MICROCOMPUTER APPLICATIONS IN SELECTED SMALL APPAREL STORES

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INTRODUCTION

Of the 14.3 million business enterprises in the United States, approximately 99.7 percent are small (United States Small Business Administration, 1984). The United States Small Business Administration (1980) classifies a small business as one that has an annual sales volume less than $1 million, with fewer than 20 employees.

The continuous growth of small businesses results from several forces in the environment, one of which is computer technology. During the last several years, advances in computer technology have created a wide range of systems that small firms can use and afford (Render and Stair, 1976). Reductions in the size and costs of computers and the development of new applications have increasingly made data processing available to small businesses (Drury, 1980). Low cost mini- and microcomputer systems now perform routine data processing operations for small organizations. A variety of application software can process orders, inventory, payroll, and other important business functions necessary in small firms.

Computers are definitely finding their way into small businesses. A recent report indicated that small businessmen and professionals bought about 60 percent of all personal computers manufactured (Hedberg, 1982). About two decades earlier, Senator William Proxmire cited the importance of data processing to the small businessman.

He stressed that

> Today, the information explosion threatens to bury the small entrepreneur . . . .Whether in the area of financial reports, sales and inventory, accounts receivable, research or elsewhere, data processing can be the answer to small business problems (Carter, 1966, Preface).

Accordingly, a Senate report stated that the small businessman who will survive and compete in the American business environment needs to acquire and retrieve key information relevant to the present and future operations of his firm (Automatic Data Processing, 1968).

Smith (1981) indicated that an increasing number of small business managers realize the necessity of the computer in their firms because it helps entrepreneurs be more competitive and productive, and offers them support in decision-making. The growth in the number of small firms acquiring their computers is rapidly rising because of the benefits they bring businessmen. These benefits range from such tangible ones as increased profits to less tangible ones such as improved internal control and simplified preparation of government reports (Pickle and Abrahamson, 1981; Sharp, 1976).

As the computer becomes an integral part of small businesses, entrepreneurs must know and understand its functions in order to better assess whether or not it will fit the needs of their organizations (Sanders, 1966). Senator John Sparkman emphasized the importance of providing guidance to the small businessman in the use of computers as tools to improve management in a report to the Small Business Committee.

> It is absolutely essential for small business owners and managers to keep abreast of the times and changing developments. In the future, it is reasonable to assume that nearly all businesses will be able to justify the use of automative data processing equipment either on their premises or shared through a service center. Meanwhile, we must do all we can do to provide the small businessman with guidelines through

> the maze of hardware, software and computer salesmen's promises (Automatic Data Processing, 1968, p. 6).

The Center for Apparel Marketing and Merchandising (CAMM) was established at Oklahoma State University in May 1982. The Center provides educational assistance to retailers throughout the United States to help them improve their business efficiency and profitability. The majority of clients served by the Center are retailers in operation for less than five years with annual sales volume of $500,000 or less.

The CAMM staff conducts seminars and workshops for retailers attending regional apparel markets. Consultant services for store owners, managers, and/or buyers are provided, and the needs and problems of retailers are researched. Learning materials are prepared and distributed to aid retailers. A quarterly newsletter and a biannual research report are published for CAMM Retail Associates in order to disseminate current merchandising and research information.

The growing involvement and interest in computer technology support the need to provide guidance for small apparel retailers in the development of an in-house microcomputer system. An increased understanding of computer use in small apparel stores would make it possible to develop guidelines for retailers who will be future computer users.

Purpose and Objectives

The major purposes of the study were to investigate the computer utilization of a selected group of small apparel stores and to prescribe procedures for the development of an in-store microcomputer system for small apparel retail operations. The specific objectives of the study were:

1. To compile information related to the selection and use of electronic data processing systems by small businesses.
2. To examine the current applications of microcomputer systems in selected small apparel stores.
3. To formulate guidelines to assist the apparel retailers in selecting, acquiring, and implementing an in-store microcomputer system.

Assumptions and Limitations

The assumptions for the study were as follows:

1. Computers are powerful business tools vital to retailing.
2. The potential of computer use in small business is notable.

The study limitations were as follows:

1. Case studies were based on the development and utilization of in-store microcomputer systems of selected small apparel stores.
2. The study was limited to three apparel stores located within a 70-mile radius of Stillwater, Oklahoma, and with annual sales volume of less than $1 million.

Definition of Terms

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

Computer - an electronic data processing device capable of receiving input, storing sets of instructions for solving problems, and generating output with high speed and accuracy (Silver and Silver, 1981).

Computer Service Center or Bureau - a computer organization whose

main purpose is to computerize a part or all of a company's operations for a stated fee (Pickle and Abrahamson, 1981).

Electronic Data Processing (EDP) - a high speed method of organizing large volume of random information into a meaningful format (Carter, 1966).

Hardware - the actual physical equipment associated with the computer, including the mechanical, electrical or electronic devices used such as the input terminal, processing unit, and the output unit (Larson, Weigand, and Wright, 1982).

In-Store Microcomputer System - a microcomputer operated within the store premises, also referred to as in-house.

Microcomputer - a small computer system built using a silicon chip for a microprocessor, and also has memory and input-output controllers. Sometimes called a personal computer.

Microcomputer System - includes both hardware and software.

Package - consists of one or more computer programs (Stair, 1979).

Small Apparel Store - for the purpose of the study, a single unit retail operation, independently owned and managed, and with annual sales volume less than $1 million.

Software - consists of computer programs and instructions given to computers to perform specific functions and activities (Stair, 1979).

CHAPTER II

REVIEW OF LITERATURE

Small business firms are an important part of the American business system. Because of this reason, owners and managers of small enterprises must be able to anticipate and adjust quickly to the shift in costs, competition and consumer demand. With inflation affecting all businesses, the small entrepreneur must become more cost conscious and more aware of the business environment. Rising costs and lower profits in small businesses require quick and educated business decisions. Cost effective help is necessary to improve small business productivity in order to survive in a highly competitive environment. Computers help the small businessman obtain timely and accurate financial and operational information to meet his decision making needs (Render and Stair, 1976; Smith, 1981).

According to Pickle and Abrahamson (1981), all types of information were necessary for the continuous monitoring of small business performance. Consequently, a common factor which may lead to business failure is the nonavailability of vital information such as inadequate inventory control records and credit control (Pickle and Abrahamson, 1981). Detailed, accurate information provided by computer, therefore, aids the entrepreneur in managing his business more efficiently.

The literature related to this study was organized into the following sections: Computers and Information Management, Small

Business and Computers, Role of Computers in Retailing, Research Techniques, and Related Research.

Computers and Information Management

Forty years after the first electronic computer was created, it has become not only an indispensable tool but a dominant force in today's society. Every aspect of business, science, service, and leisure virtually use computers. Business organizations, government agencies, hotels, banks, hospitals, schools, factories, and research facilities depend on the computer to process data and make information available for use in making decisions. The rapid decline in computer costs and size continue to create great impact in society.

The Electronic Data Processing Era

Computer technology has undergone rapid and continuous changes since the development of the first electronic computer in the 1940s. Mark I, the first digital computer was created by Howard Aiken using telephone relays and rotating mechanical wheels. The machine used punched paper tape and punched cards to input data (Silver and Silver, 1981).

Shortly after the appearance of Mark I, John Mauchly and J. Presper Eckert developed the first electronic general purpose computer using 18,000 vacuum tubes as the basic electronic components to store data. The ENIAC computer employed a binary system of mathematics, was 1,700 times faster than the Mark I, and used punched tape and circuit boards for data input. ENIAC immediately became obsolete with the appearance of the EDSAC and EDVAC, the first computers to store instructions or

"programs" in their own internal memories (Lewis, 1983).

Computer generations refer to the different stages and innovations in computer development for the past several decades (Paulson, 1973). First generation computers used vacuum tubes, and were large and often unreliable. These machines were developed during the late 1940s until the mid-1950s. Examples of these machines were the ENIAC, EDSAC, EDVAC, and UNIVAC, the first commercial computer (Silver and Silver, 1981).

The later 1950s and early 1960s saw the introduction of second generation computers which used transistors that improved their speed and reliability. Computers of this generation were more compact, cost less to produce, and were programmed with higher level languages.

The development of the semiconductor integrated circuit or the "chip" in 1957 produced the third generation computing systems in the late 1960s. These systems were smaller in size, less expensive, faster, more efficient and accurate, had better data input, output, and storage capacity, and used magnetic tape and magnetic disks for storage (Larson, Weigand, and Wright, 1982; Silver and Silver, 1981).

The 1970s marked the invention of the large-scale integrated circuit (a single silicon chip with the capability of an entire computer) and led to the development of fourth generation computing systems. The microcomputer, a fourth generation computer, was manufactured using a small silicon chip. The introduction of the microcomputer represented a change of course in digital computer development. The appearance of extremely small, inexpensive computers with significant processing power and versatility extended stored-program control and data processing into the smallest electronic insturments (Wise, Chen, and Yokely, 1980).

In 1977, floppy disks, also called diskettes, emerged to provide necessary disk operating software for micros. At the same time, application programs for microcomputers such as payroll, receivables, and general ledger started appearing in the market (Schwartz, 1979).

Growth of Microcomputers

The declining cost, decreasing size, increasing capability, and breaking down of user resistance were factors stimulating the demand and supply of computers (Miller, 1981). Smith (1981) noted that the tremendous proliferation of computers in the home and in small business will increase the use of computers in the future. Accordingly, Smith predicted that in the next 10 years, the small computer will be an indispensable tool in every type of small business. The small operator who uses some form of data processing will stay competitive because he/she will have more time and energy for planning and managing the business.

In 1980, there were 425,000 microcomputers sold in the United States, of which 60 percent were bought by small businessmen and professionals such as doctors, lawyers, and accountants (Hedberg, 1982). A Frost and Sullivan study (Schatz, 1982) reported that about 2.5 million businesses with annual sales of less than $10 million can cost effectively use computers because of their potential to help small businesses become more efficient, profitable, and competitive. The study also predicted that 44 percent of these firms will have installed computers by 1985, and the number will rise to 77 percent by the end of the decade. According to Schatz (1982), about two percent of the gross revenue of small companies was budgeted for data processing.

Freeland (1983) estimated that there were 2.3 million potential computer users in the very small business segment, 2.5 million users in the self-employed professional market, and 15 million potential users in the middle manager market. Today, computers are no longer limited to corporate use. The availability of microcomputers and off-the-shelf programs has made it possible for the smallest business with no technical expertise to have accessibility to electronic data processing at costs easily affordable (Merchant, 1982).

Management of Information

Historically, businessmen used their intuition, an educated guess, or the common sense approach in making business decisions. With the increasing complexity of the business environment, more sophisticated customers, and intensive competition, it became highly important especially for small business owners to make intelligent and forceful decisions. DeBoer (1974) indicated that

> One of the greatest needs of managers of small business is to have adequate, accurate, and current information on which to base their decisions concerning the marketing of their product or services (p. 2).

According to Brightman, Luskin and Tilton (1971), efficient management requires efficient decision-making that is highly dependent on the information available to the decision makers or managers.

Mason and Mayer (1980) stated that aside from land, labor and capital, information and communications were now considered assets. Information is meaningful material that conveys knowledge useable to the recipient. To be of value, information must meet the needs of the recipient, be accurate, be available at the proper time, be in the

proper place, be in the proper form, and be understandable (Petrof, Carusone, and McDavid, 1972). Rothman (1980) considered information as the keystone of merchandising.

The management of information is basic to the conduct of business, and is needed by managers to support the decisions they make (Sanders, 1974). One method used to manage business information is through the use of electronic data processing. Automating manual information system of business firms improves management by: a) providing current, more accurate operating information; b) accomplishing more work with the same number of people; and c) improving use of capital with lower inventories (Greenwood, 1982).

The computer had become an important business tool because of its speed and accuracy in processing information. More and better information is made available with the use of the computer, thus relevant and faster decisions can be made (Hasty, 1983). However, for information to be useful in making effective decisions, it is important that small firms maintain adequate records, that give an accurate, thorough picture of the business operations (Broom and Longenecker, 1975). A 1974 Dun and Bradstreet study (Christy and Jones, 1982) reported that 80 percent of the causes of failure in retailing and service firms was the result of inadequate business records. Accurate records processed by the computer provide the manager effective information that improves business planning and control, and decision-making techniques (Sanders, 1974).

Small Business and Computers

During the 1980 White House Conference on Small Business, President Carter said that the single most important segment of the free enterprise system was the small business community (Packard and Carron, 1982). Carter also stressed that the small business firms constitute the backbone of the American economy. With the increasing complexity of small businessmen's management tasks, electronic information systems have become relevant to small businesses, as they already have in larger firms (Withington, 1973).

Status of Small Business

Traditionally, small business was defined based on dollar sales volume, number of employees, or type of ownership. However, as the economy gradually shifted from heavy industries to services, the distinction began to blur. Baumback (1983) defined a small business as one that was owner-managed, highly personalized, localized in operation, relatively small within the industry, and self-financed.

According to the Small Business Adminstration (1984), approximately 99.7 percent of all businesses in the United States are small and provide jobs for about 47.8 percent of the American workforce. Small businesses generate approximately 38 percent of the Nation's gross national product (GNP) and contribute 42 percent of annual business receipts (United States Small Business Administration, 1984).

A large number of small businesses exist in all types of industry and commerce because they provide closer contact with customers and employees, allow flexibility in production, marketing and service, and

increase motivation since the owner works harder, longer and with more personal involvement (Baumback and Lawyer, 1979).

Problems of Small Business

There are a number of problems that exist in small business operations. Markland (1972) reported that the most common business problems experienced by small businesses were maintaining adequate records, dealing with unreliable help, and difficulty obtaining business information. The study also indicated that the manual accounting system used by the respondents was unsatisfactory. Consequently, the primary information needs were in the financial areas such as accounting information for tax purposes and internal control.

Senn and Gibson (1981) cited common problems that affect the efficiency of small firms as: a) lack of adequate operating data and information; b) inaccurate, untimely or irrelevant data; c) lack of adequate monitoring of operations; d) unknown costs, margins and profits; e) failure to capture, maintain or use historical or trend data; and f) inefficient procedures.

A small business survey was developed by Franklin and Goodwin (1983) that classified small problems into three types:

a) external factors - elements usually beyond management's direct control;

b) internal factors - items management encounters day-to-day and over which it has some degree of control; and

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

Of the top ten problems cited by the respondents of the survey, four

were identified as internal factors namely, costs, paperwork, labor quality, and recordkeeping. In addition, one financial problem was identified as cash flow.

Computerization of Small Business

One of the important needs of modern business firms, whether large or small, is the ability to handle vast amounts of data accurately and efficiently (Silver and Silver, 1981). The computer is a tool that has the capability of meeting this need. The computer was considered ideally suited for business operations that have one or more of the following characteristics: a) large volume of transactions or records generated regularly; b) repetitious generation of reports, statements, label and other documents; c) need for timely, reliable and accurate information and reports; and d) complex computations or processing requirements (Curling, Ernst and Ernst, and Hicks, 1979; Dorf, 1972).

Smith (1981) stated that the miniaturization of computers has decreased the costs of small business systems and made them affordable by small firms. However, as early as 1965, the potential of electronic data processing for small business was considered when the Senate Select Committee of Small Business conducted a survey to assess this new technology (Automatic Data Processing, 1968). As a result of this study, a 148-page "guide" for the utilization of computerized information and data processing systems by small businesses was published (Markland, 1972, 1974).

Computer usage by small business has been proliferating at a rapid rate. The development of the microcomputer has helped small business managers manage effectively by providing timely information needed to

make informed management decisions and improve business activities (Dologite, 1981). Christy and Jones (1982) indicated that in the recent years, the increasing processing capability offered by computers at much lesser cost has justified the purchase of these machines by small businesses.

Computer acquisition was considered by small businesses to aid in accounting or as a means of reducing costs (Newpeck and Hallbauer, 1981). Accordingly, Benbasat and Dexter (1977) disclosed four dominating reasons small businesses acquire a computer. These reasons were: a) increased flexibility in handling data inputs; b) reduced complexity of the accounting system; c) improved accuracy and timeliness of control data; and d) improved competitive advantages. A recent report (Defining and Using, 1982) cited reduced labor costs, increased productivity, increased profits, reduced inventory, and enhanced management efficiency as other reasons for computerization.

The study conducted by Markland (1972, 1974) implied that: a) computerized systems could solve some of the typical problems of small businesses; b) the small businessman was aware of the computer's potential; c) the small businessman was concerned about the lack of business information; and d) the small businessman understood some of the risks of computer usage. The findings also disclosed that economic feasibility was the most important factor considered in computerization, and accounting/financial areas were the most likely to be initially automated in small businesses.

A private survey of 216 small computer users listed 494 applications for which the computer was used. Three hundred eighty five applications identified fell under five categories: payroll, inventory,

general ledger accounting, accounts payable and receivables, and billing (Withington, 1973).

Solomon (1973) took a survey of small firms in the Washington-Baltimore metropolitan area to investigate computer selection and use. The most popular computer applications were identified as billing, accounts receivable, sales analysis, inventory control, account payable, and payroll. Forty six percent of the sampled firms utilized service bureaus for services such as payroll and keypunching. The study showed that: a) the problems faced by small and inexperienced computer users were different from large and experienced computer users; b) small firms do not typically engage in precise and extensive pre-installation feasibility studies to test proposals and alternatives; c) there was substantial dissatisfaction with the computer installation; and d) the kinds of applications performed by the small firms were very much standardized.

A study conducted by Cook and Russell (1977) investigated the status of small business computer usage and identified the present and future areas of computer applications. Expected cost savings on clerical help and better decision-making were the common reasons for computerization found by the study. Almost 70 percent of the 103 small business firms initiated computer usage in the 70s and have had computers for an average of four years. Over 50 percent of the firms spent less than $1000 per month for computer expenses and more than 85 percent of the companies utilized the computer less than 40 hours per week. Cook and Russell also reported that only 24 percent of the small firms had their own computers. The four most popular computer applications being used were accounting applications particularly accounts

receivable, payroll, accounting or financial statements, and sales analysis.

Pauls (Henkel, 1981) surveyed 38 small firms in Florida, and found that 65 percent were using some form of data processing. The computer users indicated serviceability as the most important factor considered in buying a small business computer, while vendor reputation was the second factor. Almost half of the computer users indicated that the computers were bought to save money. Most of the computer owners were satisfied with their system's performance and vendor service. The most significant benefits gained from computer usage included data analysis, mailing list preparation, better tax information, and more timely information. However, major drawbacks identified were the slow process of custom programming, high impact of the system on the employees, difficulty in implementing new business methods, and more errors entered into the system.

The study by Vitelli (Smith, 1981) emphasized the need of small business owners for sufficient knowledge and information about computers. Vitelli surveyed a number of small businesses in the Northeast and found that: a) small business owners were unfamiliar with the computer industry, systems, and applications; b) a majority of the entrepreneurs were not aware of the advantages that can be gained from computers; c) over 50 percent of the respondents could not afford computers; d) some of the owners viewed the computer with fear; and e) a number of entrepreneurs were under the impression that if they purchase a computer they also have to hire computer personnel.

Turney and Laitala (1976) indicated that small businesses need more guidance in order to be successful in determining their own data

processing needs. Accordingly, smaller firms generally do not have enough financial resources to hire an outside consultant, or pay a computer manufacturer, to perform a feasibility study nor are they big enough to employ a data processing manager whose responsibility will be to supervise the design, implementation, and operation of a computer system. Most likely it will be the owner/manager who will be responsible for data processing, therefore, there is a need to guide the small entrepreneur in developing and implementing the firm's computer system.

Role of Computers in Retailing

One industry that has a great potential for computer usage is the retailing industry because it thrives on a large variety of merchandise, minimal inventory, and rapid turnover (Mason and Mayer, 1981). While Jones and Spellman (1959) recognized the significance of electronic data processing (EDP) in the field of merchandising because of EDP's ability to capture improved unit information, computerization came later to the retail industry. In the 1950s and 1960s, very few retailers used computers, and the retailing industry had the lowest average investment in computers (Paulson, 1973). Mason and Mayer (1981) cited several reasons for retailers' slow adoption of computers. The reasons were: a) high dollar investment in equipment; b) complicated transactions, especially in general merchandise retailing; and c) problems in training people to work with new equipment.

Retailing Characteristics

According to a Datapro Report (1980), while retail was the second largest industry, it has the lowest penetration, only 4.55 percent, and

the greatest potential for computer use. The retailing industry also has the largest number of businesses in the $100,000 to $500,000 size category.

The computer has tremendous potential for improving and facilitating retailing operations because of certain retialing features. According to Paulson (1973), high volume of paperwork, fast turnover of merchandise, low profit margin, high turnover of personnel, constant shifts in consumer demand, and growing sophistication in retailing characterized typical retailing operations.

Computer Applications in Retailing

Retailers began to realize the need to use computers in some form during the seventies (Paulson, 1973). Small retailers began using computer service bureaus, which provided them data processing services, to compete with large retailers (Hasty, 1983). Accounting departments were the first areas in retailing that used computers since accounting activities consisted of defined and highly structured repetitive functions (Hasty, 1983).

The challenges in the retailing environment have brought about the need to improve productivity of resources and inventories, and to produce profits that provide for continued growth and a reasonable return on investment. Decisions made must be based on facts rather than assumptions. Goldberg (1979) stressed the increasing need for quick decision-making in the constantly changing retail scene. Timely, accurate and complete information were necessary in making retail and merchandising decisions.

Mason and Mayer (1981) indicated that lower prices of computer

systems, the need to increase labor productivity, and the increased savings from inventory management were some of the factors that led to the rapid advances of computer usage in retailing. The computer has enabled "retailers to conduct a variety of operations quickly and accurately" (Morgenstein and Strongin, 1983, p. 47). This new tool has provided retailers assistance with merchandise management problems, and increasing benefits and opportunities for better decisions (Markin, 1977). Jarmick (1983) indicated that the retailer who has the information a customer needs will be the one to survive in today's severely competitive market.

Accounting and payroll applications were the most commonly used by nearly all retailers (Paulson, 1973). The primary purpose of these applications was direct-cost control required to conduct day-to-day business operations. Applications such as fashion and merchandise control, open-to-buy reports, purchase order systems, personnel systems, price-line reports, and credit authorizations were some of the more complex retail applications used by retailers with a more sophisticated computer-based system. Shern (1980) indicated that the most important application areas for retailers were merchandise reporting and inventory control. Information that defined customer trends and buying habits helped maintain service levels and gross margins, as well as overall buying and merchandising functions.

A study by McConaughy (1970) found improvement in three main areas of inventory management performance in department stores using computers. As a result of computer utilization, control of stocks improved, item movement was identified, and inventory requirements were better planned. The longitudinal research with 30 apparel retailers

conducted by Greenidge (1968) and Wilson (1968) disclosed that the retailers increased their gross margins substantially by using a computerized inventory control system.

The development of smaller computers has enabled small retailers to compete more effectively with their large competitors. According to Abend (1983), financial and inventory activities were the common areas small retail firms were initially computerizing. A recent Frost and Sullivan study, Small Computers in the Retail Industry (Abend, 1983), estimated that of the 780,000 retailers studied, only 43 percent used any form of electronic data processing, with 30 percent using service bureaus, 10 percent operating small, in-house computers, and three percent having complete retail management systems. The study concluded that smaller retailers who want to have continuous success will have to computerize.

According to Wright (1973), retailers must meticulously plan and analyze the installation of computerized systems in order to benefit from it. Some of the important prerequisites for computer installation were identified by Wright as: a) identification and definition of management needs; b) support and participation by top management; c) organization of plan for orderly conversion; d) training of management and other employees; e) establishing a realistic project budget; and f) initiating a dual operation of old and new systems during conversion.

The National Retail Merchants Association (Paikert, 1981) cited specific benefits retailers can expect from the installation of a computer system. The benefits were: a) improved salesperson productivity; b) improved sales, payroll, and commission data capture; c) improved

inventory management; d) reduction in sales audit costs, bad debts, inventory levels, markdowns, and shrinkage; and e) increase in accounts receivable cash flow. Pickle and Abrahamson (1981) also mentioned the following advantages for small retailers using computers: a) availability of new, timely, and accurate information; b) reduction of clerical staff; c) improved internal control; d) better customer service; e) more efficient purchasing procedures; f) faster report preparation; and g) increased efficiency of firm's operation.

Apparel Retailing

Retail stores comprise the largest group of small businesses. Compared to other kinds of business enterprises, retail stores account the most with 34 percent (Baumback, 1983).

Characteristics of Apparel Retailing. One of the various business options in retailing is apparel stores. Different types of apparel stores that are small or large, specialty or department, carry clothing and accessories for men, women, and children.

Clothing is one of the biggest items in the average American family budget. More than $70 billion is spent by Americans annually by expressing themselves through dress (Cingolani and George, 1978). This is one of the reasons why new apparel stores are established continuously every year. Dun and Bradstreet (1982) reported that new apparel businesses in 1981 increased 7.5 percent to 2,316 stores from 2,154 in 1980.

Packard, Winters and Axelrod (1983) described fashion apparel as a big business in the United States. "Although fashion is big business

at the retail level, small specialty stores throughout the country account for a significant proportion of the sales of fashion goods" (Greenwood and Murphy, 1978, p. 219). The last census reported that there were approximately 1.8 million retail stores in the United States, of which approximately 140,000 specialize in apparel and accessories (United States Bureau of Census, 1978). Nearly 93 percent of these apparel and accessory stores were single unit operations while about 40 percent had fewer than four employees and over 87 percent had an annual sales volume of $500,000 or less (United States Bureau of Census, 1978). In 1982, retail sales of apparel and accessory stores were 4.7 percent of $1.1 trillion, while sales for 1983 were expected to total $52.8 million (United States Department of Commerce, 1983).

Jarnow and Judelle (1974) stated that "small stores specializing in apparel for men or women play a very dominant role in the fashion business" (p. 239). Accordingly, they added that independently owned shops constitute a majority of small stores and exist in most small towns and big cities. Greenwood and Murphy (1978) described these apparel stores as predominantly small single unit operations, with employees fewer than 20, and with annual sales volume of less than $100,000.

Changing lifestyles, competition, and unpredictable customers are a few of the factors that make apparel retailing a risky business. Failures of small apparel stores were due to tough competition from discount and department stores which capture rougly 40 percent of men's apparel sales, 49 percent of all women's purchases, and more than 50 percent of the children's wear business (Cingolani and George, 1978).

Clayton (1981) emphasized that the nature of retailing is

"intensive and extensive in terms of owner/manager input and output" (p. 23). Retailing involves a wide variety of activities such as purchasing and maintaining inventory, maintaining store equipment, preparing merchandise displays, making sales, delivering merchandise, maintaining property, maintaining recordkeeping systems, advertising and promoting products, pricing merchandise, taking buying trips, controlling credit, studying competition, and making short and long-range financial plans (Clayton, 1981).

Apparel Retailing Failures and Problems. A great number of problems confront the operation of a retail business. Women's and men's apparel stores are no exceptions. In fact, clothing stores consistently place near the top of the business failure list (Cingolani and George, 1978). Baumback and Lawyer (1979) observed that one out of three new stores do not survive the first years, and two out of three close their doors within six years of operation.

In 1981, 783 apparel and accessory stores failed, the largest number since 1963 (Dun and Bradstreet, 1982). According to Dun and Bradstreet (1982), the major underlying causes of apparel retail store failures were incompetence (37.5 percent), lack of experience (22.5 percent), unbalanced experience (19.7 percent), and lack of managerial experience (12.3 percent). Consequently, lack of experience and managerial ineptitude of small apparel retailers resulted in inadequate sales, inventory difficulties, heavy operating expenses, and competitive weaknesses.

A longitudinal study conducted by Khan and Rocha (1982) revealed that the small firms most vulnerable to operational deficiencies were

retail sole proprietorships under five years of operation. Four major recurring problem areas found in these firms were in marketing, accounting, inventory control, and cash flow management. All four problem areas inclined to be interrelated. According to this study, slow inventory may result from ignorance of the target market and a severe cash shortage generated by these circumstances may not be detected on a timely basis because of deficient accounting.

Legrand (1976) found that both women's and men's apparel stores had some problems related to each of the four functional areas of retailing. The kinds of problems identified most often were keeping adequate merchandise and expenses records, spending too much time with recordkeeping, affording an accountant, knowing the styles to buy each season, keeping a balanced merchandise assortment in the store, and keeping accurate records of advertising results.

Importance of Information in Apparel Retailing. All apparel stores regardless of size are involved in the control function of maintaining accurate records of their operations. Business decisions are based on some factors such as operating expenses, inventory levels, sales records, earnings, and cost of goods sold. With the continuous increase of competition in apparel retailing, the need for accuracy and current, up-to-date factual information makes it necessary for more and more stores to convert their manual recordkeeping procedures to electronic processing.

An increasing number of large and small fashion retailers are using electronic computers to assist them in keeping a competitive edge. Electronic computers has increased the timeliness of information and

represent the fastest method of recordkeeping available. With computer printouts, fashion executives are guided into making better decisions about inventory, buying and planning for the future, and controlling operating expenses (Grace, 1978).

Survival of small apparel stores depends on their adaptability to changing environmental conditions. The use of electronic computers by small stores has provided them new strength to compete successfully with the highly automated larger corporations. Broom and Longenecker (1975) stressed that the future success of small retail businesses depends on the owners and managers' sensitivity to changing business conditions and willingness to take advantage of opportunities available.

Research Techniques

Selected research techniques were used to accomplish the purposes of the study. Several sources were reviewed in designing the research procedures.

Case History Approach

The case history approach was utilized since the study undertaken by the researcher was exploratory in nature, and involved a selected sample of subjects. The process is personalized when a limited number of cases are being studied (Best, 1977). According to Kinnear and Taylor (1979), the case history approach

> . . . involves the intensive investigation of situations which are relevant to the problem situation . . . identifies relevant variables, indicates the nature of the problem and/or opportunity present in the original decision situation (p. 99)

of the selected target cases. In addition, the case method is a

detailed investigation to obtain a complete description and understanding of the relationship of factors (Boyd and Westfall, 1972).

The case study approach is flexible, can take advantage of the unexpected, and can develop insights with the problem situation (Kinnear and Taylor, 1979). Boyd and Westfall (1972) indicated that the case method, which uses depth interviews, has several advantages such as: a) obtaining inferences from the study on an entire situation; b) description of a real event or situation; and c) acquiring more accurate data as a result of more intimate association of the researcher and respondent, greater rapport developed, and reduced reliance on formalized questions and answers.

Interview Technique

One of the most common methods of obtaining information is the personal interview. "A personal interview implies a direct face-to-face conversation between the interviewer and the respondent or interviewee" (Churchill, 1979, p. 175). According to Best (1977), the interview is a superior method of gathering data because people are usually more inclined to talk than to write. The interview is an effective technique to use when obtaining data of a personal and confidential nature. It is essential to gain the trust and cooperation of the respondent in order to avoid hostility and resistance during the interaction. While the interview technique has the ability to probe deeply than any other methods, it is time consuming, difficult to employ successfully, and requires the objectivity, sensitivity, and insight of the interviewer (Best, 1977).

Related Research

To find out the financial, problematic, and ownership factors impacting on apparel store efficiency, Swan (1981) conducted an in-depth study on four apparel retail operations. The findings indicated that apparel retailers had problems with keeping adequate records, affording computer systems, acquiring information on computer systems, affording an accountant, planning open-to-buy, knowing what to buy and from whom to buy, and knowing when to move the merchandise.

Bruce (1963) conducted several case studies to investigate the implications of electronic data processing for merchandise control of large retailers. Most computer applications used concentrated on the unit control of fashion items. Markdown, out-of-stocks, and inventory carrying costs were identified as the areas the retailer would realize a gain from the utilization of computers.

One of the earlier studies on the utilization of electronic data processing by smaller firms was done by Sanders (1965). Executives of 100 small firms using electronic data processing located in the Southwest were interviewed. Eighty four firms used computer centers while 16 businesses had their own computer equipment. The results of the study disclosed that: a) formal computer feasibility studies were made by only half of the sampled firms; b) most of the firms using computer centers were not satisfied; c) employees with over two years service with the firm resisted changes in administration methods; d) data processing activities in a small firm were usually handled by the top executive; and e) total clerical employment in the sampled firms declined by 8.7 percent.

Previous research was conducted at Oklahoma State University related to the development of learning materials for assisting apparel entrepreneurs. Cremer (1977) developed learning materials on the area of buying and merchandising for use by potential small retail entrepreneurs. LeMay (1977) studied the advertising and promotions function, and then designed learning packets to guide apparel retailers. The project of Greenwood, Callsen and Mott (1978) identified existing problems of small apparel stores. Based on the research findings, an individualized self-paced set of learning activity packages was developed to help potential apparel shop entrepreneurs prepare a business plan.

Furthermore, Strickland (1979) developed and evaluated learning materials on the development of an open-to-buy and dollar merchandise plan that were later used in workshops for apparel retailers. Similarly, the learning guides developed by Kendrick (1980) to help small retailers in the development of inventory control systems were utilized during workshops conducted at the Dallas Apparel Market in 1979.

CHAPTER III

RESEARCH PROCEDURES

The purposes of the research were to investigate the computer utilization of a selected group of small apparel stores and to prescribe procedures for the development of an in-store microcomputer system for small apparel retail operations. The three objectives of the study were: 1) to compile information related to the selection and use of electronic data processing systems by small businesses; 2) to examine the current applications of microcomputer systems in selected small apparel stores; and 3) to formulate guidelines to assist the apparel retailer in selecting, acquiring, and implementing an in-store microcomputer system. The methods used to attain the research objectives were organized in the following categories: Sources of Information, Selection of Stores, Development of Instruments, Collection and Analysis of Data, Formulation of Guidelines, and Final Conference.

Sources of Information

Primary and secondary sources were used to obtain information pertaining to the use of electronic data processing or computers in small businesses. Selected sources were concerned with management information needs, computer selection, acquisition, conversion, and implementation, computer applications, types of computer systems, and computer software. A review of literature was conducted by the

researcher in order to establish current procedures and experiences of small businesses using computers. Secondary sources of information included books, periodicals such as Stores, Datamation, Nation's Business, Computerworld, Infosystems, and Data Management, research journals such as Journal of Retailing, Journal of Small Business Management, Journal of Systems Management, and American Journal of Small Business, trade reports such as Datapro Feature Reports and Dun and Bradstreet, and related theses and dissertations. Literature from computer hardware and software firms was utilized and provided valuable information. Information from two computer experts and a computer usage study conducted by the researcher at a major department store were also used as primary sources of information. The summary of the department store study was included in Appendix A. Information from these sources was compiled and served as the basis for the development of interview guides and the formulation of guidelines.

Selection of Stores

The selection of small apparel stores was based on a sample of convenience for the purposes of the study. Seventeen stores were considered as possible participants in the study, however, only four stores were identified that met the following criteria: a) the store was located within a 70-mile radius of Stillwater, Oklahoma; b) the store was a single unit of operation; c) the store was a specialty shop selling apparel and accessories for men, women, and/or children; d) the store was independently owned and managed; e) the stores had an annual sales volume less than $1 million; and f) the store had been using an in-store microcomputer for more than six months. A model of the

selection procedures was included in Appendix B.

Telephone conferences were held with each of the four retailers in order to determine the willingness to participate in the study, which was the final criteria. One apparel retailer was not available to participate and was eliminated from the study. The remaining three retailers were considered eligible to participate and were utilized in the data collection for the study.

The three stores used in the study represented different characteristics in relation to annual sales volume, length of time in business, type of merchandise carried, time spent in developing in-store microcomputer system, and length of microcomputer use. The distinguishing characteristics of the three apparel stores used in the study were shown in Appendix C.

Development of Instruments

A pre-interview questionnaire was designed to gather preliminary information about each of the three apparel stores. Questions pertaining to the store background and history, owner's background, and computer experience were included in the pre-interview questionnaire. The pre-interview questionnaire was included in Appendix C.

A tentative interview guide was developed by the researcher based on the information gathered from the review of literature and materials, questionnaires used in previous studies, and results of conferences with computer experts. Closed and open-ended types of questions were used in the interview guide. Checklists and rating sheets were developed to obtain the desired information from the three selected apparel retailers.

The tentative interview guide was pre-tested by conducting a personal interview with one of the participating retailers. After the interview was conducted, a case study of the store was written. The case study of the store, together with an evaluation form, was sent to four apparel retailers in Stillwater, Oklahoma, who were not computer users. The retailers were asked to indicate their reactions to the information presented in the case study.

Based on the responses and suggestions of the four retailers, changes were incorporated into the revised interview guide. Revisions were made in questions pertaining to reasons for computerization, initial costs of computer system, maintenance, amount of time spent in using the computer, computer benefits and problems, and system evaluation.

The revised interview guide included questions in the following categories: a) reasons for computerization; b) microcomputer system description; c) microcomputer selection and acquisition; d) microcomputer conversion and implementation; e) microcomputer uses and applications; f) microcomputer benefits and problems; and g) microcomputer system evaluation. Forms for hardware and software description, and system cost breakdown were included in the final interview guide. A checklist on computer-generated information, and rating sheets for computer system benefits, problems, hardware evaluation, software evaluation were also part of the interview guide. A copy of the final interview guide was included in Appendix E.

A second interview guide was developed and was used in the follow-up interview. The questions on the second interview guide were concerned with the store's future computer plans and retailer's suggestions

to future users of in-store computer systems. Shown in Appendix F was the second interview guide.

Collection and Analysis of Data

The case study technique utilizing a series of interviews was used in the collection and analysis of the data. Two interviews and one conference were conducted with each of the three participating apparel retailers. The interviews were taped in order that the researcher could review the session during the analysis process. Case studies for each store was written using the results of thre pre-interview questionnaires and data collected during the two personal interviews conducted with each of the three apparel retailers.

Pre-Interview Activities

The Pre-Interview Questionnaire was mailed to the three eligible apprel retailers to obtain store and owner information. Replies of the three retailers were reviewed by the researcher. The Store and Owner Profile of each store was studied and the store description portion of each case study was prepared.

After the preparation of the store description portion of the case study, telephone calls were made to the retailers to schedule the first interview session with each apparel retailer.

First Interview Session

The first interview was conducted in the store of each participating retailer. Each retailer was provided a copy of the interview guide to maintain the consistency and efficiency of the interviews.

Using the interview guide, the researcher obtained information pertaining to the experiences of each retailer with the selection, acquisition, implementation, and utilization of the in-store microcomputer system. Forms, checklists, and rating sheets were used to obtain information regarding hardware and software descriptions, computer-generated information, computer benefits and problems, and hardware and software evaluations. The researcher verified the store description information prepared prior to the first interview and made necessary revisions. Each interview session was approximately 45 minutes long.

The information collected during the first interview session was analyzed by the researcher. Each of the three stores was designated a letter (such as Store A) to insure confidentiality. Responses of each retailer were tabulated to identify the similarities and differences of computer experiences.

The responses to the rating sheets were tabulated and points were computed to identify similarities and differences. The Computer Benefits Rating Sheet contained 17 statements, each rated on a scale of five to one to indicate degree of importance. Presented below were the ratings for each response:

5 = Most Important Benefit

4 = Important Benefit

3 = Somewhat Important Benefit

2 = Least Important Benefit

1 = Not Important Benefit

After the responses were tabulated, the average score was computed for each benefit statement. The average score for each statement was obtained by adding the rating indicated by each retailer and dividing the

sum by the number of retailers that responded. The average score of 3.0 and above was arbitrarily established to identify statements that expressed the major benefits gained by each of the three apparel retailers.

Thirteen statements composed the Computer Problems Rating Sheet. Statements perceived by the retailers as a problem experienced with the microcomputer system were rated on a scale of five to one. The corresponding description of the points were presented below:

5 = Most Significant Problem

4 = Significant Problem

3 = Somewhat Significant Problem

2 = Least Significant Problem

1 = Not Significant Problem

The average score for each problem statement was obtained after the retailers' responses were tabulated. The average score was computed by dividing the sum of the retailers' responses by the number of retailers who responded. The statement that obtained an average score of 3.0 and above was identified as a primary problem experienced by the three apparel retailers.

The summaries of the User Satisfaction Rating Sheets for the computer hardware and application software were tabulated separately. The hardware rating sheet consisted of 13 factors, while the software rating sheet had 12 factors used for evaluation. Each retailer was asked to rate each factor as follows:

4 = Excellent 2 = Fair

3 = Good 1 = Poor

The satisfaction rating of each retailer was computed by adding the

points given to each factor. For the hardware evaluation, the range of possibilities for total scores was from 13 to 52 points using 13 factors. The application software evaluation with 12 factors had its range of possibilities from 12 to 48 points. The higher total scores indicated a higher level of satisfaction with hardware and software.

Second Interview Session

Information about the future plans for the store's microcomputer system was obtained from each of the three apparel retailers during a second interview. The participating retailers were also asked to give suggestions and recommendations for apparel retailers considering an in-store microcomputer system. The information collected during the first interview was verified during the second interview session.

Information collected during the second interview was analyzed by the researcher for inclusion in the written case study. A list of recommendations and suggestions from the participating retailers was prepared by the researcher and used as the basis for the formulation of the guidelines for the development of an in-store microcomputer system. The list was included in Appendix G.

Case Study Preparation

Using the information obtained from the pre-interview questionnaire and two interviews, a case study was prepared for each of the three apparel stores. The stores were designated by alphabet letters (A, B, and C) for confidential purposes. The case study described the retailer's experiences with the development and utilization of an in-store microcomputer system. The organization of the case study was as

follows: Store Description, Microcomputer System Development, Microcomputer Uses and Applications, System Evaluation, and Future Plans.

Formulation of Guidelines

Suggestions, recommendations, and experiences of the apparel retailers interviewed, together with information obtained from literature reviewed were used to formulate the tentative guidelines for the development of an in-store microcomputer system. A list was prepared consisting of the responses, common to a minimum of two of the three retailers, related to the development and utilization of an in-store microcomputer system. The composite listing of these responses was included in Appendix H.

Three sections were chosen to compose the set of guidelines for in-store microcomputer system development. These sections were: Computerization Prerequisites, Selection and Acquisition, and Conversion and Implementation. Worksheets and information forms were developed to coordinate with the guidelines, and to illustrate how the development could be achieved individually.

Final Conference

Prior to the final conference, a copy of each respective case study and the tentative guidelines formulated by the researcher were sent to the three participating apparel retailers for reactions and verifications. Retailers were asked to suggest changes either by rewording, adding, or deleting a part of the case study and/or guideline statements. During the conference, the researcher discussed with each retailer the suggested changes for the case study and guidelines.

Additional reactions about the guidelines were obtained from four Retail Apparel Guides (RAGs), experienced retailers who serve as consultants for the Center for Apparel Marketing and Merchandising. A copy of the evaluation form used to obtain the reactions was included in Appendix I.

The researcher revised the case studies and the guidelines based on the results of the final conference with each of the three apparel retailers and reactions of the experienced retailers.

CHAPTER IV

FINDINGS AND DISCUSSION

The purposes of the study were to investigate the computer utilization of a selected group of small apparel retailers and to prescribe procedures for the development of an in-store microcomputer system for small apparel retail operations. The objectives of the study were: 1) to compile information related to the selection and use of electronic data processing by small businesses; 2) to examine the current applications of microcomputer systems in selected small apparel stores; and 3) to formulate guidelines to assist the apparel retailer in selecting, acquiring, and implementing an in-store microcomputer system. The findings of the study were organized and reported according to the following categories: Description of Participants, Considerations for Computerization, Microcomputer System Development, Microcomputer Utilization, Assessment of Microcomputer Performance, Summary of Findings, and Guidelines for Computerization.

Description of Participants

The three apparel stores involved in the study met the following criteria: an independently owned and managed, single unit store that sold apparel and accessories for men, women, and/or children, with an annual sales volume under $1 million, located within a 70-mile radius of Stillwater, Oklahoma, and has been using an in-store microcomputer

system for more than six months. A complete description of each store was included in case study form in Appendix J. The profile of each store was summarized in Table I.

Two of the stores that participated in the study were located in Stillwater, Oklahoma. The other store was located in Oklahoma City. The three stores were specialty stores situated in strip center locations.

The length of time in operation ranged from eight to 29 years. The two stores longest in business had a corporate form of ownership, while the younger store had a partnership. The oldest store had the lowest annual sales volume of $375,000, and the largest store space of 6,000 square feet. Although the newer store had the smallest store area of 2,2000 square feet, it had the largest annual sales volume, $700,000, among the three businesses. The number of full-time employees ranged from one to three. Two stores had seven part-time employees, while one store had six.

The average monthly dollar inventory of the three stores ranged from $80,000 to $135,000 with approximately 3,000 to 11,500 pieces of merchandise. Two stores had 95-100 percent of its inventory in women's apparel and accessories, and one store had 55 percent in women's, 30 percent in men's, and 15 percent in children's apparel and accessories. All three stores had credit plans available but of different types. Each of the three apparel stores had financial institutions credit plans such as VISA and Mastercard, and a company credit plan.

The profile of each apparel retailer who participated in the study was included in Table II. The retail experience ranged fron five to 17 years. Retailer A had the most computer experience, four years.

TABLE I

PROFILE OF THREE APPAREL STORES

Characteristic	Store A	Store B	Store C
Location	Strip Center	Strip Center	Strip Center
Type of Store	Specialty	Specialty	Specialty
Length of Time in Operation	29 years	8 years	17 years
Nature of Ownership	Corporation	Partnership	Corporation
Size of Store:			
Store Square Footage	7,500 sq. ft.	2,200 sq. ft.	4,500 sq. ft.
Annual Sales Volume	$ 375,000	$ 700,000	$ 500,000
Number of Employees	2 Full-time 7 Part-time	1 Full-time 7 Part-time	3 Full-time 6 Part-time
Inventory:			
Average Monthly Stock	3,000 items	5,000 items	11,500 items
Average Monthly Inventory	$ 80,000	$ 100,000	$ 135,000
Types of Merchandise:			
Women's Apparel/Accessories	100%	55%	95%
Men's Apparel/Accessories		30%	
Children's Apparel/Accessories		15%	
Gift Items			5%
Credit Type	Installment	30-Day	Revolving
Credit Plans	Company Financial Institutions	Limited Company Financial Institutions	Company Financial Institutions

Retailer B and C had only one and one-half years of experience with the computer. The three retailers obtained their knowledge and background of electronic data processing through self-study. Retailer A and C indicated they subscribed to computer periodicals for current computer developments. Retailer A was the only member of a computer user group.

TABLE II

PROFILE OF THREE APPAREL RETAILERS

Characteristic	Store A	Store B	Store C
Position	Manager	Owner	Owner
Years of Retail Experience	5 years	16 years	17 years
Years of Computer Experience	4 years	1½ years	1½ years
Source of Computer Knowledge	self-study	self-study	self-study
Subscriber to Computer Publications	Yes	No	Yes
User Group Member	Yes	No	No

Considerations for Computerization

Automation Objectives

The detailed list of objectives for in-store microcomputer systems identified by each store was reported in Table III. Each of the three

stores specified the need for greater accuracy of store information as one of the main reasons for obtaining an in-store microcomputer system. Additional reasons identified by the retailers were saving time, reducing operating costs, increasing merchandise control, and having complete, timely, and reliable store information.

TABLE III

REASONS FOR COMPUTERIZATION IDENTIFIED BY THREE APPAREL RETAILERS

Reasons	Store A	Store B	Store C
Timesaving	X		X
Greater Accuracy	X	X	X
New Information			X
Business Productivity		X	
Cost Reduction		X	X
Better Operating Margin			X
Merchandise Control	X	X	
Complete, Timely, and Reliable Information	X		X
In-House Data Processing			X

Store Problems

While the computer should not be considered as a panacea to all business problems, certain problems present in the stores prior to the installation of the in-store microcomputer were identified by the retailers. Shown in Table IV were the problems retailers experienced with the previous manual system of each store.

TABLE IV

PROBLEMS WITH MANUAL SYSTEMS IDENTIFIED BY THREE APPAREL RETAILERS

Problems	Store A	Store B	Store C
Inaccurate, untimely, or irrelevant data	X		X
Inefficient procedures			X
Unbalanced inventory and order system		X	
Unmanageable accounts receivable	X	X	
Duplication of information			X

The difficulties with the accounts receivable function was a problem commonly experienced in Store A and B, but was not encountered in Store C. Retailers A and C had problems obtaining accurate, timely, and relevant information needed for decision-making.

An unbalanced inventory and order system was perceived by Retailer B as somewhat a problem. However, Retailer B emphasized in the interview sessions that an in-store microcomputer was considered because the business grew faster than anticipated.

Retailer C cited inefficient store procedures as a problem. Previously, too much time had been spent manually duplicating information that was processed through a computer service bureau according to comments made by the retailer in the interview sessions.

Microcomputer System Development

Prior to the installation of an in-store microcomputer system, Retailer A and C obtained computer services from an outside source for two years and 14 years respectively, for the purpose of processing accounts receivable and inventory data. Retailer B had not had any experience with electronic data processing until the in-store system was acquired. The length of in-store computer experience among the three retailers ranged from one to three years.

A more complete description of the selection, acquisition, conversion, and implementation procedures undertaken by the three apparel retailers were included in Appendix J.

Microcomputer System Description

All three stores acquired a microcomputer system for business applications. The specifications of each system were summarized in Table V. Each store had a different brand of computer. Store A had a Zenith Z-89, Store B had an Apple IIe, and Store C had a NEC 8000. The internal memory capacity of all three models was 64K or 64,000

characters. Floppy disks were used for secondary storage by Store A and B. The secondary storage used with the Store C microcomputer was a hard disk. Each store had all the basic microcomputer components such as monitor, keyboard, line printer, and disk drives. In addition to its hard disk, Store C also had floppy disk drives used for producing back-up files.

TABLE V

DESCRIPTION OF MICROCOMPUTER SYSTEMS
OF THREE APPAREL STORES

System Components	Store A	Store B	Store C
Hardware			
Microcomputer Brand/Model	Zenith Z-89	Apple IIe	NEC 8000
Word Length	8 bit	16 bit	8 bit
Main Memory	64K	64K	64K
Secondary Storage	Floppy Disks	Floppy Disks	Hard Disk
Input/Output Devices	Monitor Keyboard Printer Disk Drives	Monitor Keyboard Printer Disk Drives	Monitor Keyboard Printer Disk Drives
Software			
Operating System	CP/M	CP/M	CP/M
Application Software	Custom-made Packaged	Packaged	Packaged

The operating system software used by each of the three stores was Computer Processing for Microcomputers, commonly known as CP/M. The application programs used in Store A were a combination of custom-made and packaged software. Store B and C had packaged or canned application software. The types of application programs used in the three stores were presented in Table VI. The standard application programs used by the three apparel stores were accounts receivable, inventory management, payroll, general ledger, and mailing list. The other programs common to two stores were accounts payable, word processing, electronic spread sheet, and filing system.

The breakdown of expenses for each store microcomputer system was included in Table VII. The initial costs of the microcomputer system ranged from $5,500 to $12,000. The most recent user, Retailer B, spent the least amount for the microcomputer. The costs for the equipment ranged from 55 percent to 61.5 percent. Software costs ranged from 23 percent to 33 percent. Additional expenses such as modification costs, supplies, site preparation, and miscellaneous costs ranged from 12 percent to 15.5 percent.

Selection and Acquisition of System

The in-store microcomputer system used in Store A and B were store-owned. Store C leased its system from a partnership because it provided better financial and tax advantages for the store. An annual leasing fee of $4,000 was paid by Store C. However, Retailer C was involved in the selection and implementation of the system leased to the store, and the procedures used were also included in the discussion.

Retailer A took 18 months to select and decide which microcomputer

TABLE VI

APPLICATION SOFTWARE USED BY
THREE APPAREL STORES

Applications	Store A	Store B	Store C
Accounts Payable	CM		P
Accounts Receivable	CM	P	P
General Ledger	CM	P	P
Inventory Management	CM	P	P
Payroll	CM	P	P
Word Processing	P	P	
Mailing List	P	P	P
Electronic Spreadsheet	P	P	
Filing System		P	P

CM = Custom-made Program P = Packaged Program

TABLE VII

BREAKDOWN OF MICROCOMPUTER SYSTEM EXPENSES
OF THREE APPAREL STORES

Items	Store A	Store B	Store C
Hardware	60%	61.5%	55%
Software	25%	23%	33%
Miscellaneous	15%	15.5%	12%
Total Initial Expenses	$12,000	$5,500	$10,200

system to purchase. Retailer B decided after five months of consideration. The longest search for the right store microcomputer system was performed by Retailer C, who spent five years looking for the system to meet the store's needs. Shown in Table VIII were the steps carried out by the three retailers in selecting the microcomputer system acquired for their respective stores.

TABLE VIII

SUMMARY OF STEPS UNDERTAKEN BY THREE APPAREL RETAILERS IN SELECTING A MICROCOMPUTER SYSTEM

Steps	Store A	Store B	Store C
Obtain knowledge and information about computers	X	X	X
Conduct system analysis	X	X	X
Identify needs	X	X	X
Do cost/benefit analysis			X
Attend computer demonstrations	X	X	X
Vist/talk with users		X	X
Evaluate systems and vendors' proposals	X	X	X

The most common selection procedures apparent to the three apparel stores included obtaining basic computer knowledge and information,

conducting an analysis of the manual system in operation, identifying needs for store information, attending computer demonstrations, and evaluating microcomputer systems and proposals submitted by computer vendors.

Retailer A and C indicated that the application software was selected prior to the selection of the hardware compati le with it. Retailer B, however, decided on the hardware first, and then found the compatible application software to use with it.

Three major problems encountered by all three apparel retailers during the selection process were stressed during the interview sessions: a) inadequate software developed for small apparel stores; b) insufficient storage capacity of the hardware; and c) limited hard disk-compatible computers.

Several factors were considered by the apparel retailers in the selection of the microcomputer systems as shown in Table IX. Cost was the most common factor recognized by the three apparel retailers. The other factors considered by two of the three retailers were simplicity, power, service, and reliability of the microcomputer system.

The acquisition process followed after the components of the microcomputer system were selected by the three apparel retailers. The manner in which Store A acquired its system was different from the two other stores. Retailer A agreed with a new software firm to serve as the test model in developing application programs for small retail firms. The software manufacturer suggested the type of hardware needed and where to obtain it. Retailer B and C purchased their software and hardware from local computer dealers. The computer dealers put the microcomputer systems of Store B and C based on the needs of each store.

The microcomputer system of Store A and C were financed with a bank loan, while the system of Store B was a direct cash purchase.

TABLE IX

FACTORS CONSIDERED BY THREE APPAREL RETAILERS IN SELECTING A MICROCOMPUTER SYSTEM

Factors	Store A	Store B	Store C
Cost	X	X	X
Simplicity		X	X
Power	X		X
Service		X	X
Reliability		X	X
Capability			X
Ease of Use			X
Good Documentation			X
Flexibility			X
Close Proximity of Vendor		X	

Implementation of System

Retailer A and C indicated that the new microcomputer system was implemented during the beginning of the stores' fiscal year. The implementation process took the stores from two to five months to complete.

The procedures undertaken by the three retailers for the implementation of the computerized system were summarized in Table X.

TABLE X

SUMMARY OF STEPS UNDERTAKEN BY THREE APPAREL RETAILERS IN IMPLEMENTING A MICROCOMPUTER SYSTEM

Steps	Store A	Store B	Store C
Plan implementation		X	X
Prepare installation site	X	X	X
Document the system	X	X	X
Choose initial function/s to be converted	X	X	X
Prepare initial data	X	X	X
Test programs with store data		X	X
Develop operating procedures	X	X	X
Provide for data back-up	X	X	X
Develop new manual store procedures that interface with computer system	X	X	X
Assign responsibilities and train personnel	X	X	X
Run both manual and computer systems for a few months		X	X

Retailer A and C indicated during the interview sessions that several functions were converted at one time. Retailer B initially converted only one function, inventory control. The other functions were converted after the inventory conversion was completed.

Two of the three stores indicated that the business functions that were converted used both the manual and computerized systems from three to five months. Simultaneous operations were conducted until management was assured of the adequacy and efficiency of the computerized system, and no more errors in the application programs existed. Computerized store data and information were duplicated on disks and paper copy, and kept at a separate location for back-up purposes.

Two implementation problems were encountered by two of the three retailers: a) time consuming data entry, and b) getting used to the new microcomputer system. Before the implementation of the microcomputer system, Retailer B indicated that the application software purchased had to be modified because the original programs did not perform as expected, and was taking too much time in executing the programs. The programs were modified by the accountant of Store B to meet the specific needs identified.

Microcomputer Utilization

Computer Applications

The majority of applications performed in the three apparel stores were accounting and recordkeeping functions. A list of the computerized business functions in the three stores were included in Table XI.

TABLE XI

COMPUTERIZED BUSINESS FUNCTIONS
IN THREE APPAREL STORES

Functions	Store A	Store B	Store C
Accounts Receivable	X	X	X
Accounts Payable	X		X
General Ledger	X	X	X
Inventory Management	X	X	X
Payroll and Personnel		X	X
Price Ticketing	X	X	
Sales Analysis	X	X	X
Mailing List	X	X	
Vendor Evaluation			X
Business Planning	X		X
Correspondence	X	X	

The automated functions present and common to the three stores consisted of accounts receivable, general ledger, inventory management, and sales analysis. The microcomputer systems in Store A and C, also performed accounts payable and business planning tasks. Price ticketing, mailing list, and correspondence were also handled by the microcomputer systems in Store A and B. In Store C, price ticketing and correspondence were performed manually because the management did not see an urgent need to automate these two tasks. Store A had a

payroll program custom-made for the store, which was used initially. However, Retailer A reverted the payroll processing to manual operation because it was found to be faster and more efficient for a store with only nine employees. Vendor evaluation, a merchandising function, was performed only in the microcomputer system in Store C. Although the three retailers purchased several types of application software, not all of the programs had been put into use at the time of the study, but were being considered for future implementation.

A breakdown of how much the microcomputer was used for the different store tasks and operations was summarized in Table XII. The largest percentage (40%) of the computer time in Store A was spent in keeping track of store information. Fifty percent of the Store B microcomputer was used for inventory management and analysis. Sales analysis functions utilized 55 percent of the Store C computer time. Accounting operations were the next largest user of the microcomputers in Store A and B, with 20 percent and 25 percent of computer time respectively. Making financial projections, and producing correspondence and documentation were the two types of operation that used the least computer time for all three stores.

Computer-Generated Information

The three apparel retailers indicated that the new microcomputer system provided additional information that helped in making store management decisions. The additional information generated by the computer was presented in Table XIII.

TABLE XII

COMPUTER UTILIZATION OF THREE APPAREL STORES FOR DIFFERENT TASKS AND OPERATIONS

Tasks and Operations	Store A	Store B	Store C
Accounting operations	20%	25%	10%
Inventory management and analysis	5%	50%	30%
Keeping track of information (customers, orders, etc.)	40%		
Price ticketing	10%	10%	
Sales analysis	10%		55%
Making financial projections	5%		5%
Producing correspondence/ documentation	2%	5%	
Mailing list	3%	10%	
Program development	5%		
Total	100%	100%	100%

TABLE XIII

COMPUTER-GENERATED INFORMATION USED IN THREE APPAREL STORES

Informationa	Store A	Store B	Store C
Daily Dollar Sales	X	X	X
Sales by Classification		X	X

TABLE XIII (Continued)

Information	Store A	Store B	Store C
T.Y. Sales vs. L.Y. Sales			X
Stock Sales Ratio			X
Turnover Rate			X
Maintained Markup		X	X
Best Sellers	X	X	
Slow Sellers	X	X	
Stock on Hand	X	X	X
Merchandise on Order			X
Merchandise Received	X	X	X
Vendor List	X	X	X
Vendor Sales Performance			X
Vendor Chargebacks			X
Accounts Receivable	X	X	X
Accounts Payable	X		X
Profit and Loss Statement	X	X	X
Balance Sheet	X	X	X
General Ledger	X	X	X
Personnel Information	X		X
Payroll		X	X
Customer List	X	X	X

The prevalent information used by all three stores included daily dollar sales, stock on hand, merchandise received, vendor list, accounts receivable, financial reports such as profit and loss statement and balance sheet, general ledger, and customer list. Retailer A and B made use of information on best sellers and slow sellers. Information on sales by classification, maintained markup, and payroll were utilized by Retailer B and C. Additional information helpful to Retailer C were a comparison of current sales with last year's sales, stock sales ratio, turnover rate, merchandise on order, vendor sales performance, and vendor chargebacks.

The important computer-generated information reported by the three apparel stores was summarized in Table XIV.

TABLE XIV

MOST IMPORTANT COMPUTER-GENERATED INFORMATION IDENTIFIED BY THREE APPAREL RETAILERS

Information	Store A	Store B	Store C
Accounts Receivable	X	X	
Financial Statements			X
Inventory	X	X	X
Payroll			X
Sales	X		X

From all the information generated by the stores' microcomputer systems, the most important information identified by the three retailers was concerned with store inventory. Sales and accounts receivable information were considered important by two stores. These three information were considered by the retailers as essential in making daily and long-range decisions.

Assessment of Microcomputer Performance

The three apparel retailers identified several benefits gained and a number of problems experienced with the use of the in-store microcomputer system. The hardware and software of each systems were also evaluated to determine the satisfaction level of the apparel retailer.

Benefits of Microcomputer System

The benefits of the in-store microcomputer system identified by each apparel retailer were summarized in Table XV. Statements perceived as the most important benefits were rated five points, and statements considered not important received one point. The statement with the higher average score indicated a benefit perceived by the three apparel retailers as most important.

Sixteen benefit statements that received an average score of 3.0 and above were identified by the three apparel retailers as the benefits of using an in-store microcomputer system. The benefit statements with the highest score of 4.3, identified as the most important, were reduction in clerical work, greater degree of operating flexibility, and larger amounts of information available to management. Statements concerned with the availability of accurate, timely, and meaningful

TABLE XV

BENEFITS OF AN IN-STORE MICROCOMPUTER SYSTEM IDENTIFIED BY THREE APPAREL RETAILERS

	Benefits	Store A	Store B	Store C	Average Score
1.	Reduction in clerical work	5	4	4	4.3
2.	Reduction in paperwork	2	4	5	3.7
3.	Reduction in inventory	3	4	4	3.7
4.	Reduction in redundant information	1	4	4	3.0
5.	Reduction in accounts receivable delinquencies	3	4	4	3.7
6.	Reduction in accounts receivable lead time	3	3	4	3.3
7.	Reduction in costs	2	2	4	2.7
8.	Closer monitoring of operations by management	4	4	4	4.0
9.	Larger amounts of information available to management	4	4	5	4.3
10.	Faster and more comprehensive analysis of information	2	4	5	3.7
11.	Improved performance indicators	1	4	4	3.0
12.	Improved customer service	4	3	4	3.7
13.	Reduction of human error possibilities	3	4	4	3.7
14.	Permits more and improved validation procedures	3	3	4	3.3
15.	Improved profitability	2	4	4	3.3
16.	Accurate, timely, and meaningful reports	3	4	5	4.0
17.	Greater degree of operation	4	4	5	4.3

Scoring Code:

5 = Most Important
4 = Important
3 = Somewhat Important
2 = Least Important
1 = Not Important

action reports, and closer monitoring of operations by management had an average score of 4.0 The benefit statement concerned with reduction in costs received the lowest average score of 2.7, and was identified as the least important.

Only one of the 17 benefit statements elicited a reply of most important (rating of five points) from Retailer A, while four statements were rated as important. The most important benefit was identified as reduction in clerical work. Statements regarding reduction in costs and improved performance indicators were not considered as unimportant (rating of one point) benefits by Retailer A.

Retailer B indicated that 13 of the 17 statements were important benefits. Retailer C rated five of the 17 statements as most important benefits, and the remaining 12 statements as important gains received with the in-store microcomputer system.

Retailer A emphasized in the interview sessions that with the computerization of some of the store functions, the time spent on the selling floor and with customers had increased considerably. The up-to-date and complete information generated with the microcomputer helped Retailer B, as well as Retailer C, in identifying exact merchandise requirements, and in making better buying decisions.

Retailer B stressed that automation did not reduce costs as expected because an additional employee had to be hired to work with the computer. Accordingly, Retailer C commented that it was still to early to identify the savings generated from the new microcomputer system.

Problems with Microcomputer System

The Problem Rating Sheet contained 13 statements. Responses of the apparel retailers to the problem statements were presented in Table XVI. Statements designated as the most significant problems were rated five points and a score of one point for problems that were not significant. The statement that obtained the highest average score indicated the most significant problem encountered by the three apprel retailers.

Five problem statements received an average score of 3.0 and above based on the reactions of the three apparel retailers to the microcomputer systems used. The problem identified by the three retailers as almost significant was concerned with software limitations. Two problem statements with an average score of 3.3 were concerned with information errors and long implementation lead time. Two less significant problems evidenced by the low average score of 1.3 were the acceptance by store personnel and customers, and the impersonal nature of computer systems.

Retailer A identified three of the 13 statements as the most significant problems experienced with the use of an in-store microcomputer system. Retailer B rated six out of 13 statements as significant problems. Retailer C had only one somewhat significant problem, which was concerned with information errors produced by the microcomputer system.

User Satisfaction Ratings

Microcomputer Hardware. A list of 13 hardware factors were used to rate the satisfaction of the three apparel retailers. The responses of the retailers were summarized in Table XVII. A score of four points

TABLE XVI

PROBLEMS OF AN IN-STORE MICROCOMPUTER SYSTEM IDENTIFIED BY THREE APPAREL RETAILERS

	Problems	Store A	Store B	Store C	Average Score
1.	Acceptance by store personnel and customers	1	1	1	1.0
2.	Costs and delay	2	4	2	2.7
3.	Equipment limitations	4	3	2	3.0
4.	Software limitations	5	4	2	3.7
5.	Errors and/or questionable reliability/usefulness of information produced	3	4	3	3.3
6.	Excessive information produced	3	2	2	2.3
7.	Require long implementation lead time	4	4	2	3.3
8.	Breakdowns resulting from inability to handle peak loads, volume increases, etc.	5	1	2	2.7
9.	Impersonal nature of systems	1	1	2	1.3
10.	Inability to utilize the computer to full capacity	3	4	2	3.0
11.	Total dependence on the computer	3	3	2	2.7
12.	System is complicated and difficult to understand	1	4	1	2.0
13.	Large volumes of unneeded, unrealizable and limited-value information produces	5	1	2	2.7

Scoring Code:

5 = Most Significant
4 = Significant
3 = Somewhat Significant
2 = Least Significant
1 = Not Significant

was assigned to each user rating of excellent, three points for a rating of good, two points for a rating of fair, and one point for a rating of poor. The points for each retailer were summed to determine the total points. The range of possibilities for total scores was 13 to 52 points. The higher scores indicated a higher level of microcomputer hardware satisfaction.

Retailer C received the highest total satisfaction score of 44 out of 52 points. Seven of the 13 hardware factors rated excellent were cost, cost/performance, ease of operation, reliability of peripherals, service responsiveness and effectiveness, and technical trouble-shooting.

Retailer A scored a total of 33 out of 52 possible points, and had the second highest level of satisfaction. Hardware features found excellent were reliability of the central processing unit, and technical support with education and documentation.

Retailer B had a total of 32 out of 52 points. Nine hardware features were rated satisfactory.

Application Software. The application software checklist consisted of 12 factors utilized to assess the general satisfaction level of each apparel retailer. The retailers' responses were presented in Table XVIII. Rating procedures similar to the hardware evaluation were used. The total scores range of possibilities for software was 12 to 48 points. The higher the total points received by the retailer, the higher the satisfaction with the applications software.

Retailer C obtained the highest total satisfaction score of 33 out of 48 points. Nine of the 12 software factors were perceived as satisfactory by Retailer C. The three remaining factors were rated fair.

TABLE XVII

SATISFACTION RATINGS OF THREE APPAREL RETAILERS FOR IN-STORE MICROCOMPUTER HARDWARE

	Factors	Store A	Store B	Store C
1.	Cost	2	3	4
2.	Cost/Performance	2	3	4
3.	Expansion capability	3	3	2
4.	Reliability of CPU	4	3	3
5.	Ease of operation	3	2	4
6.	Reliability of peripherals	2	3	4
7.	Ease of programming	3	3	3
8.	Ease of conversion	3	3	3
9.	Responsiveness of service	0	3	4
10.	Effectiveness of service	0	3	4
11.	Technical support trouble-shooting	3	1	4
12.	Technical support in education	4	1	2
13.	Technical support in documentation	4	1	3
	Total Points	33	32	44

Scoring Code:

4 = Excellent
3 = Good
2 = Fair
1 = Poor

TABLE XVIII

SATISFACTION RATINGS OF THREE APPAREL RETAILERS FOR IN-STORE APPLICATION SOFTWARE

Factors	Store A	Store B	Store C
1. Cost	2	3	3
2. Ease of use	1	3	3
3. Packaged	4	2	3
4. Developed	2	2	3
5. Ease of conversion	3	3	3
6. Documentation	1	2	3
7. Software maintenance	1	3	2
8. Flexibility	4	1	2
9. Cost/Performance	2	3	3
10. Reliability	2	2	3
11. Efficiency	2	2	3
12. Ease of installation	3	3	2
Total Points	27	29	33

Scoring Code:

4 = Excellent
3 = Good
2 = Fair
1 = Poor

Retailer B had a total score of 29 out of 48 possible points. Six of the 12 software factors were rated good.

Retailer A, who initially used custom-made software, had the lowest satisfaction score of 27 out of 48 points. However, Retailer A rated two of the 12 factors as excellent, software packaging and flexibility.

Summary of Findings

The results of the interview with the selected apparel retailers revealed common experiences relating to the development and utilization of an in-store microcomputer system. Microcomputers were perceived as important business tools that offer great management assistance potentials for small retailers.

The need for more accurate business information was indicated as the basis for computerization. Experiences of the three apparel retailers with the development of an in-store microcomputer system revealed that it was an undertaking that required serious commitment of time and money, and long-range planning. Accordingly, the retailers expressed that tangible results of computerization should not be expected immediately, but could be expected after a reasonable period of time.

In the selection of the microcomputer system, the three retailers emphasized computer knowledge acquisition, system analysis, need identification, and computer system and vendor evaluation, as the important steps to pursue. The apparel retailers also stressed the need to select the software first, since the operating and application programs make the computer work and perform the tasks identified.

Purchasing and leasing were the two ways the retailers obtained the microcomputer systems. Both methods of acquisition had advantages and disadvantages for the apparel retailers. The retailers also indicated that purchasing the microcomputer from a local computer dealer was beneficial in terms of prompt service and support.

Implementation of the in-store microcomputer system involved several procedures and took a minimum of two months to a maximum of five months. The retailers stressed the importance of conducting simultaneous operations of both the manual and computer systems for several months to insure adequacy and efficiency of the computer system.

The findings of the study further indicated that the most common applications used by the three apparel retailers were accounts receivable, general ledger, inventory management, and sales analysis. The availability of timely and accurate computer-generated information helped the apparel retailers make business decisions. Inventory information was considered the most important data derived from the use of an in-store microcomputer. Information concerned with store inventory helped the apparel retailers have better control of their merchandise and guided them in making buying deicisions.

The use of microcomputers provided the three apparel retailers with advantages such as reduction in paperwork, more time for business supervision, more meaningful business information, and greater degree of business flexibility. The inadequacy of software programs such as merchandising and buying applications was considered an obstacle for the more extensive use of the in-store microcomputer system in small apparel stores.

Guidelines for Computerization

The findings of the study support the need for more guidance and assistance with the development of computerized systems in order for retailers to obtain the benefits and advantages of automation to the fullest. Guidelines for the development of an in-store microcomputer system were formulated by the researcher to assist small apparel retailers in the selection and implementation of microcomputer systems.

The guidelines consisted of three sections: Computerization Prerequisites, Selection and Acquisition, and Conversions and Implementation. Fact sheets and worksheets were prepared were preprared to help the retailer understand and obtain the specified outcome. The detailed set of nineteen guidelines formulated were included in Appendix K along with six information sheets and thirteen worksheets. The case studies of the three apparel stores were included with the guidelines as references.

A summary of the guidelines formulated follows:

I. Computerization Prerequisites

1. Obtain knowledge and information about computers.
2. Examine your present manual system and identify any current problems and deficiencies.
3. Define your business needs and computer requirements.
4. Prepare a budget and estimate the time involved in developing an in-store microcomputer system.

II. Selection and Acquisition

1. Examine software options available and consider software

programs that can meet your business needs and computer requirements.

2. Obtain information about the hardware options compatible with your software options.
3. Evaluate and test software and hardware alternatives compatible with your existing manual system and store functions.
4. Decide which software programs and hardware best fit the business needs you identified.
5. Acquire the microcomputer system you select by either buying or leasing.

III. Conversion and Implementation

1. Develop a plan to implement the microcomputer system in your store.
2. Plan carefully the business functions you want to convert.
3. Prepare your employees for the conversion to the new microcomputer system.
4. Make preparations for the installation of the new microcomputer system in your store.
5. Prepare initial data for conversion and programming.
6. Install the new microcomputer system.
7. Convert your store data from the existing manual mode into microcomputer readable mode.
8. Test the software programs to examine system accuracy and reliability.
9. Implement the microcomputer system in your store.

10. Evaluate the efficiency of your in-store microcomputer system.

Based on the findings of the study, the researcher proposed the dissemination of the guidelines to apparel retailers who have participated in workshops conducted by the Center of Apparel Marketing and Merchandising, Oklahoma State University.

CHAPTER V

SUMMARY AND RECOMMENDATIONS

The purposes of the study were to investigate the computer utilization of a selected group of small apparel stores and prescribe procedures that could be used in the development of an in-store microcomputer system for small apparel retail operations. The three objectives of the study were: 1) to compile information related to the selection and use of electronic data processing systems by small businesses; 2) to examine the current applications of microcomputer systems in selected small apparel stores; and 3) to formulate guidelines to assist the apparel retailer in selecting, acquiring, and implementing an in-store microcomputer system.

Summary

Information about the computer usage in small businesses was obtained from primary and secondary sources. The information collected was used in developing the instruments used in the study and formulating the computer guidelines for the apparel retailer.

The three apparel stores selected for the purposes of the study met the following criteria: independently owned and managed, single unit apparel and accessories store for men, women, and/or children, with annual sales volume less than one million dollars, located within a 70-mile radius of Stillwater, Oklahoma, and has been using an in-store

microcomputer system for more than six months.

A pre-interview questionnaire was designed to obtain characteristics and background information about each store and owner/manager. Two interview guides were developed to gather information about the experiences of each apparel retailer with the development and utilization of an in-store microcomputer. Two interviews were conducted with each of the apparel retailers selected for the study.

The responses of each apparel retailer were compared and analyzed for each of the following categories: reasons for computerization, microcomputer system description, microcomputer selection and acquisition, microcomputer implementation, microcomputer uses and applications, microcomputer benefits and problems, and microcomputer system evaluation.

Rating sheets were developed to identify the benefits and problems perceived by each apparel retailer. A five point scale was used to rate the benefit and problem statements. The average score was computed to identify the important benefits and significant problems experienced by the three apparel retailers.

The computer satisfaction of each apparel retailer was revealed with the use of rating sheets for hardware and application software. Analysis of the rating sheets was based on points assigned to each response option. The higher total scores indicated a higher level of satisfaction with hardware and software.

A case study was prepared for each apparel store using the information obtained from the pre-interview questionnaire and the two personal interviews.

Guidelines for the development of an in-store microcomputer system

were formulated. A final conference was conducted with each apparel retailer to verify and discuss suggested changes and revisions in the guidelines. Reactions from experienced retailers were also obtained.

The need for greater accuracy of store information was the major reason for installing an in-store microcomputer system, according to the three apparel retailers who participated in the study. The development of an in-store microcomputer system consisted of selection, acquisition, and implementation procedures which involved the apparel retailer. The length of time for in-store development ranged from a minimum of seven months to a maximum of five and one-half years.

The microcomputer system was used in a similar manner by the three apparel retailers in the following business functions: account receivable, general ledger, inventory management, and sales analysis. Primarily, the microcomputer was used for four tasks: analyzing sales, keeping track of store information, managing and analyzing inventory, and performing accounting operations. Inventory information was identified as the most important computer-generated information.

The three most important benefits identified in the study were reduction in clerical work, increase in store information, and greater degree of operation flexibility. The major problem identified was concerned with the limitation of software available for apparel retail operations.

The apparel retailer who recognized the most benefits had identified the least problems with the in-store microcomputer. In the user satisfaction analysis, the scores indicated that one of the apparel retailers had a higher total satisfaction score for the microcomputer hardware and application software than the two other retailers. The

same apparel retailer reported a longer time spent in the store's microcomputer system development. The apparel retailer who received the lowest satisfaction score selected the store's microcomputer system in the shortest period of time.

Based on the interviews with three apparel retailers and literature reviewed, nineteen guidelines were formulated including six information sheets and thirteen worksheets. The three categories included in the guidelines designed to assist the apparel retailer in the development of an in-store microcomputer system were: Computerization Prerequisites, Selection and Acquisition, and Conversion and Implementation.

Recommendations

Based on the findings of the research, the researcher formulated the following recommendations for further study:

1. Initiate a follow-up study to assess the microcomputer usage of the three apparel retailers five years after implementation.

2. Conduct further research on small apparel stores using in-store microcomputer systems throughout the United States.

3. Replicate the study with small apparel stores using computer service bureaus.

4. Investigate apparel stores using in-store computer systems and service bureaus, and compare similarities and differences in usage.

5. Conduct an in-depth study of a selected group of apparel store owners who used the guidelines developed in the study to determine which of the guidelines were most critical to the process.

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APPENDIX A

SUMMARY OF COMPUTER USAGE SURVEY CONDUCTED AT SANGER-HARRIS DEPARTMENT STORE, DALLAS, TEXAS, 1982

COMPUTER USAGE SURVEY RESULTS

BACKGROUND INFORMATION		N=16	%
Respondents:	Buyers	8	50%
	Assistant Buyers	8	50%
Divisions Represented:	Apparel	7	44%
	Home Furnishings, Msc.	9	56%
Length of Time in Present Position:			
	Less than 6 months	1	6%
	6 months - 1 year	3	19%
	1 - 3 years	9	56%
	4 - 6 years	3	19%
Where data processing knowledge was obtained*:			
	College	7	44%
	Store training program	15	94%
	Seminar/workshop outside store	1	6%
	Previous work experience	1	6%
*Total do not equal 16 since respondents were allowed to respond to more than one category			
Recommend basic data processing course:			
	Yes	15	94%
	No	0	0%
	No Answer	1	6%

Reasons why:
- Important for any kind of business
- All sizeable retailers will eventuall computerize
- Makes job transitions easier
- Integral part of the future
- Important in retailing
- Helpful in explaining information available to merchants
- Computers are keys to the future

DUTIES OFTEN PERFORMED USING A COMPUTER TERMINAL			
1.	Sales Planning		
	Forecasting sales	9	56%
	Calculating open-to-buy	11	69%
	Calculating six-month plans	8	50%
2.	Sales Analysis		
	Retrieving flash sales from previous days	16	100%
3.	Markup/Markdown		
	Entering retail price changes	12	75%
4.	Inventory Control		
	Checking amount of basic stock on hand	6	37.5%
	Entering purchase orders	14	88%
	Checking status of purchase orders	16	100%
	Recording merchandise arrival at dock	9	56%
	Checking location of merchandise shipments	8	50%

COMPUTER-GENERATED REPORTS USED DAILY	N=16	%
1. Dollar sales report	7	44%
2. Merchandise item sales report	8	50%
3. Comparative sales report	8	50%
COMPUTER-GENERATED REPORTS USED WEEKLY		
1. Sales by classification report	9	57%
2. Stock to sales ratio report	8	50%
3. Open-to-buy report	9	57%
4. Retail price change report	11	69%
5. Maintained markup report	6	38%
6. Percentage of total markdown dollars spent to date report	8	50%
7. Best seller report	8	50%
8. Slow seller report	7	44%
9. Purchase journal	12	75%
10. Dollar amount of inventory on hand report	10	63%
11. Sales performance of merchandise from each vendor	5	31%
COMPUTER-GENERATED REPORTS USED MONTHLY		
1. Six-month plan	8	50%
2. Gross margin report	13	81%
3. Profit and loss report	7	44%
COMPUTER-GENERATED REPORTS USED ANNUALLY		
1. Inventory reconciliation report	13	81%

OTHER DUTIES USING THE COMPUTER

1. Trends analysis
2. Markdown analysis
3. Checking distribution of orders
4. Updating open orders

APPENDIX B

STORE SELECTION PROCEDURAL MODEL

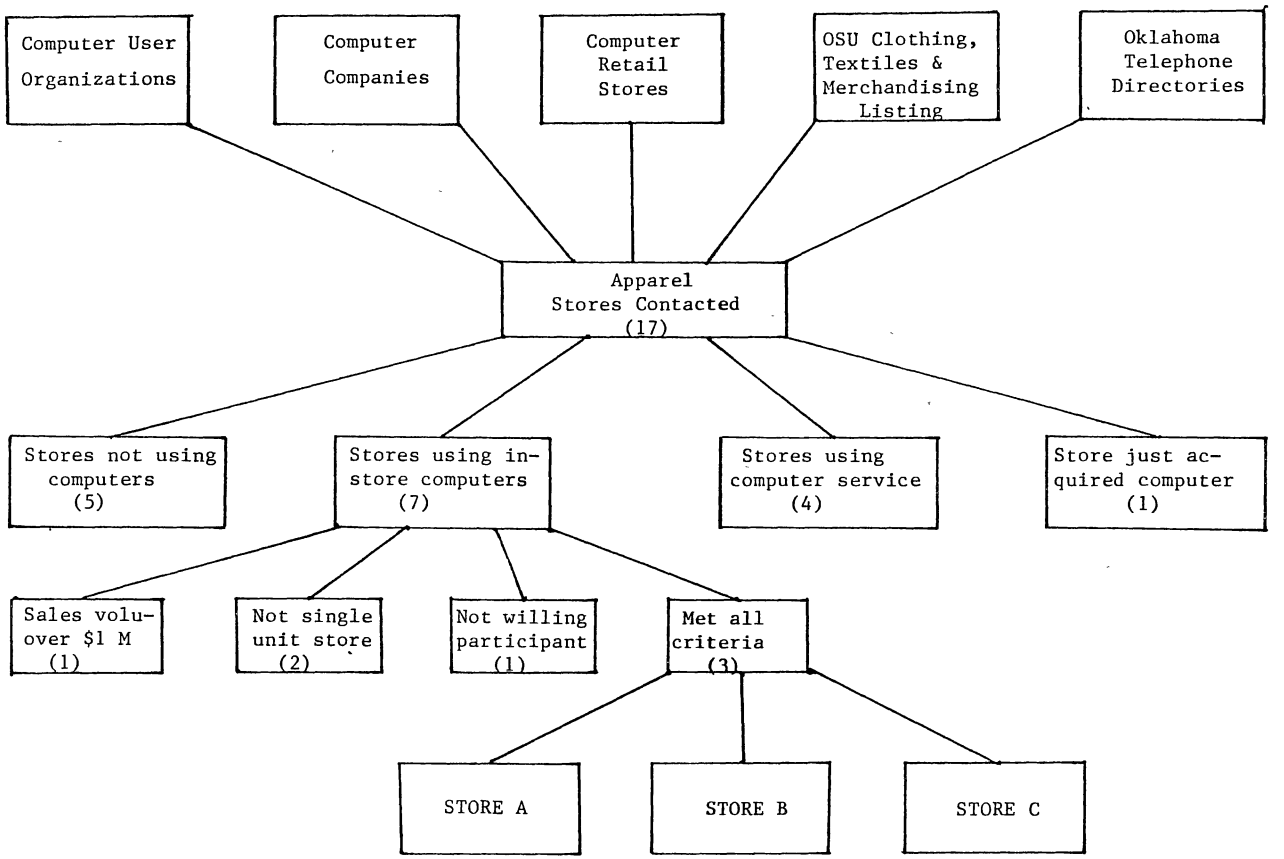

Figure 1. Procedural Model for Selection of Apparel Stores

APPENDIX C

DISTINGUISHING CHARACTERISTICS OF SELECTED APPAREL STORES

CHARACTERISTICS	STORE A	STORE B	STORE C
Annual Sales Volume	$ 375,000	$ 700,000	$ 500,000
Length of Time in Business	29 years	8 years	17 years
Type of Merchandise Carried	Women's Apparel & Accessories	Men's, Women's and Children's Apparel & Accessories	Women's Apparel & Accessories & Gifts
Time Spent for In-Store Microcomputer System Development	2 years	7 months	5 years & 5 months
Length of Microcomputer Use	3 years	1 year & 2 months	1 year & 5 months

APPENDIX D

PRE-INTERVIEW QUESTIONNAIRE

Oklahoma State University

CENTER FOR APPAREL MARKETING & MERCHANDISING

STILLWATER, OKLAHOMA 74078
HOME ECONOMICS WEST 306
(405) 624-7469

February 1, 1984

Dear Apparel Retailer

Thank you for indicating your willingness to participate in our research on computer usage of independant apparel stores. As was explained to you earlier, we will be preparing case studies of apparel stores using computer systems. Telephone and personal interviews will be conducted to gather our information from participating retailers. To insure confidentiality, your name nor store name will not be mentioned and will be designated by an assigned letter (i.e., Store X).

Before we schedule an interview with you, we would like to obtain basic store and owner information from you. It is most important to have your responses to the enclosed questionnaire. Fold the stamped and self addressed questionnaire and return it by February 14, 1984.

We will be contacting you by telephone to arrange a convenient time to conduct an interview as soon as receive the questionnaire. The interview will take approximately 45 minutes. We greatly appreciate your time and effort in assisting us in our research. If you have any questions, please feel free to contact us at (405) 624-7469.

Sincerely,

Maria Dayrit

Maria Dayrit
Graduate Assistant

Kathryn M. Greenwood

Dr. Kathryn M. Greenwood
Director, CAMM

COMPUTER USAGE SURVEY

Store and Owner Profile

Owner(s):_____

Name of Store:_____

Store Address:_____
City State Zip Code

Telephone:_____

Please answer the following questions completely and accurately as you can.

STORE BACKGROUND

1. Length of Time in Operation:_____
2. Nature of Ownership: (Circle answer)
   a Single Proprietorship
   b Partnership
   c Corporation
3. Store Location: (Circle answer)
   a Central Business District
   b Major Shopping Mall
   c Regional Shopping Mall
   d Strip Center
   e Free Standing Location
   f Other (specify)_____
4. Size of City or Town Where Store is Located:_____
5. Selling Space Square Footage (approx.):_____
6. Total Square Footage (approx.):_____
7. Annual Sales Volume (approx.):_____
8. Number of Employees (excluding owner):
   Full-time:_____
   Part-time:_____
9. Type of Store: (Circle answer)
   a Department Store
   b Junior Department Store
   c Specialty Store
   d Family Clothing Store
   e Other (specify)_____

10. Type of Merchandise in Inventory: (Indicate Percentages)

Type	Percentage
Women's Apparel/Accessories	_____%
Men's Apparel/Accessories	_____%
Children's Apparel/Accessories	_____%
Family Apparel/Accessories	_____%
Other (specify)_____	_____%
TOTAL	100%

11. Merchandise Classifications Carried: (Indicate Percentages)

Classification	Percentage
Sportswear	_____%
Dresses	_____%
Suits	_____%
Coats	_____%
Evening Wear	_____%
Infant's Wear	_____%
Toddlers	_____%
Boy's Wear	_____%
Girl's Wear	_____%
Ladies' Lingerie	_____%
Men's Underwear and Sleepwear	_____%
Hosiery	_____%
Shoes	_____%
Accessories	_____%
Other (specify)_____	_____%
TOTAL	100%

12. Average Monthly Inventory (approx.):$_____

13. Average Monthly Inventory (approx. no. of items):_____

14. Type of Credit Offered: (Circle answer)

    a 30-Day
    b Revolving
    c Installment
    d Other (specify)_____

15. Type of Credit Plan Offered: (Circle answer/s)

    a Company Plan
    b Community Credit Plan
    c Financial Insitutions Plan (VISA, Mastercard, etc.)

OWNER BACKGROUND

16. Years of Retail Experience:_____

17. Is this the first retail store you have owned?

    a Yes
    b No, please list previous store/s owned:_____

18. Computer Experience Background:
    Years of experience with computers:_____
    How and where obtained:_____

19. Do you subscribe to any computer publications? (Circle answer)
    a Yes, which one/s?_____
    b No

20. Are you a member of a user's group or computer organization? (Circle answer)
    a Yes, which one?_____
    b No

THANK YOU!

Please fold and staple at bottom and return to us by February 14, 1984.

APPENDIX E

FIRST INTERVIEW GUIDE

INTERVIEW SESSION SCHEDULE

Date_____

I. Enter Store

II. Introduce myself to store owner/manager.

III. Conduct interview in private, if possible. Use tape recorder to record interview.

IV. Explain purpose of study:

I am working on my master's degree at Oklahoma State University. For my thesis research, I am investigating the computer use by a selected group of small apparel stores in Oklahoma. For this interview session, I will be asking tou questions regarding your use of the computer in your store. The information I am interested in obtaining from you concern your reasons for computerization, computer system description, selection and acquisition methods, computer conversion and implementation, uses, benefits, and problems. After this interview, I will write the case study on your store and to insure confidentiality, you or your store name will not be mentioned and will be represented by an alphabet (such as Store A). To verify the case study, I will set another appointment with you so we can go over it.

V. Use interview guide to gather information from store owner/manager.

VI. Verify information from pre-interview questionnaire.

INTERVIEW GUIDE

STORE NAME:_____ TIME STARTED:_____
OWNER/MANAGER NAME:_____ TIME ENDED:_____

REASONS FOR COMPUTERIZATION

1. How long have you been using a computer to process your store data?
2. How long have you had your store computer system?
3. What were your main reasons for using a computer?

____timesaving
____greater accuracy
____clerical accuracy
____better customer service
____spacesaving
____new information
____increase business productivity
____cost reduction
____improvement of operating margin
____competitive pressures
____merchandise control
____improve quality, quantity, timeliness & reliability of information
____other_____

4. What were the critical problems your store had before you used a computer?

____lack of adequate, operating data and information
____inaccurate, untimely, or irrelevant data
____unknown cost, margins and profits
____failure to capture, maintain, or use historical and trend data
____inefficient procedures
____difficulty in putting financial reports together
____too much backlog
____inventories and purchase order system unbalanced
____other_____

MICROCOMPUTER SYSTEM DESCRIPTION

1. What type of computing equipment are you using in the store?
   ____store owned
   ____leased
   ____services obtained from outside source
   ____time sharing service
2. What were your reasons for purchasing/leasing/contracting services?
   ____capital investment consideration
   ____operating cost considerations
   ____availability of hardware
   ____availability of software
   ____availability of trained and experienced computer personnel
   ____hardware and software obsolescence
   ____other_____
3. Could you describe your microcomputer hardware and its features? (USE FORM A)
4. Could you describe your operating system software? (USE FORM B)

5. What type of application software are you using?
   ____custom-made
   ____packaged or canned
6. Could you describe the application software you are using? (USE FORM C)
7. Do you have a maintenance contract on your system?
8. What is the initial cost of the whole microcomputer system (hardware, software, training, service, etc.)?
9. Using percentages how would you breakdown the initial cost of your microcomputer system? (USE FORM D)
10. What is your average monthly expense for the system?
11. What are these monthly expenses for?
    ____electricity ____consultant
    ____paper ____maintenance
    ____insurance ____additional disks
    ____modification costs ____new software programs
    ____other_____
12. Do you have a back-up system or file? In what form is it?

MICROCOMPUTER SELECTION AND ACQUISITION

1. What steps did you undertake in selecting your microcomputer system?
   ____get educated about computers
   ____hire a consultant
   ____conduct a feasibility study
   ____conduct a system analysis
   ____do cost/benefit analysis
   ____visit other users
   ____see computer demonstrations
   ____try out microcomputers with test data
   ____prepare request for proposal to be sent to vendors
   ____evaluate proposals submitted by vendors
   ____narrow vendors to 3-5 bidders
   ____select software
   ____select hardware
   ____other_____
2. How long did the selection process take?
3. What factors did you consider in selecting your software and hardware?
   ____cost ____capability to do what I wanted
   ____simplicity ____ease of use
   ____power ____good documentation
   ____service ____flexibility
   ____reliability ____other_____
4. Did you have problems in selecting your software? hardware? What were these problems?
5. Which component of the system did you acquire first? Why this?
6. Where did you obtain your software? Why?
7. Where did you obtain your hardware? Why?
8. How did you acquire your software and hardware?
9. When did you acquire your microcomputer system?

10. For custom-made software:
    a. What were the phases involved in preparing your own custom-made software? How long did each phase take? Who were involved?
    b. How much of your time was involved in designing and developing the software?
    c. What were the problems encountered in the process?
    d. Was the software designed to meet the exact needs of your store?
11. For packaged software:
    a. Did the software you acquired perform as the vendor promised?
    b. Did you have to modify the original package? Why?
    c. How did you carry that out? Who were involved? How much of the original package was modified? What was the result?
    d. How much did the modification costs?

MICROCOMPUTER CONVERSION AND IMPLEMENTATION

1. When was the new microcomputer system implemented?
2. What were the procedures undertaken for the computer implementation?
    ____plan the implementation
    ____choose initial function to be converted
    ____prepare installation site
    ____do a physical inventory
    ____prepare initial data
    ____develop operating procedures
    ____assign responsibilities and train personnel
    ____monitor and test programs
    ____test all applications and ability of the system to meet all software specs
    ____develop new manula procedures that interface with the computer system
    ____establish equipment failure maintenance and security procedures
    ____provide data and hardware back-up
    ____document the system
    ____run parallel operations (simultaneous manual and computer systems)
    ____other_____
3. Which business activity was initially converted?

____accounts receivable	____merchandise analysis
____accounts payable	____mailing list
____customer billing	____payroll processing
____forecasting	____price ticketing
____financial reports	____sales analysis
____inventory control	____other_____

4. Why this activity?
5. Did you operate your manual and computer system simultaneously during the conversion process?
6. How long were you running parallel operations
7. What were the problems you encountered during the implementation of the microcomputer system?

MICROCOMPUTER USES AND APPLICATIONS

1. Who operates or uses the computer most of the time?
2. Which business functions are currently using the microcomputer?

____accounts payable	____payroll check printing
____accounts receivable	____payroll processing
____bookkeeping	____price ticketing
____cost accounting	____open-to-buy
____inventory control	____mailing list
____correspondence	____sales analysis
____business planning	____purchase order preparation
____sales history	____credit collection
____vendor check printing	____salesperson information
____vendor evaluation	____other_____

3. Which of the following information do you obtain from your microcomputer? (USE LIST A)
4. What are the three most important information generated by the microcomputer that has helped in decision making and better store management?
5. How much time is spent daily in keying and processing information?
6. How much time do you or your employees use the computer in the following store tasks and operations?

Accounting operations	_____%
Inventory control & analysis	_____%
Keeping track of information (customers, orders, etc.)	_____%
Price ticketing	_____%
Sales analysis	_____%
Sales transactions	_____%
Making financial projections	_____%
Selling	_____%
Producing correspondence/ documentation	_____%
Other_____	_____%
_____	_____%
	100%

MICROCOMPUTER BENEFITS AND PROBLEMS

1. What are the important benefits you have derived from your in-store microcomputer system? (USE LIST B)
2. What are the significant problems you have encountered with the use of the microcomputer? (USE LIST C)
3. Have you generated some savings with the computerization of your store? In what way?
4. Has your business improved in any way since you computerized? In what way?

MICROCOMPUTER SYSTEM EVALUATION

1. How would you rate your satisfaction with your microcomputer hardware and equipment? (USE LIST D)
2. How would you rate your satisfaction with your application software? (USE LIST E)

FORM A

HARDWARE DESCRIPTION

Central Processor:

Word size (bits)_____

Main memory size (Kbytes)_____

Manufacturer_____

Model_____

Storage Medium Used:

Floppy disks_____

Hard disks_____

Magnetic disks_____

Magnetic tape_____

Data Input/Output:

Line printer: Dot matrix_____

Letter quality_____

Monitor (CRT)_____

Typewriter/Keyboard_____

Secondary Storage:

No. of disks drives_____

Disk capacity (Kbytes)_____

Convertability to hard disk: Yes No

Expandability:

Maximum main memory_____

Maximum number of disk drives_____

Maximum number of terminals_____

Maximum number of printers_____

FORM B

OPERATING SYSTEM SOFTWARE
DESCRIPTION

Name_____

Company_____

Main memory required (Kbytes)_____

Secondary memory required (Kbytes)_____

Type: Monitor

Serial batch

Multiprogramming

Time sharing

Real time

Description_____

Language Software: BASIC

COBOL

FORTRAN

RPG

Other

FORM C

APPLICATION PACKAGES

	Name of Package	Company	Subject Area	Price	Language	Maintenance Available
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

FORM D

SYSTEM COST BREAKDOWN

Hardware Costs

Computer. . . . . _____%

Monitor . . . . . _____%

Disk Drive(s) . . . . . _____%

Printer . . . . . _____%

Additional peripherals. . . . . _____%

Total cost, initial hardware. . . . . _____%

Software Costs

Software Programs

_____ . . . . _____%

_____ . . . . _____%

_____ . . . . _____%

_____ . . . . _____%

Consultant. . . . . _____%

Modifications costs . . . . . _____%

Total costs, initial software . . . . . _____%

Initial Training Costs . . . . . _____%

Additional Costs

In-service costs. . . . . _____%

Service-support costs . . . . . _____%

Installation costs. . . . . _____%

Total cost, additional costs. . . . . _____%

TOTAL SYSTEM COSTS 100%

LIST A

COMPUTER-GENERATED INFORMATION

Information	Available Now
Daily Dollar Sales	X
Sales by Classification	X
T.Y. Sales vs. L.Y. Sales	X
Stock Sales Ratio	X
Turnover Rate	X
Sales Per Square Foot of Selling Space	X
Maintained Markup	X
Amount of Stock at Markdown	X
Amount of Stock at Regular Price	X
Best Sellers	X
Slow Sellers	X
Open-to-Buy	X
Six-Month Plan	X
Stock on Hand	X
On Order	X
Purchase Orders	X
Merchandise Received	X
Vendor List	X
Sales Performance of Vendor	X
Vendor Chargebacks	X
Accounts Receivable	X
Accounts Payable	X
Profit/Loss Statement	X
Balance Sheet	X
General Ledger	X
Sales Records	X
Expenses Records	X
Personnel Information	X
Salesperson Report	X
Payroll	X
Retail Credit/Collection	X
Customer list	X
Other_____	X

LIST B

COMPUETER BENEFITS RATING SHEET

Rate the following benefits from the most important to the least important.

Benefits	Most Important				Least Important
Reduction in clerical work	5	4	3	2	1
Reduction in space required for people and equipment	5	4	3	2	1
Reduction in paperwork by utilization of management by exception principle	5	4	3	2	1
Reduction in inventory	5	4	3	2	1
Reduction in redundant information	5	4	3	2	1
Reduction in accounts receivable delinquencies	5	4	3	2	1
Reduce lead time in accounts receivable	5	4	3	2	1
Reduction in costs	5	4	3	2	1
Closer monitoring of operation by management	5	4	3	2	1
Larger amounts of information available to management	5	4	3	2	1
Faster and more comprehensive analysis of information	5	4	3	2	1
Improved performance indicators	5	4	3	2	1
Improved customer service	5	4	3	2	1
Reduces human error possibilities	5	4	3	2	1
Permits more and improved validation procedures	5	4	3	2	1
Improved profitability	5	4	3	2	1
Accurate, timely, meaningful action reports	5	4	3	2	1
Greater degree of operation flexibility	5	4	3	2	1
Other_____	5	4	3	2	1

LIST C

COMPUTER PROBLEMS RATING SHEET

Rate the following problems from the most significant to the least significant.

Problems	Most Significant				Least Significant
Acceptance by store personnel and customers	5	4	3	2	1
Costs and delay	5	4	3	2	1
Equipment limitations	5	4	3	2	1
Software limitations	5	4	3	2	1
Errors and/or questionable reliability/usefulness of information produced	5	4	3	2	1
Excessive information produced	5	4	3	2	1
Require long implementation lead time	5	4	3	2	1
Breakdowns resulting from inability to handle peak loads, volume increases, technical difficulties, etc.	5	4	3	2	1
Impersonal nature of the systems	5	4	3	2	1
Inability to utilize the computer to full capacity	5	4	3	2	1
Total dependence on computer	5	4	3	2	1
System is complicated and difficult to understand	5	4	3	2	1
Large colume of unneeded, unrelizable, inaccurate, and limited value information produced	5	4	3	2	1
Other_____	5	4	3	2	1

LIST D

HARDWARE USER SATISFACTION RATING SHEET

Evaluate your computer hardware and equipment based on the following criteria:

Features	Excellent	Good	Fair	Poor
Cost	4	3	2	1
Cost/Performance	4	3	2	1
Expansion capability	4	3	2	1
Reliability of CPU	4	3	2	1
Ease of operation	4	3	2	1
Reliability of peripherals	4	3	2	1
Ease of programming	4	3	2	1
Ease of conversion	4	3	2	1
Maintenance of service:				
Responsiveness	4	3	2	1
Effectiveness	4	3	2	1
Technical support:				
Trouble-shooting	4	3	2	1
Education	4	3	2	1
Documentation	4	3	2	1

LIST E

SOFTWARE USER SATISFACTION RATING SHEET

Evaluate your application programs (software) based on the following criteria:

Features	Excellent	Good	Fair	Poor
Cost	4	3	2	1
Ease of use	4	3	2	1
Packaged	4	3	2	1
Developed	4	3	2	1
Ease of conversion	4	3	2	1
Documentation	4	3	2	1
Software maintenance	4	3	2	1
Flexibility (customization)	4	3	2	1
Cost/Performance	4	3	2	1
Reliability	4	3	2	1
Efficiency	4	3	2	1
Ease of installation	4	3	2	1

APPENDIX F

SECOND INTERVIEW GUIDE

INTERVIEW SESSION SCHEDULE

Date:_____

I. Enter Store

II. Conduct interview in private, if possible. Use tape recorder to record interview.

III. Use interview guide to gather information from store owner/ manager.

IV. Verify information obtained during first interview.

FUTURE PLANS

1. What are your planned computer acquisition/implementation (if you have any) in the next year?
2. Do you have plans to replace your present microcomputer system or part of the system in the near future? Why?
3. How would you describe your involvement in computer/EDP systems over the next five years?
   ____remain at about the same level
   ____increase slightly
   ____increase moderately
   ____increase dramatically

SUGGESTIONS/RECOMMENDATIONS

1. What would be the first thing you would suggest to a small clothing retailer who is considering automating his operations?
2. What other things would you recommend him to do to avoid the problems you encountered while computerizing your store?
3. Would you have any additional comments to add?

APPENDIX G

SUMMARY OF RETAILERS' SUGGESTIONS AND RECOMMENDATIONS

SUGGESTIONS AND RECOMMENDATIONS

1. Be informed and educated about computers by reading computer publications.

2. Get a home computer first to learn how it works and what it does.

3. Join a user's group.

4. Look for software first and check its portability.

5. Hire a consultant.

6. Get a system new enough to do what you want it to do.

7. Do computer conversion one activity at a time.

8. Consdier a service contract for regular maintenance.

9. Consider a computer not as a solution to business problems but as a means for growth and improvement.

10. If you are going to put inventory information that can be pulled out anytime, get a hard disk for more suffificent storage space.

11. Write out what you want out of the computer system and what you expect from the system.

12. Test hardware and software to see if they actually work.

13. Realize initially it will take 4-6 months from conversion to total implementation.

14. Know what information to key in so you can estimate how much time will be involved.

15. Run dual systems for a few months.

16. Have an efficient and sound manual system before converting to a computerized system.

17. Be familiar with your accounting system and confer with your accountant.

18. Visit and talk with computer users and consultants.

19. Purchase your computer system at a local computer store that offers service and is located within close proximity of your business.

APPENDIX H

RESPONSES OF TWO OR MORE RETAILERS RELATED TO THE DEVELOPMENT AND UTILIZATION OF AN IN-STORE MICROCOMPUTER SYSTEM

RETAILERS' RESPONSES

Reasons for Computerization

- greater accuracy
- timesaving
- cost reduction
- merchandise control
- improve quality, quantity, timeliness and reliability of information

Store Problem

- unmanageable accounts receivables

Microcomputer Selection and Acquisition Procedures

- obtain knowledge and information about computers
- identify needs
- conduct system analysis
- attend computer demonstrations
- visit and talk with other computer users
- evaluate computer systems and vendors' proposals

Microcomputer Conversion and Implementation Procedures

- plan implementation
- prepare installation site
- document the system
- choose initial function/s to be converted
- prepare initial data
- test all applications with store data
- develop operating procedures and train personnel
- provide for data back-up
- develop new manual procedures that interface with computer system
- assign responsibilities
- run parallel operations

Business Function Initially Processed

- accounts receivable
- inventory control

Business Functions Currently Computerized

- accounting
- inventory
- sales analysis
- payroll
- price ticketing
- mailing list
- correspondence

Computer-Generated Store Information

- daily dollar sales
- sales by classification
- maintain mark-up
- best sellers
- slow sellers
- stock on hand
- merchandise received
- vendor list
- vendor sales performance
- accounts receivable
- accounts payable
- profit and loss statement
- balance sheet
- general ledger
- personnel information
- payroll
- customer list

APPENDIX I

EVALUATION FORM

COMPUTER GUIDELINES EVALUATION SHEET

Please review the attached guidelines that were formulated to assist apparel retailers who are considering the installation of an in-store microcomputer system. After reviewing the guidelines, please complete this reaction sheet and return it to the Center for Apparel Marketing and Merchandising on or before June 11, 1984. Thank you for your kind cooperation.

Maria Dayrit
Graduate Research Assistant

General Reactions	Very Much				Questionable
	5	4	3	2	1
1. Were the guidelines helpful to an apparel retailer considering an in-store computer system?					
2. Were the guidelines comprehensive?	5	4	3	2	1
3. Were the guidelines easy to follow?	5	4	3	2	1

4. What portion(s) of the guidelines do you think will be most useful and why?

_____

_____

5. What topic(s) do you feel need to be more adequately covered and why?

_____

_____

6. What suggestions do you have to improve parts of the guidelines?

Guidelines_____

Worksheets_____

Infosheets_____

7. Please list additional information you think should be included in the guidelines?

_____

_____

8. Please add other comments you would like to make about the guidelines:

_____

_____

_____

_____

APPENDIX J

CASE STUDIES

CASE STUDY INFORMATION

STORE A

Store Description

Store A was a specialty clothing store established in 1955 for the purpose of retailing women's apparel and accessories. The store was a family corporation that had been in operation for 29 years. The store was located in a strip center in a city with an approximate population of over 100,000.

Store A had an approximate footage of 7,500 square feet with 6,000 square feet of selling space. The approximate annual sales volume of Store A was $375,000. Two full-time and seven part-time employees were on the store's payroll.

An average monthly stock of approximately 3,000 items was carried in inventory by Store A, at an average cost of $80,000. Women's apparel and accessories comprised the total store inventory. The stock was divided into five major classifications with the following percentages: after five (40%), sportswear (20%), dresses (15%), accessories (15%), and lingerie (10%).

Two types of credit plans were available to customers: an installment company credit plan and financial institution sponsored credit plan.

The store manager was the owner's son, who handled the data processing operations of the store. He has had five years retail experience and four years computer experience. He obtained his computer knowledge through self-study. He subscribed to computer publications and was a computer user group member to obtain current information about computers.

Microcomputer System Development

Retailer A had been using an in-store microcomputer system for three years. Prior to obtaining the in-store system, Store A used a service bureau for two years to process accounts receivable data.

The decision to install a microcomputer system was made due to the following reasons: a) the computer service was expensive and unreliable; b) there was too much backlog in inventory; and c) accounts receivable were unmanageable manually.

Microcomputer System Description

Retailer A purchased a Zenith Z-89, 8 bit, 64K microcomputer. The peripheral equipment consisted of a cathode ray tube (CRT) monitor, a keyboard, two disk drives, and a dot matrix printer. The microcomputer has the capability to be expanded to a hard disk storage type to accomodate more volume of data. Floppy disks were used for secondary storage. The microcomputer has a Computer Processing for Microcomputer (CP/M) operating software. Retailer A had been using a combination of custom-made and packaged programs. The custom-made software developed by Data Resources and Systems, Inc. (DRI) consisted of inventory management, accounts receivable, general ledger, accounts payable, and payroll programs. The packaged programs were SuperCalc, Wordstar, BASIC, COBOL, PASCAL, and LISP 80 interpreters, COBOL and FORTRAN compilers, and ASM 80 assemblers.

Initial cost of the system was $12,000 with 60% spent for hardware, 25% for software, and 15% for installation and miscellaneous expenses. The software was obtained at a discounted price because Store A served as the test case for the software firm. Average monthly expenses for the microcomputer system were estimated at $47.00, which was spent on paper and forms, floppy disks, ribbons, and insurance. Retailer A did not obtain a maintenance contract for the system, so maintenance was provided by the store manager.

Selection and Acquisition

Retailer A spent 18 months searching for the suitable software to meet the store needs. During the process of selection, Retailer A subscribed to computer magazines and publications to obtain as much information about computers and the software and hardware available in the market. The specific needs of the store were also identified, computer demonstrations were attended, and software and hardware were evaluated. After looking at the different types of systems available, Retailer A identified the specific type of system that was needed by the store and what it was expected to perform. Proposals from different vendors were evaluated. The decision to have the software custom-made was made after considering their needs and what the market had to offer. It was also partly a result of a software company's offer to use the store as the test case in the development of application software for small retail operations.

Cost and power of the microcomputer system were the major factors considered in selection. The software firm helped in selecting the hardware that was compatible with the software to be developed.

Problems encountered during the selection process were unavailability of application software for small apparel stores and insufficient disk capacity of available hardware

The computer was obtained from a jobber and the operating system software was provided by the software company developing the application programs. The computer system was acquired in January 1981, and was

financed with a bank loan. Retailer A decided to purchase the microcomputer because buying the system was cheaper than leasing, and there was more freedom with modifications.

The application programs took three months to design and develop after several consultations between Retailer A and the software personnel. The programs developed were in useable form after six months. The development of the application programs for Store A took one and one half years to complete. Packaged software for word processing and financial spreadsheet applications were purchased after the first year.

The problems encountered with obtaining custom-made programs were a) lack of communication and understanding between store management and software personnel; b) lack of fashion merchandising and retail business operations by the software people; and c) lack of a consultant who was knowledgeable about computers and apparel retailing.

Conversion and Implementation

The microcomputer system was implemented at the beginning of Store A's fiscal year, which was June 1981. Prior to implementation, several arrangements and preparation were made. To accomodate the system, the store office was moved to a new location within the store. The documentation for both the hardware and the software were put together for easier access and use. Inventory, accounts receivable, payroll, and financial reports were selected to be the functions to be converted initially. A physical inventory was conducted for three days and all the initial data to be keyed into the computer were prepared. Since Store A converted four functions at one time, all the data prepared were keyed into the computer for about three weeks of 12 to 18 hours a day. Operating procedures concerning how long the data were to be stored and which reports to print were also developed. Since price ticketing was computerized, a new system of writing sales receipts was developed. Personnel responsibilities were assigned and employees were trained with new store procedures.

The store activities initially processed by the computer system were inventory control, price ticketing, accounts receivable, customer billing, payroll processing, and financial reports. All the data for these functions were duplicated into several disks for back-up purposes in case data got lost during processing.

Retailer A indicated that the major problems encountered were the presence of "bugs" or errors in the custom-made software and the unexpected amount of time needed for keying initial data. Other problems included getting used to the new system, controlling the information entered and produced by the computer, and using the machine productively and efficiently.

Microcomputer Uses and Applications

Store A used a combination of manual and computer procedures to perform business activities and obtain store information. The activities that utilized the microcomputer were inventory control, accounts receivable, accounts payable, sales analysis, general ledger, price ticketing, and correspondence. Payroll was no longer computerized, and was changed back to manual processing because management felt it was more efficient and less time consuming to do it manually. Open-to-buy, six-month planning, and vendor evaluation were also handled manually.

The computer was operated by the store manager on the average of three hours per day to key in and process data. Forty percent of the microcomputer's time was used to keep track of information (customers, orders, etc.), 20 percent for accounting operations, 10 percent for price ticketing, 10 percent for sales analysis, 5 percent each for inventory management analysis, financial projection, and program development, 3 percent for mailing list, and 2 percent for correspondence/ documentation.

The computer-generated information Retailer A found useful in business decision-making were identified as: a) daily dollar sales; b) best/slow sellers; c) accounts receivable; d) accounts payable; e) vendor list; f) stock on hand; g) merchandise received; h) profit and loss statement; j) balance sheet; k) general ledger; and 1) customer list. Sales, receivables, and inventory information were the three most important computer-generated information Retailer A considered as helpful in decision-making and better store operations.

System Evaluation

Computer Benefits

The most important benefits Retailer A gained from the installation of an in-store computer included: a) reduction in clerical work; b) close monitoring of operations by management; c) larger amounts of information available to management; d) improved customer service; and e) greater degree of operation flexibility. Retailer A indicated that after the microcomputer was installed, there was more time available to spend on the selling floor and to be with customers that helped determine their needs and in making buying decisions. The store had generated savings with the use of the microcomputer with the reduction of one employee, and lower monthly expenses for processing store data with the computer. The computer itself was fully paid up after one and one-half years.

Computer Problems

The most significant problems identified by Retailer A were: a) software and equipment limitations; b) breakdowns resulting from inability to handle peak loads, volume increases and technical

difficulties; c) large volume of unneeded and limited value of information produced; and d) long implementation time.

System Satisfaction

Retailer A was moderately satisfied with the performace of its microcomputer. The reliability of the central processing unit (CPU) and the technical support in education and documentation were found to be excellent. However, cost, cost/performance, and peripheral reliability were rated only as fair.

Although Store A had its software custom-made to its needs, the degree of satisfaction was conly considered fair. The ease of use, documentation, and software maintenance were considered poor, and only the flexibility and packaging were found to be excellent.

Future Plans

Future plans of Store A included changing the present disk drive to improve the computer system and prevent loss of data, and obtaining a merchandise analysis program to supplement their inventory program. Retailer A indicated that its ultimate goal was to acquire a data base management system that will contain all the store's records and information on a hard disk, and make data processing faster. Retailer A also stated that the store intends to keep their microcomputer although it is quite outdated, and will just find ways to expand its capability. Involvement in computers in the next five years is expected to increase slightly.

STORE B

Store Description

Store B was a specialty clothing store. The form of ownership was a partnership and had been in operation for eight years. Store B was located near a college campus in a town with an approximate population of 40,000.

Store B had an approximate footage of 2,200 square feet with 2,000 square feet of selling space. The approximate annual sales volume of Store B was $700,000. One full-time and seven part-time persons were employed by Store B.

An average monthly stock of approximately 5,000 pieces of merchandise was carried in inventory by Store B, at an average cost of $100,000. Store B had 55 percent of its stock in women's, 30 percent in men's, and 15 percent in children's apparel and accessories. The stock was distributed into several classifications: men's sportswear (26%), women's sportswear (52%), dresses (9%), suits (8%), lingerie (2%), men's underwear and sleepwear (1%), hosiery (1%), and accessories (1%).

Store B had a limited company credit plan and accepted financial institution credit cards such as VISA, Mastercard, and other similar cards on a 30-day credit.

Retailer B had 16 years of retail experience and owner of a men's store previously. He had one and one-half years of computer experience, and acquired his computer knowledge through self-study.

Microcomputer System Development

Retailer B's experience with electronic data processing began with the purchase of an in-store microcomputer. Store B had been using the microcomputer for one year.

The owners considered computerizing the store activities because the business was growing rapidly. The main reasons for installing the microcomputer were: a) for greater accuracy of information; b) to increase business productivity; c) for cost reduction; and d) for merchandise control. Store B did not have any major problems with the existing manual procedures. However, some minor difficulties noted were the unbalanced inventory and purchase order system, and the unmanageable accounts receivable.

Microcomputer System Description

Store B directly purchased its own store microcomputer without financing. The owners decided to purchase the system because they believed it was cheaper to buy the system, it could be modified to fit the store's needs, and it would give the store more control with the microcomputer.

The computer hardware and peripherals consisted of an Apple IIe, 16 bit, 64K microcomputer, a monitor, a keyboard, two disk drives, and a letter quality printer. Floppy disks were used for secondary storage. The microcomputer had the capability to be converted to a hard disk secondary storage.

The software used consisted of packaged programs. The operating software was Computer Processing for Microcomputer (CP/M). The application software from BPI Systems consisted of inventory control, accounts receivable, and general accounting programs. Other software were VisiCalc (electronic spreadsheet program), Applewriter (word processing), and file management programs.

Initial cost of the microcomputer system was $5,500, with 6.15 percent spent for hardware, 23 percent for software, and 15 5 percent for installation and miscellaneous expenses. Approximately $200.00 was spent monthly for expenses such as paper, insurance, additional disks, and consultant fees. The system did not have a maintenance contract, but service support was provided by the computer dealer.

Selection and Acquisition

The selection process took Retailer B almost five months to complete. The steps undertaken by Retailer B in selecting the microcomputer system included obtaining some computer knowledge and information, and then identifying and listing the store's data processing needs. Computer users and experts were visited and consulted. Retailer B also attended computer demonstrations and analyzed the systems available in the market. Finally, vendors' proposals were evaluated.

Retailer B selected the hardware first, and then selected the software recommended by the computer dealer. The factors considered in selecting the microcomputer system included cost, simplicity, service, reliability, and close proximity of the computer dealer. The major problem encountered by Retailer B during the selection process was the inadequacy of retail apparel software.

Retailer B purchased its hardware and software from a computer dealer located in the community. The Apple IIe microcomputer included a word processing and file management programs with it. The computer dealer obtained the operating system software and the other application programs from a software company, and sold it together with the hardware to Store B. The system was acquired by Store B in February 1983.

The application software that was purchased had to be modified because it took too much time to process the data, and it was not meeting the needs identified by the store. The store's accountant redesigned the programs to make them work simply and meet the store's processing needs.

Conversion and Implementation

The microcomputer system was implemented in the store in April 1983. Retailer B prepared an implementation plan and selected inventory control as the initial function to be computerized. A portion of the store's office was selected as the site where the computer was to be installed. A complete store physical inventory was performed and the initial data was prepared. New manual procedures that interfaced with the microcomputer system were developed. An electronic cash register was acquired to record daily sales receipts. The application programs were tested with initial store data to check for any errors. Simultaneous manual and computer procedures for the inventory control function were run for three to four months to make sure they were producing the expected results. All the data entered and processed by the computer were duplicated into floppy disks and kept in a fireproof safe.

After the inventory control was converted, the next function to be converted was general ledger, and finally, accounts receivable. Retailer B encountered several problems during the implementation stage such as: a) getting used to the new system; and b) time consuming computer conversion.

Microcomputer Uses and Applications

Store B used a combination of the manual and computer system procedures to perform business activities and to obtain store information. The activities that utilized the microcomputer were accounts receivable, inventory control, general ledger, payroll, price ticketing, sales analysis, mailing list and correspondence. Accounts payable, vendor evaluation, and open-to-buy were handled manually. Not all application programs had been utilized.

The microcomputer was operated by Retailer B and a part-time employee, who keyed in the daily sales information. About one hour per day was spent on entering data and processing. Store B used the microcomputer 50 percent of the time for inventory management and analysis, 25 percent for accounting operations, 10 percent for price ticketing, 10 percent for mailing list, and 5 percent for correspondence.

The computer-generated information Store B found useful was identified as: a) daily dollar sales; b) sales by classification; c) maintained markup; d) best/slow sellers e) stock on hand; e) merchandise received; f) vendor list; g) accounts receivable; h) profit and loss statement; i) balance sheet; j) general ledger; k) payroll; and p) customer list. Information related to inventory control and accounts receivable was considered the most important computer-generated information. Retailer B indicated that this information can show the exact status of stock required, identify requirements, and help control merchandise.

System Evaluation

Computer Benefits

The most important benefits obtained by Retailer B from the use of the in-store microcomputer included: a) reduction in clerical work; b) reduction in paperwork; c) reduction in inventory; d) reduction in redundant information; e) reduction in accounts receivable delinquencies; f) closer monitoring of management; g) more information available; h) faster and more comprehensive analysis of information; i) improved performance indicators; and j) reduction of human error possibilities. Retailer B indicated that since the computer has been in operation for only a year, it was not yet possible to determine the savings generated from its installation.

Computer Problems

The significant problems experienced by Retailer B included: a) costs and delay in implementation; b) software limitations; c) errors in information produced; d) long implementation lead time required; e) inability to utilized the computer to full capacity; and f) difficulty to understand the computer system.

System Satisfaction

Retailer B was moderately satisfied with the performance of the in-store microcomputer system. A rating of good was given for cost, expansion capability, cost/performance, reliability of CPU and peripherals, ease of programming and conversion, and responsiveness and effectiveness of service. Factors rated as poor were technical support in trouble-shooting, education, and documentation.

The application programs obtained by Store B were considered moderately good. Factors rated as poor were cost, ease of use, ease of onversion, software maintenance, cost/performance, and ease of installation.

Future Plans

Retailer B indicated that one of the store's plans was to replace the current microcomputer system with a more sophisticated small business computer system within one and one-half years. The VisiCalc application program was scheduled to be used for planning the open-to-buy of the store. Involvement in computers over the next five years was expected to increase slightly.

STORE C

Store Description

Store C was a specialty clothing store. The ownership of the store was a corporation and has been in operation for 17 years. The store was located near a college campus in a town with an approximate population of 40,000.

Store C has an approximate footage of 4,500 square feet with 2,750 square feet of selling space. The approximate annual sales volume of Store C was $500,000. Three full-time and six part-time persons were employed by the store.

An average monthly stock of approximately 11,500 pieces of merchandise was carried in inventory by Store C, at an average cost of $135,000. Store C had 95 percent of its stock in women's apparel and accessories, and five percent in gifts. The stock was distributed into several classifications: sportswear (42%), shoes (20%), accessories (15%), dresses, (12%), gifts (5%), lingerie (2%), hosiery (2%), suits (1%), and evening wear (1%).

Store C offered a revolving company credit plan and financial institutions credit plan to its customers.

Retailer C had 17 years of retail experience. Store C was the first retail operation owned by Retailer C. He had one and one-half

years of computer experience obtained from self-study. Retailer C subscribed to computer publications for current computer information.

Microcomputer System Development

Retailer C had been using an in-store microcomputer for almost one and one-half years. Prior to the acquisition of the in-store system, Store C used a computer service bureau for 14 years. Inventory data was initially processed by the service bureau. When Store C acquired an electronic cash register with a cassette tape, accounts receivable data was also sent to the service bureau for processing.

Retailer C decided to install an in-store microcomputer system for the following reasons; a) to save time: b) for greater accuracy; c) for new information; d) to reduce costs; e) to improve operating margin; f) to improve quality, quantity, timeliness, and reliability of information; and g) to have data processing in-house.

Retailer C identified several problems experienced by the store prior to the acquisition of the microcomputer. The problems were inaccuracy of data, inefficient store procedures, and duplication of bookkeeping tasks by the store and the accountant.

Microcomputer System Description

The microcomputer system of Store C was leased to the store by a partnership. Store C leased the computer because of these advantages: automatic deductions for lease expense, capital gains, tax deductions, and the lessor was also the store owner himself.

The computer hardware and peripherals consisted of a NEC 8000, 8 bit, 64K microcomputer, monitor, keyboard, hard disk drive, two floppy disk drives, and dot matrix printer. The hard disk, which had a capacity of ten megabytes, was used for secondary storage, while the floppy disks were used for back-up files.

The software consisted of packaged programs. The operating software was Computer Processing for Microcomputer (CP/M). The application software consisted of general ledger, accounts payable, accounts receivable, inventory, payroll, and filing system from TCS Software, and a mailing program from High Technology Software.

Initial cost of the microcomputer system was $10,200, with 55 percent spent for hardware, 33 percent for software, and 12 percent for installation and miscellaneous expenses. The leasing fee paid by Store C was $4,000 per year. In addition, monthly expenses incurred were approximately $65.00 for electricity, paper, insurance, and additional disks. The computer system did not have a maintenance contract but service support was provided by the local computer dealer.

Selection and Acquisition

The selection process took Retailer C almost five years to complete. During the process of selection, Retailer C acquired knowledge and information about computers by reading computer magazines and publications. The data processing needs of the store were identified. With the store's accountant, a feasibility study was conducted and a cost/benefit analysis was made. Computer users and experts were consulted, computer demonstrations were attended, and systems available in the market were studied and evaluated. Vendors and their proposals were also evaluated to reach a decision.

Retailer C selected the software first and then decided on the hardware compatible with the software. A hard disk secondary storage was selected because its capacity was ten megabytes, allowing it to store all the operating and application software, and making processing easier and faster.

The factors considered in selecting the microcomputer system included cost, simplicity, power, service, reliability, capability, ease of use, good documentation, and flexibility.

The problems encountered by Store C during the selection process were costs, difficulty in finding hard disk compatible hardware, and insufficient software package that had payroll and accounts payable.

Retailer C obtained the microcomputer system from a computer dealer located in the community. The computer dealer obtained the software from a software firm and sold it together with the hardware to Retailer C. The system was acquired in August 1982. No modifications were made on the software since it had its own coding system preventing any changes in the programs.

Conversion and Implementation

The microcomputer system was implemented in Store C at the end of January 1983. Prior to the installation of the system, target dates for the key phases of conversion were set and the implementation plan was made. The site, where the microcomputer system was to be installed, was prepared. The functions to be converted were selected. A complete physical inventory of the store merchandise was conducted, and then, the initial data to be keyed into the computer was prepared. The application programs were tested using the store data, and operating procedures were developed. Provisions for data and hardware back-up were determined. New manual procedures were developed such as changing the way tickets were written. Store personnel were trained with the new procedures. Accounts receivable data was keyed in first, followed by payroll, general ledger, accounts payable, and inventory. Since a hard disk storage was used, all the data were keyed in at one time. Dual procedures, both manual and computer, were run simultaneously for five months to make sure errors were removed, and to discover any problems within the system.

The only problem encountered during the implementation of the new microcomputer system was booting the hard disk which caused the scrambling of data.

Microcomputer Uses and Applications

Store C was not totally computerized. A combination of manual and computer system procedures were utilized to perform business activities and to obtain store information. The activities that used the computer were accounts receivable, accounts payable, general ledger, inventory, payroll, personnel, sales analysis, vendor evaluation, and business planning. Price ticketing and open-to-buy were handled manually.

The microcomputer was operated by Retailer C and the bookkeeper for an average of three hours per day to key in and process data, and to print reports. The microcomputer was used 55 percent of the time for sales analysis, 30 percent for inventory management and analysis, 10 percent for accounting operations, and 5 percent for making financial projections.

The computer-generated information found useful were identified by Retailer C as: a) daily dollar sales; b) sales by classification; c) this year's sales vs. last year's sales; d) stock sales ratio; e) turnover ratio; f) maintained markup; g) merchandise on order; h) merchandise received; i) stock on hand; j) vendor list; k) vendor sales performance; 1) vendor chargebacks; m) accounts receivable; n) accounts payable; o) profit and loss statement; p) balance sheet; q) general ledger; r) personnel information; s) payroll; and t) customer list. Retailer C considered payroll, inventory, and financial information as the most important computer-generated information helpful in decision-making and better store management.

System Evaluation

Computer Benefits

The most important benefits derived by Retailer C from the installation of the microcomputer included: a) reduction in paperwork; b) availability of more store information; c) faster and more comprehensive analysis of information; d) accurate, timely and meaningful reports; and e) greater degree of operation flexibility. Retailer C indicated that with the installation of the microcomputer, there was more time available to be on the selling floor and be with customers, since paperwork was lessened. Accordingly, the in-store microcomputer had eliminated the process of doing double work in recording. Merchandise movement awareness was increased, and overhead expenses were determined more accurately. Savings identified with the use of the microcomputer included elimination of the computer service expenses and savings in some operating expenses. According to Retailer C, who is also the lessor of the microcomputer, the system was paid up after 15 months.

Computer Problems

Retailer C indicated very few significant problems with the in-store microcomputer system. The only problem identified as somewhat significant was errors in information produced, which was attributed to erroneous data keyed into the computer.

System Satisfaction

Retailer C was highly satisfied with the performance of the microcomputer hardware. The cost, cost/performance, ease of operation, reliability of peripherals, responsiveness and effectiveness of service, and technical support in trouble-shooting were considered excellent.

The application software was considered moderately satisfactory. Factors such as cost, ease of use, packaging, development, ease of conversion, documentation, cost/performance, reliability, and efficiency were rated good. However, documentation, flexibility, and ease of installation were rated only as fair.

Future Plans

Future plans of Store C included expanding the interface between the microcomputer and the printer, obtaining a spreadsheet program, and purchasing a computer for the home that can interface with the store system for easier access. There were no plans to replace the system nor its parts. Retailer C indicated that the store's involvement in computers was expected to increase slightly over the next five years.

APPENDIX K

GUIDELINES

GUIDELINES FOR THE DEVELOPMENT OF A MICROCOMPUTER SYSTEM FOR A SMALL APPAREL STORE

I. COMPUTERIZATION PREREQUISITES

1. Obtain knowledge and information about computers.
   - Find out what a computer is, what it can do, the components of a system, the modes of operation involved, the different types available, and how your business can benefit from using it.
   - Acquire computer information from various sources available. (See INFOSHEET A)
   - Gain some practical experience with computers before investing in a business system by either renting from a computer dealer or buying an inexpensive home computer to learn how it works and what it can do.

2. Examine your present manual system and identify any current problems and deficiencies.
   - Examine the different business functions present in your store. Analyze in terms of accuracy, efficiency, reliability, control and data procedures, and information production. Review the number of business transactions that occur daily, weekly, and monthly. Determine what records, statements invoices, etc. are currently used, what information is needed to prepare tax forms and government reports, etc. Consider future business information needs. (Do WORKSHEET 1 and 2)
   - Compile a list of business operation details or store information required for making decisions. (See INFOSHEET B)

3. Define your business needs and computer requirements.
   - Decide which tasks can be improved by computerization.
   - Determine the reasons for installing a microcomputer, prioritize these reasons and identify critical concerns. (Do WORKSHEET 3)
   - Consider problems you anticipate with the installation of a microcomputer. (Do WORKSHEET 4)
   - Determine the volume of work that will be computerized including the amount of data to be entered into the computer, the length and number of reports, documents, statements, etc. to be produced.
   - Consider the file storage capacity, computer speed, and length of conversion time required by your business. (See INFOSHEET C)

4. Prepare a budget and estimate time involved in developing an in-store microcomputer system.
   - Analyze costs of a microcomputer. Estimate the costs of

hardware, software, supplies, and operating costs after acquisition such as installation costs, taxes, insurance, maintenance, modification costs, disks, etc. (Do WORKSHEET 5a) Determine if a microcomputer is economically justifiable for your business.

- Establish a time table as a guide and set deadlines for selection, acquisition, conversion, and implementation. (Do WORKSHEET 5b)

II. SELECTION AND ACQUISITION

1. Examine software options available and consider software programs that can meet your business needs and computer requirements.

   - Hire a consultant if your computer background and experience is not sufficient, and you can afford one. A consultant with business system automation experience and familiarity with retail store operations can assist in software acquisition and modification, hardware selection, system conversion and implementation.

   - Consider the application software carefully and consider those that impact on several functions of the store. Check if the software is compatible to several machines and not only limited to one. (See INFOSHEET D and Do WORKSHEET 6a and 6b) Let the software dictate the hardware to be selected.

2. Obtain information about the hardware options compatible with your software options.

   - Consider microcomputers that are widely used and can use the same software of other machines. Secure as much information about the hardware and peripheral equipment. (Do WORKSHEET 7)

   - Obtain information about the vendor or dealer such as reputation, warranties, services available, prices, and discounts. (Do WORKSHEET 8).

   - Attend demonstrations of microcomputer systems. Request computer dealers for references of systems installed. Visit users and inquire about computer experiences. (Do WORKSHEET 9)

3. Evaluate and test software and hardware alternatives compatible with your existing manual system and store functions.

   - Request a complete demonstration and test all the application programs being considered, and compare with the list of requirements, store data, and actual forms and reports used in your store. (Refer to WORKSHEET 2) Determine the system's capacity and capability to process all the information needed. Revise your list as more information becomes available.

   - Check the available manuals and documentation for both software and hardware. Make sure they are complete and easy to follow.

4. Decide which software programs and hardware best fit the business needs you identified. (Refer back to WORKSHEET 3)
   - Obtain the hardware compatible with the chosen software.
   - Review the information obtained about the hardware and software, and the reasons for computerization. Compare costs and benefits of the different systems being considered. (Do WORKSHEET 10)

5. Acquire the microcomputer system you select by either buying or leasing.
   - Consider the typical advantages and disadvantages of buying and leasing. (See INFOSHEET E)
   - Negotiate the price of the system before the transaction is closed. Since the market is competitive, dealers may be open to price negotiation.
   - Consider buying/leasing from an independent store since they give less biased advice, put hardware and software together, and support their products well. Consider a local computer store located within close proximity of your business for faster technical advice and service.
   - Consider a service contract for regular maintenance from a third party, if service is not provided by the computer dealer or manufacturer.

III. CONVERSION AND IMPLEMENTATION

1. Develop a plan to implement the microcomputer system in your store. Obtain the aid of a consultant or your accountant to help identify steps necessary for conversion.
   - Prepare time schedule for implementation. (Do WORKSHEET 11)

2. Plan carefully the business functions you want to convert.
   - Select initial functions to be converted first and list other functions in the order of conversion.
   - Convert one application at a time. Start with the easiest or the one with the best existing manual procedures, as this will give the least problems.

3. Prepare your employees for the conversion to the new microcomputer system.
   - Discuss the reasons for acquiring the computer with employees. Explain what is expected from them, and any changes in store procedures that may result from the installation of the microcomputer system.
   - Assure employees that the microcomputer will not take over their jobs. Help the employees understand the importance of the new system to store operations and productivity.

- Arrange for training in the use and operation of the microcomputer for employees as need arises.

4. Make preparations for the installation of the new microcomputer system in your store.

   - Select a site in the store where the system is to be installed. Make sure it is located in a place where there is minimum interruptions. Arrange for availability of stationery and computer consummables.

   - Prepare storage space required: near the equipment - shelves and bookcases for manuals and boxes to keep data disks; nearby - cabinets for computer supplies (paper, ribbons, labels, etc.); separate location - safe deposit box or fireproof safe for back-up disks and files.

5. Prepare initial data for conversion and programming.

   - Conduct a physical inventory to make sure the information in the books and actual merchandise balance. Make sure the books are maintained on a consistent time schedule.

   - Check all files and records. Remove out-of-date files and useless records.

   - Assign numbers or codes to data that will be keyed into the microcomputer system such as merchandise (department number, style number, size, color, etc.), customers, vendors, employees, etc. (See INFOSHEET F)

   - Redesign forms if needed for easier input and output.

6. Install the new microcomputer system.

   - Obtain complete documentation - system description, user's manual, and software documentation. Review the entire software package and the different elements that work together. Read the software manuals thoroughly before converting.

   - Develop operating procedures relating to how to operate the microcomputer, how data is entered, how long data will be maintained in the system, and how the data will be "backed-up."

   - Define security procedures. Determine who has access to what information and who can update the data files by either assigning identification numbers or passwords.

7. Convert your store data from the existing manual mode into the microcomputer readable mode.

   - Determine the manner of conversion based on the volume of records to be converted. Use automatic conversions (using magnetic tape) if a large volume of records is to be converted at one time. Key data manually if converted in smaller batches.

   - Complete conversion of transaction files first, since they are valid only for a certain period of time. Master files or

permanent records can be converted in an extended period of time, and gradually completed as long as changes that occur are included.

- Provide conversion procedures that detect transactions that were skipped, keyed in error, or keyed more than once. Verify input by printing out all data entered and compare to manually prepared records.

8. Test the software programs to examine system accuracy and reliability.

   - Perform a test drive using a mix of current transactions at a minimum. Also, test the most difficult and complicated transactions.

   - List and record the "bugs" or errors found while testing the programs. Record its priority or how important the correction is to the success of the system. Make necessary modifications to correct errors identified.

9. Implement the microcomputer system in your store.

   - Schedule the implementation at the beginning of your store's fiscal year to ensure that a full year's activity will be programmed into the system.

10. Evaluate the efficiency of your in-store microcomputer system.

    - Maintain the old manual system while running the new computerized system for at least three months to provide assurance that the new system works and produces the same results as the manual system.

    - Analyze benefits gained and problems encountered with the use of the in-store microcomputer system. (Do WORKSHEET 12).

INFOSHEET A

Partial list of several sources of computer information and hands-on experience:

I. Computer Information Sources

1. Books and Magazines[a]
2. Computer Dealers and Vendors
3. Computer Organizations
   - Computer Societies
   - Computer Clubs
   - User's Groups
4. Computer Users
5. Consultants
6. Computer Companies

II. Hands-On Opportunities

1. Classes
   - Extension Courses
   - Business Schools
   - Trade and Technical Schools
   - Computer Stores
2. Tutorials/Seminars/Conferences
3. Computer Fairs
4. Computer Demonstrations
5. Timesharing
6. Friends

[a]Suggested Materials:

- Computerworld
- Byte
- Interface Age
- Personal Computing
- Creative Computing
- Microcomputing
- Mini-Micro Systems

WORKSHEET 1

Study your business operation and obtain data and information by completing this worksheet as completely as possible.

1. Below is a list of functions that are present in most apparel stores. Identify which functions apply to your store and add functions that are not included. Indicate if other functions are dependent on another function.

FUNCTION DESCRIPTION	EXISTING	DEPENDENT FUNCTIONS
Accounting and Control		
General accounting		
Accounts receivable		
Accounts payable		
Payroll		
Inventory		
Retail Credit		
Buying and Merchandising		
Merchandise Planning		
Purchasing/Ordering		
Receiving & Handling Merchandise		
Sales		
Sales Management		
Marketing Research		
Operations and Management		
Personnel		
Store Planning		
Budgeting		
Advertising and Promotions		
Advertising		
Store Display		
Sales Promotions		
Other Functions		

2. Identify which of the following business tasks consume most of your and your employees' time during daily business:

TASKS	PERCENTAGE
Accounting operations	_____%
Inventory control and analysis	_____%
Keeping track of information (customers, orders, etc,)	_____%
Making financial projections	_____%
Sales transactions	_____%
Selling	_____%
Sales analysis	_____%
Merchandise analysis and planning	_____%
Ordering/Purchasing	_____%
Receiving/Handling Merchandise (price ticketing, etc.)	_____%
Producing correspondence/ documentation	_____%
Other _____	_____%
_____	_____%
_____	_____%

3. Ask these basic questions for each function present in your store:

Function Description:_____

Who performs the function/tasks:_____

Hours spent to perform function/tasks:
Daily_____ Weekly_____ Monthly_____

Current status of function:

Adequate	Yes	No
Reliable	Yes	No
Accurate	Yes	No
Timely	Yes	No

4. Obtain business information by completing the following:

Accounts Payable

Number of resources/suppliers_____
Number of resources I have credit with_____
Number of invoices received /month_____
Number of vouchers/month_____
Number of purchase orders/month_____
Maximum number of payables outstanding/month_____
Number of checks/month_____
Credit memos/month_____
Debit memos/month_____
Largest account balance_____

Accounts Receivable

Number of customers_____
Number of credit customers_____
Number of invoices/month_____
Number of statements sent/month_____
Number of payments received/month_____
Credit memos/month_____
Debit memos/month_____
Is aging of accounts needed?_____
Aging period desired: 30 days 60 days 90 days 120 & over
Largest account balance_____
Are delinquency notices sent?_____
Anticipated growth in the next 12 months (%)_____

General Ledger

Number of general ledger accounts_____
Number of journal entries/month_____
Are tax calculations provided?_____
Is prior year comparison information needed?_____
Is budgeting information needed?_____

Inventory

Number of items in stock (maximum)_____
Number of inventory transactions/day_____
Number of departments_____
Number of monthly inventory postings_____
Number of items received/week_____
Are item numbers assigned?_____
Are historical levels needed?_____
Activity level_____
How many new items will be added in the next 12 months (%)_____

Payroll

Number of employees: Full time_____ Part-time_____
Types of payroll: Weekly Bi-monthly Monthly
Number of deductions_____
Number of transactions at each payroll period_____
What state taxes are needed?_____
What is the largest pay rate?_____
What is the largest annual salary?_____
Projected employee growth in the next 12 months (%)_____

Sales

Number of sales receipts/month_____

Highest sales receipts/day_____
Number of items per sales receipts_____

Word Processing/Mailing List

Number of letters/month_____
Number of notices sent/month_____
Number of people in mailing list_____

WORKSHEET 2

List all the key records, file, reports, letters, invoices, documents used in each function/ tasks. Complete the information required for each column.

Function	Records/Files	Prepared By	Manner Prepared (Automated/Semi-Automated/Manual)	Frequency (Daily/Weekly/ Monthly/Annual)	Present Volume Max./Ave.	Volume in 2 years

INFOSHEET B

Below is a list of store information needed in making business decisions. Check what you have and what you need to have in the future.

INFORMATION	CURRENTLY AVAILABLE	FUTURE NEED
Daily Dollar Sales at Cost	X	X
Daily Dollar Sales at Retail	X	X
Daily Dollar Sales at Markdown	X	X
T.Y. Sales vs. L.Y. Sales	X	X
Stock-Sales Ratio	X	X
Turnover Rate	X	X
Sales Per Square Foot of Seling Space	X	X
Maintained Markup	X	X
Amount of Stock at Regular Price	X	X
Amount of Stock at Markdown	X	X
Best Sellers	X	X
Slow Sellers	X	X
Stock on Hand	X	X
Open-to-Buy	X	X
Purchase Orders	X	X
Merchandise Received	X	X
Vendor List	X	X
Sales Performance of Vendor	X	X
Vendor Chargebacks	X	X
Accounts Receivable	X	X
Accounts Payable	X	X
Profit and Loss Statement	X	X
Balance Sheet	X	X
General Ledger	X	X
Salesperson Report	X	X
Personnel Information	X	X
Payroll	X	X
Customer List	X	X
Other (Specify)_____	X	X
_____	X	X
_____	X	X

WORKSHEET 3

Below is a list of reasons for installing a microcomputer system. Identify which ones apply to your situation after analyzing your existing system. Indicate the priority and identify which is critical.

REASONS	PRIORITY	CRITICAL
Improve cash flow		
Reduce costs		
Greater customer service/satisfaction		
Increase sales or revenue		
New information		
Greater accuracy of information		
More timely and reliable information		
Better competitive position in the community		
Reduce paperwork		
Fewer clerical employees		
Improve internal control		
More efficient operations		
Improve salesperson productivity		
Improve inventory management		
Reduce sales audit costs		
Reduce bad debts		
Reduce inventory levels		
Reduce markdowns and shrinkage		
Style and vendor analysis		
Better turnover of merchandise		
Better return on investment		
Lower operational expenses		
Reduce stock outs		
Reduce carryover of old season merchandise		
Increase maintain markup		
Help in vendor selection		
More professional looking letters, statements, invoices, reports, etc.		
Other (specify)_____		
_____		
_____		
_____		

WORKSHEET 4

Below is a list of problems that can be anticipated with the installation of a microcomputer. Identify those which apply to your particular situation and prioritize according to the order of importance.

PROBLEMS/DIFFICULTIES	PRIORITY
Capital investment required	
Learning how to operate the computer	
Acceptance and training of employees for the change	
Developing new store procedures	
Putting data into the computer	
Disruption of normal store operation	
Site for the computer	
Computer dependence	
Incomplete records and files	
Availability of economical equipment and programs	
Conversion and breakdown problems	
Lack of experience with computers	
Rapid obsolescence of computing systems	
Availability of competent computer personnel	
Complexity of computing equipment, programming, and installation requirements	
Other_____	
_____	
_____	
_____	

INFOSHEET C

Below are some information that can serve as guidelines in determining the storage capacity, computer speed and length of conversion time you may need in planning your computer system selection and implementation.

1. Computer Speed

   8-bit system: limited to a maximum of 9000 records for a single store operation

   16-bit system: limited to a maximum of 25,000 records for a multi-store operation

2. Computer Memory

   64K is divided as follows:

monitor functions	-	2Kbytes
operating system	-	30Kbytes
language	-	10-15Kbytes
random access memoy	-	20Kbytes

   64Kbytes = 35 double-spaced typewritten pages

3. Storage

   5¼-inch floppy disks, single density = 25 to 35 typed pages

   8-inch floppy disks, single density = 100 to 140 typed pages

4. Hard disks are recommended for systems that require more than 4000 records. Hard disks can store 5-50 megabytes (5M-50M characters).

5. To compute external storage requirements:

   9 records = 1 Kbyte

   Divide maximum number of records by 9 to get storage requirements.

6. Disk Space (unformatted)

5¼-inch, single density	=	128Kbytes
5¼-inch, double density	=	356Kbytes
8-inch single density	=	400Kbytes
8-inch double density	=	800Kbytes

7. Word processing data entry times:

To enter original material	=	approx. 100 lines/hour
To do repetitive typing	=	approx. 200 lines/hour
To do revision typing	=	approx. 150 lines/hour

8. Approximate time to sort 1000 records = 1 hour

9. Time to print a report of 150 records from a base of 200, with some computing and formatting, dot matrix printer = 10 to 15 minutes

WORKSHEET 5a

Estimate the costs you will incur in the acquisition and implementation of an in-store microcomputer system using the form below.

COMPUTER SYSTEM COST ANALYSIS

I. Estimated Cost of New Computer System

A. Cost of Site Preparation	$_____
B. Training/Education Costs	$_____
C. Conversion Costs	$_____
D. Costs of New Software and Application Programs	$_____
E. Miscellaneous Costs (Security, Communications, Special Consulting)	$_____
TOTAL ONE-TIME COSTS	$_____

II. Estimated Annual Operating Costs

A. Equipment Rental or Amortization	$_____
B. Maintenance Charges	$_____
C. Software Rental	$_____
D. Professional Staff	$_____
E. Supplies	$_____
F. Miscellaneous Costs (Electricity, Taxes. Insurance, etc.)	$_____
TOTAL ANNUAL OPERATING COSTS	$_____
TOTAL ESTIMATED COSTS	$_____

WORKSHEET 5b

It may take four to six months to totally implement an in-store microcomputer system using packaged software, and up to 12 months for a system using custom-made software.

Estimate the length of time you need in developing a microcomputer system in your store by using the form below.

Target Date of Microcomputer Implementation:_____

TYPICAL STAGES OR STEPS	BEGIN	DEADLINE
Selection and Acquisition:		
1. Conduct manual system analysis	_____	_____
2. Identify needs	_____	_____
3. Obtain computer information on options available	_____	_____
4. Attend computer demonstrations	_____	_____
5. Visit computer users	_____	_____
6. Evaluate and test hardware and software alternatives	_____	_____
7. Select the software and hardware	_____	_____
8. Acquire microcomputer system	_____	_____
Conversion and Implementation:		
1. Select functions to be converted	_____	_____
2. Prepare employees	_____	_____
3. Prepare installation site	_____	_____
4. Conduct physical inventory and update files	_____	_____
5. Install system and develop operating procedures	_____	_____
6. Convert data to microcomputer readable mode	_____	_____
7. Test programs with store data	_____	_____
8. Implement new microcomputer system	_____	_____

INFOSHEET D

The following are features to look for when evaluating software packages for accounting applications.

Accounts Receivable

- maintain customer files and accounts
- generate accurate monthly customer statements
- automatically post receipts to each account and to the general ledger
- automatically "age" accounts into 30,60,90, and 120-day timer periods
- calculate and post service charges on past due accounts
- provide up-to-date information on account activity and status

Outputs or Reports Generated:

Monthly
Periodic Activity Report
Aged Accounts Receivable
Invoice Register
Payment, Credit, and Adjustment Register
Customer Account Status
Current Customer Accounts Listing
Invoices and Statements
G/L Transaction Register
Sales Analyses by Customer, Salesperson, and Customer Category
Debit and Credit Entry Lists
Twelve-Month Sales Histories

Accounts Payable

- gives a choice of different payment methods (all outstanding invoices, pay by due date, partial payments, selected invoices)
- provide audit trails
- flag and/or automatically pay invoices that offer discounts
- automatically generate checks and mailing labels or envelopes
- generate A/P aging reports by invoice
- forecast cash requirements based on discount dates or due dates and ages past-due payables
- voucher regular monthly notes and payments automatically
- summarize year-to-date purchases and latest payments by vendor for management's analysis and control of buying activities

Outputs or Reports Generated:

Vendor File List
Open Vouchers
Accounts Payable Aging
Cash Requirements
Check Register
Checks
G/L Transaction Register
Year-to-Date Transaction Summary

General Ledger

- keep a master chart of accounts (with user definable account numbers) that maintains basic information about each
- maintain a general ledger that records and summarizes financial information for each account
- print financial reports and summaries
- generate audit trails through transaction listings
- produce departmental and summary income statements in an easy-to-read format showing current and year-to-date amounts, percentages by category

Outputs or Reports Generated:

Trial Balance
Balance Sheet
Income Statement
Comparative Balance Sheet
Comparative Income Statement

Inventory Control

- maintain a master record of each item in stock (including product/style number, name or description, quantity on hand, unit cost, unit price, retail price, and total cost)
- identify stock by unit, weight, volume, etc.
- call up any item on record to find out quantity in stock, or order, or on back order
- delete or update any item on record
- automatically record sales, receipts, and adjustments (such as returns, shrinkage, or overages) and transfer information to the G/L and A/R
- tag products with prices
- identify reorder levels, which the computer can watch for and flag
- learn, within a few seconds, the total value of your inventory by product and/or department
- sort, search, and arrange information into summaries and reports by merchandising category, department, location, vendor, or periods (commonly month-to-date and year-to-date)

Outputs or Reports Generated:

Merchandise Master List
Sales and Activity Summary
Profit Margin Report
Merchandise on Order Report
Merchandise Received Report
Reorder and Back-Ordered Items Report
Inventory On-Hand List
Department Activity Summary
Best and Slow Seller Report
Purchase Order Summary
Year-to-Date Sales Transaction Summary

WORKSHEET 6a

SYSTEM SOFTWARE INFORMATION

Operating System:

Name_____ Cost_____

Manufacturer/Company_____

Description_____

Dealer/Vendor_____

Main memory required (Kbytes)_____

Secondary storage requireed (Kbytes)_____

Languages:	Costs
Assembler	_____
BASIC	_____
COBOL	_____
FORTRAN	_____
RPG	_____
PASCAL	_____
Other (specify)_____	_____
_____	_____

Utilities:

Editor	_____
Sort	_____
Merge	_____
Other (specify)_____	_____

Manuals:(List below)

_____	_____
_____	_____
_____	_____

WORKSHEET 6b

APPLICATION SOFTWARE INFORMATION

Name of Package_____ Cost_____

Company_____

Dealer/Vendor_____

Delivery Lead Time_____

Purpose or Subject Area_____

Features (List):

Documentation:

Clearly written?_____

Easy to use?_____

Other comments:_____

Ease of modification?_____

Compatible with RAM/Hardware System:_____

Software maintenance available?_____Where?_____

Location of current users:

Contact Person	Address	Telephone Number
_____	_____	_____
_____	_____	_____
_____	_____	_____

WORKSHEET 7

HARDWARE CONFIGURATION

Dealer/Vendor_____ Delivery Lead Time_____

COMPONENTS	PROPOSED COSTS
Central Processing Unit:	_____
Manufacturer_____	
Model_____	
Word size (bit)_____	
Main memory size (Kbytes)_____	
Maximum main memory (Kbytes)_____	
Disk Storage:	_____
Manufacturer_____	
Type_____	
Fixed_____ Removable_____	
Capacity (Kbytes)_____	
Medium required:	
Size_____ Density_____	
Hard disk upgradable?_____	
Terminal (CRT Monitor):	_____
Manufacturer_____	
Model_____	
Lines/column display_____	
Number of characters/line_____	
B/W_____ Color_____	
Screen size_____	
Keyboard:	_____
Manufacturer_____	
Model_____	
Number of keys_____	
Numeric keypad_____	
Graphic symbols_____	
Function keys_____	
Printer:	_____
Manufacturer_____	
Model_____	
Dot matrix____ Letter quality____	
Speed_____ Ribbon_____	
Paper width_____	
Other Peripherals:	
_____	_____

SYSTEM EXPANDABILITY:

Maximum number of disk drives_____

Maximum number of terminals supported_____

Maximum number of printers_____

Total number of peripheral devices_____

Additional memory required per new terminal_____

WORKSHEET 8

VENDOR INFORMATION

Vendor Name_____

Address_____

Number of Years in Business_____

Sales Volume Last Year_____

System_____

Total Number of Systems Installed_____

Current System Users:

Contact Person	Address	Telephone Number
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Support Offered:

System assistance Cost/Hour_____

Programming assistance Cost/Hour_____

Training owner Cost/Hour_____

Documentation Cost/Hour_____

Maintenance:

Preventive_____ Backup Facilities_____

Emergency _____ Hours Available_____

Warranty:_____

Terms:

Rental arrangements_____

Lease arrangements_____

Purchase arrangements_____

Down payment_____ Monthly payment_____

WORKSHEET 9

USER EVALUATION

Name of User_____

Address_____ Telephone Number_____

System Installed_____ When Installed_____

Modifications Made_____

Length of Implementation Time_____

Benefits of the System:	Rank Importance				
	Most				Least
Reduction in clerical work	5	4	3	2	1
Reduction in paperwork	5	4	3	2	1
Reduction in inventory	5	4	3	2	1
Reduction in A/R delinquencies	5	4	3	2	1
Reduction in costs	5	4	3	2	1
Reduction in A/R lead time	5	4	3	2	1
Closer monitoring of operations	5	4	3	2	1
More available information	5	4	3	2	1
Faster and more comprehensive information analysis	5	4	3	2	1
Improved customer service	5	4	3	2	1
Improved performance indicators	5	4	3	2	1
Improved validation procedures	5	4	3	2	1
Improved profitability	5	4	3	2	1
Accurate, timely, meaningful action reports	5	4	3	2	1
Greater operation flexibility	5	4	3	2	1
Other_____	5	4	3	2	1

Problems of the System:	Rank Significance				
	Most				Least
Acceptance by store personnel & customers	5	4	3	2	1
Cost and delay	5	4	3	2	1
Equipment limitations	5	4	3	2	1
Software limitations	5	4	3	2	1
Errors in information produced	5	4	3	2	1
Excessive information produced	5	4	3	2	1
Long implementation lead time	5	4	3	2	1
Technical difficulties, breakdowns	5	4	3	2	1
Impersonal nature of systems	5	4	3	2	1
Total dependence on computer	5	4	3	2	1
Complicated and difficult system	5	4	3	2	1
Inability to utilized to full capacity	5	4	3	2	1
Large volume of unneeded, inaccurate and limited value information produced	5	4	3	2	1

Hardware Satisfaction:	Rank Satisfaction			
	Excellent			Poor
Cost	4	3	2	1
Cost/Performance	4	3	2	1
Expansion capability	4	3	2	1
Reliability of CPU	4	3	2	1
Ease of operation	4	3	2	1
Reliability of peripherals	4	3	2	1
Ease of programming	4	3	2	1
Ease of conversion	4	3	2	1
Responsiveness of service	4	3	2	1
Effectiveness of service	4	3	2	1
Technical support:				
Trouble-shooting	4	3	2	1
Education	4	3	2	1
Documentation	4	3	2	1
Overall satisfaction	4	3	2	1

Software Satisfaction:	Rank Satisfaction			
	Excellent			Poor
Cost	4	3	2	1
Ease of use	4	3	2	1
Packaged	4	3	2	1
Developed	4	3	2	1
Ease of conversion	4	3	2	1
Documentation	4	3	2	1
Software maintenance	4	3	2	1
Flexibility (customization)	4	3	2	1
Cost/Performance	4	3	2	1
Reliability	4	3	2	1
Efficiency	4	3	2	1
Ease of installation	4	3	2	1
Overall satisfaction	4	3	2	1

Other comments:_____

_____

_____

_____

_____

WORKSHEET 10

SYSTEM COMPARISON CHART

FACTORS ALTERNATIVE A.....X

I. General Background
   A. Demonstration & Visits
   B. Local backup

II. Hardware Factors
   A. Name of system
   B. Manufacturer(s)
   C. Proposed Configuration
      1. Central processing unit
      2. Disk storage
         a. capacity
         b. medium
      3. Terminal
      4. Keyboard
      5. Printer
      6. Other entry devices
      7. Other output devices
   D. System Expandability
      1. Maximum main memory
      2. Maximum disk drives
      3. Maximum terminals
      4. Maximum printers
      5. Additional memory required per new terminal
      6. Other entry devices
      7. Other output devices
   E. Upgradable to bigger system
   F. Ease of upgrading
   G. Purchase price
   H. Maintenance
      1. Provided by
      2. Cost per month
      3. Terms of service
      4. Duration of contract

III. Hardware Vendor Factors
   A. Number of years in business
   B. Sales volume last year
   C. User references
   D. Support given to user

IV. Systems Software
   A. Operating system
   B. Main memory required
   C. Secondary memory required
   D. Languages available
   E. Ease of expansion

FACTORS ALTERNATIVE A.....X

V. Software Vendor Factors
  A. Number of years in business
  B. Sales volume last year
  C. User references
  D. Support given to user
  E. Applications
    1. Documentation
    2. Compatible with RAM/ Hardware System
    3. Software maintenance
  F. Software price

VI. Warranty
  A. Hardware
  B. Software

VII. Financial Considerations
  A. Total purchase price
  B. Rental arrangements
  C. Available lease arrangements
    1. Terms of lease
    2. Monthly payment
  D. Payment terms
    1. Down payment
    2. Monthly payment

INFOSHEET E

BUYING

Advantages	Disadvantages
* control of ownership - can make modifications, mix and match components, choose own maintenance contract	* drains cash reserves
* freedom of choice - can modify the equipment	* downpayment higher than upfront costs of leasing
* power to sell when you want	* ties up capital that might be needed for emergencies or expansion
* financial advantages - depreciation deductions and tax credits	

LEASING

Advantages	Disadvantages
* lower cash requirements	* need to make commitment
* alternate form of financing - no down payment; receive 95% of financing	* high cost of terminating a lease
* tax advantages - payments deductible as operating expense, investment tax credit	* greater long-term cost
* have an option to buy the leased equipment	* total cost higher than bank loan

WORKSHEET 11

MICROCOMPUTER IMPLEMENTATION SCHEDULE

	STEPS	DATE START	DEADLINE
1.	Select functions to be converted	_____	_____
2.	Prepare employees for conversion	_____	_____
3.	Select and prepare installation site	_____	_____
4.	Conduct physical inventory	_____	_____
5.	Check and up-date files & records	_____	_____
6.	Install system	_____	_____
7.	Develop operating & security procedures	_____	_____
8.	Convert transaction files	_____	_____
9.	Convert master files	_____	_____
10.	Test software & hardware with test store data	_____	_____
11.	Modify system (if needed)	_____	_____
12.	Implement system	_____	_____
13.	Run both manual and computer systems	_____	_____
14.	Evaluate computer system	_____	_____

INFOSHEET F

Numbers or codes may be assigned to store data for easier conversion and programming.

Department/Category	
51	Blouses
52	Skirts
53	Pants
54	Jackets, Vests, Tunics
61	Misses Dresses
62	Formals/Party Wear
63	Coats & Jackets
.	
.	
.	
H1	Hosiery
J1	Junior Tops
J2	Junior Skirts
W1	Women's Tops
.	
.	
M1	Missy Tops

Vendor	
LS	Levi Strauss
WR	Wrangler
JD	Jordache

Customer	
0001	Mary Smith
0002	Gloria Davis

Employee	
101	Jane Denison
102	Bill Bradley

WORKSHEET 12

IN-STORE MICROCOMPUTER EVALUATION

System Installed_____When Installed_____

Benefits of the System:	Rank Importance				
	Most				Least
Reduction in clerical work	5	4	3	2	1
Reduction in paperwork	5	4	3	2	1
Reduction in inventory	5	4	3	2	1
Reduction in A/R delinquencies	5	4	3	2	1
Reduction in costs	5	4	3	2	1
Reduction in A/R lead time	5	4	3	2	1
Closer monitoring of operations	5	4	3	2	1
More available information	5	4	3	2	1
Faster and more comprehensive information analysis	5	4	3	2	1
Improved customer service	5	4	3	2	1
Improved performance indicators	5	4	3	2	1
Improved validation procedures	5	4	3	2	1
Improved profitability	5	4	3	2	1
Accurate, timely, meaningful action reports	5	4	3	2	1
Greater operation flexibility	5	4	3	2	1
Other_____	5	4	3	2	1
_____	5	4	3	2	1

Problems of the System:	Rank Significance				
	Most				Least
Acceptance by store personnel & customers	5	4	3	2	1
Cost and delay	5	4	3	2	1
Equipment limitations	5	4	3	2	1
Software limitations	5	4	3	2	1
Errors in information produced	5	4	3	2	1
Excessive information produced	5	4	3	2	1
Long implementation lead time	5	4	3	2	1
Technical difficulties, breakdowns	5	4	3	2	1
Impersonal nature of systems	5	4	3	2	1
Total dependence on computer	5	4	3	2	1
Complicated and difficult system	5	4	3	2	1
Inability to utilize to full capacity	5	4	3	2	1
Large volume of unneeded, inaccurate and limited value information produced	5	4	3	2	1
Other_____	5	4	3	2	1
_____	5	4	3	2	1

VITA 2

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