10 OPPORTUNITIES TO CUT COST IN CUSTOM & ON-DEMAND PRODUCTION

I've worn many hats over the many years that I have been in print on-demand. From founding a leading web-2-print brand when digital was first emerging, to creating a full-service white label business and building a plant serving many major retail brands. Now, my team and I, are developers of the ZenSmart cloud workflow automation platform which maximizes insight, efficiency and minimizes plant cost.

These diverse roles have taken me into plants around the world, as a customer and supplier. Each of those involvements provides insight into the different approaches that leaders have use to optimize production workflow. Plants have ranged from those producing just a few items a day to others churning out tens of thousands. Some have ranges as small as 100 SKU's and others thousands. Some factories are incredibly capital intensive with the latest in machine automation whereas others use a people centric approach. Amongst this group some have failed when they thought they were succeeding where others have brilliantly executed, expanding their product ranges, growing new businesses and creating super-aligned culture. All that exposure has provided a rich perspective on how different companies tackle the challenge of running their plants to the best of their capability.

In this article, I aim to distil the collective knowledge gained from years of observing how various individuals navigate the often-stressful world of operating an on-demand business. I've tried to consolidate these observations into a guide highlighting areas where opportunities exist to reduce costs or reallocate resources to enhance overall efficiency.

So, let's dive in and get started.

I'll step through them in turn but here they are as a list, if the number of words get in the way and you want to jump ahead:

1. Orders: Automate order processing
2. File flow: Automate work onto the press
3. Imposition: Optimise products imposition (ganging) and eliminate waste
4. People: Make people accountable
5. Machines: Automation and making dumb machines smart
6. Materials: Eliminate (almost) waste
7. Shipping: Optimise freight costs
8. Scheduling: Right product, right time
9. Culture: Singing from the same hymn book
10. Insight: Finding the truth

COST SAVING 1: FILE PROCESSING

ORDER AND ARTWORK PROCESSING – NO STAFF FROM FILE TO READY

There's a good argument to split Cost Saving 1 in 2, but then I would break my even 10. There are two distinct savings to be realised here, firstly order processing and secondly pre-press or image correction/processing. Often these are distinct groups of people and skills.

Regardless it's still surprising to me how many firms manually move files within their systems, run jobs and wrangle the order data daily to correct the files and the file data. Anything that gets in the way of order processing increases the risk that you will miss your Service Level Agreement (SLA) target and adds variable cost to each order.

So, cost reduction area 1 starts with fully automating order processing, and I mean fully. All the order data should be structured impeccably, fields validated, and any out-of-bounds values re-mapped and corrected so the order can flow straight through to the production process, all without any manual intervention.

If you are chasing work from some of the better-known consumer brands be aware that they all have issues and idiosyncrasies. They structure their data differently and have various errors that need to be coded around. To deal with these issues any field validation should be done as you receive the order and any data re-mapping and standardisation totally automated – it is totally doable. The goal should be to achieve a zero-cost order processing system with no labor required.

> ***"There should be zero touch on an order into the production queue"***

The data needs to be fully logged and readily accessible. When you are taking work from various brands this will richly pay off. All the brands have issues with intermittent gateway and transfer issues, they will blame you for it in the first instance and the best defence is data.

Knowing that your order data is beautifully structured, then the next step is to streamline all pre-press actions – image XY dimensions, scaling & cropping, colour management and image optimisation and embed that into wholly automated systems which seamlessly hand off to 3rd party systems where required. Similarly to order processing zero-cost image management should be the goal.

In summary, savings available to be realised are:

1. Reduction in IT/File Management and done well, elimination of the role
2. Rapid recovery from file interruptions and ability to prevent/minimise cost
3. Eliminate/redeploy pre-press effort

Cost Saving 2: Press room. Automate orders onto the press – zero staff from file to press

We have seen 6-figure $ savings realised in challenging tradition and completely reinventing how the press room is staffed. Basically, the goal here is to 1) queue, batch, and get files onto the press in a zero-touch way and then 2) embed all the rules of what products are printed on what presses on what substrate and imposed to the right finishing option all automatically.

The objective is to stretch your sights as far as no staff involvement or costs between the file and the moment ink meets paper. This means that for this type of workflow that prepress can be removed and a big reduction in the size of the press room achieved. It also means that all the rules around how orders and manufactured are stored inside workflow and so staff can't hold the business hostage or absences interrupt production. While it's challenging to eliminate people entirely due to the maintenance and support required for presses, the aim should be to eliminate all variable costs associated with getting work onto the press. One of, for example, eliminated all senior press operators, retained a single press room manager for each shift, and rehired casual workers to

supply consumables to the presses and handle paper removal. This move resulted in the removal of hundreds of thousands of dollars in press room costs.

Cost Saving 3: Materials.

Optimise press impositions and get rid of waste

One of the challenges of custom and on-demand manufacturing is the fragmentation of batches and the sheer number of options, styles and variations that drive daily volume.

The sheer quantity of these job numbers either drives batches that are not optimised for downstream finishing or are jobs which are not ideally imposed (ganged) for the product option-substrate. Materials waste and poor press utilisation results.

The goal is to create material and press time optimised batches that are the combination of 1) customer Due Date 2) product SKU 3) substrate and 4) the volume that is in pre-production WIP. The challenge is that the quantity of combinations beats people's ability to juggle the batch sizes by SKU, time of day and day of week to optimise the batches. This means that Orders miss due dates or batches aren't optimally imposed for the layout that means least-cost wait.

This is where workflow automation can have a big impact. Systems are ideal for juggling the myriad of inputs to make optimised decisions, multiple times per second and handle other parameters such as different week day patterns, weekends and public holidays so that batches can be optimised for those permutations. Simplistically batches can (normally) build out and grow fatter across weekends when SLA is not at risk, whereas during the week there is a time-based pressure that may drive a different time-batch formation decision. Automation can totally drive this execution.

Cost Saving 4: People.

Tracking productivity and creating accountability

In most factories, work simply progresses from one stage to the next, and the sheer volume and variety of tasks can obscure visibility into who is doing what. While there's a general sense of who the top workers are, hard data is almost always lacking. This means that there is a lack of accountability for the work being done and a lack of intelligence around the rate at which product moves through the factory.

The next significant cost-saving opportunity in workflow automation arises from having precise, actual, and well-informed knowledge about who is doing what work, when, and on which workstation. With this data, you can make informed decisions about how to allocate effort to meet production demands.

I was at a site very recently where they had strong scheduling capability but no accountability for task level performance. Management felt that they couldn't explain 10-20% of effort but on average they were hitting their deadlines. It demands the question of what could be?

On the other hand, one of our sites used ZenSmart's scan data to overhaul their dispatch department. Several weeks of data made it clear who was consistently meeting customer order dispatch deadlines and at what hourly rate productivity. Key counselling and staff selection decisions flowed from the hard statistical data that was available to underpin the decision.

Cost saving 4 flows from having staff log into their workstations and setting short no action time outs on their workstations. Coupled with scanning of Batch or Job Sheets the data foundation for being able to attach work quantity to individuals is established.

By having staff logged in at their workstations and scanning work passing their workstation, we establish the "who, what and where" of all work. Who is working, what they are working on and where they are working.

It may sound simple (it's not) but the implication of this information is profound. The level of staffing and scheduling decision that can flow from this data enables whole production flows (and schedules but more on that later) to be recast and significant cost to be removed.

Cost Saving 5: Machines. Automation and making dumb machines smart

When people think of workflow automation, this area of machine automation is often what first springs to mind. It's unfortunate because automation rather than being a way of thought, gets associated with hardware and potentially large capital expenditure. That creates a blocker for a more structured approach to workflow automation and a view that automation is about removing people from processes.

Going straight to a new level of machine-driven automation is an immediate productivity win and a variable cost saving albeit with a (potentially large) capital requirement. Whether its loading, inserting, folding, casing, cutting or packing there's a machine that at a cost will get the job done faster. Most of the current generation of new machines offer the ability to directly integrate to push work to the machines or pull logs to directly observe the work being done on the machines. So, directly integrating smart machines into workflow is a single focussed piece of work that can unblock workflow in a particularly impactful way.

In order to make sure that the capital is focussed at the most impactful function in the facility, I recommend reading into the Toyota manufacturing method and in particular the project they mounted to unblock die change and the factory wide impact this had.

But this focus on single piece hardware obscures a broader factory wide opportunity to reduce cost by seeing all machines in the factory as a whole and taking an 'no-islands' approach to the work that is being done by the machines.

By taking any machine and converting it into a work recording station, critical insight can be gained into how work moves through the factory – we'll take a closer look at this in Cost Saving 8.

The best way to do this and able to be done easily and cheaply is to attach a scanner and either a Raspberry Pi or a cheap Windows Mini PC to record every unit of work that goes past a machine. This method even works up to high-speed laminators.

This gives the ability remove staff from a barcode scanning task or the data can further supplement existing insight and build out an even more complete picture of the movement of product in the plant.

Cost Saving 6: Fails and Rework. (Almost) eliminate waste

A few years back we outsourced a part of one of our brands to a sprawling production facility. At this site the General Manager managed efficiency

by the 240lt and 500lt bin. He would roam the factory, inspect the bins every day or two and challenge different staff members about what was happening. Unfortunately, staff were aware of this routine, so they made sure to empty the bins into the shredder as quickly as possible. Thousands of dollars were draining from the business every week, and there was no accountability.

Significant (there's that word again) can be realised by making every fail event visible, trackable and accountable. In the best factories it is not possible for a reprint to be issued without a trackable quality fail event initiating the ability to reprint the file. In the very best of the factories we see fail-budgets per staff member implemented, requiring escalation if budgeted limits get exceeded.

The trick is to be able to do this without reducing productivity (and in fact speed it). We observe two ways to drive down on this cost – either 1.. grant the ability to quality fail work widely and then track via budget limits or 2. Centralise the fail function and have someone given the task of fail processing to inspect and fail, but do with the StationID of where the work was failed.

Regardless of the method being used, the objective is to create accountability and attach ownership of the failed work. In doing this its important that you have the ability to see the whole workflow, as the fail reason could have originated in upstream workflow.

We've seen this fail accountability technique used to great effect. In another site, each peak season as they moved to peak operations and a three-shift, seven-day operation, waste levels would spike reaching a peak of 20% of total production. With a large number of seasonal workers skill and knowledge fell when management was under peak of pressure. It became easier amidst tight seasonal deadlines to simply reprint work. By introducing fail accountability, the culture of the plant was rapidly transformed and within 8 weeks the issue had been solved, which created the capacity for a whole raft of new innovation.

Cost Saving 7: Freight

Optimize freight costs.

Cost saving 7 votes itself in. Covid put the accelerator on ship costs and inflation plus fuel surcharges of more recent times has kept it down. Everyone is feeling the pinch.

There's a few ways to cut costs in shipping. Depending on your volume, variability and ship destinations, one of the easiest ways is through one of the online shipping portals. Some provide community wide negotiated rates and well documented API's that enable direct integration to their service. They support label production, customs and shipping documentation and can provide good rates.

But this doesn't fit everyone's requirement and many companies have fixed freight contracts and lack agility in selecting freight options based on different time, weight and cube trade-offs.

To maximise freight savings a workflow automation system should have the ability to:

1. Enable live rate shopping between different shipping options – basically putting out a live bid request from the various logistic providers and selecting the best time/cost bid and automatically consigning the shipment.
2. Vary ship options based on day of week, time of year to balance deadline ship date
3. Vary ship options by weight, cube and service level to optimise freight selection

4. Forward analyse production looking for new combine options for the same shipping destination, working out whether it is optimal to hold an order waiting for a partner to join it.
5. Drop shipping – mass shipping individual orders to a destination and then unboxing and consigning them directly into the local postal or courier service provider.

Collectively savings can be rapidly realised as well as tying information back into the organisation providing better customer service where shipping issues are encountered by the customer.

Cost Saving 8: Scheduling

Right product, right time

This area of cost savings is a little more subtle and rests on having implemented several of the preceding areas of savings – critically Cost Saving 5 – People and Cost Savings 6 – Machines.

Finding the right cadence in a plant is a skill and an art. Often plants are run to the capability of their most productive piece, rather than focus on where the process bottleneck is inhibiting the plant. That bottleneck injects cost into the process through lumpy labor costs, higher spoil rates and missed SLA.

Back in Cost Saving 5, I mentioned Toyota's single minded pursuit of creating a whole ability to change a cast die. This project was about the ability to run a Toyota plant to a different cadence and level of flexibility that proved to be transformational. The Toyota philosophy is founded on focussing on the process bottlenecks.

In a Custom and On-Demand manufacturing plant it can be a little more challenging, particularly with high SKU counts and multiple parallel lines. This makes data important and why having good scan data available for both people and machines. With this in place then down to a fine grain level deep insight can be gained into the cadence of goods in a factory.

With this richness of data available the way that production can be looked at can be 100% inverted. Instead of examining what WIP must be completed to hit Service Level today, management focus can shift to *the product that is running behind schedule*. It's a forest versus trees perspective shift. It is possible to focus on everything in production up to a pretty modest amount of daily production, but beyond a tipping point significant cost can be removed by focussing on what components in production are dwelling at a stage of production too long.

This perspective shift means that the focus moves to what needs to be done to lift the productivity of that machine or process to preserve the overall flow of the components of production in the plant.

With that flow unblocked the savings will flow down through the plant and labor, product and missed SLA penalties will be removed from the business. It also creates a powerful capability for continuous improvement and pushing down on dwell time by process stage and the savings will keep flowing.

Cost Saving 9: Culture

Singing from the same hymn book

Culture and a cost saving –sounds a little nebulous doesn't it? Far from it. Culture drives behaviour and workflow automation has a powerful part to play in supporting the culture that management is seeking to implement. We note a wide disparity in focus on culture between low and high performing factories.

The big difference I note between lower and higher performing factories is the level to which they inform and empower their people. The way in which they share information and what type of information they share to support a change in attitude and performance.

In some factories I see staff doing the work in front of them. They are trained and skilled in a task but they have no context for their performance, no understanding of the cadence of the work that is coming to them, their performance or the wider performance of the business.

In some (unfortunately a small number) on the other hand I observe rich dashboards mounted on big LCD TV screens that refresh every minute that paint information about volume, work outstanding, throughput and quality rates. In the best of the factories these are distributed down to the individual cell level providing fine grain influence on performance.

The really interesting thing about this approach is that it doesn't just change the behaviour of staff, it also changes management behaviour. The reason is that done well, these dashboards replicate a large part of the data that is available back in the office. This means that the old management adage of 'management by walking around' becomes possible and a new level of relationship between management and staff created. With live data available to both staff and management conversations move from being episodic (and often too late) to spontaneous and real time.

The potential for this to engender a big shift in cost through creating continuous improvement cannot be underestimated. The only word of caution is that the technique is only as good as your data and this rests on having implemented Cost Savings 5 and 6 to give maximum cost impact.

Cost Saving 10: Insight & Finding the truth

As we've run through the 10 areas of cost saving in Custom and On Demand manufacturing you will have seen a gradually growing emphasis on data.

My philosophy is that workflow automation is not about machines and removing tasks, although that certainly comes into it, it is about information and particularly so in On-Demand production.

What is unusual about this industry is how fragmented and agile manufacturing is and how widely cost of goods can vary from batch to batch in the facility. COGS can move from a few cents to tens of $ from one batch to the next.

What that means is that it is only be having access to the data down to the batch and the product and being able to see trends over time can long run cost re removed from the business.

Many of the cost saving initiatives above are targeted at observable incidents happening 'now'. About building a new level of agility and response in being to either prevent or contain the cost. This last area of cost saving takes a different perspective.

Some costs are incurred as a pattern or might be at a lower incidence but at a higher per unit cost and therefore demand a response.

Cost Saving 10 is developing the capability to see the patterns in the business and being able to diagnose and solve for those problems. Sometimes it might require collecting more data to help solve for the problems, but an effective workflow automation system will provide the mechanism to be able to capture information through your daily operations that will associate the events with the components, products and batches that the events are associated with.

We've seen big cost savings found through identifying patterns in shifts, weather, machines and materials. At times these patterns have existed for long periods of time, but the nature of the pattern meant that it was just accepted as being part of an average level of experience of running the plant. From humidity to mill variance, machine maintenance cycles and different stock suppliers they are all drivers of cost for which data driven insight can have enormous impact on plant cost.

SUMMARY

In Custom and OnDemand Manufacturing, the pursuit of cost savings is more than just numbers in a Profit and Loss statement — it's about cultivating a holistic approach that intertwines efficiency, culture, and foresight. From the factory floor to the management desks, every detail counts, every process can be refined, and every individual has a role in this tapestry of efficiency. This journey through the ten areas of cost savings underscores the significance of adaptability, data-driven insights, and the transformative power of an informed and empowered workforce. The future of the Custom and On Demand manufacturing industry doesn't solely lie in the reduction of costs but in reimagining how we see, interpret, and act upon the intricate dance of processes and people. As we move forward, armed with these insights and strategies, businesses can anticipate not just reduced expenses but a paradigm shift in how Custom and On Demand Manufacturing defines success.

About the author

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