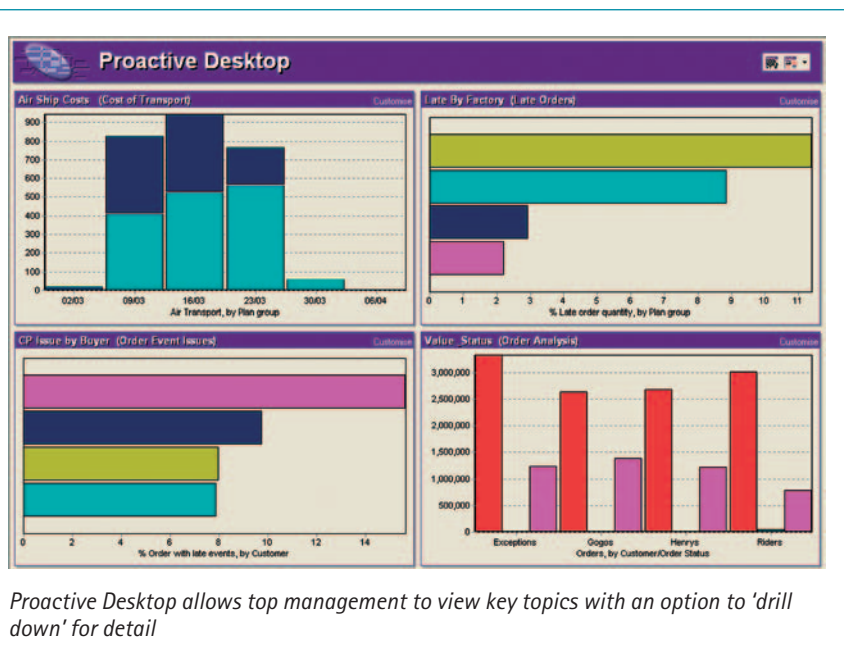




# How much planning is worthwhile?

That's a very good question to pose. Some planning is obviously needed but it is increasingly uneconomic to use manpower to get down to fine detail when unexpected events can still cause disruption. Changing industry requirements have not generally been matched by systems development and this is a topic that is very much one of 'horses for courses'. While enterprise resource planning, material requirements planning and management information systems are widely used the focus is not on production planning, so the modules related to this can be rather pedestrian.

## Mixed production

Where companies operate traditional mixed production lines, the main need is for a planning system that can balance the workload on key operations (or skills) over a changing mix of styles throughout the week. Achieving this and striking an ideal balance between efficiency and costs is difficult.

Given this scenario, it is common to

plan upper cutting and assembly to include a range of sizes and styles in the same material to run together. This allows maximum economy of material and minimum thread colour changes, etc., but may not produce ideal loading for lasting, so the resultant uppers usually go into a storage bank. A separate plan is produced for lasting based on the available last plant which minimises changes of last style and size. A sound basis of operation times and work content is also required if plans are to be achieved in practice.

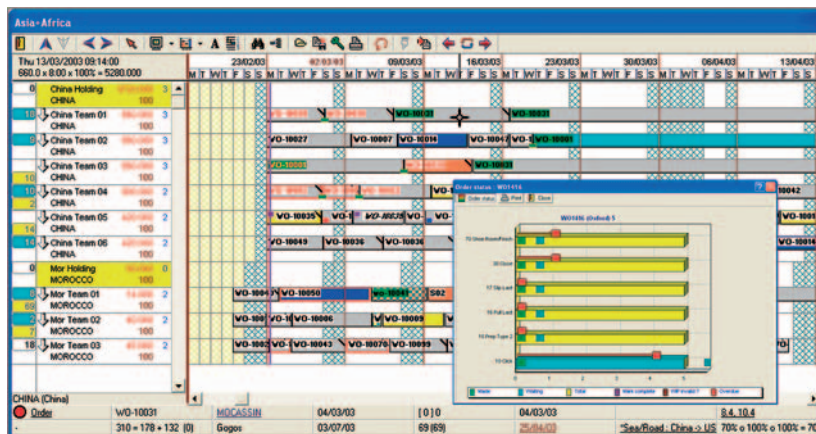
This is a complex situation and, once the ideal plan is created, it is often not difficult to cope with changes. The time taken to recalculate sometimes encourages changes that bypass the system altogether and are never actually recorded. A typical example would be a quality problem revealed after cutting. In this case, the work is already in progress and the line management in stitching may simply be expected to accommodate the change and catch up as best they can

rather than altering the lasting schedule accordingly. Frequent checking of production and feedback to the planning system is usually required to keep track of exactly where production is as it is easy for batches of work to be processed out of sequence—or even overlooked.

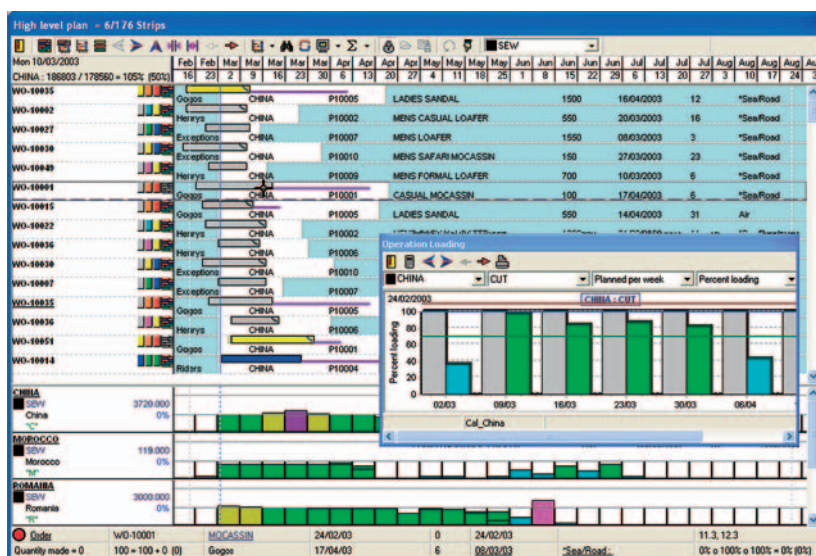
Where an individual incentive scheme is operated, feedback from the factory floor needs to be even more detailed, as individual operators need to be linked to individual batches of work. Some companies therefore opt for real time feedback from each operator/workstation rather than simply the point of departure from a department needed by the planning process. Systems that contain individual feedback are available from Anzani and Leadtec.

## Dedicated production lines

With dedicated production lines making a single style in bulk, the requirement is totally different. The need to assess work content still remains but, once the initial effort of creating



The detailed planning level displays individual orders and allows fast 'what-if' calculations



Overall situation can be assessed at a high level planning stage and any balancing carried out

optimum line balance is complete, the basic capacity is known and production can proceed with a simple schedule based on capacity. The need to check on production is less and the frequency and detail of necessary feedback is probably reduced to only reporting exceptions to the schedule.

The pressure on materials management is greater as, in the event of a problem, there is likely to be no alternative production. Naturally, good practice dictates that the line balance is periodically reviewed in the light of operator changes, increases in skill levels, etc., to ensure capacity figures remain

valid. Similarly, once companies have changed to small teams where jobs can be shared, the team capacity on a particular style is established and no further plan is needed.

With empowered teams, capacity is often assessed by comparison to existing styles followed by trial and error, rather than calculations from synthetic databases or timings from sample production. Very precise planning is therefore not possible. It is easy to monitor the exact output and this is often fed back to management on an hourly basis. On-going planning in these instances is reduced to providing

enough material, equipment and trained operators to maintain the set-up.

### Rotary moulding

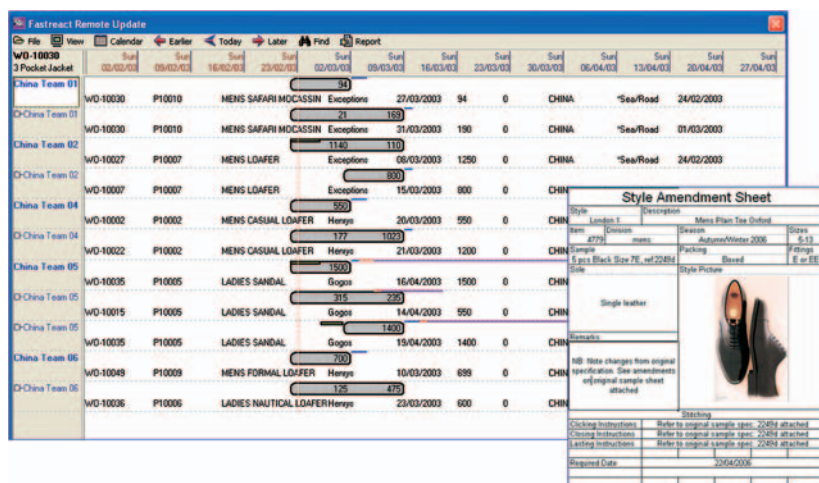
There are special considerations when operating rotary moulding machines. By their nature, these involve large investment and output must be maximised to justify it. Machines are typically run in three shifts for six days a week, so the planning demand is already heavy and routine maintenance and cleaning need to be assiduously factored in to keep the equipment functioning at its peak. After that, the primary need is to ensure no shot is missed as any missed mouldings cannot be caught up.

However good value they are, moulds are expensive items and no company wants to purchase more than is necessary. This means that only the most frequently used sizes in each style will be purchased in duplicate, giving rise to a very similar situation to the last plant constraint in lasting. In moulding, however, there is the added complication of minimising colour changes because of the time taken and material wasted. Leading machine makers are constantly working to improve colour/material changes and modern machines are far better in this respect than their predecessors.

As a result of an EU project involving leading machinery suppliers, large footwear producers and SATRA, an interactive 'fuzzy logic' planning system was developed and it is now possible to purchase additional software to optimise the loading of machines from Klöckner Desma.

### Multiple site operation

While the detail of line or team balance is usually a matter for an individual factory to determine, multiple production sites (or customers using numerous suppliers) have a need for another level of planning: overall balance of all the sources. The need here is for dependable systems to maintain deliveries in the event of problems. Inevitably, they will occur from time to time and production may need to be reallocated from site to site in order to maintain supplies to retailers. Assuming the system copes adequately with the diversity of production sources, a key need is for rapid 'what if' calculations, followed by a summary of the overall impact of a change. ➤



Detailed Planning displays individual orders and allows fast 'what if' calculations

## Planning systems

The use of an all-encompassing system fulfilling all the varied requirements of footwear manufacture and covering all the other associated management functions is a crucial decision and major expense for a company. This is complicated by the fact that the industry has specialist requirements that others lack. The fact that one product style extends over a large range of overlapping full and half size ranges, and that 'one' product is actually a 'pair', means it is impossible to even enter footwear requirements into some systems.

Companies have therefore tended to either accept the cost and probability of changing some established procedures while ensuring they at least reap all the benefits of a totally comprehensive system or shy away from such commitment entirely. This has created a comparatively small and specialised market for systems providers, and it is not surprising that few new full-blown systems are launched.

Where companies have not made the commitment, they often end up with numerous specialised application packages operated by various personnel throughout the company, all of which impinge on production planning and include:

- Orders for overall planning and purchasing to ensure materials availability
- Specifications for work instructions, tooling availability, etc.
- Material costings for purchasing and issuing materials

- Labour costings for operator planning and production scheduling
- Data for production scheduling including substandard product to be replaced

These are often not integrated and result in frequent exchanges of spreadsheets for manual extraction of data and repeated amendment of production plans.

An intermediate approach is provided by Fastreact. Its systems were originally designed for the garment industry but recent developments have allowed further advances specifically related to footwear industry usage. The key point is the speed with which alternative plans can be assessed and selected, allowing confident rapid decision making.

The systems are intended to provide fast, flexible planning for mixed production, dedicated production lines or teams. They draw together all the relevant data in a networked system by taking input from a variety of specialised packages such as costings or a main management system. They then use them in an intuitive rapid planning module and display the results in an easy to understand graphics format. Any change in the data is immediately reflected throughout the system so that it is always up to date.

## Detailed production planning

The detailed plan can be automatically compiled by the system from the inputs according to the required pairage and any constraints applicable such as

cutting capacity in pairs or minutes of work content. The result is displayed graphically and can then be amended when needed by dragging and dropping an order from one team/production line/supplier to another. Any different constraints are reflected in the new result displayed (e.g. an alternative team may have a different daily capacity). Colour coding allows warnings regarding material shortage or late delivery to be immediately obvious. Feedback from actual production allows achieved output and performance to be acknowledged and included in future calculations if needed.

## Communication

Wherever the plan is compiled, it has to be communicated between supplier and customer. Fastreact tackles this over time zones by providing automated email exchanges for the plan and any related topics such as specification changes. The automatic transmissions mean that all users know when to expect the latest communication. The email can be reviewed by the recipient and then automatically incorporated into the system.

Naturally, top management at both customer and supplier need information from the planning system. For any one customer this could cover several countries, many suppliers and hundreds of products, so an overall summary of key topics is required. More than one view per user is possible and information is refreshed every few minutes. When the full system is in use, all items can be 'drilled down' for further levels of detail.

A good planning system can yield many advantages:

- Improved decision making
- Faster response to problem solving
- Improved efficiency through efficient loading of personnel and plant
- Possible reduced lead times
- Probable increase in on-time deliveries

The search for a system to precisely suit an individual company's needs is not easy and should certainly not be rushed. However, the potential benefits certainly make a review of existing practice a desirable undertaking.

Screen images courtesy of  
Fastreact Systems Ltd