

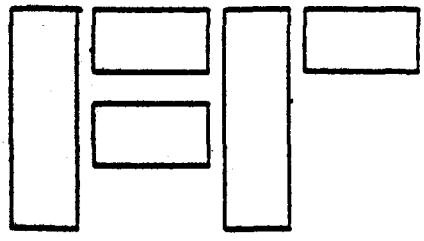
# FASHION INSTITUTE OF TECHNOLOGY

# RESEARCH REPORT

# DEVELOP A BUSINESS PLAN PHASE I

## INFORMATION ACCUMULATION AND INTEGRATION

*Fashion Institute of Technology*




DLA900-87-D-0016/0008

FEBRUARY, 1992





# ADVANCED APPAREL MANUFACTURING TECHNOLOGY

FASHION INSTITUTE OF TECHNOLOGY

DLA900-87-D-0016-0008


## DEVELOP A BUSINESS PLAN

## PHASE I

Information Accumulation
and Integration

FINAL TECHNICAL REPORT A008

Elaine Stone
Project Leader

February, 1992

This project has been sponsored by the
DEFENSE LOGISTICS AGENCY
CAMERON STATION
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**EDITOR'S NOTE**

This Final Technical Report A008, "Develop a Business Plan, Phase I", begins the process of defining the structure of an on-going Advanced Apparel Manufacturing Technology Demonstration unit. This report, which covers the accumulation and integration of information deemed necessary for constructing a business plan, is expected to be followed, in time, by two additional reports. These additional reports will cover Phase II, Preplanning, or Information Analysis; and, Phase III, Finalization, or the Written Plan.

Formalized completion of the work involved in the development of the final reports for Phases II and III will be dependent upon the future issuance of Defense Logistics Agency short term research and development task contracts for them.

February 14, 1992

This research report is the result of work performed under sponsorship of the Fashion Institute of Technology and the United States Department of Defense, Defense Logistics Agency (Contract DLA900-87-D-0016). 

It is hereby submitted to the DLA office (DPMSO), Cameron Station, Alexandria, VA 22304-6100 in accordance with the Contract Data Requirements List, sequence A008.

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# THE MISSION OF THE ENTERPRISE

**The Fashion Institute of Technology (F.I.T.) and The Educational Foundation for the Fashion Industries both agree that the formation of an "independent" Advanced Apparel Manufacturing Technology Demonstration center (AAMTD) will be an important support system to the implementation of the mission goals of the College and the Foundation.**

## THE INSTITUTIONAL MISSION STATEMENT*

The Fashion Institute of Technology is a specialized college offering associate, baccalaureate and graduate programs to prepare men and women for careers in fashion and its related industries, including design, business and communication. The college offers professional studies combined with a broadly based curriculum in the liberal arts to both full-time and part-time students. Not limited by geography, the community that the college serves extends through the state, the nation and the world.

The objectives of F.I.T. are:

- to offer its students professional education in design, communication, business and technology by providing courses that develop their abilities and knowledge for career advancement that are taught by professional faculty in cooperation with industry.
- to provide its students with a broad-based education in liberal arts by offering a wide spectrum of courses in all disciplines that emphasize multi-cultural, intellectual, social and ethical values.
- to promote and foster student growth, maturation and self-development through comprehensive student support services, programs and activities.
- to expose students to the realities of industry by providing opportunities for research, internships, cooperative education and other field experiences.
- to create an environment that stimulates creativity, promotes and supports student diversity and develops individual potential by responding to each student's educational and developmental needs.
- to enable students to develop critical thinking and communication skills in all courses.
- to develop an understanding and appreciation of globalization by offering international courses on campus and study abroad options, as well as opportunities to interact with foreign students at F.I.T.
- to meet the special education needs of employed adults.

The objectives of F.I.T. with respect to the industries it serves are to provide:

- a source of future leadership.
- opportunities for training and retraining.
- a forum for the interchange of information/ideas.
- resources for research and demonstration.

* As approved by the Dean's Cabinet of F.I.T., January 23, 1991.

It is obvious that to meet the objectives of F.I.T.'s mission, a viable AAMTD is a must - both for it's students and for the industry.

The AAMTD, or the succeeding organization with a different name, will still have the same general mission that it had at its founding. That is; to instill in the domestic apparel industry the concept that one of the main paths to successful world competition is by the use of advanced apparel technologies, and to assist the industry with the selection, design and application of these technologies.

## THE BUSINESS OF THE ENTERPRISE

The directions that the newly constituted AAMTD enterprise will take will be two-tracked. Track One will be on the academic side of the Fashion Institute of Technology. An in-depth initial study of current courses has indicated many areas where the integration of the facilities of the AAMTD will broaden the course content and upgrade the understanding of the technology important in all phases of the fashion business (see Exhibit I). The use of the AAMTD as a support system to academic and technical courses will reinforce the quality of the education F.I.T. is justly noted for, not only in the U.S.A., but in the international marketplace.

Track Two will be devoted to the growth of the ongoing program of industry education and support. New dimensions as consultants/ trainers through workshops, symposia and conferences should be undertaken. Acting as an evaluator and as a catalyst and/or broker for new technologies and equipment, designing new plants and/or on-line systems and redesigning old ones, developing new marketing techniques for use in the future, and producing and supplying training manuals for use throughout the country should be among the major thrusts of the new AAMTD.

Most major consulting firms are called upon to conduct comprehensive studies and research programs in both macro and micro environments. Acting in a similar capacity, AAMTD should consider involvement in technical areas where such studies might include:

- development of production plants
- development of technical and production systems
- engineering/reengineering plants
- planning/devising new production systems
- planning/devising new management systems

- engineering of individual garments and/or entire garment lines
- designing/redesigning garments for ease of manufacturing and assembly
- development of quality control systems.

The expertise of AAMTD personnel and the versatility of its facilities can be called upon for professional assistance in all of these and other areas. The AAMTD can function both as a primary supplier of services or act as a sub-contractor when working with leading consulting and management firms. Senior students can be utilized in research and fact-finding on both the macro and micro studies in the same manner as other educational institutions employ their graduate students.

## BUSINESS OPPORTUNITIES FOR THE NEW AAMTD

The risks in manufacturing and marketing apparel today continue to escalate. Published figures report the constant rise in the jobless rate in our industry and, with the current downturn in the economy, more and more business failures are reported. In a perverse manner, these doomsday figures and predictions can have a positive impact on the need for the services AAMTD can provide. Cutting production costs, improving/increasing the utilization of existing facilities, insuring better quality control, reacting to the need for Quick Response, etc., are all programs which need proper training and implementation of new methods and technologies. Manufacturing research has determined that the new technological advances will be of the greatest aid in supporting the movement of apparel manufacturing into production that will be cost effective and competitive in the global marketplace. Most companies will need help to accomplish this move into more technological-oriented manufacturing. It is in this area that the new AAMTD will be able to be most helpful and beneficial to the segment of the market it should target. It should capitalize on the renewed efforts, country-wide and industry-wide, to institute the training and/or retraining of current employees in order to enhance and broaden their skills and to cross-train them; to train and/or retrain their supervisors so they can function better in the advanced technologies milieu; and to supplement the introduction and usage of new apparel manufacturing technologies into more and more companies.

## IDENTIFYING BUSINESS OPPORTUNITIES

During the preceding months, the existence of market needs and/or desires for an enterprise such as the newly envisioned AAMTD was researched. Extensive interviews were conducted with industry professionals in the manufacturing, retail, and auxiliary sectors, as well as with consultants who have been servicing these sectors. This was done in order to ascertain whether there is a compelling need for services that the new AAMTD could offer.

It is easily seen that the fashion industry, like most product industries, has as its final decision-maker, the consumer. As seen in Exhibits II and III, there is an interdependent nature to the fashion business. All levels work together so that the product that reaches the ultimate consumer is one that he/she needs and wants - and is of a desired quality and at a price that can be sustained.

It has been ascertained that there is a great need for technical assistance in the fashion industry. Major trade associations, union groups and professional consulting firms have all been actively conducting research and development studies, applying new technology as it pertains to the textile/apparel industries, and training/retraining workers to function better in a more technologically advanced industry.

Exhibits IV and V show the expected trends in U.S. population by age and major apparel markets. Careful study points out that the major growth in age groups will be in the 45-54 year old male and female groups. This will have a major impact on American apparel makers, sellers and marketers. This age group, historically, buys apparel for different reasons than the 25-44 year old group which has, historically, been the major target group of most apparel manufacturers and retailers. Quality and price are the major factors behind purchase decisions for the older group, whereas change of fashion design is not nearly as important as it is for the younger group. Therefore, makers, retailers and support agencies have to expend their time and energies in preparing to produce and market technologically high-quality apparel to meet the needs and desires of the 45-54 year olds.

From our research studies it has become evident that contractors are in the greatest need of special upgrading in training for the quality-at-a-price type of product. Our research also indicates the need for and a willingness to consider upgrading by manufacturers and contractors at all price lines. The data highlighted research and training needs in:

- new equipment use
- quality control output (TQM, SPC)
- computer use in design (CAD)
- computer use in apparel manufacturing (CIM)
- "how to train" training.

## EXTERNAL VARIABLES

It is obvious that there are many conditions and factors which are not within the control of the AAMTD or any of its future sponsoring or co-sponsoring agencies which will be critical to the success or failure of the new enterprise.

One of the major factors facing the industry is the penetration of imports into the American retail apparel market. Statistics show that there will be an ever-increasing rise in domestic consumption - with a corresponding decrease projected for domestic production - thereby giving rise to the ever-increasing penetration of imports. Particularly impacted already are the types of garment manufacturing best served by the AAMTD and these types are expected to be even more drastically impacted in the future, as seen in Exhibits VI and VII.

Other variables that have major impact upon the industry are the overhead costs and expenses incurred by manufacturers and retailers in the fashion industry. Exhibit VIII clearly shows that these two charges have a sharp impact on the profit margins of both producers and sellers and ultimately add to the prices the consumers have to pay. The factors that lead to these high costs of doing business are uncontrollable variables that the AAMTD cannot impact upon.

However, labor costs are a variable on which AAMTD can have a positive impact for the manufacturer. Markdowns and shortages on the retailers' side can be controlled with the introduction of Quick Response (QR) programs and better and more intensive training of retail managements. Both are services that AAMTD can provide.

It is a fact that the central sales location for the fashion industry is New York City. It is the premier marketing and design center for apparel even if it is no longer the production capital. The production jobs which do remain are concentrated in firms which have forged close ties to the "designer" segments of the industry or who capitalize on particular aspects of marketing or structure of the industry in the region.

The manufacturing sector of the apparel industry has undergone a massive transfer of production to the South and to off-shore areas and foreign producers. The new AAMTD would have a unique opportunity to work with these producers and devise meaningful seminars and training sessions for them.

Still another external variable is the lack of cooperation between levels of the industry. Historically, there has been an adversarial relationship between retailers and manufacturers, as well as between manufacturers and their suppliers. However, new technologies and an emerging spirit of cooperation can be used to assist these groups in working together. The fastest and best method is education and training in the new technologies and training all levels of the industry in the modes of cooperative interface.

Competition among suppliers of consulting services, both academic and technical, is another external variable that can have a tremendous impact upon the success of the new AAMTD. Consultants from every discipline; financial, technological, marketing, international trade, etc., are all endeavoring to capture as large a segment of the fashion industry consulting business as possible.

In fact, external competition from many sources must be evaluated and critical assumptions must be made as to the impact they individually and collectively may have upon the success of a new AAMTD. These sources include the following agencies each of which provides some form of training, seminars and/or technical consulting:

- equipment manufacturers
- trade associations
- unions
- government agencies
- domestic consultants
- international consultants
- $TC^2$-type educational services
- other educational institutions

However, although the economic climate now may have a disquieting effect on the number and scope of consulting contracts, Exhibits IX, X, XI, XII, XIII, XIV and XV clearly show that the issues and concerns of the '90s, compared to the issues and concerns of the '80s, display a definite movement toward technological-based concerns where the expertise of the new AAMTD can be very effective. These concerns are:

In Apparel

- responsive manufacturing
- human resources
- information technology
- flexibility
- product development
- quality
- consumer marketing

In Textiles

- human resources
- responsive manufacturing
- flexibility
- information technology
- quality
- product development
- global sourcing and marketing

In Retail

- technology
- human resources
- systems cost efficiency
- information technology
- strategic focus
- consumer marketing
- service.

## CONDITIONS AND FACTORS

There are many important conditions and factors that are or can be within the control of the new AAMTD or of its sponsoring or co-sponsoring organizations. Simultaneously, there are other factors which cannot be controlled. Some of these elements can have positive impacts upon the success of the enterprise while others may have negative or hindering effects upon the success of the new AAMTD.

On the positive side, we now have in place a modern, operating pilot apparel facility utilizing as much new technology as possible. Also in place is a cadre of experienced specialists in their respective fields that is available for projects and consulting requests. Another positive factor is the outstanding world-wide reputation of F.I.T. which is enhanced constantly by the accomplishments of its graduates and faculty.

Controllable cost, in some areas of the AAMTD, is another plus for the implementation of the new AAMTD.

All of these positive factors, unfortunately, also have corresponding down-side negative impacts. The present modern operating pilot facility is funded by the contract with the Defense Logistics Agency (DLA). If DLA funding lapses it will provide a negative impact and create a huge void of monies needed to maintain the existing facility, continue its operation and to build the new AAMTD. Most of the F.I.T. on-campus specialists are in great demand because of their extraordinary expertise and a lapse in funding could permit the creation of a shortage of the right persons for the right jobs. As a result of the availability of funding, and because of administration's belief in supporting our industry, the AAMTD has worked with industry firms, individuals, trade associations, unions, government agencies and industry consultants many times on a pro-bono basis. The new AAMTD will not be able to continue in this manner.

Another internal element that can have both a positive and negative impact on the new AAMTD is the group of F.I.T. departments and offices that offer technical and general fashion industry training and consulting. To our industry these services enhance the range and variety of the support available at F.I.T. and add to the public image of innovation, creativity and technical know-how that F.I.T. enjoys. These F.I.T. groups include the following:

Office of Industry Research

The Industry Research Department at F.I.T. undertakes industry-sponsored projects in applied research and provides technical assistance to the textile, apparel and other fashion-related industries. Recent sample projects include:

. Apparel designs for new fabric applications

. Design of new product lines for national manufacturers

. Development of garment specifications and review of procedures for prospective state agency contractors

. Market research programs for new products

. Development of specifications and product testing for private label programs

. Members of the F.I.T. faculty work individually and in student/faculty teams to solve manufacturing problems, conduct marketing analyses of new and redesigned products and design interiors. Consultants are provided on a fee-for-service basis.

Seminar Department

The Seminar Department offers workshops, seminars and conferences targeted to the professional and personal growth of adults employed in the related fashion industries. Programs are open-to-the-public offerings as well as custom-designed training sessions and include the following:

. T.I.P.S. - Training and Information Programs and Seminars provide executive-level sessions related to the critical concerns of developing fashion-related businesses

. S.O.S. - The Special Order Seminar service provides customized programs held on-site or at F.I.T., to companies as a supplement to their training and information needs. F.I.T.'s industry-experienced professionals meet with company representatives to create an individualized program to help improve employee performance in today's competitive marketplaces

. Lifestyle Series - seasonal series of contemporary topics that address leisure pursuits, personal development issues and career opportunities.

## Resource Center

F.I.T.'s Edward C. Blum Design Laboratory houses the world's largest collection of swatches, costumes and accessories from the 17th century to the present. A comprehensive research facility, it comprises more than one million articles of dress, including men's, women's and children's garments, furs, accessories, foundation garments and lingerie, as well as a collection of 19th and 20th century designer clothing.

The textile collection consists of four million indexed swatches and 300 swatch books, as well as quilts, rug samples, laces, embroideries and color swatch cards.

## Small Business Center

With a 60 percent increase in small business start-ups in the last five years, the need for services and support systems that address small business and entrepreneurial issues has grown dramatically. The Small Business Center at F.I.T. supports the critical role that entrepreneurship plays in the economic system by instructing present and future small business owners.

The Small Business Studies Program is a five-course series offering basic instruction, from start-up to operation, in small business management.

The center's Industry Assistance Program works with trade organizations to offer consulting services, training sessions and information resources.

## Export Advisory Service

Fashion industry firms with little or no export experience and companies already exporting can learn how to take advantage of export trade opportunities and become successful exporters by participating in workshops and consultations offered by the Export Advisory Service (E.A.S.E.) which is funded by the United States Department of Education and the New York State Department of Economic Development.

The service offers guidance and technical assistance to firms wishing to find a foreign market for their products and shows them how to take advantage of export trade opportunities in the simplest, most productive ways.

Workshops and meetings with industry experts help firms develop competitive international sales strategies, obtain foreign representation, set prices, obtain financing, etc.

The E.A.S.E. industry advisory desk, staffed by specialists, provides individual, confidential services and offers advice and technical assistance in international trade.

Office of International Affairs

This office serves as a liaison between the international fashion communities and the college. Its activities include consultation and the provision of technical assistance for projects initiated and sponsored by international firms, industry-wide organizations or foreign government agencies. The office also promotes student and faculty exchange programs and facilitates the organization of special academic programs for visiting international "Fellows". During the 1990/91 academic year, 16 Fellows, representing 7 countries, participated in study programs at F.I.T.

Faculty/Consultants

Many of F.I.T.'s full-time and adjunct faculty members are also consultants in the areas of fashion business and technology.

In several instances the enumerated F.I.T. departments and offices could constitute competition to the new AAMTD. However, by properly structuring the new AAMTD it could become the conduit through which all of the non-academic F.I.T. programs and services could be coordinated.

## CRITICAL ASSUMPTIONS

In order to project the positive or negative impact of the noted conditions and factors, certain critical assumptions must be made as to the importance of each of these upon the successful operations and performance of the new AAMTD enterprise.

### Imports

The impact of imports on the garment industry cannot be minimized. It is a major factor in the decrease of domestic production. Because of this, federal, state and city agencies are all extending services and financial aid to companies which are adversely affected.

It is assumed that garment import volumes have peaked and, due to recessionary influences and "buy American" programs, they will slowly recede.

### Exports

Recently, U.S. apparel manufacturers' interest in exporting has accelerated, and companies are now in need of more technically-oriented consulting services than ever before. The need to produce better quality products in order to compete in the international arena makes updating of equipment essential, and training of personnel in the use of that equipment mandatory.

It is assumed that the garment industry's need for technically-oriented export programs will grow at an accelerating rate over the next three-to-five year period.

### Manufacturing Overheads and Other Expenses

Rising rents, salaries, insurance and financing costs, etc., all lead to an increasing ratio of overhead and other expenses to the bottom line. The new AAMTD cannot effect changes in these external variables. However, impacting manufacturing and labor costs can be an important function of the new AAMTD. New machinery, new design systems and better trained workers resulting from AAMTD projects will definitely lead to a progressive lowering of manufacturing and labor costs.

It is assumed that interest in short courses, consulting programs and other undertakings directed at lowering costs of manufacturing will increase in the near term and remain constant thereafter.

Retail Merchandising, Marketing and Training Programs, Etc.

In the retail sector, AAMTD can work with retailers to help lower selling costs through innovative merchandising, marketing and training programs. AAMTD can also address the markdown and shortage dilemmas by readdressing the merchandising skills of buyers and managers and by strengthening their mathematical and computer skills. Also, surveys and analyses, planning services, Quick Response linkages, etc., etc., are potential services that the new AAMTD could offer to the retail sector.

These opportunities are expected to be available based on the assumption that, with increasing competitiveness for the consumers' disposable income, retailers will be desirous of finding new, effective ways to lower costs, reach a wider market and increase sales.

Industry Cooperation

The historical low level of cooperation between different segments of the apparel industry has always been a stumbling block to interaction throughout the industry. Recognizing this factor, many trade associations have worked with industry members to demonstrate how cooperation between the different levels ultimately will lead to better business for all.

Linkages in the textile, apparel and retail sectors are coming about because of, and through, new technology. Demonstrations of how new techniques and technology can work for everyone's betterment could be a key part of the new AAMTD programming.

It is assumed that the degree of cooperation between industry members at different levels of the manufacturer-to consumer chain will increase geometrically as manufacturers expand their cooperative programs forward and retailers expand their programs backward. It is further assumed that within five years 65% of all major U.S. retailers will have interactive programs in place with 20% of the U.S. garment producers.

## Consulting and Research Services

Consulting and research services, always a crowded and competitive field peopled with firms such as the giant Kurt Salmon, Inc. and grading down to small, one-person organizations with industry-specific expertise, is presently undergoing an upheaval. Because of the current economic downturn or due to a movement to long-term reduction of work force and year-round payroll, consultants are finding that it is most cost effective to use sub-contractors for specific expertise instead of keeping people on their year-round payrolls.

Because the fashion industry is unique in its needs, and volatile in its response to consumer moods in fashion, specialists with a background in the industry, such as full-time and adjunct members of the F.I.T. faculty, are and always will be in demand as consultants or as sub-contractors to consultants. Channeling this demand for F.I.T. personnel through the AAMTD would permit the most advantageous assignments of expertise where needed and allow for proper administration, coordination and supervision of all contractual obligations.

It is assumed that the rate of growth for consulting and research services will be not less than 6.5% per year over the next five years.

## Present AAMTD Facilities

Currently, we have in place a modern operating pilot apparel factory utilizing as much new technology as possible. Through a coalition of producers and vendors of the newest and best technologies, this factory is state-of-the-art in both its hardware and software.

Through the support and funding of the DLA and the assignment of major research and development tasks, this demonstration site is serving the fashion industry and the military services in various phases of apparel design, production, training, problem-solving, etc., etc.

It is assumed that some level of on-going support will continue from the DLA and that the coalition of manufacturers now furnishing the AAMTD with equipment will continue to do so.

## F.I.T. Outreach Departments

As previously noted, F.I.T. offices and/or departments maintain liaison with and support systems for different but sometimes overlapping segments of the industry.

Currently, this outreach is multi-faceted but not organized as a total support entity to the industry. Services such as basic and applied research, seminars, international focus, training, support for small businesses, and consultant help can be furnished by, most often, more than one office at F.I.T. The offices, in turn, apply to the industry and to government agencies for funds, sometimes inadvertently becoming each other's competitor for the same grant, program or project.

The assumption is that, to strengthen the total outreach and delivery services, one agency should become the conduit of services from F.I.T. and that the new AAMTD should become that agency.

## MAJOR STRENGTHS OF THE ENTERPRISE

The major strength of the new enterprise will be the world-renowned reputation of the Fashion Institute of Technology which, for over 40 years, has been the catalyst for the fashion industry, introducing new technologies, improving old methods and developing new ones while educating new generations of leaders in the industry. Because of its reputation, most members of the industry look to F.I.T. for aid in research, development and training.

For the past 20 years F.I.T. has maintained a collaborative effort with foreign schools of fashion, exchanging faculty, students and ideas. New techniques in designing, manufacturing and marketing are constantly being exchanged and refined.

Another strength is the large faculty pool of eminently qualified experts and practitioners in all segments of the fashion industry who work together to help associations, government agencies, producers, designers and marketers adopt, upgrade or change technologies and techniques that they require to maintain currency in today's rapidly changing marketplace. In effect, F.I.T. is able to offer a one-stop-shopping atmosphere for companies looking for help in a myriad of disciplines. Not many other places can deliver as broad a range of services as the new AAMTD will be able to provide in areas such as

Production Methods and Equipment
Computer Aided Design (CAD)
Computer Assisted Manufacturing (CAM)

Computer Integrated Manufacturing (CIM)
Equipment Technology
Textile Interface Technology
Computer Shop Floor Control
Plant Layout and Operations Design
Pressing Technology.

Also available, in-house, are experts in product design, interpretation of new technology as it relates to design, advertising and communication, merchandising and marketing.

Being able to focus and coordinate the efforts of these experts from every segment of the fashion industry at a moment's notice will permit the new AAMTD to offer "total" coverage to any company, agency or organization seeking its services.

Another strength is the strong linkage that is presently in place between F.I.T. and the chief executives of a large segment of the manufacturing sector of the fashion apparel business. For many years, leaders in textile and garment production have served as advisory board members for the major departments in the college and have also served as board members of The Educational Foundation for the Fashion Industries.

More recently, top executives of firms that are leaders in marketing and retailing have looked to F.I.T. to serve their corporate needs in much the same way as the other sectors have been served. F.I.T. has become a place where they can design, discuss, dissect and adopt the newest techniques in textile and apparel marketing; and where they can initiate research and development projects relative and important to their segments of the fashion industry.

The ability to coordinate teleconferences from our campus will soon be on-line. Interactive programs will be possible and a full menu of workshops and roundtables will be accessible across the region, the country and eventually, internationally.

Competitive costs are another strength of the new AAMTD. It is assumed that much if not all of the required technology and human resources will be available on-campus, the planning of programs, execution of projects and delivery of services will be facilitated. F.I.T. researchers and consultants are primarily dependent on their faculty salaries and only incidentally upon their project and program fees. The combination of these factors should be expected to result in competitive costs that should be easy to administer and contain.

## MAJOR WEAKNESSES OF THE ENTERPRISE

Operational and expansion financing appear to be the major weaknesses of the new AAMTD. With the curtailment of DLA monies, new sources of funding will have to be found. Initial research indicates that there are several potential areas and sources that can be approached in the effort to obtain the needed financing. The following general and specific sources have been identified:

Fashion Institute of Technology Funds
Government Agencies
Private Foundations
Industry Consortium Contributors
Membership Fees
Users Fees
Retainers
Other Educational Institutions
Research & Development Fees
Workshops and Seminars
Short Courses
Video Conferences
Royalties, Patents and Licensing Fees

Within the general outlines of the preceding list of funding sources, some of the specific funding agencies the new AAMTD might work with include

### Federal Agencies

Department of Commerce
Department of Defence
Department of Education
Air Force Human Systems Division
Army Natick Research, Development and Engineering Center
Navy Clothing and Textile Research Facility
National Institute of Standards and Technology

### New York State Agencies

Department of Economic Development
Job Development Authority
Science and Technology Foundation
State University of New York
Industrial Effectiveness Program

## New York City Agencies

Office of Business Development
Port Authority of New York and New Jersey
Office for Economic Development
Industrial Technology Assistance Corporation

## Trade Unions

ACTWU
ILGWU

## Trade Associations

Acrylic Council, The
Affiliated Dress Manufacturers
Allied Underwear Association
American Apparel Contractors Association
American Apparel Manufacturers Association
    Swimwear Industry Manufacturers
    Southern Garment Manufacturers Association
American Association of Exporters and Importers
American Cloak and Suit Manufacturers Association
American Fiber, Textile, Apparel Coalition
American Textile Machinery Association
American Textile Manufacturers Institute
Apparel Guild
Associated Corset and Brassiere Manufacturers
Association of Rain Apparel Contractors
Atlantic Apparel Contractors Association
Boys and Young Mens Apparel Manufacturers Association
Career Apparel Institute
Childrenswear Credit Guild Inc.
Childrenswear Manufacturer Association
Clothing Manufacturers Association of the USA
Color Association of the US, The
Cotton Incorporated
Council of American Fashion
Council of Fashion Designers of America
Crafted with Pride USA
Custom Tailors and Designers Association of America
Federation of Apparel Manufacturers
Federation of Retail Merchants
Fiber, Fabric, and Apparel Coalition for Trade
Garment Industry Development Corporation
Greater Blouse, Skirt, and Undergarment Association
Headwear Institute of USA
Industrial Association of Juvenile Apparel Manufacturers

Infant and Juvenile Manufacturers Association
Infants', Children's and Girls' Sportswear and Coat Association
International Association of Clothing Designers
International Formalwear Association
International Mass Retail Association
Intimate Apparel Association
Intimate Apparel Manufacturers Association
Juvenile Products Manufacturers Association
Knitted Textile Association
Ladies Apparel Contractors Association
Men's Apparel Club of New York City
Men's Apparel Guild of California
Men's Fashion Association of America
Menswear Retailers of America
Metropolitan Area Apparel Association
Millinery Information Bureau
Mohair Council of USA
National Association of Blouse Manufacturers
National Association of Fashion and Accessory Designers
National Association of Hosiery Manufacturers
National Association of Milliners, Dressmakers, and Tailors
National Association of Uniform Manufacturers and Distributors
National Knitwear Manufacturers Association
National Knitwear and Sportswear Association
National Outerwear and Sportswear Association
National Retail Merchants
Neckwear Association of America
New York Coat and Suit Association
New York Skirt and Sportswear Association
New York State Infants & Children's Wear Association
Southeastern Apparel Manufacturers and Suppliers
Sundries and Apparel Findings Council
Textile Apparel Linkage Council
Underfashion Club
United Better Dress Manufacturers Association
United Infants' and Children's Wear Association
Voluntary Interindustry Communications Standards Committee
Wool Bureau, Inc. The
Young Menswear Association

Other important business functions of the new AAMTD that must be strengthened are marketing of products and services and public relations support.

At present, there are some technology resource deficiencies in the existing AAMTD in the fields of identification technology (EDI, bar codes, etc.) and robotics. These will have to be expanded and strengthened for the new AAMTD.

The present name of our enterprise, Advanced Apparel Manufacturing Technology Demonstration, is not broad enough to cover all the multiple areas that the new organization will service. Choosing a name and marketing it and the expanded services to the industry will be a major undertaking.

Finally, the abundance of available support services, both external and internal, presents a challenge to the new AAMTD - a challenge to develop a program and establish a service center that will be able to coordinate all the positive and negative factors into an interactive and cooperative design that works to serve an industry greatly in need of assistance and support.

# EXHIBIT I
# THE ADVANCED APPAREL TECHNOLOGY LABORATORY AT THE FASHION INSTITUTE OF TECHNOLOGY

For 2 years we have been developing and fine tuning an advanced technology laboratory for modern garment production.

It's been successful - over $1.5 million R&D - over $1.5 million latest equipment - computerized - automation - represents world class apparel making techniques.

Presently U.S. Government Funded

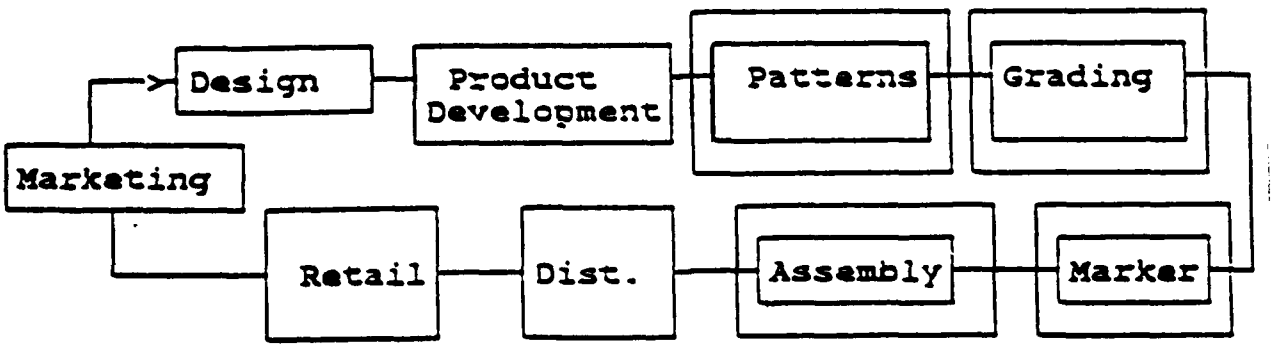
Mission - demonstrate to the U.S. industry (civilian and military) better available methods
- Research into new methods
- Provide universities with latest technology for inclusion in curriculum

Progress - Demonstrations on-going
- R&D projects span the industry (Design to Robotics)
- Effective student activity increasing

Present student activity
- APM project (analysis and improvement of M/C)
- Demonstration Operators
- Independent Instruction (self and assisted) of CAD, Pressing, Assembly, etc.
- Time study of auto vs. manual
- Plant layout
- Statistical Analysis of Fabric Stabilization

BUT --

There's more to the apparel industry than the shop floor:



In the Advanced Technology Laboratory we do:

Pattern design and modification

Costing

Grading

Marker Making

Assembly (Auto/Manual)

Cutting (Auto)

Spreading (semi-automatic)

Production Control

(Retail/Mfg. linkage) By 4th Q of '90
(Textile/Mfg. linkage)

The principle techniques that we use involve:

- Design
- Product Development
- Distribution
- Production
- Costing
- Retailing
- Marketing

The Advanced Technology Laboratory, therefore, is not isolated but is woven into the whole chain.

FIT deals with the whole chain in:

- Fashion Buying and Merchandising
- Fashion Design
- Production Management
- Menswear
- Marketing

The Advanced Technology Laboratory can enhance these.

**HOW?**

- By bridging the gap between classroom activities and the actualities of a changing industry.
- By maintaining an up to date source of knowledge of industry design and production practices and their impact on the whole industry.
- By providing students and faculty with exposure to the current industry realities for research, instruction, demonstration, and training.

**EXAMPLES**

<u>Knowledge of Industry Practices</u> (Survey)

- Computer Aided Design
  - Pattern Design
  - Grading
  - Marker Making
  - Costing
- Modular/Unit Production Systems
- Automatic Assembly - advantage and design latitudes
- Quick Response and Just in Time relationships with suppliers and retailers
- International assembly techniques
- Computerized costing

Knowledge of Industry Practices (Workshop)

- Real time design / sourcing / distribution / marketing operation

POSSIBLE COURSE ASSIGNMENTS/PROJECTS

AP 101 - Apparel Design

- Determine the cost of production utilizing the Cybrid computerized fabric costing system and compare it to pre-determined manual cost.

AP 141 - Design Room Techniques

- Construct sample garments utilizing automatic and semi-automatic laboratory equipment. Compare advantages and latitudes of construction over traditional techniques.

AP 221/321 - Flat Pattern Design

- Enter the master pattern into the Accumark 300 Computer Aided Design system (by lab technician) and modify styling on screen. Compare with conventional methods to enhance the traditional method knowledge and prepare for increasing common industry practice.

AP 256 - Design Studio

- Determine how the cost of a better priced ready to wear garment may be reduced 20% (to meet competition) by the use of automatic systems.

AP 261 - Contemporary Tailored Design
AP 266 - Sportswear Design
AP 271/AP 274 - Intimate Apparel

- For one or more of the above courses, develop a report on possible production techniques, how they might differ from sample room practices, and their impact on cost and quality.

AP 276 - Children's Wear - Boys

- Utilizing the Computer Aided Design System, compare the fabric utilization of men's and boys' wear markers. Also, compare the grading methods of the two.

AP 262 - Tailoring Techniques

- Translate fine tailoring suit design to lower price point volume manufacture utilizing advanced assembly methods.

AP 421 - Computerized Pattern Design

- Comparison study of the new Accumark 300 design and the existing CAMSCO system. Report on the advantages/disadvantages.

FM 433 - Workshop in Apparel Merchandising
FM 121 - Merchandise Planning and Control
FM 111/113 - Survey of the Fashion Business
FM 112 - The Marketing of Menswear

- For one or more of the above courses, examine the present industry practices of Quick Response (Electronic Data Interchange) with the retailer, responsive shop floor scheduling, Just in Time fabric delivery possibilities (short run), bar coded merchandise and materials.

FM 244 - Product Development

- Develop the specification for a garment now being produced in the laboratory in a simulated private label approach. Develop requirements for distribution (Bar codes, EDI, etc.)

MW 161 - Survey of Menswear

- Report the influence of changing manufacturing techniques on menswear design. (Fusibles, automatic pocket setters, computerized cutting, etc.)

MW 299 - Independent Study of Menswear

- Cost and quality comparison of automatic vs manual construction
- Complete exercise of pattern entry, grading, costing, and marker making for menswear.
- Fabricate coat and/or trousers utilizing advanced laboratory equipment. Determine limitations and design.

MG 106 - Management Analysis of Menswear Manufacturing

- Compare cost of assembly of Unit Production vs bundle system.
- Compare work in process of same
- Compare quality of assembly between automatic seaming (cutting) and manual methods.
- Time study comparisons of automatic vs manual assembly.
- Development of work methods, on computer programmable sewing machines.

MK 311 - Principles of Marketing

- Formulate product plan for design, production, distribution, and sales of a garment line to be made in the Advanced Technology Laboratory. This will utilize the laboratory's planned one-day-a-week production of the selected garment.

MK 313 - Channels of Distribution

- Plan and operate the distribution network of one-day-a-week garment production from the laboratory. The customers will consist of a mix of wholesale/retail requirements.

MK 499 - Independent Study in Marketing

- Develop new retail possibilities for the one-day-a-week garment production of the laboratory.
- Devise and operate a Quick Response application for customers of the one-day-a-week laboratory production.
- Determine the possibilities of increasing prices for improved quality due to advanced production technologies.

## POSSIBLE INDEPENDENT STUDY PROJECTS

- Setting up (and running) Quick Response input/output activities for the laboratory
- Design for manufacturing project on specific garment
- Develop criteria for contractor production abilities
- Intensive work on the Accumark 300 and Gerber Cutter to develop pre-sewing room management expertise.
- Research projects on:
  - equipment application
  - retail/production bar code requirements
  - fabric costing by computer
  - design/manufacture and
  - manufacture/retail interface

## FACULTY SERVICE

- Provide actual demonstration of up-to-date garment production systems to enhance faculty's industry currency studies.
- Provide workshops for introduction of new technology
- Provide a facility for development of new course material.

# EXHIBIT II

## The Fashion Pipeline

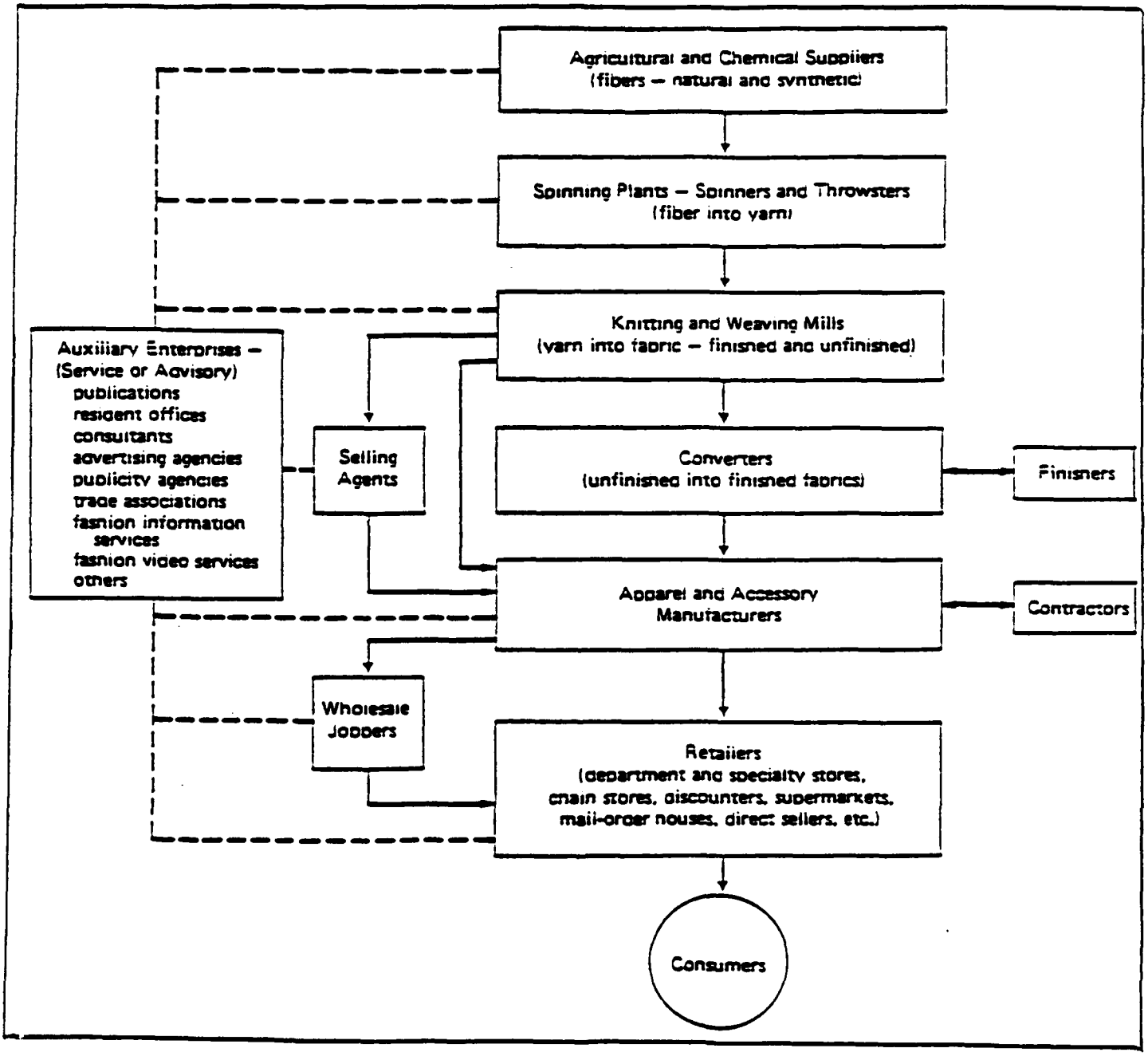



Chart showing the interdependent nature of the fashion business. All levels work with each other in order to satisfy the consumer.

## EXHIBIT III

## A TYPICAL PRODUCT FLOW IN THE APPAREL INDUSTRY

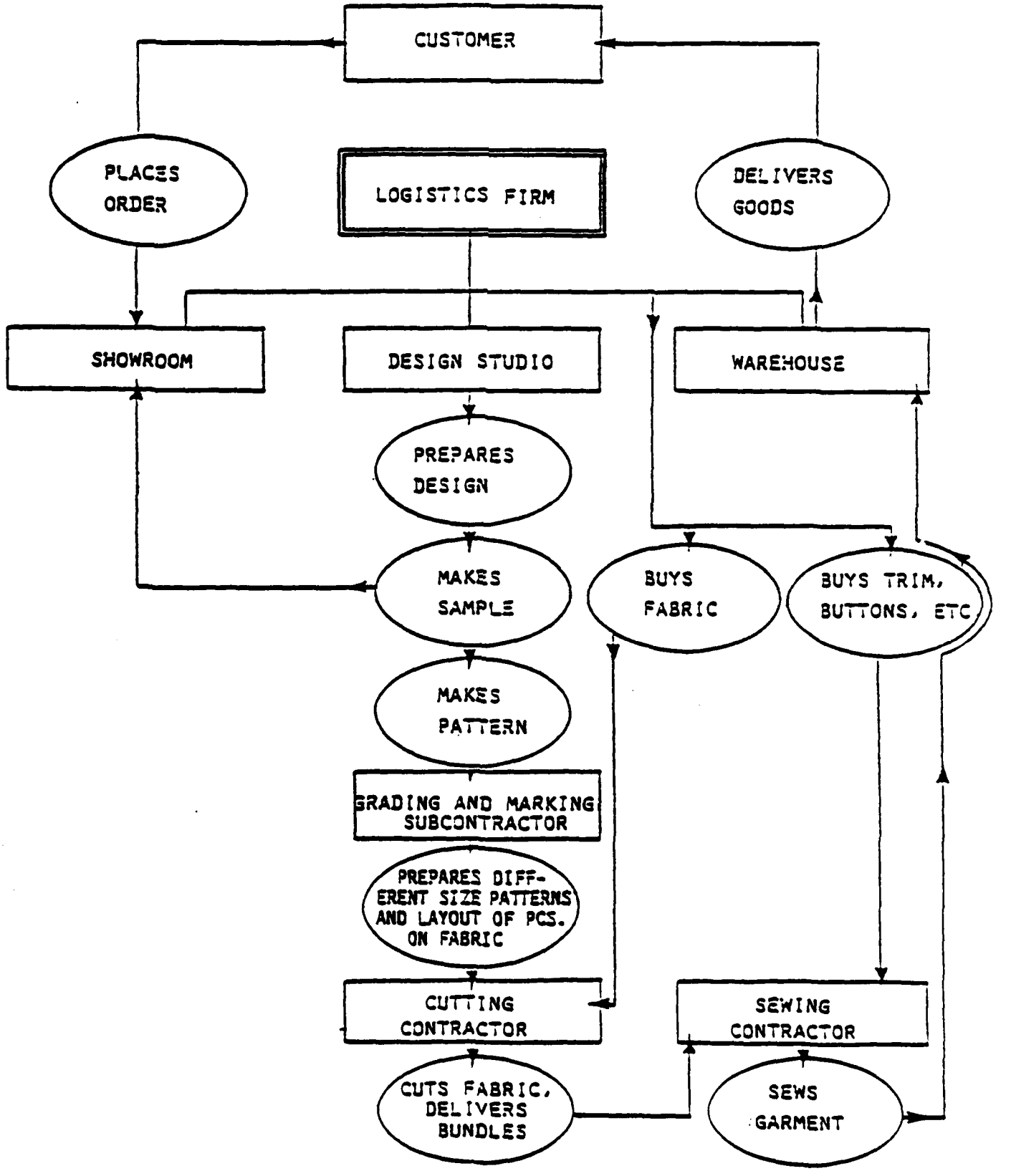


EXHIBIT IV

# Demographics that Affect the Fashion Industry

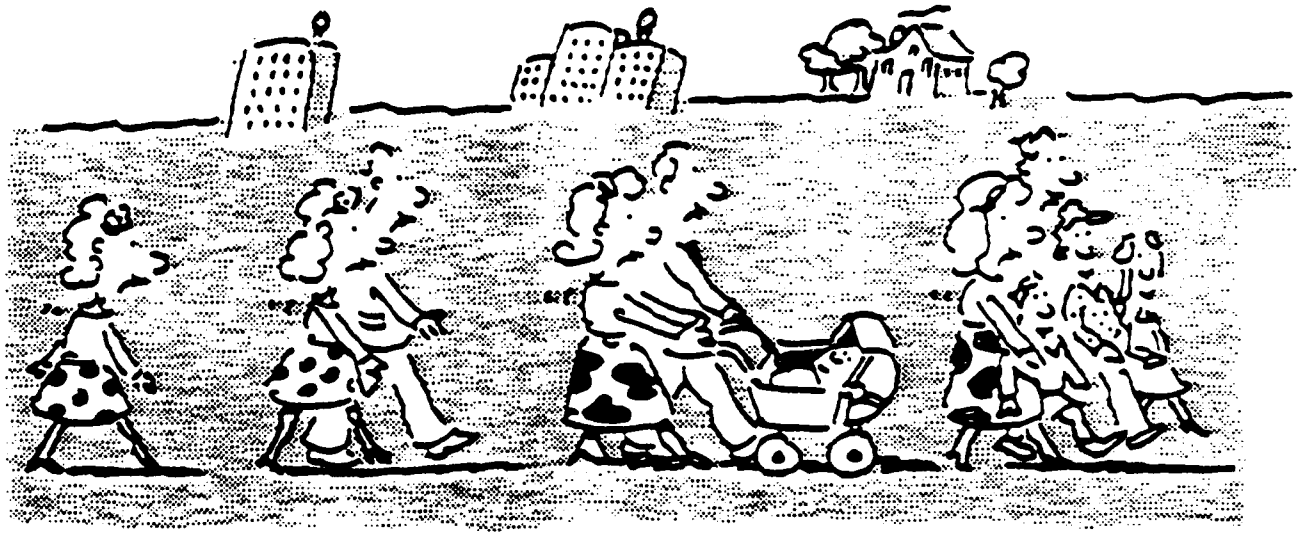
## Expected Trends in U.S. Population by Major Apparel Markets, 1990 1995, 2000, and 2005 (Figures in millions)

| Markets | | 1990 | 1995 | 2000 | 2005 | Percentage Change 1990–2005 |
|---|---|---|---|---|---|---|
| Infants | Ages 0–2 | 11.0 | 10.5 | 10.0 | 9.9 | −10% |
| Children's | | | | | | |
| Boys' | Ages 3–7 | 9.5 | 9.5 | 9.1 | 8.7 | −8% |
| Girls' | Ages 3–7 | 9.0 | 9.1 | 8.6 | 8.4 | −7% |
| Boys & Girls | | | | | | |
| Boys' | Ages 8–17 | 17.7 | 19.0 | 19.5 | 19.1 | +8% |
| Girls' | Ages 8–14 | 12.0 | 12.8 | 12.9 | 12.4 | +3% |
| Adult Total | | | | | | |
| Male | 18+ | 89.4 | 93.2 | 97.6 | 102.0 | +14% |
| Female | 15+ | 101.8 | 106.0 | 110.6 | 115.1 | +13% |
| Adult Markets by Age | | | | | | |
| Male | Ages 18–24 | 13.2 | 12.3 | 12.8 | 13.6 | +3% |
| | 25–34 | 22.1 | 20.6 | 18.7 | 18.1 | −18% |
| | 35–44 | 18.8 | 21.1 | 21.9 | 20.5 | +9% |
| | 45–54 | 12.4 | 15.3 | 18.3 | 20.6 | +66% |
| | 55–64 | 10.1 | 10.1 | 11.6 | 14..3 | +42% |
| | 65+ | 12.8 | 13.8 | 14.3 | 14.9 | +16% |
| Female | Ages 15–24 | 17.8 | 17.2 | 18.1 | 19.0 | +7% |
| | 25–34 | 21.8 | 20.4 | 18.4 | 17.9 | −18% |
| | 35–44 | 19.1 | 21.2 | 22.0 | 20.5 | +7% |
| | 45–54 | 13.1 | 16.0 | 18.9 | 21.0 | +60% |
| | 55–64 | 11.3 | 11.2 | 12.6 | 15.4 | +36% |
| | 65+ | 18.7 | 20.0 | 20.6 | 21.3 | +14% |
| Total All Ages | | 250.4 | 260.1 | 268.3 | 275.6 | +10% |

SOURCES: U.S. Department of Commerce: Bureau of the Census.

EXHIBIT V

# Tracking the Postwar Generation to the Year 2000



Gary Zamchick

## Population by Age: 1985-2000 (in thousands)

■ Baby-Boom Generation

| | 1985 | 1990 | 1995 | 2000 | % Change* |
|---|---|---|---|---|---|
| All Ages | 238,631 | 249,657 | 259,559 | 267,955 | 12.3 |
| Under 15 | 51,861 | 54,582 | 56,724 | 55,903 | 7.8 |
| 15-24 | 39,717 | 35,548 | 34,110 | 36,088 | - 9.1 |
| 25-34 | 41,788 | 43,529 | 40,520 | 36,415 | -12.9 |
| 35-44 | 32,004 | 37,847 | 41,997 | 43,743 | 36.7 |
| 45-54 | 22,464 | 25,402 | 31,397 | 37,119 | 65.2 |
| 55-64 | 22,188 | 21,051 | 20,923 | 23,767 | 7.1 |
| 65 and older | 28,609 | 31,697 | 33,888 | 34,921 | 22.1 |

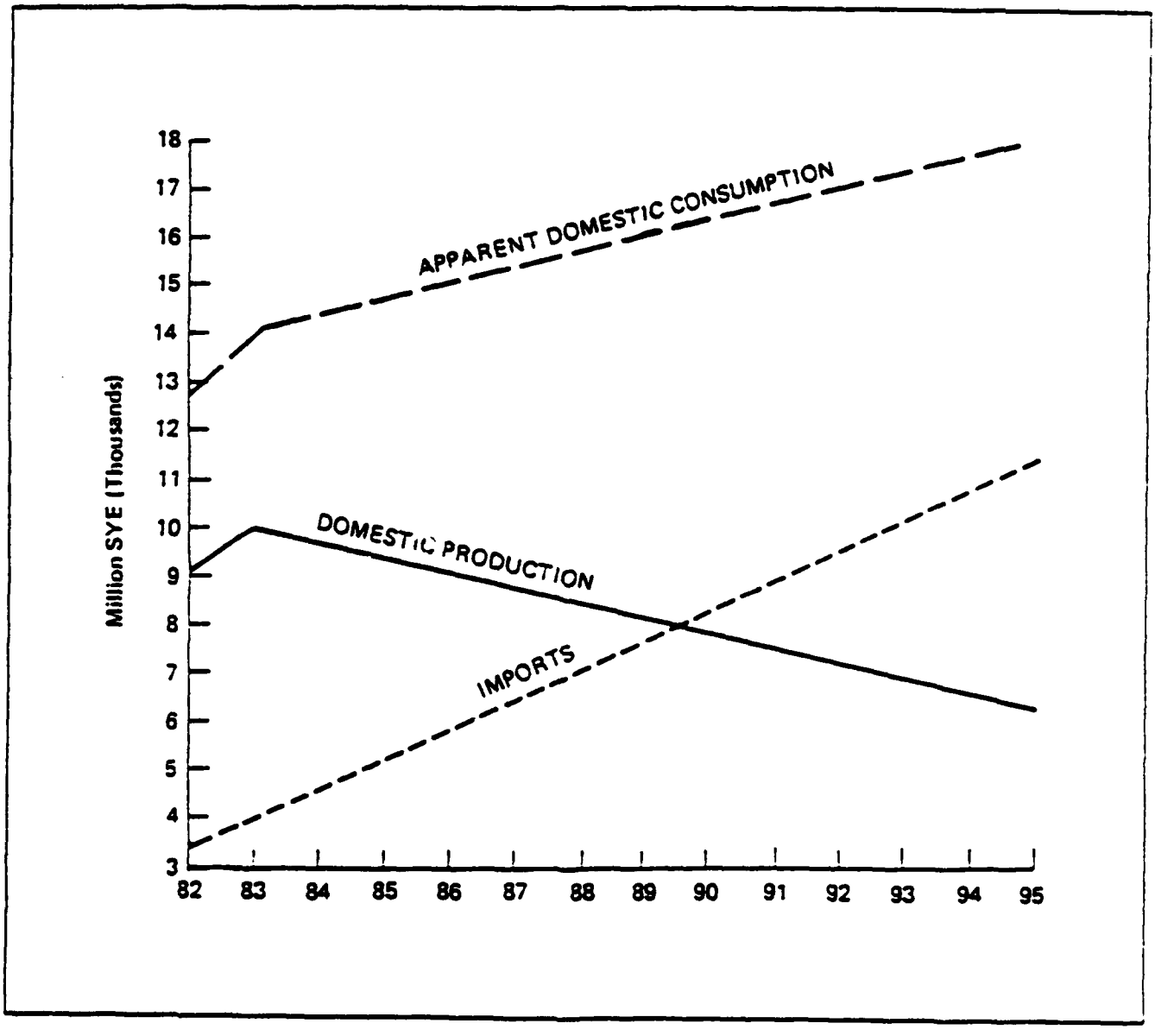
*Source: U.S. Bureau of the Census*

*1985 to 2000

EXHIBIT VI

## Projected Domestic Production, Imports, and Consumption of Apparel

1982 - 1995




*SOURCE:* U.S. Commerce Department.

EXHIBIT VII

## Growth of Imports and Import Penetration in Selected Women's Garments (Imports in thousands of units: Penetration by %)

| Type of Garments | 1980 | | 1989 | |
|---|---|---|---|---|
| | Import Units | Import Penetration | Import Units | Import Penetration |
| Coats, jackets, raincoats | 47,441 | 65.9% | 78,701 | 235.6% |
| Suits and dresses | 26,168 | 7.2 | 81,435 | 39.6 |
| Blouses (woven fabric) | 210,960 | 45.9 | 271,508 | 158.3 |
| Knit shirts | 168,809 | 54.3 | 527,060 | 130.7 |
| Sweaters | 123,106 | 130.7 | 307,253 | 373.5 |
| Skirts | 14,774 | 15.3 | 85,595 | 83.9 |
| Slacks and shorts* | 168,036 | 34.8 | 446,054 | 93.5 |
| Nightwear & pajamas | 8,534 | 3.2 | 87,357 | 28.7 |
| Underwear | 53,466 | 5.8 | 450,724 | 34.9 |
| Bras & girdles | 200,983 | 66.6 | 219,759 | 101.9 |

*Includes jeans

SOURCE: *U.S. Bureau of the Census and ILGWU Research Department.*

EXHIBIT VIII

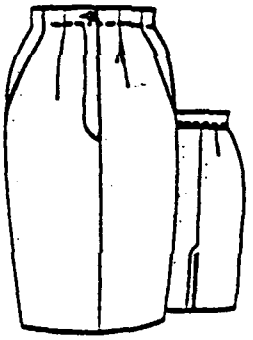
# Behind the Price Tag of a $73.00 Skirt

**Poly/cotton skirt: wholesale price, $35.00; retail price, $73.00.**

**Behind the Price Tag of a $73.00 Skirt**

Poly/cotton skirt: Wholesale price $35.00
Retail price $73.00

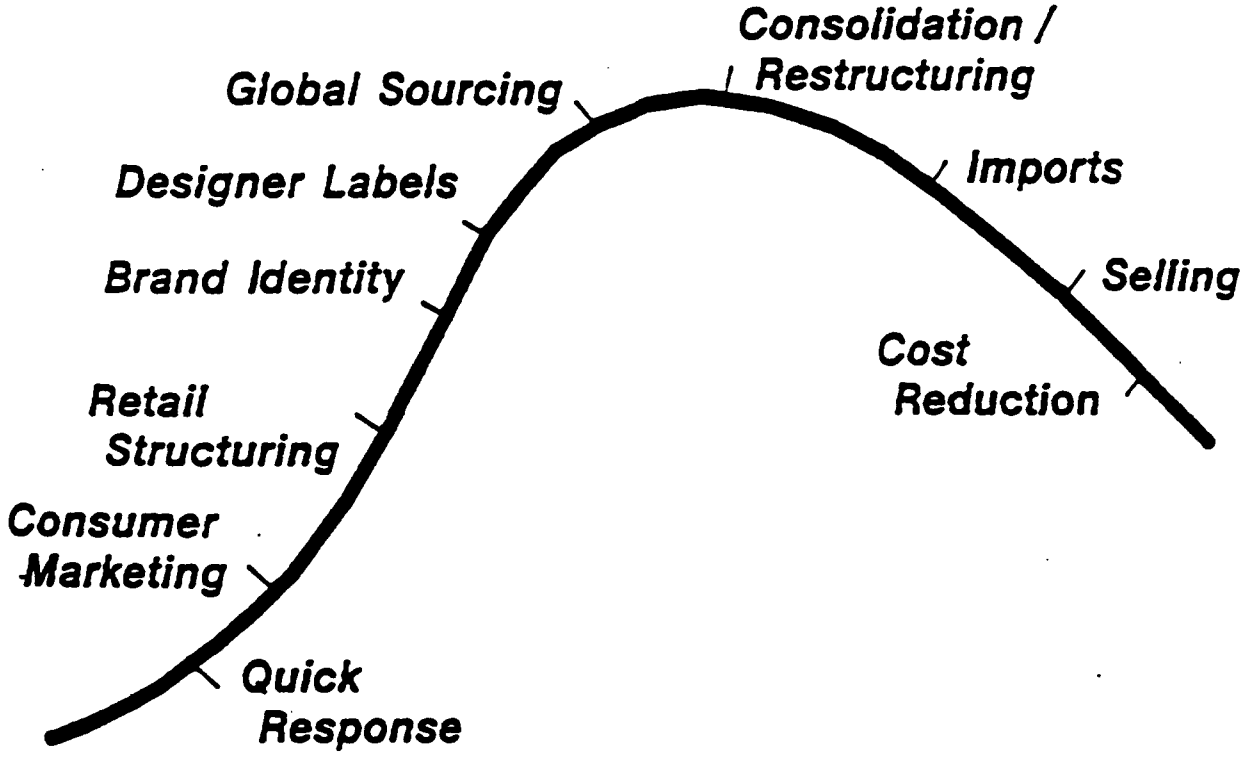
| Manufacturer's Costs | |
|---|---|
| Material | $5.45 |
| Lining | .55 |
| Packing costs (tags, labels, hangers, pins, bags) | .95 |
| Zipper | .15 |
| Labor | $10.65 |
| Overhead (rent, insurance, utilities, salaries, cost of samples, financing, etc. | $10.42 |
| Trade discount (8% off cost for prompt payment) | $2.80 |
| Profit | $4.03 |
| Wholesale Selling Price | $35.00 |



| Retailer's Costs | |
|---|---|
| $35.00 less discount for prompt payment | $32.20 |
| Markdowns (averaged overall sportswear) | $7.80 |
| Shortage | .75 |
| Expenses (salaries, sales promotion, rent, utilities, receiving, marking, administrative costs, insurance) | $29.00 |
| Profit | $3.25 |
| Selling Price | $73.00 |

EXHIBIT IX

# Apparel Issues / Concerns of the '80s




EXCERPTED FROM: 16th ANNUAL RETAIL/SOFT GOODS
BUSINESS REVIEW - KURT SALMON ASSOICATES JUNE 5, 1990, New York

EXHIBIT X

# Apparel Concerns in the '90s

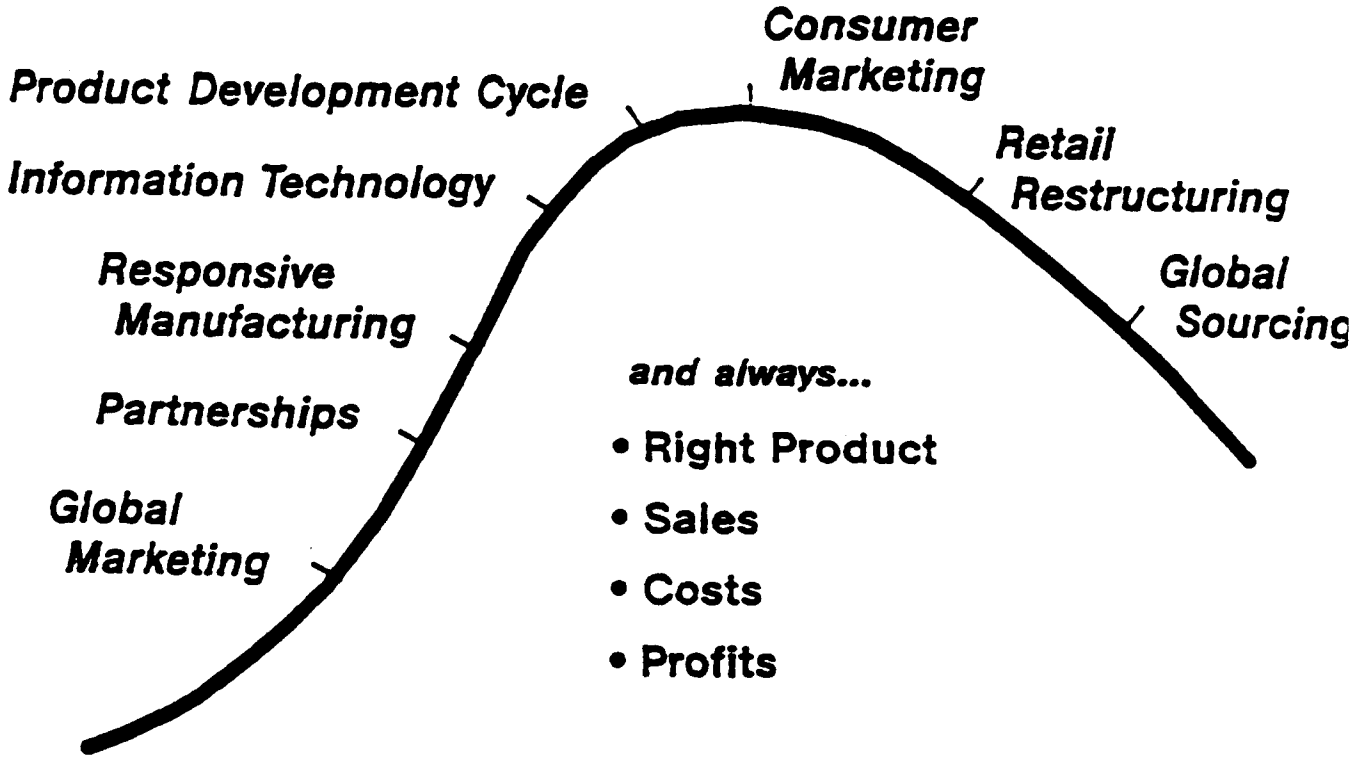



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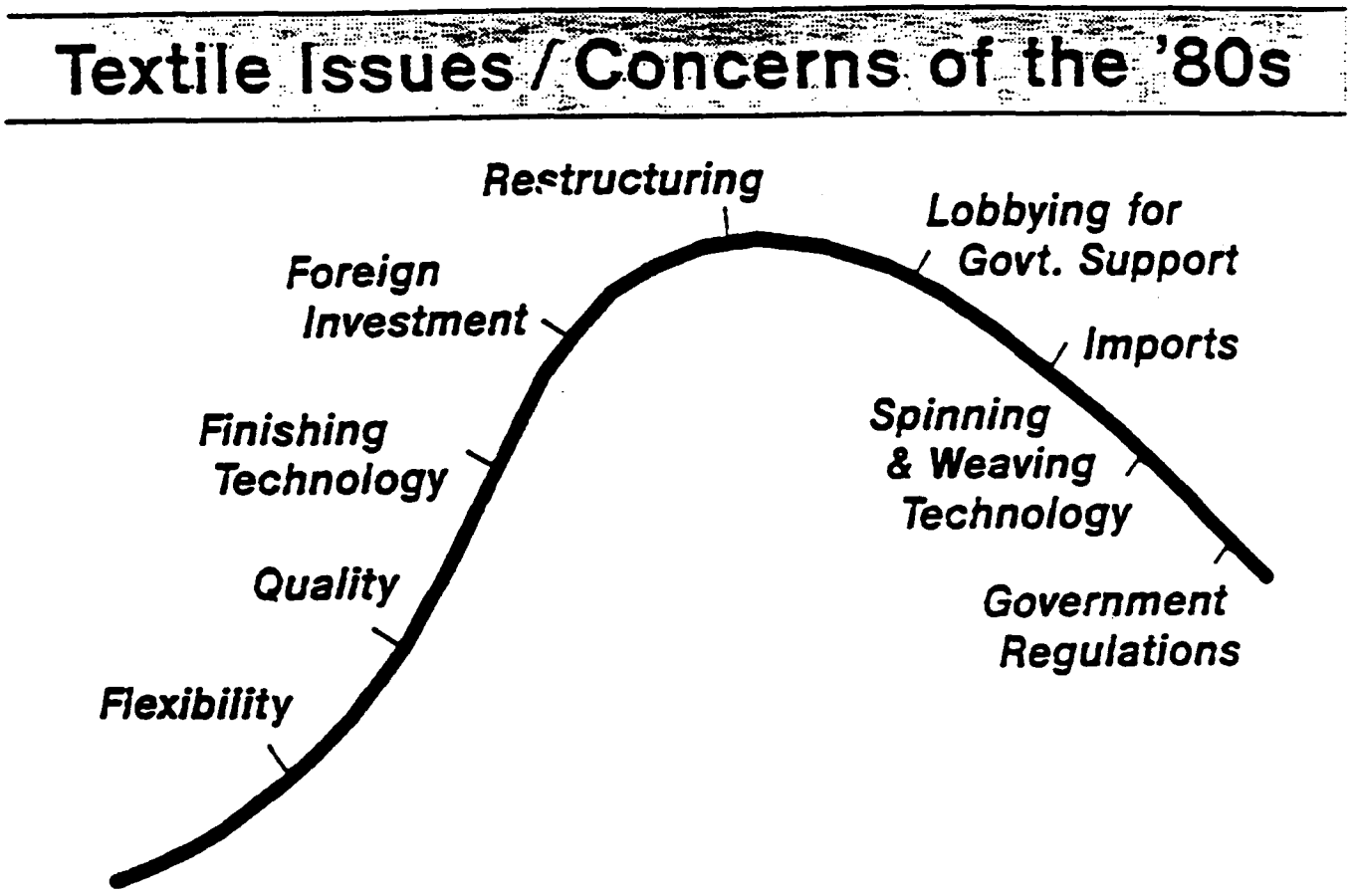
EXHIBIT XI

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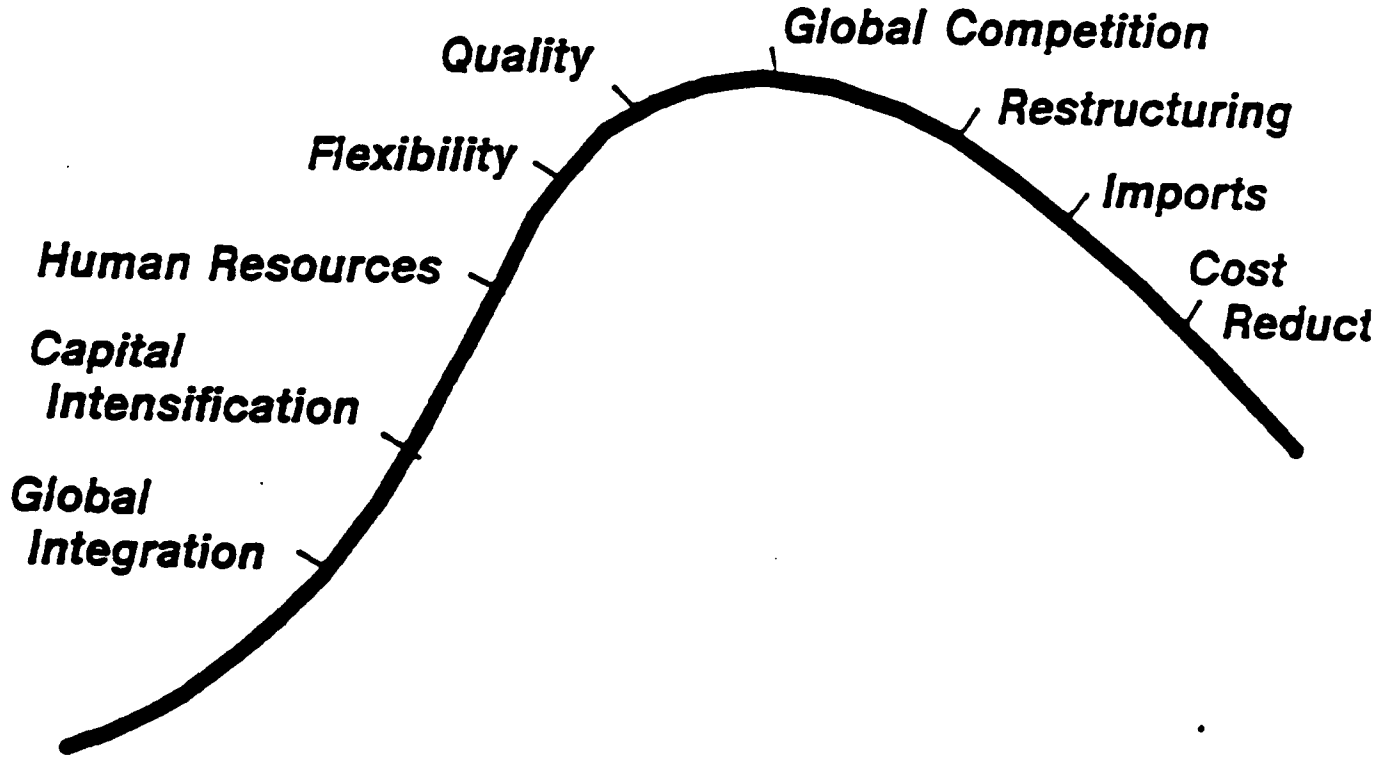
BUSINESS REVIEW - KURT SALMON ASSOICATES JUNE 5, 1990, New York

EXHIBIT XII

# Textile Concerns in the '90s




EXCERPTED FROM: 16th ANNUAL RETAIL/SOFT GOODS
BUSINESS REVIEW - KURT SALMON ASSOICATES JUNE 5, 1990, New York

EXHIBIT XIII

# Retail Issues / Concerns of the '80s

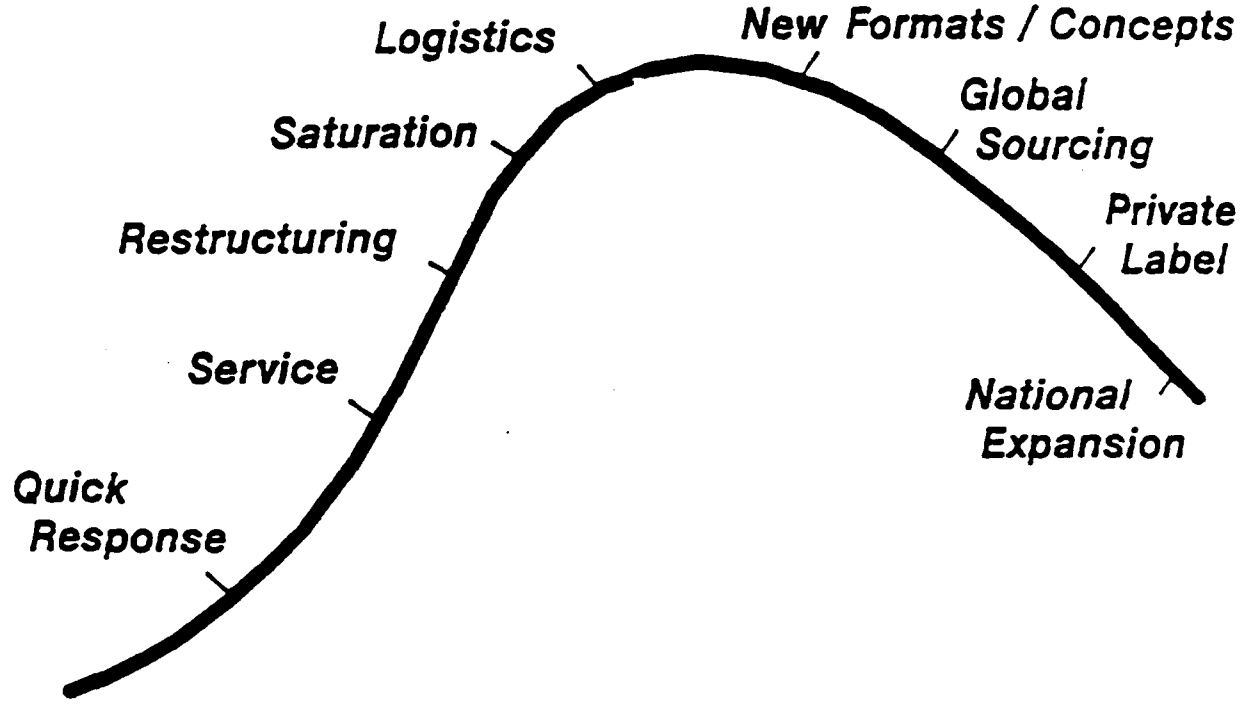



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EXHIBIT XIV

# Retail Concerns in the '90s

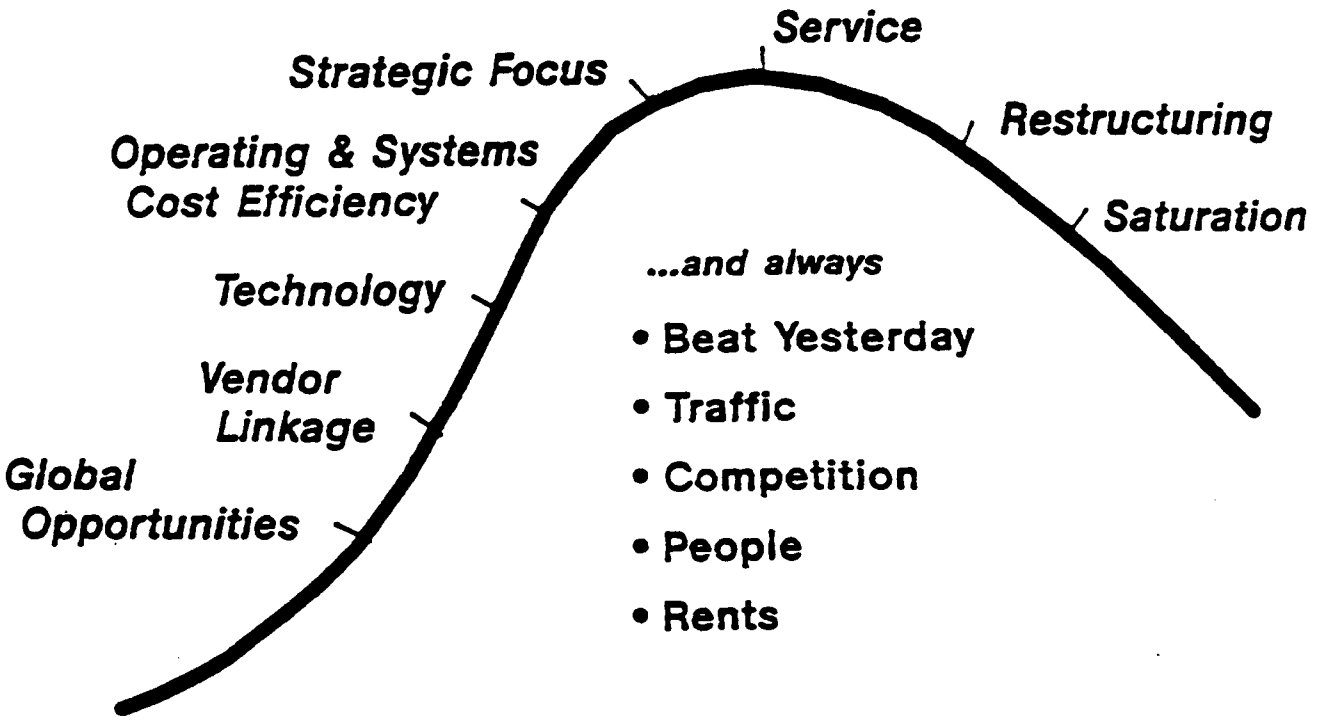


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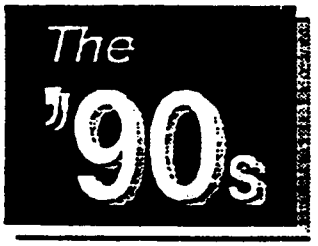
EXHIBIT XV




*can become a*

***Golden Decade in Soft Goods***

*if...*

- Successful Retail / Vendor / Supplier firms align with each other and work together
- They use modern tactics and techniques
- Cost and Value are redefined all the way to the consumer
- They develop world class products and technology
- They manage transition to a global economy

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