Apparel manufacturing technology

Management briefing

by Malcolm Newbery

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# Table of contents

**Single-user licence edition** ............................................................................................................. ii  
  Copyright statement .................................................................................................................. ii  

**Table of contents** ........................................................................................................................... iii  

**List of tables** ................................................................................................................................... iv  

**List of figures** .................................................................................................................................. v  

**just-style.com membership** ........................................................................................................... vi  

## Lessons from the past

- Apparel – a labour intensive industry .......................................................................................... 1  
- The pursuit of the Holy Grail – automated apparel manufacturing ........................................... 4  
- Apparel manufacturing techniques .............................................................................................. 4  
- The "engineered" apparel factory ................................................................................................. 5  
- De-massification .......................................................................................................................... 6  
- Apparel cutting technology ........................................................................................................... 7  

## Abolition of textile quotas ............................................................................................................. 11  

## Lessons for the future

- A shared viewpoint ..................................................................................................................... 14  
- Sewing scale, time and flexibility ............................................................................................... 14  
- Sewing scale and cost ................................................................................................................. 16  
- Sewing technology and costs ....................................................................................................... 18  
- CAD/CAM technology ............................................................................................................... 19  

## Who’s leading whom?

- The market ................................................................................................................................. 21  
- The world turns full circle ......................................................................................................... 21  
- Technology ............................................................................................................................... 21  

## Online sources of information

- Free email newsletters ............................................................................................................... 22  
- Other research reports ............................................................................................................. 22  
- Global news and feature articles ............................................................................................... 22  
- Search the web .......................................................................................................................... 22  

## Your feedback ............................................................................................................................... 23
List of tables

Table 1: Cost elements of manufacturing and selling woven apparel.................................2

Table 2: Decreasing sewing costs and improving fabric utilisation....................................3

Table 3: T-Shirt Imports to the EU, % change 1st quarter 2005 over 2004 .......................11

Table 4: Sewing scale, time and flexibility......................................................................15

Table 5: Sewing time and cost, large batches of 600 ...................................................16

Table 6: Batch size and sewing costs, medium batches of 100......................................17

Table 7: Batch size and sewing costs, small batches of 50............................................18
List of figures

Figure 1: Added value in the clothing industry .................................................................9
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Lessons from the past

In this management briefing, a reflective look is taken at the effects of manufacturing technology on the apparel industry in the past three decades. This is used to speculate on what technology will do to this global manufacturing activity in the foreseeable future, which means, in common sense terms, about 25 years.

Special thanks are due to Lectra for sharing their views on technology in the cutting room.

Apparel – a labour intensive industry

The manufacture of clothing (now usually referred to by its American terminology of apparel) has always been a labour intensive activity. You have only to look at two people sewing by hand to see the difference that skill makes in both the quality and the speed of manufacture. As making clothing developed into an industry and the concepts of work-study were applied to the sewing process, the differences between a basic and a “skilled and motivated” sewing machinist were quantified. More about that will follow in subsequent sections.

But the fundamental point about the apparel industry is illustrated in Table 1.
### Table 1: Cost elements of manufacturing and selling woven apparel

<table>
<thead>
<tr>
<th>Element</th>
<th>% of sales value</th>
<th>% of manufacturing cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wholesale selling price</td>
<td>100</td>
<td>133</td>
</tr>
<tr>
<td>Materials</td>
<td>40</td>
<td>53</td>
</tr>
<tr>
<td>Trims</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Sewing labour</td>
<td>20</td>
<td>27</td>
</tr>
<tr>
<td>Direct manufacturing cost</td>
<td>65</td>
<td>-</td>
</tr>
<tr>
<td><strong>Overheads</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing labour</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>Administrative labour</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>Property and equipment</td>
<td>10</td>
<td>-</td>
</tr>
<tr>
<td>Total overheads</td>
<td>30</td>
<td>-</td>
</tr>
<tr>
<td><strong>Profit</strong></td>
<td>5</td>
<td>-</td>
</tr>
</tbody>
</table>

Source just-style.com

Materials and trims comprise 45% of the selling price and 60% of the manufacturing cost.

Sewing and other manufacturing labour (which means cutting, pressing, and inspection) comprises 30% of the selling price and 40% of the manufacturing cost.

Administration, property, equipment and profit are only 25% of the selling price.

It is difficult to influence:

- the material cost, because fabric is sold in a global market, and volume discounts are the only way to gain a benefit and these are relatively small;
- the fixed overheads, because by their nature they are fixed in the short term
Consequently, most management attention, since clothing became a “serious” industry, has been concentrated on two things intended to decrease cost and squeeze up the profit. They are:

1. Cutting the direct labour (sewing) cost
2. Improving the materials (fabric) utilisation

Table 2 shows how small changes in these costs can have big effects on profit.

Table 2: Decreasing sewing costs and improving fabric utilisation

<table>
<thead>
<tr>
<th>Element</th>
<th>Before % of sales value</th>
<th>Improvement %</th>
<th>After % of sales value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wholesale selling price</td>
<td>100</td>
<td>-</td>
<td>100</td>
</tr>
<tr>
<td>Materials</td>
<td>40</td>
<td>2.5</td>
<td>39</td>
</tr>
<tr>
<td>Trims</td>
<td>5</td>
<td>-</td>
<td>5</td>
</tr>
<tr>
<td>Sewing labour</td>
<td>20</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>Direct manufacturing cost</td>
<td>65</td>
<td>-</td>
<td>62</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Overheads</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing labour</td>
<td>10</td>
<td>-</td>
<td>10</td>
</tr>
<tr>
<td>Administrative labour</td>
<td>10</td>
<td>-</td>
<td>10</td>
</tr>
<tr>
<td>Property and equipment</td>
<td>10</td>
<td>-</td>
<td>10</td>
</tr>
<tr>
<td>Total overheads</td>
<td>30</td>
<td>-</td>
<td>30</td>
</tr>
<tr>
<td>Profit</td>
<td>5</td>
<td>-</td>
<td>8</td>
</tr>
</tbody>
</table>

Source just-style.com

If a business can make:

- a 2.5% improvement in the use of fabric;
- a 10% improvement in the cost of sewing labour;

then it turns its 5% profit into 8%, which is a massive 60% improvement in profit for the owners.
The pursuit of the Holy Grail – automated apparel manufacturing

In the quest for these financial improvements, vast amounts of time and human ingenuity have been devoted to automating apparel manufacturing in order to reduce labour costs. At its most extreme, the Toyota project (yes the car company, which also is big in sewing machines) attempted to automate the entire sewing line from the sewing of cut parts such as collars and cuffs to final assembly. It was a failure. The complexity of dealing with soft materials (fabric) and curved sewing to create a three dimensional product defeated the technicians.

But although complete sewing automation has not been achieved, many advances have been made in the partial automation of various apparel product types, a few of which are reviewed in the next two sections.

Apparel manufacturing techniques

Perversely, the apparel product types in which sewing automation has been most successful are those where there is lower sewing content and therefore fewer potential labour savings. To understand this, it is necessary to appreciate the industrial engineering (work study) concept of a “standard minute”. A standard minute is the amount of work done by an experienced motivated operator working at a 100 performance. “Motivated” means that part of the pay of the operator that is based upon his or her output (piecework). To earn basic pay traditionally means in a piecework situation working at a 75 performance. Therefore the sewing operator working at 100 is earning 33% of his/her earnings as a result of his/her output and 67% on a time basis. Consequently, although improving performance both decreases the cost per unit produced whilst increasing the operator’s earnings, it cannot be a major cost saver.

Because of this, manufacturing techniques have sought to improve overall efficiency, rather than just sewing performance. Overall efficiency takes into account work done that is not controlled by the operator's performance such as:

- sewing/knitting tasks performed by an untended machine
- handling of parts between sewing operations
- waiting time and other lost time, when nothing productive is happening
The product groups where most efficiency gains have been achieved as a result of automated techniques are in:

- hosiery, through circular knitting technology, automated toe and gusset seaming, and packaging machinery
- simple underwear and T-shirts, through similar techniques
- shaped garment knitting (fully fashioned) through knitting machines which automatically increase and decrease the knitting rows to create a curve
- standard shirts and jeans through the use of computerised sewing of parts (collars, cuffs, pockets, plackets) in engineering style jigs

The perverse part is that the product groups that have gained from automation are the product types that do not have high standard minute sewing work content. Those products that should get the most benefit from automation are those with high work content, namely:

- men’s and ladies’ suits
- jackets
- dresses

To put this into context:

- hosiery and underwear have less than ten standard minutes
- jeans and shirts have 10-15 standard minutes
- dresses have anything from 20-50 standard minutes
- a man's suit has at least 120 standard minutes

The "engineered" apparel factory

Two examples of the use of these manufacturing techniques are worth remembering because they tell a salutary lesson about apparel manufacturing technology. Both come from the author’s direct experience.

A well known branded jeans manufacturer set itself a goal of producing the ten standard minute classic five pocket western jean. A huge amount of capital equipment was bought and considerable expense in bought-in work-study expertise was spent.
Just as the target was reached on long runs of one standard style, the jeans market exploded into a riot of different fashion stylings, such as:

- cropped legs
- boot cuts
- distressed fabrics needing different sewing
- slim fits

The automation and the higher operator performances were unsustainable in a fashion environment of short runs and regular style change.

A leading men’s shirt manufacturer used the availability of generous capital and labour grants in a region of the UK to fund a project to engineer its shirt manufacturing factories. The specifically expressed aim was to compete with low cost manufacturing countries. Standard minutes (again on long single style runs) were reduced from 18 to 13 minutes. The company then took over another shirt manufacturer whose production was mainly offshore. It saw the cost benefits that the acquired company was achieving and gradually closed its expensive UK operations. The equipment eventually found its way to the same low cost countries that the shirt manufacturer had bought it to compete against.

**De-massification**

Both of the examples of engineering illustrate two principles about apparel manufacturing technology:

1. Automation does not work on complex manufactured products in short runs;
2. It is very difficult to compete with a low cost country where the direct labour cost (purely because of pay rates) is as little as 10% of that of US or Europe.

Of even more importance is the fact that, since around 1990, the developed world has undergone a process that the sociologist Toffler called (using a truly horrible word) “de-massification”.
De-massification in fashion terms means that:

- consumers refuse to all wear the same garments
- consumers have the economic power to back up what they want
- the market becomes demand- rather than supply-driven

When this is accompanied (as has been pointed out in previous just-style research reports) with ferocious retail competition and negative cost inflation, manufacturing technology in sewing in the developed world does not stand a chance of outweighing low costs.

**Apparel cutting technology**

The situation, however, is somewhat different in the cutting room of the developed world’s sophisticated apparel factory, to what it is in the sewing room.

The author witnessed a competition at the IMB (apparel manufacturing equipment trade fair) nearly 20 years ago. The competition was between an experienced and skilled marker maker, and a computerised system. The competition was to ascertain:

- which approach provided the best material utilisation
- which approach was quicker

At that time, marker making technology was developing but was still extremely expensive, so the contest ignored the cost of each method. The conclusion at the time was that:

- a skilled man, if given enough time to experiment a few times, could beat the computer on materials utilisation
- the computer would always beat the man for speed

Since then, the real cost of computerised pattern design, marker making and cutting has come down in much the same way as the cost/power of PCs and pocket calculators. But the real USP for the use of technology in the cutting room has been based, not on cost, but on speed and flexibility.
Lectra is a world leader in cutting room technology providing systems for:

- pattern design and grading (Modaris)
- marker making (Diamino)
- computer controlled cutting (Vector Fashion and Mosaic for the matching of stripes, plaids and prints)

The marketing materials for Lectra’s systems concentrates upon the soft benefits, rather than on cost, as these quotes illustrate:

Modaris: “As a professional of the apparel market, your everyday challenges are reducing your product development cycle, ensuring of the perfect fitting and grading of your garments, improving your overall communication and enjoying the use of a simple and user-friendly pattern design application”

Diamino: “Significantly reduces marker-making time, so that more piece marker combinations can be tested to find out the best solution. Modaris, the pattern-making software and Diamino are fully integrated. Any modification to a piece in Modaris is immediately reflected in Diamino”

Vector Fashion: “The renewal of collections is virtually constant these days. New trends, new styles and new materials demand accelerated production while maintaining irreproachable quality and ever lower costs”

The argument for the use of computerised technology in the cutting room is about:

- speed
- consistency

And the flexibility to work with any material and on volumes from 7cm high lays right down to a single ply.

Apart from very small (less than 15 workers) factories, or when it is more convenient to use hand cutting for individual sample making, there is hardly an apparel factory in the developed world that does not have some modern technology in the cutting room.
The situation is somewhat different in the developing world. Most manufacturers in low cost countries start out as purely sewers of previously cut parts. As time goes on and their skills develop, they have the opportunity to move up what the author calls the added value curve. As a simple example, if a sewer can make a garment for £5, then more skilled factories, brands and designers can command progressively higher value per unit of output. The added value curve is shown diagrammatically as Figure 1.

Figure 1: Added value in the clothing industry

<table>
<thead>
<tr>
<th>Outworker</th>
<th>Make and Trim</th>
<th>Cut, make and trim</th>
<th>Markers making</th>
<th>Pattern grading capability</th>
<th>Design capability</th>
<th>Brand</th>
<th>Brand with retail outlets</th>
</tr>
</thead>
</table>

Most manufacturers in the developed world sit at one of the following points on the curve:

1. a make and trim sewer
2. cut, make and trim
3. marker making ability
4. pattern or grading making ability

As Pierre-Michel Richer of Lectra points out: “In Lectra’s experience the use of automation in the cutting rooms of the developing world’s subcontractors starts
with CAD systems. The first application is often marker making, using the customer’s pattern. This is followed by the customer allowing the supplier to adapt markers to different fabric widths. Finally the customer asks the manufacturer to grade the pattern from the sample size. This progression traces the natural development of trust between the developed world customer and their lower-cost manufacturing partner."

It is only when these CAD activities have been computerised, and only for relatively large operations, that computerised cutting has become cost effective. Pierre-Michel Richer explains the benefits as being, “when the final move is made to computerised cutting, the main benefit over the last ten years has been to allow manufacturers to produce in small runs without adding to the overhead cost of their organisation.”
Abolition of textile quotas

Anyone who reads the daily and weekly just-style newsletters will be aware that on 1st January 2005, textile quotas were abolished by the World Trade Organisation. This happened in spite of defensive lobbying from the US and EU clothing and textile industries. Since then the arguments about world trade have intensified with both America and Europe imposing curbs on the growth of imports from China in certain product categories, which appears to be a last ditch attempt to return to the rules of the Multi Fibre Agreement by unilateral dictat.

The reason this is important, at least in the short term for apparel manufacturing technology, is because of the climate of indecision it has created about technology investment. It is not the purpose of this briefing to talk about quotas and their effect on sourcing. just-style is already addressing that through its sourcing experts. But it is worth noting the reaction of technology providers to statistics such as these quoted in the London Times on 4th June 2005, and events reported in the trade press.

Table 3: T-Shirt Imports to the EU, % change 1st quarter 2005 over 2004

<table>
<thead>
<tr>
<th>Country</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morocco</td>
<td>-8%</td>
</tr>
<tr>
<td>Tunisia</td>
<td>-22%</td>
</tr>
<tr>
<td>Romania</td>
<td>-29%</td>
</tr>
<tr>
<td>Pakistan</td>
<td>-36%</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>-25%</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>-9%</td>
</tr>
<tr>
<td>China</td>
<td>+164%</td>
</tr>
</tbody>
</table>

Source: EU Trade Commission

In this context, the Times reported that Delta Apparel, one of Pakistan’s biggest garment exporters closed down earlier this year. “We cannot compete with much cheaper Chinese goods that have flooded the international markets
since January… now there is no limit to the quantity we can export but the buyers want us to reduce the prices”, said Majyd Aziz, chief executive.

To illustrate that Pakistan is not an isolated case, figures from the Textiles South East Asia Newsletter, published by Textile Media Services, show that Vietnam, a recent high flyer in the low cost country sourcing business is also suffering. Vietnamese apparel exports to both the US and the EU are down in the first three months of 2005 from the same period for 2004.

From the same magazine comes a news report from June stating that in Indonesia, four garment manufacturers have laid off 10,000 workers, “due to the absence of orders following the removal of textile quotas at the start of 2005.”

The same magazine reported in April that a number of Taiwanese clothing makers were expanding in Cambodia as a direct response to the expiration of the World Trade Organisation textile and clothing quotas.

In June of this year, The Hellenic Fashion Industry Association (Greece) announced further job losses in textiles and clothing for 2004 and cited “both a growth in cheap imports from China, and the movement of production to neighbouring Balkan countries.”

Finally, it is not just the EU and US that are taking political legal action over China. Mexico is set to file a list of anti-dumping complaints against China with the WTO (source: just-style newsletter, 21st June 2005). “We know that Chinese exporters are incurring in dumping activities in the US, and Mexico has the right to complain against this as a third party affected,” said Samuel Quiroz, general manager of the Mexican Chamber of the Central Textile Industry.

Opinions differ as to whether this is permanent or merely caused by developed world customers placing initial orders in China. What is clear however is that it is having an adverse effect on technology providers. Lectra announcing its first quarter 2005 results, was quoted by Business Wire as follows:

“In its press release of February 10th on the financial results for 2004, the company indicated that abolition of textile quotas had created a climate of indecision and hesitancy. The actual outcome is proving worse than any of the
experts expected. This situation threatens to disrupt the market in its entirety, amplifying concerns and paralysing investment decisions.

“In these conditions, orders for software and equipment have decreased by 30% like for like. Growth in orders for new systems from China is up 55% like for like… but all other regions, with a handful of exceptions, were down.

“The main uncertainty for the company concerns the date and scale of the resumption of technology spending by its customers.”

In the remainder of this briefing we look at whether this is a blip, a trend or a cosmic shift, and what affect it could have on the development of apparel manufacturing technology in the future.
Lessons for the future

A shared viewpoint
The author’s experience of macro-economic future forecasting is that uninformed (and sadly often also informed) opinion tends to think in straight lines. Something is changing and it is believed by the forecaster that it will carry on changing in that direction. This mindset contradicts all the experience of supply and demand, which suggests that after a supply boom caused by shifting demand or prices (the Chinese situation contains both), the trend reverses. However it does not go back to where it was before. China will continue:

- to gobble up export market share of world apparel,
- but at a lower rate of growth than the abolition of quotas created,
- and the (deliberately?) depressed levels of prices from China will not remain forever.

However, one trend appears irreversible. The movement of high volume, middle to low priced goods away from high cost US and Europe, and from somewhat lower cost North Africa and Eastern Europe is permanent. This has serious implications for the apparel technologies used in those areas of the world; implications which are based around the concepts of scale and flexibility.

Sewing scale, time and flexibility
In Section 2, we considered the engineered factory, a concept that was rooted in supply side economics, to wit:

- demand exceeded supply, but the customers accepted that they would get what the suppliers had to offer,
- therefore supply ramped up the amount of homogenous merchandise it could deliver.

Consumers in the 1990s rebelled against the sameness of supply (as they had done in the sixties). The combination of that, and the discovery of low cost
country sourcing, destroyed developed world mass-production. Consequently, the developed world no longer needs the technology to increase output and to drive down cost. The technology it needs now is:

1. to recognise a winner quickly
2. to make it in the shortest time possible
3. to distribute it effectively
4. to get out and move on to the next one

Manufacturing technology can only help achieve the second point, although forecasting and distribution technologies can improve the chances of success with 1, 3 and 4. So today’s manufacturing technologies are about obtaining styling, patterns and materials fast, and then making the garments in the shortest possible time.

To achieve this speed of response in sewing, the whole concept of the engineered factory has had to be discarded. The engineered factory only worked on a fairly large scale, by which, is meant 100-300 sewing machinists. We are now talking about a new paradigm of 20-30 sewing machinists making flexibly on a small scale, either as a small line, or more and more these days in work groups. We are also talking about a complete garment being produced in hours rather than weeks of elapsed time. The author has been involved with and advised government on the nature of these changes and the reasons why government support for mass production in the UK is like King Canute trying to prevent the tide coming in. The scenario is that of manufacturing being small scale and fast fashion with ever decreasing batch sizes. The likely time scales and batch sizes are shown in Table 4.

Table 4: Sewing scale, time and flexibility

<table>
<thead>
<tr>
<th>Method</th>
<th>Sewing operators</th>
<th>Batch size</th>
<th>Batches per week</th>
<th>Batch WIP hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make through</td>
<td>1</td>
<td>1</td>
<td>78</td>
<td>0.5</td>
</tr>
<tr>
<td>Work group</td>
<td>5</td>
<td>20</td>
<td>21</td>
<td>2.0</td>
</tr>
<tr>
<td>Small line</td>
<td>25</td>
<td>100</td>
<td>26</td>
<td>16.0</td>
</tr>
<tr>
<td>Engineered</td>
<td>150</td>
<td>600</td>
<td>35</td>
<td>40.0</td>
</tr>
</tbody>
</table>

Source: just-style.com
The combination of scale and time delivers the following manufacturing approach:

- make through needs a batch of 1 changing every 30 minutes
- a work group needs a batch of 20 changing every 2 hours
- a small line needs a batch of 100 changing every 2 days
- an engineered factory needs 600 changing every 1 week

The engineered factory works very effectively if:

- style change is infrequent
- the batch size is 600 or more
- the target work in progress sewing throughput time of a week is acceptable

To this concept some cost numbers are applied in Table 5, in which the four different manufacturing methods are compared.

**Sewing scale and cost**

As previously stated, when the batch volumes are large the economies of engineering bring benefits. The comparison in Table 5 applies to one or a group of sewing machinists making the same garment over a considerable period of time (large batches). The garment chosen is a man’s shirt (which is a mid standard minute work content garment, without excessive style changes).

<table>
<thead>
<tr>
<th>Method</th>
<th>Making time (minutes)</th>
<th>Sewing operator £s pay per week</th>
<th>Total cost £.p. per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make through</td>
<td>30</td>
<td>280</td>
<td>3.59</td>
</tr>
<tr>
<td>Work group</td>
<td>25</td>
<td>220</td>
<td>2.63</td>
</tr>
<tr>
<td>Small line</td>
<td>20</td>
<td>245</td>
<td>2.34</td>
</tr>
<tr>
<td>Engineered factory</td>
<td>15</td>
<td>260</td>
<td>1.84</td>
</tr>
</tbody>
</table>

Source: just-style.com

The total sewing cost in £.p. per unit falls as the level of engineering increases. This is because the batches are big enough to avoid much downtime. Engineered operators also earn more because they are doing one job
repetitively, build up speed and are paid on a piecework incentive system. The problem that the developed world has today is that as mass production shifts to lower cost countries, there are not many batches of 600 of a style left in high cost countries.

Table 6 shows how that if the batch size is reduced from 600 to 100 the costs of the engineered and small line system increases.

<table>
<thead>
<tr>
<th>Method</th>
<th>Making time (minutes)</th>
<th>Sewing operator £s pay per week</th>
<th>Total cost £.p. per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make through</td>
<td>30</td>
<td>280</td>
<td>3.59</td>
</tr>
<tr>
<td>Work group</td>
<td>25</td>
<td>220</td>
<td>2.63</td>
</tr>
<tr>
<td>Small line</td>
<td>20</td>
<td>245</td>
<td>2.34</td>
</tr>
<tr>
<td>Engineered factory</td>
<td>17</td>
<td>242</td>
<td>2.75</td>
</tr>
</tbody>
</table>

Source: just-style.com

A number of factors combine to produce this result:

○ the making time in the engineered factory increases because the batches are smaller and there is more style change,
○ downtime for the engineered factory increases significantly,
○ therefore the number of garments produced per week decreases.

As Table 7 shows, if the batch size reduces again to 50, then:

○ the small line becomes more expensive than the work group
○ the engineered factory becomes more expensive than single machinist make through

The factors producing this result are the same as they were in the Table 7 example, but are more extreme.
Table 7: Batch size and sewing costs, small batches of 50

<table>
<thead>
<tr>
<th>Method</th>
<th>Making time (minutes)</th>
<th>Sewing operator £s pay per week</th>
<th>Total cost £.p. per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make through</td>
<td>30</td>
<td>280</td>
<td>3.59</td>
</tr>
<tr>
<td>Work group</td>
<td>25</td>
<td>220</td>
<td>2.63</td>
</tr>
<tr>
<td>Small line</td>
<td>22</td>
<td>241</td>
<td>2.76</td>
</tr>
<tr>
<td>Engineered factory</td>
<td>20</td>
<td>234</td>
<td>3.91</td>
</tr>
</tbody>
</table>

Source: just-style.com

The two fundamental conclusions that affect the future of sewing room technology are that:

1. small batches and quick throughput times favour old fashioned make through or small work groups
2. these methods gain competitive advantage in a high style-change fast-fashion environment

This is the environment that a large part of the world is now experiencing, as mass production has moved to low labour cost countries.

Sewing technology and costs

Sewing equipment costs are quite cheap. “Real” costs (capital equipment versus labour and other overhead costs) have been getting cheaper as the amount of second hand machinery on the market has increased. The cost of an engineered factory is quite high. The demand, as shown above, for an engineered factory is reducing. The case for high technology sewing in the developed world is getting weaker and weaker.

If I were an entrepreneur with a work group and a small line factory, and I were given an order for a series of styles totalling 2,000 garments but in batches of 50 or 100 garments, I would:

○ organise my sewing room into the most effective work groups
○ use existing or any necessary specialist machinery from the second hand market
○ pay sewing operators on flat rates with bonuses for high quality and on-time production

**CAD/CAM technology**

In the section on lessons from the past, comments were made about the demise of the engineered sewing factory, but of the development of CAD/CAM. Just-style asked Lectra where it thought CAD/CAM was going in the next few years. Our questions were based around:

○ electronic information exchange from customer to supplier on styling, specifications etc
○ marker making and grading
○ pattern making
○ cutting
○ cut room planning

The author has a strong view on electronic information exchange, based on personal experience of clothing industry computer systems. It is that almost all of them can send, instantaneously over the net, information on designs, specifications, technical drawings, patterns, gradings and markers to suppliers anywhere in the world, as long as they are web-enabled, and can read the information in the language in which it is presented.

Lectra’s views on how this will be received and dealt with by suppliers anywhere are as follows:

“**Lectra accepts that the era of mass production in high cost countries has passed. However, the use of cutting technology will still be important as labour costs rise and time becomes more important.**

“**Automated cutting is now at the stage where it can be used on any material and for any style change. Lectra’s vision of the future is that its systems have to remain simple for managers and operators to use. An easy user interface requires a lot of technology hidden behind the system. This includes making Lectra systems linkable to other CAD software.**

“**It is unlikely that there will be revolutionary changes in CAD/CAM because all areas of planning, spreading and cutting have been automated. What we will**
see is further continuous improvements to existing technology. One example is the recently launched Vector Fashion MP9. It is a system capable of cutting up to 300 plies of jersey by compressing the lay from 15cm high to only 9cm high.

“The most fertile ground for improvement, as costs increase even in the developing world, is not in the techniques themselves but in improving organisation. A good example is Lectra’s Optiplan. It is a decision tool, which looks at the past performance and proposes the best solution for future marker making, spreading and cutting. For manufacturers who already have CAM the preparation utilisation times can be improved radically”.

Cecile Harari-Alle
Pierre-Michel Richer

The author would like to add his views to those of Lectra about planning systems. The company is correct in principle but the market may not accept its reasoning:

○ in the high cost world, and in small businesses, there is often only one person involved in the production planning activities. An offer may be made by a technology supplier to improve their productivity in the planning process, in exchange for a capital cost. If there is nothing else they can do with the saved time, then there is no benefit to the company

○ in the developed world, there will be significant benefits because the:
  ➢ volumes are greater
  ➢ the need to utilise planning time is greater
  ➢ the benefits are greater
Who’s leading whom?

The market
just-style believes that the era of supply driven developments is well and truly over. For the time being (which means at least the next ten years) the demands of the market will determine what technology is asked to provide.

The world turns full circle
And it may be some eclectic elements that are required of technology:

○ de-massification may go as far as returning to the bespoke suit. Already there is an entrepreneur in Hong Kong offering made to measure suits in the EU and US where the measurements are taken off the customer and the product is produced on the other side of the world

○ unusual, ironic, iconic brands will require the textile materials to be unique to them, placing new demands for small scale manufacturing upon the fabric and finishing sectors

Technology companies, which were born on the theology of thinking big, need to think small.

Technology
But just-style believes that, in spite of the hype that surrounds what is exciting to journalists (individualism, eclecticism), there will always be a volume market somewhere in the world. So what will it need?

○ CAD/CAM cutting technology will be a permanent part of the apparel industry, regardless of consolidation of suppliers in this world market
○ The need for sewing efficiency in today’s low cost countries will come back, as their unit costs rise
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Name __________________________  Job title __________________________

Company ______________________  Phone ______________________

Email __________________________

Study title ________________________________________________________________

Things I liked about this study...
_________________________________________________________________________
_________________________________________________________________________
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Things I disliked about this study...
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My questions regarding the content...
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I would like to see more information on...
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Other subject areas of interest to me include...
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