UTILIZATION AND INVENTORY BENEFITS OF MICROCOMPUTERS IN SMALL APPAREL STORES

By

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CHAPTER I

INTRODUCTION

Approximately six million businesses are operating in the United States today. Most of these businesses can be described as small. Small businesses predominate in all types of industry and commerce, but particularly in retailing and service trades (Baumback, 1983). Considering the great number of potential customers, the computer industry has begun targeting its products to this group (Schwartz, 1979).

Small retailers have been slow to acquire and use the computer. The increasing capabilities and decreasing costs of computer systems now provide small retailers a greater opportunity to use them (Johnson and Hill, 1981).

Although many advances have occurred in computer hardware and software in recent years, these advances have not been matched by equal gains in effective computer usage (Hooper and Page, 1981). This imbalance is due in part to the fact that retailers are underutilizing their computer systems (Hooper and Page, 1981). Retailers often do not know the system's potential, and therefore, use it only to automate mechanical, clerical tasks. The computer is often used as an expensive adding machine.

Much has been written to assist small and large organizations in analyzing the potential benefits and costs of a computer system and in choosing an appropriate system (Decker, 1984; Garris and Burch, 1983; Heintz, 1981; Horr and Barker, 1984; Petro, 1983; Seigal and Seigal, 1984). Many small retailers, however, are not convinced that the benefits of using a computer justify the costs incurred.

The ability of a computer system to compile, process, store and manage information could be helpful to a small retailer who must perform many different management functions (Himrod, 1979). One of the most vital management functions of the small retailer is controlling inventory. Inventory represents the major capital investment of a small retailer (Baumback, 1983). Tasks related to inventory management have been consistently cited as major problems for small retailers (Khan and Rocha, 1982; Wichman, 1983). Since inventory related benefits are the most frequently cited advantages for computerization in large retail establishments, evidence of these benefits for small retailers could have promising implications.

Studies of small retailers have produced varying results as to the benefits obtained from computerization. Numerous microcomputer benefits have been theorized for the small retailer (Cook and Russell, 1977; Curling, Ernst, Ernst, and Hicks, 1979; Dologite, 1981; Himrod, 1979; Hooper and Page, 1981; Markland, 1972). Little empirical evidence has been reported to indicate whether these theoretical

benefits are actual. Research is needed to determine how microcomputers have been of benefit to the small retailer. Specifically, the inventory related benefits of computerization were studied.

Purpose and Objectives

The purpose of the study was to investigate the utilization and the inventory benefits of in-store microcomputer systems in small apparel stores. The objectives of the study were as follows:

1. To identify characteristics of users and non-users of microcomputer systems.
2. To identify differences between users and non-users of microcomputer systems.
3. To identify differences among microcomputer users.
4. To identify inventory related benefits of microcomputers for small apparel retailers.
5. To measure inventory performance ratios of small apparel retailers.

Assumptions and Limitations

This study is based on the assumption that improvements in inventory performance will be reflected in the inventory performance data. The study is limited by certain factors. Specifically, the sample was drawn from a population of retailers in the West South Central Region of the United States (Arkansas, Louisiana, Oklahoma, Texas). The

generality of the findings is limited to retailers with similar characteristics.

Definition of Terms

Throughout the study the following definitions were used:

Apparel Retailer - the owner, manager, and/or buyer of a store selling clothing and accessories for men, women, and/or children.

Computer - a device capable of performing systematic sequences of operation, including numerous arithmetic and logic procedures, without intervention by a human operator during the run (Silver, 1978).

Inventory Performance Data - data obtained from year-end financial statements that will be combined to calculate inventory performance ratios. For the purpose of this study, the inventory performance data are: gross sales, net sales, gross cost of goods sold, and average monthly inventory.

In-Store Microcomputer System - a microcomputer operated within the store premises.

Inventory Performance Ratios - a percentage representing the comparison of one number with another number. For the purpose of this study, three inventory performance ratios will be calculated: sales per square foot of selling space, stock turnover rate, and maintained markup.

Microcomputer - a small computer system built around a microprocessor but having all the necessary peripherals and memory to link with the outside world and store information (Bradbeer, DeBono, and Laurie, 1982).

Microcomputer System - includes the actual physical equipment and the computer programs and instructions.

Small Apparel Store - for the purpose of this study, a single unit operation, independently owned and managed, selling apparel and accessories for men, women, and/or children, with an annual sales volume of less than $5 million (13 "C.F.R." (1985) 268.)

CHAPTER II

REVIEW OF LITERATURE

Since customers are more sophisticated and competition more intense, it has become more important for the small business to analyze and use more information (Petrof, Carusone, and McDavid, 1972). Information can be defined as meaningful material which conveys knowledge usable by the recipient (Lusch, 1981). For information to be usable it must meet the following criteria:

1. help the recipient accomplish goals
2. be accurate
3. be available at the proper time
4. be in the proper place
5. be in the proper form
6. be understandable (Petrof, Carusone, and McDavid, 1972).

The microcomputer has been suggested as a tool for providing information that meets the criteria listed above.

Microcomputers have just recently become available to small businesses as a result of increasing technology. The benefits of computers for large retailers have been sub-

stantiated. However, the benefits for small apparel retailers are inconclusive. The first section of this chapter will contain selected literature pertaining to microcomputer uses and benefits for small apparel retailers. The second section will contain literature pertaining to the measurement of inventory performance. The last section will review the problems of small business.

Theoretical Framework

The information management concept will be used as a theoretical framework for this study (Petrof, Carusone, and McDavid, 1972). The information management concept recognizes that all businesses engage in activities related to clerical and record-keeping functions. For the small business, the owner and/or manager must be responsible for obtaining the required information to make sound decisions. The information management concept assumes that an internal information system be developed and implemented. This information system includes four basic operations: collecting, processing, retaining, and distributing information (Terry, 1966). (See Figure 1.)

A microcomputer is able to aid the retailer in collecting and retaining information. The owner or manager must be able to process this information into meaningful data and distribute the information where it can be used to benefit store operations. This research seeks to determine whether small apparel retailers have been able to

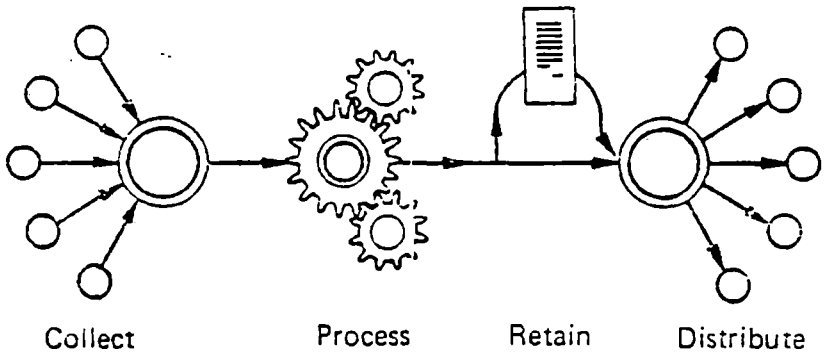

Figure 1. Information Management Concept

process and distribute information to lessen common inventory performance problems.

Microcomputers in Small Business

The silicon chip technology, which has made the relatively inexpensive microcomputer possible has affected virtually all industries and is increasingly affecting the jobs and lives of many people (Bradbeer, DeBono, and Laurie, 1982). Computing power is virtually the only commodity which is decreasing in cost each year. As a result, small apparel retailers have computers available today that were, until recently, available only to large retailers. Large retailers have obtained reduced markdowns, reduced inventory levels, increased stock turnover rates, and other benefits as a result of computerization (Abend, 1982a; Abend, 1982b; Computer-Monitored, 1981; Inventory Control, 1984; Jaffe, 1980; System Provides, 1981). The uses and benefits of microcomputers for small retailers have been inconclusive (Raymond and Magnenat-Thalmann, 1982).

Microcomputer Uses

Virtually all business applications can be computerized, but some applications are more suited for the capabilities of the microcomputer and the needs of the small business (Clifton, 1975). Microcomputers are particularly suited for applications that involve: a) a large number of transactions or records, b) complex computations or

processing requirements, c) access to records through many different indices, and d) generation of routine reports, labels, and statements (Curling et al., 1979).

Himrod (1979) identified the following microcomputer applications that were particularly helpful for a small business. These applications included general accounting, cost accounting, tax return preparation, customer listing preparation for advertising, and trend and statistical analysis. In addition, Abend (1983) found that small businesses were using microcomputers for inventory functions and financial management and for economizing in areas such as mail lists and garment alterations.

The small apparel retailers interviewed by Dayrit (1984) used the microcomputer to analyze sales, manage and analyze inventory, keep track of store information, and perform accounting operations. Cook and Russell (1977) surveyed small businesses to determine microcomputer uses. Of the 103 respondents, 59 were using a computer. The most common reason cited for computerization was to obtain better information for more informed decision making. The most common computer applications were accounts receivable, payroll, accounting statements, accounts payable, sales analysis, and inventory control.

Microcomputer Benefits

The microcomputer's penetration into the small business market began slowly but is increasing (Schwartz, 1979).

Small business owners have been hesitant to accept the microcomputer since the long list of theoretical benefits boasted by numerous salespeople has not been substantiated (Clifton, 1975). Studies have produced varying results regarding the benefits a microcomputer actually provides for the small retailer (Raymond and Magnenat-Thalmann, 1982).

Petro (1983) conducted a study to help small business persons understand, select, install, and use a microcomputer. Petro noted that microcomputer systems maximize stock turnover rates, maximize the use of labor, machines, and materials, reduce inventory levels, increase profitability, and provide management with more timely and accurate information.

Dologite (1981) identified credit management, inventory control, and management control as three areas in which a microcomputer could provide information to improve a small business. She studied examples of how small business managers were using microcomputers to manage each area more effectively. In the area of credit management, the small business managers studied were able to keep accounts up-to-date. As a result, the managers were able to obtain a running credit history for each customer, know immediately when a customer had reached the approved credit limit, quickly and accurately process collections, and mail statements on a timely basis. All these things helped to shorten the payment cycle and, thereby, improve the cash position of the business.

It was further noted by Dologite (1981) that the microcomputer allowed another business to improve inventory control. An item by item sales history allowed the manager to recognize trends and plan merchandise more effectively. A current inventory status information list enabled the manager to identify slow and fast moving merchandise or stock outages.

Another small business with a fully developed microcomputer system realized many management control benefits. By automating accounts payable, an accurate picture of the business's status with vendors was available at all times. The manager was able to obtain a quick overview of how much was owed, to whom, and on what date. Automating payroll allowed the manager to easily obtain the productivity of each employee and to predict labor requirements based upon sales.

Heintz (1981) cited many of the same benefits as Dologite (1981). These benefits included reducing personnel costs, reducing inventory levels, increasing sales through better service, controlling inventory shrinkage, improving the management of cash and receivables, and providing better overall management control.

Case studies of selected small apparel store owners were conducted by Dayrit (1984). The three most important benefits of the microcomputer system as cited by the small apparel store owners were a reduction in clerical work, an increase in store information, and a greater degree of

operation flexibility. The most important computer-generated information they obtained was related to inventory.

Clifton (1975), noted that all advantages of a microcomputer system must, in the long or short run, be financial. Without a financial gain, small businesses are not likely to consider the cost worthwhile. Clifton (1975) identified several areas in which a microcomputer achieved financial benefits for a small business. Sales analysis provided a cue to the patterns and trends of merchandise, which helped in predicting future sales. Cost of sales figures enabled managers to identify the most profitable items, the optimum selling price of each item, and the contribution of each product to total profit. Credit control can also be achieved through automation. The small business can reduce the amount of debt owed to them if they can keep an accurate record of customer credit limits and late payments. According to Clifton (1975), stock control can also benefit from automation. By closely monitoring stock levels, orders, purchase times, and demand, stock can be minimized and yet still meet consumer demand.

Markland (1972) surveyed small business owners to obtain their views of the potential benefits of a microcomputer. Sixty-four percent of those questioned viewed computerized reports as helpful. The largest portion of the same group responded unfavorably when asked about the feasibility of the microcomputer for their business. The

group indicated that a microcomputer system was either too costly or would be disliked by their employees, and would not work well for them.

Raymond and Magnenat-Thalman (1982) studied small businesses to determine problems, factual data on computer operations and opinions about computer-based information systems. Fifty-nine percent of the respondents were using computer-based information systems. Of the respondents using a computer system, 64 percent owned a microcomputer system, 12 percent leased a system, and 24 percent used service bureaus. Benefits perceived to be most important were more efficient operations, personnel reduction, and improved cash flow. Although the respondents stated these benefits of the microcomputer system, the problems faced by the users and non-users of the systems were the same. The researchers found no significant difference between the groups in terms of problem importance ratings and related information satisfaction.

Inventory Performance

Inventory represents the major capital investment of a small retailer. The ability to convert inventory into cash while producing a profit is vital to the success of the retailer (Baumback, 1983). Inventory must be evaluated in order to determine its efficiency and performance (Packard and Carron, 1982). If the retailer understands merchandise trends and patterns, the business will be on its way to

becoming more profitable (Bolen, 1982). Inventory performance is measured by evaluating sales and inventory data (Packard and Carron, 1982).

Sales

A sales figure has little meaning until it is refined and analyzed. By putting the sales figures in context, the retailer can determine whether the inventory is profit producing (Packard and Carron, 1982). While an increase in sales is normally seen as profitable, it can be deceptive. Nationally known retail organizations have been forced out of business while generating sales in the multi-million dollar range (Hartley, 1981). Two ratios are often calculated to analyze sales results and determine inventory performance. They are maintained markup and sales per square foot of selling space (Bolen, 1982; Lusch, 1981).

Actual markup is the difference between the cost of an item and its proposed selling price (Petrof, Carusone, and McDavid, 1972). It is often necessary to reduce the proposed selling price and the final selling price is called markdown. Excessive markdowns are a result of poor inventory management or more specifically, buying errors, pricing errors, or promotion errors (Lusch, 1981).

Maintained markup is the difference between the actual selling price and the gross cost of goods sold (Wingate, Schaller, and Miller, 1972). The formula for maintained markup is net sales minus gross cost of goods sold divided

by net sales. The maintained markup is often less than the initial markup since mark-downs, employee discounts, and stock shortages reduce it. The maintained markup must be adequate to cover operating expenses and still produce a profit.

Petrof, Carusone, and McDavid (1972) identify sales per square foot of selling space as a means by which managers can determine how efficiently inventory is handled. The formula for sales per square foot of selling space is gross sales divided by square feet of selling space. Store managers use this calculation to determine where their business stands in relation to the rest of the industry.

Inventory

Inventory performance can be measured by calculating the stock turnover rate (Britney, 1982). The owner's goal in bringing in merchandise is to plan the assortment so that each dollar invested will be productive in generating sales and profit. The stock turnover rate is used to measure how well this goal has been met (Wingate and Friedlander, 1978). Baumback (1983) described the inventory turnover rate as the small business person's best measure of how well purchases and inventory were managed.

Stock turnover rate, sometimes called inventory or merchandise turnover, is the measure of how quickly merchandise is sold and replaced by the store (Bolen, 1982). It is defined as the number of times during a specified

period of time that the average inventory of the store is replaced in order to support the store's level of sales. It is a measure of how long the merchandise is on hand before it is sold (Bolen, 1982).

Stock turnover rate is the ratio of net sales to average inventory (Britney, 1982). The higher the stock turnover rate, the shorter the length of time the merchandise is on hand. The lower the stock turnover rate, the longer the length of time the merchandise is on hand. A rapid turnover rate means the merchandise on hand is newer. It gives a greater return on the money that is committed to inventory, but can also cause an increase in some expenses (Lusch, 1982). As the stock turnover increases, the average inventory required decreases. Smaller inventories require a smaller amount of capital and thus the interest expense will be lower. Smaller inventories are also associated with increased expenses. More frequent purchases of small quantities often increases the costs of correspondence, clerical work, and shipping costs.

Stock turnover rates can help identify slow and fast moving merchandise. Turnover rates can be increased or decreased accordingly (Mayo and Rosenbloom, 1975). Although finding the optimal stock turnover rate is difficult, it is necessary in propelling the retailer towards the goal of high performance results (Lusch, 1982).

Problems of Small Business

Small businesses encounter problems common to large and medium size businesses, as well as problems unique to their size. Small businesses need the same type of information as larger businesses, but are disadvantaged in obtaining it (Senn and Gibson, 1981). The small business owner/manager must be a generalist and function in different roles as manager, buyer, seller, visual merchandiser, and advertiser, just to name a few. Small businesses lack the capital to obtain specialists for every role and lack the time to gather all the information needed to perform each role. Together, these two shortages create problems for the small business (Senn and Gibson, 1981).

Khan and Rocha (1982) investigated the recurring managerial problems of small businesses in a study of retail, manufacturing, and service firms located in New England. The investigation of 52 businesses included a review of the variables that affected profitability and the problem areas of small businesses. The major recurring problem areas were marketing, accounting, inventory control, and cash flow. These four areas will be used to categorize the problems of small business found by other researchers.

Marketing Problems

In the Khan and Rocha (1982) study, 68 percent of the manufacturing firms, 54 percent of the retailing firms, and

35 percent of the service firms experienced marketing problems. The researchers attributed this problem to a lack of knowledge of the target market. Without the necessary information to identify the target market, their products were not advertised or promoted successfully. Since the advertisements and promotions did not focus on any particular segment, they were ineffective.

An eight year study of small businesses in Alaska and Wyoming revealed more marketing problems (Wichman, 1983). Wichman cited marketing as the second biggest problem area for small businesses. The 762 small businesses responding found advertising and promotion, pricing, defining a target market, inadequate sales, layout and appearance, location, and seasonal variations in sales to be their most important marketing problems.

Accounting Problems

Accounting has been described as a means whereby business owners and managers can determine where they have been, where they are going, and how to get where they want to go (Baumback, 1983). Without accounting and record keeping information, managers do not know how effectively they are functioning. The accounting procedures of small businesses have been found to be inadequate and represent a second problem area (Khan and Rocha, 1982).

Wichman (1983) identified the most important accounting problem as record keeping, followed by the problems of

using accounting information, followed by controlling cash, and finally, controlling cost. The financial reports prepared by small businesses are few in number, and are usually pursued for tax purposes only. Financial reports are often not understood by the small business person, and consequently are of little use (Khan and Rocha, 1982).

The absence of financial information does not allow retailers to compare their financial data with that of others in the industry. Performance cannot be evaluated or improved if the retailer does not know where the business stands in relation to the industry average. Khan and Rocha (1982) concluded that the absence of financial information was a major reason why 75 percent of the businesses they studied had current ratios (current assets divided by current liabilities) below the industry average.

Senn and Gibson (1981) reported the following as common problems of small businesses, all of which could result from inadequate accounting procedures:

1. inadequate operating data
2. inaccurate, untimely, or irrelevant data
3. unknown costs, margins, and profits
4. failure to capture, maintain, or use historical or trend data
5. inefficient procedures
6. lack of adequate monitoring of operations

Other small business accounting problems have been identified. Markland (1972) conducted personal interviews

with representatives of 50 small businesses in St. Louis, Missouri. He found that maintaining adequate records and obtaining timely, relevant business information were among the top three problems of the respondents.

Inventory Problems

Inventory problems were cited most frequently in previous studies. Greenidge (1967) cited excessive markdowns absorbing profits as the biggest problem of the small specialty apparel retailer. Khan and Rocha (1982) found problems associated with carrying excessively high amounts of inventory, some of which was slow-moving or non-moving merchandise. They found that the small business people in their study were often ignorant of their inventory situation. This was attributed to ineffective accounting procedures discussed earlier.

One objective of a study by Wright (1967) was to investigate and categorize the major problems confronting retailers. One hundred questionnaires were mailed to chief executive officers of small, medium, and large retailing businesses. Of the problems identified by the respondents, a majority were inventory problems. The inventory related problems, in order of importance were: a) inventory shrinkage; b) identifying trends in merchandise movement; c) declining gross margins; d) increase in the number of stock-keeping units; and e) declining sales per square foot of selling space.

Cash Flow Problems

Khan and Rocha (1982) concluded that cash flow became a problem as a result of poor inventory control and a lack of marketing skills and accounting knowledge. Of the small businesses they studied, 46 percent of the small retailing businesses and 35 percent of the small service businesses were suffering from weak cash flows. The underlying factor contributing to the cash flow problem was the lack of understanding of pricing strategies. The small businesses surveyed were underpricing goods and/or services as the primary means of competition.

The major small business problems reported by Markland (1972) included one problem related to cash flow. Debt collection was seen as the fourth most important problem. Franklin and Goodwin (1983) mailed 10 thousand questionnaires to small businesses chosen randomly from a list provided by the Metropolitan Atlanta Area Chamber of Commerce. The researchers classified the problems into three types:

1. external factors - factors beyond the direct control of management

2. internal factors - items which management encountered daily and over which it has some degree of control

3. financial - a combination of internal financial factors and external capital markets.

Of the 46 problems identified by the respondents, seven were financial factors and related to cash flow. The problems were operating capital, collecting past accounts, credit terms, too much debt, long-term financing, mortgage loans, and accounts payable.

Other Problems

Markland (1972) identified unreliable and unskilled help as the second most important problem of the small business person. The respondents in Wright's (1973) survey found the low rate of employee productivity to be the second largest problem. Greenidge (1967) cited the high cost of employees to be a major problem for small specialty apparel retailers. He attributed this high cost to the level of demand for customer service in the specialty apparel shop. The increase in demand for customer service results in a high percentage of sales paying for employees.

The internal problems found by Franklin and Goodwin (1983) were predominately employee related. Record keeping and time management were the exceptions. The internal problems identified by the 670 respondents were labor quality, employee motivation, Occupational Safety and Health Administration (OSHA) regulations, employee insurance costs, personnel training, employee fringe benefits, and employee turnover.

External factors were ranked the highest by the respondents of the Franklin and Goodwin (1983) study. Six

of the top eight problems were external factors directly linked to the government. The problems the respondents identified were inflation, taxes, governmental intervention, difficulty with governmental regulations, paper work, and interaction with federal agencies. The authors concluded that the internal problems were indeed more important and usually the cause of failure. They observed that these businessmen were blaming the government and other outside forces instead of carefully studying and applying internal management strategies.

Summary

The small business person is faced with numerous problems. The ability of the owner or manager to overcome these problems is the key to success (Wright, 1973). Inventory problems were identified as the most important problems in previously conducted studies. This seems logical since the small retailer's biggest investment is in inventory (Baumback, 1983). Khan and Rocha (1983) suggested that inadequate accounting procedures presented the largest inventory problem for small retailers. The abilities of a microcomputer system to compile, process, store, and manage data may be a way for the small retailers to obtain the records necessary to improve inventory performance.

CHAPTER III

RESEARCH PROCEDURES

The purpose of the study was to investigate the utilization and the inventory benefits of in-store microcomputer systems in small apparel stores. The objectives of the study were as follows:

1. To identify characteristics of users and non-users of microcomputer systems.

2. To identify differences between users and non-users of microcomputer systems.

3. To identify differences among microcomputer users.

4. To identify inventory related benefits of microcomputers for small apparel retailers.

5. To measure inventory performance ratios of small apparel retailers.

The procedures used are discussed in the following sections: Selection of Stores, Development of Questionnaire, Pretest of Questionnaire, Collection of Data, and Analysis of Data.

Selection of Stores

Participants in the study were selected from Dun and Bradstreet's Million Dollar Directory (1985). This directory lists over 120,000 businesses which have more than

$500,000 in assets. Only those businesses listed as having sales under $5 million were used in this study. The small apparel retailers were selected from the West South Central Region as defined by the Statistical Abstracts of the United States (1980). This region includes Arkansas, Louisiana, Oklahoma, and Texas. The directory was used to obtain names, addresses, and the dollar sales volume of businesses listed in the following Standard Industrial Code (SIC) categories:

Men's, Boy's Clothing and Furnishings - SIC 5611
Women's Ready to Wear Stores - SIC 5621
Women's Accessory and Specialty Shops - SIC 5631
Children's and Infant's Wear Stores - SIC 5641
Family Clothing Stores - SIC 5651
Shoe Stores - SIC 5661
Furriers and Fur Shops - SIC 5681
Miscellaneous Apparel and Accessory Shops - SIC 5699

Table I indicates the number of stores surveyed in each state and in each store classification.

Development of Questionnaire

A questionnaire was designed to gather information about the small apparel retailers' use or non-use of microcomputers in order to accomplish the research objectives. Since it was unknown whether the retailers surveyed would be using any type of computer system, questions were directed at both non-computer users and computer users. Objective questions were used to obtain information on whether a microcomputer was being used, the type of computer software being used, the length of time the

TABLE I

NUMBER OF STORES SURVEYED BY STATE AND STORE CLASSIFICATION

Store Classification	State				Total
	Arkansas	Louisiana	Oklahoma	Texas	
Men's and Boy's Clothing and Furnishings (SIC 5611)	4	20	5	41	70
Women's Ready to Wear Stores (SIC 5621)	19	30	22	133	184
Women's Accessory and Specialty Shops (SIC 5631)	0	1	2	5	8
Children's and Infant's Wear Stores (SIC 5641)	2	5	5	13	25
Family Clothing Stores (SIC 5651)	2	19	30	51	102
Shoe Stores (SIC 5661)	8	8	8	24	48
Furriers and Fur Shops (SIC 5681)	1	0	1	1	3
Miscellaneous Apparel and Accessory Shops (SIC 5699)	4	6	3	17	30
Total	40	89	76	265	470

store had been computerized, the length of time the store had been in operation, reasons for computerization or non-computerization, and future involvement with computers. Objective questions were also used to obtain inventory performance data. The retailers were asked to indicate their approximate gross sales, net sales, gross cost of goods sold, average monthly inventory, and square feet of selling space. Retailers using microcomputers were requested to provide these figures for the year prior to the installation of the in-store microcomputer system and for the year 1984. Retailers not using computers were requested to provide these figures for the year 1984.

Check lists and rating scales were used to determine the inventory related information retailers obtained from the computer, the most beneficial inventory information obtained from the computer, and the extent to which the computer alleviated the common inventory problems of small apparel retailers. Two open-ended questions were included to determine the retailers' desired inventory control information and the business improvements since computerization.

Pretest of Questionnaire

The questionnaire was pretested with 92 small apparel retailers located in Kansas, Missouri, and Nebraska and listed in Dun and Bradstreet's Million Dollar Directory (1985). Twenty-six questionnaires were returned which represented a response rate of 28.26 percent. As a result

of the pretest, several changes were made on the questionnaire.

Several check list type questions gave respondents the option to add a response not included in the question. These "other" responses were used in most cases to improve the final questionnaire. An additional question directed to those not using a computer system was added due to the large percentage of non-computer users. Two questions pertaining to the type of store operated were eliminated. The researcher was able to obtain this information from Dun and Bradstreet's SIC identification of each store. A copy of the finalized questionnaire may be found in Appendix A.

Collection of Data

Each of the 470 small apparel stores selected for the study was mailed a packet containing the following items: a cover letter (Appendix B) explaining the purpose of the study and soliciting participation in the study, a copy of the questionnaire, and a coded postpaid return envelope. The return envelopes were number coded to determine which retailers had responded. The participants were given twenty days in which to respond. Fifty-three questionnaires (11.27 percent) were returned at the end of this time period. A follow-up postcard was sent to the 417 non-respondents (Appendix B). Ten questionnaires (2.13 percent) were received after this follow-up. Approximately three weeks later, a third letter (Appendix B), a second copy of the

questionnaire, and a coded postpaid return envelope were sent to the remaining 407 non-respondents. As an incentive to complete and return the questionnaire within two weeks, each store was offered a free issue of the CAMM Researcher, a newsletter published by the Center for Apparel Marketing and Merchandising (CAMM) at Oklahoma State University. Fifty-one questionnaires (10.85 percent) were returned after this follow-up. Four hundred seventy questionnaires were distributed and a total of 114 (24.26 percent) were returned. The frequency and percent of questionnaires returned for each mailing is reported in Table II.

Three respondents returned but did not answer any questions and one respondent removed the identifying mark on the return envelope. Thus, 110 questionnaires were usable for analysis of sales volume, state, and store classification data. One hundred eleven questionnaires (23.62 percent) were usable for the remaining analyses.

Analysis of Data

The questionnaire was designed to accomplish the following objectives: to identify characteristics of users and non-users of microcomputer systems, to identify differences between users and non-users of microcomputer systems, to identify differences among microcomputer users, to identify inventory related benefits of microcomputers for small apparel retailers, and to measure inventory performance ratios of small apparel retailers.

TABLE II

RESPONSE RATES FOR EACH MAILING

Mailing	Frequency	Percent	Cumulative Frequency	Cumulative Percent
First Mailing	53	11.27	53	11.27
Second Mailing	10	2.13	63	13.40
Third Mailing	51	10.85	114	24.26

The retailers owning microcomputers were asked to rate on a scale from 1 to 5 the extent to which the microcomputer system had helped them in 11 inventory related areas. The high end of the scale (5) represented a "definite benefit" while the low end of the scale (1) represented "no benefit." Responses indicated the retailer's perception of the benefits derived from their microcomputer system.

Differences among microcomputer users were analyzed by comparing the extent of inventory related benefits with the type of software used, the extent of inventory related benefits with the owning or leasing of a microcomputer system, and the extent of inventory related benefits with anticipated future involvement with computers. Differences were also analyzed by comparing sales volume, state, and store classification data.

Differences between computer users and non-users were analyzed by comparing the use of computers with sales volume, store classification, state, and anticipated future involvement with computerized systems.

The inventory performance data were analyzed by calculating three inventory performance ratios often used to evaluate the effectiveness of inventory (Sweeney, 1973). These ratios were sales per square foot of selling space, stock turnover rate, and maintained markup rate. The formulas for each of these ratios are presented in Table III.

TABLE III

FINANCIAL VARIABLES AND FORMULAS

Variable	Formula
Sales Per Square Foot	$\frac{\text{Gross Sales}}{\text{Square Feet of Selling Space}}$
Stock Turnover Rate	$\frac{\text{Net Sales}}{\text{Average Inventory}}$
Maintained Markup	$\frac{\text{Net Sales - Gross Cost of Goods Sold}}{\text{Net Sales}}$

Inventory performance ratios of microcomputer users were calculated for two time periods: 1) the store data one year prior to acquiring a microcomputer system (Prior Ratios), and 2) the 1984 store data (Present Ratios). Inventory performance ratios of non-computer users were calculated for one time period: the 1984 store data (Non-User Ratios). Present Ratios and Non-User Ratios were individually compared to 1984 industry standard ratios. Prior Ratios were individually compared to industry standard ratios for the year in which that particular store had acquired a microcomputer system. Industry standards were obtained from the National Retail Merchants Association's Merchandising and Operating Results located in the October issues of Stores magazine.

Data were analyzed using t-tests, frequency counts, mean scores, correlations, and factor analyses when appropriate. A presentation of the findings for each objective is included in chapter four.

CHAPTER IV

FINDINGS AND ANALYSIS

The purpose of the study was to investigate the utilization and the inventory benefits of in-store microcomputer systems in small apparel stores. The objectives of the study were to: 1) identify characteristics of users and non-users of microcomputer systems, 2) identify differences between users and non-users of microcomputer systems, 3) identify differences among microcomputer users, 4) identify inventory related benefits of microcomputers for small apparel retailers, 5) measure inventory performance ratios of small apparel retailers.

A questionnaire was developed to obtain information about small apparel retailers' use or non-use of microcomputers. The questionnaire included items regarding the main reasons for computerization or non computerization, type of software being used, length of time the store had been in operation, length of time the store had been computerized, anticipated future involvement with computers, inventory related information obtained from computers, inventory benefits of computers, and financial performance.

The findings of the study are organized and discussed in the following categories: Description of Sample,

Comparison of Microcomputer Users and Non-Users, Analysis of Non-Computer Users, Analysis of Microcomputer Users, Analysis of Inventory Performance Ratios, and Discussion.

Description of Sample

The small apparel retailers selected for the study were listed in Dun and Bradstreets's Million Dollar Directory (1985), were coded as an Apparel and Accessory Establishment by the Standard Industrial Code (SIC 5600), were located within the West South Central Region defined by the Statistical Abstracts of the United States (1980) as Arkansas, Louisiana, Oklahoma, and Texas, and had an annual sales volume of less than $5 million. Data were obtained by means of a questionnaire from 111 of the 470 retailers meeting the above criteria.

Of the 111 respondents, 41 percent (46) were currently using microcomputer systems and 59 percent (65) were not currently using microcomputer systems. The respondents were from four states with Texas representing 51 percent of the responses, Oklahoma 23 percent, Louisiana 16 percent, and Arkansas 10 percent. These percentages are an approximation of the percentage of questionnaires sent to each state (Table IV).

A majority (79.09 percent) of the respondents were in one of three store classifications: Women's Ready to Wear, Family Clothing Stores, or Men's and Boy's Clothing and Furnishings. The remaining respondents (20.91 percent) were

TABLE IV

FREQUENCY AND PERCENT OF TOTAL SAMPLE AND TOTAL RESPONDENTS BY STATE

State	Total Sample (N=470)		Total Respondents (N=110)[a]	
	N	%	N	%
Arkansas	40	8.51	11	10.00
Louisiana	89	18.94	18	16.36
Oklahoma	76	16.17	25	22.73
Texas	265	56.38	56	50.91
Total	470	100.00	110	100.00

[a]Total does not equal 111 since one respondent removed the state identification mark.

in one of the other five store classifications: Shoe Stores, Miscellaneous Apparel and Accessory Stores, Children's and Infants Wear Stores, Women's Accessory and Specialty Shops, or Furriers and Fur Shops. The number of respondents in each store classification category is reported in Table V.

In regard to the length of time in business, over one-third (38.68 percent) had been in operation less than 20 years. Two-thirds (67.92 percent) had been in operation less than 40 years. The length of time in business ranged from two years to 115 years. The average length of time in operation was 32 years (Table VI).

Sales volume ranged from $55,000 to $4 million. Approximately one-half (45.45 percent) of the respondents had a sales volume of $500,000 or less. Thirty-nine percent were reported to have a sales volume between $1 million and $5 million. Only fifteen percent were listed as having a sales volume between $500,001 and $1 million. The frequency and percent of respondents in each sales volume category is summarized in Table VII. For a detailed list of the number of respondents by sales volume refer to Appendix C.

The respondents were asked to estimate their future involvement with computers (Table VIII). Of the 81 retailers responding, 43.21 percent indicated their computer use would increase dramatically in the next five years. Twenty seven percent expected a moderate increase and 21 percent expected use to remain at the same level. Although

TABLE V

FREQUENCY AND PERCENT OF APPAREL RETAILERS BY STORE CLASSIFICATION

Store Classification	Frequency (N=110)[a]	Percent
Men's and Boys Clothing and Furnishings SIC 5611	17	15.45
Women's Ready to Wear SIC 5621	45	40.91
Women's Accessory and Specialty Shop SIC 5631	3	2.73
Children's and Infants Wear Store SIC 5641	6	5.45
Family Clothing Stores SIC 5651	25	22.73
Shoe Stores SIC 5661	8	7.27
Furriers and Fur Shops SIC 5681	0	0.00
Miscellaneous Apparel and Accessory Stores SIC 5699	6	5.45
Total	110	99.99[b]

[a]Total does not equal 111 since one respondent removed the store classification code.

[b]Percentages do not equal 100 percent due to rounding.

TABLE VI

FREQUENCY AND PERCENT OF APPAREL RETAILERS BY LENGTH OF TIME IN OPERATION

Years in Operation	Frequency (N=106)[a]	Percent
2 - 9 years	21	19.81
10 - 19 years	20	18.87
20 - 29 years	12	11.32
30 - 39 years	19	17.92
40 - 49 years	6	5.66
50 - 59 years	16	15.09
60 - 69 years	5	4.72
70 - 79 years	1	0.94
80 - 89 years	3	2.83
90 - 99 years	2	1.89
100 - 109 years	0	0.00
110 - 115 years	1	0.94
Total	106	99.99[b]
No Response	5	

[a]Five participants did not respond to this question.

[b]Percentages do not equal 100 percent due to rounding.

TABLE VII

FREQUENCY AND PERCENT OF APPAREL RETAILERS BY COLLAPSED SALES VOLUME CATEGORIES

Sales Volume	Frequency (N=110)[a]	Percent
0 - $ 500,000	50	45.45
$ 500,001 - $ 999,999	17	15.45
$1,000,000 - $4,999,999	43	39.09
Total	110	99.99[b]

[a]Total does not equal 111 since one respondent removed the sales volume figure.

[b]Percentages do not equal 100 percent due to rounding.

TABLE VIII

FREQUENCY AND PERCENT OF ANTICIPATED FUTURE COMPUTER USE REPORTED BY APPAREL RETAILERS

Anticipated Future Involvement	Frequency (N=81)[a]	Percent
Remain at the Same Level	17	20.99
Increase Slightly	4	4.94
Increase Moderately	22	27.16
Increase Dramatically	35	43.21
Decrease	3	3.70
Total	81	100.00
No Response	30	

[a]Thirty participants did not respond to this question.

30 (27.03 percent) of the 111 apparel retailers did not respond to this question, the trend seems to be toward increasing computer usage.

The data were further analyzed to determine whether stores were more likely to increase or decrease their future computer usage based on their store classifications or sales volumes. A majority of the stores classified as Men's and Boy's Clothing and Furnishings Shops, Women's Ready To Wear Stores, Children's and Infant's Wear Stores, Family Clothing Stores, and Shoe Stores chose "increase dramatically" the most frequently. These findings are presented in Table IX.

In regard to sales volume and future involvement with computers, several trends were noted. Stores with a sales volume above $800,000 anticipated dramatically or moderately increased computer involvement. Stores with a sales volume below $800,000 had a higher percentage of respondents indicating their computer involvement would "remain at the same level." The percentage of anticipated future involvement with computers by sales volume is presented in Table X.

Comparison of Microcomputer Users and Non-Users

Responses were analyzed to determine whether differences existed between users and non-users based on store classification (SIC), sales volume, state, future involvement with computers, or number of years in operation.

TABLE IX

PERCENTAGES OF ANTICIPATED FUTURE INVOLVEMENT WITH MICROCOMPUTERS BY STORE CLASSIFICATION

Store Classification	N[a]	Anticipated Involvement: Remain at the Same Level	Increase Slightly	Increase Moderately	Increase Dramatically	Decrease
Men's and Boy's Clothing and Furnishings (SIC 5611)	16	6.25	0.00	37.50	50.00	6.25
Women's Ready to Wear Stores (SIC 5621)	35	22.86	8.57	25.71	42.86	0.00
Women's Accessory and Specialty Shops (SIC 5631)	2	50.00	0.00	50.00	0.00	0.00
Children's and Infant's Wear Stores (SIC 5641)	5	20.00	0.00	20.00	60.00	0.00
Family Clothing Stores (SIC 5651)	17	29.41	0.00	29.41	35.29	5.88
Shoe Stores (SIC 5661)	4	0.00	25.00	0.00	50.00	25.00
Furriers and Fur Shops (SIC 5681)	0	0.00	0.00	0.00	0.00	0.00
Miscellaneous Apparel and Accessory Shops (SIC 5699)	2	50.00	0.00	0.00	50.00	0.00

[a]Represents the number of respondents to this question in each store classification.

TABLE X

PERCENTAGES OF ANTICIPATED FUTURE INVOLVEMENT WITH MICROCOMPUTERS BY SALES VOLUME

Store Classification	N[a]	Anticipated Involvement				
		Remain at the Same Level	Increase Slightly	Increase Moderately	Increase Dramatically	Decrease
0 - $ 199,999	6	33.33	16.67	16.67	33.33	0.00
$ 200,000 - $ 299,999	5	0.00	0.00	20.00	40.00	40.00
$ 300,000 - $ 399,999	6	33.33	16.67	16.67	33.33	0.00
$ 400,000 - $ 499,999	5	40.00	0.00	20.00	40.00	0.00
$ 500,000 - $ 599,999	5	0.00	0.00	20.00	80.00	0.00
$ 600,000 - $ 699,999	6	0.00	16.67	50.00	33.33	0.00
$ 700,000 - $ 799,999	4	50.00	0.00	0.00	50.00	0.00
$ 800,000 - $ 899,999	3	0.00	33.33	33.33	33.34	0.00
$ 900,000 - $ 999,999	1	0.00	0.00	0.00	100.00	0.00
$1,000,000 - $1,999,999	14	28.57	0.00	21.43	42.86	7.14
$2,000,000 - $2,999,999	13	30.77	0.00	30.77	38.46	0.00
$3,000,000 - $3,999,999	8	12.50	0.00	25.00	62.50	0.00
$4,000,000 - $4,999,999	5	0.00	0.00	80.00	20.00	0.00

[a]Represents the number of respondents to this question in each sales volume category.

All store classifications except "Furriers and Fur Shops" had both computer users and non-users. No retailers classified as "Furriers and Fur Shops" responded to the survey. Of the eight store classifications, only one had more computer users than non-computer users. The category "Women's Ready to Wear Stores" had 23 (51.11 percent) microcomputer users and 22 (48.89 percent) non-users. The percent of users to non-users in all other categories was approximately one-third to two-thirds, respectively. The frequency and percent of computer use status by store classification is presented in Table XI.

The sales volume of retailers using microcomputer systems ranged from $121,000 to $4,000,000. The sales volume of retailers not using microcomputer systems ranged from $55,000 to $3,000,000. To facilitate analysis of computer use status by sales volume, sales volume figures were collapsed into the following categories: $0 - $500,000; $500,001 - $999,999; and $1,000,000 - 4,999,999. As sales volume increased, the percentage of computer users also increased. Only 20 percent of the retailers with a sales volume less than $500,000 were currently using computers. Forty-seven percent of the retailers with a sales volume between $500,001 and $1,000,000 were currently using computers. Sixty-five percent of the retailers with a sales volume above $1 million were currently using computers. The frequency and percent of computer use status by sales volume for the three collapsed categories appears in Table XII. A

TABLE XI

FREQUENCY AND PERCENT OF COMPUTER USE STATUS
BY STORE CLASSIFICATION

Store Classification	Non-Computer User		Computer User	
	N	%	N	%
Men's and Boy's Clothing and Furnishings	11	64.71	6	35.29
Women's Ready to Wear Stores	22	48.89	23	51.11
Women's Accessory and Specialty Shops	2	66.67	1	33.33
Children's and Infant's Wear Stores	4	66.67	2	33.33
Family Clothing Stores	16	64.00	9	36.00
Shoe Stores	5	62.50	3	37.50
Furriers and Fur Shops	0	0.00	0	0.00
Miscellaneous Apparel and Accessory Shops	4	66.67	2	33.33

TABLE XII

FREQUENCY AND PERCENT OF COMPUTER USE STATUS BY SALES VOLUME

Sales Volume	Non-Computer User		Computer User	
	N	%	N	%
$ 0 - $ 500,000	40	80.00	10	20.00
$ 500,001 - $ 999,999	9	52.94	8	47.06
$1,000,000 - $4,999,999	15	34.88	28	65.12

complete list of the frequency and percent of computer use by sales volume is presented in Appendix G.

Computer users and non-computer users responded from each state. In Arkansas, Oklahoma, and Texas, the percentage of users to non-users was approximately 40 percent to 60 percent. Louisiana was the only state with a higher percent of users than non-users. Nine (75 percent) of the Louisiana stores were using computers, while only 3 (25 percent) were not using computers. The frequency and percent of computer use status by state is reported in Table XIII.

Thirty-seven (57.81 percent) of the 64 non-computer users and 44 (95.65 percent) of the 46 computer users responded to the question concerning their anticipated future involvement with computers. Half of the retailers expecting use to "remain at the same level" or to "increase slightly" were non-computer users and half were computer users. Seventy-seven percent of the retailers anticipating a "moderate increase" were computer users. Slightly more than half of the retailers expecting a "dramatic increase" in computer usage were non-computer users. Of the three retailers expecting use to "decrease," all were non-computer users. The frequency and percent of future involvement by computer use status is reported in Table XIV.

The number of years in operation for the computer users ranged from two to ninety-seven. The number of years in operation for the non-computer users ranged from two to one

TABLE XIII

FREQUENCY AND PERCENT OF COMPUTER USE STATUS BY STATE

State	Non-Computer User		Computer User	
	N	%	N	%
Arkansas	7	63.64	4	36.36
Louisiana	3	25.00	9	75.00
Oklahoma	15	60.00	10	40.00
Texas	33	58.93	33	41.07

TABLE XIV

FREQUENCY AND PERCENT OF COMPUTER USE STATUS BY ANTICIPATED FUTURE INVOLVEMENT WITH COMPUTERS

Future Involvement With Computers	Non-Computer User		Computer User	
	N	%	N	%
Remain at Same Level	8	47.06	9	52.94
Increase Slightly	2	50.00	2	50.00
Increase Moderately	5	22.73	17	77.27
Increase Dramatically	19	54.29	16	45.71
Decrease	3	100.00	0	0.00

hundred fifteen. For the purpose of analysis, the number of years a store had been in operation was grouped in 20 year intervals. The majority of the retailers whose stores had been in operation less than 60 years were non-computer users. The majority of the retailers whose stores had been in operation between 60 and 100 years were computer users. The percentage of computer users and non-users in each 20 year interval is presented in Table XV.

Analysis of Non-Computer Users

Responses from non-computer users were analyzed to determine their characteristics. Specifically, store classification (SIC), sales volume, state, future involvement with computers, number of years in operation, and main reason for not using computers were studied. Percentages should be viewed with caution since in several cases the percentages reflect the group size distribution.

Of the 111 respondents, 65 (59 percent) were non-computer users. A majority (76.56 percent) were in one of three store classifications: Women's Ready to Wear, Family Clothing Stores, or Men's and Boy's Clothing and Furnishings. The remaining non-computer users (23.44 percent) were in one of the other five store classifications: Shoe Stores, Miscellaneous Apparel and Accessory Shops, Children's and Infant's Wear Stores, Women's Accessory and Specialty Shops, or Furriers and Fur Shops. The frequency

TABLE XV

FREQUENCY AND PERCENT OF COMPUTER USE STATUS BY NUMBER OF YEARS IN OPERATION

Years in Operation	Non-Computer User		Computer User	
	N	%	N	%
2 - 19	22	53.66	19	46.34
20 - 39	19	61.29	12	38.71
40 - 59	16	64.00	6	36.00
60 - 79	2	33.33	4	66.67
80 - 99	2	40.00	3	60.00
100 - 115	1	100.00	0	0.00

and percent of non-computer users and computer users by store classification is reported in Table XVI.

The sales volume of retailers not using microcomputer systems ranged from $55,000 to $3,000,000. To facilitate analysis of sales volume, the sales volume figures were collapsed into the following categories: $1 to $500,000; $500,001 to $999,999; and $1,000,000 to $4,999,999. Sixty-three percent of the non-users had a sales volume below $500,000. Twenty-four percent had a sales volume above $1 million. Sales volume figures for microcomputer users and non-users are found in Table XVII.

Non-computer users responded from all four states. Fifty-two percent of the non-computer users were from Texas. Twenty-three percent were from Oklahoma, fourteen percent from Louisiana, and eleven percent from Arkansas. These percentages are an approximation of the percentage of questionnaires sent to each state (Table XVIII).

When non-computer users were asked to estimate their future involvement with computers, 19 (51.35 percent) indicated their computer use would increase dramatically in the next five years. Eight (21.62 percent) expected use to remain at the same level and five (13.51 percent) expected use to increase moderately. Although 27 (41.54 percent) of the 65 non-computer users did not respond to this question, the trend seems to be toward increased computer usage. These percentages are reported in Table XIX.

TABLE XVI

FREQUENCY AND PERCENT OF EACH STORE CLASSIFICATION BY COMPUTER USE STATUS

Store Classification	Non-Computer User		Computer User	
	N	%	N	%
Men's and Boy's Clothing and Furnishings (17)[a]	11	17.19	6	13.04
Women's Ready to Wear Stores (45)[a]	22	34.38	23	50.00
Women's Accessory and Specialty Shops (3)[a]	2	3.12	1	2.17
Children's and Infant's Wear Stores (6)[a]	4	6.25	2	4.25
Family Clothing Stores (25)[a]	16	25.00	9	19.57
Shoe Stores (8)[a]	5	7.81	3	6.52
Furriers and Fur Shops (0)[a]	0	0.00	0	0.00
Miscellaneous Apparel and Accessory Shops (6)[a]	4	6.25	2	4.35
Total	64[b]	100.00	46	100.00

[a]Total number of responses.

[b]Total does not equal 65 since one respondent removed the store classification code.

TABLE XVII

SALES VOLUME OF SMALL APPAREL RETAILERS
BY COMPUTER USE STATUS

Sales Volume	Non-Computer User		Computer User	
	N	%	N	%
$ 0- $ 500,000 (50)[a]	40	62.50	10	21.74
$ 500,001 - $ 999,999 (17)[a]	9	14.06	8	17.39
$1,000,000 - $4,999,999 (43)[a]	15	24.44	28	60.87
Total	64[b]	100.00	46	100.00

[a]Total number of responses.

[b]Total does not equal 65 since one respondent removed the sales volume figure.

TABLE XVIII

FREQUENCY AND PERCENT OF RESPONDENTS IN EACH STATE BY COMPUTER USE STATUS

State	Non-Computer User		Computer User	
	N	%	N	%
Arkansas (11)[a]	7	10.94	4	8.70
Louisiana (12)[a]	3	14.06	9	19.57
Oklahoma (25)[a]	15	23.44	10	21.74
Texas (56)[a]	33	51.56	23	50.00
Total	64[b]	100.00	46	100.01[c]

[a]Total number of responses.

[b]Total does not equal 65 since one respondent removed the state identification mark.

[c]Total does not equal 100 percent due to rounding.

TABLE XIX

FREQUENCY AND PERCENT OF ANTICIPATED FUTURE INVOLVEMENT WITH COMPUTERS BY COMPUTER USE STATUS

Future Involvement With Computers	Non-Computer User (N = 37)		Computer User (N = 44)	
	N	%	N	%
Remain at Same Level (17)[a]	8	21.62	9	21.45
Increase Slightly (4)[a]	2	5.41	2	4.56
Increase Moderately (22)[a]	5	13.51	17	38.64
Increase Dramatically (35)[a]	19	51.35	16	36.36
Decrease (3)[a]	3	8.11	0	0.00
Total	37	100.00	44	100.00
No Response	27		2	

[a]Total number of responses.

The number of years in operation for the non-computer user ranged from 2 to 115 years. Sixty-six percent had been in operation less than 40 years. Ninety-one percent had been in operation less than 60 years. The frequency and percent of number of years in operation by computer use status is presented in Table XX.

Non-computer users were asked to indicate their main reason for not using a computer system. The most frequent response was "current procedures are adequate," followed by "store is too small." Other reasons cited were "store personnel lack computer experience," "computer systems are difficult to understand," and "computer systems are too expensive." The frequency and percent for each of the main reasons for non-computerization is presented in Table XXI.

Analysis of Microcomputer Users

Responses from computer users were analyzed to determine their characteristics. Percentages for store classification (SIC), sales volume, and state should be viewed with caution since in several cases the percentages reflect the group size distribution.

Of the 111 respondents, 46 (41 percent) were currently using microcomputer systems. Twenty-three (50 percent) of the microcomputer users were classified as Women's Ready to Wear Stores. Nine (20 percent) were Family Clothing Stores; and 6 (13 percent) were Men's and Boy's Clothing and Furnishing Stores. The 8 remaining microcomputer users (17

TABLE XX

FREQUENCY AND PERCENT OF NUMBER OF YEARS IN OPERATION BY COMPUTER USE STATUS

Years in Operation	Non-Computer User		Computer User	
	N	%	N	%
2 - 19 (41)[a]	22	35.48	19	43.18
20 - 39 (31)[a]	19	30.65	12	27.27
40 - 59 (22)[a]	16	25.81	6	13.64
60 - 79 (6)[a]	2	3.23	4	9.09
80 - 99 (5)[a]	2	3.23	3	6.82
100 - 115 (1)[a]	1	1.61	0	0.00
Total	62	100.01[b]	44	100.00
No Response	3		2	

[a]Total number of responses.

[b]Percentages do not equal 100 percent due to rounding.

TABLE XXI

MAIN REASON FOR NON-COMPUTER USE IDENTIFIED BY APPAREL RETAILERS

Reasons	Frequency (N=56)[a]	Percent
Current procedures are adequate.	23	41.07
Store is too small.	7	12.50
Store personnel lack experience with computers.	6	10.71
Computer systems are difficult to understand.	6	10.71
Computer systems are too expensive.	6	10.71
Computer systems are impersonal.	3	5.36
Computer systems are not cost effective.	3	5.36
In the process of acquiring a computer.	1	1.79
Suitable software is unavailable.	1	1.79
Total	56	100.00
No response	8	

[a]Eight non-computer users did not respond to this question.

percent) were in one of the other five store classifications: Shoe Stores, Miscellaneous Apparel and Accessory Shops, Children's and Infant's Wear Stores, Women's Accessory and Specialty Shops, or Furriers and Fur Shops. The frequency and percent of microcomputer users and non-users by store classification is presented in Table XVI, p. 55.

The sales volume of retailers using microcomputer systems ranged from $121,000 to $4,000,000. To facilitate analysis of sales volume, the sales volume figures were collapsed into the following categories: $1 to $500,000; $500,001 to $999,999; and $1,000,000 to $4,999,999. Sixty-one percent of the computer users had a sales volume above $1,000,000. Seventeen percent had a sales volume between $500,001 and $999,999. The remaining twenty-two percent had a sales volume less than $500,000 (Table XVII, p. 56).

Computer users responded from all four states. Fifty percent of the users were from Texas. Twenty-two percent were from Oklahoma, twenty percent from Louisiana, and nine percent from Arkansas. The frequency and percent of computer users and non-users by state is reported in Table XVIII, p. 57.

When microcomputer users were asked to indicate their anticipated future involvement with computers, 17 (39 percent) indicated their computer use would increase moderately in the next five years. Sixteen (36 percent) anticipated a dramatic increase, nine (21 percent) expected

use to remain at the same level, and two (5 percent) reported their use would increase slightly. These percentages are reported in Table XIX, p. 58.

The number of years in operation for the microcomputer user ranged from 2 to 97 years. Seventy percent had been in operation less than 40 years. Eighty percent had been in operation less than 60 years. These percentages are presented in Table XX, p. 60.

The majority (83 percent) of the apparel retailers using microcomputers owned their computer systems. Six respondents (14 percent) used a time-sharing system or service bureau and only one leased a microcomputer system. In regard to the type of software being used, two-thirds (66 percent) used packaged software systems, the remaining one-third used custom-made software. Lotus 1-2-3, National Cash Register, Multiplan, and D Base II were among the common types of packaged software used by the respondents. However, twenty different software packages were listed by one or more of the 46 respondents using microcomputers. Names of software packages used and the number of respondents using each package were reported in Appendix D.

Fifty percent of the apparel retailers first began using a computer to process store data by 1980. However, only eight retailers (23.53 percent) reported the purchase or lease of an in-store microcomputer system by 1980. Fifty percent of the retailers first began to use a computer for processing data between 1981 and 1985. Over 75 percent of

the respondents purchased or leased an in-store microcomputer between 1981 and 1985 (Table XXII). The earliest year any respondent began using a computer to process store data was 1967. The earliest year any respondent bought or leased an in-store microcomputer was 1972.

The apparel retailers specified the need to control accounts receivable, control merchandise, and save time as the three main reasons for computerizing. Additional reasons identified by the retailers were improving quality of information, automating general ledger, generating new information, and improving reliability of information. A detailed list of reasons cited for computerization is reported in Table XXIII.

The apparel retailers responded to a check list of common inventory control information by indicating the information they received from their computer system and specifying which three pieces of information were most important. The most common microcomputer generated inventory control information was, in this order, monthly sales records, sales by classification, this year's sales by last year's sales, stock on hand, vendor list, daily sales records, and weekly sales records. These data were obtained by more than 40 percent of the retailers. For a complete listing of microcomputer generated inventory control information obtained by small apparel retailers, refer to Table XXIV. The three most important pieces of computer generated data were sales by classification, monthly sales

TABLE XXII

FREQUENCY AND PERCENT OF RESPONDENTS' PROCESSING DATA WITH COMPUTERS AND PURCHASING COMPUTERS BY YEAR

Year of First Use or Purchase	Respondents Processing Store Data with Computers (N=42)[a]		Respondents Purchasing In-Store Microcomputers (N=34)[b]	
	N	%	N	%
1967 - 1970	3	7.14	0	0.00
1971 - 1975	7	16.67	2	5.88
1976 - 1980	11	26.19	6	17.65
1981 - 1985	21	50.00	26	76.47
Total	42	100.00	34	100.00
No Response	4		12	

[a]Four participants did not respond to this question.

[b]Twelve participants did not respond to this question.

TABLE XXIII

FREQUENCY AND PERCENT OF THREE MAIN REASONS FOR COMPUTERIZATION IDENTIFIED BY APPAREL RETAILERS

Reason for Computerization	Frequency (N=39)[a]	Percent[b]
Control merchandise	17	43.59
Control accounts receivable	17	43.59
Save time	15	38.46
Improve quality of information	15	38.46
Automate general ledger	11	28.21
Improve reliability of information	9	23.08
Improve timeliness of information	8	20.51
Generate new information	8	20.51
Increase business productivity	6	15.38
Improve operating margin	3	7.69
Improve customer service	2	5.13
Track invoice due dates	2	5.13
Reduce costs	1	2.56
Other:		
Service accounts receivable	1	2.56
Automate payroll	1	2.56
Generate sales comparisons and scheduling	1	2.56
No response	7	

[a]Seven of the microcomputer users did not respond to this question.

[b]Percentages do not equal 100 percent since respondents were asked to check more than one item.

TABLE XXIV

FREQUENCY AND PERCENT OF MICROCOMPUTER GENERATED INVENTORY CONTROL INFORMATION OBTAINED BY APPAREL RETAILERS

Inventory Control Information	Frequency (N=36)[a]	Percent[b]
Monthly sales records	30	65.22
Sales by classification	25	54.35
This year's sales by last year's	23	50.00
Stock on hand	22	47.83
Vendor list	20	43.48
Daily sales records	19	41.30
Weekly sales records	19	41.30
Maintained markup	17	36.96
Invoice payment dates	17	36.96
Merchandise received	16	34.78
Stock turnover rate	14	30.43
Sales performance by vendor	14	30.43
Stock to sales ratio	13	28.26
Amount of stock at regular price	12	26.09
Open to buy	11	23.91
Stock on hand	11	23.91
Purchase orders	9	19.57
Best sellers	9	19.57
Amount of stock at markdown	8	17.39
Slow sellers	8	17.39
Sales per square of selling space	1	2.17
Sales by elements	1	2.17
Balance of goods bought	1	2.17
Inventory by class and department	1	2.17
Book inventory	1	2.17
Stock transfer	1	2.17
No response	10	

[a]Ten of the microcomputer users did not respond to this question.

[b]Percentages do not equal 100 percent since respondents were asked to check all that apply.

records, and stock on hand. Other important pieces of information were sales performance by vendor, this year's sales by last year's sales, and maintained markup. The frequency and percent of the most important computer generated information was reported in Table XXV.

In an open-ended question, respondents were asked to list the inventory control information they would like to obtain from their microcomputer systems. Of the sixteen apparel retailers who responded, seven wanted information on the sales performance of the vendor, four wanted more merchandise details (color, size, vendor, style), and three wanted information about fast and slow sellers. Other information listed by one or two of the respondents included markdown information, purchase orders, open to buy information, turnover, cost of sales, stock to sales ratio, daily sales records, merchandise receiving dates, stock on order, in-house account status, and back order information. For a complete list of the inventory control information desired by the apparel retailers see Appendix E.

Microcomputer users were asked to rate eleven inventory related benefits of microcomputers on a scale from 1 to 5. Five represented a "definite benefit" and one represented "no benefit." The inventory related benefits of the in-store microcomputer system identified by the apparel retailers are summarized in Table XXVI. The following benefits received a mean score greater than 3.00: "increased knowledge of customer buying patterns," "improved

TABLE XXV

FREQUENCY AND PERCENT OF THE MOST IMPORTANT INVENTORY CONTROL INFORMATION OBTAINED FROM MICROCOMPUTER SYSTEMS

Important Information Received	Frequency (N=22)[a]	Percent[b]
Sales by classification	11	50.00
Monthly sales records	10	45.45
Stock on hand	8	36.36
Sales performance by vendor	6	27.27
This year's sales by last year's sales	5	22.73
Maintained markup	5	22.73
Daily sales record	3	13.64
Stock to sales ratio	3	13.64
Invoice payment dates	3	13.64
Weekly sales records	2	9.09
Slow sellers	2	9.09
Open to buy	2	9.09
Merchandise received	2	9.09
Best sellers	1	4.55
Purchase orders	1	4.55
No Response	24	

[a]Twenty four of the microcomputer users did not respond to this question.

[b]Percentages do not equal 100 percent since respondents were asked to check more than one item.

TABLE XXVI

PARTICIPANT RESPONSES REGARDING ELEVEN INVENTORY RELATED BENEFITS OF IN-STORE MICROCOMPUTER SYSTEMS IN DESCENDING ORDER BY MEAN SCORE

Benefit of Computerization	No Benefit 1	2	3	4	Definite Benefit 5	Total Response	No Response	Mean[a]
1. Increased knowledge of customer buying patterns	3	2	4	10	10	29	17	3.76
2. Improved profitability	3	1	9	9	5	27	19	3.44
3. Increased knowledge of slow moving merchandise	4	7	3	6	9	29	17	3.31
4. Reduced average inventory	4	6	3	6	8	27	19	3.30
5. Improved maintained markup	3	3	7	9	5	27	19	3.24
6. Increased knowledge of merchandise trends	6	4	4	8	6	28	18	3.14
7. Increased stock turnover	3	5	12	4	3	27	19	2.96
8. Reduced number of markdowns	8	4	5	6	5	28	18	2.77
9. Increased sales per square foot	10	6	5	2	3	26	20	2.31
10. Reduced cost of goods sold	9	7	6	3	1	26	20	2.23
11. Reduced inventory shrinkage	8	10	5	1	2	26	20	2.19

[a]Mean was determined by multiplying the value of the rating (i.e. No Benefit =1, Definite Benefit =5, etc.) by the number of resonses to the rating, summing the products, and dividing by the total number of respondents to the items.

profitability," "increased knowledge of slow moving merchandise," "reduced average inventory," "improved maintained markup," and "increased knowledge of merchandise trends." "Increased knowledge of customer buying patterns" received the highest mean score (X=3.76). "Reduced inventory shrinkage" received the lowest mean score (X=2.19).

In an open-ended question, microcomputer users were asked to explain how business had improved since they began using a computer system. Eleven responses included a reference to more information such as "more timely information about inventory." Ten responses included a reference to accounts receivable efficiency such as "faster, more efficient accounts receivable." Seven responses included a reference to controlling open to buy such as "better control of merchandise for buying purposes." The frequency and percent in each category is presented in Table XXVII. Literal responses of the apparel retailers for each category appear in Appendix F.

For further analysis, microcomputer users were divided into two categories according to the type of computer software they were using. Sixty-five percent (30) of the microcomputer users had packaged software and thirty-five percent (16) had custom-made software. Percentages were also calculated for sales volume, state, and store classification. These percentages should be viewed with caution since in several cases the percentages reflect the group size distribution. Analysis using t-tests was implemented

TABLE XXVII

BUSINESS IMPROVEMENT CATEGORIES IDENTIFIED BY RETAILERS AFTER COMPUTER USE

Business Improvement Categories	Frequency (N=33)[a]	Percent[b]
More Information	11	33.33
Accounts Receivable Efficiency	10	30.30
Control of Open to Buy	7	21.21
Improved Records	4	12.12
Better Control of Inventory	3	12.12
No Significant Improvements	3	12.12
Reduction in Inventory	2	6.06
More control of Cash	2	6.06
No Response	13	

[a]Thirteen microcomputer users did not respond to this question.

[b]Percentages do not equal 100 percent since respondents were asked to identify all that apply.

to determine whether significant differences existed between apparel retailers who had packaged software and those who had custom-made software.

The sales volume of retailers using packaged computer software and custom-made computer software ranged from $100,000 to $4,000,000. The percentage below and above $1 million was approximately the same in each category. Sixty three percent (19) of the packaged computer software users had a sales volume above $1 million. Sixty percent (9) of the custom-made computer software users had a sales volume above $1 million. The frequency and percent in each group are presented in Table XXVIII.

In regard to the number of retailers using custom-made or packaged computer software in each state, Texas was the only state in which more retailers used custom-made computer software. In the other three states, the small apparel retailers using packaged computer software outnumbered those using custom-made computer software (Table XXIX). Seventy five percent (12) of the custom-made computer software users were located in Texas. Only thirty-six percent (11) of the packaged computer software users were operating in Texas.

In four of the eight store classifications, the percentage of retailers using packaged computer software was greater than the percentage of retailers using custom-made computer software. The owners of Women's Ready to Wear Stores, Shoe Stores, and Miscellaneous Apparel and Accessory Shops seemed more likely to have custom-made computer

TABLE XXVIII

FREQUENCY AND PERCENT OF TYPE OF SOFTWARE USED BY SALES VOLUME

Sales Volume	Packaged Software (N=30)		Custom-Made Software (N=15)[b]	
	N	%	N	%
$ 100,000 - $ 499,999 (8)[a]	6	20.00	2	13.33
$ 500,000 - $ 999,999 (9)[a]	5	16.67	4	26.67
$1,000,000 - $4,999,999 (28)[a]	19	63.33	9	60.00
Total	30	100.00	15	100.00

[a]Total number of responses.

[b]One computer user did not respond to this question.

TABLE XXIX

TYPE OF SOFTWARE USED BY SMALL APPAREL RETAILERS IN EACH STATE

State	Packaged Software (N = 30)		Custom-Made Software (N = 16)	
	N	%	N	%
Arkansas (4)[a]	4	13.33	0	0.00
Louisiana (9)[a]	6	20.00	3	18.75
Oklahoma (10)[a]	9	30.00	1	6.25
Texas (23)[a]	11	36.67	12	75.00
Total	30	100.00	16	100.00

[a]Total number of responses.

software. Frequencies and percents for each store classification are presented in Table XXX.

Microcomputer users were asked to rate eleven inventory related benefits on a scale from 1 to 5. Five represented a "definite benefit," while one represented "no benefit." Mean scores of apparel retailers using custom-made software were higher than mean scores of apparel retailers using packaged software for ten of the eleven inventory related benefits (Table XXXI). However, t-tests did not indicate significant differences at the 0.05 level (Table XXXII).

Relationships among the eleven inventory related benefits of microcomputers were calculated using the Pearson Product Moment Correlation Coefficient. Intercorrelations among the items are presented in Table XXXIII. Several benefits were highly correlated. Improved maintained markup had a strong positive correlation ($r = 0.80$, p 0.001) with improved profitability and with increased stock turnover rate ($r = 0.67$, p 0.001). Item correlations higher than 0.50 and significant at p 0.01 are noted in Table XXXIII.

A factor analysis was completed on the eleven inventory related benefits of microcomputers using the varimax rotation method. The three factors that resulted explained 73.63 percent of the variance in the data. A listing of the inventory related benefits with factor loadings greater than 0.60 is presented in Table XXXIV. Factor 1 was labeled "Buying and Pricing." Each statement loading on this factor described a benefit that could result from effective buying

TABLE XXX

FREQUENCY AND PERCENT OF TYPE OF SOFTWARE USED BY STORE CLASSIFICATION

Store Classification	Packaged Software (N=30)		Custom-Made Software (N=16)	
	N	%	N	%
Men's and Boy's Clothing and Furnishings (6)[a]	5	16.67	1	6.25
Women's Ready to Wear Stores (23)[a]	14	46.67	9	56.25
Women's Accessory and Specialty Shops (1)[a]	1	3.33	0	0.00
Children's and Infant's Wear Stores (2)[a]	2	6.67	0	0.00
Family Clothing Stores (9)[a]	6	20.00	3	18.75
Shoe Stores (3)[a]	1	3.33	2	12.50
Furriers and Fur Shops (0)[a]	0	0.00	0	0.00
Miscellaneous Apparel and Accessory Shops (2)[a]	1	3.33	1	6.25
Total	30	100.00	16	100.00

[a]Total number of responses.

TABLE XXXI

FREQUENCY AND MEANS FOR TYPE OF SOFTWARE BY ELEVEN INVENTORY RELATED BENEFITS

Benefit of Computerization	No Benefit 1	2	3	4	Definite Benefit 5	Total Response	No Response	Mean[a]
1. Reduced Average Inventory								
Packaged[b]	3	2	3	3	3	14	16	3.07
Custom-Made[c]	1	4	0	3	5	13	3	3.54
2. Reduced Number of Markdowns								
Packaged	5	0	3	3	2	13	17	2.77
Custom-Made	3	4	2	3	2	14	2	2.79
3. Reduced Amount of Inventory Shrinkage								
Packaged	6	3	2	1	1	13	17	2.08
Custom-Made	2	7	3	0	1	13	3	2.31
4. Reduced Cost of Goods Sold								
Packaged	7	1	2	3	0	13	17	2.08
Custom-Made	2	6	4	0	1	13	3	2.38
5. Improved Profitability								
Packaged	3	0	4	4	2	13	17	3.15
Custom-Made	0	1	5	5	3	14	2	3.71
6. Improved Maintained Markup								
Packaged	3	0	3	4	1	11	19	3.00
Custom-Made	0	3	4	5	2	14	2	3.43

TABLE XXXI (Continued)

Benefit of Computerization	No Benefit 1	2	3	4	Definite Benefit 5	Total Response	No Response	Mean[a]
7. Increased Knowledge of Customer Buying Patterns								
Packaged[b]	2	1	3	4	5	15	15	3.60
Custom-Made[c]	1	1	1	6	5	14	2	3.93
8. Increased Sales Per Square Foot								
Packaged	6	3	1	1	2	13	17	2.23
Custom-Made	4	3	4	1	1	13	3	2.38
9. Increased Stock Turnover								
Packaged	3	1	6	2	2	14	16	2.93
Custom-Made	0	4	6	2	1	13	3	3.00
10. Increased Knowledge of Slow-Moving Merchandise								
Packaged	2	3	3	2	5	15	15	3.33
Custom-Made	2	4	0	4	4	14	2	3.29
11. Increased Knowledge of Merchandise Trends								
Packaged	4	2	2	4	3	15	15	3.00
Custom-Made	2	2	2	4	3	13	3	3.31

[a]Mean was determined by multiplying the value of the rating (i.e. No Benefit = 1, Definite Benefit = 5, etc.) by the number of responses to the rating, summing the products, and dividing by the total number of respondents to the item.

[b]Packaged = Packaged Software User.

[c]Custom-Made = Custom-Made Software User.

TABLE XXXII

ANALYSIS OF ELEVEN INVENTORY BENEFIT MEAN SCORES USING t-TESTS FOR TYPE OF SOFTWARE

Benefit of Computerization	N	Mean[a]	Standard Deviation	t Value	Degrees of Freedom	Probability
1. Reduced Average Inventory						
Packaged[b]	14	3.07	1.49	-0.81	24.8	0.97
Custom-Made[c]	13	3.54	1.51	-0.81	25.0	
2. Reduced Number of Markdowns						
Packaged	13	2.77	1.59	-0.03	24.2	0.70
Custom-Made	14	2.79	1.42	-0.03	25.0	
3. Reduced Amount of Inventory Shrinkage						
Packaged	13	2.08	1.32	-0.50	22.7	0.40
Custom-Made	13	2.31	1.03	-0.50	24.0	
4. Reduced Cost of Goods Sold						
Packaged	13	2.08	1.32	-0.66	22.8	0.43
Custom-Made	13	2.38	1.04	-0.66	24.0	
5. Improved Profitability						
Packaged	13	3.15	1.41	-1.22	20.4	0.14
Custom-Made	14	3.71	0.91	-1.24	25.0	
6. Improved Maintained Markup						
Packaged	11	3.00	1.41	-0.85	17.5	0.26
Custom-Made	14	3.43	1.02	-0.88	23.0	

TABLE XXXII (Continued)

Benefit of Computerization	N	Mean[a]	Standard Deviation	t Value	Degrees of Freedom	Probability
7. Increased Knowledge of Customer Buying Patterns						
Packaged[b]	15	3.60	1.40	-0.68	26.8	0.60
Custom-Made[c]	14	3.93	1.21	-0.67	27.0	
8. Increased Sales Per Square Foot						
Packaged	13	2.23	1.54	-0.28	23.1	0.50
Custom-Made	13	2.38	1.26	-0.28	24.0	
9. Increased Stock Turnover						
Packaged	14	2.93	1.33	-0.16	23.1	0.20
Custom-Made	13	3.00	0.91	-0.16	25.0	
10. Increased Knowledge of Slow-Moving Merchandise						
Packaged	15	3.33	1.50	0.08	26.7	0.91
Custom-Made	14	3.29	1.54	0.08	27.0	
11. Increased Knowledge of Merchandise Trends						
Packaged	15	3.00	1.56	-0.54	25.9	0.79
Custom-Made	13	3.31	1.44	-0.54	26.0	

[a]Mean was determined by multiplying the value of the rating (i.e. No Benefit = 1, Definite Benefit = 5, etc.) by the number of responses to the rating, summing the products, and dividing by the total number of respondents to the item.

[b]Packaged = Packaged Software User.

[c]Custom-Made = Custom-Made Software User.

TABLE XXXIII

INTERCORRELATIONS AMONG ELEVEN INVENTORY RELATED BENEFITS OF MICROCOMPUTERS

Variables	1	2	3	4	5	6	7	8	9	10	11
1. Reduced average inventory	1.00	.48	-.10	.56[a]	.44	.33	-.08	.21	.49[a]	.24	.08
2. Reduced the number of markdowns		1.00	.27	.37	.47	.46	.14	.28	.37	.04	-.04
3. Reduced the amount of inventory shrinkage			1.00	.11	.42	.40	.54[a]	.59[a]	.21	.00	-.03
4. Reduced the cost of goods sold				1.00	.54[a]	.54[a]	.15	.39	.45	.27	.38
5. Improved profitability					1.00	.80[a]	.40	.43	.59[a]	.13	.16
6. Improved maintained markup						1.00	.41	.48	.67[a]	.02	.20
7. Increased knowledge of customer buying patterns							1.00	.44	.45	.50[a]	.48
8. Increased sales per square foot of selling space								1.00	.48	.30	.10
9. Increased stock turnover rate									1.00	.42	.61[a]
10. Increased knowledge of slow moving merchandise										1.00	.54[a]
11. Increased knowledge of merchandise trends											1.00

[a]Represents a correlation higher than 0.50 and significant at p 0.01.

TABLE XXXIV

FACTOR ANALYSIS OF INVENTORY RELATED BENEFITS

Factor	Factor Loading
Factor 1 - Buying and Pricing	
reduced average inventory	0.81
reduced the number of markdowns	0.70
reduced the cost of goods sold	0.70
improved profitability	0.74
improved maintained markup	0.70
increased stock turnover rate	0.68
Factor 2 - Result of Reaction to Sales	
reduced the amount of inventory shrinkage	0.90
increased knowledge of cutomer buying patterns	0.71
increased sales per square foot of selling space	0.70
Factor 3 - Reaction to Sales	
increased knowledge of slow moving merchandise	0.87
increased knowledge of merchandise trends	0.87

of inventory or effective pricing of inventory. Factor 2 was labeled "Result of Reaction to Sales." The three statements loading on this factor were benefits that occurred as a result of an accurate reaction to sales. Factor 3 was labeled "Reaction to Sales." Each statement loading on this factor described a benefit derived from an analysis of sales.

Based upon the microcomputer users' ratings of the eleven inventory related benefits, a mean score was calculated for each of the three factors. "Buying and Pricing" received a mean score of 2.96, "Result of Reaction to Sales" received a mean score of 2.31, and "Reaction to Sales" received a mean score of 3.14. Factor means were also calculated for each microcomputer user. Individual factor means were then compared to the overall factor mean in order to divide the microcomputer users into two groups: "High Benefit" or "Low Benefit." Users having a factor mean lower than the overall factor mean were placed in the low benefit group and users having a factor mean higher than the overall factor mean were placed in the high benefit group. High and low benefit groups were compared by type of software used, store classification, sales volume, state, and anticipated future involvement with computers.

A comparison of the high and low benefit groups based on type of software used revealed that users with custom-made software perceived greater benefits for each of the three inventory benefit factors than retailers using

packaged software (Table XXXV). Although the percent with a "High Benefit" was greater for custom-made software users than packaged software users in all three categories, the majority of the custom-made users obtained a "High Benefit" in only one factor - "Buying and Pricing." Fifty-six percent of the custom-made users obtained a "High Benefit" in "Buying and Pricing," while 33.33 percent of the packaged users obtained a "High Benefit" in this area. Thirty-seven percent of the custom-made users and 13.33 percent of the packaged users obtained a "High Benefit" in "Result of Reaction to Sales." Forty-four percent of the custom-made users and 23.33 percent of the packaged users obtained a "High Benefit" in "Reaction to Sales."

Three of the eight store classifications (Men's and Boy's Clothing and Furnishings, Women's Accessory and Specialty Shops, and Family Clothing Stores) had a higher percentage of retailers obtaining a "High Benefit" for "Buying and Pricing." Only one of the store classifications (Women's Accessory and Specialty Shops) had a higher percentage of retailers obtaining a "High Benefit" for "Result of Reaction to Sales" and "Reaction to Sales." Sixty-seven percent of the retailers operating a Men's and Boy's Clothing and Furnishing Store obtained a "High Benefit" for "Buying and Pricing." For "Result of Reaciton to Sales" and "Reaction to Sales," only 33.33 percent of the retailers operating Men's and Boy's Clothing and Furnishing Stores obtained a "High Benefit." Although one-hundred

TABLE XXXV

LEVEL OF BENEFIT OBTAINED ON THREE INVENTORY FACTORS ACCORDING TO TYPE OF SOFTWARE USED

Type of Software	Factor 1 Buying and Pricing				Factor 2 Result of Reaction to Sales				Factor 3 Reaction to Sales			
	Low Benefit[a]		High Benefit[b]		Low Benefit		High Benefit		Low Benefit		High Benefit	
	N	%	N	%	N	%	N	%	N	%	N	%
Packaged Software	20	66.67	10	33.33	26	86.67	4	13.33	23	76.67	7	23.33
Custom-Made Software	7	43.75	9	56.25	10	62.50	6	37.50	9	56.25	7	43.75

[a] A respondent was interpreted as having a Low Benefit if the respondents' mean score was below the mean score of the total group.

[b] A respondent was interpreted as having a High Benefit if the respondents' mean score was equal to or above the mean score of the total group.

percent of the retailers operating a Women's Accessory and Specialty Shop obtained a "High Benefit" for each of the three inventory benefit factors, this reflects the response of only one retailer. Fifty-six percent of the retailers operating a Family Clothing Store obtained a "High Benefit" for "Buying and Pricing." Thirty-three percent obtained a "High Benefit" for "Result of Reaction to Sales." And, only 22.22 percent obtained a "High Benefit" for "Reaction to Sales." The level of benefits obtained by small apparel retailers in each store classification is presented in Table XXXVI.

Retailers did not perceive higher or lower inventory benefits based on sales volume. For each sales volume category, a majority of the retailers were in the "Low Benefit" category. This was true for two of the inventory benefit factors. Retailers with a sales volume of $1,000,000 to $4,999,999 were divided equally between the "Low Benefit" and "High Benefit" categories. Although the percentage of retailers obtaining a "Low Benefit" was greater in each category, the differences between a "High" and "Low Benefit" were less in the area of "Buying and Pricing." The frequency and percent of each sales volume category by the inventory benefit factors is reported in Table XXXVII.

In regard to the level of benefit obtained by apparel retailers in each state, the same trend occurs. Benefits were more often perceived for the "Buying and Pricing"

TABLE XXXVI

LEVEL OF BENEFIT OBTAINED ON THREE INVENTORY FACTORS ACCORDING TO STORE CLASSIFICATION

Store Classification	Factor 1 Buying and Pricing				Factor 2 Result of Reaction to Sales				Factor 3 Reaction to Sales			
	Low Benefit[a]		High Benefit[b]		Low Benefit		High Benefit		Low Benefit		High Benefit	
	N	%	N	%	N	%	N	%	N	%	N	%
Men's and Boy's Clothing and Furnishings (SIC 5611)	2	33.33	4	66.67	4	66.67	2	33.33	4	66.67	2	33.33
Women's Ready to Wear (SIC 5621)	16	69.57	7	30.43	20	86.96	3	13.04	15	65.22	8	34.78
Women's Accessory and Specialty Shop (SIC 5631)	0	0.00	1	100.00	0	0.00	1	100.00	0	0.00	1	100.00
Children's and Infant's Wear Stores (SIC 5641)	2	100.00	0	0.00	2	100.00	0	0.00	2	100.00	0	0.00
Family Clothing Stores (SIC 5651)	4	44.44	5	55.56	6	66.67	3	33.33	7	77.78	2	22.22
Shoe Stores (SIC 5661)	2	66.67	1	33.33	3	100.00	0	0.00	3	100.00	0	0.00
Furriers and Fur Shops (SIC 5681)	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Miscellaneous Apparel and Accessory (SIC 5699)	1	50.00	1	50.00	1	50.00	1	50.00	1	50.00	1	50.00

[a] A respondent was interpreted as having a Low Benefit if the respondents' mean score was below the mean score of the total group.

[b] A respondent was interpreted as having a High Benefit if the respondents' mean score was equal to or above the mean score of the total group.

TABLE XXXVII

LEVEL OF BENEFIT OBTAINED ON THREE INVENTORY FACTORS IN EACH SALES VOLUME CATEGORY

Sales Volume	Factor 1 Buying and Pricing				Factor 2 Result of Reaction to Sales				Factor 3 Reaction to Sales			
	Low Benefit[a]		High Benefit[b]		Low Benefit		High Benefit		Low Benefit		High Benefit	
	N	%	N	%	N	%	N	%	N	%	N	%
$ 0 - $ 500,000	7	63.64	4	36.36	8	72.73	3	27.27	8	72.73	3	27.27
$ 500,001 - $ 999,999	6	85.71	1	14.29	7	100.00	0	0.00	7	100.00	0	0.00
$1,000,000 - $4,999,999	14	50.00	14	50.00	21	75.00	7	25.00	17	60.71	11	39.29

[a] A respondent was interpreted as having a Low Benefit if the respondents' mean score was below the mean score of the total group.

[b] A respondent was interpreted as having a High Benefit if the respondents' mean score was equal to or above the mean score of the total group.

factor. Sixty-seven percent of the retailers in Louisiana obtained a "High Benefit" in "Buying and Pricing" and fifty percent of the retailers in Oklahoma received a "High Benefit" in "Buying and Pricing." For the other two states and for the other two inventory benefit factors, the number of retailers receiving a "Low Benefit" was greater than the number receiving a "High Benefit." These figures are presented in Table XXXVIII.

Responses of retailers regarding anticipated future involvement with computers were analyzed in relation to perceived inventory benefits. A majority of the retailers anticipating a dramatic increase in computer involvement were in the "Low Benefit" category for each of the three inventory benefit factors. The frequency and percent of anticipated future involvement with computers by inventory benefit factors is reported in Table XXXIX.

Analysis of Inventory Performance Ratios

All respondents were asked to provide the following 1984 inventory performance data: gross sales, net sales, gross cost of goods sold, average monthly inventory, and square feet of selling space. Microcomputer users were also asked to provide inventory performance data for the year prior to acquiring a microcomputer. The inventory performance data was used to calculate three inventory performance ratios: maintained markup, sales per square foot of selling space, and stock turnover rate. The 1984

TABLE XXXVIII

LEVEL OF BENEFIT OBTAINED ON THREE INVENTORY FACTORS ACCORDING TO STATE

State	Factor 1 Buying and Pricing				Factor 2 Result of Reaction to Sales				Factor 3 Reaction to Sales			
	Low Benefit[a]		High Benefit[b]		Low Benefit		High Benefit		Low Benefit		High Benefit	
	N	%	N	%	N	%	N	%	N	%	N	%
Arkansas	3	75.00	1	25.00	3	75.00	1	25.00	3	75.00	1	25.00
Louisiana	3	33.33	6	66.67	8	88.89	1	11.11	5	55.56	4	44.44
Oklahoma	5	50.00	5	50.00	7	70.00	3	30.00	7	70.00	3	30.00
Texas	16	69.57	7	30.43	18	78.26	5	21.74	17	73.91	6	26.09

[a]A respondent was interpreted as having a Low Benefit if the respondents' mean score was below the mean score of the total group.

[b]A respondent was interpreted as having a High Benefit if the respondents' mean score was equal to or above the mean score of the total group.

TABLE XXXIX

LEVEL OF BENEFIT OBTAINED ON THREE INVENTORY FACTORS ACCORDING TO ANTICIPATED FUTURE INVOLVEMENT WITH COMPUTERS

Anticipated Future Involvement	Factor 1 Buying and Pricing				Factor 2 Result of Reaction to Sales				Factor 3 Reaction to Sales			
	Low Benefit[a]		High Benefit[b]		Low Benefit		High Benefit		Low Benefit		High Benefit	
	N	%	N	%	N	%	N	%	N	%	N	%
Remain at the Same Level	6	66.67	3	33.33	7	77.78	2	22.22	7	77.78	2	22.22
Increase Slightly	1	50.00	1	50.00	2	100.00	0	0.00	2	100.00	0	0.00
Increase Moderately	8	47.06	9	52.94	12	70.59	5	29.41	11	64.71	6	35.29
Increase Dramatically	10	62.50	6	37.50	13	81.25	3	18.75	10	62.50	6	37.50
Decrease	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00

[a] A respondent was interpreted as having a Low Benefit if the respondents' mean score was below the mean score of the total group.

[b] A respondent was interpreted as having a High Benefit if the respondents' mean score was equal to or above the mean score of the total group.

inventory performance ratios for the microcomputer users (Present Ratios) and the non-computer users (Non-User Ratios) were individually compared to industry averages for 1983. The 1984 industry averages were unavailable at the time of this study. Present Ratios and Non-User Ratios were compared to determine whether users obtained higher ratios than non-users.

Microcomputer users' inventory performance ratios for the year prior to computerization (Prior Ratios) were individually compared to industry averages for the same year. Prior Ratios were also individually compared to the After Ratios of the same store. Although increases or decreases in inventory performance ratios cannot show a causal relationship between microcomputer use and inventory performance, differences can be noted. Differences should be viewed with caution since less than 20 percent of the microcomputer users and less than 17 percent of the non-computer users provided data for these calculations.

Maintained markups for non-computer users averaged 9.75 below the industry averages. Maintained markups for computer users averaged 4.80 below the industry averages. The average sales per square foot for non-computer users was $9.00 below industry standards compared to $2.00 above for computer users. For the stock turnover rate, non-computer users averaged 0.31 above the industry standard, while computer users averaged 0.19 above the industry standard. Industry and store averages for each inventory performance

ratio are presented in Table XL. A comparison of industry and store performance ratios before and after computer use were calculated for individual stores (See Appendix H).

Discussion

During the course of the study, several shortcomings were identified. This section will include suggestions for improvement of procedures and for further revision of the questionnaire.

Each of the 470 small apparel stores selected for the study was mailed a packet containing a cover letter, a questionnaire, and a postpaid return envelope. After 20 days, 53 questionnaires were returned. A follow-up postcard was then sent to the remaining 417 non-respondents. The follow-up postcard only prompted 10 additional responses after a three week time period. Since only 63 of the 470 retailers had responded, a third mailing was initiated. The third contact was made with the remaining 407 non-respondents. It consisted of a cover letter offering a free issue of the CAMM Researcher for completing and returning the questionnaire, a second copy of the questionnaire, and a postpaid return envelope. Fifty-one questionnaires were returned as a result of the third mailing.

The third mailing prompted approximately the same number of responses as the first mailing, while the second mailing (postcard reminder) prompted only a fraction of the

TABLE XL

COMPARISON OF INDUSTRY AND STORE INVENTORY PERFORMANCE RATIOS OF COMPUTER USERS AND NON-USERS

Inventory Performance Ratios	Industry Standard	Store Average	Store Average Minus Industry Standard
Maintained markup percent	51.60		
Computer User		46.80	-4.80
Non-User		41.85	-9.75
Dollar Sales per square foot	168.20		
Computer User		170.20	+2.00
Non-User		159.11	-9.09
Stock turnover ratio	3.20		
Computer User		3.39	+0.19
Non-User		3.51	+0.31

total responses. The natural phenomenon would be to expect a decrease in responses after each mailing. Therefore, the effectiveness of the postcard reminder may be questioned. The money spent on the three mailings could have been utilized more effectively by eliminating the postcard reminder and including a more valuable incentive in the other two mailings.

This money could also have been more effectively used by telephoning a random sample of the non-respondents after two mailings. The results of this study were based upon only 24 percent of the retailers who received questionnaires. Non-respondents could have been contacted by telephone to determine whether non-respondents were similar to respondents.

Several revisions could be made to the questionnaire. The list of inventory control information in Question 8 was quite long and many of the items were interrelated. These 21 items could possibly have been grouped into fewer, but broader categories of information. This would have allowed for more discussion and analysis of the type of inventory control information obtained. An additional question could be included concerning what type of computer generated inventory control information (Question 8) the retailer would need in order to obtain the benefits listed in Question 10.

The retailers were asked to indicate their anticipated future involvement with computers in Question 12. An

additional question should have been included to determine level of current computer usage. This would have been helpful for comparative purposes.

Finally, a major problem was lack of response to Question 14. Retailers were asked to give five different financial figures. These five figures allowed the researcher to calculate three inventory performance indicators (sales per square foot of selling space, stock turnover rate, and maintained markup). While many retailers provided at least a portion of the financial information, few gave enough information to calculate all three inventory performance indicators. This question might have proven more effective if the retailers had been asked to give sales per square foot of selling space, stock turnover rate, and maintained markup rather than gross sales, net sales, gross cost of goods sold, average monthly inventory, and square feet of selling space. Presentation of industry standards for the various performance indicators could have been provided on the questionnaire. A range from high to low for each inventory performance indicator could be determined using the industry standard as a guide. Retailers could then rate their stores' performance as being higher than, lower than, or the same as the industry standard.

CHAPTER V

SUMMARY AND RECOMMENDATIONS

The purpose of the study was to investigate the utilization and the inventory benefits of in-store microcomputer systems in small apparel stores. The objectives of the study were as follows:

1. To identify characteristics of users and non-users of microcomputer systems.

2. To identify differences between users and non-users of microcomputer systems.

3. To identify differences among microcomputer users.

4. To identify inventory related benefits of microcomputers for small apparel retailers.

5. To measure inventory performance ratios of small apparel retailers.

Summary

Information was collected from primary and secondary sources regarding microcomputer uses and benefits for small apparel retailers, inventory performance measures, and problems of small retail businesses. The information collected was used in questionnaire development.

The retailers selected for the study operated apparel and accessory stores with a sales volume of less than $5 million.. They were members of Dun and Bradstreet's Million Dollar Directory (1985) and were located within the West South Central Region of the United States (Arkansas, Louisiana, Oklahoma, and Texas).

A questionnaire was designed to gather information about users and non-users of in-store microcomputer systems. Questions pertained to whether an in-store microcomputer system was being used, reasons for use or non-use, inventory control information obtained, inventory control information found to be most helpful, inventory benefits, anticipated future involvement with computers, and financial performance ratios.

Forty-one percent of the respondents were currently using microcomputer systems, while 59 percent were not using microcomputer systems. Two-thirds of the resondents had been in operation less than 40 years and had sales volumes that ranged from $55,000 to $4,000,000. In regard to the main reason for use or non-use of microcomputer systems, the adequacy of current procedures and the smallness of the store were the two most common reasons given for not using an in-store microcomputer system. Controlling merchandise, controlling accounts receivable, saving time, and improving quality of information were the most common reasons given for using in-store microcomputer systems.

Seventy percent of the retailers indicated that in the next five years their involvement with computers would increase moderately or dramatically. The retailers anticipated use of computers was somewhat related to sales volume. The retailers with higher sales volumes anticipated a dramatic or moderate increase in computer usage more often than retailers with lower sales volumes. However, retailers in lower sales volume categories still seem to be interested in future computer usage.

One of the major differences between microcomputer users and non-users was in regard to sales volume. As sales volume increased, the percentage of microcomputer users also increased. Although the cost of microcomputers has steadily decreased, use still seems limited by sales volume. The majority of the microcomputer users (60.87 percent) had a sales volume above $1 million. The majority of the non-computer users (62.50 percent) had a sales volume under $500,000. Louisiana was the only state in which more retailers were microcomputer users. Seventy-five percent of the retailers from Louisiana were microcomputer users.

The main difference between microcomputer users' and non-users' anticipated future involvement with computers is in the degree of increase expected. Fifty-one percent of the non-computer users indicated they would increase use dramatically, while 36 percent of the microcomputer users indicated a dramatic increase.

A majority (83 percent) of the apparel retailers using microcomputer systems owned their systems. The microcomputer users identified monthly sales records and sales by classification as the most common inventory control information generated by the computer system. The most important inventory control information obtained from the computer system was sales by classification, monthly sales records, and stock on hand. The information most often desired but not currently obtained from computer systems was sales performance by vendor.

Eleven inventory benefits were rated on a five point scale to determine the extent to which the small apparel retailers received benefits by using a microcomputer system. An average score was computed for each inventory item to determine the degree to which in-store microcomputers had benefitted the store. Six inventory benefits received an average score higher than 3.00. The benefit "increased knowledge of customer buying patterns" received the highest benefit score.

A majority (65 percent) of the apparel retailers using microcomputer systems had packaged computer software. Thirty-five percent used custom-made computer software. The mean benefit scores for retailers using custom-made software and those using packaged software were compared. The mean scores of retailers using custom-made software were higher than the mean scores of retailers using packaged software

for ten of the eleven inventory benefits. However, these differences were not significant.

A factor analysis of the eleven inventory related benefits generated three factors. These three inventory benefit factors were labeled "Buying and Pricing," "Result of Reaction to Sales," and "Reaction to Sales." Based upon the microcomputer users' ratings of the eleven inventory related benefits, a mean score was calculated for each of the three factors. Factor means were also calculated for each microcomputer user. Individual factor means were then compared to overall factor means in order to categorize the retailers as receiving a "High Benefit" or a "Low Benefit."

A comparison of the "High Benefit" and "Low Benefit" groups revealed that microcomputer users with custom-made software perceived greater benefits than users with packaged software for each of the three factors. However, the majority of the custom-made users obtained a "High Benefit" for only one factor - "Buying and Pricing." Sales volume of the microcomputer users did not seem to be related to the level of benefit obtained. The level of benefit obtained did not seem to have any relationship to the anticipated future involvement with computers. Overall, the retailers did not perceive any clear, definite benefits for any of the three factors. But, when a benefit was obtained, the benefit occurred in the area of "Buying and Pricing." "Buying and Pricing" included reduced average inventory, reduced the number of markdowns, reduced the cost of goods

sold, improved profitability, improved maintained markup, and increased stock turnover rate.

Three inventory performance ratios (stock turnover rate, sales per square foot of selling space, and average maintained markup) were obtained from both microcomputer users and non-users. Average maintained markup and sales per square foot were higher for computer users than for non-users. The average stock turnover rate for non-computer users was higher than for computer users. When looking at the inventory performance ratios of computer users before and after computerization, no definite trend emerged. Differences should be viewed with caution since less than 20 percent of the microcomputer users and less than 17 percent of the non-computer users provided data for these calculations.

Recommendations for Further Study

Based on the experience of conducting the present study, other ideas were formulated for future study.

1. Expand the sample base to include small apparel retailers throughout the United States.

2. Conduct an in-depth study of a selected group of retailers who have indicated many inventory related benefits from in-store microcomputers and those who indicated no benefits, and compare similarities and differences.

3. Investigate personal and psychological factors of small retailers that lead to greater microcomputer benefits.

4. Conduct further research on small apparel retailers using custom-made and packaged software, and compare similarities and differences.

5. Investigate the types of inventory reports generated from the computer to determine which reports are needed to improve inventory performance.

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APPENDICES

APPENDIX A

SMALL APPAREL MERCHANT QUESTIONNAIRE

APPAREL MERCHANT QUESTIONNAIRE

Directions: Please fill in the blanks or check as applicable.

PART I: Computer Information

1. Does your store currently utilize a computer system?

_____ YES. IF YES, PLEASE SKIP TO QUESTION NUMBER 3.
_____ NO. If no, please continue with the next question.

2. What is your main reason for not using a computer system? Please check your response and SKIP TO QUESTION NUMBER 12.

_____ computer systems are impersonal
_____ computer systems are too expensive
_____ suitable software is unavailable
_____ store personnel lack experience with computer systems
_____ computer systems are difficult to understand
_____ current procedures are adequate
_____ other (please specify)
_____

3. If you are using a microcomputer in your store, is it

_____ store owned
_____ leased
_____ a time-sharing system or service bureau (PLEASE SKIP TO QUESTION NUMBER 6)

4. What software are you using?

_____ Lotus 1-2-3
_____ The Apparel Store
_____ Retail Data Systems, Inc.
_____ Santoro
_____ Multiplan
_____ TCS
_____ Real World
_____ DBase II
_____ Retail Micro
_____ Peachtree
_____ Custom Made
_____ Other (please specify)
_____

5. When did you purchase or lease your in-store microcomputer?

_____ month _____ year

6. When did you first begin using a computer to process your store data?

_____ month _____ year

7. Please check your three most important reasons for first using a computer.

_____ track invoice due dates
_____ save time
_____ improve customer service
_____ control merchandise
_____ reduce costs
_____ generate new information
_____ increase business productivity
_____ receive investment tax credit
_____ control accounts receivable
_____ automate general ledger
_____ improve operating margin
_____ improve quality of information
_____ improve timeliness of information
_____ improve reliability of information
_____ meet competitive pressure
_____ other (please specify)
_____
_____

8. Please check the inventory control information you obtain from your computer system, then circle the three most important pieces of information generated by your computer system.

_____ daily sales records
_____ weekly sales records
_____ monthly sales records
_____ this year's sales versus last year's sales
_____ sales by classification
_____ sales per square foot of selling space
_____ stock to sales ratio
_____ stock turnover rate
_____ maintained markup
_____ amount of stock at markdown
_____ amount of stock at regular price
_____ slow sellers
_____ best sellers
_____ open-to-buy
_____ stock on hand
_____ stock on order
_____ purchase orders
_____ invoice payment dates
_____ merchandise received
_____ vendor list
_____ sales performance by vendor
_____ other (please specify)
_____
_____

9. What inventory control information would you like to obtain from your computer system that you do not currently obtain? Please list below.

1. _____ 3. _____

2. _____ 4. _____

10. In what way has the computer system benefited your store? Please rate each inventory related benefit listed below on a scale from 1 to 5 by circling a corresponding number.

BENEFIT	NO BENEFIT				DEFINITE BENEFIT
reduced average inventory	1	2	3	4	5
reduced the number of markdowns	1	2	3	4	5
reduced the amount of inventory shrinkage	1	2	3	4	5
reduced the cost of goods sold	1	2	3	4	5
improved profitability	1	2	3	4	5
improved maintained markup	1	2	3	4	5
increased knowledge of customer buying patterns	1	2	3	4	5
increased sales per square foot of selling space	1	2	3	4	5
increased stock turnover rate	1	2	3	4	5
increased knowledge of slow moving merchandise	1	2	3	4	5
increased knowledge of merchandise trends	1	2	3	4	5

11. In what way has your business improved since you began using a computer system? Please explain below.

1. _____

2. _____

3. _____

12. **Do you anticipate that your involvement in computerized systems over the next five years will**

_____ remain at about the same level
_____ increase slightly
_____ increase moderately
_____ increase dramatically
_____ decrease

PART II: Store Information

13. How long has your store been in operation?

_____ years _____ months

14. Please complete the following as accurately as possible and be sure to respond to each item. All information will remain strictly confidential.

	1984	1 year prior to computerizing
Gross Sales	$ _____	$ _____
Net Sales	$ _____	$ _____
Gross Cost of Goods Sold	$ _____	$ _____
Average Monthly Inventory (approx.)	$ _____	$ _____
Square Feet of Selling Space (approx.)	_____	_____

THANK YOU!! PLEASE RETURN THE COMPLETED QUESTIONNAIRE IN THE SELF-ADDRESSED, POSTPAID ENVELOPE TO DEBBIE MALONEY, HEW 315, OKLAHOMA STATE UNIVERSITY, STILLWATER, OKLAHOMA 74078

APPENDIX B

CORRESPONDENCE WITH SMALL APPAREL RETAILERS

Oklahoma State University

DEPARTMENT OF CLOTHING, TEXTILES & MERCHANDISING

STILLWATER, OKLAHOMA 74078
HOME ECONOMICS WEST 312
(405) 624-5034

July 15, 1985

Dear Apparel Merchant:

Increased computer availability for the small retailer has prompted researchers and retailers to try to determine the benefits of computerization. In response to this need, faculty in the Clothing, Textiles, and Merchandising Department at Oklahoma State University are studying the inventory related benefits of microcomputers for small apparel retailers. It is hoped that the results can be used to develop computer applications of benefit to you, the apparel retailer.

Only a select group of small apparel retailers listed in Dun and Bradstreet's Million Dollar Directory has received a copy of this questionnaire. Your response, as an active retailer, is vital to this study regardless of whether or not you are currently using a computer in your store.

Please take about 15 minutes of your time to complete the questionnaire, and return it to us in the self-addressed, postpaid envelope. All responses will be kept confidential.

Thank you very much for your assistance!

Debra D. Maloney
Graduate Assistant

Laura D. Jolly, Ph.D.
Assistant Professor
Clothing, Textiles, and Merchandising

CENTENNIAL DECADE
1980 • 1990

August 2, 1985

Dear Apparel Merchant:

You were recently sent a questionnaire regarding computer usage of small apparel retailers. At this point, we have not received your response. If you have returned the questionnaire, we appreciate it.

The response has been excellent and much valuable information has been gained. However, we are striving to receive information from as many retailers as possible. Please assist us by completing the questionnaire and returning it today. If you have misplaced the questionnaire, please contact us at (405)624-5035 and we will provide another one.

Many thanks!!

Laura D. Jolly

Laura D. Jolly, Ph.D.
Assistant Professor

Debra D. Maloney

Debra D. Maloney
Graduate Assistant

Oklahoma State University

DEPARTMENT OF CLOTHING, TEXTILES & MERCHANDISING

STILLWATER, OKLAHOMA 74078
HOME ECONOMICS WEST 312
(405) 624-5034

August 23, 1985

Dear Apparel Merchant:

You were recently sent a questionnaire regarding computer usage of small apparel retailers. As of yet, we have not heard from you. It is hoped that the results of this study can be used to benefit you. The knowledge you can provide is vital to this study regardless of whether or not you are currently using a computer in your store.

Since previous efforts to receive your response have been unsuccessful, we are offering an added incentive. If you will complete the enclosed questionnaire and return it to us by September 9, we will send you a free issue of a newsletter published by our Center for Apparel Merchandising and Marketing (CAMM). This newsletter reflects on-going research from which you may benefit. Articles featured in this newsletter include:

Making the Most of Being Small
Creating Distinctive Advertising
What Retailers are Talking About Today
Keeping an Eye on the Youthful Consumer

Please take about 15 minutes of your time to complete the questionnaire and return it to us in the self-addressed postpaid envelope. All responses will be kept strictly confidential.

Thank you very much for your valuable assistance! If you would like a copy of the results of this study, please indicate so on the questionnaire.

Laura D. Jolly

Laura D. Jolly, Ph.D.
Assistant Professor

Debbie Maloney

Debbie Maloney
Graduate Assistant

APPENDIX C

FREQUENCY & PERCENT OF APPAREL RETAILERS BY SALES VOLUME

TABLE XLI

FREQUENCY AND PERCENT OF APPAREL RETAILERS BY SALES VOLUME

Sales Volume	Frequency[a]	Percent
0 - 50,000	0	0.00
50,001 - 100,000	4	3.64
100,001 - 150,000	9	8.18
150,001 - 200,000	4	3.64
200,001 - 250,000	6	5.45
250,001 - 300,000	7	6.36
300,001 - 350,000	5	4.55
350,001 - 400,000	6	5.45
400,001 - 450,000	4	3.64
450,001 - 500,000	5	4.55
500,001 - 550,000	3	2.73
550,001 - 600,000	6	5.45
600,001 - 650,000	0	0.00
650,001 - 700,000	1	0.91
700,001 - 750,000	2	1.82
750,001 - 800,000	2	1.82
800,001 - 850,000	2	1.82
850,001 - 900,000	0	0.00
900,001 - 950,000	1	0.91
950,001 - 999,999	0	0.00

TABLE XLI (Continued)

Sales Volume	Frequency[a]	Percent
1,000,000 - 1,999,999	14	12.73
2,000,000 - 2,999,999	14	12.73
3,000,000 - 3,999,999	10	9.10
4,000,000 - 4,999,999	5	4.55
Total	110	100.00

[a]Total does not equal 111 since one respondent removed the sales volume figure.

APPENDIX D

TYPE OF SOFTWARE PACKAGES USED BY APPAREL RETAILERS

TABLE XLII

TYPE OF SOFTWARE PACKAGES USED BY APPAREL RETAILERS

Type of Software Package	Number of Respondents
Custom made	16
Lotus 1-2-3	3
National Cash Register	3
Multiplan	3
D Base II	3
P.F.S.	2
Santoro	2
Apparel Store	1
B.D.I.	1
Burroughs	1
Business Library	1
Data E	1
Dencom	1
Fisher Apparel	1
National Business Consultants	1
Programming for the Fashion World	1
Radio Shack	1
Real World	1
RMSA-California	1
S.T.S. Store	1
Word Microfile	1

APPENDIX E

INFORMATION DESIRED BY APPAREL RETAILERS FROM COMPUTER SYSTEM BUT NOT CURRENTLY OBTAINED

TABLE XLIII

INFORMATION DESIRED BY APPAREL RETAILERS FROM COMPUTER SYSTEM BUT NOT CURRENTLY OBTAINED

Information Desired	Number of Respondents
Sales performance by vendor	7
Merchandise details (sales by color, size, vendor, style)	4
Fast/slow sellers	3
Markdown information	2
Purchase orders	2
Open to buy	2
Turnover	1
Cost of sales	1
Stock to sales ratio	1
Daily sales records	1
Merchandise receiving dates	1
Stock on order	1
In house account status	1
Back order information	1
No response	30

APPENDIX F

LITERAL RESPONSES OF APPAREL RETAILERS REGARDING BUSINESS IMPROVEMENT CATEGORIES

TABLE XLIV

LITERAL RESPONSES OF APPAREL RETAILERS REGARDING BUSINESS IMPROVEMENT CATEGORIES

Business Improvement Categories	Literal Response	Frequency
More Information	better overall picture of sales faster reaction to trends faster reaction to best sellers better and faster merchandise information immediate feedback for making adjustments more timely information about inventory better knowledge of inventory more information in less time more information knowledge of what is selling knowledge of stock on hand	11
Accounts Receivable Efficiency	accurate accounts receivable faster more efficient accounts receivable accounts receivable handled more efficiently better control of accounts receivable better accounts receivable control improved collections better collection of accounts receivable faster more efficient accounts receivable methods lower accounts receivable costs accurate customer billing	10
Control of Open to Buy	tighter control of open to buy better analysis of inventory when going to market able to watch inventory and purchase more carefully better open to buy picture better control of merchandise for buying purposes ability to stock merchandise customers want allows buyers to pick and choose to customer needs	7

TABLE XLIV(continued)

Business Improvement Categories	Literal Response	Frequency
Improved Records	speeds office functions less office help great improvement on general ledger easy records	4
Better Control of Inventory	better inventory control better balance of goods better inventory control	3
No Significant Improvements	doesn't improve business enough to pay for itself inventory methods have never proven reliable none	3
Reduction in Inventory	reduced inventory maintain lower inventory levels	2
More Control of Cash	better expense control better cash flow	2
Other	less mistakes	1
	able to calculate expenses and sales quickly	1
	provided customer mailing lists for more customer contact	1
	smaller percentage of markdowns	1
	employee productivity information	1
	realization that large sales volume doesn't necessarity mean large profit	1
	increased turnover	1
	neat and accurate sales tickets	1
	better control of expanded operation	1
	improved inventory taking	1
	improved record of invoices	1
	greater profitability	1
No Response		10

APPENDIX G

FREQUENCY AND PERCENT OF COMPUTER USE BY SALES VOLUME

TABLE XLV

FREQUENCY AND PERCENT OF COMPUTER USE BY SALES VOLUME

Sales Volume	Computer User (N=46)		Non-Computer User (N=64)	
	N	%	N	%
$ 0 - $ 50,000	0	0.00	0	0.00
$ 50,001 - $ 100,000	0	0.00	4	6.25
$ 100,001 - $ 150,000	2	4.35	7	10.94
$ 150,001 - $ 200,000	0	0.00	4	6.25
$ 200,001 - $ 250,000	0	0.00	6	9.38
$ 250,001 - $ 300,000	1	2.17	6	9.38
$ 300,001 - $ 350,000	1	2.17	4	6.25
$ 350,001 - $ 400,000	3	6.52	3	4.69
$ 400,001 - $ 450,000	2	4.35	2	3.13
$ 450,001 - $ 500,000	1	2.17	4	6.25
$ 500,001 - $ 550,000	1	2.17	2	3.13
$ 550,001 - $ 600,000	5	10.87	1	1.56
$ 600,001 - $ 650,000	0	0.00	0	0.00
$ 650,001 - $ 700,000	0	0.00	1	1.56
$ 700,001 - $ 750,000	1	2.17	1	1.56
$ 750,001 - $ 800,000	1	2.17	1	1.56
$ 800,001 - $ 850,000	0	0.00	2	3.13
$ 850,001 - $ 900,000	0	0.00	0	0.00
$ 900,001 - $ 950,000	0	0.00	1	1.56
$ 950,001 - $ 999,999	0	0.00	0	0.00

TABLE XLV(continued)

Sales Volume	Computer User (N=46)		Non-Computer User (N=64)	
$1,000,000 - $1,999,999	7	15.22	7	10.94
$2,000,000 - $2,999,999	9	19.57	5	7.81
$3,000,000 - $3,999,999	7	15.22	3	4.69
$4,000,000 - $4,999,999	5	10.87	0	0.00
Total	46	99.99	64	100.02[a]

[a]Percentages do not equal 100 percent due to rounding.

APPENDIX H

COMPARISON OF INDUSTRY AND STORE INVENTORY PERFORMANCE RATIOS BEFORE AND AFTER COMPUTER USE

TABLE XLVI

COMPARISON OF INDUSTRY AND STORE INVENTORY PERFORMANCE RATIOS BEFORE AND AFTER COMPUTER USE

Inventory Performance Ratios[a]		Industry Standards	Store Averages	Variation from Industry Ave.
Maintained Markup				
	Prior[b]	51.60	46.74	-4.86
	Present[c]	50.30	46.74	-3.56
	Prior	51.90	N/A[d]	N/A
	Present	50.30	45.00	-5.30
	Prior	51.90	44.44	-7.46
	Present	51.60	46.94	-4.66
	Prior	51.90	55.00	+3.10
	Present	51.90	55.00	+3.10
	Prior	50.40	42.15	-8.25
	Present	N/A	N/A	N/A
Sales Per Square Foot Of Selling Space				
	Prior	104.30	101.95	-2.35
	Present	88.69	126.39	+37.70
	Prior	215.40	148.84	-66.56
	Present	238.20	175.00	-63.20
	Prior	215.40	158.43	-56.97
	Present	166.40	158.43	-7.97
	Prior	143.90	250.00	+106.10
	Present	142.70	166.67	+23.97
	Prior	143.90	143.15	-0.75
	Present	N/A	N/A	N/A
	Prior	143.90	223.00	+79.10
	Present	143.90	187.00	+43.10
	Prior	104.30	67.80	-36.50
	Present	N/A	N/A	N/A
	Prior	143.90	140.63	+3.27
	Present	N/A	N/A	N/A

TABLE XLVI(continued)

Inventory Performance Ratios[a]	Industry Standards	Store Averages	Variation from Industry Ave.
Stock Turnover Rate			
Prior[b]	3.8	2.13	-1.67
Present[c]	N/A[d]	N/A	N/A
Prior	3.8	4.50	+0.70
Present	4.2	4.38	+0.18
Prior	2.6	2.03	-0.57
Present	2.2	2.25	+0.05
Prior	2.6	1.99	-0.61
Present	2.3	1.99	-0.31
Prior	3.8	4.00	+0.20
Present	4.3	N/A	N/A
Prior	3.8	1.66	-2.14
Present	N/A	N/A	N/A
Prior	3.8	5.00	+1.20
Present	3.6	4.77	+1.17
Prior	3.8	8.92	+5.02
Present	3.8	7.48	+3.68
Prior	2.6	2.17	-0.43
Present	N/A	N/A	N/A

[a]Comparisons are made between Prior Ratios and Present Ratios for individual stores.

[b]Prior Ratio (store date one year prior to computerizing.)

[c]Present Ratio (1984 store date)

[d]Data not available for calculation.

VITA

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