	0.00	12.17
34 BUTTERFINGER	2	0	4	0.00	40.75
35 TOOTSIE ROLL	1	1	15	6.66	13.40
35 TOOTSIE ROLL	2	1	14	7.14	19.50
37 HERSHEY MILK CHOCOLATE BAR	1	0	0	0.00	0.00
37 HERSHEY MILK CHOCOLATE BAR	2	0	0	0.00	0.00
39 CHERRY RED LICORICE	1	0	0	0.00	0.00
39 CHERRY RED LICORICE	2	0	0	0.00	0.00
AVERAGES-TOTALS	1	4	310	1.29	12.53
AVERAGES-TOTALS	2	26	270	9.62	11.04

SERVICEMAN 1 AVERAGE STOCK-OUTS PER SERVICE 0.26
SERVICEMAN 2 AVERAGE STOCK-OUTS PER SERVICE 1.73

SERVICEMAN 1- 20 DIFFERENT BRANDS CARRIED. AVERAGE WEEKLY INVENTORY 259.50
SERVICEMAN 2- 21 DIFFERENT BRANDS CARRIED. AVERAGE WEEKLY INVENTORY 258.52

SERVICEMAN 1 MADE 13 COLUMN CHANGES IN 15 SERVICES, OR 0.86 CHANGES PER SERVICE.
SERVICEMAN 2 MADE 32 COLUMN CHANGES IN 15 SERVICES, OR 2.13 CHANGES PER SERVICE.

**********WEEK 4 **********

DISPLAY PATTERNS ROUTE 1

MACHINE	DAY OF SERVICE	COLUMN 1	2	3	4	5	6	7	8	9	10
1	SAT	18	16	12	6	20	21	2	34	35	10
	MON	18	16	12	33	20	21	2	34	35	10
	WEDS	18	16	12	33	30	21	2	34	35	10
2	FRI	18	16	12	6	28	21	2	34	35	10
	MON	18	16	12	33	28	21	2	34	35	10
	WEDS	18	16	12	33	28	21	2	30	35	10
3	FRI	18	16	12	8	28	21	2	34	13	10
	MON	18	16	12	33	28	21	2	34	13	10
	WEDS	18	16	12	33	28	33	2	34	15	10
4	FRI	18	16	12	8	28	21	2	34	35	10
	MON	18	16	12	33	28	21	2	34	30	10
	WEDS	18	16	12	33	28	30	2	34	15	10
5	FRI	18	16	12	6	20	21	2	34	4	13
	MON	18	16	12	6	20	21	2	34	4	13
	WEDS	18	16	12	6	20	21	2	34	4	15

DISPLAY PATTERNS ROUTE 2

MACHINE	DAY OF SERVICE	COLUMN 1	2	3	4	5	6	7	8	9	10
1	FRI	8	16	6	28	23	21	10	29	2	35
	MON	27	16	35	28	23	21	10	29	2	10
	WEDS	16	31	35	22	23	18	10	29	2	27
2	FRI	16	29	2	10	0	6	21	8	23	28
	MON	16	29	2	18	0	22	35	10	23	28
	WEDS	16	29	2	18	0	22	35	10	35	27
3	FRI	16	23	18	29	10	21	6	28	2	21
	MON	16	23	18	29	10	21	27	28	2	21
	WEDS	16	23	18	29	10	35	27	28	2	29
4	FRI	29	21	23	18	10	16	35	2	0	0
	MON	29	21	23	18	16	2	35	10	0	0
	WEDS	29	21	23	18	16	37	35	10	0	0
5	FRI	27	22	29	16	35	18	31	10	0	0
	MON	27	22	29	16	35	18	31	10	0	0
	WEDS	27	22	29	16	35	18	31	10	0	0

**********WEEK 4 **********

NO. CANDY	BRAND OF CANDY	ROUTE	OLD BIN INV.	TOT. BEGIN. INVENTORY	NEW BIN INVENTORY	TOT. ENDING INVENTORY	ORDERS RECEIVED	UNIT SALES	DOLLAR SALES
2	NESTLE CRUNCH	1	208	456	33	281	0	175	17.50
2	NESTLE CRUNCH	2	0	184	0	102	0	82	8.20
4	MILKSHAKE	1	0	51	0	51	0	0	0.00
4	MILKSHAKE	2	0	0	0	0	0	0	0.00
6	O'HENRY	1	243	396	240	291	0	105	10.50
6	O'HENRY	2	107	260	0	0	0	260	26.00
8	POWERHOUSE	1	57	152	10	10	0	142	14.20
8	POWERHOUSE	2	43	145	0	0	0	145	14.50
10	PLANTER JUMBO BLOCK	1	131	328	69	268	240	302	30.20
10	PLANTER JUMBO BLOCK	2	546	751	98	252	0	499	49.90
12	MOUNDS	1	449	697	396	644	240	293	29.29
12	MOUNDS	2	480	480	377	428	0	52	5.19
13	LUCY ELLEN VANILLA PEANUT CLUSTER	1	0	95	0	51	0	44	4.40
13	LUCY ELLEN VANILLA PEANUT CLUSTER	2	0	0	0	0	0	0	0.00
14	SEVEN-UP	1	0	0	157	157	360	203	20.29
14	SEVEN-UP	2	0	0	360	432	60	-372	-37.20
15	LUDEN PEPPERMINT PATTIE	1	0	0	0	95	0	-95	-9.50
15	LUDEN PEPPERMINT PATTIE	2	0	0	0	0	0	0	0.00
16	BAGGED PEANUTS	1	499	747	429	677	600	670	67.00
16	BAGGED PEANUTS	2	772	977	526	782	300	495	49.50
18	PEANUT BUTTER CHEESE CRACKER	1	201	449	5	253	200	396	39.60
18	PEANUT BUTTER CHEESE CRACKER	2	889	992	476	681	0	311	31.10
20	VANILLA CREME COOKIE	1	0	102	0	51	0	51	5.10
20	VANILLA CREME COOKIE	2	0	0	0	0	0	0	0.00
21	SHORTBREAD	1	0	248	0	153	0	95	9.50
21	SHORTBREAD	2	0	225	0	21	0	204	20.40
22	CHOCOLATE CREME COOKIE	1	0	0	0	0	0	0	0.00
22	CHOCOLATE CREME COOKIE	2	600	621	425	548	0	73	7.30
23	CHOCOLATE CHIP COOKIE	1	0	0	0	0	0	0	0.00
23	CHOCOLATE CHIP COOKIE	2	378	552	178	374	0	179	17.90
27	5TH AVENUE	1	120	120	120	120	0	0	0.00
27	5TH AVENUE	2	480	501	155	308	0	193	19.29
28	WINDMILL COOKIE	1	160	306	6	152	0	154	15.35
28	WINDMILL COOKIE	2	100	253	0	102	0	151	15.10
29	CARAVELLE	1	0	0	0	0	0	0	0.00
29	CARAVELLE	2	114	309	0	174	0	135	13.50
30	TOFFEE CRISP	1	360	360	33	186	0	174	17.40
30	TOFFEE CRISP	2	0	0	0	0	0	0	0.00

31	LUCY ELLEN JELLY BAR	1	0	0	0	0	0	0.00
31	LUCY ELLEN JELLY BAR	2	360	391	276	309	120	200	20.20
32	CHUNKY	1	0	0	168	168	240	72	7.19
32	CHUNKY	2	0	0	0	0	0	0	0.00
33	BABY RUTH	1	0	0	74	315	432	117	11.70
33	BABY RUTH	2	0	0	0	0	0	0	0.00
34	BUTTERFINGER	1	234	482	264	461	288	309	30.90
34	BUTTERFINGER	2	0	0	0	0	0	0	0.00
35	TOOTSIE ROLL	1	48	201	0	102	0	99	9.89
35	TOOTSIE ROLL	2	322	425	81	214	0	211	21.10
36	HYDROX COOKIE	1	0	0	276	276	400	124	12.39
36	HYDROX COOKIE	2	0	0	200	200	200	0	0.00
37	HERSHEY MILK CHOCOLATE BAR	1	0	0	288	288	288	0	0.00
37	HERSHEY MILK CHOCOLATE BAR	2	288	288	401	504	144	-72	-7.19
TOTALS-		1	2710	5190	2568	5048	3288	3430	343.00
TOTALS-		2	5479	7354	3555	5430	824	2748	274.79

**********WEEK 4 **********

NO.	BRAND OF CANDY	ROUTE	STOCK-OUTS	EXPOSURES	STOCK-OUTS/EXPOSURES(PCT)	SALES/EXPOSURES
2	NESTLE CRUNCH	1	0	30	0.00	5.83
2	NESTLE CRUNCH	2	0	22	0.00	3.72
4	MILKSHAKE	1	0	6	0.00	0.00
4	MILKSHAKE	2	0	0	0.00	0.00
6	O'HENRY	1	0	9	0.00	11.66
6	O'HENRY	2	2	6	33.33	45.33
8	POWERHOUSE	1	0	4	0.00	35.50
8	POWERHOUSE	2	1	4	25.00	36.25
10	PLANTER JUMBO BLOCK	1	0	24	0.00	12.58
10	PLANTER JUMBO BLOCK	2	3	32	9.37	15.59
12	MOUNDS	1	0	30	0.00	9.75
12	MOUNDS	2	0	0	0.00	0.00
13	LUCY ELLEN VANILLA PEANUT CLUSTER	1	0	10	0.00	4.40
13	LUCY ELLEN VANILLA PEANUT CLUSTER	2	0	0	0.00	0.00
14	SEVEN-UP	1	0	0	0.00	0.00
14	SEVEN-UP	2	0	0	0.00	0.00
15	LUDEN PEPPERMINT PATTIE	1	0	4	0.00	-23.75
15	LUDEN PEPPERMINT PATTIE	2	0	0	0.00	0.00
16	BAGGED PEANUTS	1	3	30	10.00	22.33
16	BAGGED PEANUTS	2	9	30	30.00	18.50
18	PEANUT BUTTER CHEESE CRACKER	1	0	30	0.00	13.20
18	PEANUT BUTTER CHEESE CRACKER	2	6	24	25.00	12.95
20	VANILLA CREME COOKIE	1	0	9	0.00	5.66
20	VANILLA CREME COOKIE	2	0	0	0.00	0.00
21	SHORTBREAD	1	0	26	0.00	3.65
21	SHORTBREAD	2	2	20	10.00	10.20
22	CHOCOLATE CREME COOKIE	1	0	0	0.00	0.00
22	CHOCOLATE CREME COOKIE	2	0	12	0.00	6.08
23	CHOCOLATE CHIP COOKIE	1	0	0	0.00	0.00
23	CHOCOLATE CHIP COOKIE	2	1	22	4.54	8.13
27	5TH AVENUE	1	0	0	0.00	0.00
27	5TH AVENUE	2	2	16	12.50	12.06
28	WINDMILL COOKIE	1	0	18	0.00	8.55
28	WINDMILL COOKIE	2	0	18	0.00	8.38
29	CARAVELLE	1	0	0	0.00	0.00
29	CARAVELLE	2	1	30	3.33	4.50
30	TOFFEE CRISP	1	0	8	0.00	21.75
30	TOFFEE CRISP	2	0	0	0.00	0.00
31	LUCY ELLEN JELLY BAR	1	0	0	0.00	0.00
31	LUCY ELLEN JELLY BAR	2	1	8	12.50	25.25

32 CHUNKY	1	0	0	0.00	0.00
32 CHUNKY	2	0	0	0.00	0.00
33 BABY RUTH	1	0	20	0.00	5.85
33 BABY RUTH	2	0	0	0.00	0.00
34 BUTTERFINGER	1	0	28	0.00	11.03
34 BUTTERFINGER	2	0	0	0.00	0.00
35 TOOTSIE ROLL	1	1	14	7.14	7.07
35 TOOTSIE ROLL	2	1	24	4.16	8.79
36 HYDROX COOKIE	1	0	0	0.00	0.00
36 HYDROX COOKIE	2	0	0	0.00	0.00
37 HERSHEY MILK CHOCOLATE BAR	1	0	0	0.00	0.00
37 HERSHEY MILK CHOCOLATE BAR	2	0	2	0.00	-36.00
AVERAGES-TOTALS	1	4	300	1.33	11.43
AVERAGES-TOTALS	2	29	270	10.74	10.17

SERVICEMAN 1 AVERAGE STOCK-OUTS PER SERVICE 0.26
SERVICEMAN 2 AVERAGE STOCK-OUTS PER SERVICE 1.93

SERVICEMAN 1- 22 DIFFERENT BRANDS CARRIED. AVERAGE WEEKLY INVENTORY 229.45
SERVICEMAN 2- 18 DIFFERENT BRANDS CARRIED. AVERAGE WEEKLY INVENTORY 301.66

SERVICEMAN 1 MADE 13 COLUMN CHANGES IN 15 SERVICES, OR 0.86 CHANGES PER SERVICE.
SERVICEMAN 2 MADE 44 COLUMN CHANGES IN 15 SERVICES, OR 2.93 CHANGES PER SERVICE.

**********WEEK 5 **********

DISPLAY PATTERNS ROUTE 1

MACHINE	DAY OF SERVICE	COLUMN 1	2	3	4	5	6	7	8	9	10
1	SAT	18	16	12	33	30	21	2	34	35	10
	WEDS	18	16	12	33	30	21	2	34	14	10
2	FRI	18	16	12	33	28	21	2	30	35	10
	SAT	18	16	12	33	28	21	2	30	35	10
	WEDS	18	16	12	33	28	32	2	30	35	10
3	SAT	18	16	12	33	28	33	2	34	15	10
	WEDS	18	16	12	33	28	33	2	34	15	10
	FRI	18	16	12	33	28	33	2	34	14	38
4	THUR	18	16	12	33	28	30	2	34	15	10
	SAT	18	16	12	33	28	30	2	34	15	10
	WEDS	18	16	12	33	28	30	2	34	15	10
5	FRI	18	16	12	6	20	21	2	34	4	13
	WEDS	18	16	12	33	36	32	2	34	14	13

DISPLAY PATTERNS ROUTE 2

MACHINE	DAY OF SERVICE	COLUMN 1	2	3	4	5	6	7	8	9	10
1	FRI	16	18	35	22	23	18	10	29	2	27
	MON	16	36	35	22	23	18	14	29	12	31
	WEDS	16	36	21	22	18	32	14	2	12	31
2	FRI	16	29	2	14	0	22	37	16	23	37
	MON	16	12	31	14	0	22	37	18	23	37
	WEDS	34	12	31	14	0	22	37	18	23	37
3	FRI	16	23	18	29	10	35	27	28	12	24
	MON	16	23	18	29	36	14	27	28	12	35
	WEDS	16	23	18	22	36	14	27	28	12	31
4	FRI	29	21	23	18	16	37	35	10	0	0
	MON	12	22	23	18	31	14	37	16	0	0
	WEDS	12	22	23	18	31	14	37	16	0	0
5	FRI	37	22	23	14	10	18	31	16	0	0
	MON	37	22	36	14	10	18	31	16	0	0
	WEDS	37	22	36	14	31	18	30	16	0	0

**********WEEK 5 **********

NO. CANDY	BRAND OF CANDY	ROUTE	OLD BIN INV.	TOT. BEGIN. INVENTORY	NEW BIN INVENTORY	TOT. ENDING INVENTORY	ORDERS RECEIVED	UNIT SALES	DOLLAR SALES
2	NESTLE CRUNCH	1	33	281	0	197	0	84	8.39
2	NESTLE CRUNCH	2	0	102	0	0	0	102	10.20
4	MILKSHAKE	1	0	51	0	0	0	51	5.10
4	MILKSHAKE	2	0	0	0	0	0	0	0.00
6	O'HENRY	1	240	291	240	240	0	51	5.10
6	O'HENRY	2	0	0	110	161	120	-41	-4.10
8	POWERHOUSE	1	10	10	0	0	0	10	1.00
8	POWERHOUSE	2	0	0	0	0	0	0	0.00
10	PLANTER JUMBO BLOCK	1	69	266	524	575	480	171	17.10
10	PLANTER JUMBO BLOCK	2	98	252	240	240	480	492	49.20
12	MOUNDS	1	396	644	370	618	240	266	26.59
12	MOUNDS	2	377	428	169	343	0	85	8.50
13	LUCY ELLEN VANILLA PEANUT CLUSTER	1	0	51	0	0	0	51	5.10
13	LUCY ELLEN VANILLA PEANUT CLUSTER	2	0	0	0	0	0	0	0.00
14	SEVEN-UP	1	157	157	158	406	244	-5	-0.50
14	SEVEN-UP	2	360	432	64	248	0	184	18.40
15	LUDEN PEPPERMINT PATTIE	1	0	95	0	0	0	95	9.50
15	LUDEN PEPPERMINT PATTIE	2	0	0	0	0	0	0	0.00
16	BAGGED PEANUTS	1	429	677	465	713	600	564	56.40
16	BAGGED PEANUTS	2	526	782	400	564	400	618	61.80
18	PEANUT BUTTER CHEESE CRACKER	1	5	253	247	495	1000	758	75.80
18	PEANUT BUTTER CHEESE CRACKER	2	476	681	578	783	500	398	39.80
20	VANILLA CREME COOKIE	1	0	51	0	0	0	51	5.10
20	VANILLA CREME COOKIE	2	0	0	0	0	0	0	0.00
21	SHORTBREAD	1	0	153	0	0	0	153	15.29
21	SHORTBREAD	2	0	21	0	51	0	-30	-3.00
22	CHOCOLATE CREME COOKIE	1	0	0	0	0	0	0	0.00
22	CHOCOLATE CREME COOKIE	2	425	548	226	421	0	127	12.70
23	CHOCOLATE CHIP COOKIE	1	0	0	0	0	0	0	0.00
23	CHOCOLATE CHIP COOKIE	2	173	373	0	72	0	301	30.09
27	5TH AVENUE	1	120	120	120	120	0	0	0.00
27	5TH AVENUE	2	155	308	63	165	120	263	26.29
28	WINDMILL COOKIE	1	6	152	0	44	0	108	10.80
28	WINDMILL COOKIE	2	0	102	0	51	0	51	5.10
29	CARAVELLE	1	0	0	0	0	0	0	0.00
29	CARAVELLE	2	0	174	0	0	0	174	17.40

30	TOFFEE CRISP	1	33	186	0	102	0	84	8.33
30	TOFFEE CRISP	2	0	0	0	0	0	0	0.00
31	LUCY ELLEN JELLY BAR	1	0	0	0	0	0	0	0.00
31	LUCY ELLEN JELLY BAR	2	278	309	0	123	0	186	18.60
32	CHUNKY	1	168	168	0	51	0	117	11.70
32	CHUNKY	2	0	0	72	123	120	-3	-0.30
33	BABY RUTH	1	74	315	144	392	432	355	35.50
33	BABY RUTH	2	0	0	0	0	0	0	0.00
34	BUTTERFINGER	1	264	461	132	329	144	276	27.54
34	BUTTERFINGER	2	0	0	0	51	144	93	9.30
35	TOOTSIE ROLL	1	0	102	0	95	0	7	0.70
35	TOOTSIE ROLL	2	81	214	300	300	300	214	21.40
36	HYDROX COOKIE	1	276	276	270	474	300	102	10.20
36	HYDROX COOKIE	2	200	200	52	175	0	25	2.50
37	HERSHEY MILK CHOCOLATE BAR	1	288	288	180	231	0	57	5.69
37	HERSHEY MILK CHOCOLATE BAR	2	401	504	248	402	144	246	24.60
38	SUNFLOWER SEEDS	1	0	0	500	748	800	52	5.19
38	SUNFLOWER SEEDS	2	0	0	900	952	900	-52	-5.19
39	CHERRY RED LICORICE	1	0	0	0	0	0	0	0.00
39	CHERRY RED LICORICE	2	0	0	240	312	240	-72	-7.19
40	ORANGE CREME COOKIE	1	0	0	0	0	0	0	0.00
40	ORANGE CREME COOKIE	2	0	0	400	400	400	0	0.00
TOTALS-		1	2568	5048	3350	5830	4240	3458	345.79
TOTALS-		2	3555	5430	4062	5937	3868	3361	336.10

**********WEEK 5 **********

NO.	BRAND OF CANDY	ROUTE	STOCK-OUTS	EXPOSURES	STOCK-OUTS/EXPOSURES(PCT)	SALES/EXPOSURES
2	NESTLE CRUNCH	1	0	31	0.00	2.70
2	NESTLE CRUNCH	2	0	6	0.00	17.00
4	MILKSHAKE	1	0	4	0.00	12.75
4	MILKSHAKE	2	0	0	0.00	0.00
6	O'HENRY	1	0	4	0.00	12.75
6	O'HENRY	2	0	0	0.00	0.00
5	POWERHOUSE	1	0	0	0.00	0.00
8	POWERHOUSE	2	0	0	0.00	0.00
10	PLANTER JUMBO BLOCK	1	0	23	0.00	7.43
10	PLANTER JUMBO BLOCK	2	2	10	20.00	49.20
12	MOUNDS	1	0	31	0.00	8.58
12	MOUNDS	2	0	18	0.00	4.72
13	LUCY ELLEN VANILLA PEANUT CLUSTER	1	0	6	0.00	8.50
13	LUCY ELLEN VANILLA PEANUT CLUSTER	2	0	0	0.00	0.00
14	SEVEN-UP	1	0	6	0.00	-0.83
14	SEVEN-UP	2	0	26	0.00	7.07
15	LUDEN PEPPERMINT PATTIE	1	0	12	0.00	7.91
15	LUDEN PEPPERMINT PATTIE	2	0	0	0.00	0.00
16	BAGGED PEANUTS	1	2	31	6.45	18.19
16	BAGGED PEANUTS	2	6	32	18.75	19.21
18	PEANUT BUTTER CHEESE CRACKER	1	5	31	16.12	24.45
18	PEANUT BUTTER CHEESE CRACKER	2	4	32	12.50	12.43
20	VANILLA CREME COOKIE	1	0	4	0.00	12.75
20	VANILLA CREME COOKIE	2	0	0	0.00	0.00
21	SHORTBREAD	1	0	13	0.00	11.76
21	SHORTBREAD	2	1	4	25.00	-7.50
22	CHOCOLATE CREME COOKIE	1	0	0	0.00	0.00
22	CHOCOLATE CREME COOKIE	2	1	26	3.84	4.88
23	CHOCOLATE CHIP COOKIE	1	0	0	0.00	0.00
23	CHOCOLATE CHIP COOKIE	2	0	24	0.00	12.54
27	5TH AVENUE	1	0	0	0.00	0.00
27	5TH AVENUE	2	1	10	10.00	26.30
28	WINDMILL COOKIE	1	0	20	0.00	5.40
28	WINDMILL COOKIE	2	0	8	0.00	6.37
29	CARAVELLE	1	0	0	0.00	0.00
29	CARAVELLE	2	2	12	16.66	14.50

30 TOFFEE CRISP	1	0	18	0.00	4.66
30 TOFFEE CRISP	2	0	0	0.00	0.00
31 LUCY ELLEN JELLY BAR	1	0	0	0.00	0.00
31 LUCY ELLEN JELLY BAR	2	2	22	9.09	8.45
32 CHUNKY	1	0	4	0.00	29.25
32 CHUNKY	2	1	2	50.00	-1.50
33 BABY RUTH	1	0	34	0.00	10.44
33 BABY RUTH	2	0	0	0.00	0.00
34 BUTTERFINGER	1	0	25	0.00	11.04
34 BUTTERFINGER	2	0	2	0.00	46.50
35 TOOTSIE ROLL	1	0	9	0.00	0.77
35 TOOTSIE ROLL	2	0	10	0.00	21.40
36 HYDROX COOKIE	1	0	2	0.00	51.00
36 HYDROX COOKIE	2	0	14	0.00	1.78
37 HERSHEY MILK CHOCOLATE BAR	1	0	0	0.00	0.00
37 HERSHEY MILK CHOCOLATE BAR	2	1	24	4.16	10.25
38 SUNFLOWER SEEDS	1	1	2	50.00	26.00
38 SUNFLOWER SEEDS	2	0	4	0.00	-13.00
39 CHERRY RED LICORICE	1	0	0	0.00	0.00
39 CHERRY RED LICORICE	2	0	0	0.00	0.00
40 ORANGE CREME COOKIE	1	0	0	0.00	0.00
40 ORANGE CREME COOKIE	2	0	0	0.00	0.00
AVERAGES-TOTALS	1	8	310	2.58	11.15
AVERAGES-TOTALS	2	21	286	7.34	11.75

SERVICEMAN 1 AVERAGE STOCK-OUTS PER SERVICE 0.61
SERVICEMAN 2 AVERAGE STOCK-OUTS PER SERVICE 1.40

SERVICEMAN 1- 23 DIFFERENT BRANDS CARRIED. AVERAGE WEEKLY INVENTORY 219.47
SERVICEMAN 2- 22 DIFFERENT BRANDS CARRIED. AVERAGE WEEKLY INVENTORY 245.81

SERVICEMAN 1 MADE 25 COLUMN CHANGES IN 13 SERVICES, OR 1.92 CHANGES PER SERVICE.
SERVICEMAN 2 MADE 50 COLUMN CHANGES IN 15 SERVICES, OR 3.33 CHANGES PER SERVICE.

**********WEEK 6 **********

DISPLAY PATTERNS ROUTE 1

MACHINE	DAY OF SERVICE	COLUMN 1	2	3	4	5	6	7	8	9	10
1	FRI	18	16	12	33	36	10	2	34	14	38
	MON	18	16	12	33	36	10	2	34	14	38
	WEDS	18	16	12	33	36	10	2	34	14	38
2	FRI	18	16	12	33	36	35	37	30	14	33
	MON	18	16	12	33	36	35	37	30	14	38
	WEDS	18	16	12	33	36	35	37	30	14	38
3	MON	18	16	12	33	28	35	2	34	14	38
	WEDS	18	16	12	33	28	35	2	34	14	38
4	FRI	18	16	12	33	36	30	2	34	14	38
	MON	18	16	12	33	36	35	2	34	14	38
	WEDS	18	16	12	33	36	35	2	34	14	38
5	FRI	18	16	38	33	36	32	2	34	14	12
	WEDS	18	16	38	33	36	35	37	34	14	12

DISPLAY PATTERNS ROUTE 2

MACHINE	DAY OF SERVICE	COLUMN 1	2	3	4	5	6	7	8	9	10
1	FRI	16	36	21	22	18	32	14	37	12	31
	MON	16	36	38	22	18	31	14	37	12	39
	WEDS	16	36	38	22	31	18	33	37	39	12
2	FRI	34	12	31	14	0	22	27	18	6	37
	MON	16	12	38	39	0	23	18	35	31	37
	WEDS	16	38	18	39	0	36	31	26	14	37
3	FRI	16	23	18	22	38	14	27	28	12	39
	MON	38	23	16	22	36	14	31	37	18	39
	WEDS	16	33	38	23	36	18	12	37	31	39
4	FRI	12	22	23	18	38	14	37	16	0	0
	MON	39	22	36	18	38	31	37	16	0	0
	WEDS	39	23	36	18	38	31	37	16	0	0
5	MON	37	22	36	31	39	18	38	16	0	0
	WEDS	37	22	36	31	39	18	38	16	0	0

**********WEEK 6 **********

NO. CANDY	BRAND OF CANDY	ROUTE	OLD BIN INV.	TOT. BEGIN. INVENTORY	NEW BIN INVENTORY	TOT. ENDING INVENTORY	ORDERS RECEIVED	UNIT SALES	DOLLAR SALES
2	NESTLE CRUNCH	1	0	197	0	95	0	102	10.20
2	NESTLE CRUNCH	2	0	0	0	0	0	0	0.00
6	O'HENRY	1	240	240	240	240	0	0	0.00
6	O'HENRY	2	110	161	0	0	0	161	16.10
10	PLANTER JUMBO BLOCK	1	524	575	598	598	240	217	21.70
10	PLANTER JUMBO BLOCK	2	240	240	128	159	0	81	8.10
12	MOUNDS	1	370	618	257	505	240	353	35.30
12	MOUNDS	2	169	343	360	462	480	361	36.09
14	SEVEN-UP	1	158	406	194	442	240	204	20.40
14	SEVEN-UP	2	64	248	240	291	240	197	19.70
16	BAGGED PEANUTS	1	465	713	449	697	600	616	61.59
16	BAGGED PEANUTS	2	400	564	301	516	400	448	44.80
18	PEANUT BUTTER CHEESE CRACKER	1	247	495	400	648	800	647	64.69
18	PEANUT BUTTER CHEESE CRACKER	2	578	783	609	865	500	418	41.80
21	SHORTBREAD	1	0	0	0	51	0	-51	-5.10
21	SHORTBREAD	2	0	51	400	400	400	51	5.10
22	CHOCOLATE CREME COOKIE	1	0	0	0	0	0	0	0.00
22	CHOCOLATE CREME COOKIE	2	226	421	0	0	0	421	42.09
23	CHOCOLATE CHIP COOKIE	1	0	0	0	0	0	0	0.00
23	CHOCOLATE CHIP COOKIE	2	0	72	0	123	0	-51	-5.10
27	5TH AVENUE	1	120	120	25	25	0	95	9.50
27	5TH AVENUE	2	63	165	0	0	0	165	16.50
28	WINDMILL COOKIE	1	0	44	0	44	0	0	0.00
28	WINDMILL COOKIE	2	0	51	0	0	0	51	5.10
30	TOFFEE CRISP	1	0	102	0	102	0	0	0.00
30	TOFFEE CRISP	2	0	0	0	0	0	0	0.00
31	LUCY ELLEN JELLY BAR	1	0	0	0	0	0	0	0.00
31	LUCY ELLEN JELLY BAR	2	0	123	0	174	0	-51	-5.10
32	CHUNKY	1	0	51	0	0	0	51	5.10
32	CHUNKY	2	72	123	0	0	0	123	12.30
33	BABY RUTH	1	144	392	10	256	288	422	42.20
33	BABY RUTH	2	0	0	351	474	480	-42	-4.19
34	BUTTERFINGER	1	132	329	0	197	0	132	13.20
34	BUTTERFINGER	2	0	51	0	0	0	51	5.10
35	TOOTSIE ROLL	1	0	95	157	354	0	-259	-25.90
35	TOOTSIE ROLL	2	300	300	560	862	360	-2	-0.20
36	HYDROX COOKIE	1	270	474	315	468	300	306	30.59
36	HYDROX COOKIE	2	52	175	152	296	0	-121	-12.10

37	HERSHEY MILK CHOCOLATE BAR	1	180	231	73	226	144	149	14.89
37	HERSHEY MILK CHOCOLATE BAR	2	248	402	181	335	288	365	36.50
38	SUNFLOWER SEEDS	1	500	748	515	763	600	585	58.50
38	SUNFLOWER SEEDS	2	900	952	522	778	200	374	37.40
39	CHERRY RED LICORICE	1	0	0	0	0	0	0	0.00
39	CHERRY RED LICORICE	2	240	312	120	264	240	288	28.79
40	ORANGE CREME COOKIE	1	0	0	0	0	0	0	0.00
40	ORANGE CREME COOKIE	2	400	400	0	0	0	400	40.00
TOTALS-		1	3350	5830	3233	5713	3452	3569	356.90
TOTALS-		2	4062	5937	3924	5799	3540	3678	367.79

**********WEEK 6 **********

NO.	BRAND OF CANDY	ROUTE	STOCK-OUTS	EXPOSURES	STOCK-OUTS/EXPOSURES(PCT)	SALES/EXPOSURES
2	NESTLE CRUNCH	1	0	20	0.00	5.10
2	NESTLE CRUNCH	2	0	0	0.00	0.00
6	O'HENRY	1	0	0	0.00	0.00
6	O'HENRY	2	1	2	50.00	80.50
10	PLANTER JUMBO BLOCK	1	0	6	0.00	36.16
10	PLANTER JUMBO BLOCK	2	0	0	0.00	0.00
12	MOUNDS	1	0	31	0.00	11.38
12	MOUNDS	2	3	16	18.75	22.56
14	SEVEN-UP	1	0	31	0.00	6.58
14	SEVEN-UP	2	1	14	7.14	14.07
16	BAGGED PEANUTS	1	1	31	3.22	19.87
16	BAGGED PEANUTS	2	7	26	26.92	17.23
18	PEANUT BUTTER CHEESE CRACKER	1	3	31	9.67	20.87
18	PEANUT BUTTER CHEESE CRACKER	2	8	28	28.57	14.92
21	SHORTBREAD	1	0	0	0.00	0.00
21	SHORTBREAD	2	1	2	50.00	25.50
22	CHOCOLATE CREME COOKIE	1	0	0	0.00	0.00
22	CHOCOLATE CREME COOKIE	2	0	20	0.00	21.05
23	CHOCOLATE CHIP COOKIE	1	0	0	0.00	0.00
23	CHOCOLATE CHIP COOKIE	2	0	12	0.00	-4.25
27	5TH AVENUE	1	0	0	0.00	0.00
27	5TH AVENUE	2	2	4	50.00	41.25
28	WINDMILL COOKIE	1	0	4	0.00	0.00
28	WINDMILL COOKIE	2	1	2	50.00	25.50
30	TOFFEE CRISP	1	0	8	0.00	0.00
30	TOFFEE CRISP	2	0	0	0.00	0.00
31	LUCY ELLEN JELLY BAR	1	0	0	0.00	0.00
31	LUCY ELLEN JELLY BAR	2	6	24	25.00	-2.12
32	CHUNKY	1	0	4	0.00	12.75
32	CHUNKY	2	1	2	50.00	61.50
33	BABY RUTH	1	0	31	0.00	13.61
33	BABY RUTH	2	2	4	50.00	-10.50
34	BUTTERFINGER	1	0	25	0.00	5.28
34	BUTTERFINGER	2	1	2	50.00	25.50
35	TOOTSIE ROLL	1	1	19	5.26	-13.63
35	TOOTSIE ROLL	2	0	4	0.00	-0.50
36	HYDROX COOKIE	1	0	27	0.00	11.33
36	HYDROX COOKIE	2	0	22	0.00	-5.50

37 HERSHEY MILK CHOCOLATE BAR	1	0	11	0.00	13.54
37 HERSHEY MILK CHOCOLATE BAR	2	1	26	3.84	13.65
38 SUNFLOWER SEEDS	1	5	31	16.12	18.47
38 SUNFLOWER SEEDS	2	5	22	22.72	17.00
39 CHERRY RED LICORICE	1	0	0	0.00	0.00
39 CHERRY RED LICORICE	2	3	22	13.63	13.09
40 ORANGE CREME COOKIE	1	0	0	0.00	0.00
40 ORANGE CREME COOKIE	2	0	0	0.00	0.00
AVERAGES-TOTALS	1	10	310	3.22	11.51
AVERAGES-TOTALS	2	43	254	16.92	14.48

SERVICEMAN 1 AVERAGE STOCK-OUTS PER SERVICE 0.76
SERVICEMAN 2 AVERAGE STOCK-OUTS PER SERVICE 3.07

SERVICEMAN 1- 17 DIFFERENT BRANDS CARRIED. AVERAGE WEEKLY INVENTORY 336.05
SERVICEMAN 2- 21 DIFFERENT BRANDS CARRIED. AVERAGE WEEKLY INVENTORY 276.14

SERVICEMAN 1 MADE 9 COLUMN CHANGES IN 13 SERVICES, OR 0.69 CHANGES PER SERVICE.
SERVICEMAN 2 MADE 50 COLUMN CHANGES IN 14 SERVICES, OR 3.57 CHANGES PER SERVICE.

**********WEEK 7 **********

DISPLAY PATTERNS ROUTE 1

MACHINE	DAY OF SERVICE	COLUMN 1	2	3	4	5	6	7	8	9	10
1	FRI	18	16	12	33	30	21	37	34	14	38
	TUES	18	16	12	33	30	21	37	34	14	38
2	FRI	18	16	12	33	36	35	37	30	14	38
	TUES	18	16	12	33	36	35	37	27	14	38
3	FRI	18	16	12	33	28	35	2	34	14	38
	TUES	18	16	12	33	28	35	2	34	14	38
4	FRI	18	16	12	33	36	35	2	34	14	38
	TUES	18	16	12	33	36	35	2	34	14	38
5	TUES	18	16	38	33	36	35	37	34	14	12
	TUES	18	16	38	33	36	35	37	34	14	12

DISPLAY PATTERNS ROUTE 2

MACHINE	DAY OF SERVICE	COLUMN 1	2	3	4	5	6	7	8	9	10
1	FRI	16	36	38	18	18	33	31	37	38	12
	MON	16	21	38	18	18	33	31	37	35	12
2	FRI	16	38	18	39	0	23	31	35	14	33
	TUES	16	38	18	39	0	36	31	35	14	12
3	FRI	16	35	38	23	36	18	12	37	31	39
	MON	16	35	38	23	36	18	12	37	18	39
4	FRI	39	23	36	18	38	10	37	16	0	0
	MON	12	21	36	18	38	1	37	14	0	0
5	FRI	37	33	36	31	39	18	38	16	0	0
	MON	37	33	21	31	12	18	38	16	0	0

**********WEEK 7 **********

NO. CANDY	BRAND OF CANDY	ROUTE	OLD BIN INV.	TOT. BEGIN. INVENTORY	NEW BIN INVENTORY	TOT. ENDING INVENTORY	ORDERS RECEIVED	UNIT SALES	DOLLAR SALES
1	NESTLE ALMOND	1	0	0	0	0	0	0	0.00
1	NESTLE ALMOND	2	0	0	0	31	0	-31	-3.09
2	NESTLE CRUNCH	1	0	95	0	95	0	0	0.00
2	NESTLE CRUNCH	2	0	0	480	480	480	0	0.00
6	O'HENRY	1	240	240	0	0	0	240	24.00
6	O'HENRY	2	0	0	0	0	0	0	0.00
10	PLANTER JUMBO BLOCK	1	598	598	142	142	0	456	45.59
10	PLANTER JUMBO BLOCK	2	128	159	0	0	0	159	15.89
11	HERSHEYETTS	1	0	0	298	298	432	134	13.39
11	HERSHEYETTS	2	0	0	576	576	576	0	0.00
12	MOUNDS	1	257	505	281	529	240	216	21.60
12	MOUNDS	2	360	462	654	798	480	144	14.39
14	SEVEN-UP	1	194	442	172	420	0	22	2.20
14	SEVEN-UP	2	240	291	120	171	0	120	12.00
16	BAGGED PEANUTS	1	449	697	486	714	400	383	38.30
16	BAGGED PEANUTS	2	301	516	649	964	700	352	35.20
18	PEANUT BUTTER CHEESE CRACKER	1	400	648	559	807	800	441	44.09
18	PEANUT BUTTER CHEESE CRACKER	2	609	865	729	1067	500	278	27.79
20	VANILLA CREME COOKIE	1	0	0	200	200	200	0	0.00
20	VANILLA CREME COOKIE	2	0	0	0	0	0	0	0.00
21	SHORTBREAD	1	0	51	0	51	0	0	0.00
21	SHORTBREAD	2	400	400	280	373	0	27	2.70
23	CHOCOLATE CHIP COOKIE	1	0	0	0	0	0	0	0.00
23	CHOCOLATE CHIP COOKIE	2	0	123	0	51	0	72	7.19
24	TATER STIX	1	0	0	0	0	0	0	0.00
24	TATER STIX	2	0	0	1000	1000	1000	0	0.00
27	5TH AVENUE	1	25	25	0	51	0	-26	-2.59
27	5TH AVENUE	2	0	0	0	0	0	0	0.00
28	WINDMILL COOKIE	1	0	44	0	44	0	0	0.00
28	WINDMILL COOKIE	2	0	0	0	0	0	0	0.00
29	CARAVELLE	1	0	0	360	360	360	0	0.00
29	CARAVELLE	2	0	0	0	0	0	0	0.00
30	TOFFEE CRISP	1	0	102	0	51	0	51	5.10
30	TOFFEE CRISP	2	0	0	0	0	0	0	0.00
31	LUCY ELLEN JELLY BAR	1	0	0	0	0	0	0	0.00
31	LUCY ELLEN JELLY BAR	2	0	174	0	123	0	51	5.10
33	BABY RUTH	1	10	258	401	649	432	41	4.10
33	BABY RUTH	2	351	474	815	887	720	307	30.70

34	BUTTERFINGER	1	0	197	0	197	0	0	0.00
34	BUTTERFINGER	2	0	0	0	0	0	0	0.00
35	TOOTSIE ROLL	1	157	354	0	197	0	157	15.70
35	TOOTSIE ROLL	2	560	662	567	720	240	182	18.20
36	HYDROX COOKIE	1	315	468	102	255	0	213	21.29
36	HYDROX COOKIE	2	152	296	0	123	0	173	17.29
37	HERSHEY MILK CHOCOLATE BAR	1	73	226	15	168	0	58	5.80
37	HERSHEY MILK CHOCOLATE BAR	2	181	335	0	154	0	181	18.10
38	SUNFLOWER SEEDS	1	515	763	130	378	0	385	38.50
38	SUNFLOWER SEEDS	2	522	778	232	437	0	341	34.09
39	CHERRY RED LICORICE	1	0	0	360	360	360	0	0.00
39	CHERRY RED LICORICE	2	120	264	0	102	0	162	16.20
40	ORANGE CREME COOKIE	1	0	0	0	0	0	0	0.00
40	ORANGE CREME COOKIE	2	0	0	600	600	600	0	0.00
TOTALS-		1	3233	5713	3486	5966	3024	2771	277.10
TOTALS-		2	3924	5799	6702	8577	5296	2513	251.79

**********WEEK 7 **********

NO.	BRAND OF CANDY	ROUTE	STOCK-OUTS	EXPOSURES	STOCK-OUTS/EXPOSURES(PCT)	SALES/EXPOSURES
1	NESTLE ALMOND	1	0	0	0.00	0.00
1	NESTLE ALMOND	2	0	3	0.00	-10.33
2	NESTLE CRUNCH	1	0	10	0.00	0.00
2	NESTLE CRUNCH	2	0	0	0.00	0.00
6	O'HENRY	1	0	0	0.00	0.00
6	O'HENRY	2	0	0	0.00	0.00
10	PLANTER JUMBO BLOCK	1	0	0	0.00	0.00
10	PLANTER JUMBO BLOCK	2	1	2	50.00	79.50
11	HERSHEYETTS	1	0	0	0.00	0.00
11	HERSHEYETTS	2	0	0	0.00	0.00
12	MOUNDS	1	0	22	0.00	9.81
12	MOUNDS	2	0	16	0.00	9.00
14	SEVEN-UP	1	0	22	0.00	1.00
14	SEVEN-UP	2	2	5	40.00	24.00
16	BAGGED PEANUTS	1	0	22	0.00	17.40
16	BAGGED PEANUTS	2	1	25	4.00	14.08
18	PEANUT BUTTER CHEESE CRACKER	1	3	22	13.63	20.04
18	PEANUT BUTTER CHEESE CRACKER	2	2	35	5.71	7.94
20	VANILLA CREME COOKIE	1	0	0	0.00	0.00
20	VANILLA CREME COOKIE	2	0	0	0.00	0.00
21	SHORTBREAD	1	0	5	0.00	0.00
21	SHORTBREAD	2	0	9	0.00	3.00
23	CHOCOLATE CHIP COOKIE	1	0	0	0.00	0.00
23	CHOCOLATE CHIP COOKIE	2	0	10	0.00	7.20
24	TATER STIX	1	0	0	0.00	0.00
24	TATER STIX	2	0	0	0.00	0.00
27	5TH AVENUE	1	0	2	0.00	-13.00
27	5TH AVENUE	2	0	0	0.00	0.00
28	WINDMILL COOKIE	1	0	5	0.00	0.00
28	WINDMILL COOKIE	2	0	0	0.00	0.00
29	CARAVELLE	1	0	0	0.00	0.00
29	CARAVELLE	2	0	0	0.00	0.00
30	TOFFEE CRISP	1	0	8	0.00	6.37
30	TOFFEE CRISP	2	0	0	0.00	0.00
31	LUCY ELLEN JELLY BAR	1	0	0	0.00	0.00
31	LUCY ELLEN JELLY BAR	2	0	17	0.00	3.00
33	BABY RUTH	1	0	22	0.00	1.56
33	BABY RUTH	2	1	13	7.69	23.61
34	BUTTERFINGER	1	0	17	0.00	0.00
34	BUTTERFINGER	2	0	0	0.00	0.00

35 TOOTSIE ROLL	1	0	17	0.00	9.23
35 TOOTSIE ROLL	2	0	13	0.00	14.00
36 HYDROX COOKIE	1	0	12	0.00	17.75
36 HYDROX COOKIE	2	0	16	0.00	10.81
37 HERSHEY MILK CHOCOLATE BAR	1	0	12	0.00	4.83
37 HERSHEY MILK CHOCOLATE BAR	2	0	20	0.00	9.05
38 SUNFLOWER SEEDS	1	2	22	9.09	17.50
38 SUNFLOWER SEEDS	2	0	27	0.00	12.62
39 CHERRY RED LICORICE	1	0	0	0.00	0.00
39 CHERRY RED LICORICE	2	0	14	0.00	11.57
40 ORANGE CREME COOKIE	1	0	0	0.00	0.00
40 ORANGE CREME COOKIE	2	0	0	0.00	0.00
AVERAGES-TOTALS	1	5	220	2.27	12.59
AVERAGES-TOTALS	2	7	225	3.11	11.19

SERVICEMAN 1 AVERAGE STOCK-OUTS PER SERVICE 0.50
SERVICEMAN 2 AVERAGE STOCK-OUTS PER SERVICE 0.70

SERVICEMAN 1- 21 DIFFERENT BRANDS CARRIED. AVERAGE WEEKLY INVENTORY 272.04
SERVICEMAN 2- 19 DIFFERENT BRANDS CARRIED. AVERAGE WEEKLY INVENTORY 305.21

SERVICEMAN 1 MADE 3 COLUMN CHANGES IN 10 SERVICES, OR 0.30 CHANGES PER SERVICE.
SERVICEMAN 2 MADE 11 COLUMN CHANGES IN 10 SERVICES, OR 1.10 CHANGES PER SERVICE.

********** TOTALS **********

NO. CANDY	BRAND OF CANDY	ROUTE	OLD BIN INV.	TOT. BEGIN. INVENTORY	NEW BIN INVENTORY	TOT. ENDING INVENTORY	ORDERS RECEIVED	UNIT SALES	DOLLAR SALES
1	NESTLE ALMOND	1	0	44	0	0	0	44	4.40
1	NESTLE ALMOND	2	0	51	0	0	0	51	5.10
2	NESTLE CRUNCH	1	57	159	0	0	600	759	75.90
2	NESTLE CRUNCH	2	310	464	480	480	840	824	82.40
3	WAYNE MAPLE BUN	1	0	0	0	0	0	0	0.00
3	WAYNE MAPLE BUN	2	0	0	0	0	0	0	0.00
4	MILKSHAKE	1	0	197	0	0	0	197	19.70
4	MILKSHAKE	2	0	0	0	0	0	0	0.00
5	GIANT	1	0	102	0	0	0	102	10.20
5	GIANT	2	0	0	0	0	0	0	0.00
6	O'HENRY	1	466	714	0	0	480	1194	119.39
6	O'HENRY	2	77	77	0	0	240	317	31.70
7	PAYDAY	1	0	0	0	0	432	432	43.20
7	PAYDAY	2	0	184	0	0	0	184	18.40
8	POWERHOUSE	1	0	0	0	0	360	360	36.00
8	POWERHOUSE	2	82	287	0	0	120	407	40.70
9	ZAGNUT	1	27	275	0	0	0	275	27.50
9	ZAGNUT	2	0	123	0	0	0	123	12.30
10	PLANTER JUMBO BLOCK	1	65	65	142	142	1440	1363	136.30
10	PLANTER JUMBO BLOCK	2	0	0	0	0	1440	1440	144.00
11	HERSHEYETTS	1	0	0	298	298	432	134	13.38
11	HERSHEYETTS	2	0	0	576	576	576	0	0.00
12	MOUNDS	1	496	744	281	281	1680	2143	214.29
12	MOUNDS	2	165	370	654	654	1920	1636	163.60
13	LUCY ELLEN VANILLA PEANUT CLUSTER	1	0	197	0	0	0	197	19.70
13	LUCY ELLEN VANILLA PEANUT CLUSTER	2	0	51	0	0	0	51	5.10
14	SEVEN-UP	1	0	0	172	172	844	672	67.19
14	SEVEN-UP	2	0	0	120	120	300	180	18.00
15	LUDEN PEPPERMINT PATTIE	1	0	0	0	0	0	0	0.00
15	LUDEN PEPPERMINT PATTIE	2	0	0	0	0	0	0	0.00
16	BAGGED PEANUTS	1	888	1136	466	466	3560	4230	423.00
16	BAGGED PEANUTS	2	300	484	649	649	3620	3455	345.50
18	PEANUT BUTTER CHEESE CRACKER	1	552	800	559	559	3500	3741	374.10
18	PEANUT BUTTER CHEESE CRACKER	2	379	523	729	729	3200	2994	299.40
19	LEMON-LIME CREME COOKIE	1	0	51	0	0	0	51	5.10
19	LEMON-LIME CREME COOKIE	2	0	154	0	0	0	154	15.39
20	VANILLA CREME COOKIE	1	116	313	200	200	200	313	31.29
20	VANILLA CREME COOKIE	2	6	201	0	0	0	201	20.10

21 SHORTBREAD	1	108	356	0	0	100	456	45.59
21 SHORTBREAD	2	100	100	280	280	700	520	52.00
22 CHOCOLATE CREME COOKIE	1	0	51	0	0	200	251	25.10
22 CHOCOLATE CREME COOKIE	2	100	202	0	0	700	902	90.19
23 CHOCOLATE CHIP COOKIE	1	0	0	0	0	0	0	0.00
23 CHOCOLATE CHIP COOKIE	2	0	0	0	0	700	700	70.00
24 TATER STIX	1	0	0	0	0	0	0	0.00
24 TATER STIX	2	0	0	1000	1000	1000	0	0.00
25 NECCO CHOCOLATE ROLL	1	0	51	0	0	0	51	5.10
25 NECCO CHOCOLATE ROLL	2	0	0	0	0	0	0	0.00
26 LUCY ELLEN NUT FUDGE	1	0	0	0	0	0	0	0.00
26 LUCY ELLEN NUT FUDGE	2	0	51	0	0	0	51	5.10
27 5TH AVENUE	1	0	0	0	0	120	120	12.00
27 5TH AVENUE	2	0	21	0	0	600	621	62.09
28 WINDMILL COOKIE	1	0	0	0	0	300	300	30.00
28 WINDMILL COOKIE	2	500	500	0	0	500	1000	100.00
29 CARAVELLE	1	0	0	360	360	560	200	20.00
29 CARAVELLE	2	480	480	0	0	0	480	48.00
30 TOFFEE CRISP	1	0	0	0	0	360	360	36.00
30 TOFFEE CRISP	2	120	171	0	0	0	171	17.10
31 LUCY ELLEN JELLY BAR	1	0	0	0	0	0	0	0.00
31 LUCY ELLEN JELLY BAR	2	360	360	0	0	840	1200	120.00
32 CHUNKY	1	0	0	0	0	240	240	24.00
32 CHUNKY	2	203	203	0	0	120	323	32.30
33 BABY RUTH	1	0	0	401	401	1584	1183	118.30
33 BABY RUTH	2	0	0	815	815	1152	337	33.70
34 BUTTERFINGER	1	330	330	0	0	1152	1482	148.20
34 BUTTERFINGER	2	144	144	0	0	432	576	57.59
35 TOOTSIE ROLL	1	0	0	0	0	488	488	48.80
35 TOOTSIE ROLL	2	0	0	567	567	1600	1033	103.30
36 HYDROX COOKIE	1	0	0	102	102	1000	898	89.80
36 HYDROX COOKIE	2	0	0	0	0	200	200	20.00
37 HERSHEY MILK CHOCOLATE BAR	1	0	0	15	15	432	417	41.70
37 HERSHEY MILK CHOCOLATE BAR	2	0	0	0	0	864	864	86.40
38 SUNFLOWER SEEDS	1	0	0	130	130	1400	1270	127.00
38 SUNFLOWER SEEDS	2	0	0	232	232	1100	868	86.80
39 CHERRY RED LICORICE	1	0	0	360	360	360	0	0.00
39 CHERRY RED LICORICE	2	0	0	0	0	580	580	58.00
40 ORANGE CREME COOKIE	1	0	0	0	0	0	0	0.00
40 ORANGE CREME COOKIE	2	0	0	600	600	1000	400	40.00
TOTALS-	1	3105	5585	3486	3486	21824	23923	2392.30
TOTALS-	2	3325	5201	6702	6702	24344	22643	2264.30

********** TOTALS **********

NO.	BRAND OF CANDY	ROUTE	STOCK-OUTS	EXPOSURES	STOCK-OUTS/EXPOSURES(PCT)	SALES/EXPOSURES
1	NESTLE ALMOND	1	0	2	0.00	22.00
1	NESTLE ALMOND	2	0	11	0.00	4.63
2	NESTLE CRUNCH	1	0	164	0.00	4.62
2	NESTLE CRUNCH	2	1	108	0.92	7.62
4	MILKSHAKE	1	0	34	0.00	5.79
4	MILKSHAKE	2	0	0	0.00	0.00
5	GIANT	1	0	12	0.00	8.50
5	GIANT	2	0	2	0.00	0.00
6	OHENRY	1	0	92	0.00	12.97
6	OHENRY	2	7	18	38.88	17.61
7	PAYDAY	1	2	16	12.50	27.00
7	PAYDAY	2	6	16	37.50	11.50
8	POWERHOUSE	1	0	12	0.00	30.00
8	POWERHOUSE	2	2	50	4.00	8.14
9	ZAGNUT	1	0	36	0.00	7.63
9	ZAGNUT	2	2	8	25.00	15.37
10	PLANTER JUMBO BLOCK	1	0	86	0.00	15.84
10	PLANTER JUMBO BLOCK	2	9	78	11.53	18.46
11	REESHEYETTS	1	0	0	0.00	0.00
11	REESHEYETTS	2	0	0	0.00	0.00
12	MOUNDS	1	0	201	0.00	10.66
12	MOUNDS	2	4	100	4.00	16.36
13	LUCY ELLEN VANILLA PEANUT CLUSTER	1	0	68	0.00	2.89
13	LUCY ELLEN VANILLA PEANUT CLUSTER	2	0	8	0.00	6.37
14	SEVEN-UP	1	0	59	0.00	11.38
14	SEVEN-UP	2	3	45	6.66	4.00
16	BAGGED PEANUTS	1	13	201	6.46	21.04
16	BAGGED PEANUTS	2	43	193	22.27	17.90
18	PEANUT BUTTER CHEESE CRACKER	1	11	201	5.47	18.61
18	PEANUT BUTTER CHEESE CRACKER	2	31	191	16.23	15.67
19	LEMON-LIME CREME COOKIE	1	0	12	0.00	4.25
19	LEMON-LIME CREME COOKIE	2	1	20	5.00	7.70
20	VANILLA CREME COOKIE	1	0	78	0.00	4.01
20	VANILLA CREME COOKIE	2	3	30	10.00	6.70
21	SHORTBREAD	1	0	131	0.00	3.48
21	SHORTBREAD	2	8	75	10.66	6.93
22	CHOCOLATE CREME COOKIE	1	0	10	0.00	25.10
22	CHOCOLATE CREME COOKIE	2	1	74	1.35	12.18
23	CHOCOLATE CHIP COOKIE	1	0	0	0.00	0.00
23	CHOCOLATE CHIP COOKIE	2	1	118	0.84	5.93
24	TATER STIX	1	0	0	0.00	0.00
24	TATER STIX	2	0	0	0.00	0.00

25	NECCO CHOCOLATE ROLL	1	0	10	0.00	5.10
25	NECCO CHOCOLATE ROLL	2	0	0	0.00	0.00
26	LUCY ELLEN NUT FUDGE	1	0	0	0.00	0.00
26	LUCY ELLEN NUT FUDGE	2	0	18	0.00	2.83
27	5TH AVENUE	1	0	2	0.00	60.00
27	5TH AVENUE	2	6	34	17.64	18.26
28	WINDMILL COOKIE	1	0	59	0.00	5.08
28	WINDMILL COOKIE	2	4	60	6.66	16.66
29	CARAVELLE	1	0	4	0.00	50.00
29	CARAVELLE	2	3	92	3.26	5.21
30	TOFFEE CRISP	1	0	42	0.00	8.57
30	TOFFEE CRISP	2	0	40	0.00	4.27
31	LUCY ELLEN JELLY BAR	1	0	2	0.00	0.00
31	LUCY ELLEN JELLY BAR	2	10	95	10.52	12.63
32	CHUNKY	1	0	8	0.00	30.00
32	CHUNKY	2	4	24	16.66	13.45
33	BABY RUTH	1	0	107	0.00	11.05
33	BABY RUTH	2	3	17	17.64	19.82
34	BUTTERFINGER	1	1	146	0.68	10.15
34	BUTTERFINGER	2	1	18	5.55	32.00
35	TOOTSIE ROLL	1	3	78	3.84	6.25
35	TOOTSIE ROLL	2	2	73	2.73	14.15
36	HYDROX COOKIE	1	0	41	0.00	21.90
36	HYDROX COOKIE	2	0	52	0.00	3.84
37	HERSHEY MILK CHOCOLATE BAR	1	0	23	0.00	18.13
37	HERSHEY MILK CHOCOLATE BAR	2	2	72	2.77	12.00
38	SUNFLOWER SEEDS	1	8	55	14.54	23.09
38	SUNFLOWER SEEDS	2	5	53	9.43	16.37
39	CHERRY RED LICORICE	1	0	0	0.00	0.00
39	CHERRY RED LICORICE	2	3	36	8.33	16.11
40	ORANGE CREME COOKIE	1	0	0	0.00	0.00
40	ORANGE CREME COOKIE	2	0	0	0.00	0.00
AVERAGES-TOTALS		1	38	2010	1.89	11.90
AVERAGES-TOTALS		2	165	1829	9.02	12.48

SERVICEMAN 1 AVERAGE STOCK-OUTS PER SERVICE 0.42
SERVICEMAN 2 AVERAGE STOCK-OUTS PER SERVICE 1.68

SERVICEMAN 1- 35 DIFFERENT BRANDS CARRIED. AVERAGE WEEKLY INVENTORY 99.60
SERVICEMAN 2- 35 DIFFERENT BRANDS CARRIED. AVERAGE WEEKLY INVENTORY 148.60

SERVICEMAN 1 MADE 83 COLUMN CHANGES IN 90 SERVICES, OR 0.92 CHANGES PER SERVICE.
SERVICEMAN 2 MADE 271 COLUMN CHANGES IN 98 SERVICES, OR 2.76 CHANGES PER SERVICE.