Performance Improvement

Alan Ramias & Cherie Wilkins
Consultants
Performance Design Labs (PDL)

ARamias@ThePDLab.com
CWilkins@ThePDLab.com

For this Column we've decided to step aside and give the spotlight to one of our colleagues (with obvious family ties) from our company, Performance Design Lab (PDL). Chris Ramias has been a consultant with PDL for a number of years and has become particularly adept at process modeling and analysis. He has come up with a technique he calls "visual analysis" that he applies as a powerful addition to the typical toolkit loaded with waste analysis and variation charts. The following was written by him.

Seeing a Process
The Power of Visual Analysis

By Chris Ramias

Sometimes, it's just a matter of really *looking* at a process to begin to understand it.

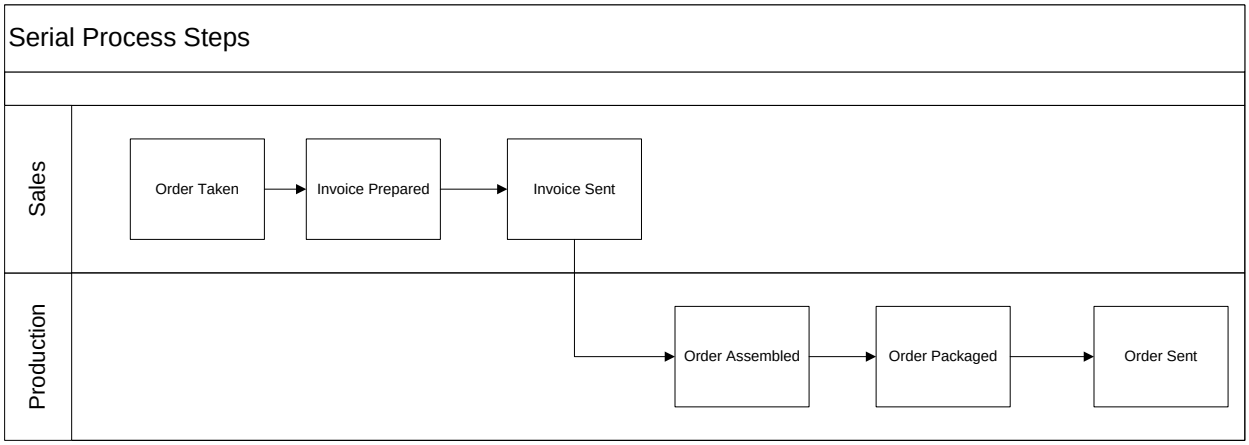
As many process modelers discover, the very act of trying to build a process model can be very revealing about the quality of that process' design and performance. Points of confusion that come up while building the process model often serve to reveal issues not with the model but with the design of the process itself. To take advantage of this vantage point, I sometimes perform a preliminary analysis of process performance that I've come to call "visual analysis".

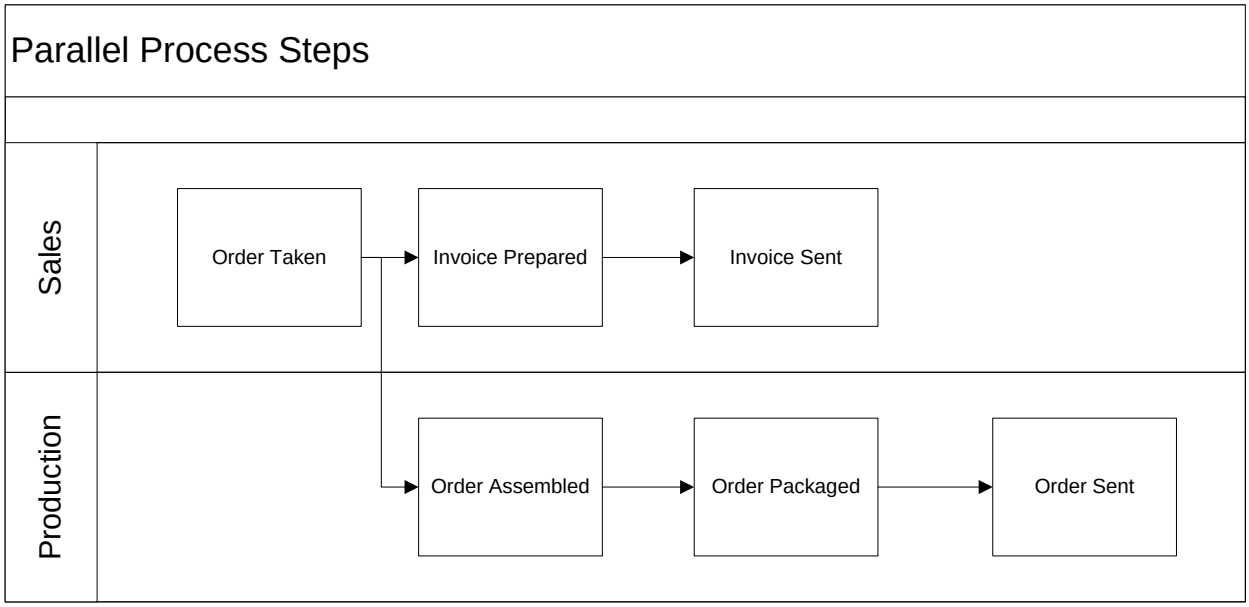
To illustrate visual analysis, I will use commonplace performance problems, the kind that show up in Lean analysis. Visual analysis does not replace Lean, it just supplements it. With many of these performance problems, it's often a case of "where there's smoke, there's fire." For instance, repeating rework loops can indicate problems at the front end of the process where the order is taken or customer information is gathered. Repeated inspections and approvals may indicate a distrust of process performers to do their work properly, or an assumption that management has to be involved in and approve each step of the process. So when reviewing a process map, I don't simply stop at identifying the problem. I try to go a step beyond that to determine the assumption or root cause problem appearing in the process. This is the real value of visual analysis: it lets you identify issues that you can then verify and go deeper on to dig out root causes.

With that said, here is the list of issues you may encounter when reviewing a process model.

Serial vs. Parallel Process Steps

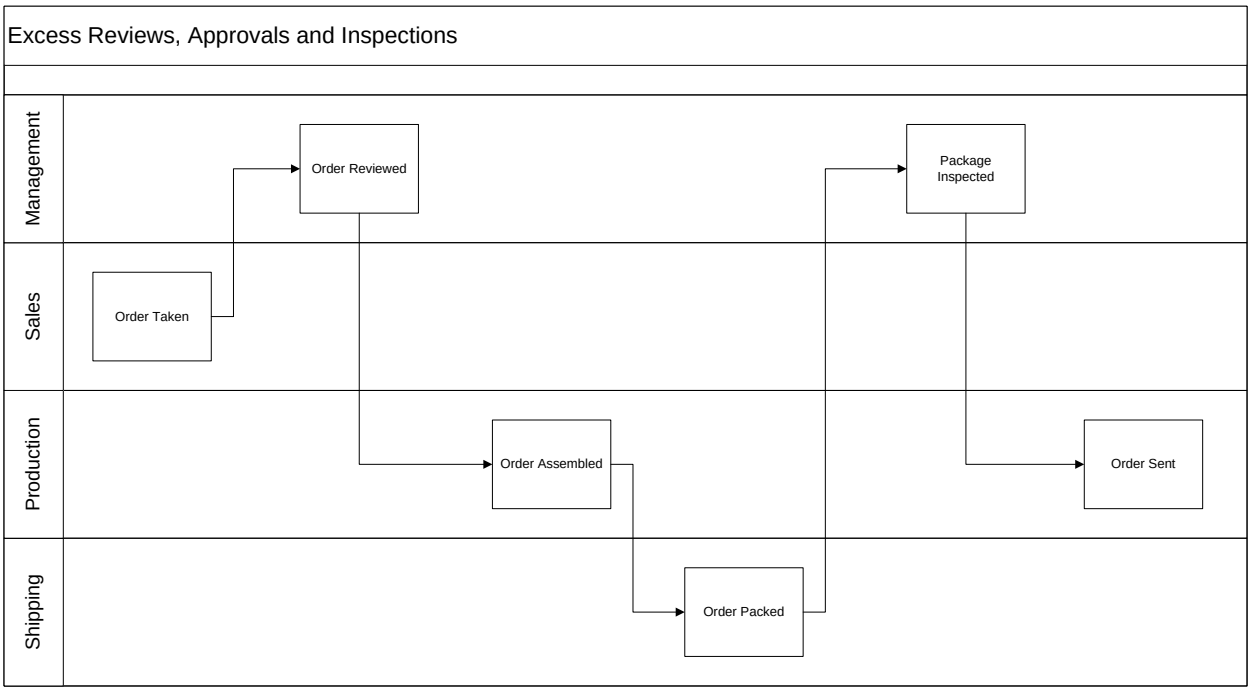
This issue consists of performers at a given process step waiting for process steps to be completed upstream when waiting isn't really necessary. Any sign of batching, items in an inbox, on a to-do list, or in a holding area, may be an indicator of a process that has been designed serially when it might be possible for some process steps to happen in parallel.





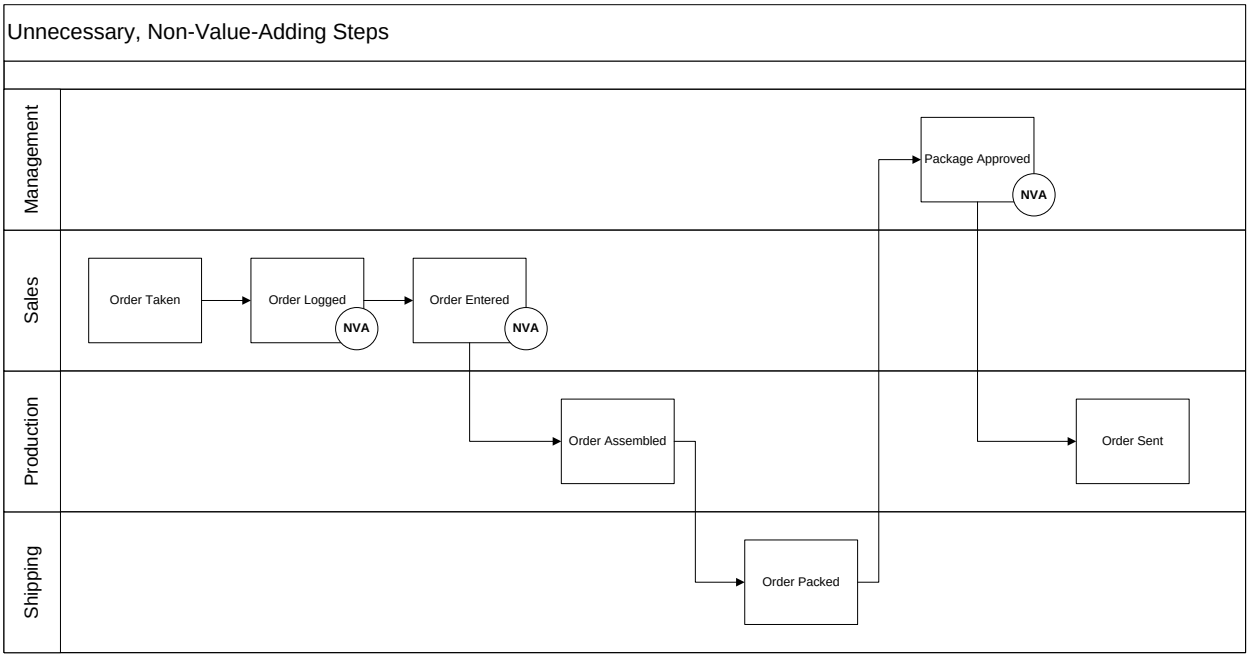
Excess Reviews, Approvals and Inspections

Any time a review, approval, or inspection shows up in a process, it's worth investigating to determine the value of said activity. While approvals and inspections may be completely necessary for internally-driven quality control reasons or externally-driven regulatory compliance reasons, there's no doubt that many of the reviews and approvals taking place are unnecessary. This is especially true if there appears to be a redundant or excessive number of these activities. Even if an inspection initially appears necessary, in some cases it may be possible to redesign the process in such a way that it's not possible for a process step to produce errors—thus eliminating defects but also obviating the need for an inspection in the first place.



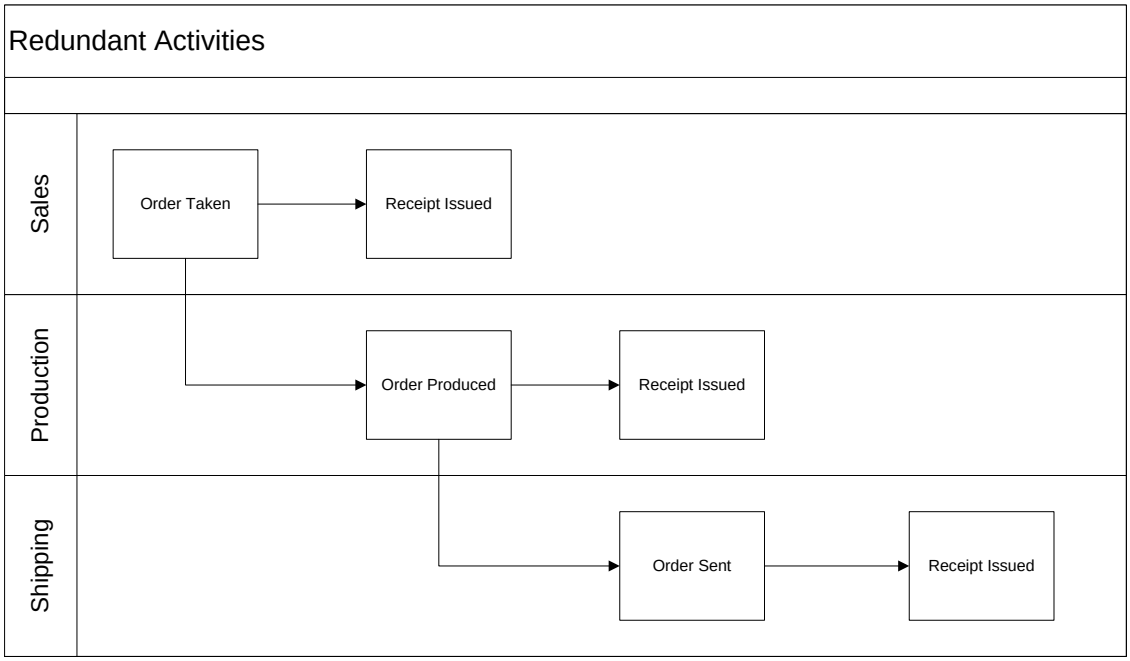
Unnecessary, Non-Value-Adding Steps

An item in a process may be subjected to any number of non-value-adding activities. These can take many forms, including rework, duplicated effort, overprocessing (e.g., refining the item beyond the point that is required by the process), waiting/idle time, and so on. The previous example (i.e., excess reviews, approvals, and inspection), is also an unnecessary non-value-adding step. Of course, rarely will you be told upfront that a certain activity is unnecessary. In many cases, this design flaw will show up as a process step for which the purpose or value of the step is vague, unclear or debatable. Any time the purpose or value of a given process step is unclear, it's worth questioning to determine the contribution that that process step is making to the final output.



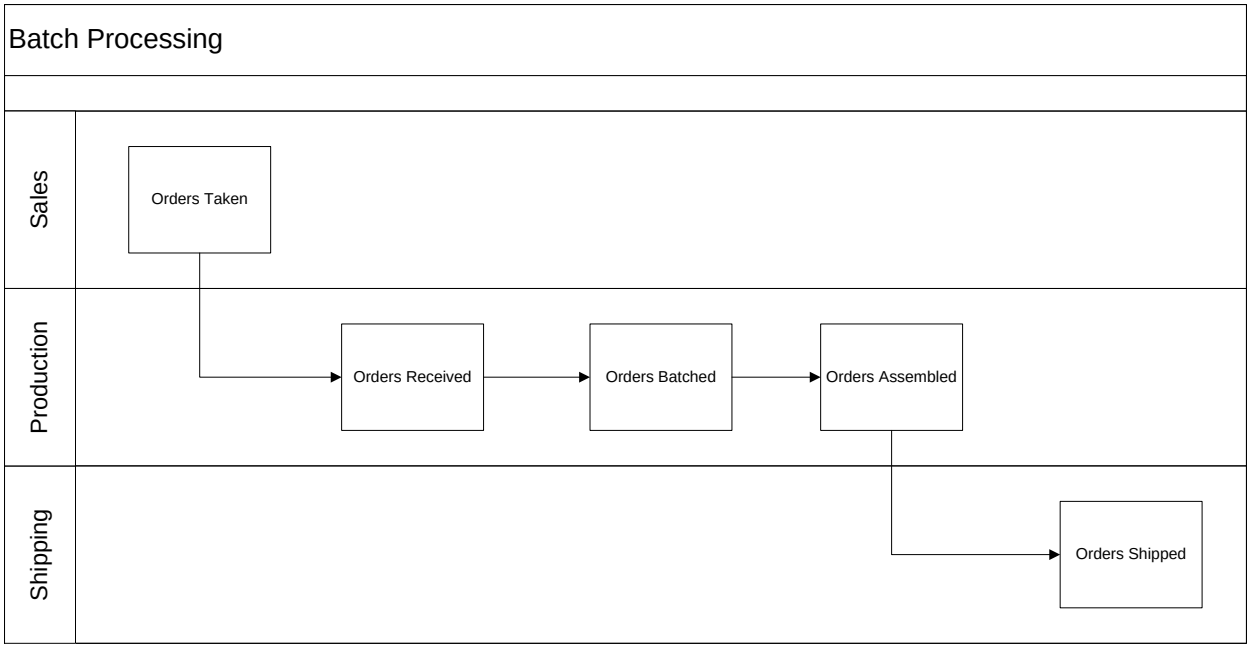
Redundant Activities

This item is very similar to the last item: yet another type of non-value-adding activity. The key here is that the activity seems to be a duplication of effort. This appears as the same activity taking place multiples times, often in different areas. A cause of this behavior in some cases is silos, so each department does the same activity separately due to mistrust or lack of alignment with other departments. Any time you see what appears to be the same activity taking place multiple times, it's worth investigating to determine the value of the activity.



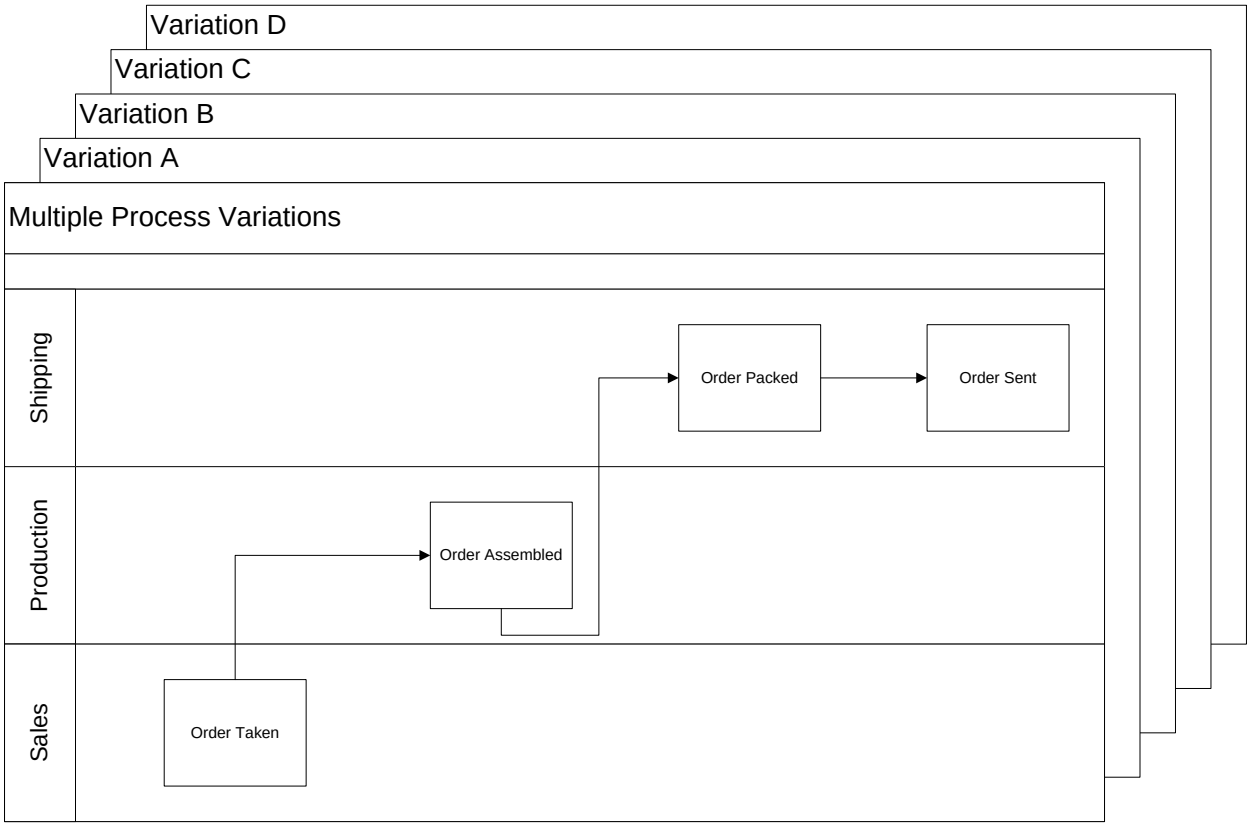
Batch Processing

Batch processing can take a number of different forms. Any time you see items being sent to a holding area, an inbox, or a to-do list, it's a potential indicator of batch processing. Batch processing isn't necessarily an issue – in fact, it may be helpful and quite necessary given the situation. For example, a small bakery that receives an order for 200 cakes may produce them in batches of 50 cakes each, which ensures that all of the cakes won't be ruined if there's a manufacturing problem with one batch. Small businesses lacking the capital to engage in continuous production often use batch processing. With that said, batch processing often creates delays, downtime and inefficiencies. If a manufacturing process is complicated, the downtime between batch runs may be significant. Even on a smaller scale, batching may result in downstream process steps waiting for inputs from upstream. Any time batching shows up in a process, it's worth investigating to see what effects the batching has on the process as a whole.



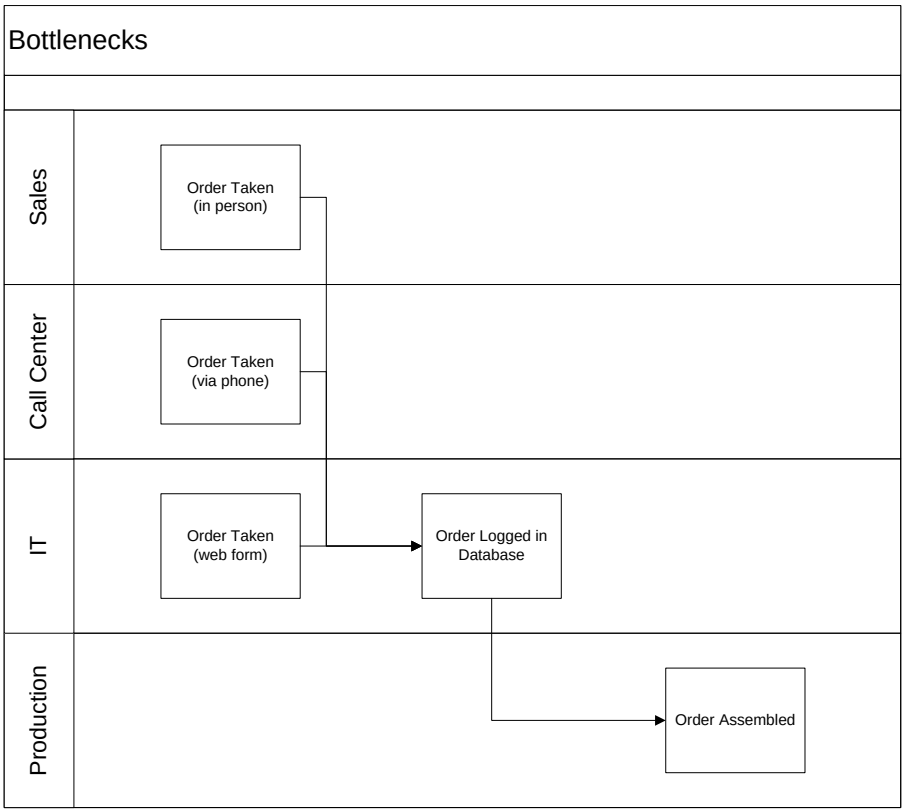
Multiple Process Variations

Similar to the last example on batch processing, the fact that a given process has multiple variations isn't necessarily an issue. Process variations may be absolutely essential to adapt to the complexity of different customers, product types, regions, or other factors. With that said, however, the opposite can also be true. There is often much leverage for improvement to be found in reducing or standardizing a process with multiple variations. For example, a customer home products store offered thousands of possible product variations. After a thorough analysis, they determined they could reduce that to 8-10 of the most popular variations for each of the 20 product lines, which offered great possibilities to streamline their processes and eliminate inefficiencies while still offering their customers a "customized" product line. Where multiple variations are occurring, it is a sound practice to ask the question if this is truly necessary or if it is a potential point of leverage for change.



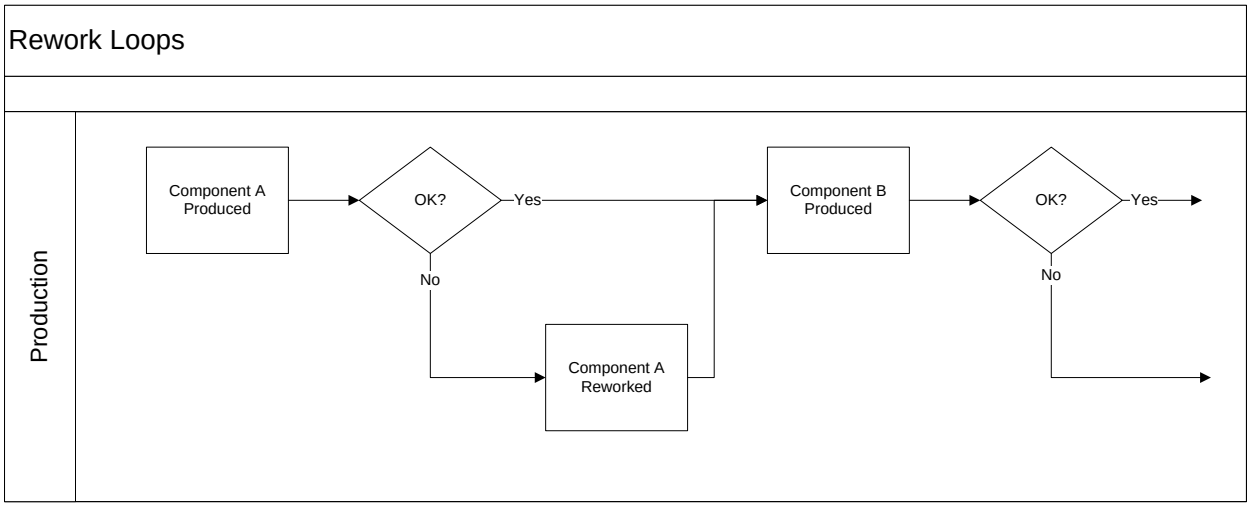
Bottlenecks

Like batch processing and process variations, a bottleneck in a process isn't necessarily a bad thing. While it may be possible to eliminate a bottleneck, it also may simply be an unavoidable fact that a process step is only going to be able to produce X number of outputs in a given timeframe. So, on locating a bottleneck in a process, the question is really twofold – first, can the throughput of the bottleneck be improved, and second, is the rest of the process *around* the bottleneck designed in such a way to maximize the efficiency of the bottleneck? If it is truly unavoidable that a process step will produce only a certain number of outputs at a given rate, then the rest of the process should work to maximize that rate; for instance, by ensuring that that process step has no downtime, that inputs are batched appropriately, and that any material that can be shunted off to a different process step is. Designing a process around capacity constraints is a complex topic. At this point, it is sufficient to be able to recognize when there is a constraint or a bottleneck exists, and then to ask the question of what effects that bottleneck has on the process that surrounds it.



Rework Loops

Rework loops are easy to recognize: they consist simply of a process step that fixes the outputs of an earlier process step. Often, this issue goes hand-in-hand with the earlier issue of excessive inspections and reviews. Frequently, the reason for those all those inspections is to identify items that require rework. It's not uncommon to find processes that have whole "fix-it" chains, with rework happening multiple times over on the same item. Rework is often an indicator of problems upstream in earlier process steps. If a blueprint is faulty, then obviously the house built from that blueprint will have multiple issues that require fixing. Similarly, for a service process, if the customer information-gathering is done poorly at the front end, then there will be all sorts of issues downstream that require circling back to the customer to clarify. Any time you discover rework, it's worth looking upstream to see if you can identify root causes. Similarly, if you're finding disconnects at the front end of a process, you may need to look downstream to find the actual impacts of those disconnects. This is a great example of the value of visual analysis, as no one may have thought to connect causes to effects before, but with a model the connection becomes obvious.



Conclusion

An unfortunate side effect of the popularity of flowcharts and cross-functional process maps, or "swimlane charts", is they have been relegated to being viewed as simply data capture tools. It's been our experience that a skillful review of process models has the potential to generate a bounty of insights into how a process works and where the problems might be. The ability to visually analyze a process map is a skill well worth cultivating.

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