

Financial Impact of Improved Resource Utilization at XYZ Manufacturing, Inc.¹

Purpose

This case study demonstrates the impact of improved resource utilization. A financial model is included² to validate the extent to which incremental improvements to production scheduling (resulting in machine and labor efficiency gains) translate to reduced variable costs and expanded capacity to capture revenue.

Situation

XYZ Manufacturing, Inc. (XYZ) fabricates widgets for commercial aerospace customers at a unit price of \$175. The company currently has 45 employees and projects 2021 revenue of \$8M.

XYZ plans to implement a five-year growth strategy with the goal of \$20M+ in revenue by 2025. XYZ has long sought to enter the defense aerospace market to sell widgets at more favorable margins (proposed unit price of \$225). In 2020, XYZ raised \$3M in equity financing and \$6M in debt to expand production capacity. Capital was allocated towards plant improvements and new CNC machine purchases. XYZ now has 30 machines.

Problem

XYZ executives believe critical resources are underutilized due to scheduling inefficiencies. Scheduling is managed via spreadsheets disseminated each morning after a production meeting. The schedule becomes inaccurate and misleading when something changes in production and doesn't make it back to the schedule owners. The inflexibility of the process results in unacceptable delays, idle time, and late deliveries.

Current machine utilization is estimated at 55%. Labor is spread thin over the increased number of machines with an average of 0.80 operators per machine, resulting in labor costs of \$54.55/unit. There is very little slack in labor supply; if one worker calls in sick, delays and cost overruns are almost guaranteed.

XYZ wants to improve scheduling to drive better resource (machine and labor) utilization and model the financial impact of doing so over the first year of implementation.

Solution

XYZ will implement a cloud-based scheduling system, the Ondema Workspace, to simplify scheduling and drive efficiencies in resource utilization. The software provides clarity with intuitive interfaces and collaboration tools and reduces time spent managing the production schedule.

By implementing the Workspace and improving the scheduling process, XYZ estimates it can incrementally boost machine utilization to 65% while reducing the average number of operators required per machine. Forecasting impacts on key metrics over the first year provides clarity on the expected return on XYZ's software

¹ The name has been changed at the company's request.

² Download "XYZ_Manufacturing_financial_model.xlsx" and test your own scenarios at:

https://ondema.io/wp-content/uploads/case-studies/XYZ_Manufacturing_financial_model.xlsx

investment. Metrics chosen to assess this are: added capacity for revenue (i.e., the ability to accept more orders), units produced per machine, labor cost per unit, and total cost of goods sold (COGS) per unit.

Impact

Improving machine utilization from 55% to 65% and reducing the average number of operators per machine from 0.80 to 0.75 yields significant financial improvements in the first year alone. XYZ forecasted a 21.5% increase in monthly units produced per machine (132 to 160), as well as a 20.7% reduction in labor cost per unit (\$54.55 to \$43.27). These drivers translate in capacity to accept an additional \$796K in revenue (green area in Figure 1 below) and a 11.6% reduction in total cost per unit (\$78.72 to \$69.57).

Additional summary metrics are shown in Table 1 below.

Figure 1: Revenue Impact of Improved Resource Utilization

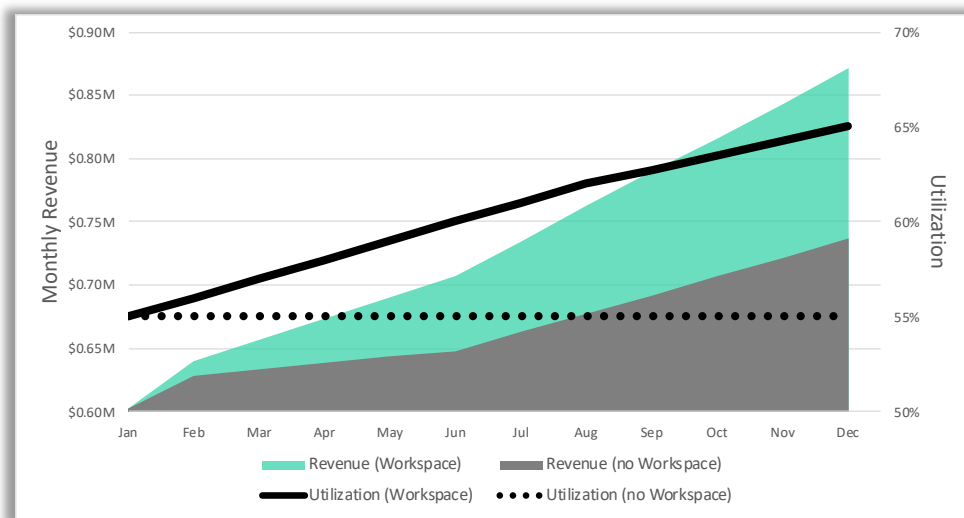


Table 1: Summary of Key Metrics

| | Jan 2021 | Feb 2021 | Mar 2021 | Apr 2021 | May 2021 | Jun 2021 | Jul 2021 | Aug 2021 | Sep 2021 | Oct 2021 | Nov 2021 | Dec 2021 | Total |
|----------------------------------|-----------|------------|------------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|--------------|
| UNDERUTILIZED RESOURCES | | | | | | | | | | | | | |
| Revenue, \$ | 603K | 629K | 633K | 638K | 643K | 648K | 663K | 677K | 692K | 707K | 722K | 737K | 8.0M |
| Production | | | | | | | | | | | | | |
| Machine Utilization | 55.00% | 55.00% | 55.00% | 55.00% | 55.00% | 55.00% | 55.00% | 55.00% | 55.00% | 55.00% | 55.00% | 55.00% | 55.00% |
| #of Units per Machine | 132 | 132 | 133 | 133 | 133 | 134 | 134 | 134 | 135 | 135 | 135 | 136 | |
| COGS, \$ | -271K | -282K | -284K | -286K | -288K | -289K | -292K | -295K | -297K | -300K | -303K | -305K | -3.5M |
| # of Operators per Machine | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | 0.80 | |
| Labor Cost per Unit, \$ | 54.55 | 54.55 | 54.54 | 54.54 | 54.54 | 54.54 | 54.54 | 54.54 | 54.54 | 54.54 | 54.54 | 54.54 | |
| Total Cost per Unit, \$ | 78.72 | 78.80 | 78.87 | 78.95 | 79.02 | 79.10 | 79.38 | 79.67 | 79.96 | 80.25 | 80.55 | 80.84 | |
| OPTIMIZED RESOURCES | | | | | | | | | | | | | |
| Revenue, \$ | 603K | 640K | 657K | 673K | 690K | 707K | 735K | 763K | 790K | 816K | 843K | 871K | 8.8M |
| Production | | | | | | | | | | | | | |
| Machine Utilization | 55.00% | 56.00% | 57.00% | 58.00% | 59.00% | 60.00% | 61.00% | 62.00% | 62.75% | 63.50% | 64.25% | 65.00% | |
| #of Units per Machine | 132 | 135 | 137 | 140 | 143 | 146 | 149 | 151 | 154 | 156 | 158 | 160 | |
| COGS, \$ | -271K | -281K | -282K | -283K | -284K | -285K | -289K | -294K | -298K | -302K | -306K | -310K | -3.5M |
| # of Operators per Machine | 0.80 | 0.79 | 0.78 | 0.77 | 0.76 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | 0.75 | |
| Labor Cost per Unit, \$ | 54.55 | 52.90 | 51.32 | 49.78 | 48.30 | 46.87 | 46.10 | 45.36 | 44.82 | 44.29 | 43.77 | 43.27 | |
| Total Cost per Unit, \$ | 78.72 | 77.15 | 75.64 | 74.18 | 72.78 | 71.43 | 70.94 | 70.49 | 70.23 | 70.00 | 69.78 | 69.57 | |
| Revenue Increase, \$ | 0K | 11K | 23K | 35K | 47K | 59K | 72K | 86K | 98K | 109K | 121K | 134K | 796K |
| Cost Reduction, \$ | 0K | 1K | 2K | 3K | 3K | 4K | 3K | 1K | -1K | -2K | -4K | -5K | 5K |
| VALUE OF OPTIMIZATION, \$ | 0K | 12K | 25K | 37K | 50K | 63K | 75K | 87K | 97K | 107K | 118K | 129K | 800K |