Through the Lens of Lean (CASE STUDY)

Lean may have been designed for manufacturing, but it can also transform QC labs, as this case study shows.

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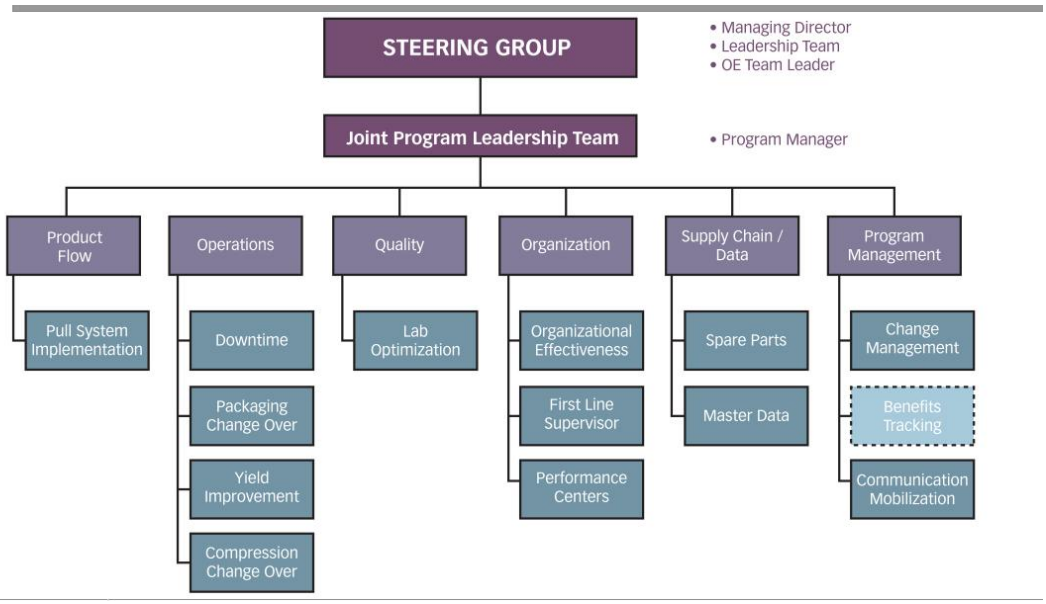
In our case study, the company-wide transformation initiative began with the creation of a team of representatives from manufacturing, QA/QC, packaging, and planning and scheduling. Each representative led sub-teams in his or her area to help design, implement and maintain the new way of working.

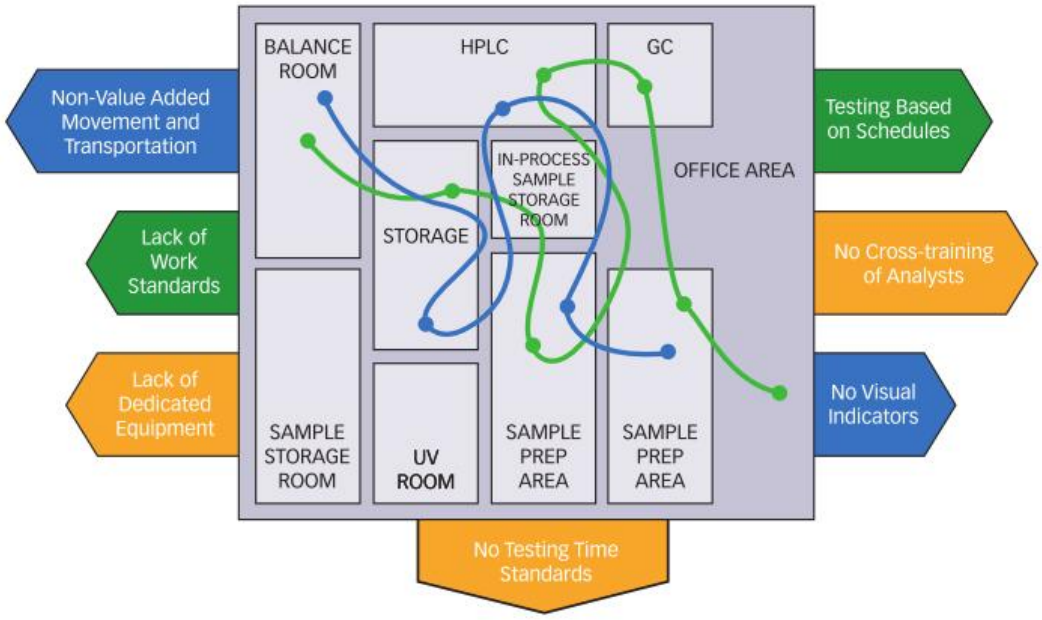
They used a six-step approach :

1. Identify how the lab creates value
2. Map and improve the entire value stream, not just parts of it (which only creates bottlenecks elsewhere)
3. Target waste reduction affecting throughput variability as well as speed
4. Level the laboratory's load and mix of samples
5. Create a system that "pulls" samples rapidly through the Lab based on supply chain priorities
6. Measure performance to keep it on track

From the outset, the lab team recognized an ultimate goal of implementing visual cues to manage sample flow and set about building the prerequisite Lean foundation. The team began by analyzing incoming workload over the preceding year. The arrival patterns and mix of samples revealed significant variation on a daily, weekly and annual basis, both in terms of overall volume and the mix of sample types. The lab team assessed lab capacity, not just in terms of averages, but also in terms of their ability to manage the peaks and valleys. Because the overarching goal of the company-wide transformation was a 20% or better reduction in product conversion cost, it was understood that increasing capacity must occur through improvements in productivity, speed and predictability.



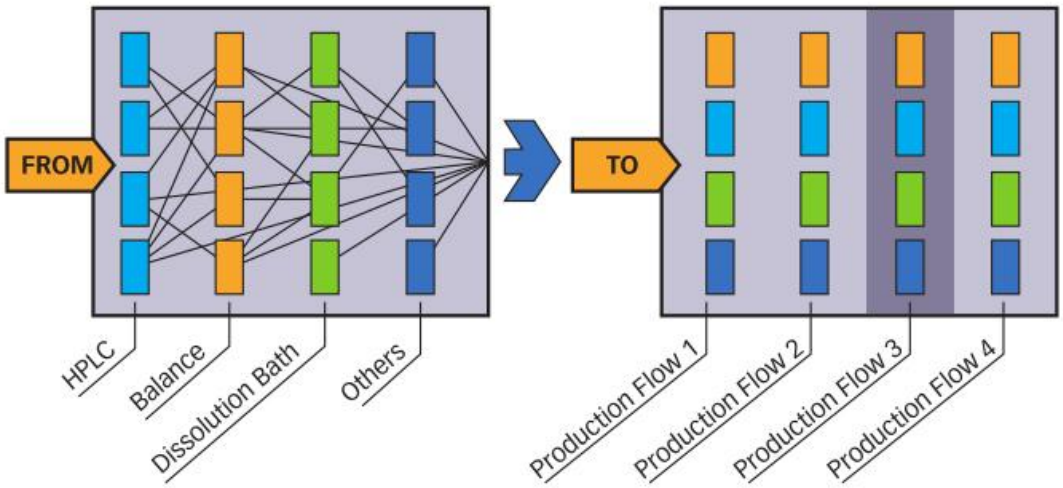
Examining their work practices through the lens of Lean thinking created a new perspective. This allowed the laboratory team to visualize their current state, identify opportunities and prioritize corrective actions.



Clear opportunities bubbled to the surface that allowed motion and wait-time waste to be reduced. To reorganize physical proximity, the team opted for cell- based work spaces for high-volume samples. While these efforts might seem to have focused on improving productivity and throughput time, they made a significant positive collateral impact on “Right-First-Time” and in creating the predictability required to reduce sample lead time planning values. Moreover, they increased “On-Time-Release” percentages in a way that was meaningful and effective for the overall manufacturing process.

- Reorganizing the placement of glassware and other supplies
- Consolidation and/or outsourcing of reagent preparation
- Kitting to reduce wasted motion
- “Hot-prep” for bullet train turnaround times
- Cell based (operating room) organization for high volume tests

The team assessed capacity and designed what they felt would optimize the flow of test samples through the lab, including the equipment on which they would be tested and the personnel who would test them. Then, in close coordination with concurrent efforts in manufacturing and packaging, they allocated samples to dedicated test lanes. To design testing lanes for the products in the company’s solids family, for example, the team analyzed a complex set of data that included all of the factors that could affect the speed and productivity of the lab in the context of their role in the overall production cycle. Similar analysis and design work was undertaken for the five other product groups. Sample flow went from instrument-centric to product-centric. Key performance indicators were identified and visual management tools were implemented in order to maintain open communication and feedback.



Throughput time for the solids group dropped from 15 days to just eight days, an improvement of 46%, which far exceeded the target of 30% and is likely to drop to as few as six days within a year of implementation. People utilization — defined as the percentage of time that personnel spend in value-adding activities — climbed from about 65% to 90%. Within the solids group, the percentage of cross-trained personnel — that is, those who are trained to perform all tests as well as the review step — rose to 100% within two months of implementation, an increase of 42%. The percentage of Right-First-Time testing climbed from 95% to 98%, reducing laboratory investigations and decreasing laboratory throughput time.

Granted, visual “pull” sample management and understanding the interdependence of functional groups is not the only key to successful Lean Lab transformations. Nevertheless, this case study shows how important their leverage is to producing a competitive advantage. More importantly, the culture and capabilities that resulted not only produced a competitive advantage in the short term, but allowed the company to gain a significant ongoing competitive advantage. As a result of its Lean Lab efforts, it is now much better positioned to dynamically react to the inevitability of continuously changing market demand and new product introductions.