Art meets science in glorious technicolour

Advanced planning and scheduling systems and lean thinking aren't often bracketed together, but ColArt paints a picture of perfect harmony. Brian Tinham reports

Art meets science stories tend in my experience to be somewhat facile, but here's an interesting one that concerns none other than ColArt, probably the world leader in artists' paints and materials, with brands like Windsor & Newton and Lefranc & Bourgeois, and products sold in more than 120 countries.

With around 2,500 products in its catalogue and some surprisingly complexity in its manufacturing and supply chain processes, this company has successfully piloted a world first for real-time scheduling that it says has considerably exceeded its target of 3% production efficiency improvement while also contributing to better operational consistency and flexibility as well as product quality.

It's also contributed to being able to substantially cut expensive stock holding requirements and has enabled managers to get a much better grip on predicting job fulfilment dates as well as maintenance cycles. So pleased is ColArt with the results that it's now rolling out the new system beyond the trial at its oil-based colour manufacturing section on its main Harrow site, and looking at the rest of its production operations around the UK.

> **"There's no more progress chasing or specualtive estimation of lead times"**
>
> *Martin Rutherford, ColArt*

It hasn't come easy: ColArt worked with manufacturing enterprise software vendor Epicor on extensions of its Vantage ERP system APS (advanced planning and scheduling) module over a two year period. But with the development work done, ColArt and Epicor reckon they've got a "revolutionary" solution for the artist paints industry that also has wider implications for any batch process manufacturer in which the processes themselves can be subject to a large number of variables – like the paint, cosmetics and pharmaceutical industries.

Here's the original difficulty: to mix its paints the company has to deal with some 3,000 ingredients including synthetic, petrochemical and organic materials in liquid and powder form, some of which have lead times up to 14 months and many of which also have short lifespans or complex storage requirements. Not only that: there are complex production sequencing and optimisation issues.

As manufacturing manager Martin Rutherford explains: "Certain colours can be processed with minimal clean-down routines after certain others on milling machines. So for example a dark red is more efficient after a medium brown, but if you need subsequently to make a yellow in the same machine, that would require a full clean cycle, which slows down your manufacturing process."

And for artists' colours at this level, quality control and rework needs to be pretty sophisticated: "Every batch needs to be tested for colour and consistency at various stages before the next process is started," says Rutherford. "If a sample fails and the job needs to be reworked or adjusted, this can have a major impact on scheduling."

So while packing lines and warehousing were highly automated, sheer complexity meant that production was using traditional batch manufacturing processes. "We are probably the most technologically advanced in our industry, but even we were using a card-based batch system for production scheduling.

After talking to literally dozens of vendors, we concluded there was nothing on the market that could cope with our constantly changing environment."

But a couple of years ago, as part of an ongoing technology evaluation, Rutherford approached Epicor and explained ColArt's manufacturing issues and its goal of creating a real-time scheduling system to spearhead a move towards JIT (just-in-time) processing to reduce inventories, while also improving productivity and getting system-supported continuous improvement through automated accurate production cycle time data collection on top of machine utilisation and efficiency reporting.

Exceeded expectations

"We justified the expected cost of the project based on a 3% productivity gain and prepared ourselves for a lengthy development process as there was no solution like this on the market," says Rutherford. And two years of APS development work and some 20 significant functional additions later, the APS technology is proven and working well.

Now, for example, the Epicor APS software runs the logic that automatically optimises the order of colour production processing based on product mix, due dates and priorities, as well as minimised cleaning cycles and maximised utilisation. It also looks after internal communications around the results of quality checks. Integration with ERP and shop floor terminals allows it to get information from the quality control department, and to alter schedules accordingly – using third party Conductor software to send pager messages to supervisors and operators to notify them to either proceed or collect correction or re-routing instructions for jobs.

The new system has now replaced ColArt's paper card batch system. In operation it collects data from remote terminals at the start and end of each process, currently considering around 50 of ColArt's manufacturing centres, and the scheduling engine then automatically re-optimises the production plan, providing a dynamic Gantt chart based on real-time events data. The result is a 100% real-time representation of the manufacturing environment coupled with a forward plan extending some three months.

Rutherford confirms that the project justification metrics and business expectations have been exceeded. "We hold around £1m worth of stock to ensure order fulfilment and we are now able to substantially reduce this, as we can schedule more accurately and manufacture essentially just-in-time to serve our packaging section... Using Epicor APS, we can dynamically change the priority of individual products or lines and instantly see the resultant impact on the rest of the schedule."

The immediate result: "There's no more progress chasing or speculative estimation of production lead times. The system currently uses base line estimates for processing times, which has proved surprisingly accurate for weekly capacity-based planning. However, as it runs for longer and continually collects real process data we intend to introduce self-learning feedback of actual process times to further improve predictive accuracy."

ColArt now has plans to expand the Epicor APS solution across the other manufacturing parts of its UK operation with a view to extending the software to the rest of the ColArt Group based on a final evaluation by the board. Says Rutherford: "The impact for production planning staff has been extremely beneficial as we have less confusion as different product or line managers try to prioritise on an individual level. The system now works out what is the optimal order for manufacturing."

And he adds: "This is a massive change for us in terms of planning and scheduling and contributes significantly to our continued growth and lead in our industry. I've visited countless operations similar to our own where these same benefits could be derived, not just in our industry but other related business with similar processing requirements such as in cosmetics and pharmaceuticals." ■

Enter 220 at www.mcsolutions.co.uk/enquiry

Planning and scheduling at ColArt has moved into a new era of efficiency and flexibility alongside optimised resource usage