

MAJOR PRINTING SUPPLIES COMPANY

Taylor Scheduler cuts costs during explosion of products and complexity

Taylor Scheduler has cut scheduling time and skill level, slashed inventory costs, and reduced production changeover costs at a the toner operation of a major computer printer supplies maker. Implementation was about on time and in budget, including integration to ERP. Payback time was less than a year. The business benefits have been double original projections to justify the project, and the application is expanding to meet continued growth and product proliferation.

Business Drivers

In the fast-changing world of home and office printing, prices keep going down, so costs must, too. Yet product proliferation, frequent new product ramp-ups and demand changes on short notice tend to increase costs for production complexity and frequent changeovers. This company's worldwide success further compounds the complexity for the facility that makes toner for laser printers. To handle growth, the plant more than doubled its equipment, and is producing over 30 different product variants through the same facility that once handled three or four.

The problem became so complex that logistics managers had to take on the job. Occasional efforts to offload scheduling onto staff reporting to these logistics managers had failed. Managers were the only ones who knew enough about the facility, equipment, products, order priorities and changeover issues to schedule the plant manually. This day-to-day production scheduling left them less time to deal with worldwide supply chain issues, which were mounting.

Looking ahead, the plant's staff saw that new generations of printers would not use the same raw materials. This would mean even further complexity in production, with more campaigns to juggle on more pieces of equipment. The complexity would become unmanageable with manual scheduling.

"Exceptions are the rule in our environment. So we needed something graphical that allows manual manipulation of the schedule. Taylor was one of the few products we evaluated that had both a visual means to schedule manually and optimization for sequencing as well."

Business Systems Analyst,
Major Printer Manufacturer
Printing Supplies Facility

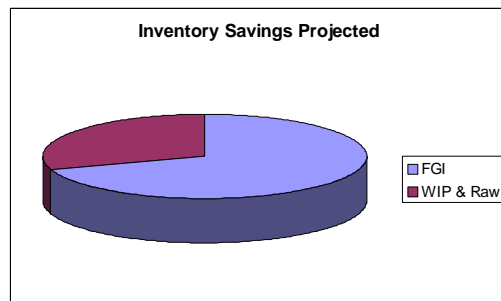
This global company is a leading developer, manufacturer and supplier of printing solutions — including laser and inkjet printers, associated supplies and services — for offices and homes. Like many high tech companies, it has grown in dramatically in the past decade, and the pace of growth continues to be strong. This printing supply plant needed production scheduling that could keep pace with the company's continuing growth.

The Business Case

The printing supplies facility needed to reduce the burden of the scheduling process to run the plant efficiently. In a consumer electronics driven business, they also needed to reduce costs and increase flexibility in the toner plant. As a result, the team launched a scheduling improvement project.

Like most sizeable companies, this printer company's employees must build a business case for improvement projects. Initially, this justification was across both toner and photoconductor drum production in the plant. The three major areas of savings in the business case for production scheduling software were:

- ♦ Delay in headcount increase – forecasted growth, would require more scheduling time so this plant planned to add one person per year for the next two years.
- ♦ Inventory reductions – Finished goods inventory (FGI) was to account for 70% of the savings, and Work-in-Process (WIP) and Raw materials were to account for the remaining 30% with a predicted \$180K inventory reduction over a one-year period.
 - Finished goods inventory reductions were based on an ability to produce closer to the time they really needed to ship it to laser toner cartridge assembly partners.
 - WIP inventory reductions were projected mostly as a result of more efficient product changeover, with an improved rollover schedule that produces less waste and again timed early production stages to correspond more tightly to the final stages.
 - Raw material reduction was based on the ability to get a more accurate time when manufacture would take place, and providing that estimate to raw material suppliers.
- ♦ Product changeover cost savings – A more sophisticated scheduling system would improve the sequencing between products so changeovers could be more efficient, with less purging of product between runs.



This company ensures they get a return on their investments by asking groups to measure actual results against the initial business case. So the team at this plant was conservative, and only included benefits required to meet a payback hurdle rate of one year.

Selecting & Implementing Taylor

The company narrowed down the candidates to a handful of leading APS and supply chain software vendors. Three of the major criteria that allowed the team to narrow the field quickly were:

- ♦ Proven ability to interface to JD Edwards World ERP;
- ♦ Visual means to manually manipulate the schedule, to handle changing priorities and frequent engineering experiments;
- ♦ Optimization algorithms for more automated methods of determining good sequences of product through the plant – even though they were not sure they would use them initially.

Three of the software vendors had other products in use at this company, so they had some advantage through their current relationship. Taylor, not one of those three, was selected for

its combination of a graphical approach for manually manipulating the schedule optimization features. It also had an interface to the JD Edwards ERP system already proven to work at another customer.

In the final implementation, Taylor was only rolled out to the toner production area. The implementation went smoothly, coming in exactly to the plan laid out by the Taylor implementation team. Having an experienced team leader from the solution provider that assessed the project early allowed an accurate estimate of time and resources. Costs also came in very close to budget.

Taylor's previous JD Edwards interfacing expertise also paid off. The original programmer for the existing JD Edwards interface made modifications to get 90% of the way to the company's goal for ERP interface. Once in place, user testing pinpointed the final 10% of fine tuning needed to run smooth two-way schedule-to-ERP data exchange.

Performance Improvement Achieved

This plant met and exceeded its conservative business case. In just over 11 months, the Taylor Scheduling Software paid for itself in headcount delays, inventory savings, and product change cost savings. They achieved greater benefits for just the toner area than they had projected for both toner and drum areas. As with any project, not all of the savings may be directly attributable to the software, but certainly a large portion did come from the improved scheduling capability.

- ♦ Headcount has not gone up, and the managers no longer do scheduling themselves, but have a direct report now designated as the scheduler.
- ♦ Inventory has dropped by double the original estimate, although the implementation does not include the photoconductor drum operation. In addition to \$180K in FGI savings, the toner operation saved \$180K in WIP and raw materials. Some of this is due to changes in policy, so suppliers own inventory until later in the cycle. In addition, a sister plant in another continent implemented its own extruder, so this plant ships less finished goods there that still count as in-transit inventory.
- ♦ The product changeover savings amounted to about half the original estimate, since only the toner operation has implemented the system. Still, improved sequencing has resulted in lower changeover and product purge costs.

"The biggest benefit we get from using the Taylor Scheduler is the visual presentation of the schedule. The weekly production scheduling meeting where engineering and production decide what to do the following week and adjust the schedule for the current week is now done with the system. No one can figure out how they used to do it," says the IT analyst. They run simulations and publish a new detailed schedule at the end of each meeting.

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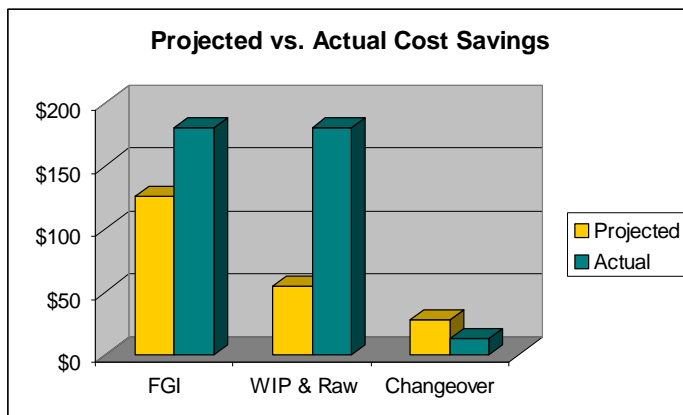
Another major benefit has been the accuracy and timeliness of data, based on the automatic interface between ERP and the Taylor Scheduler. The ERP system gets real-time production reports from the plant. The schedule can see changes to work order quantities immediately – with no data entry mistakes. As the number of products grew, manual scheduling occasionally missed out on a product demand, which meant the plant would have longer than promised order fulfillment times or miss shipment dates.

This facility can now schedule more frequently, since scheduling takes 2-3 hours instead of 2-3 days. This means if there is an increase in demand, the plant can quickly run a what-if simulation to determine whether they can fulfill increased demand. If they can, they feed the new schedule to ERP, which runs MRP to increase material demands on the suppliers.

Future of Taylor at Major Printing Supplies Manufacturer

One of the services Taylor provides to its customers is an annual review, to provide recommendations on how the customer is using the software. The IT analyst admits “We are not using optimization now; the current scheduler does it manually, to meet changing demand quickly. My big project now is to get optimization algorithms in there – to capture more of the knowledge about sequence and order prioritization that now sits in the scheduler’s head.”

This plant has also modified the ERP interface to allow order splits. Given the number of products that need to move through the plant’s equipment, campaigns often must be divided up to meet due dates.



Note that original projections were for both toner and drum operations at this major supplies plant, and only toner was actually implemented.

The spreadsheet the plant uses for rough cut capacity planning shows only 60% utilization based on averaging assumptions. In the Taylor Scheduler, it’s clear they are operating much closer to capacity than that. As a result, they are running 2-3 months future schedules, rather than just one. Running near capacity may lead to several changes in how they use Taylor:

1. Labor constraints – If someone is on vacation or out, the toner operation sometimes does not have the human resources to run the equipment. So they plan to include labor as a resource in the Scheduler model moving forward.
2. Capacity planning – Taylor offers a capacity planning product that the company is likely to evaluate and use.
3. Evaluating options – how to expand effective capacity best: whether by qualifying products on different production lines or moving selected products to a new extruder. Taylor Scheduler gives a view of the best products to select in either case.

Complexity at the toner facility is likely to increase significantly as color laser printing ink is added into the mix. In addition to the factor of four products for the additional colors, changeover purge requirements are also more complex.

The need for the Taylor Scheduler at this plant’s toner operations has only intensified. It has more than met the original business goals, and will be exercised more rigorously moving forward. The Taylor Scheduler is supporting this major printing supplies company in providing its customers more product options at ever-lower costs. And it is ready to meet the new generation of challenges at the toner plant.