Developing a Production Planning Model for a Contract Manufacturer

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Sponsor: ZY Machining & Distribution

Motivation / Background

Contract manufacturing industry is growing rapidly

- Share of Engineer-to-Order Orders
  - 2014: 55%
  - 2015: 64%
  - 2016: 69%
  - 2017: 69%
  - 2018: 75%

- Profit Margin of Engineer-to-Order Products
  - 2014: 28%
  - 2015: 26%
  - 2016: 25%
  - 2017: 24%
  - 2018: 19%

- Decreased profit margin of ETO products from 28% to 19%

Key Question / Hypothesis

1. How can the contract manufacturer ensure:
   - Feasible Production Plan
   - For ETO Product
   - With Minimal Cost
2. How to account for the process uncertainty

Relevant Literature


Methodology

- Process mapping and problem statement
- Scope definition and model selection
- Building optimization model
- Results assessment

Minimize costs

- WIP Inventory holding
- Overtime hours Hiring
- In-house production Outsourcing

Meet shipment date

Initial Results

1. Formulated MILP Cost Optimization Model
2. Performed Shadow Price Analysis
3. Scenario Analysis for Process Uncertainty

Expected Contribution

1. Our model will be used by the sponsor company:
   - Guideline for APP to ensure feasible production plans
   - Foundation for price quotes and sales & operations coordination
   - Plan with minimal production costs
   - Insights on strengthening constraints
2. Developed model could be used by any company with similar manufacturing environment

Month 2019 Poster Session