

A NEEDS ASSESSMENT OF OKLAHOMA  
APPAREL MANUFACTURERS

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APPAREL MANUFACTURERS

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## TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION . . . . .	1
Apparel Manufacturing in the United States . . . . .	1
Significant Industrial Employer . . . . .	1
Contributor to Gross National Product . . . . .	2
Vital Element of the Retail Industry . . . . .	3
Reasons for United States Apparel Manufacturers' Decline in Share of the Domestic Market . . . . .	4
Imports . . . . .	4
Strength of the United States Dollar . . . . .	4
Oklahoma Apparel Manufacturing . . . . .	5
Justification . . . . .	6
Purpose of Study . . . . .	7
Objectives . . . . .	7
Null Hypotheses . . . . .	7
Definitions . . . . .	8
II. LITERATURE REVIEW . . . . .	10
Industry Structure . . . . .	10
Significant Industrial Employer . . . . .	10
Industry Composed of Small Firms Involved in Labor Intensive Manufacturing . . . . .	11
Employer Paying Low Wages . . . . .	12
Industry Experiencing Intense Domestic and Foreign Competition . . . . .	13
Present Status of United States Apparel Manufacturing . . . . .	14
Decline in Share of Domestic Market . . . . .	14
Decline in Image and Status . . . . .	15
Decline in Employment and Wages . . . . .	15
Reasons for Decline of United States Apparel Manufacturing . . . . .	16
Global Production . . . . .	17
Strength of United States' Dollar . . . . .	18
United States' Policy of Open Market for Free Trade . . . . .	18

Chapter	Page
Ineffective Communication Between Manufacturers and Retailers . . . . .	19
United States' Apparel Manufacturers'	
Needs . . . . .	20
Needs Assessment Studies . . . . .	20
Content Analysis . . . . .	21
Production Equipment . . . . .	22
Computerized Manufacturing . . . . .	23
Sewing Systems. . . . .	23
Adjustment Strategies . . . . .	24
Quick Response . . . . .	25
Benefits of Quick Response . . . . .	25
How Quick Response Works . . . . .	27
Intense Marketing Program . . . . .	29
Trade Agreements/Policies . . . . .	31
Summary . . . . .	31
III. METHODOLOGY . . . . .	32
Description of Survey . . . . .	32
Sample . . . . .	33
Data Collection . . . . .	34
Response Rate . . . . .	35
Statistical Analysis . . . . .	36
IV. MANUSCRIPT . . . . .	37
Abstract . . . . .	38
Purpose of Study . . . . .	41
Methodology . . . . .	41
Survey . . . . .	41
Sample . . . . .	42
Data Collection . . . . .	43
Response Rate . . . . .	44
Results . . . . .	45
Demographic . . . . .	45
Baseline Data . . . . .	46
Employment . . . . .	46
Production . . . . .	47
Production Capacity . . . . .	48
Technology . . . . .	48
Investments . . . . .	49
Oklahoma Apparel Manufacturers'	
Attitudes and Needs . . . . .	50
Employee Training . . . . .	50
Production . . . . .	50
Technology . . . . .	51
Supplier/Manufacturer . . . . .	
Relationship . . . . .	51

Chapter	Page
Manufacturer/Customer Relationship and Marketing Program . . . . .	52
Chi Square . . . . .	53
T Test . . . . .	53
Manufacturer Educational Needs . .	54
Primary Problems . . . . .	56
Discussion . . . . .	56
Employment . . . . .	56
Production . . . . .	59
Investments . . . . .	61
Technology . . . . .	62
Manufacturer Relationships . . . . .	63
Marketing . . . . .	64
Conclusion . . . . .	65
Acknowledgements . . . . .	66
References . . . . .	67
Table 1 . . . . .	69
Table 2 . . . . .	70
Table 3 . . . . .	74
V. INTRODUCTION, METHODS, CONCLUSIONS AND RECOMMENDATIONS . . . . .	75
Introduction and Methods . . . . .	76
Conclusion and Recommendations . . . . .	76
Employment . . . . .	76
Production . . . . .	77
Investments . . . . .	78
Technology . . . . .	78
Manufacturing Relationships . . . . .	79
Marketing . . . . .	80
Recommendations for Further Research . . . . .	81
BIBLIOGRAPHY . . . . .	82
APPENDIX A - COVER LETTERS, POSTCARD, AND SURVEY INSTRUMENT . . . . .	85
APPENDIX B - TABLES . . . . .	97
APPENDIX C - INSTITUTIONAL REVIEW BOARD APPROVAL .	118

## LIST OF TABLES

Table		Page
1.	Reasons Manufacturers Cited for Annual Employee Turnover . . . . .	69
2.	Manufacturers' Perceived Needs by Size of Manufacturer . . . . .	70
3.	Manufacturers' Educational Needs . . . . .	73
4.	Topics Covered In <i>Apparel Manufacturer: A Technical Journal of Bobbin Magazine</i> . . .	98
5.	Number of Years in Business With Present Owner . . . . .	99
6.	Number of Employees . . . . .	100
7.	Source of Employee Training . . . . .	101
8.	Percentage of Annual Employee Turnover . . .	102
9.	Available Equipment to Perform Functions on Woven and Knit Fabrics . . . . .	103
10.	Organizations Oklahoma apparel Manufacturers Belong To . . . . .	104
11.	Manufacturers' Perceived Needs . . . . .	105
12.	Sources of Information Used by Oklahoma Apparel Manufacturers . . . . .	108
13.	Manufacturing Processes Performed at Oklahoma Plants . . . . .	109
14.	Computerized Manufacturing Processes . . . .	110
15.	Percent of Full Production Achieved by Oklahoma Manufacturers . . . . .	111
16.	Equipment Purchases Made in 1990-1991 and Anticipated in 1992-1993. . . . .	112



Table		Page
17.	Types of Equipment Purchases Anticipated in 1992-1993 . . . . .	113
18.	Capital Improvements Anticipated In 1992-1993 . . . . .	114
19.	Technology or Equipment That Would Enable Manufacturer to Improve Present Market Position . . . . .	115
20.	Oklahoma Apparel Manufacturer Customers . . .	116
21.	Primary Problems Faced by Manufacturers . . .	117

## CHAPTER I

### INTRODUCTION

The textile complex (an industry chain from fiber to fabric, through end uses of apparel, home furnishings, and industrial products) is a vital contributor to the United States' economic health. The textile complex as a whole represents the largest industrial employer in the United States, employing almost two million workers or 10% of the industrial workforce (Hamilton & Dickerson, 1990). A critical dimension of the textile complex is apparel manufacturing. Apparel manufacturing is critical because it is a significant industrial employer, a major contributor to the Gross National Product (GNP), and vital to the retail industry.

#### Apparel Manufacturing in the United States

##### Significant Industrial Employer

Apparel manufacturing, which includes the manufacturing of men's, boys', women's, girls', children's, and infants' apparel, and apparel accessories employed approximately 1,096,000 persons in 1988 (Dickerson, 1991). Along with being a major industrial employer, apparel manufacturers

also employ a high ratio of women and minorities--persons who have traditionally experienced difficulties in obtaining employment.

Apparel manufacturing is often a significant employer in small towns. Many small, rural towns are dependent upon one, or a couple of factories to sustain the community's economy. Across the United States and in Oklahoma, some of the factories that are relied upon for economic health are apparel manufacturers. These manufacturers are often critical as first and second income for families of the community (Dickerson, Dalecki, & Meyer, 1991).

Along with providing direct employment, apparel manufacturing also generates employment in related fields, e.g. growing cotton, production of dye stuff, fabric finish, and transportation. One million dollars worth of output in the apparel manufacturing industry generates a total of 30.8 jobs, which breaks down into 24.1 jobs in manufacturing, 3.2 jobs in trade and transportation, and 1.6 jobs in transactional services such as media, finance, real estate, and business services. The remaining 1.9 jobs are generated in areas such as natural resources, construction, personal services, and social services (Dickerson, 1991).

#### Contributor to Gross National Product

As an industry, apparel manufacturing is a major contributor to the GNP. The textile complex as a whole is

the third largest contributor to the GNP. In 1987, the Farming, Forestry, Fishing, Agriculture Services generated 94.9 billion dollars of the GNP. The Aerospace industry generated 56 billion dollars with the textile complex following close behind generating 50 billion dollars. This is more than was generated by the paper, primary metals, and petroleum refining industries. Separate from the textile complex, apparel manufacturing generated 22.5 billion dollars of the GNP (Dickerson, 1991).

#### Vital Element of the Retail Industry

Although domestic apparel producers are gradually losing their share of the United States retail market, they are still a vital element of the retail industry. Retailers have two sources for obtaining their products--domestic and/or foreign manufacturers. One of the biggest advantages of obtaining goods from domestic manufacturers is to receive merchandise more quickly from manufacturers. Having the right product at the right time--ideally before competitors, can mean the difference between profit and loss for retailers.

Reasons for United States Apparel  
Manufacturers' Decline in Share  
of the Domestic Market

Imports

The poor health of United States apparel manufacturers is most clearly seen in the steady decline of their share of the domestic market. One of the culprits for the decline is the influx of foreign imports. In 1990, United States consumers spent \$148 billion on apparel--of this total, slightly more than half was imported. Seventy-seven percent of all sweaters were imported in 1989 along with 68% of women's and girls' knit shirts, and 61% of men's and boys' woven shirts (American Apparel Manufacturers Association [AAMA], 1991a).

Strength of the United States Dollar

Also responsible for the decline of the United States apparel manufacturers' share of the domestic market are the strength of the United States dollar and the open import/export policy practiced by the United States. Retailers are able to purchase more imports with the strong dollar, and it is easier to import products into the United States than into other countries such as those in the European Community and Japan.

## Oklahoma Apparel Manufacturing

Presently, the only data available related to Oklahoma apparel manufacturing are demographic data. The data include the present number of manufacturers, number of employees, and wages paid to employees.

Of the 13 different types of manufacturers listed in the 1987 Oklahoma Annual Report to the Governor (Oklahoma Department of Commerce [ODOC], 1988), apparel manufacturing was the eighth largest manufacturing employer in Oklahoma. However, like the United States as a whole, Oklahoma apparel manufacturers are experiencing a decline in number of employees. In 1978, 12.4 thousand Oklahomans were employed in apparel manufacturing. In 1984 this figure dropped to 9.3 thousand and further declined to 7.8 thousand in 1990 (AAMA, 1991a).

Although experiencing a decline in number of employees between 1970 and 1990, Oklahoma apparel manufacturers have experienced a seven percent increase in the number of manufacturers listed under SIC 23. However, a closer look at the data for 1970 through 1990 reveal broad fluctuations of both growth and decline in the number of plants in business in the industry. Between the years 1970 and 1974, the Oklahoma apparel manufacturing industry experienced an 18% growth in number of plants, and a 4% growth between 1974 and 1980. Between 1980 and 1985, the industry experienced a dramatic decrease of 20%, and then an increase of 9% between

1985 and 1990 (ODOC, 1970, 1985, 1990).

Traditionally, apparel manufacturers are known as low paying employers. In 1990, the average weekly wage of United States apparel manufacturing employees was \$239.88, which is only 54% of the average wage for all manufacturing--\$442.27 (AAMA, 1991a). In 1987, the average Oklahoma weekly wage for apparel manufacturing was 211.09, which is only 47% of the wage for all manufacturing (\$448.22) in Oklahoma.

#### Justification

During the early 1980s a primary contributor and focus of the Oklahoma economy was the oil industry. When the oil industry declined, jobs were lost, and Oklahoma entered into a recession. As a result, during the 1980s and early 1990s Oklahoma has focused on diversifying its economic interests.

Apparel manufacturing is an industry that can make a profound contribution to the Oklahoma economy. It is a major employer in terms of persons employed and number of plants. However, like other apparel manufacturers in the United States, Oklahoma apparel manufacturing has been in a state of decline in terms of persons employed, and experienced broad fluctuations in numbers of plants in operation between 1970 and 1990. The decline and fluctuation in the industry indicate that Oklahoma apparel manufacturers are in need of some type of assistance.

Without more precise information about Oklahoma apparel manufacturers, it is not possible to accurately target their needs or the type of assistance that will be most beneficial to them.

### Purpose of Study

The purpose of this study is to gather data and determine the needs of Oklahoma apparel manufacturers.

### Objectives

1. To determine baseline data relating to the 1991 status of Oklahoma apparel manufacturers in terms of employment, production, and technology.

2. To determine Oklahoma apparel manufacturers' perceived needs in terms of employee training, production, technology, supplier/manufacturer relationships, marketing, and manufacturer/customer relationships; to determine if these needs differ by size of manufacturer.

3. To determine the interest of Oklahoma apparel manufacturers in expanding production.

### Null Hypotheses

1. There is no significant difference between small and large apparel manufacturers' perceived needs in relation to employee training.

2. There is no significant difference between small



and large apparel manufacturers' perceived needs in relation to production.

3. There is no significant difference between small and large apparel manufacturers' perceived needs in relation to technology.

4. There is no significant difference between small and large apparel manufacturers' perceived needs in relation to supplier/manufacturer relationships.

5. There is no significant difference between small and large apparel manufacturers' perceived needs in relation to marketing.

6. There is no significant difference between small and large apparel manufacturers' perceived needs in relation to manufacturer/customer relationships.

#### Definitions

Adjustment Strategies--Restoring the competitiveness of an industry within the domestic economy (Dickerson, 1991, p. 374).

Large Oklahoma apparel manufacturers--Manufacturers employing 50 or more employees (as defined for present study).

Small Oklahoma apparel manufacturers--Manufacturers employing 49 or fewer employees (as defined for present study).

Standard Industrial Classification (SIC)--A  
classification of establishments by type of activity in  
which manufacturer is engaged (Oklahoma Department of  
Commerce, 1988).

## CHAPTER II

### LITERATURE REVIEW

The literature review addresses the following topics related to United States apparel manufacturers: industry structure, current status, reasons for demise, industry needs, and adjustment strategies.

#### Industry Structure

"Industry structure" refers to the characteristics that comprise and reflect the apparel manufacturing industry. The characteristics that reflect the apparel industry are: (a) a significant industrial employer, (b) an industry composed of small firms, involved in labor-intensive manufacturing, (c) an employer paying low wages, and (d) an industry experiencing intense domestic and foreign competition.

#### Significant Industrial Employer

Collectively, apparel manufacturers are the seventh largest industrial employer in the United States, employing just over one million workers in 1989 (Dickerson, 1991). The workforce in this industry is composed primarily of

women and minorities. In 1988 women accounted for nearly 78% of the workforce in apparel manufacturing which is dramatically higher than the 33% of the women working in the workforce for all manufacturing. In terms of minorities, nearly 36% of the 1988 apparel manufacturing workforce were of either black or hispanic origin as compared to the 18.5% for all manufacturing.

Industry Composed of Small Firms Involved  
in Labor Intensive Manufacturing

In 1986 the apparel manufacturing industry was composed of more than 15,000 firms operating 22,525 different establishments. The bulk of these manufacturers, 58%, were very small firms employing under 20 persons (Dickerson, 1991). Nineteen percent of the manufacturers employed 20 to 49 persons, and 23% employed 50 or more persons. The average number of employees per establishment was 48.

These apparel manufacturers are typically characterized by three types of producers: (a) jobbers who are responsible for their own designs, acquiring the necessary fabric and related materials, and arranging for the sale to retailers. Jobbers may perform cutting operations, but they contract out most of the production operations; (b) contractors that are independent producers performing sewing operations and sometimes the cutting for apparel manufacturers and/or jobbers; and (c) manufacturers who perform the entire range

of processes involved in garment making (United States Congress, 1987; Dickerson, 1991). In this literature review unless otherwise specified, the term "manufacturer" includes all three types of producers.

Although some dimensions of the apparel production process are automated, for the most part, apparel production is a labor intensive manufacturing process. Of the almost one million workers in apparel manufacturing, approximately 900,000 are production workers (Dickerson, 1991). The reason apparel production is so labor intensive is because (a) a machine has not been developed that can assemble two-dimensional fabric to fit the three-dimensional human body and (b) automation is not readily available to handle limp fabrics (Dickerson, 1991). To date, the most efficient device available for guiding the fabric through the sewing process is human hands.

#### Employer Paying Low Wages

The apparel industry, along with being a major industrial employer in a labor intensive industry, pays low wages in comparison to other manufacturers. In recent years, apparel manufacturing wages have experienced a steady decline in comparison to the average manufacturing wage. After World War II, the typical apparel worker earned 75% of the average manufacturing wage; by 1970 the percentage had

dropped to 65%, and in 1990 it was just over 50% of the average manufacturing wage (Bailey, 1990).

Industry Experiencing Intense Domestic  
and Foreign Competition

The last characteristic reflective of the apparel manufacturing industry is one of intense competition. This competition is composed of two factors--other domestic producers in the United States and foreign producers. From the end of World War II to the present date, many developing countries have used apparel manufacturing as a means of building their economy and entering the global market. Between 1953 and 1980, developing countries doubled their share of global textile production and tripled their share of apparel production (Hamilton & Dickerson, 1990). The increased production has greatly affected competition in the United States in that wages are lower in developing countries; consequently, they are able to produce apparel at a lower cost than most manufacturers in the United States. Many retailers in the United States are now supplying their stores with the less expensive imports from these developing countries. In addition, due to low wages, many American manufacturers and retailers are now manufacturing their garments in foreign countries.

## Present Status of United States

### Apparel Manufacturing

The present status of the United States apparel manufacturing industry can best be described by the word "decline." Apparel manufacturing in the United States is experiencing decline in almost every area, i.e., (a) domestic market share, (b) image and status and (c) employment. These declines in the apparel industry are also having a negative impact on small communities across the United States.

#### Decline in Share of Domestic Market

Apparel imports into the United States have negatively affected domestic producers in terms of market share measured in both dollars and yardage. Measured in dollars, in 1973 domestic producers had 88% of the domestic market, in 1983 the percentage dropped to 75% (American Apparel Manufacturers Association [AAMA], 1984). Measured in square yards, 48% of the United States apparel market was imported in 1985; these percentages have more than doubled since 1975 (United States Congress, 1987). When measured in units (e.g. number of dresses) 1973 United States apparel producers had 80% of the market share of domestic apparel consumption. In 1983 this figure dropped to 67% (AAMA, 1984). More current data reveal an equally bleak picture. Imports of tops, bottoms, dresses, suits, coats, and jackets

in 1990 amounted to 243,128,000 dozen or 2.92 billion garments. Imports have increased 131% since 1980 when imports of these same garments were 105,036,000 dozen. This 1990 level is equal to 11.7 imported garments per capita (American Apparel Manufacturers Association [AAMA], 1991b).

#### Decline in Image and Status

Most of the "blue collar" manufacturing industries in the United States are currently experiencing a decline in status. Bailey (1990) states that a general view appears to be developing in the United States that there is something less than worthy in blue collar work. The apparel industry has the added negative image of an industry in trouble. "Young people do not want to commit themselves to a declining industry, and the loud cries by the industry import protectionists promote the image of an industry in trouble" (p. 86).

#### Decline in Employment and Wages

Along with a decline in the domestic market share and image, the apparel manufacturing industry is experiencing a decline in employment. Between 1980 and 1985 employment in the apparel manufacturing industry fell 11% and textile manufacturing employment fell 15%--collectively, a total of 142,000 jobs were lost during this period (United States Congress, 1987). Looking at the figures over a longer



period of time reveals a continued steady decline. In 1960, 1,234,000 persons were employed in apparel manufacturing, whereas only 1,090,000 persons were employed in 1989--a decrease of 144,000 jobs (Dickerson, 1991).

As previously stated the apparel manufacturing industry is also experiencing a decline in wages paid to employees. Authors of at least two articles have proposed that the decline in employment and wages is having a negative effect on small communities, particularly those that are dependant upon apparel manufacturing as a main source of industrial employment (United States Congress, 1987; Dickerson, Dalecki, & Meyer, 1991). A study conducted by Dickerson, Dalecki, and Meyer (1991) found that many of the Missouri respondents saw apparel jobs as vital first and second incomes. Nineteen percent strongly agreed and 47% agreed that apparel jobs were vital as first incomes; 31% strongly agreed and 56% agreed that the jobs were vital as second incomes. If these survey respondents were from small towns (as were 64% of the total surveyed respondents), one could conclude that the apparel manufacturers were important contributors to the economy in the small communities.

#### Reasons for Decline of United States

##### Apparel Manufacturing

Several factors contributed to the demise or decline of the United States apparel manufacturing industry. They

include: (a) global production, (b) strength of the United States dollar (c) United States policy of an open market for free trade, and (d) ineffective communication between manufacturers and retailers.

### Global Production

Global production, particularly in developing countries, is probably the primary factor contributing to the decline of the United States apparel manufacturing industry. Less developed countries have realized that the labor intensive apparel industry offers them one of the easiest ways to convert large labor supplies into hard currency-earning exports (AAMA, 1984). Developing countries have the competitive advantage because typically, the hourly costs of labor are much lower than wages in the developed countries of the world. Also only limited capital and technology are required to enter the apparel manufacturing industry; therefore it is often one of the first industries developing countries enter when trying to advance economically (Dickerson, 1991).

Another component of global production is the new 9802 classification under the Harmonized Tariff Schedule which allows United States manufacturers to export garment pieces to low-wage countries for assembly, with the re-entry duty paid only on the value of the assembling (the "value added"). In other words the tariff is paid on the "value

added" rather than on the total value of the merchandise produced (Dickerson, 1991). This offshore assembly is done in the Caribbean and Mexico which have lower wages (Forney, Rosen, & Orzechowski, 1990).

#### Strength of United States Dollar

Between 1980 and 1985 the strength of the United States' dollar played a strong role in the purchases of foreign textile and apparel products. During these years the strength of the dollar made imports far less expensive, relative to domestically produced items (United States Congress, 1987). Retailers were quick to purchase the less expensive imports as a means of increasing their profit margins and saving money for their customers.

#### United States Policy of Open Market for Free Trade

While other developed and developing countries were closing their borders to textile and apparel imports, the United States maintained its support for open markets pushing for free trade rather than protectionism and/or government intervention. As a result of other countries closing their borders, the United States has absorbed a large bulk of the imports that under different circumstances would have been sent to other nations. Since 1983 the European Economic Community has made moves to strengthen

their import restrictions significantly, pursuant to bilateral agreements negotiated under the Multifiber Arrangement (MFA). Japan restricts imports more informally by placing pressure on the distribution network found in Japan, and by reaching a variety of non-MFA bilateral restraint agreements (United States Congress, 1987).

#### Ineffective Communication Between Manufacturers and Retailers

Dickerson (1991) states that in the past the textile complex "has not functioned at its best because of poor communication among fiber, textile, apparel, and retail operations" (p. 185). In a survey of Missouri apparel manufactures Dickerson and Dalecki (1991) found that two trends emerged in the working relationships of the manufacturers and their retail customers. Larger, more active manufacturers experienced limited difficulties in their working relationships with retailers. Whereas, smaller and less active producers reported greater difficulty in their working relationships with retailers. The smaller manufacturers also appeared to feel the impact of imports more severely than did the larger manufacturers. (Dickerson and Dalecki define "larger and more active" or "small and less active" manufacturers by number of employees, but do not specify the number of employees in each category.)

## United States Apparel Manufacturers' Needs

The needs of United States manufacturers can be assessed or determined through a multitude of methods. Two of these methods are a needs assessment conducted through a scientific research project, and a content analysis of the literature used by the manufacturing population. Both of these methods are discussed below.

### Needs Assessment Studies

McDowell and Hester performed a needs assessment study of New York state manufacturers in 1986 as did Dickerson, Dalecki, and Meyer of Missouri manufacturers in 1991. In both studies marketing was identified by New York and Missouri manufacturers as their primary need. The McDowell and Hester (1986) study did not define what is meant by the term marketing, but did discuss ways in which university-based programs could be used to assist the manufacturers with their marketing needs. Marketing research, information on trends, and data on imports for specific industry segments were listed as ways university-based programs could assist the manufacturers. Other needs identified in this study were related to technology, labor, and overall management problems.

In the Dickerson, et al. (1991) study, manufacturers were asked to rank the three most important areas in which they believed their companies should focus in order to

improve their competitiveness. Marketing was ranked as the first priority, with increased productivity as the second priority, and government policy ranked third of the needs. In this study, marketing was defined as "finding out what the customer wants or needs and attempting to meet those needs" (p. 41); a separate category was used for advertising/promotion. This type of distinction was not used in the McDowell and Hester (1986) study. Therefore, although both studies identified marketing as a primary need, the two populations may have differing concepts of the term "marketing."

In the Dickerson, et al. study (1991), the term "productivity" related specifically to production per se and to increasing productivity through introduction of new technology with greater capability. Again, although the McDowell and Hester study (1986) did not define their terminology, it is possible that their population interpreted "technology" to mean replacing old machines with new technology having greater production capabilities.

### Content Analysis

A content analysis was performed on the articles in *Apparel Manufacturer: A Technical Journal of Bobbin Magazine* volume one, numbers one through three (1989) and volume two, numbers one through nine (1990). These journals were selected for the content analysis because only three

journals were produced in 1989, and only the first nine journals of 1990 were available when the content analysis was performed. Each article was reviewed and was categorized based on the primary topic covered in the article. The three categories most often covered in the journal were (a) production equipment, (b) computerized manufacturing, and (c) sewing systems (See Table One in Appendix B).

Production Equipment. In the category of production equipment, the most commonly covered topic was that of equipment purchases. The articles predominately offered advice in evaluating equipment and justifying equipment purchases. The advice is offered in terms of a five-point scale for rating equipment attributes, the influence of equipment purchases on the cost structure, life-cycle management, technology accounting, and economic analysis to be used in equipment purchases.

Another topic frequently covered in the category of production equipment was technology and product development. This topic was primarily covered through interviews with suppliers discussing the technical features of their equipment in order to provide a better understanding of the equipment capabilities and features. Two of the articles addressed areas of interest in the topic of technological development such as where do ideas for development come from, products manufacturers appear to be most interested

in, and methods for obtaining information from manufacturers when developing new equipment.

Computerized Manufacturing. Computerized manufacturing consists of three subcategories: (a) computer assisted design (CAD), (b) computer assisted manufacturing (CAM), and (c) computer integrated manufacturing (CIM). The three subcategories of computerized manufacturing are still relatively new concepts in apparel production. Thus, the articles reviewed in this category predominately discussed new developments in computerized manufacturing such as the technology involved, equipment used, and advantages of computerized manufacturing.

One article, *Computer Use for Apparel Pattern Making* (Staples, 1990) was a research study examining the use of CAD in the apparel manufacturing industry, specifically pattern making. The results of the study indicated that computer use is increasing, but the adoption of computers for pattern making is still low and slower than previous projections. Computers are more often used in large companies whose products are subject to less change, and are more often used for marking and grading than for pattern making.

Sewing Systems. The traditional sewing system in apparel manufacturing is one of a traditional bundle system where operators work piece rates by doing one particular



repetitive job. Articles covered in the category of Sewing Systems proposed alternatives to the traditional sewing system. The most often proposed alternative was modular manufacturing which is defined by Gilbert (1990) as:

A contained manageable work unit of 5 - 17 people performing a measurable task. The operators are interchangeable among tasks within the group to the extent practical, and incentive compensation is based upon the teams' output of first quality product. (p. 44).

The following topics were covered in the articles discussing modular manufacturing: (a) advantages of the system, (b) the philosophy behind modular manufacturing, (c) purchasing equipment to be used with modular manufacturing, (d) negative aspects of modular manufacturing, and (e) employee pay methods associated with modular manufacturing. One article is a case study of how a manufacturer of outerwear changed from the progressive bundle system to modular manufacturing.

### Adjustment Strategies

The term "adjustment strategies" refers to "restoring the competitiveness of an industry within the domestic economy" (Dickerson, 1991, p. 374). Adjustment strategies in the United States apparel manufacturing industry include Quick Response and an intense marketing program.

### Quick Response

Quick Response is a term that has taken on a multitude of different definitions and used in numerous different situations. Dickerson (1991) provides the most comprehensive definition of Quick Responses which states that:

Quick Response (QR) is an industry initiative that at first focused on shortening production cycle time based on extensive use of electronic data transmission from the retailer to various segments of manufacturing. The concept evolved into a transformation of the way in which apparel is made and distributed, and is based largely on closer working relationships between suppliers and retailers. (pp. 193-194)

Kurt Salmon Associates estimates that effective QR systems can overcome a 30% cost differential between the domestic and foreign producers (Bailey, 1990).

Benefits of Quick Response QR was designed to provide manufacturers with a competitive edge in the domestic market. The competitive edge is seen through: (a) quicker turnaround and production time, (b) reduced inventory, (c) reduced stockouts, and (d) improved communication in the manufacturer/retailer relationships.

Success in the retail business is contingent upon having the right product at the right time, and most preferably before the same product appears in competitors' retail stores. Through the use of QR, quicker production and turnaround time are two of the benefits that domestic apparel manufacturers can offer retailers. Along with the

quicker production and turnaround times, through the use of QR, retailers are now able to more accurately forecast product orders.

QR should reduce incidence of forced markdowns that result from orders of goods that fail to sell as expected. During the past decade, forced markdowns grew by 50%, and the National Mass Retail Institute estimates that total losses may have been as high as 15% of retail sales (United States Congress, 1987). These forecasting failures were due to long planning cycles that are typical of the apparel manufacturing industry. With the implementation of QR, it may be possible to reduce initial order times to two to three months.

Two significant benefits of the reduced order time are the ability to reduce inventory and stockouts. One of the principles of QR is holding inventories low and avoiding overstocking while at the same time, ensuring that retailers stock what their customers want to buy. Stockouts, not having merchandise available in the store upon customer demand, is also eliminated through the retailers' ability to make smaller orders and reorder more of a product that proves to be popular (United States Congress, 1987).

Historically, communication between apparel manufacturers and retailers has been poor. Apparel manufacturers have produced garments with little, if any, communication with the retailers--the people closest to the

customers. Dickerson (1991) states that when retailers did attempt to communicate to the apparel manufacturers what customers desired in product design, they were ignored. This is one of the reasons retailers have sought out foreign apparel manufacturers. Improved communications between apparel manufacturers and retailers is an important benefit of QR.

Improved communications between apparel manufacturers and retailers has been established through the use of labels and tags printed with Universal Product Code (UPC) information. These bar codes, which are read at the point of sale, transmit sales information back to the manufacturers, triggering automatic reordering of items based on a pre-agreed program. This information aids in the quicker turnaround time, reduced inventory, and reduced stockouts. Increasingly, bar coded labels are being attached prior to shipment to eliminate sorting and labeling by the retailer and to facilitate the movement of textile items to the sales floor (Collier & Collier, 1990).

A comprehensive summarization of the benefits of QR is to say that apparel manufacturers are now working as a team instead of two separate entities whose paths occasionally cross.

How Quick Response Works At the apparel manufacturing end (as opposed to the retail end), QR is accomplished through CAD and CAM systems. CAD can be divided into two

classifications--CAD for design/illustration and CAD for pattern development. Presently, the two-dimensional CAD systems in use allow interactive manipulation to take place faster and more easily than in the normal drafting process. In like manner, the grading of patterns is also computerized which dramatically shortens the time required for pattern production as well as improving the pattern development (Collier & Collier, 1990).

Although CAD systems have been on the market a number of years, they are still not used by the majority of apparel designers and manufacturers. In a survey with 95 responding manufacturers from across the United States, Sheldon (1988) found that the most commonly used CAD classification was that for pattern making which was computerized in 37% of the companies with 65% of the companies projecting computerized pattern making in the next five years. Only 10% of the respondents reported using design/illustration CAD systems, and 48% of the companies projected using design/illustration CAD system in the next five years.

A survey of 38 Louisiana manufacturers (Belleau & Didier, 1989) found that only a small percentage of the manufacturers were utilizing CAD systems. Only one of the companies surveyed had a computerized design/illustration system and two of the companies had computerized pattern grading systems.

CAM involves the use of automatization and computers in the production process of manufacturing and also nontraditional approaches to sewing systems. Unit production systems (UPS) is an example of automatization and a nontraditional approach. UPS consists of conveyor mechanisms on which garment pieces are hung for transport to work stations which is a contrast to the traditional process of bundling, tying, and moving pieces in batches (Collier & Collier, 1990). With UPS, the transport of pieces is controlled by computer programs which aid in minimizing the waiting time for work-in-progress. If a particular workstation is not ready for a piece, it is automatically sent to another operator or shunted to a waiting station until an operator is ready.

Automated knife or laser cutting of fabric from markers stored in computer data bases are further examples of the use of CAM technology in apparel manufacturing (Collier & Collier, 1990). In the survey to Louisiana apparel manufacturers, six of the 38 manufacturers were using computerized marker making systems, four used computerized cutters, and five manufacturers had some phase of the assembly operation computerized (Belleau & Didier, 1989).

#### Intense Marketing Program

American apparel manufacturers initiated an intense marketing program as a means of making domestic consumers

aware of garments made in the United States. The most predominate aspect of this program is the "Crafted with Pride in U.S.A." campaign. The original goal of the Crafted with Pride campaign was to increase awareness of United States-made textile and apparel products and to motivate consumers, retailers, and apparel manufacturers to buy domestic rather than foreign-made products (Dickerson, 1991).

Douglas and Morganosky (1990) surveyed 171 textile and apparel manufacturers throughout the United States to investigate possible relationships between support for the Crafted with Pride campaign and managerial business practices in textile and apparel companies. Survey responses indicated that supporters (ranging from general to financial support) of the Crafted with Pride campaign have a strong degree of faith in the United States industry; do little offshore production, and believe their customers prefer to buy United States-made products. Survey results also indicated that general and financial support for Crafted with Pride was somewhat lower on the part of apparel manufacturers than textile manufacturers. These survey results are important for illuminating managerial attitudes of manufacturers participating in the campaign.

### Trade Agreements/Policies

Apparel manufacturers have also tried to limit the influx of imports through multilateral agreements such as Multifiber Agreement (MFA) one through four. Lobbying Congress is another tool manufacturers have employed to limit imports. The Textile and Apparel Trade Enforcement Act of 1987 passed Congress, but was later vetoed by president Reagan. Although the bill did not pass, the lobbying efforts were effective in gaining Congress's cooperation for tighter trade controls. These two methods of restricting imports are only the tip of the proverbial iceberg, and far too complex and lengthy to address in this study.

### Summary

Although United States apparel manufacturers are a major industrial employer, they also represent an industry in trouble. The industry is experiencing decline in almost every aspect--domestic market share, image and status, employment, and wages. Recognizing these acute problems, adjustment strategies were targeted as a means of restoring health to this seriously ill industry. The adjustment strategies were dominated by three strategies--QR, the Crafted With Pride in the United States Campaign, and trade agreements.



## CHAPTER III

### METHODOLOGY

#### Description of Survey

A survey instrument was developed to gather baseline information and data related to the current status as well as the perceived needs of Oklahoma apparel manufacturers. Items in the survey were designed to gather demographic information and address apparel manufacturers' needs in the following categories: (a) employment, (b) training, (c) production (d) technology, (e) supplier/manufacturer relationships, (f) marketing, and (g) manufacturer/customer relationships. Development of the items was based upon the problems previously identified in the literature (Dickerson, Dalecki, & Meyer, 1991; McDowell & Hester, 1986). In addition, items were included to obtain information specifically desired by the funding source.

Survey question format included open-ended questions, multiple-choice questions, and statements with a five-point fixed response scale measuring the respondents' degree of agreement or disagreement with each statement. Survey questions and overall survey format followed the one recommended in Dillman's book, *Mail and Telephone Surveys*:

*The Total Design Method* (1978). A copy of the survey instrument is provided in Appendix A.

The survey instrument was pilot tested using two Oklahoma apparel manufacturers. The first manufacturer was independently owned with approximately 35 employees, and manufactured knit sportswear such as t-shirts and warmups. The second manufacturer was owned by a major corporation. Their plant employed approximately 200 persons and manufactured primarily blue jeans. Based upon results of the pilot test, wording was modified to eliminate questions that were ambiguous, unclear, or inappropriately stated. Questions addressing concerns and problems faced by the manufacturers involved in the pilot test were also added to the survey.

### Sample

In an effort to reach the total population of Oklahoma apparel manufacturers listed under Standard Industrial Codes (SICs) 2311 - 2389, data were obtained from three sources. A listing of 70 manufacturers was obtained from the 1990 edition of *Oklahoma Manufacturers and Processors Directory*. Thirty manufacturers were acquired from a report provided by the Oklahoma Department of Commerce (ODOC), and seven manufacturers were obtained from a list of contacts several professors in the Department of Design, Housing, and Merchandising at Oklahoma State University (OSU) had with

apparel manufacturers. The total population consisted of 106 manufacturers.

### Data Collection

The data were gathered by mailing a cover letter (Appendix A), the survey, and a postage-paid return envelope to each manufacturer. Approximately one week later, a postcard was mailed to each manufacturer reminding them to complete and return the survey, along with thanking the manufacturers who had completed and returned their survey. Approximately three weeks later a second cover letter (Appendix A), survey, and postage-paid return envelope were mailed to the manufacturers who had not returned the original survey.

Data were gathered in two stages--stage one took place during November and stage two during January. The first stage included the 70 Oklahoma apparel manufacturers listed in the 1990 edition of *Oklahoma Manufacturers and Processor Directory*. During stage two, six weeks later, 36 more manufacturers were identified through the updated listings provided by ODOC and the OSU professors. These manufacturers were then contacted following the above format.

Before mailing the first cover letter and survey in stage one, the manufacturers were called to inform them about the survey and to request their participation in the

study. Many manufacturers who agreed to participate in the study did not return their surveys. Therefore, it was determined that the telephone call was not an effective means to increase the response rate. Consequently, the decision was made not to call manufacturers in the second stage.

During the time period that the surveys were being returned, the response rate among large apparel manufacturers was not as high as among small manufacturers. Consequently, to ensure an adequate response rate, among large apparel manufacturers, the researcher contacted 14 manufacturers by telephone. Three of these manufacturers agreed to complete the surveys which the researcher personally hand delivered and retrieved from the manufacturers.

#### Response Rate

Through the process of mailing the letters and surveys, along with placing telephone calls to the manufacturers, 16 manufacturers were identified as no longer being in business. One manufacturer closed its plant in Oklahoma and moved to Mississippi. Seven of the identified manufacturers were not actually apparel manufacturers; they were either retailers, performed embroidery work on apparel, or manufactured covers for equipment. After eliminating each of these manufacturers from the population, the final

population size consisted of 82 manufacturers. Of this population, a total of 39 surveys were returned, giving a response rate of 48%.

### Statistical Analysis

Both descriptive and inferential statistics were used for data analysis. T-tests were used to test the hypotheses dealing with the difference between small and large manufacturers. The t-test analysis is a comparison of two sample means. The purpose of this type of analysis is to establish whether the difference between the two samples is significant. When using the t test, the assumption is made that the underlying population is normally distributed. Violations of this assumption are important only when the sample size is less than 10 (Witte, 1985).

Chi square was used to test the null hypothesis for the qualitative data expressed as frequencies. The assumptions of the chi square require that the observations be independent (one outcome should have no influence on another), and the expected frequencies of the population should not be too small. A cell size of less than five may lead to an invalid test (Bartz, 1988).

Tables summarizing responses given by the manufacturers are given in Appendix B.

CHAPTER IV  
MANUSCRIPT  
A NEEDS ASSESSMENT OF OKLAHOMA  
APPAREL MANUFACTURERS

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## ABSTRACT

Thirty-nine Oklahoma apparel manufacturers completed self-administered questionnaires. The purpose of the study was to gather baseline data and determine the needs of Oklahoma apparel manufacturers. Comparisons were made between different sized companies based on number of employees. Results showed that Oklahoma manufacturers do have needs in the areas of employee training, production, technology, supplier/manufacturers relationships, marketing, and manufacturer/customer relationships. More small than large manufacturers reported a need for assistance and a stronger interest in educational training.

The textile complex (an industry chain from fiber to fabric, through end uses of apparel, home furnishings, and industrial products) is a vital contributor to the United States' economic health. The textile complex as a whole represents the largest industrial employer in the United States, employing almost two million workers or 10% of the industrial workforce (Hamilton & Dickerson, 1990). A critical dimension of the textile complex is apparel manufacturing. Apparel manufacturing is critical because it is a significant industrial employer, a major contributor to the Gross National Product, and vital to the retail industry (Dickerson, 1991; Dickerson, Dalecki, & Meyer, 1991).

The present status of the United States apparel manufacturing industry can best be described by the word "decline." Apparel manufacturing in the United States is experiencing decline in almost every area, i.e. domestic market share, image/status, and employment (American Apparel Manufacturers Association [AAMA], 1984; United States Congress, 1987; Bailey, 1990; Dickerson, 1991). In terms of employment, between the years 1960 and 1989 apparel manufacturing in the United States experienced a decrease of 144,000 jobs (Dickerson, 1991). In Oklahoma, between 1978 and 1990, approximately 3000 jobs were lost in apparel manufacturing (AAMA, 1991a).

Several factors contributed to the decline of the apparel manufacturing industry. They include global



production, strength of the United States dollar, the United States policy of an open market for free trade, and ineffective communication between manufacturers and retailers (Dickerson, 1991; United States Congress, 1987; Dickerson & Dalecki, 1991).

Needs analysis studies were performed in Missouri (Dickerson, Dalecki, & Meyer, 1991; Dickerson & Dalecki, 1991) and New York (McDowell & Hester, 1986) in an effort to provide assistance to apparel manufacturers. In both studies marketing was identified by apparel manufacturers as their primary need. In the Dickerson and Dalecki (1991) study, large apparel manufacturers reported fewer difficulties in marketing to retailers and in working with mass merchandisers than did small manufacturers.

In the Dickerson, Dalecki, and Meyer (1991) study manufacturers were asked to rank the three most important areas in which they believed their companies should focus in order to improve their competitiveness. Marketing was ranked as the first priority, with increased productivity as the second priority, and government policy ranked third. Needs, other than marketing, identified in the McDowell and Hester study were related to technology, labor, and overall management problems.

Studies were also performed to determine the present use of technology, specifically Computer Aided Design (CAD) and Computer Aided manufacturing (CAM) in the United States

(Belleau & Didier, 1989; Collier & Collier, 1990; Staples, 1990). These studies found that CAD and CAM use is increasing, but the adoption of computers in apparel manufacturing is still low and slower than previously projected. Computers are more often used in large companies whose products are subject to less change, and are more often used for marking and grading than for pattern making.

### Purpose of Study

The objectives of this study were to determine (a) baseline data relating to the 1991 status of Oklahoma apparel manufacturers in terms of employment, production, and technology; (b) to determine Oklahoma apparel manufacturers' perceived needs in terms of employee training, production, technology, supplier/manufacturer relationships, marketing, and manufacturer/customer relationships; to determine if these needs differ by size of manufacturer; and (c) to determine the extent of interest of Oklahoma apparel manufacturers in production expansion.

### Methodology

#### Survey

A survey instrument was developed to gather demographic information and address apparel manufacturers' needs in the following categories: (a) employment, (b) training, (c) production (d) technology, (e) supplier/manufacturer

relationships, (f) marketing, and (g) manufacturer/customer relationships. Development of the items was based upon the problems previously identified in the literature (Dickerson, Dalecki, & Meyer, 1991; Dickerson & Dalecki, 1991; McDowell & Hester, 1986). In addition, items were included to obtain information specifically desired by the funding source. Survey questions and overall survey format followed the one recommended in Dillman's book, *Mail and Telephone Surveys: The Total Design Method* (1978).

The survey instrument was pilot tested using two Oklahoma apparel manufacturers. Based upon results of the pilot test, wording was modified for items that were ambiguous, unclear, or inappropriately stated. Questions addressing concerns and problems faced by the manufacturers involved in the pilot test were also added to the survey.

### Sample

In an effort to reach the total population of Oklahoma apparel manufacturers listed under SICs 2311 - 2389, data were obtained from three sources. A listing of 70 manufacturers was obtained from the 1990 edition of *Oklahoma Manufacturers and Processors Directory*. Thirty manufacturers were acquired from a report provided by the Oklahoma Department of Commerce (ODOC, 1991), and seven manufacturers were obtained from Oklahoma State University

faculty contacts. The total population consisted of 106 manufacturers.

### Data Collection

The data were gathered by mailing a cover letter, the survey, and a postage-paid return envelope to each manufacturer. Approximately one week later, a postcard was mailed to each manufacturer reminding them to complete and return the survey. In addition gratitude was expressed to the manufacturers who had completed and returned their survey. Approximately three weeks later a second cover letter, survey, and postage-paid return envelope were mailed to the manufacturers who had not returned the original survey.

Data were gathered in two stages. The first stage included the 70 Oklahoma apparel manufacturers listed in the 1990 edition of *Oklahoma Manufacturers and Processor Directory*. During stage two, six weeks later, 36 more manufacturers were identified through the updated listings provided by ODOC and the OSU professors. These manufacturers were then contacted following the above format.

Before mailing the first cover letter and survey in stage one, the manufacturers were called to inform them about the survey and to request their participation in the study. Many manufacturers who agreed to participate in

the study did not return their surveys. Therefore, it was determined that the telephone call was not an effective means to increase the response rate. Consequently, the decision was made not to call manufacturers in the second stage.

During the time period that the surveys were being returned, the response rate among large apparel manufacturers was not as high as among small manufacturers. Consequently, to ensure an adequate response rate, among large apparel manufacturers, the researcher contacted 14 manufacturers by telephone. Three of these manufacturers agreed to complete the surveys which were personally hand delivered and retrieved by the researcher at their place of business.

Multiple methodologies were used as a means of increasing the response rate. It has been found that it is difficult to obtain responses from apparel manufacturers (McDowell & Hester, 1986).

#### Response Rate

Through the process of mailing the letters and surveys, along with placing telephone calls to the manufacturers, 16 manufacturers were identified as no longer in business. One manufacturer closed its plant in Oklahoma and moved to Mississippi. Seven of the identified manufacturers were not

actually apparel manufacturers; they were either retailers, performed embroidery work on apparel, or manufactured covers for equipment. After eliminating each of these manufacturers from the population, the final population size consisted of 82 manufacturers. Of this population, a total of 39 surveys were returned, giving a response rate of 48%.

## Results

### Demographic

Ninety percent of the respondents were top management personnel including owners, managers, presidents, vice presidents, a director of manufacturing, and a chief executive officer. One supervisor, one secretary, and two office managers also completed the survey. The responding manufacturers have been in business with the present owner from one to 54 years with 47% in business four or fewer years. Thirteen manufacturers reported having a parent or sister company located in either Oklahoma or another state. None of the manufacturers responding to the survey are unionized. Manufacturers most often described their customers as retailers.

Of the 38 manufacturers responding to the question concerning membership with professional organizations, only 11 professional memberships were reported--nine were members of the American Apparel Manufacturers Association, one was a member of the American Apparel Contractors Association, and

one was a member of the Luggage and Leather Goods Association. Sources of information most frequently utilized by manufacturers included sales representatives (57%) and trade shows (51%). All of the sources such as (a) sales representatives, (b) trade shows, (c) trade associations/journals, (d) educational institutions, (e) government programs, (f) seminars/workshops, (g) other manufacturers, and (h) cooperative extension are utilized by the manufacturers at least some of the time.

#### Baseline Data

Baseline information was obtained relative to the following areas of interest: (a) employment, (b) production, (c) production capacity, and (d) technology.

Employment The manufacturers reported employing from one to 450 workers. Fifty-eight percent of the manufacturers employed 50 or fewer persons. Ninety-seven percent of the manufacturers reported that the majority of their employees receive their training on the job. One manufacturer each, reported that their employees also receive their training at industry seminars, vocational/technical schools, and four year colleges.

The annual employee turnover rate reported by manufacturers ranged from zero to 100%. The six manufacturers reporting zero percent turnover employed 21 or fewer workers. It is possible that the small manufacturers

had zero percent turnover because of their size or length of time in business. Of the two manufacturers reporting 100% turnover, one employed 46 persons, and the other employed 200. There is no clear explanation why these manufacturers reported 100% turnover--perhaps they did not understand the question. The manufacturers experienced an average annual turnover rate of 27%. This figure includes manufacturers reporting zero and 100% turnover.

Manufacturers were asked to indicate the three primary reasons for employee turnover with "1" indicating the most frequent reason, "2" the second most frequent reason and "3" the third most frequent reason. The two most frequently cited reasons for employee turnover were "personal" such as family illness, relocation, etc. and "lifestyle" such as prefers government assistance rather than working (Table 1). Only one manufacturer reported "management/employee conflicts" as a reason for employee turnover.

Production Manufacturers were asked to indicate the manufacturing processes that were performed at their plants. Acquiring fabric and related material, cutting fabric, and production of fabric into completed garments were the processes most frequently cited by the manufacturers. Eighty-one percent of the manufacturers are involved in the cutting process and 91% in the sewing process. Grading patterns and arranging sale of garments to retailers were the processes least frequently cited by manufacturers. Over



half of the manufacturers have the equipment available to both cut and sew woven and knit fabrics.

Production Capacity Manufacturers were also asked to specify the percentage of full production capacity that was being utilized by their plant. Thirty-two manufacturers responded to the question with a range of zero percent to 100% full production. The manufacturers reporting zero to 30% production were small manufacturers, and it is possible that during various times of the year, they could be closed or operating at a very low production rate. The manufacturers (n=32) reported operating at a mean of 66% full production.

Technology To gather baseline data related to technology, manufacturers were asked to specify (a) manufacturing processes performed at their plant that are computerized, (b) dollar amount of equipment purchases made in the past two years and anticipated in the next two years, and (c) to specify technology or equipment that would enable manufacturers to improve their present market position.

Sixty-two percent of the manufacturers indicated that their data management processes are computerized; 30% use computers for production planning. About 16% of the manufacturers reported using CAD processes such as making patterns, grading patterns, and marker making. Few manufacturers have computerized processes such as garment

design, cutting fabric, production of fabric into completed garments, and quality control.

Investments In the past two years, 58% (n=36) of the manufacturers spent \$10,000 or more on equipment purchases. Only one manufacturer did not make an equipment purchase in the past two years. Forty-seven percent of the manufacturers anticipate making an equipment purchase of \$10,000 or more in the next two years, and 17% of the manufacturers do not anticipate making an equipment purchase in the next two years. The remaining manufacturers anticipate making equipment purchases between \$1 and \$9,999. The most frequently cited type of equipment purchase anticipated was sewing machines, followed by computers.

Sixty-eight percent (n=32) of the manufacturers responded that there is technology or equipment that would enable them to improve their present market position if they were able to purchase it. Reasons for not making equipment purchases were cited as: (a) volume of production does not justify equipment purchase (58%), (b) need for employee training on equipment (27%), and (c) equipment maintenance (15%).

Along with making equipment purchases, many of the manufacturers anticipate making capital improvements in the coming two years. These improvements include remodeling, adding air conditioning, roof repair, etc.

Oklahoma Apparel Manufacturers' Attitudes and Needs

Data relating to manufacturers' perceived attitudes and needs were obtained using a five-point fixed response scale. In order to analyze manufacturers' responses to the attitudinal statements, the "strongly agree" and "agree" response categories were collapsed into one category, as were responses "disagree" and "strongly disagree." These attitudinal data were also examined by number of employees. Small manufacturers were defined as employing 49 or fewer employees (n=22) while large manufacturers employed 50 or more employees (n=17). A summary of the data is reported in Table 2.

Employee Training (See items A - C.) Seventy-six percent of the manufacturers (n=38) indicated that obtaining skilled employees is difficult. As Table 2 indicates, this need did not differ by size of manufacturer. Also, 64% (n=39) felt that their employees needed more training. However, 74% (n=23) of the small manufacturers responded that this was a need for them, and only 50% of the large manufacturers expressed this need. Ninety-two percent of the manufacturers felt that their plant could increase labor productivity per worker, and this did not differ by size of manufacturer.

Production (See items D - F.) Fifty-nine percent (n=29) of the manufacturers agreed that they are willing to

act as a contractor to produce new products. This was more characteristic of large manufacturers with 78% expressing a willingness to act as a contractor as compared to 50% for small manufacturers. In addition, 78% (n=37) indicated an interest in expanding production. About a third, 34% (n=29), indicated an interest in entering into joint or co-operative ventures with other manufacturers. Similar percentages were reported by both small and large manufacturers for interest in expansion and co-operative ventures.

Technology (See items G - I.) In general, between 30% and 40% of the Oklahoma manufacturers indicated that they had technological needs; however, their needs varied somewhat by size of manufacturer. Forty percent of the manufacturers agree that they need to use more sophisticated equipment (n=37), but more small manufacturers agreed with this statement (45%). About 30% (n=36) of the manufacturers, regardless of size, reported the need to devote more money to CAD equipment. Thirty percent (n=37) of the manufacturers also indicated that they need to devote more money to CAM equipment. There was a tendency for a higher percent of large manufacturers to report this need.

Supplier/Manufacturer Relationship (See items J - O.) Overall data on 42% (n=36) of the manufacturers indicated dissatisfaction with the price paid for supplies and 48%

(n=35) indicated a preference to order supplies in smaller quantities. There was a tendency for small manufacturers to be more dissatisfied with price paid for supplies and quantity necessary for orders. Half (n=38) of the manufacturers responded that they are satisfied with the quality of supplies received, and this differed only 4% between large and small manufacturers. Oklahoma manufacturers did not indicate a problem with receiving substitute supplies from vendors. Only about 24% (n=33) of the manufacturers reported difficulty writing specifications. Seventy percent (n=37) said that supplies are delivered in a timely manner.

Manufacturer/Customer Relationship and Marketing Program (See items P - S.) Forty-three percent (n=28) of the manufacturers experienced difficulty in making contact with retailers to show their lines. This is more of a problem for small manufacturers. Oklahoma manufacturers (52%, n=29) did indicate that retailers make production decisions more difficult, and more small manufacturers agreed with this statement.

Almost three-fourths (74%, n=31) of the manufacturers do not perceive their geographic location as a handicap in maintaining effective contact with retailers.

Sixty-two percent (n=29) of the manufacturers responded that their plant needs to focus on a stronger marketing program. However, only 37% (n=8) of the large manufacturers

reported this need compared with 71% (n=21) of the small manufacturers.

Chi square Chi square analysis was used to determine if there was a significant difference in responses to attitudinal statements by size of manufacturer. An assumption of the chi square test is that a cell size must equal five or more. In order to increase the likelihood of having the required number per cell, only the collapsed agree versus disagree responses were used to create a two by two chi square table. Nevertheless, small cell size remained a problem for many of the items. No significant differences were found between small and large manufacturers' attitudes and needs.

T test Attitudinal items were originally developed to obtain information on four constructs (see Table 2): (1) production including items D, E, and F; (2) technology including items G, H, and I; (3) supplier/manufacturer relationships including items J, K, L, M, N, and O; and (4) marketing/manufacturer/customer relationship including items P, Q, R, and S. Responses to items developed for each construct were summed together to obtain a score for each construct. T-tests were performed using these construct scores to determine if manufacturer scores differed significantly by size of manufacturer. T-tests were also performed using demographic items to determine if a

significant difference existed by size of manufacturer.

A significant difference at the .01 level existed between production capacity achieved by small and large manufacturers. Small manufacturers reported operating at an average of 52% full production, while large manufacturers operate at 82%. None of the other relationships were significant at the .05 or .01 level.

#### Manufacturer Educational Needs

Manufacturers were given a list of 11 educational content areas and asked to indicate on a scale of one (very helpful) to three (not helpful at all) the degree of helpfulness educational training in each content area would represent. The degree of training helpfulness in each content area was further analyzed by size of manufacturer.

The data in Table 3 clearly show that Oklahoma manufacturers indicate a strong need for educational training in management/supervisory development with 92% reporting that this would be helpful. The response to this need was about equal between small and large manufacturers. Seventy-seven percent of the manufacturers indicated that marketing would be helpful. However, 95% of the small manufacturers reported this as helpful and only 53% of the larger manufacturers reported marketing as helpful. About 68% indicated computerized bookkeeping would be helpful, but 90% of the small manufacturers indicated this need

compared with 35% of the large manufacturers.

Overall, 70% of the manufacturers reported that contracting would be helpful. However, 90% of the small manufacturers reported this as helpful while only 40% of the large manufacturers reported it as helpful. Between 59% and 64% of the manufacturers perceived CIM and CAM training would be helpful. These responses did not differ by size of manufacturer.

Sixty percent of all manufacturers reported training in computerized inventory control would be helpful. This type of training was reported as helpful by more small (82%) than large (47%) manufacturers. Fifty-seven percent of the manufacturers reported that training in CAD would be helpful. Small and large manufacturers differed in their responses to training in this area--72% of small manufacturers reported it would be helpful while only 31% of large manufacturers reported it would be helpful.

Forty-two to 47% of all manufacturers cited that labeling, exporting, and language proficiency would be helpful. There was a tendency for more small than large manufacturers to find training in these areas as helpful. Almost three-fourths of the large manufacturers do not perceive training covering these topics as helpful.

Chi square analysis was used to determine if there was a significant difference in responses to educational training needs by size of manufacturer. A significant



relationship existed at the .05 level between large and small manufacturers' responses to CAD training with significantly more small than large manufacturers reporting CAD training as helpful. At the .01 level significantly more small than large manufacturers' reported training in contracting and computerized inventory control as helpful.

### Primary Problems

The manufacturers were given an open-ended question asking them what their primary problems were. These responses were studied, grouped as appropriate and given labels. They were (a) government policies with specific items such as workman's compensation, taxes, welfare system, not having a Right-to-Work law, etc.; (b) financing which included items such as wages, cash flow problems, financing to advertise, and increasing production costs; and (c) miscellaneous which included items such as imports, employee lifestyles, insurance, seasonal work, etc.

## Discussion

### Employment

Both large and small Oklahoma apparel manufacturers appear to be experiencing difficulty in obtaining skilled employees. In addition, the majority of employees are receiving their training on the job. Even so, the

manufacturers indicate that additional employee training would be helpful. Ninety-two percent of the manufacturers reported that training in management/supervisory development would be helpful. The response to this type of training was almost equal among large and small manufacturers. More than likely training received on the job relates to the cutting and sewing processes, and on the job training for these processes can be handled in-house. Whereas additional training for management/supervisory positions is needed. It is possible that front-line personnel are being promoted to supervisory positions without prior training or experience. This type of training could be acquired through a number of sources such as industry seminars, university-sponsored seminars, and vocational-technical schools.

Collectively, manufacturers experience an average turnover rate of 27%. However, this percentage may not be a true reflection of the average turnover rate as six small manufacturers reported zero turnover and two large manufacturers reported 100% turnover. It is not clear as to why the large manufacturers reported 100% turnover--possibly they did not have a clear understanding of the question.

The reasons most often cited for turnover were "personal" such as family relocation or illness, and "lifestyle" such as prefers government assistance rather than working. Little, if anything, can be done to reduce

turnover due to personal reasons. However, turnover due to the lifestyle reason could be minimized through government policy. As a result of a Missouri study (Dickerson, Dalecki, & Meyer, 1991), a working relationship was established with a member of the State House of Representatives who became an advocate for the apparel industry with the governor and the legislature. A similar relationship with an Oklahoma representative could be beneficial to Oklahoma apparel manufacturers as government policy appears to be affecting Oklahoma apparel manufacturers in many areas. When asked about their primary problems, manufacturers most frequently cited government policy in general such as workman's compensation, taxes, and the welfare system. These are specific areas where the representative could lobby for policies that would assist Oklahoma apparel manufacturers.

There are many contributing factors to employee turnover. One possible factor is manufacturers hiring the wrong employee for a position. This could be particularly true for employees who leave as a consequence of lifestyles. It is possible that the manufacturers are not adequately screening employees during the interviewing process. Recruiting and hiring employees with a higher commitment to employment could help reduce turnover.

A specific program for improving interviewing techniques is "Targeted Selection" (Development Dimensions

International, 1981). Through this program an interviewer learns to use an applicant's specific past behaviors, actions, accomplishments, and experiences to predict the applicants' future job behavior. For example instead of questioning the interviewee on his philosophy about time management, the interviewee is asked to give specific, detailed examples that demonstrate his use of time-management techniques. With this method, the interviewer can better identify the interviewee's work history in terms of productivity and employment longevity thereby possibly eliminating high-risk candidates.

### Production

Oklahoma apparel manufacturers are presently operating at a production rate of 66% full capacity. This production rate leaves room for increased production, and in addition, manufacturers indicated an interest in increasing production. When responding to ways of increasing production, the strongest interest was in expanding present production, followed by manufacturers serving as a contractor to produce new products (more large than small manufacturers were interested in this option). The option least favorably received by manufacturers was entering into joint or co-operative ventures with other manufacturers.

Ninety-two percent of the manufacturers felt that they could increase labor productivity per worker, and this

attitude did not differ by size of manufacturer. There are many articles and books that cite case examples of manufacturers improving individual and overall employee productivity. These articles emphasize implementing programs such as work teams that focus on employee empowerment and a horizontal management structure. Another method of increasing productivity, and at the same time quality, is through a program called Total Quality Management (TQM) where the focus is on a "strategy for continuously improving performance at every level, and in all areas of responsibility. It combines fundamental management techniques, existing improvement efforts, and specialized technical tools under a disciplined structure focused on continuously improving all processes" (Hunt, 1992; p. 74).

In order for increased production to be profitable, there should also be an increased demand for the manufacturers' products. One means of increasing demand is through a sourcing fair similar to the one held by Auburn University (Warfield, Barry, & Anderson, 1986). Auburn faculty organized a sourcing fair to bring together retailers and Alabama manufacturers to introduce retailers to the state's apparel producers. If a similar fair were to be held in Oklahoma, it would be wise to also include Oklahoma apparel designers. Introducing these three groups (designers, manufacturers, and retailers) could help

increase manufacturing production through increased demand and contract work for new products.

### Investments

During the past two years Oklahoma apparel manufacturers have been investing sizeable funds in their plants. All but one manufacturer made an equipment purchase, with 58% making purchases of \$10,000 or more. However, it is possible that Oklahoma apparel manufacturers have been affected by the recession; fewer manufacturers indicated that they will be making equipment purchases of \$10,000 or more in the coming two years, and 17% do not anticipate making equipment purchases at all.

The two most frequently anticipated types of equipment purchases are sewing machines and computers. More than likely, these purchases will be made by the small and younger manufacturers who are still reinvesting funds in basic equipment. To complement the anticipated computer purchases, approximately 60% of the manufacturers indicated that training in computerized bookkeeping and inventory control would be helpful. Interest in computer training was stronger with the smaller manufacturers. Computer training can be obtained through numerous sources--vendors selling computer hardware and/or software, community colleges, vocational-technical schools, and universities.

### Technology

Sixty-eight percent of the manufacturers (n=32) responded that there is technology or equipment that would enable them to improve their present market position if they were able to purchase it. The primary reason cited for not making the purchases was that the volume of production does not justify the purchase. At the same time, in the attitudinal statements, Oklahoma apparel manufacturers did not indicate a strong interest in using more technologically advanced equipment. Presently 16% of the manufacturers reported using CAD processes such as making patterns, grading patterns and marker making. Even so, only 30 to 40% of the manufacturers indicated that they need to devote more money to technological processes such as using more sophisticated equipment, CAD, and/or CAM. Both sizes of manufacturers reported a need to devote more money to CAD, and more large manufacturers reported a need to devote more money to CAM. These responses are in agreement with other research studies (Staples, 1990; Sheldon, 1988; Belleau & Didier, 1989) who found that CAD use is increasing, but the adoption of computers for pattern making is still low. Similarly, large Oklahoma apparel manufacturers tend to use computers more often than small companies, and CAD is used primarily for pattern making rather than for design/illustration purposes.

Although a small percentage of the manufacturers reported a need to devote money to CAD and CAM, a high percentage (59 - 64%) indicated an interest in CAD and/or CAM training. This interest was stronger with small manufacturers.

In summary, although presently not perceived as a strong need, there is an awareness of and interest in knowing more about CAD and CAM. It is possible that some of the large manufacturers are already using CAD at the parent or corporate level which would explain their lack of interest. The small manufacturers are interested in training with CAD and CAM, but may not feel that they presently have the capital or that production justifies such a high dollar investment.

#### Manufacturer Relationships

Overall, Oklahoma apparel manufacturers appear to be satisfied in their supplier/manufacturer relationships. The quality of supplies received is satisfactory, and they do not have a problem of receiving substitutions rather than supplies ordered from vendors. Although less than half, some of the manufacturers expressed dissatisfaction with the price paid for supplies and the quantity of supplies stipulated by vendors to fill orders. This was more of a problem for the small manufacturers. Perhaps the volume of production by small manufacturers does not justify the cost



and required quantities of supplies required to fill orders. This could be a critical issue for the small manufacturer who is often operating on a small budget and a low profit margin.

More small than large Oklahoma apparel manufacturers tend to experience difficulty in their manufacturer/customer relationships. Specific areas of difficulty are making contact with customers and the manufacturers' geographic location. These findings agree with those of the Dickerson and Dalecki (1991) study. It is possible that the small manufacturers do not have the resources available to make contact with retailers to establish profitable relationships. Many of these difficulties could be reduced somewhat through a sourcing fair with designers and retailers as mentioned earlier.

### Marketing

Sixty-two percent of the manufacturers reported a need to focus on a stronger marketing program. The manufacturers also indicated that training in marketing would be helpful. In both cases, the response was stronger with small manufacturers. It is possible that the large manufacturers presently have the resources through a parent company to meet their marketing needs. A stronger marketing focus and assistance to support the focus was also found as a need in the Missouri and New York (Dickerson, Dalecki, & Meyer,

1991; McDowell & Hester, 1986) studies. A seminar focusing on marketing methods and techniques could be beneficial to the manufacturers. This seminar could be held on a semi-annual basis in order to continually provide support to the manufacturers with additional innovative marketing techniques.

### Conclusion

Overall, small apparel manufacturers appear to have a stronger need for assistance than do large apparel manufacturers. These needs are most apparent in the areas of obtaining and retaining skilled employees, increasing production, utilizing technological equipment, and maintaining relationships with both the supplier and customer. Overall, small manufacturers also reported a stronger interest in educational training. Therefore, persons and programs geared toward assisting Oklahoma apparel manufacturers might consider focusing their assistance on the small manufacturers. Many of their needs can be met through educational training programs offered by university-sponsored programs, industry seminars, and vocational technical schools. Additional ways of meeting the manufacturers' needs are through a sourcing fair and active government representation. At the same time, the focus of the assistance should not be limited to only small manufacturers. The large apparel manufacturers expressed a

need to expand production and for training in management/supervisory development, CIM, and CAM. Overall, the large manufacturers appear to be getting the majority of their needs met--most likely, on the corporate level.

#### Acknowledgements

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Many of the survey questions used for this study were adapted from the instrument used in the Dickerson, Dalecki and Meyer (1991) and Dickerson and Dalecki (1991) studies.

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Table 1. Reasons manufacturers cited for annual employee turnover.

Reasons	Number One Reason		Number Two Reason		Number Three Reason		Total
	f	%	f	%	f	%	f
Seasonal cycles	4	40	0	0	6	60	10
Better paying jobs	5	33	6	40	4	27	15
Management/ employee conflicts	0	0	0	0	1	100	1
Personal (such as family illness, relocation, etc.)	6	25	13	54	5	21	24
Lifestyle (such as prefers government assistance rather than working)	10	48	4	19	7	33	21
Other	2	50	2	50	0	0	4

Table 2. Manufacturers' perceived needs by size of manufacturer.

Attitudes/Needs	Size	N	Agree Percent	Disagree Percent	Undecided Percent
A. Obtaining skilled employees is easy.	Small	22	9	77	22
	Large	16	12	75	16
	Total	38	11	76	38
B. Our employees need more training.	Small	23	74	13	23
	Large	16	50	31	16
	Total	39	64	21	39
C. Our plant can increase labor productivity per worker.	Small	22	91	4	4
	Large	16	94	6	0
	Total	38	92	5	3
D. Our plant is willing to act as a contractor to produce new products (for example, produce for someone else).	Small	20	50	40	10
	Large	9	78	11	11
	Total	29	59	31	10
E. Our plant is interested in expanding production.	Small	22	77	14	9
	Large	15	80	13	7
	Total	37	78	13	8
F. Our plant is interested in entering into joint or co-operative ventures with other manufacturers.	Small	21	33	38	29
	Large	8	37	37	25
	Total	29	34	38	28

Table 2 Continued.

	Attitudes/Needs	Size	N	Agree Percent	Disagree Percent	Undecided Percent
G.	Our plant needs to use more sophisticated equipment.	Small	22	45	41	14
		Large	15	33	53	13
		Total	37	40	46	13
H.	Our plant needs to devote more money to computer aided design (CAD) equipment.	Small	23	30	48	22
		Large	13	31	46	23
		Total	36	31	47	22
I.	Our plant needs to devote more money to computer aided manufacturing (CAM) equipment.	Small	23	30	35	35
		Large	14	43	36	21
		Total	37	35	35	30
J.	We are satisfied with the price we pay for our supplies.	Small	23	26	52	22
		Large	13	38	23	38
		Total	36	30	42	28
K.	We are satisfied with the quality of the supplies we receive.	Small	23	49	30	22
		Large	15	53	33	13
		Total	38	50	32	18
L.	We would prefer to order supplies in smaller quantities.	Small	22	54	32	14
		Large	13	38	38	23
		Total	35	48	34	17
M.	We receive substitutions from our vendors rather than the supplies we order.	Small	21	14	81	5
		Large	13	0	92	8
		Total	34	9	85	6



Table 2 Continued.

	Attitudes/Needs	Size	N	Agree Percent	Disagree Percent	Undecided Percent
N.	We have difficulty writing specifications to our suppliers for the product or service we want to receive.	Small	21	24	62	14
		Large	12	25	75	0
		Total	33	24	67	9
O.	Our supplies are delivered in a timely manner.	Small	23	70	17	13
		Large	14	71	14	14
		Total	37	70	16	13
P.	Making contact with retailers to show our line is often difficult.	Small	19	47	53	0
		Large	9	33	55	11
		Total	28	43	54	3
Q.	Retailers make production decisions more difficult.	Small	19	47	31	21
		Large	10	60	30	10
		Total	29	52	31	17
R.	Our plant needs to focus on a stronger marketing program.	Small	21	71	19	9
		Large	8	37	37	25
		Total	29	62	24	14
S.	Our company's geographic location makes it difficult to maintain effective contact with retailers.	Small	20	30	70	0
		Large	11	18	82	0
		Total	31	26	74	0

Table 3. Manufacturers' educational needs.

Educational Needs		Size	N	Percent Very Helpful	Percent Somewhat Helpful	Percent Not Helpful At All
A.	Labeling	Small	20	25	40	35
		Large	15	13	13	73
		Total	35	20	29	51
B.	Exporting	Small	20	30	30	40
		Large	15	20	7	73
		Total	35	26	20	54
C.	Contracting	Small	21	38	52	9
		Large	15	20	20	60
		Total	36	31	39	31
D.	Language proficiency	Small	19	37	21	42
		Large	14	7	14	79
		Total	33	24	18	58
E.	Computerized bookkeeping	Small	20	55	35	10
		Large	14	21	14	64
		Total	34	41	26	32
F.	Computerized inventory control	Small	21	62	19	19
		Large	14	14	14	71
		Total	35	43	17	40
H.	Marketing	Small	20	55	40	5
		Large	15	13	40	47
		Total	35	37	40	23

Table 3. Continued.

	Educational Needs	Size	N	Percent Very Helpful	Percent Somewhat Helpful	Percent Not Helpful At All
I.	Management/ supervisory development	Small	20	55	40	5
		Large	15	33	53	13
		Total	35	46	46	8
J.	Computer aided design (CAD)	Small	22	45	27	27
		Large	13	31	0	69
		Total	35	40	17	43
K.	Computer aided manufacturing (CAM)	Small	21	48	19	33
		Large	16	37	12	50
		Total	37	43	16	40
L.	Computer integrated manufacturing (CIM)	Small	21	48	19	33
		Large	15	27	33	40
		Total	36	39	25	36

## CHAPTER V

### INTRODUCTION, METHODS, CONCLUSIONS AND RECOMMENDATIONS

#### Introduction and Methods

The purpose of this study was to gather data and determine the needs of Oklahoma apparel manufactures. The objectives of the study were (a) To determine baseline data relating to the 1991 status of Oklahoma apparel manufacturers in terms of employment, production, and technology; (b) to determine Oklahoma apparel manufacturers' perceived needs in terms of employee training, production, technology, supplier/manufacturer relationships, marketing, and manufacturer/customer relationships; to determine if these needs differ by size of manufacturer; and (c) to determine the interest of Oklahoma apparel manufacturers in expanding production.

The sample consisted of 106 Oklahoma apparel manufacturers. Data were gathered through a survey instrument designed to obtain demographic and attitudinal information related to the objectives of this study. The survey design followed the Dillman (1978) method which included two mailings plus a postcard. Through the process

of the two mailings and telephone calls to the manufacturers, 16 manufacturers were identified as no longer being in business. After eliminating these manufacturers from the population, the final population size consisted of 82 manufacturers. A total of 39 surveys were returned, giving a response rate of 48%.

### Conclusions and Recommendations

#### Employment

The majority of apparel manufacturers in Oklahoma are experiencing difficulty obtaining skilled employees and are providing on the job training to their employees. Even so, manufacturers indicated that additional training would be helpful--specifically management/supervisory development.

Oklahoma apparel manufacturers are experiencing an average turnover rate of 27%. The reasons cited for turnover were "personal" and "lifestyle." Turnover due to the lifestyle reason could be reduced through government policy. A representative in the Oklahoma House of Representatives could become an advocate for the apparel industry with the governor and the legislature.

Another possible way of reducing employee turnover due to lifestyles is training in interviewing techniques. Targeted Selection (Development Dimensions International, 1981) is a program where the interviewer learns to use the applicant's specific past behaviors, actions,

accomplishments, and experiences to predict the applicant's future job behavior. Through this method, the interviewer can better identify the interviewee's work history in terms of productivity and employment longevity.

### Production

Oklahoma apparel manufacturers indicated an interest in increasing production by expanding present production or serving as a contractor to produce new products (more large than small manufacturers were interested in this option).

Ninety-two percent of the manufacturers felt that they could increase labor productivity per worker, and this attitude did not differ by size of manufacturer. Possible means of increasing productivity include programs that utilize work teams where the focus is on employee empowerment and a horizontal management structure. A second means of increasing productivity, and at the same time quality, is through Total Quality Management (TQM) where the focus is on continuously improving performance at every level, and in all areas of responsibility.

In order for increased production to be profitable, there should also be an increased demand for the manufacturers' products. A means of increasing demand is through a sourcing fair that would bring together retailers and Oklahoma manufacturers to introduce retailers to the

state's apparel producers, thereby providing and opportunity for increased product demand and contract work.

### Investments

During the past two years all but one manufacturer made an equipment purchase, with 58% making purchases of \$10,000 or more. At the same time, it is possible that Oklahoma apparel manufacturers have been affected by the recession; fewer manufacturers indicated that they will be making equipment purchases of \$10,000 or more in the coming two years, and 17% do not anticipate making equipment purchases at all.

The two most frequently anticipated types of equipment purchases are sewing machines and computers. In addition, approximately 60% of the manufacturers indicated that training in computerized bookkeeping and inventory control would be helpful. Interest in computer training was stronger with the smaller manufacturers. Computer training can be obtained through numerous sources--vendors selling computer hardware and/or software, community colleges, vocational-technical schools, and universities.

### Technology

Sixty-eight percent of the manufacturers (n=32) indicated an interest in more advanced technology or equipment, but cited reported that the volume of production

would not justify the purchase. A small percentage of the manufacturers reported using CAD processes; even so, only 30 - 40% reported a need to devote more money to processes involving CAD and/or CAM. These responses are in agreement with other research studies (Staples, 1990; Sheldon, 1988; Belleau & Didier, 1989) which found that CAD use is increasing, but the adoption of computers for pattern making is still low. However, a high percentage of manufacturers (59 - 64%) indicated an interest in CAD and/or CAM training. This interest was stronger with small manufacturers. It is possible that some of the large manufacturers are already using CAD at the parent or corporate level which would explain their lack of interest. The small manufacturers are interested in training with CAD and CAM, but may not feel that they presently have the capital or that production justifies such a high dollar investment.

#### Manufacturer Relationships

Overall, Oklahoma apparel manufacturers appear to be satisfied in their supplier/manufacturer relationship--more specifically, in the quality of supplies received from vendors. However, some of the manufacturers expressed dissatisfaction with the price paid for supplies and the high minimum quantity required for filling orders. This was more of a problem for the small manufacturers.



More small than large Oklahoma apparel manufacturers tend to experience difficulty in making contact with customers and feel that their geographic location is a contributing factor. These findings agree with those of the Dickerson and Dalecki (1991) study. It is possible that the small manufacturers do not have the resources available to make contact with retailers. Many of these difficulties could be reduced somewhat through the sourcing fair with designers and retailers mentioned earlier.

### Marketing

Sixty-two percent of the manufacturers reported a need to focus on a stronger marketing program and that training in marketing would be helpful. In both cases, the response was stronger with small manufacturers. It is possible that the large manufacturers presently have the resources through a parent company to meet their marketing need. A stronger marketing focus and assistance to support the focus was also found as a need in the Missouri and New York (Dickerson, Dalecki, & Meyer, 1991; McDowell & Hester, 1986) studies. A semi-annual seminar focusing on marketing methods and techniques could be beneficial to the manufacturers.

In conclusion, small apparel manufacturers appear to have a stronger need for assistance and indicated more interest in educational assistance than did large manufacturers. Many of their needs can be met through

educational training programs offered by university-sponsored programs, industry seminars, vocational-technical schools, a sourcing fair, and active government representation.

#### Recommendations for Further Research

1. It is possible that the assistance and educational needs of manufacturers vary by geographical regions. Needs assessment studies by region can help persons offering aid to the manufacturers to better focus their assistance.

2. There are many resources presently available to assist small businesses. These resources take the form of small business loans; and training in small business management, bookkeeping, supervisory skills, and technology. These resources are made available through community colleges, the vocational education system, industry seminars, etc. Many of the manufacturers, specifically the small ones, may not be aware of all the resources for assistance presently available to them. A study focusing specifically on the manufacturers' awareness could be beneficial in increasing the manufacturers' utilization of the resources, consequently meeting their needs, and possibly increasing profits.

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APPENDIX A

COVER LETTERS, POSTCARD AND  
SURVEY INSTRUMENT

November 1, 1991

Dear:

Many apparel manufacturers in the United States are experiencing critical economic times. We are gathering information about Oklahoma apparel manufacturers to determine:

- (1) a profile of Oklahoma apparel manufacturers,
- (2) the needs of Oklahoma apparel manufacturers, and
- (3) services that can be designed to meet the manufacturers' needs and increase their profits.

Your plant is one of the Oklahoma apparel manufacturers being asked to provide information regarding apparel manufacturing. As an apparel manufacturer in Oklahoma, you are able to provide information about the needs of Oklahoma apparel manufacturers that cannot be obtained elsewhere. Would you please take a few minutes to complete the enclosed questionnaire?

You may be assured that your responses will receive complete confidentiality. The questionnaire has an identification number for mailing purposes only. This is so that we may check your name off of the mailing list when your questionnaire is returned. Your name will never be placed on the questionnaire.

The results of this research will be accessible to the Oklahoma Gas & Electric Business Resource Center, Oklahoma Department of Commerce, and the Center for Apparel Marketing and Merchandising. These organizations will use the information as a basis for planning strategies to improve the position of Oklahoma apparel manufacturers.

Please return your response in the enclosed postage-paid envelope by November 18, 1991. Thank you for your time and assistance.

Sincerely,

Dr. Donna Branson

Alice Rushmore

Dear Apparel Manufacturer,

One week ago a questionnaire concerning Oklahoma apparel manufacturers was mailed to you. If you have already completed and returned the questionnaire, please accept my sincere thanks. If not, please do so by November 20, 1991.

The information that you provide is important in developing a profile of Oklahoma apparel manufacturers and determining their needs. If you did not receive the questionnaire, please call me at (405) 743-5035 and request that a questionnaire be mailed to you.

Sincerley,

Dr. Donna Branson



Dear:

About four weeks ago we wrote you seeking your opinion about Oklahoma apparel manufacturers and their needs. As of today we have not yet received your completed questionnaire.

We have undertaken this research study because of the belief that many Oklahoma apparel manufacturers are presently experiencing critical economic times. We are gathering information about Oklahoma apparel manufacturers to determine:

- (1) a profile of Oklahoma apparel manufacturers,
- (2) the needs of Oklahoma apparel manufacturers, and
- (3) services that can be designed to meet the manufacturers' needs and increase their profits.

We are writing to you again because of the significance each questionnaire has to the usefulness of this study. Your plant is one of the Oklahoma apparel manufacturers being asked to provide information regarding apparel manufacturing. In order for the results of this study to be truly representative of the opinions of Oklahoma apparel manufacturers it is essential that each person in the sample return their questionnaire.

In the event that your questionnaire has been misplaced, a replacement is enclosed.

Your cooperation is greatly appreciated.

Sincerely,

Donna Branson, PhD  
Professor

Alice Rushmore



**Directions:** Please read each question carefully and respond in the manner indicated.

- A. What is your position in the plant? (please specify)

POSITION: \_\_\_\_\_

- B. How many years has this plant been in business with the present owner? (please specify)

NUMBER OF YEARS: \_\_\_\_\_

- C. How many employees are on payroll at this plant? (please specify)

NUMBER OF EMPLOYEES: \_\_\_\_\_

- D. Where do the majority of your employees receive their training? (circle all that apply)

1. ON THE JOB
2. INDUSTRY SEMINARS
3. VOCATIONAL/TECHNICAL SCHOOL
4. UNION PROGRAM (APPRENTICESHIP)
5. COMMUNITY COLLEGE
6. FOUR YEAR COLLEGE

- E. On an annual basis, what is the average rate of employee turnover? (fill in blank line)

ANNUAL EMPLOYEE TURNOVER: \_\_\_\_\_

- F. What are the three primary reasons for employee turnover? (Place a "1" next to the most frequent reason, "2" next to the second most frequent reason, and "3" next to the third most frequent reason)

- \_\_\_\_\_ SEASONAL CYCLES
- \_\_\_\_\_ BETTER PAYING JOBS
- \_\_\_\_\_ MANAGEMENT/EMPLOYEE CONFLICTS
- \_\_\_\_\_ PERSONAL (such as: family illness, relocation, etc.)
- \_\_\_\_\_ LIFESTYLE (such as: prefers government assistance rather than working)
- \_\_\_\_\_ OTHER (please specify)

\_\_\_\_\_

G. If your plant has a parent or sister company, where is it located?

1. NOT APPLICABLE

2. LOCATION(S): \_\_\_\_\_

\_\_\_\_\_

H. Is your plant unionized? (circle number)

1. NO

2. YES

I. Do you have the equipment to perform the following functions at your plant? (circle no or yes response for each category)

NO YES CUT WOVEN FABRICS

NO YES SEW WOVEN FABRICS

NO YES CUT KNIT FABRICS

NO YES SEW KNIT FABRICS

J. Please specify what your product lines consist of (for example: men's and boys' underwear; women's misses' and juniors' blouses and shirts; girls' dresses etc.) (fill in blank lines)

PRODUCT LINES: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

K. Do you belong to the following organizations? (circle all that apply)

1. AMERICAN APPAREL MANUFACTURERS ASSOCIATION (AAMA)

2. SOUTHERN APPAREL MANUFACTURERS ASSOCIATION (SAMA)

3. AMERICAN APPAREL CONTRACTORS ASSOCIATION

4. NATIONAL KNITWEAR AND SPORTSWEAR ASSOCIATION

5. OTHER (Please specify)

\_\_\_\_\_

L. If you do **not** belong to a professional organization, please specify why (such as high dues, location, does not meet needs, etc.).

\_\_\_\_\_

\_\_\_\_\_

**Read the statements below and circle the number in the column that best represents your perception of your plant.**

**KEY: 1=STRONGLY AGREE 2=AGREE 3=UNDECIDED 4=DISAGREE  
5=STRONGLY DISAGREE NA=NOT APPLICABLE**

A.	Obtaining skilled employees is easy.	1	2	3	4	5	NA
B.	Our employees need more training.	1	2	3	4	5	NA
C.	Our plant can increase labor productivity per worker.	1	2	3	4	5	NA
D.	Our plant is willing to act as a contractor to produce new products (for example, produce for someone else).	1	2	3	4	5	NA
E.	Our plant is interested in expanding production.	1	2	3	4	5	NA
F.	Our plant is interested in entering into joint or co-operative ventures with other manufacturers.	1	2	3	4	5	NA
G.	Our plant needs to use more sophisticated equipment.	1	2	3	4	5	NA
H.	Our plant needs to devote more money to computer aided design (CAD) equipment.	1	2	3	4	5	NA
I.	Our plant needs to devote more money to computer aided manufacturing (CAM) equipment.	1	2	3	4	5	NA
J.	We are satisfied with the price we pay for our supplies.	1	2	3	4	5	NA
K.	We are satisfied with the quality of the supplies we receive.	1	2	3	4	5	NA
L.	We would prefer to order supplies in smaller quantities.	1	2	3	4	5	NA
M.	We receive substitutions from our vendors rather than the supplies we order.	1	2	3	4	5	NA
N.	We have difficulty writing specifications to our suppliers for the product or service we want to receive.	1	2	3	4	5	NA
O.	Our supplies are delivered in a timely manner.	1	2	3	4	5	NA

**KEY: 1=STRONGLY AGREE 2=AGREE 3=UNDECIDED 4=DISAGREE  
5=STRONGLY DISAGREE NA=NOT APPLICABLE**

P.	Making contact with retailers to show our line is often difficult.	1	2	3	4	5	NA
Q.	Retailers make production decisions more difficult.	1	2	3	4	5	NA
R.	Our plant needs to focus on a stronger marketing program.	1	2	3	4	5	NA
S.	Our company's geographic location makes it difficult to maintain effective contact with retailers.	1	2	3	4	5	NA

**Read the statement below and circle the number that best represents your response.**

How helpful would the following programs be in serving your plant's continuing educational needs?

**KEY: 1=VERY HELPFUL 2=SOMEWHAT HELPFUL 3=NOT HELPFUL AT ALL**

A.	LABELING	1	2	3
B.	EXPORTING	1	2	3
C.	CONTRACTING	1	2	3
D.	LANGUAGE PROFICIENCY	1	2	3
F.	COMPUTERIZED BOOKKEEPING	1	2	3
G.	COMPUTERIZED INVENTORY CONTROL	1	2	3
H.	MARKETING	1	2	3
I.	MANAGEMENT/SUPERVISORY DEVELOPMENT	1	2	3
J.	COMPUTER AIDED DESIGN (CAD)	1	2	3
K.	COMPUTER AIDED MANUFACTURING (CAM)	1	2	3
L.	COMPUTER INTEGRATED MANUFACTURING (CIM)	1	2	3

**Read the statement below and circle the number that best represents your response.**

How frequently do you use the following sources of information?

**KEY: 1=FREQUENTLY 2=SOMETIMES 3=NEVER**

A.	SALES REPRESENTATIVES	1	2	3
B.	TRADE SHOWS	1	2	3
C.	TRADE ASSOCIATIONS/JOURNALS	1	2	3
D.	EDUCATIONAL INSTITUTIONS	1	2	3
E.	GOVERNMENT PROGRAMS	1	2	3
F.	SEMINARS/WORKSHOPS	1	2	3
G.	OTHER MANUFACTURERS	1	2	3
H.	COOPERATIVE EXTENSION	1	2	3

A. Which of the following manufacturing processes *are performed at your plant?* (circle all that apply)

1. GARMENT DESIGN
2. MAKING PRODUCTION PATTERNS
3. GRADING PATTERNS
4. MARKER MAKING
5. ACQUIRING FABRIC AND RELATED MATERIALS
6. CUTTING FABRIC
7. PRODUCTION OF FABRIC PIECES INTO COMPLETED GARMENTS
8. ARRANGING SALE OF GARMENTS TO RETAILERS
9. DISTRIBUTION

B. Which of the following manufacturing processes *performed at your plant* are computerized? (circle all that apply)

1. GARMENT DESIGN
2. PRODUCTION PLANNING
3. MAKING PATTERNS
4. GRADING PATTERNS
5. MARKER MAKING
6. CUTTING FABRIC
7. PRODUCTION OF FABRIC PIECES INTO COMPLETED GARMENTS
8. QUALITY CONTROL
9. DATA MANAGEMENT

- C. About what percentage of full production capacity is utilized today by your plant? (please specify)

PERCENTAGE: \_\_\_\_\_

- D. In the past two years, have you made total equipment purchases equaling a dollar amount in one of the following ranges? (circle number)

1. LESS THAN \$1,000
2. \$1,000 TO \$1,999
3. \$2,000 TO \$4,999
4. \$5,000 TO \$9,999
5. \$10,000 OR MORE
6. NO PURCHASES MADE

- E. In the next two years, do you plan to make total equipment purchases equaling a dollar amount in one of the following ranges? (circle number)

1. LESS THAN \$1,000
2. \$1,000 TO \$1,999
3. \$2,000 TO \$4,999
4. \$5,000 TO \$9,999
5. \$10,000 OR MORE
6. DO NOT ANTICIPATE MAKING EQUIPMENT PURCHASES

- F. If you do anticipate an equipment purchase in the next two years, please specify the type(s) of equipment.

\_\_\_\_\_  
\_\_\_\_\_

- G. Do you anticipate making any other capital improvements (for example: remodeling plant, installing air conditioner, etc) in the next two years? (circle number)

1. NO
2. YES (please specify)

\_\_\_\_\_  
\_\_\_\_\_

- H. Is there technology or equipment that would enable you to improve your present market position if you were able to purchase it? (circle number)

1. NO
2. YES (please specify type(s) of equipment)

\_\_\_\_\_



- If yes,
- I. Would any of the following factors prohibit the purchase of equipment?  
(circle all that apply)
1. NEED FOR EMPLOYEE TRAINING ON EQUIPMENT
  2. EQUIPMENT MAINTENANCE
  3. VOLUME OF PRODUCTION DOES NOT JUSTIFY EQUIPMENT PURCHASE
- J. Which of the following best describes the majority of your customers? (circle number)
1. DISTRIBUTION CENTER/WHOLESALE
  2. MASS MERCHANDISERS (FOR EXAMPLE: SEARS)
  3. RETAILERS (FOR EXAMPLE: THE GAP, LOCAL RETAILERS, ETC.)
  4. FEDERAL GOVERNMENT (FOR EXAMPLE: MILITARY)
  5. CITY AND/OR STATE GOVERNMENT (FOR EXAMPLE: POLICE UNIFORMS)
  6. OTHER MANUFACTURERS
  7. INDIVIDUAL CONSUMERS
  8. OTHER (PLEASE DESCRIBE)
- 
- K. What do you perceive to be the primary problems (for example: wages, government policy, etc.) faced by your plant?
- L. Is there anything else that you would like to add or see included in this questionnaire? (please specify in space below)

**THANK YOU FOR YOUR TIME IN COMPLETING THIS SURVEY.**

## APPENDIX B

### TABLES

Table IV

Topics Covered in *Apparel Manufacturer:*  
*A Technical Journal of Bobbin*  
*Magazine (1)1-3 and (2)1-9*

Category	Number of Articles N=101	Percentage of Total Articles
Production Equipment	20	20
Computerized Manufacturing	10	10
Sewing Systems	10	10
Material Utilization	8	8
Employee Testing/Training	8	8
Payroll	5	5
Quality	5	5
Miscellaneous	35	35

TABLE V  
NUMBER OF YEARS IN BUSINESS  
WITH PRESENT OWNER

Number of Years in Business	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	4	10.5	4	10.5
2	6	15.8	10	26.3
3	6	15.8	16	42.1
4	2	5.3	18	47.4
5	5	13.2	23	60.5
6	4	10.5	27	71.1
7	1	2.6	28	73.7
8	1	2.6	29	76.3
11	1	2.6	30	78.9
12	1	2.6	31	81.6
13	1	2.6	32	84.2
21	1	2.6	33	86.8
22	1	2.6	34	89.5
24	1	2.6	35	92.1
38	1	2.6	36	94.7
45	1	2.6	37	97.4
54	1	2.6	38	100.0

n=38

TABLE VI  
NUMBER OF EMPLOYEES

Number of Employees	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0 - 19	14	37	14	37
20 - 49	8	21	22	58
50 - 99	7	18	29	76
100 - 249	6	16	35	92
250 - 450	3	8	38	100

TABLE VII  
SOURCE OF EMPLOYEE TRAINING

Source of Training	Frequency	Percent
On the job	38	100
Industry seminars	1	3
Vocational/technical school	1	3
Union program (apprenticeship)	0	0
Community college	0	0
Four-year college	1	3

n=38

TABLE VIII  
PERCENTAGE OF ANNUAL EMPLOYEE TURNOVER

Percent of Annual Employee Turnover	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	6	17.6	6	17.6
1	1	2.9	7	20.6
3	1	2.9	8	23.5
4	1	2.9	9	26.5
5	1	2.9	10	29.4
10	3	8.8	13	38.2
15	3	8.8	16	47.1
24	1	2.9	17	50.0
25	3	8.8	20	58.8
30	1	2.9	21	61.8
37	1	2.9	22	64.7
40	4	11.8	26	76.5
45	1	2.9	27	79.4
50	3	8.8	30	88.2
55	1	2.9	31	91.2
75	1	2.9	32	94.1
100	2	5.9	34	1

n=34

TABLE IX  
AVAILABLE EQUIPMENT TO PERFORM  
FUNCTIONS ON WOVEN AND  
KNIT FABRICS

---

Function	Frequency	Percent
Cut woven fabrics	28	71
Sew woven fabrics	35	90
Cut knit fabrics	24	61
Sew knit fabrics	31	79

---

n=39



TABLE X  
ORGANIZATIONS OKLAHOMA APPAREL  
MANUFACTURERS BELONG TO

Organization	Frequency	Percent
American Apparel Manufacturers Association	9	24
Southern Apparel Manufacturers Association (SAMA)	0	0
American Apparel Contractors Association	1	3
National Knitwear and Sportswear Association	0	0
Other	1	3

n=38

TABLE XI  
MANUFACTURERS' PERCEIVED NEEDS

		n	Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree	
			f	%	f	%	f	%	f	%	f	%
A.*	Obtaining skilled employees is easy.	38	12	32	17	45	5	13	4	10	0	0
B.	Our employees need more training.	39	2	5	23	60	6	15	8	20	0	0
C.	Our plant can increase labor productivity per worker.	38	11	29	24	63	1	3	1	3	1	3
D.	Our plant is willing to act as a contractor to produce new products (for example, produce for someone else).	29	9	31	8	28	3	10	4	14	5	17
E.	Our plant is interested in expanding production.	37	12	32	17	46	3	8	3	8	2	5
F.	Our plant is interested in entering into joint or co-operative ventures with other manufacturers.	29	5	17	5	17	8	28	6	21	5	17
G.*	Our plant needs to use more sophisticated equipment.	37	3	8	14	38	5	13	9	24	6	16

\*Indicates that during analysis responses were "flipped" to align negatively stated items.

TABLE XI (Continued)

	n	Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree	
		f	%	f	%	f	%	f	%	f	%
H.* Our plant needs to devote more money to computer aided design (CAD) equipment.	36	7	19	10	28	8	22	9	25	2	6
I.* Our plant needs to devote more money to computer aided manufacturing (CAM) equipment.	38	4	11	9	24	11	30	11	30	2	5
J. We are satisfied with the price we pay for our supplies.	36	0	0	11	31	10	28	11	31	4	11
K. We are satisfied with the quality of the supplies we receive.	38	0	0	19	50	7	18	11	29	1	3
L. We would prefer to order supplies in smaller quantities.	35	4	11	13	37	6	17	10	29	2	6
M.* We receive substitutions from our vendors rather than the supplies we order.	34	9	26	20	59	2	6	1	3	2	6

\*Indicates that during analysis responses were "flipped" to align negatively stated items.

TABLE XI (Continued)

	n	Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree	
		f	%	f	%	f	%	f	%	f	%
N.* We have difficulty writing specifications to our suppliers for the product or service we want to receive.	34	7	21	15	45	3	9	6	18	2	6
O. Our supplies are delivered in a timely manner.	37	6	16	20	54	5	14	4	11	2	5
P.* Making contact with retailers to show our line is often difficult.	28	4	14	11	39	1	4	10	36	2	7
Q.* Retailers make production decisions more difficult.	29	2	7	7	24	5	17	13	45	2	7
R.* Our plant needs to focus on a stronger marketing program.	29	2	7	5	17	4	14	14	48	4	14
S.* Our company's geographic location makes it difficult to maintain effective contact with retailers.	31	7	23	16	52	0	0	6	19	2	6

\*Indicates that during analysis responses were "flipped" to align negatively stated items.

TABLE XII  
SOURCES OF INFORMATION USED BY  
OKLAHOMA APPAREL MANUFACTURERS

Source of information	n	Frequently	Sometimes	Never
Sales representatives	37	57	32	11
Trade shows	37	49	38	13
Trade associations/ journals	37	30	54	16
Educational institutions	37	8	51	41
Government programs	37	0	43	57
Seminars/ workshops	36	8	61	31
Other manufacturers	37	24	59	16
Cooperative extension	37	0	30	70

TABLE XIII  
MANUFACTURING PROCESSES PERFORMED  
AT OKLAHOMA PLANTS

Process	Frequency	Percent
Garment design	24	65
Making production patterns	22	59
Grading patterns	20	54
Marker making	23	62
Acquiring fabric and related materials	26	70
Cutting fabric	30	81
Production of fabric pieces into completed garments	34	92
Arranging sale of garments to retailers	20	54
Distribution	25	68
N=37		

TABLE XIV  
COMPUTERIZED MANUFACTURING PROCESSES

Process	Frequency	Percent
Garment design	3	8
Production planning	11	30
Making patterns	6	17
Grading patterns	6	16
Marker making	6	16
Cutting fabric	3	8
Production of fabric pieces into completed garments	2	5
Quality control	1	3
Data management	23	62

N=37

TABLE XV  
PERCENT OF FULL PRODUCTION ACHIEVED  
BY OKLAHOMA MANUFACTURERS

<u>Percentage of Production</u>	<u>Frequency</u>
10	1
25	1
30	2
50	3
55	1
65	1
70	3
75	5
80	2
85	4
90	4
95	2
100	1



TABLE XVI  
EQUIPMENT PURCHASES MADE IN 1990-1991  
AND ANTICIPATED IN 1992-1993

Dollar range	Purchases Made In 1990-1991		Purchases Anticipated In 1992-1993	
	Frequency	Percent	Frequency	Percent
Less than \$1,000	0	0	2	6
1,000 to \$1,999	1	3	1	3
\$2,000 to \$4,999	5	14	3	8
\$5,000 to \$9,999	8	22	7	19
\$10,000 or more	21	58	17	47
No purchase made/anticipate d	1	3	6	17
n=36				

TABLE XVII  
 TYPES OF EQUIPMENT PURCHASES  
 ANTICIPATED IN 1992-1993

Types of equipment	Frequency	Percent
Cutting equipment	2	7
Automatic spreading machine	2	7
Sewing machine	13	46
Pressing equipment	2	7
Computer	5	18
Chairs	1	4
Pocket setter	2	7
Serger	2	7
Cutting table	2	7
Marker maker	1	4
Spreading equipment	2	7
Fusing machine	1	4
Embroidery machine	1	4
Sleeve and closing equipment	1	4
Hemmer	2	7
Button hole machine	2	7
Safety stitch machine	1	4

n=28

TABLE XVIII  
CAPITAL IMPROVEMENTS ANTICIPATED  
IN 1992-1993

Type of improvement	Frequency	Percent
Resurface parking lot	1	8
Paint interior of building	1	8
Improve heating	2	8
Roof repair	3	25
Floor repair	1	8
Air conditioner	3	25
Expansion of building	1	8
Remodeling	5	42
Moving to new location	1	8
n=12		

TABLE XIX

TECHNOLOGY OR EQUIPMENT THAT WOULD ENABLE MANUFACTURER  
TO IMPROVE PRESENT MARKET POSITION

Equipment	Frequency	Percent
Gerber cutting system	1	8
CAD	3	23
CAM	2	15
Computerized marking	1	8
Material log out	1	8
Pocket setter	1	8
Commercial sewing machines	3	23
Fusing equipment	1	8
Cutting table	1	8
Blind hemmer	1	8
Button holer machine	1	8

n=13

TABLE XX  
OKLAHOMA APPAREL MANUFACTURER CUSTOMERS

Customer	Frequency	Percent
Distribution center/wholesaler	9	23
Mass merchandisers (for example: Sears)	8	20
Retailers (for example: The Gap, local retailers, etc.)	24	61
Federal government (for example: military)	3	8
City and/or state government (for example: police uniforms)	1	3
Other manufacturers	3	8
Individual consumers	6	15
Other	2	5
n=39		

TABLE XXI  
PRIMARY PROBLEMS FACED BY MANUFACTURERS

Problem	Frequency	Percent
Government policies (specific reason not given)	11	31
Workman's compensation	10	28
Taxes	4	11
Welfare system	3	8
Lack of Right-to-Work law	1	2
807 Plan	1	2
Unemployment	1	2
Financing	2	6
Wages	5	14
Cash flow problems due to rapid growth	1	2
Financing to advertise and market items	1	2
Increasing production costs	1	2
Miscellaneous		
Imports	3	8
Workforce that is hard to train and motivate	3	8
Location	1	2
Employee lifestyles	1	2
Not enough demand for product	1	2
Exposure to retailers and public (marketing)	1	2
Work too seasonal	1	2
Paper work	1	2
Medical insurance	1	2
Insurance	1	2
Lack of information on sources of raw material	1	2
Locating home sewers to produce quality garments	1	2
n=35		

APPENDIX C

INSTITUTIONAL REVIEW BOARD APPROVAL

OKLAHOMA STATE UNIVERSITY  
INSTITUTIONAL REVIEW BOARD  
FOR HUMAN SUBJECTS RESEARCH

119

Proposal Title: A Needs Analysis of Oklahoma Apparel Manufacturers Listed  
Under Standard Industrial Code 23

Principal Investigator: Dr. D. Branson/Alice Rushmore

Date: 10-21-91 IRB # HE-92-0008

-----  
This application has been reviewed by the IRB and

Processed as: Exempt [☒] Expedite [ ] Full Board Review [ ]

Renewal or Continuation [ ]

Approval Status Recommended by Reviewer(s):

Approved [☒]

Deferred for Revision [ ]

Approved with Provision [ ]

Disapproved [ ]

Approval status subject to review by full Institutional Review Board at  
next meeting, 2nd and 4th Thursday of each month.

-----  
Comments, Modifications/Conditions for Approval or Reason for Deferral or  
Disapproval:

Signature: Marcia L. Tilley

Chair of Institutional Review Board

Date: 10-28-91



VITAY

Alice P. Rushmore

Candidate for the Degree of  
Master of Science

Thesis: A NEEDS ASSESSMENT OF OKLAHOMA APPAREL  
MANUFACTURERS

Major Field: Clothing, Textiles and Merchandising

Biographical:

Personal Data: Born in Monahans, Texas, September 29,  
1958, the daughter of Jerry Rushmore and Jo  
O'Brien.

Education: Graduated from Monahans High School,  
Monahans, Texas in May, 1977; received Bachelor of  
Science Degree in Business Education from Texas  
Tech University in May, 1982; completed  
requirements for Master of Science degree at  
Oklahoma State University in July, 1992.

Professional Experience: Graduate Research Assistant,  
Oklahoma Department of Vocational and Technical  
Education, Stillwater, Oklahoma, September, 1988  
to August 1992. Legal Secretary, Community Legal  
Services, Tulsa, Oklahoma, September 1987 to May,  
1988. Financial Associate, Transok, Inc., Tulsa,  
Oklahoma, May 1986 to February 1987. Operations  
Analyst, First National Bank, Tulsa, Oklahoma,  
December 1984 to February 1986.