

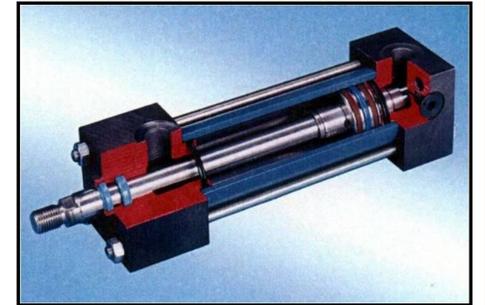
Hydraulic Cylinders Production Capacity

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Background

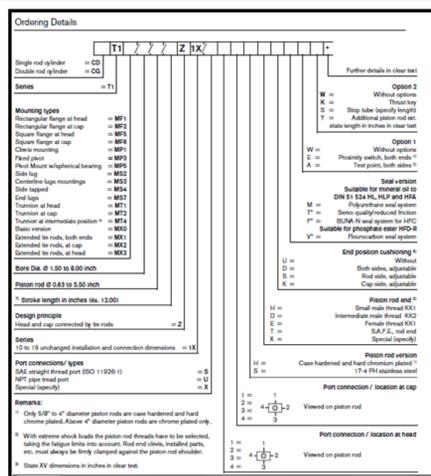
Bosch Rexroth is a leading producer of hydraulic cylinders and one of their production facilities is located in Bethlehem, PA. A hydraulic cylinder is composed of several components that need to be machined before it is assembled. Maintaining a short lead-time to customers is essential to our client's business. The forecasts show that by the end of 2013, the company is going to experience a significant increase in customer demand. To be able to meet the extra demand and be profitable, the Bethlehem plant needs to increase its throughput level by 100%. The purpose of this 15-month project is to find a solution to our client's production capacity problem.



Problem Statement

Rexroth cylinders are highly customizable. Therefore, all cylinders are made-to-order. The high variance in product configuration makes it hard to predict lead-time. It also causes the bottleneck of the system to move between stations depending on the product mix.

With the current resources, the plant will not be able to meet the increasing demand. The Management is considering various investment strategies to mitigate the bottlenecks. However, the economic returns and the system-wide impact of these investments are not yet determined.

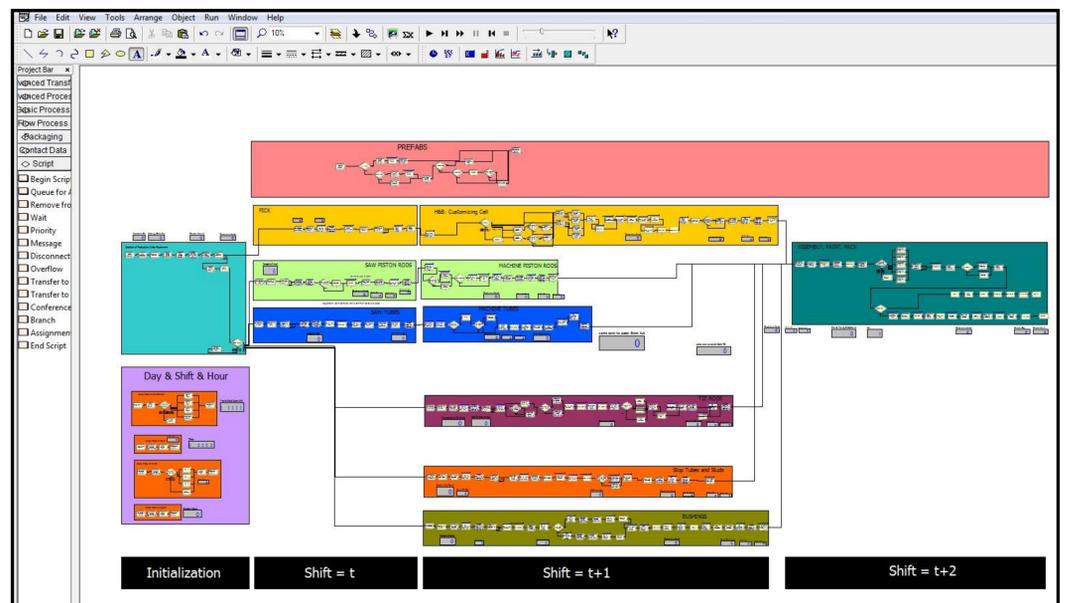
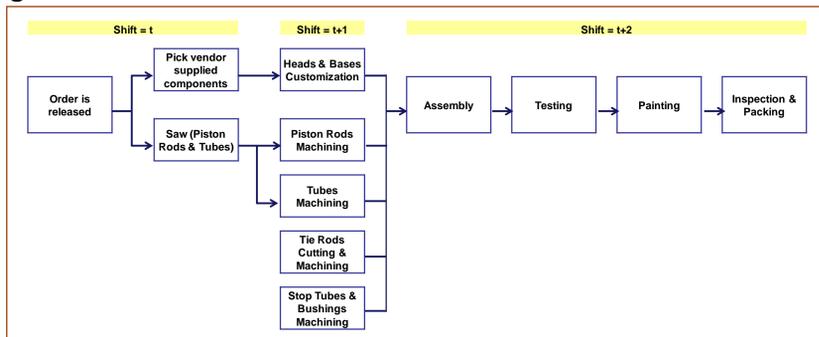


Technical Approach

- Evaluate and verify existing process data
- Collect and organize process data to support a simulation analysis
- Develop a model of the as-is system and verify the model by comparing results with empirical throughput data.
- Develop a user interface for the input/output data to allow the model to be used as a sequencing tool in the future.
- Use the simulation model to experiment with investment options and system configurations.
- Conduct cost-benefit analyses on selected investments.
- Develop a roadmap to achieve 100% increase in daily capacity.

Design Objective

In this study, we are looking for ways to predict the impact of investments by using an ARENA simulation model. Our model of the as-is state helps us to identify current system bottlenecks and test various resource allocation and order sequencing rules to develop methods to eliminate bottlenecks. The as-is model also serves as a baseline to simulate and compare the system with added resources and/or process changes.



Company Impact

- The primary result of the project will be doubling production capacity of the hydraulic cylinder manufacturing system. This will assure economic viability of the product line and establish a base for further growth.
- The project will set the stage for further growth of an additional 80% by providing a simulation model of the system that can be used to test the impact of new equipment, improved processes as well as alternative layouts and configurations that will be needed to achieve long-term business objectives.

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