Fashion Range Development for Mass Production

Lucy Carvill

FASHION RANGE DEVELOPMENT FOR MASS PRODUCTION

A FINAL YEAR DISSERTATION

by

LUCY CARVILL.

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This thesis reviews the overall process of fashion range development for mass production. It draws on many aspects of my three years of course work at Dublins National College of Art and Design, and holiday and industrial release work; including Glen Abbey Childrens-wear, Dublin. My three months at Glen Abbey gave me a very valuable exposure to the real life aspects of developing up-market childrenswear and in working for other clients.

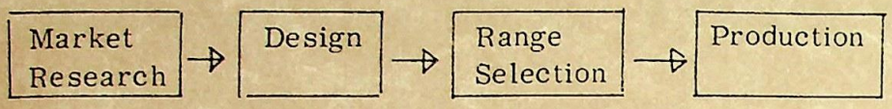
This report extends some of the concepts used at Glen Abbey to look in more general terms at the techniques and problems of range development for mass production. Much of the research for this thesis was carried out in Glen Abbey, but it also includes general observation on the industry as a whole. It is structured as follows:

- the range development process - how it all fits together
- market factors - developing an accurate customer profile
- the design stage - meeting customer needs at acceptable cost
- sampling - the interface of design and production
- range development - an iterative process involving design/sampling/the customer.
- Computer aided design - its implications for range development, production and control.

Range development is a fascinating and frustrating process that calls for many skills and great team work between marketing, design, pattern cutters, sample machinists and production. Without this teamwork, the range could not be created.

2.0 THE RANGE DEVELOPMENT PROCESS

The basic process of:



is common to all companies involved in garment mass production.

Three common approaches to the design/manufacturing process are:

1. The branded manufacturer ; who designs, selects and manufactures under his own label for wholesale or retail distribution.

2. The CMT Manufacturer whose product is designed, selected and marketed by the client .

3. The company that designs and manufactures for a client who then selects and markets these products.

Fig. 1 Illustrates the overall range development process at a typical company in the third category.

EXAMPLE OF RANGE DEVELOPMENT

The model shows the approach used in range development, and was compiled using Glen Abbey as a typical example in this category.

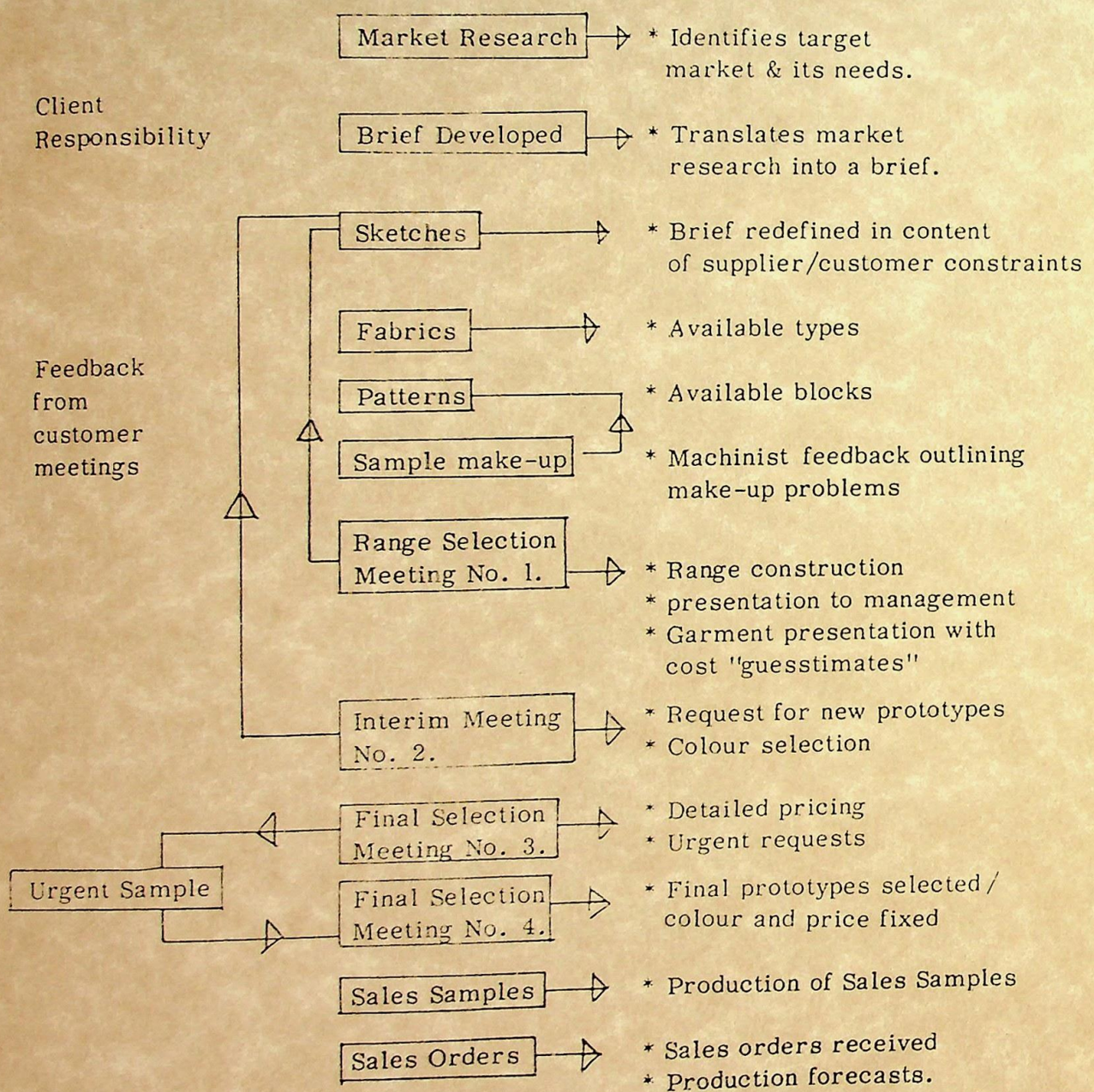


Fig. 1.

3. MARKET FACTORS

3.1 FASHION MARKETS

The fashion industry has a hierarchical structure in terms of creativity and economics. Understanding this structure is an important starting point in appreciating the constraints and driving forces in range development. See Fig. 2

Taken from Wills G., Midgley D.
"Fashion Marketing" Allen & Unwin London 1973.

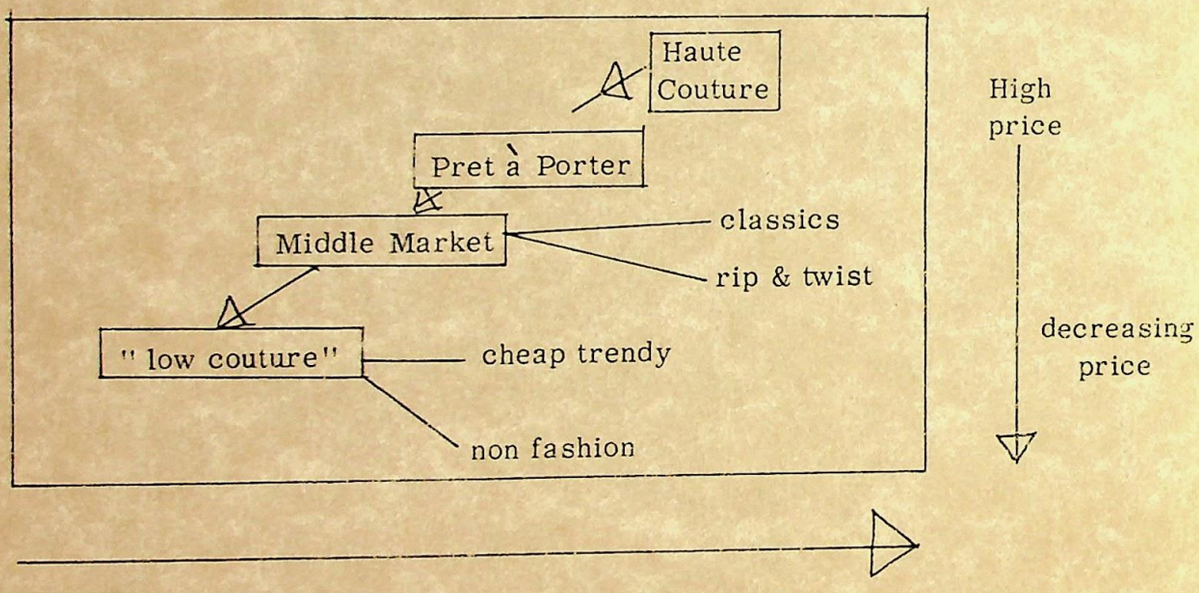
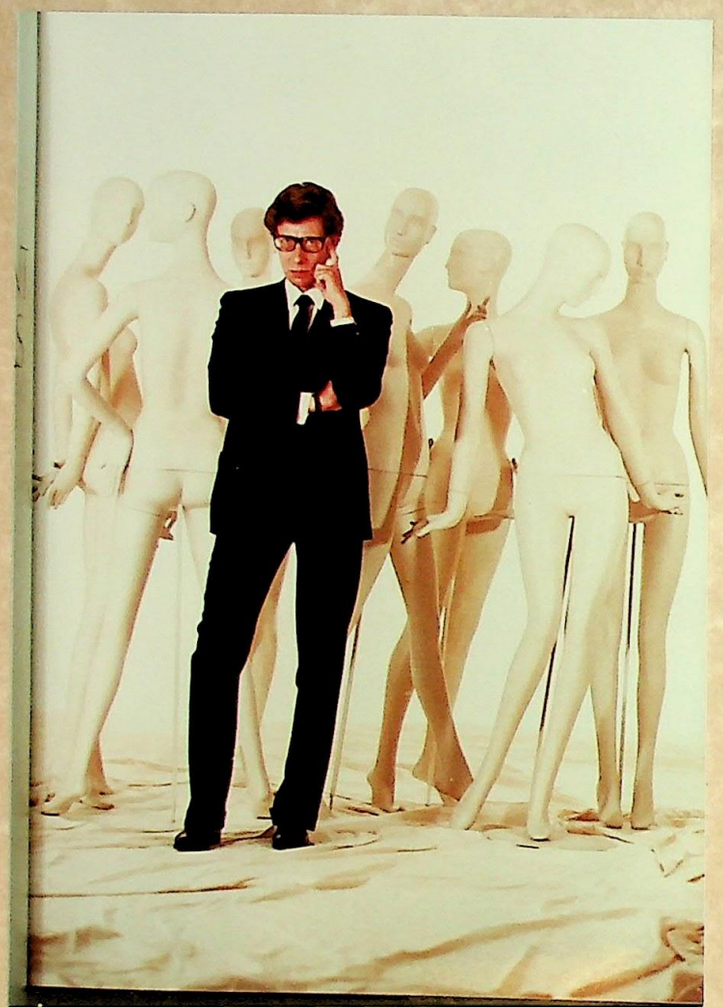


Fig. 2.

Each step in the hierarchy has its special characteristics.

HAUTE COUTURE

Traditionally this has been the creative force in the industry, but is now disappearing or becoming strictly a flagship to enable the designer franchise his name to a Pret-à-Porter line or to a range of branded products from perfumes to automobiles e.g. Yves St. Laurent. In Haute Couture there is no constraint on style, fabrics, accessories or cost. Houses such as Chanel, Givenchy, Lanvin, St. Laurent, produce select collections of masterpieces for a very limited clientele who can pay £6,000 for a suit or more often for a toile for someone further down the hierarchy to copy.



YVES SAINT LAURENT.

SEE 3.1. HAUTE COUTURE.

PRET-À-PORTER

With a disappearing haute couture clientele the big designers concentrate their energies on top-of-the-line ready to wear *1 Marcia Berss writing about the Paris Pret-à-Porter show, describes how many sectors of the industry buy ideas, garments or designer names from this source.

> "Sears Roebuck looks for trends to copy,
> Butterick patterns wants Paris designs for Duluth
> housewives"
>
> "Emanuel Ungaro books $ 7 million of orders
> which he will make up by CMT"
>
> "Yves Saint Laurent uses it as a publicity engine to
> drive his huge Licencing business; the $ 1 billion in
> goods that carry his mark"

other creative names at this end of the market include Karl Lagerfeld, Ungaro, Gianni Versace, Giorgio Armani, Jean Muir, Jasper Conran, etc.

The cost structure at this end of the market is shown in Fig. 3. The diagram breaks down the cost of European quality fashions in a U.S. Store.

*1 Berss Marcia "Paris when it sizzles" Forbes April 23, 1984.

"THE COST OF COUTURE"

"A designer wool coat will more than triple in price between the runway and sales floor. Designer royalties average 7% of manufacturers price, $ 407; customs duties add another 30%. The store's share of the $ 1,345 retail price is 59%". "Couture" Doubleday & Co. London 1972.

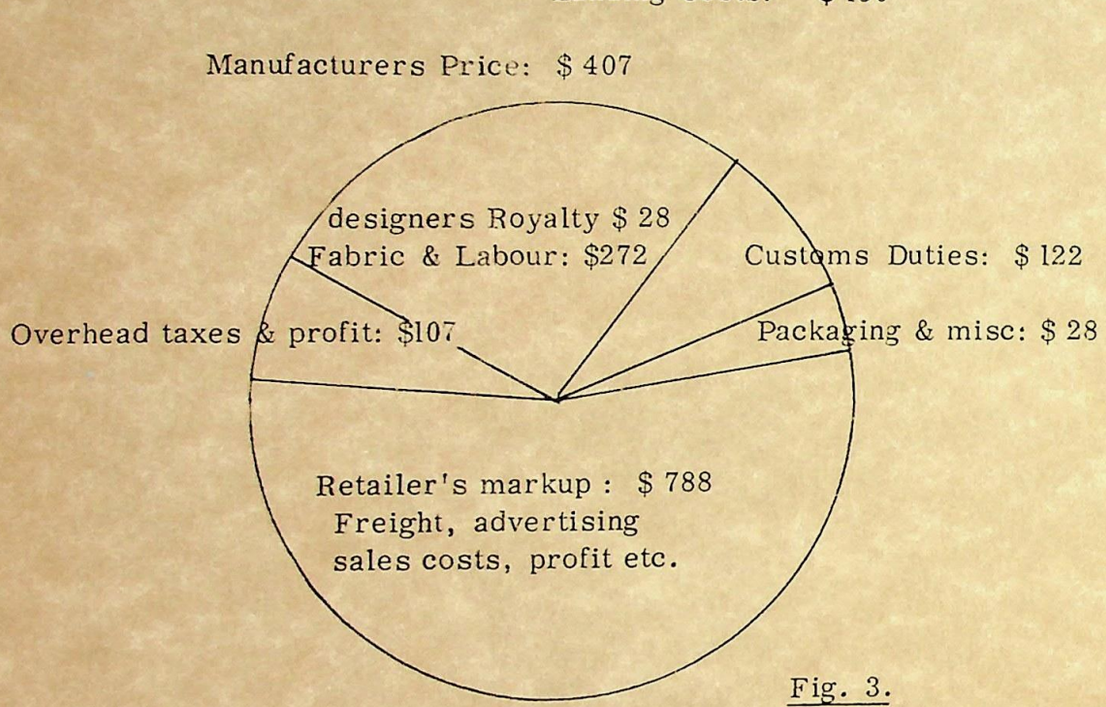


Fig. 3.

THE MIDDLE MARKET:

This market is split into:

- classics
- rip and twist

"classics" are characterised by a slightly older image : branded, traditional, quality merchandise; often sold as co-ordinates.

Names include: Jaeger, Aquascutum, Burberry, Ralph Lauren, Daniel Hechter, Liberty. Prices are medium to expensive, appealing to an affluent market. Some are vertically integrated from material to retail. Others subcontract some or all of the design - manufacturing process. "Rip and Twist" are copiests. They buy toiles or plagiarize, adapt, modify or use trend books. They sell to department stores and independent retailers in the medium price range.

RENE GRUAU (1981) SHORT DRAPED TAFFETA
DRESS FROM YVES ST. LAURENT.
AN EXAMPLE OF HAUTE COUTURE, SEE SECTION 3.
'HAUTE-COUTURE' AND 'PRET-A-PORTER'.

"LOW COUTURE"

Again there are two sections

- trendy
- non-fashion

"Trendy" aims at a younger market:
characterised by lower prices, a fast response to street trends. Cost is critical. Many "no name" designers work in this volatile and demanding sector. "Copper Knob", "Jump", "French Connection" and others sell to boutiques and chains such as "Top Shop", etc. The product life cycle is usually very short, stocks can become obsolete overnight.

"Non-fashion" is not design intensive. It operates in stable non-seasonal conservative lines with volume production across a wide price range. "Consumer Location" Marketing, March 17, 1984.

The cost structure for this end of the market is shown in fig 4. It shows the cost breakdown for a simple button-down blouse which the manufacturer sells for £6.50 to retail at £10.40.

Fig. 4

"Marketing" M & E Handbooks
London 1978

The hierarchical concept of fashion markets is based on Paul Nystron's *2 classic analysis of the economics of fashion in which he explores the way in which fashion movements are diffused downwards through the social strata. This so-called "trickle-effect" has been the dominant issue in fashion marketing for nearly 50 years. The well publicised process of diffusion and adoption in fashion, has come under attack. Charles W. King *3 in his essay "A Rebuttal of the Trickle Down Theory" claims that while the process still exists in the industry the theory does not reflect contemporary fashion behaviour among consumers. The changing environment due to social and economic factors, has completely altered the profile of consumermarkets.

Today class lines are clearly drawn only at extreme points of the social class continuum. As a result of the levelling influence, a much broader slice of the population can afford to be in fashion.

This places further constraints on the designer in mass production. Ada Heather Biggs *4 in her article "The Ends of Fashion" argues that; fashion makes commodities dearer. She states "Invention" however, increases the sum total of production; fashion does not. It simply changes the proportion in which the constituents of the sum total of production stand to each other. Inventions cheapen, fashion makes things dearer".

For example, consider the trend for Autumn '85. "All button trim details are working trims" i.e. a cuff epaulet with button details, is to have an operating buttonhole. This trend will obviously increase costs in production. Thus the economy of production can be adversely affected by a fashion change. The manufacturer must adhere to these trend changes to get business, yet maintain low costs. A good designer in mass production is one who can introduce modifications of current trends to meet the demands of a well informed mass market.

Mass communication media rapidly accelerate the spread of fashion awareness and influence mass market endorsement. This development supports the rebuttal of the trickle-down theory, in the context of the consumer market. However, the vertical flow of ideas continues to operate within the clothing industry; where exclusive designers are watched closely and emulated by lesser designers and major manufacturers are studied and copied by smaller and less expert competitors.

Design piracy is a well established competitive strategy.

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*2 Nystrom Paul, "Economics of Fashion" Fashion Marketing Allen & Unwin, London ' 72

*3 King, Charles, "A Rebuttal of the Trickle Down Theory" Marketing Association, New York 1963.

*4 Biggs, Ada Heather "The Ends of Fashion" "Fashion Marketing" - Wills and Midgley published by Allen and Unwin, London 1972.

CHANEL - PARIS - SPRING/SUMMER.

SEE SECTION 3, 'HAUTE-COUTURE'

3.2 MARKET SEGMENTATION

Success in the garment business and indeed in any business comes from "finding a (fashion) need and filling it" to paraphrase Theodore Levitt. * 5

The success of such people as Sir Terence Conran, Liz Claiborne, Calvin Klein is based on their ability to pinpoint such needs.

Sir Terence Conran has successfully catered for the needs of the young career woman by establishing the "Next" chain of stores. The aim of "Next" is to provide a range of co-ordinated merchandise which allows the individual to achieve a 'total look' under the one roof at an affordable price.

Accurate market segmentation is a well established concept in the United States - Liz Claiborne designs to the needs of the career woman; Ann Taylor stores retail to this customer segment.

From a design perspective these garments are simple in style features, but subtle sophisticated colour/texture combinations are backed up by very strong merchandising techniques.

The development of a segmentation strategy should -

- help identify new user market segments
- permit concentration on the most profitable markets by means of product design or promotion
- stimulate distribution channels
- build up a reputation for progressive leadership in the closely defined markets.
- provide a sales force with a clearly defined mission and objectives.
- force competitors into defencive strategies
- stretch product life cycles at comparatively low cost.

Planned market segmentation implies that a "distinctly homogenous group of needs has been matched closely with a group of potential customers and that there is a distinct demand/profit curve associated with satisfying the needs of that group" * 6

On finding the gap we set about filling it - by first getting to know our customer. This calls for market research.

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* 5. Levitt Theodore "Marketing Myopia", Harvard Business Review, New York Sept/Oct. 1985.

* 6. Giles - "A Marketing Handbook" by M & E Handbooks, London 1978

3.3 MARKET RESEARCH

Finding a gap or creating a gap in a specific market requires market research. Effective market research provides the business with a clear profile of the potential customer, his or her needs and preferences.

Identification of the market segment directs the design effort so that we develop ideas based on customer needs.

The designer for mass production aims at designing what the customer wants at the lowest cost and therefore relies heavily on accurate customer/market information.

The approach to market research will depend on the size and type of firm.

Some firms are large enough to justify their own in-house market research team. Others will use research firms such as Acorn, whose consumer research is more precise than the traditional "Jicnars" - A, B, C, C3 and DE categories. Michael Morton writing in "Marketing" says "because Mass Media are getting so expensive we cannot afford to make lazy broadscale definitions of target markets when we know perfectly well that most consumer markets are highly sensitive". * 7

The designer needs an accurate analysis of the consumer within these target markets.

The traditional means of segmenting markets by; organization, size, geography, business classification, socio-economic grouping, age, sex, etc. are now beginning to be supplemented by research into behavioral areas such as lifestyles, attitudes, and priority spending patterns; often combined with more conventional data.

Within the clothing industry three main techniques of research are used:

1 Desk research
2 Buyer interviews
3 Test marketing

3.3.1 DESK RESEARCH

This includes data which exists within the company such as sales records, reports, fashion magazines, marketing manuals, demographic and income group statistics.

In the larger firm the designer would receive briefs on the market trends from the marketing department.

AQUASCUTUM. HAUTE COUTURE

DAYWEAR WITH A BRITISH STAMP.

SEE SECTION 3.i - 'THE COST OF COUTURE'

3.3.2 BUYER INTERVIEWS

The small to medium sized firm relies heavily on the opinion of the buyers for up-to-the-minute information on what is selling and on styling trends.

A helpful buyer will often provide valuable insights on where a range is going wrong or right. Herbert Blumer *8 says buyers" success, indeed their vocational fate depends on their ability to sense the direction of taste in the public". Buyers are acutely aware of their market and therefore any information that they are willing to pass on to the designer or marketeer can only help in achieving the best possible range for that particular market.

3.3.3 TEST MARKETING

It could be said that couturiers who are supported through private patronage, are testing original design concepts, which if successful will be adopted and modified by the designers further down the line.

Market research for the clothing industry can provide the designer with valuable design information e.g.

- Size distribution in specific regions e.g. Northern Regions (U.K) average size tends to be 14 +, Southern Region average size tends to be 10/12.
- Colour preferences in various areas.
- Consumer incomes - the amount of money the consumer has to spend on clothes (in the U.K. that averages 8%) which could influence the target cost of a design.

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* 7 Morton Michael "Consumer Location" Marketing March 17, 1983.

* 8 Blumer, Herbert "From Class Differentiation to Collective Selection". The sociological quarterly Vol. No. 3 - 1969.

3.4 CUSTOMER PROFILE

Once the target market has been identified and researched, the information is translated into a customer profile, this in turn in translated into a brief for the designer.

This brief can be very brief indeed. For example Pringle, an English Knitwear company profile their typical male customer as being:

- the 35 year old executive type
- this man is able to spend £10-£16 on a basic sports shirt
- dressed for the sport he may not partake in it.

The Pringle female:

- the female is older, about 40 years of age
- this woman's wardrobe would contain expensive classic outfits
- unlike the man, she is likely to be seen sporting her shirt on the golf course or tennis court.

Alongside this customer profile I believe that recent trends in the knitwear market in general have shown that "name and quality" has lost strength to the "stylish and fashionable".

An accurate customer profile focuses the design effort into a specific area - improving design productivity and resulting in a marketable product.

Once the customer profile has been established one can set about designing to cater for the needs of the customer.

CLASSICAL ENGLISH COUNTRYWEAR
FROM BURBERRY.

SEE SECTION 3 (i) ' THE COST OF COUTURE'

4.0 THE DESIGN STAGE

Range design is a lengthy iterative process that starts up to 6 months in advance of the season. It combines lateral thinking and structured research to get convergence on a coherent range.

4.1 IDEA GENERATION

This creative phase shown in Fig. 5 is characterised by:

- Free wheeling thought processes
- unstructured formats
- inspirational leads
- switching-off critical and judical faculties.

See Fig. 5.

Fig. 5 Taken from "Marketing Myopia" Harvard Business review. Sept/Oct. 1965.

CLASSICAL SPORTSWEAR DESIGNS

BY RALPH LAUREN FOR POLO

SEE SECTION 3 (i) 'THE COST OF COUTURE'

A designer uses many different sources in looking for ideas. A constant awareness of the fashion mood and future trends is essential. Awareness comes from continued scanning of fashion magazines, newspapers, and visiting fashion shows and trade exhibitions such as Fabrex and Interstoff*10

The designer develops a sensitivity to new influences that may effect fashion. Many political and social changes have substantial effects on fashion.

The designer in mass production feeds on the unlimited creative ideas of couturiers who can afford to ignore cost restrictions when creating. In her article on the Paris fashion scene Marcia Berss* 11 talks of the duty on ornamentation on a garment,e.g. on importation to the U.S., buttons on a jacket sleeve without buttonholes add 40% duty; buttons with buttonholes do not. When she approached Karl Lagerfield on this matter he quickly dismisses the thought, stating "if I considered such things, I would be paralysed". Design for mass production must add cost disciplines but can still search for creativity in the less disciplined designs of the couturier.

The designer will also be influenced by design concepts from architecture, paintings, films, theatre, ballet and opera.

Pop star fashions set trends and strongly influence design. Consider the new romantic look of the early 80's. The clothes of such pop artists as Duran Duran and Madonna created a new look for the young generation. A theme which was expanded on in the fashions created for "Lady Di". This gave a tremendous boost to the British Clothing Industry.

Clothes are a visual means of communication - people make social statements through their clothes. This is more strongly identifiable amongst the youth of today who are protesting against the unsatisfactory social climate. Perhaps for the first time in the history of fashion, street fashion (cheap clothing) has filtered upwards through the design rooms of couturiers.

Sally Brompton * 12 comments "There is a new genderless army of youth, an undoubted influence on the real business of dress. Designers while they do not openly plagiarize street styles are constantly sensitive to the changes in social attitudes which it exemplifies. They might interpret it with more polish; some might even say more taste but the origins are apparent".

The Japanese have set a theme of a timeless clothes direction having no regard for sex or class with designers such as Miyake saying that they simply "design clothing for people to wear". *13 That is what designers in mass production have (or should have) been doing for years. In Greenwich village, New York "Comme des Garçons" presents fashionable counterparts of black Vietcong unisex, military uniforms in an austere concrete retail space.

Jean Paul Gaultier's *14 Spring '84 collection is reviewed with phrases such as: "he guyed anything and everything; dwarfs and Mae West, prostitutes and blind men but underneath all this some very classic dresses in pastel linens and

amazing tropical print shirts overflowing out of mechanics overalls".

This is the reversal of the trickle down theory: now "low" couture influences haute couture.

The periods of historic costume, military uniforms and national embroidery are all important sources for idea generation.

Other external influences include inspiration from flowers and nature which create impact on our use of form, colour, patterns and textures.

The designer in mass production must always be aware of the possible use of new fabrics, trims and decoration. He/she must develop an observant eye, learn to perceive detail clearly, use right side of the brain techniques. *15 Cram sketch books with ideas; concepts to form the themes for future collections. It is vital to keep and file these sketch books as a reference and stimulus for new ideas.

* 9 De Bono, Edward "Lateral Thinking" Penguin

* 10 Fabrex - Fabric Exhibitions, London; Interstoff Exhibition, Germany.

*11 Berss Marcia "Paris when it sizzles" Forbes April, 23rd, 1984.

* 12 Brompton, Sally. London Observer, March 11, 1984.

* 13 Cool Gender Bender" Apparel International, April 1984.

* 14 Image Magasine, April 1984.

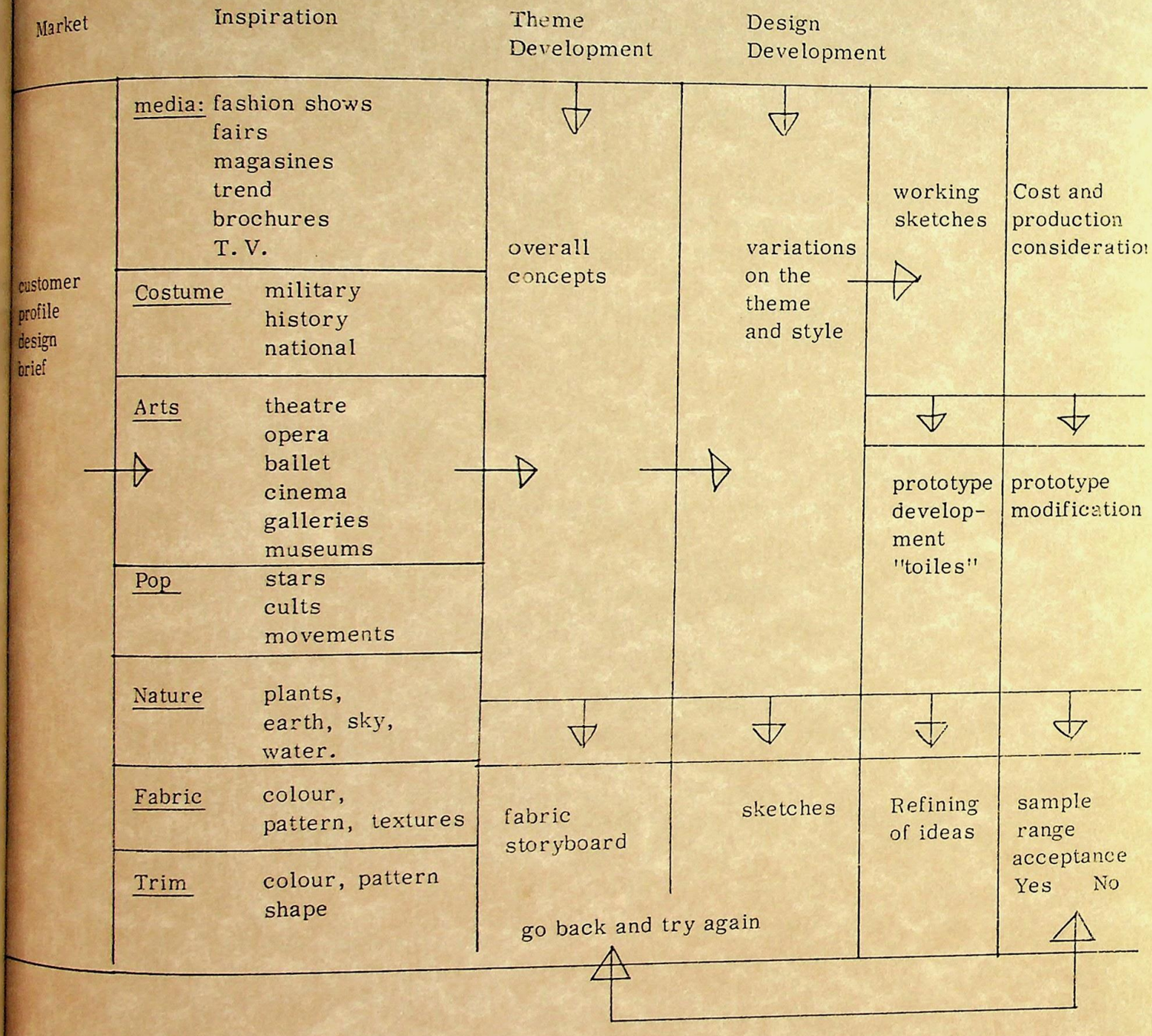
* 15 "Drawing on the Right Side of the brain".

CHRISTIAN DIOR-FOLLOWING THE CURRENT TREND
FOR DESIGN HOUSES TO HAVE A FINGER IN MANY PIES,
INCLUDING COSMETICS, INTERIOR DESIGN, A SCENT ETC...

SEE SECTION 3, 'HAUTE COUTURE'

4.2 DESIGN FOR PRODUCTION

This is the structured phase. Where we screen creative ideas and order them to achieve the desired product within our cost restraint. See Fig. 6 Taken from "The Clothing Factory" The Clothing & Footwear Institute, 1982.



The fabric story board is a key source of design inspiration and part of the structure development of the range.

Normally a range of fabrics is selected and the designer sketches on a central theme. In some cases the design is produced first and matched with fabrics later.

A series of sketches on the theme enables the designer to experiment with ideas without going to the costly extremes of having samples made up for all designs. It helps refine ideas at lowest cost. Good sketching skills are very important for a garment designer. Often sketches can be used in selling a concept.

For mass production, working sketches can often successfully illustrate a design. More often than not proper presentation drawings will be used, prepared either by the designer or a specialist fashion illustrator.

Colour and pattern can be added to the sketches suggesting the use of selected fabrics. It is more effective to keep a colour scheme on the sheet as this adds a sense of continuity.

Colour in garment design is vital, colour is the first thing that attracts the customer to a garment on the rail. Certain areas of clothes design also call for very careful use of colour e.g. outsize, children's or disabled's garments, where colour is used to conceal disproportions or deformities.

In some areas of mass production trims are the most important part of the range development. In manufacturing nightwear and childrenswear, costs must be minimized because the consumer is not willing to pay the price for garments which they consider to be outside the boundaries of fashion.

Selecting fabrics is a very important stage in the design process. A selection of fabric is built up after careful consideration and after viewing many collections.

The development of a story-board is a very useful tool for the designer who can discuss the possibilities of fabrics and colours in relation to the design by refining the board until the colours, tones and textures emerge into a coherent theme.

The cost of production is largely established at the design stage. One is trying to innovate on a standard shape bearing in mind the constraints of

- fabric
- machinery
- labour costs

These constraints will vary:-

the <u>type</u> of garment being designed will obviously restrict the choice of fabric from the wide range available e.g. a raincoat requires waterproof or shower-proof fabric.

GIANNI VERSACE, SPRING/SUMMER COLLECTIONS

MILAN.

SEE SECTION 3 'PRET-A-PORTER'.

The function of the garment will cause other fabric types to be disregarded e.g. workwear requires durable easy-care fabrics.

Finally the cost of the fabric will be the ultimate dictator of choice.

Machinery:

The designer in mass production must avoid an 'ivory tower' approach, he/she must get out of the refined air of the design room and onto the factory floor and learn

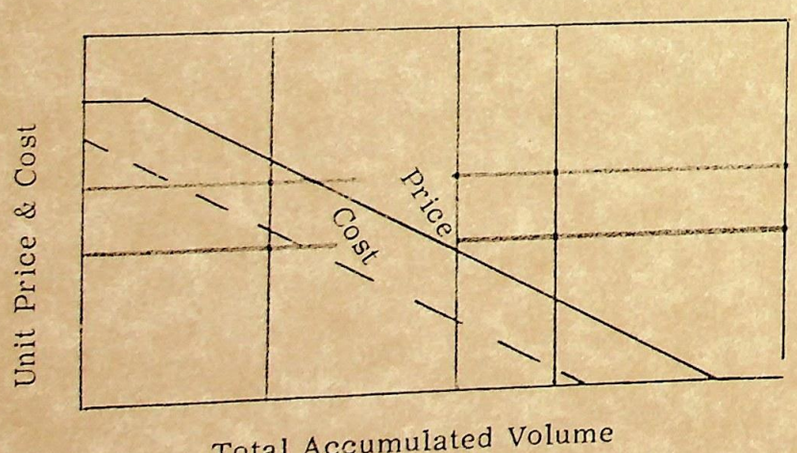
- machine speeds and flexibilities
- set up times and costs
- limitations with different fabrics

Develop a good working knowledge of the scope, limitations and cost characteristics of the overall system that translates the designers concepts to a finished product for the consumer.

Labour Costs

Seams, frills and trims and special treatments add labour costs. Production must be slow as machinists learn new skills. While design must ultimately respond to the market-place, clever design and range development can lead to longer production runs on relatively standardized items.

The Boston consulting group * 16 have researched the learning curve effects in mass production. The cost of most products reduces by 20% for each doubling of accumulated experience. See Fig. 7 * 16



A good designer in production will be able to think through the cost implications of the entire process from basic idea to workable garment. Various techniques can be employed in design to achieve the desired effect of adding variety to a basic style at low cost.

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* 16. Henderson Bruce; The Boston Consulting Group "Perspectives on Experience, New York 1970

GIANNI VERSACE - SPRING/SUMMER - MILAN.

SEE SECTION 3, 'PRET-A-PORTER'

4.3 CREATING VARIETY

In designing for mass production one is trying to create variations on a theme at minimum cost. Trims, stripes, appliques and stitching details can extend the basic concept to develop the range for the target market and indeed extend it to access other markets.

With designs, fabrics, and trims selected, it is time to move on to the next stage - the sampling process.

5.0 SAMPLING

5.1 Patterns

The pattern translates the garment design into components for manufacturing. One designs for Mr. and Mrs. Average *[17] outsize is a special market. The normal size range is 12-16. See Fig. 9 * [17]

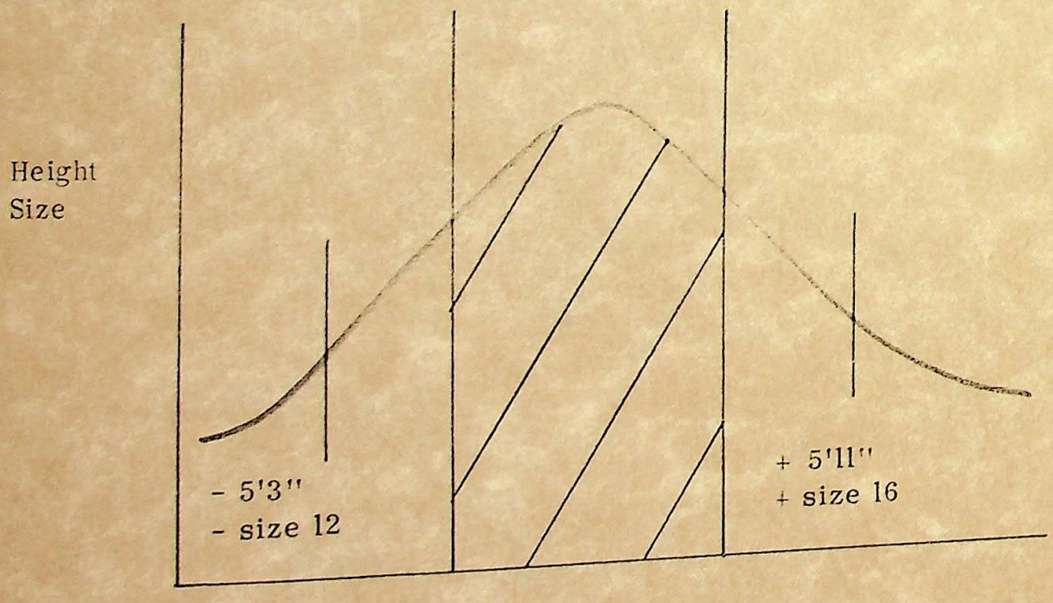


Fig. 9

Intensive research goes into preparing size scales for pattern development.

In mass production one works from a basic block. A two dimensional shape which when sewn together gives a three dimensional form that is the "Design".

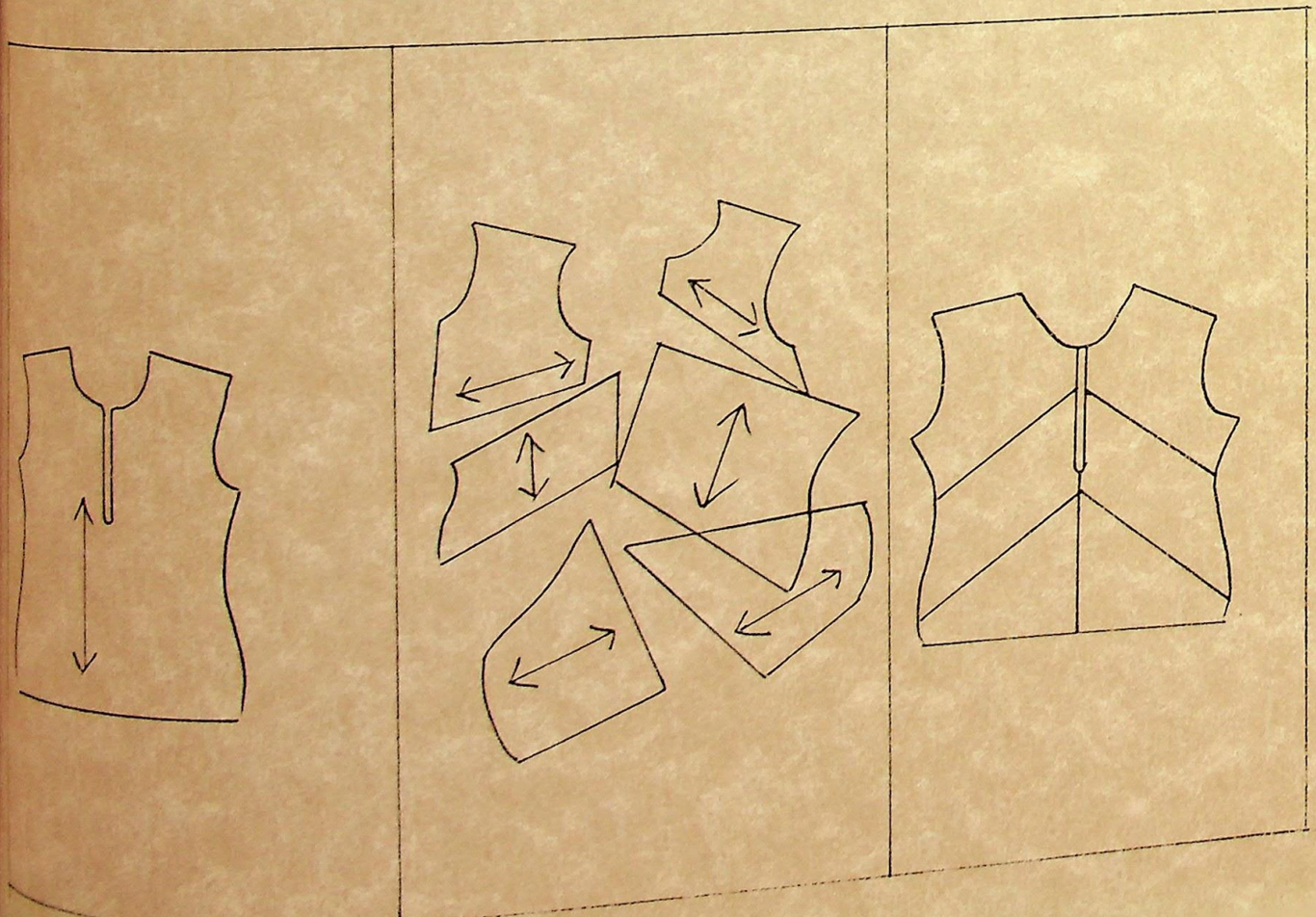
Pattern making is similar to a mathematical permutation. One is trying to find as many ways as possible of putting the basic shape together, bearing in mind the constraints of:

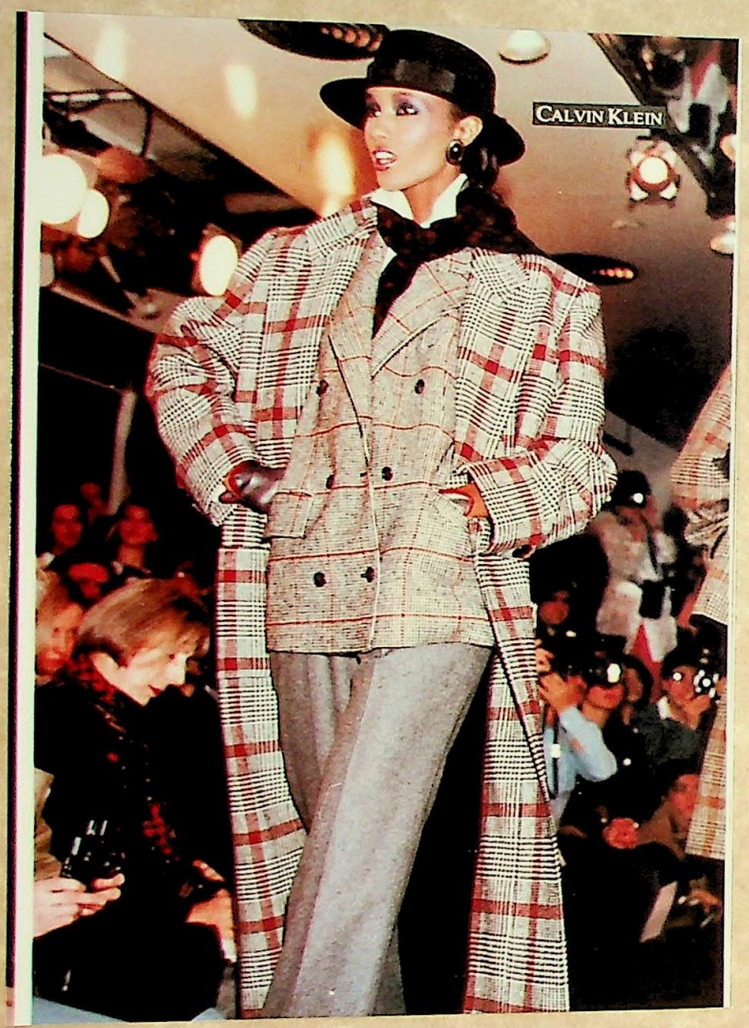
- fabric
- machinery
- costs

Slashing in various ways gives a new image to a standardized shape. The diversity and impact of this is increased by:

- changing fabric - colour, print, texture; combinations of two or three
- changing trim details - stitching pockets, yokes, pipings, appliques etc.
- combinations of all of above.

Fig. 10 *17 Shows how simple modifications can generate variants from a basic pattern, e.g. a shirt front





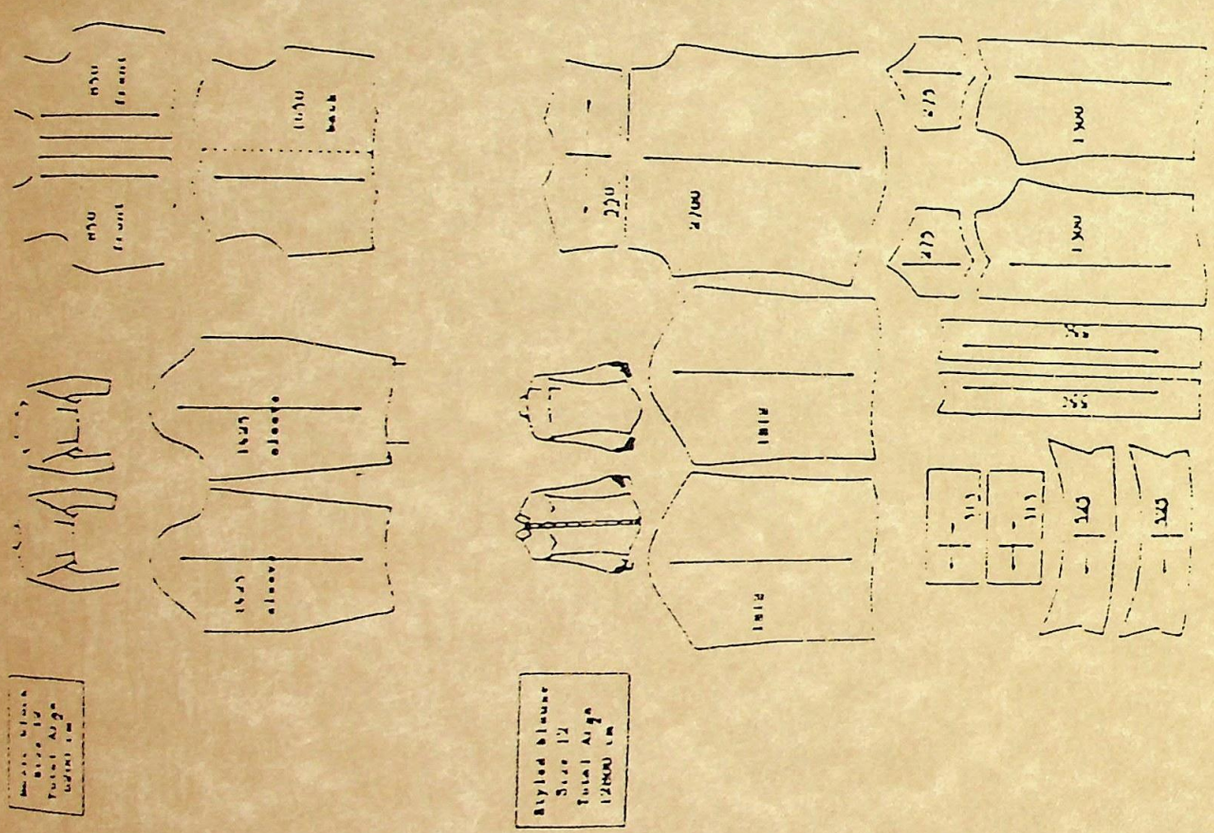
CALVIN KLEIN - AUTUMN/WINTER - NEW YORK.

SEE SECTION 3 (ii)
"MARKET SEGMENTATION"

Approximately 50% of production costs are fabric costs. Therefore economy in use of fabric is a very important consideration for the designer and those involved in cutting and lay planning.

Well engineered patterns for mass production economise on fabric. Certain styling features can increase cost dramatically. Fig. 11 illustrates the increase in fabric area when a basic shirt style is altered to provide a front and back yoke, a longer line and different sleeve detail.

FIG. 11. *17.



These changes double the fabric requirements and significantly increase sewing operations and labour costs.

The designer in mass production is constantly faced with this type of cost constraint; yet variety and styling is demanded by the consumer. It is a vicious circle providing constant pressure on the manufacturer's mark-up.

A good mass production designer is one who is aware of these constraints and can interpret a design concept using less fabric through clever pattern cutting.

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*17 Abrahams, Leonard "Block Pattern Construction Using Workroom Stands" Apparel International April 1984.

5.2 SAMPLE MAKE-UP

Manufacturing feedback is vital. A designer cannot visualize all make-up problems. A good sample machinist is a key member of the team. The sample machinist is an extension of the design process.

The machinist improves product design by pointing out the problems in make-up before it goes into production.

Clear details of the garment should be given to the machinist and a working sketch should be enclosed with each bundle.

One must be conscious of the special skills of the sample machinist. She can do the work that may be too difficult for the girls on the floor in a full production environment, where skills are often reduced to a few job operations. Abnormal details should be dealt with directly.

Once a problem in make-up is identified by the machinist a pattern should be altered immediately. This will save time and money in production.

During my period in Glen Abbey I was preparing a shirt for mass production for the Glen Abbey range, when a machinist pointed out the difficulty in avoiding distortion of the neckline while pleating the front. The solution was to pleat a larger square of fabric and cut out the front shape afterwards. See Fig. 12

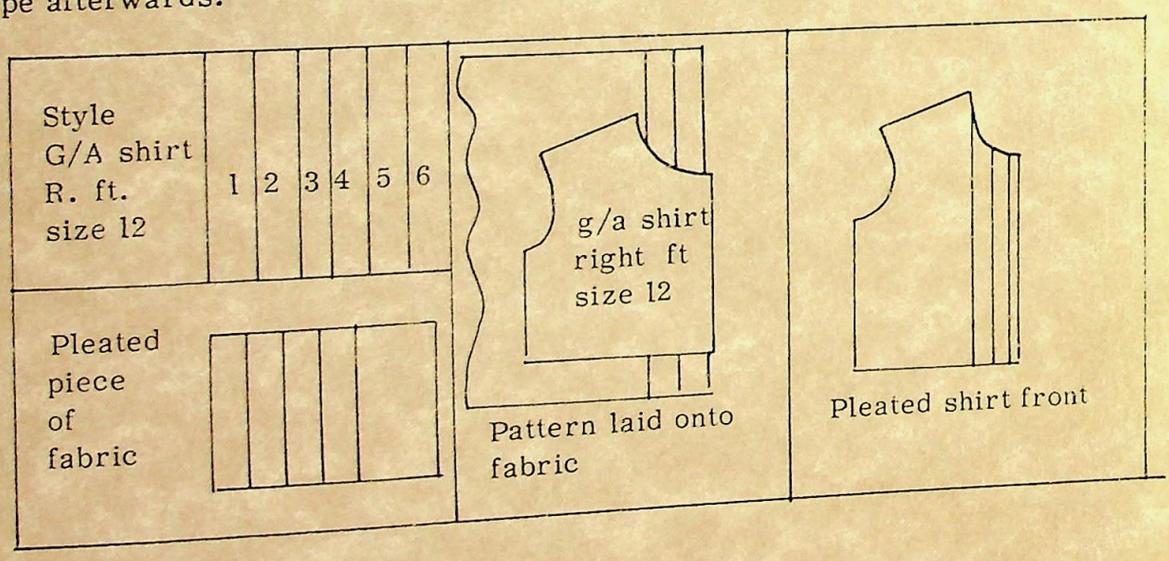
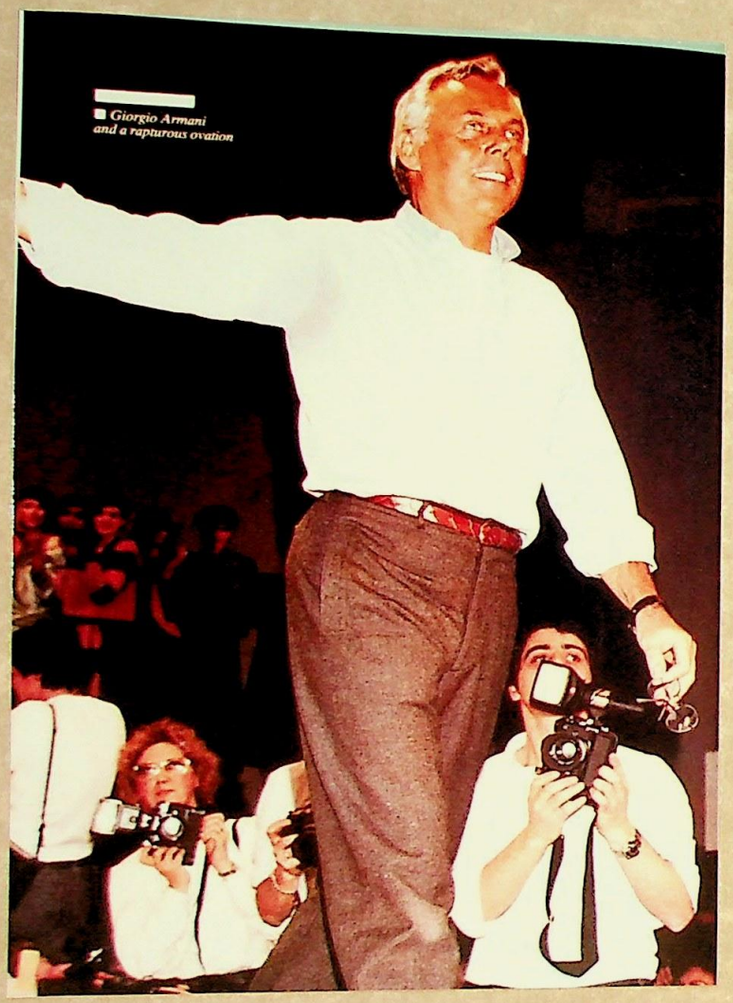


Fig. 12

Prototype garments are produced as "toiles" made up in plain cotton (calico) if the fabric is not too expensive toiles can be made in the selected fabric. This enables the designer to see the garment as it is made and develop the design further, correcting the silhouette, proportion, balance and general effects.



GEORGIO ARMANI, - MILAN.

SEE SECTION 3 'PRET-A-PORTER'

5.3 SPECIFICATIONS

The specification sheet gives details of:

- the garment style - sketch
- details of the fabric, - colour, type, usage and cost
  trims, - " " "
  and cost
  packing, - " " units/box and cost
- details of make-up, - seam types
  - button positions
  - motif positions, etc.
- details of make-up cost/operations.

Cost sheets should be made out once the sample is completed. Each sample is given a specification number in a sequence which follows through the range development from the basic style through the more expensive models of the range.

6.0 QUALITY

6.1 Quality Concepts

Quality is built into a garment from the design stage. The word has two meanings in a fashion context.

Quality of Design: the value inherent in the design in relation to customer requirements.

Quality of Conformity: A measure of the faithfullness with which the garment conforms to the design.

Today's consumer is far more quality conscious, this has been brought about by three main factors:

- consumer magasines and service such as "Which" and "Where". They aim to probe behind the advertising "hype" and give the consumer the true facts about various products.

- Marks and Spencers philosophy of "high standards of quality at a reasonable price". Their persistant emphasis on quality has contributed greatly to raising both consumer quality awareness and the standards of quality in mass production. They have established very strict quality levels which their manufacturers must adhere to. They have gained large market shares by selling garments which, while not essentially stylish, are of the highest quality.

- Recession - during any period of economic decline the average person forgets fashion fads and concentrates on buying goods which will last.

He/she will seek out the best quality garment at the best price.

Total quality control involves all departments in an organization but starts with a study of the customers real requirements in terms of performance and price.

We must consider garment design not just in relation to aesthetics or fashion but relative to the function or utility of the garment. This involves testing in order to establish standards for performance and reliability under the conditions that will be encountered in wear e.g.

swimwear: resistance to u.v. light.
resistance to chlorine

rainwear: water resistance of fabric and seams

The quality specification would typically include:

- style features
- cloth specification
- trim specifications and function
- relevant manufacturing details, machine types
- size scales e.g. 12, 14, 16
- critical garment dimensions and tolerances
  e.g. chest size 102 cm $\pm$ 0.5 cm
- stitch and seam types.

Development of these specifications will involve liaison with the garment technology department in a larger concern, or drawing on external supplier expertise and industry or college laboratories for the smaller company. I believe that it is important to know that cutting, sewing, and pressing processes can meet the design standards, otherwise reject rates will be too high. I have learnt that one must listen carefully and reconsider design features when the sample machinist says "they'll never be able to make this in production".

All those in production should understand their particular responsibility in meeting the standards set by the specification. Many firms are following the Japanese approach of setting up quality circles to communicate and innovate at the shop floor level on matters affecting quality.

6.2 Statistical Quality Control

Statistical techniques can be used to set quality standards and to measure quality performance. Standards can be set in terms of:

- size variances
- attribute variances

Limits may be set by the manufacturer's quality control department or by the customer e.g. Marks and Spencer frequently define acceptance limits for their suppliers.

GEORGIO ARMANI - AUTUMN/WINTER, MILAN.

SEE SECTION 3

'PRET-A-PORTER'

The starting point in a statistical quality control is to establish a process control chart for the variable being measured.

A sampling system is designed and tested to ensure statistically significant results, e.g. 20 sample groups of 4 garments. One measures deviations from a nominal value in the samples, the nominal value being the stated size measurement of the garment. These deviations from the nominal value are plotted to develop a control chart for the process data. The process control chart shows the pattern of variation in that particular measurement. By analysis of this pattern in statistical terms we can design acceptable tolerances.

PROCESS CONTROL CHART

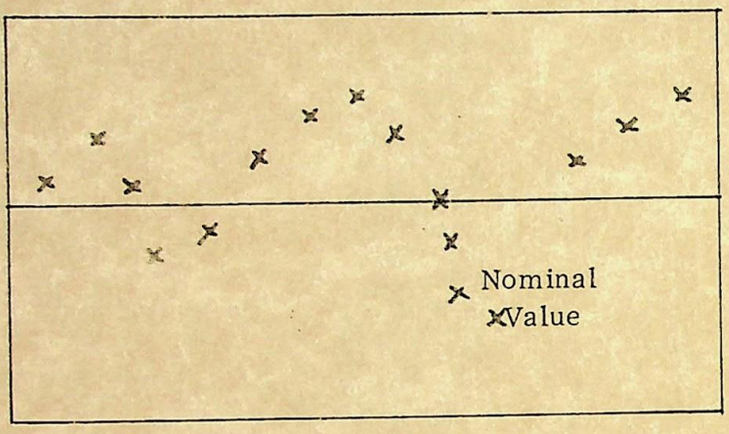


Fig. 13.

From the process control chart data the quality controller and the designer can prepare a Designer's Tolerance Sample Average Chart and define limits for acceptance, rejection and action in terms of multiples of the standard deviation of the measurements computed from the process control chart. These limits are illustrated in Fig. 14. Taken from Hertz P. T. "Product Defects & Productivity" Harvard Business Review, Sept. Oct. 1983.

The Designers tolerance sample average chart would normally be updated on a weekly or monthly basis to check that there were no statistically significant changes in the process. A skilled quality controller can learn to interpret trends from the pattern of this chart which may indicate the need for machine adjustment, consistant operative error or perhaps a change in fabric or incorrect patterning.

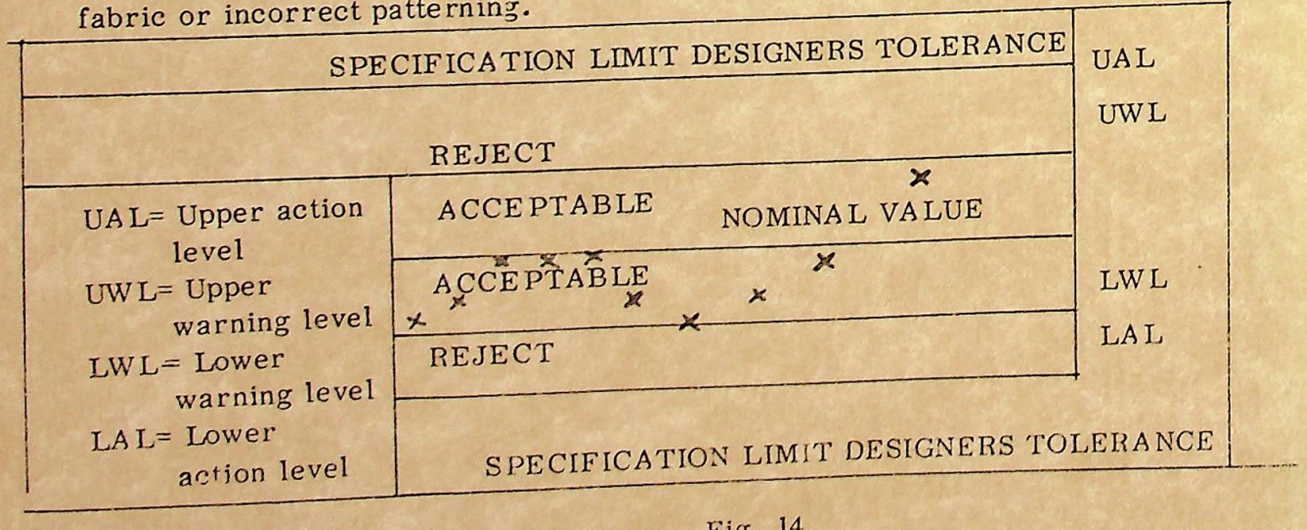


Fig. 14.

KARL LAGERFELD FOR CHLOE -
SPRING/SUMMER - PARIS.

SEE SECTION 3 'PRET - A - PORTER'

all these levels are defined in terms of the standard deviation.

The other important chart in statistical quality control is the control chart for attributes. As a starting point the department designs a sample system to focus on the particular attribute e.g.

Acceptable/Unacceptable level of seam pucker.

A Control Chart is developed to record these go/no go events. See Fig. 15. * 18

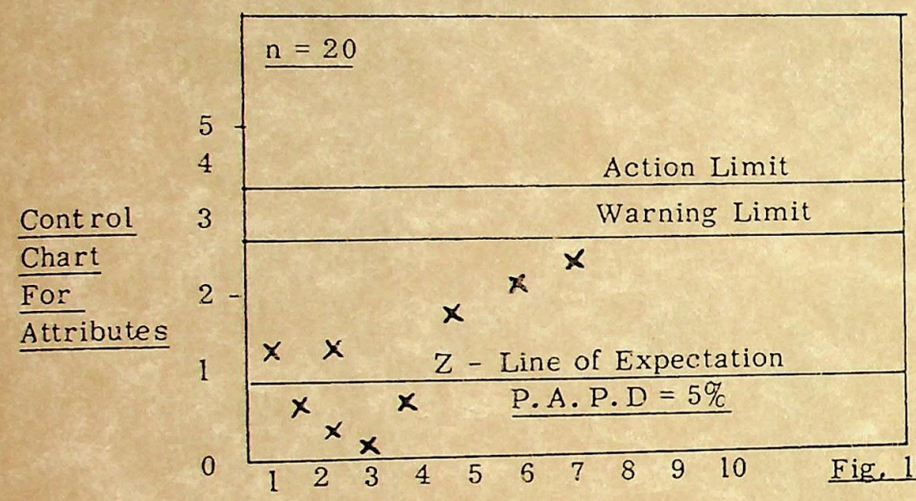


Fig. 15.

On this example the P.A.P.D. = Process average percent defective = 5%. Therefore 1 in every 20 sample bundles is defective. Quality has a cost. If standards are unrealistically high in the context of process variations, reject rates become unacceptable. We must refine the production or set more realistic standards.

Set too low, an unacceptably high level of substandard garments reach the customer and the company may quickly be put out of business. Statistical techniques give warning and action indicators to avoid both of these events.

Well designed Quality Control systems involve close liaison between the customer, designer, quality control and manufacturing often with inputs from fabric suppliers and equipment manufacturers. The good designer sees beyond the drawing board and through the total production system.

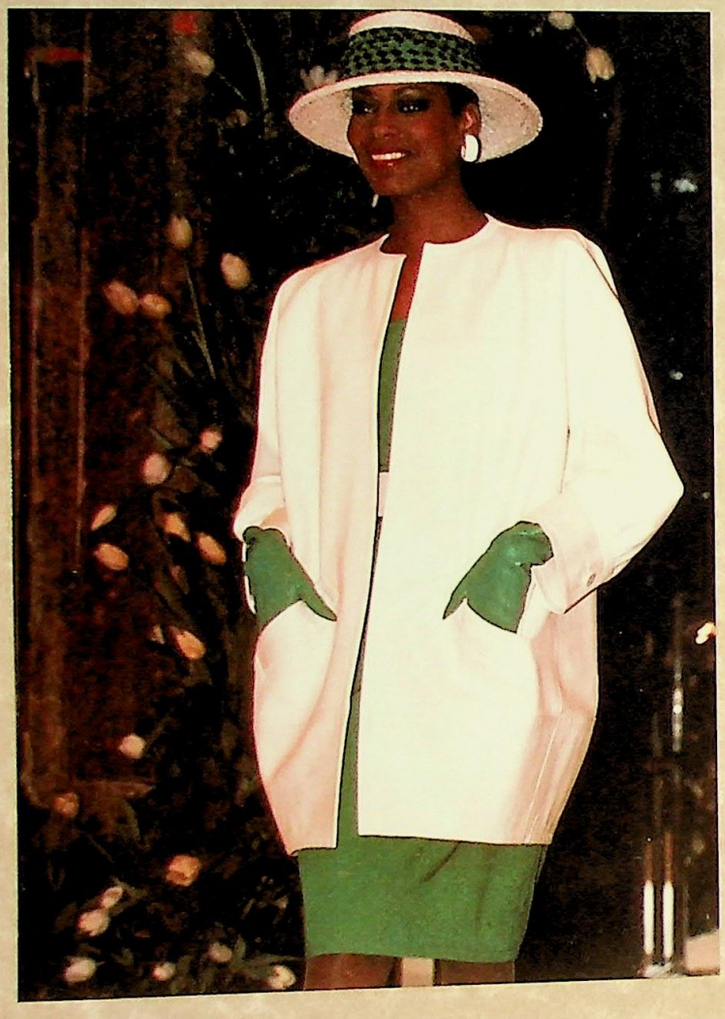
* 18 Hertz P.T. "Product Defects & Productivity" Harvard Business Review Sept/Oct. 1983.

7.0 RANGE DEVELOPMENT

7.1 Presentation

Presentation is of critical importance in selling a range.

In any range for mass production there should be three categories of garment.



KARL LAGERFELD FOR CHLOE

PARIS, SPRING/SUMMER

SEE SECTION 3
'PRET-A-PORTER'

Leaders:

- these garments attract attention
- they are expensive to produce
- the manufacturer does not want to sell this style in volume
- the customer will find it too expensive

Middle-men:

- these garments contain simple style details
- they are inexpensive
- they are commercial but attractive
- the manufacturer will try to sell this style
- this customer will buy this garment as his fancy style.

Basics:

- These garments are the manufacturer's "Bread and Butter"
- the manufacturers biggest profit maker.
- the customer definitely wants to buy.

In order to sell the basic style, we surround it by "Leaders" and "Middle men".

Following a Pareto Law; a range can be broken down as to:

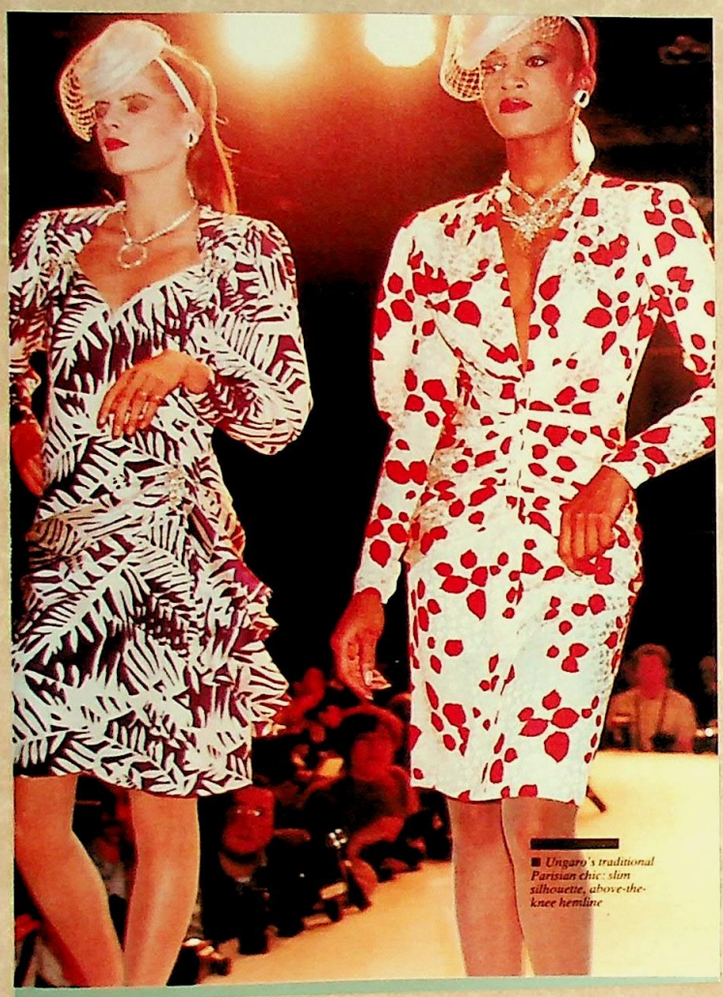
Leaders:	20%)	80%
Middle Men :	60%)	
Basics :	20%)	20%

Eighty percent of the volume will come from the twenty percent of basic designs.

This principle is reversed at the haute couture level, where eighty percent of the goods are sold for their innovative creativity while twenty percent will never be produced and are shown only to get dramatic press coverage.

The range should be presented in a manner which shows the continuity of the theme, beginning with the basics and developing into a formal series of idea/style progressions. The whole look of the range is held together by:

- the colour story
- the look



■ *Ungaro's traditional Parisian chic: slim silhouette, above-the-knee hemline*

EMANUEL UNGARO - SPRING/SUMMER, PARIS.

SEE SECTION 3 'PRET-A-PORTER'

The use of colour in a range is vital, it helps provide impact.
In the clothing trade, particularly women's fashions, seasonal colours are promoted as a stimulus for increasing sales *[19] Each year the couturiers promote a number of new shades in the hope that one or more will catch on and that every woman will decide she must follow the trends and buy a new outfit.

Colour alone can alter the appearance of a basic style. See Fig. 6.

Impact of colour on a basic style

Fig. 16.

VIVIENNE WESTWOOD - SPRING/SUMMER COLLECTIONS

LONDON.

SEE SECTION 3 "PRET-A-PORTER"

Ralph Lauren has been highly successful in using 66 subtle colour shades to sell his basic Polo range of shirts.

Clever colour blocking techniques which are translated through a range can help sell more than one outfit because the buyer can see the potential for co-ordination of a number of separate styles.

German manufacturers have used this technique effectively to help export sales.

The look of the range refers to the overall silhouette shape. This is critically important in ladies outerwear which often must follow the silhouette shape pre-determined by the top designers. The consumer is ready and waiting for the change in shape when it comes to the shops on the High Street.

Quality presentation sketches are important in selling ideas for a collection or indeed the current collection to a buyer. Showing style variations on paper alongside a developed range can be very cost effective; paper is always the cheapest material to experiment with. New ideas which could cost a lot as initial prototypes can often be presented as concepts on paper, for approval by the customer.

The presentation sketches should reflect the complete look that the designer wishes to project, and should include all the necessary details of fabric and trim including back views. Often the sketches are copied and bound in a well presented folder for the fashion buyer to view.

Many designers engage fashion illustrators or fashion sketchers to do a very professional job, producing sketches which would be suitable for reproduction and advertising purposes e.g. Antonio in America.

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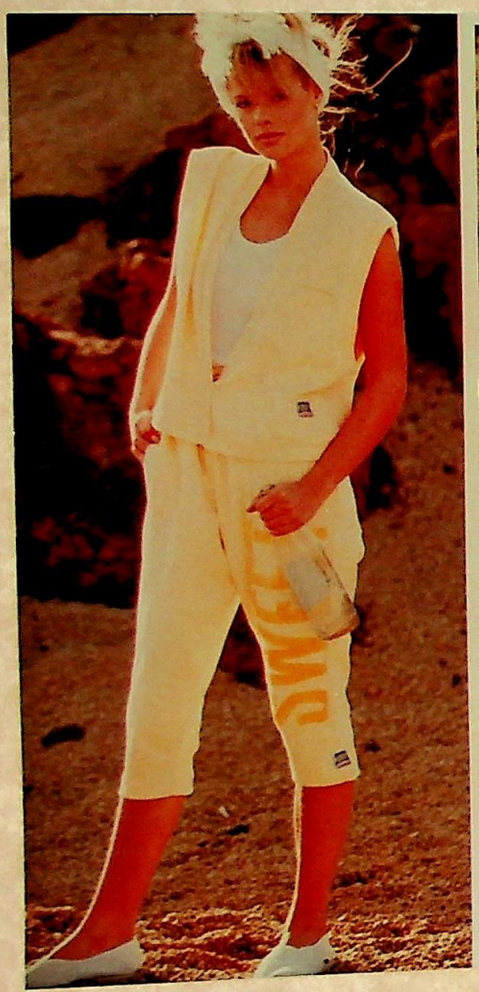
*19 Danger, Eric. P. "Using Colour to Sell" - Gower Press 1968.



■ *Exercise-conscious summer sweats from the boutiques and chain stores brought a new, relaxed prettiness to holiday wear*

THE EXERCISE-CONSCIOUS CLASS OF THE EIGHTIES,
REFLECTED IN OUR CASUAL & SPORTY DAYWEAR.

SEE SECTION 3, "LOW COUTURE"

7.2. RANGE MEETINGS

The following outline follows the format of Range Meeting at Glen Abbey.

The setting or determination of fashion takes place through an intense process of selection. Range Meetings are a vital part of this selection process, which starts well in advance of the season. The manufacturers and the buyer frequently agree a schedule of meetings with target dates and objectives for each stage of the range development process.

The first range meeting normally takes place within the firm. The designer makes a formal presentation to the management, sales and marketing. In a small firm the marketing and sales functions are often carried out by the Managing Director himself.

Selling or buying does not normally take place at the first presentation to the customer. Usually the customer will request further development of samples and sketches. These modifications must be prepared in time for the next meeting which may take place in days or weeks depending on market deadlines.

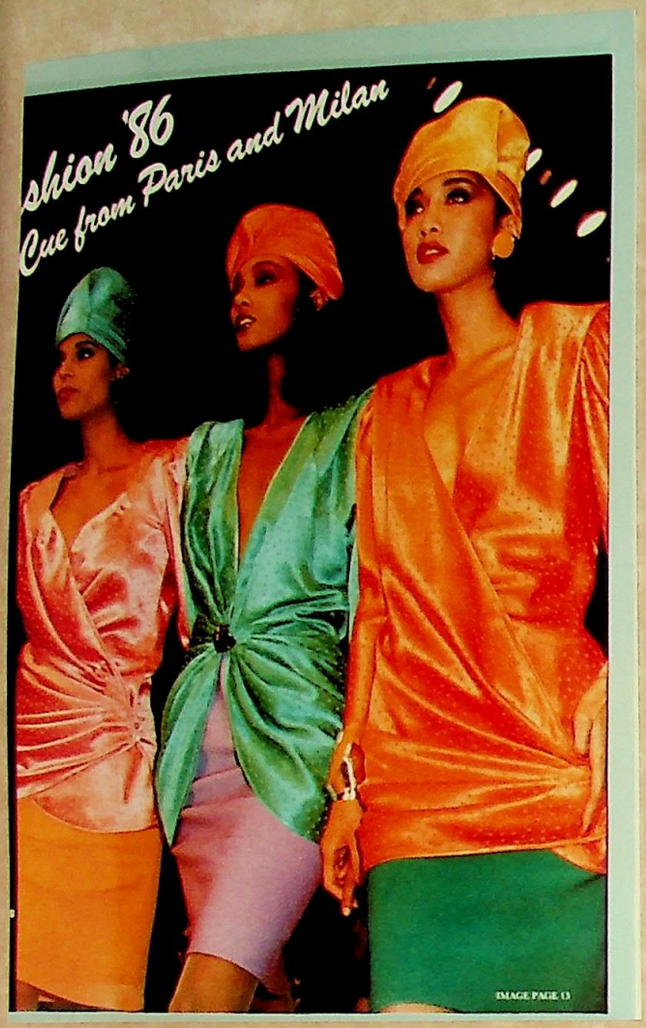
Detailed costings are rarely established at this stage. Broad "guesstimates" are given, based on experience rather than detailed calculation. Both manufacturer and customer have their "feelers" out trying to assess their negotiating limits.

As the series of meetings progress the designer will receive continued feedback on his success/failure or required modification of the line. New samples or alterations are requested often at very short notice and the designer must respond rapidly working on "real" time.

Range selection is basically a process of elimination. A range can contain as many as 200 garments of which only a few will be of interest to any one buyer.

A phenomenon of the fashion business is the similarity of "buyers choice" in their selection process. Different buyers will view the same range independently, yet their choices will converge on the same few designs. Unfortunately these few designs cannot be predicted. If they could, it would save a lot of design effort. Lord Leverhulme speaking of a similar phenomenon said: "I know very well that half my advertising budget is wasted, - but which half?"

Herbert Blummer * 20 suggests that the similarity in choice is due to the fact that buyers are immersed in, and pre-occupied with, a common world of intense stimulation; a world of close concern with their particular market type and with the prevailing tastes of the consuming public in this area. He claims that buyers come to develop common sensitivities and similar appreciations. They develop what he calls "a common appreciation mass" which channels their judgement and choice.



AN EXAMPLE OF FASHIONS
IN THIS YEARS SHOWS
FROM PARIS & MILAN.

SEE SECTION 4 (i)
"IDEA GENERATION"

Likewise designers, a selective and competitive breed, have a tendency to come up with similar ideas, even though they are created independently of each other.

Blummer suggests that designers pick up ideas of the past, but through the filter of the present: they are guided and constrained by the immediate styles in dress, particularly the direction of recent styles; above all they are seeking to catch the proximate future as it is revealed in modern development e.g. the current revamping of 60's styles in 80's eyes.

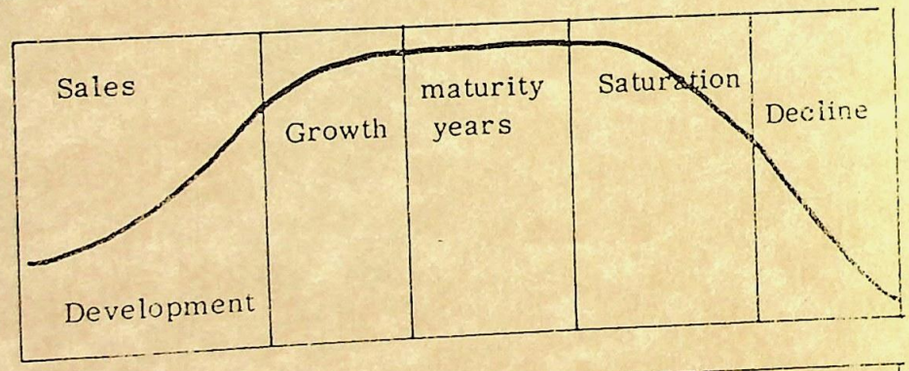
This article was written in the context of haute couture but the principles can be applied to mass production. It is the manufacturer's and designer's main challenge to INTERPRET correctly the nature of fashion in the particular market being served.

The designer cannot predict the chosen few and therefore has got to be highly sensitive to the changing trends in fashion elements.

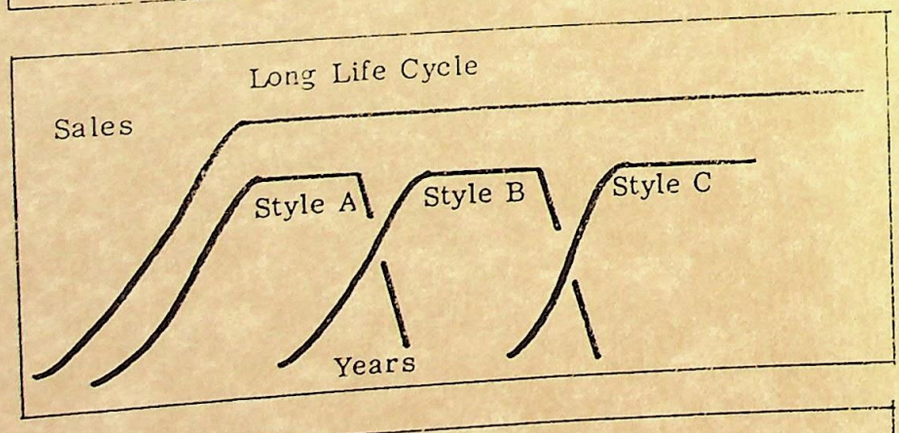
In mass production one can only produce basic garment types : shirt ; jacket, coat, dress, skirt. These product types have long life cycles in themselves but in order to renew customer interest we introduce the fashion element and shorten the product line cycle. Fig. 17 shows this life cycle effect.

Flugal J. "The Psychology of Clothes" Hogarth Press 1980.

The general life cycle concept



Classic garment
e.g. 'mackintosh' or twinset



Fashion garment
e.g. "miniskirt" "New Romantic"

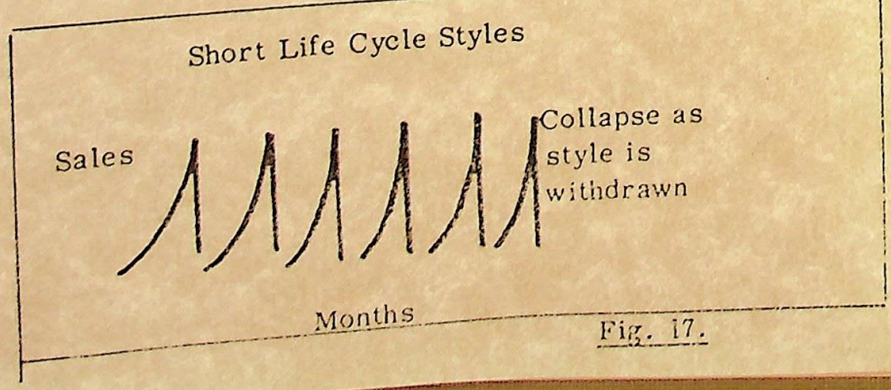
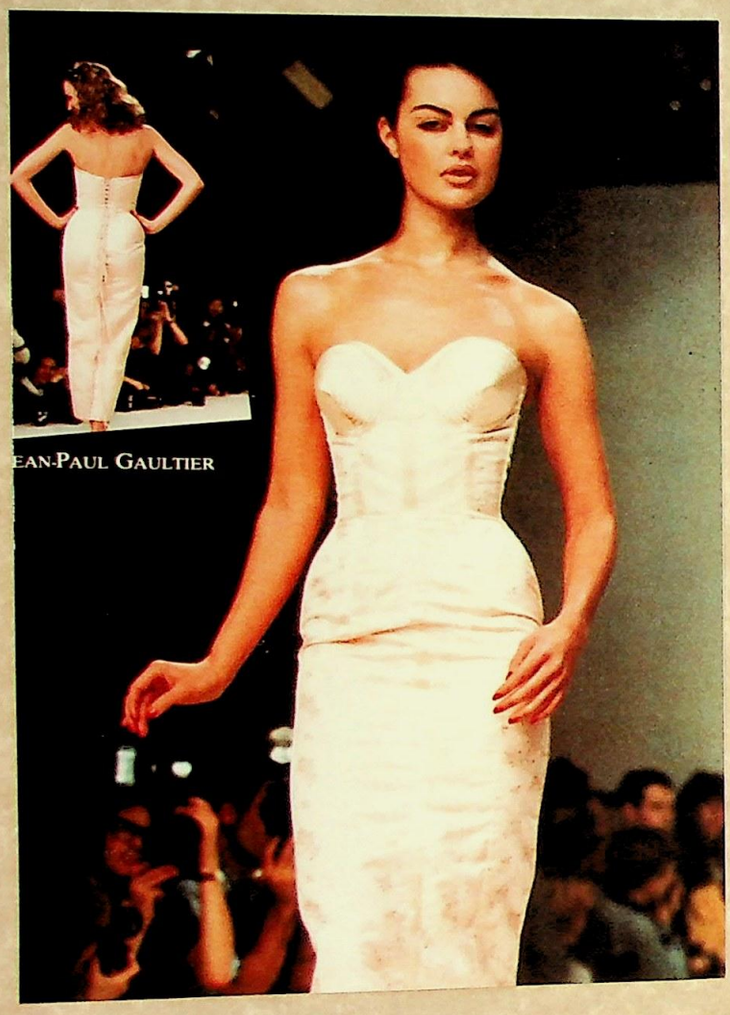


Fig. 17.



JEAN-PAUL GAULTIER - PARIS - SPRING/SUMMER COLLECTIONS.

SEE SECTION 4 (i)

"IDEA GENERATION"

The need to constantly produce new ranges and new styles is an iterative process which calls for costly and sometimes tedious reworking. Here as in other areas of the fashion industry, computers have an increasingly important part to play.

* 20 Blummer H. "From Class differentiation to Collective Selection" The Sociological Quarterly, Vol. 3, 1969.

ISSEY MIYAKE - JAPAN

AUTUMN - WINTER COLLECTION.

SEE SECTION 4 (i)
"IDEA GENERATION"

8.0. COMPUTER APPLICATIONS

8.1 In Range Development

Computer aided design's (C.A.D.) main application to date has been in the area of pattern making where there could be a 1-2 year payback on a £200,000 plus investment through savings in materials and labour. Systems such as Gerber or Camsco computerised lay planning systems are available to larger firms or through bureaus.

The computer's ability to optimise fabric yields through efficient lay planning is well described in recent literature * 22, 23

C.A.D's role in the creative design process is more contentious. Theoretically it speeds and streamlines a tedious iterative process.

- new styles can be developed and modified on the screen in seconds
- darts, tucks, lengths, lapel widths, body panels tested and changed
- the range can be shown by phone link or video on the buyer's monitor
- perhaps using holographic displays
- changes can be agreed upon ; made, reassessed, and accepted all on the screen.
- colours can be tested.
- agreed hard-copy printouts can be made of selected lines
- patterns can be developed using present C.A.D. software
- or selected from a library of all possible patterns.

There are supporters of this view. Lucille Khonak *23 in Fashion 2000 asked top designers to comment on the impact that computers will have on the role of the designer. Richard Assarthy responded " A creative mind will always remain in the forefront. Designers will feed the computer. They will program-in details such as selection of fabrics, length style of sleeve. Intricate design details will disappear but designers will still have control". *24

THE PRINCESS OF WALES -

A CREATOR OF FASHIONS

SEE SECTION 4 (i)
"IDEA GENERATION"

Barbara Nassin * 24 uses a Teledon IPS2 computer for fashion illustration "For her computer is a tool like a pencil or brush which she likens to drawing with light".

There are some limited and specialized applications in commercial use. Garland, * 22 a New York knitwear firm, uses a Stoll Gmbn computer to design sweater patterns in their showroom. Once a pattern is created by the computer which is to the buyers tastes, a floppy disk and printout is sent to Garlands factory. The disk is used to generate a punched tape at the factory which is then fed into the knitting machines. In ten working days the sweater is completed from conception to finished product.

The ultimate aim of C.A.D. is the development of C.D.P. (creative design passage) whereby one can design from nothing, produce a pattern and make a lay.

There is a contrary view that the traditional pencil and sketch pad is a simple and efficient process that is difficult to displace by the more cumbersome light pencils or computer drafting "mouse". C.A.D. has been used in the motor industry for over ten years. The "toiles" of the industry are still made on paper, in timber or clay. C.A.D. helps refine and streamline after the initial prototype is made.

S.R. Gent who operate some of the most advanced computer systems in the industry have not yet computerized their design process where twenty-three designers produce over two hundred new styles every week.

As powerful computer hardware falls exponentially in cost it is difficult to make predictions. Perhaps a compromise will evolve with the first design concepts being in the form of sketches being transferred with great precision by laser imaging to the computer, permitting the tedious iterative process to be handled on the machine. The designer will have more time for true creativity ; the computer is not the rival but the slave of design.

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21 * Webster, Nicollette "Getting it taped" Vogue March 1980

* 22 Jones, D.A. "The Computer Division" British Clothing Manufacturer, May '80.

23 * Khornak, Lucille "Fashion 2000"

24 * Nassin, Barbara "Computer Wiz" Art Centre College of Design, Pasadena, California, March 1984.

25 * " An Italian Idea, A German Machine, for American Tastes" Forbes April 30, 1984.

THE HUGE INFLUENCE OF POP &
POP STAR DRESS ON FASHION -
BOY GEORGE ; A CULT.

SEE SECTION 4 (i)
"IDEA GENERATION"
4 (2) "DESIGN FOR PRODUCTION"

8.2. Computers in Production and Control

Micro processors have been involved in many aspects of production and control for some years

- production planning and scheduling
- Machine control
- Environmental control
- data processing and record keeping.

The trend now is towards the total automation concept in garment manufacturing. Like most automation it is installed first where it has most rapid pay off. S.R. Gent send their lay plan tapes from their Camsco system directly to their three £1 million Gerber cutting units. Garland send knitwear pattern tapes to their knitwear factories in Massachusetts.

Jones * 26 describes concepts of total automation that may be more in the nature of an idealized interlinking of existing technology than practical production systems.

Some have made real progress in this direction. Jane Sasseen * 27 describes Benetton operations : "Designers create shirts on C.A.D. terminals ; in the cutting room rollers, linked to a central computer, spread layer upon layer of cloth with the number of layers to be cut and the colour of the cloth co-ordinated automatically to the shirts already ordered by Benetton stores throughout the world ... Benetton treats sweaters, gloves and scarves as raw materials ; knitting them in advance as white yarn. As orders come in, the company dyes the white goods in small lots, making exactly the number of pea green and chartreuse sweaters needed. Not only does it keep stocks low but small batch manufacturing gives Benetton the flexibility to offer far more colours and styles than its competitors can match".

The fully automated factory requires a solution to difficult materials handling problems. Sewn garments require careful manipulation and precise alignment of parts made from non-homogenous materials. Garments moulded in new materials to pre-programmed formulae may be a direction for the future.

Undoubtedly computers have already:

- simplified range development and sampling
- given a faster response time to styling changes
- reduced skilled labour, increased productivity
- made very significant savings in fabric utilization
- increased production/design reaction time and flexibility
- reduced working capital needs by cutting stocks
- streamlined the whole data processing system.

ANTONIO

IMAGE CAMPAIGN POSTER FOR
LA FORET DEPARTMENT STORE - JAPAN
AUTUMN, 1978.

SEE SECTION 7 (i)
"PRESENTATION"

The fashion industry in the Western world has lost out in recent years to cheaper imports from third world countries. Computer technology gives it the means to recover lost markets through improved efficiency.

The industry is going through an exciting transitional period. All one can confidently predict for the future is an ever increasing role for the computer. Hopefully, as Peter Druker *28 says, "not to dehumanise human work, but to mechanise subhuman work".

The leaders in automation in Japan and the U.S.A. *29 have been careful not to loose sight of the importance of the operative and his/her pride and dignity as systems become increasingly more sophisticated and automated. Quality circles, communications groups, profit sharing, equity ownership all become means of increasing importance as the shift chargehand is replaced by machine paced systems.

In a recent visit to Desmond's in Derry - a highly automated factory, it was interesting to see this philosophy, in action.

- the lay planners skills were still needed for special problems and "her knees no longer ached from bending over large lays"

- a highly motivated workforce fully involved in the business through quality circles.

- a smaller skilled workforce but increased total workforce through greater cost competitiveness and market share.

Finally ; mass production, while primarily a follower of fashion leaders in haute couture, is at the same time itself a secondary leader. It makes the clothes that most people in the world actually wear !

* 26 Jones D.A. The Computer Division- British Clothing Manufacture May '80

* 27 Sassen, Jane Forbes. April 30th, 1984.

* 28 Druker, Peter "The Practise of Management" Pelican.

* 29 Fortune Magazine, March '84.

9.0 SUMMARY AND CONCLUSIONS

Range Development for mass production requires the accurate and timely interpretation of customer needs so that they can be met at lowest cost.

It requires the closest possible liaison between marketing, design, production and quality control if it is to meet these objectives.

Precise market segmentation through good market research is critical for success. It permits accurate development of customer profiles and assessment of price constraints.

The Design process has creative and structured phases. In the creative phase the designer seeks inspiration from many sources. The structured phase focuses these creative ideas on a coherent theme and design deadlines.

There are indications that the traditional "trickle down" theory where fashion style is set by haute couture, is being reversed. Street fashions are influencing couturiers.

The designer must be totally in tune with the fashion world and the fast response times needed, particularly with the short life cycles of trendy fashions.

The ultimate cost of a product is largely established at the design stage. In designing for mass production one works constantly within a cost constraint.

One can view designing to a cost constraint as a curb on creativity or as a more unforgiving and higher form of creativity. How to permutate something simple to develop a new theme or range by subtle and simple changes in fabric, colour, trim.

Quality control starts with the design process: Standards are designed into the garment. Quality has a cost. The use of statistical techniques and close liaison between supplier, customers, design production and quality control can keep this cost at acceptable levels.

The well designed range creates appeal through higher cost variants on the basic theme but generates volume and profit from a few basic styles.

A well planned presentation is critical to selling the range. In the business world one must learn to develop the best possible product within real time and cost constraints.

Initial computer applications have concentrated where they can achieve fast payback : lay planning, tape control of cutting and knitting machines.

The traditional approach to range development is a costly and iterative process. Computer aided design has a major role to play in shortening the cycles ; but so far has made limited advances.

With continued decline in hardware costs we will move gradually towards the fully automated factory. Such factories will give faster response times and greater productivity but will still require creative skills in design, trouble-shooting, process control.

With significant labour cost differentials between the Western and undeveloped countries ; western fashion industry can go in one of two directions :

- become franchisors of designer names and outward processors sourced totally in lower cost countries ... or

- become more cost effective in the overall design production process.

Outward processing creates two serious problems:

- a continued erosion in jobs in the garment industry, still one of the most important employers in the West.

- ... and longer term, the design, creative process cannot operate effectively divorced from manufacturing. Design skills will move East as well.

A better approach may be to develop greater efficiency and economy in design and production in the west through:

- increased use of computers in design and manufacturing ... and of equal importance -

- A humanising of the shop floor through Quality Circles, and idea groups, to improve design, productivity and quality and create a more involved and motivated work force. Break the machinist's monotony that Bette Midler sang about -

"So I may work the mill
just as long as I am able
And never meet the man
Whose name is on the label
Oh, its me and my machine
for the rest of the morning
for the rest of the afternoon
for the rest of my life".

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