

# Production Scheduling

The Manufacturing Quandary





Quandary is a state of perplexity or uncertainty over what to do in a difficult situation.

Production scheduling is expected to satisfy two fundamental objectives: prediction and execution. The most important outcome of a scheduling system is a reliable prediction of what will happen and when it will happen. This prediction and subsequent execution (how it will happen) is what enables manufacturing companies to properly size resources, inventory, establish lead times and provide customer delivery commitments with confidence.

## So why is production scheduling the number one concern for most small to mid-sized manufacturers?

Sometimes, the level of demand or complexity means that the outcome from an execution-led system is not clear or communicated with the speed required. In most cases these “push-systems” create conflict by forcing over-production. This causes bottlenecks, increased WIP, extended lead-times, contributes to material shortages and brings the type of chaos to the shop floor that leads to quandary.

Continuous Improvement Specialists from Synergy Resources repeatedly find that Manufacturers today need to supplement scheduling systems or tools with continuous improvement techniques that will enable manufacturers to make fast, reliable predictions about capability. These techniques also help to establish processes that allow for quick response to customer demand. Manufacturing companies that leverage all the available tools and continuous improvement techniques are more likely to look like this:

- Pull-systems in place
- Constraints are subordinated and managed
- Inventory levels are rapid turning with near zero WIP
- Effective problem solving in place to achieve zero defects
- One-piece flow (or the smallest possible lot sizes) is understood and in practice
- Lead times are zero for make-to-stock items and near zero for make to order items
- Clean, organized facility with “status at a glance” visual controls
- Trained, flexible and empowered workforce

“ON THE ADVICE OF SYNERGY RESOURCES STRATEGIC BUSINESS SERVICES, SYNERGY RESOURCES FACILITATED A BUSINESS PROCESS MAPPING SESSION. THE ENTIRE CABOT GROUP WAS VERY PLEASED WITH THE PROCESS MAPPING THAT TOOK PLACE OVER THE PAST THREE DAYS. THEY NOW UNDERSTAND THE NEED TO CHANGE OUR PROCESSES, AND ARE ENTHUSED TO GET MOVING. WE VERY MUCH APPRECIATE THE EFFORTS OF SYNERGY RESOURCES STRATEGIC BUSINESS AND APPLICATION SERVICE GROUPS ON OUR BEHALF. AS I SAID DURING THE EVENT, IF THERE WAS SOMEWHAT OF AN UNKNOWN BEFORE STARTING THE PROJECT WITH SYNERGY’S COMMITMENT AND PROFESSIONALISM, THOSE CONCERNS ARE COMPLETELY GONE. AS I TOLD THE TEAM THIS MORNING, WE ARE IN THE BIG LEAGUES NOW.”

STEPHEN J. KELLEY

# The three primary continuous improvement techniques proven to increase operational performance are Lean, Six-Sigma and TOC (Theory of Constraints).

## Lean

tools are used to improve and redesign processes from the perspective of putting specific work practices or standard work in place to reduce waste, conflict and increase customer value. Lean's primary objective is to reduce time-to-cash by focusing on waste elimination in both the office and shop floor processes.

One Synergy manufacturing client known as a leader in quality manufactured fluid control instrumentation serving the defense, aerospace and commercial industries realized a productivity gain of more than 50% during a 4-day Shop Floor Kaizen (SFK). A re-engineered cellular work flow, deployment of standard work, implementation of 5S, establishment of visual controls and a transition to 1-piece flow allowed the newly anointed cell leader an ability to easily manage and control production. Many of Synergy's clients have realized similar gains both on the shop floor and in the front office under the guidance of our trained continuous improvement specialists.

## Six Sigma

tools are used to measure process quality, reduce process variation, and improve process performance using a formal problem solving process. Six-Sigma's primary objective is to increase customer satisfaction by focusing on the variability reduction of key product/process parameters.

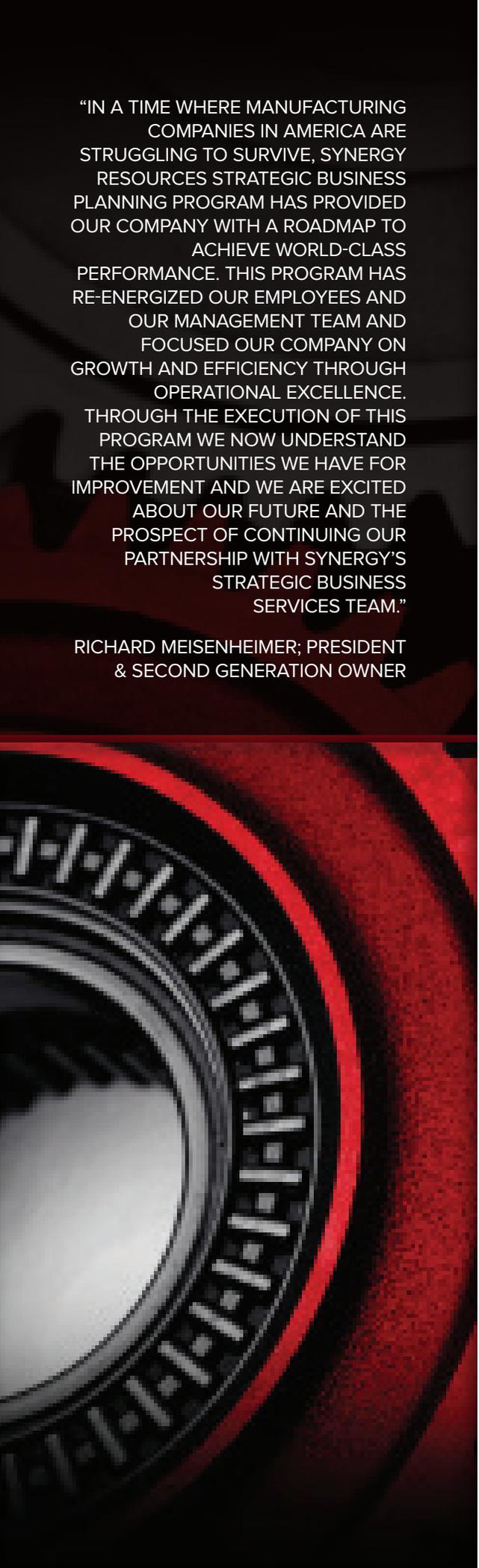
One Synergy client who provides engineered solutions and precision machining services to the medical, aerospace, optical, communications, electronics, instrumentation and commercial high-tech markets realized the importance of using a systematic approach to problem solving. Through training and tools provided by Synergy experts they were able to immediately apply problem solving tools to drive process improvements. Other clients have benefited from the implementation of defect tracking and SPC (Statistical process control) during Kaizen events. This ensures process control and supports the decision process allowing clients to focus on the right problem.



“THE STRATEGIC BUSINESS SERVICES DIVISION HELD AN 8D PROBLEM SOLVING WORKSHOP AT OUR FACILITY. THE WORKSHOP PROVIDED TRAINING AND PART OF THE SESSION INCLUDED BREAKING INTO TEAMS AND WORKING ON REAL PROBLEMS IN OUR COMPANY. THE 8D PROGRAM PRESENTED AT THE WORKSHOP CONTRIBUTED TO IMMEDIATE IMPROVEMENT IN OUR PROBLEM SOLVING ACTIVITY, HELPING TO LOWER COST AND REDUCE LEAD-TIMES.”

DAVID RYTI  
DIRECTOR OF QUALITY





“IN A TIME WHERE MANUFACTURING COMPANIES IN AMERICA ARE STRUGGLING TO SURVIVE, SYNERGY RESOURCES STRATEGIC BUSINESS PLANNING PROGRAM HAS PROVIDED OUR COMPANY WITH A ROADMAP TO ACHIEVE WORLD-CLASS PERFORMANCE. THIS PROGRAM HAS RE-ENERGIZED OUR EMPLOYEES AND OUR MANAGEMENT TEAM AND FOCUSED OUR COMPANY ON GROWTH AND EFFICIENCY THROUGH OPERATIONAL EXCELLENCE. THROUGH THE EXECUTION OF THIS PROGRAM WE NOW UNDERSTAND THE OPPORTUNITIES WE HAVE FOR IMPROVEMENT AND WE ARE EXCITED ABOUT OUR FUTURE AND THE PROSPECT OF CONTINUING OUR PARTNERSHIP WITH SYNERGY’S STRATEGIC BUSINESS SERVICES TEAM.”

RICHARD MEISENHEIMER; PRESIDENT  
& SECOND GENERATION OWNER

*At its full potential, a manufacturing process can make as much conforming product as possible with a minimum amount of waste. Lean and Six Sigma work together to help companies improve the prediction and execution of their manufacturing systems.*

## TOC

on the other hand, takes a total system approach in identifying the most important limiting factor (i.e. constraint) that stands in the way of achieving a goal and then systematically improving that constraint until it is no longer the limiting factor. This is done by adjusting the rest of the organization around the constraint. TOC’s primary objective is to increase organizational prosperity by focusing on the business system’s constraint and increasing throughput.

During one operational assessment with a manufacturer that provides industry-leading test, measurement, and imaging instruments, it was determined that decisions made relating to process negatively impacted equipment capacity from which both had contributed to poor on-time delivery.

By isolating quick-turn, “make-to-order” customer requirements from the repetitive “make-to-stock” products the team was able to improve predictability on the repetitive line and clearly identify the constraint limiting throughput on the quick-turn line. Advanced equipment limiting set-up time in conjunction with adjustments made to the rest of the processes around the constraint increased throughput dramatically.

*These adjustments included the adoption of pull-systems, inspection at the source, smaller lot sizes (what the customer wants), and 5S.*

*As is always the case, the increase in throughput directly correlated to reduced lead times and improved profit.*

Often manufacturers are compelled to select one technique to solve a multitude of problems. However, what Synergy Resources continuous improvement specialists realize is that each of these three techniques

offers manufacturers a wide range of solutions to overcome “the manufacturing quandary” and can be selectively or collectively applied to solve the most immediate problem.

What has been proven time and time again is that Lean provides manufacturers with a technique that enable them to reduce lot sizes, put pull systems in place, increase productivity, reduce lead time and bring defects to the forefront. Lean also encourages employee enablement and the continuous pursuit of perfection.

*As defects are made more visible in a Lean environment the underlying and rigorous Six-Sigma approach can be executed, ultimately ending with the implementation of a long-lasting solutions further improving the overall predictability of the manufacturing process.*

As waste and defects are eliminated from the manufacturing process it brings clarity to what or where the overall system’s constraint resides. By utilizing TOC concepts the decision can be made as to how to get the most out of the constraint by subordinating everything else in order to elevate the system’s constraint thereby increasing the company’s overall throughput.

Today, more than ever, manufacturing excellence must be built on prediction and execution. Lean places emphasis on daily execution to customer demand. It favors a system of visual signals on the factory floor and provides visibility to defects and constraints that can be addressed using Six-Sigma and TOC techniques.

*Does this mean that production scheduling tools are in conflict with the best practices of Lean, Six-Sigma, and TOC? Absolutely not.*

*Scheduling is an essential part of integrated planning and remains a powerful component in achieving world class performance.*



Using this structured approach, several key activities, including training, documentation, conference room pilot testing, organizational change management, end-user training, and benefits realization will allow you to accomplish a level of success unparalleled in the ERP industry.

SYNERGY RESOURCES REALLY STANDS OUT IN THEIR QUALITY, ATTENTIVENESS, AND COMPETENCE. NO OTHER ERP VENDOR THAT I CONTACTED HAS SPENT THE TIME AND EFFORT WITH US THAT SYNERGY DID, AND DELIVERED BOTH STRATEGIC BUSINESS CONSULTING AND AN IMPLEMENTATION PLAN THAT ADDRESSES ALL OF OUR CONCERNS. AS A SMALL BUSINESS MANUFACTURER THAT IS LOOKING TO GROW SIGNIFICANTLY IN THE NEXT FIVE YEARS, I BELIEVE THAT SYNERGY RESOURCES WILL BE A VALUABLE STRATEGIC PARTNER.

ELIZABETH KEEFE: DIRECTOR OF OPERATIONS

## *About Synergy Resources Continuous Improvement Team:*

The primary drive behind Synergy's continuous improvement approach is to increase the content of value-added activities by applying the "right" principles and tools to any given office or shop floor process in order to improve its overall performance. That has resulted in performance increases of the following proportion:

- Shop floor productivity gains of 25% - 55%
- Lead time reductions of 20% - 60%
- WIP reductions of 40% - 70%
- Inventory reductions of 30% - 60%
- On Time Delivery gains of 20% - 45%
- Cost of quality reductions of 20% - 60%



*Synergy Resources  
Strategic Business Services:  
For companies serious  
about improving business  
performance.*

This, in combination with the resolve to take the necessary action, Synergy Resources offers a unique combination of Products, Strategic Business Services, Software Application Services, Continuous Improvement Services, Quality Services and Technical support to help companies achieve sustainable business performance improvement.

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So many  
companies  
simply “hope”  
for success.  
You can plan for  
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Synergy Resources Strategic Business Services: For companies serious about improving business performance and with the resolve to take the necessary action, Synergy Resources offers a unique combination of Products, Strategic Business Services, Software Application Services, Continuous Improvement Services, Quality Services and Technical Support to help companies achieve sustainable business performance improvement.

About the author: Throughout his thirty plus years of service Michael Canty has used his vast knowledge and by applying various strategies, technologies, tools and methodologies, helped a large number of organizations develop and implement effective business strategies and processes leading to improved operational performance. In so doing, Michael has earned the respect of his employers and customers throughout his career

