PRODUCTION SYSTEM DESIGN & CONTROL

James Choo, Project Production Institute

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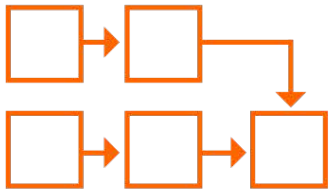
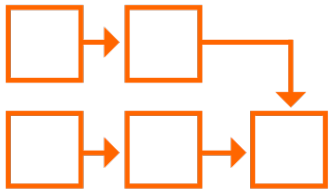
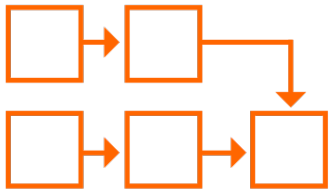
Cost, Time & Cash =  +  +  +  + 

Product Design | Process Design | Capacity | Inventory | Variability

Cost, Time & Cash =  Product Design +  Process Design +  Capacity +  Inventory +  Variability

Common Focus Toward Industrialization

Cost, Time & Cash =  Product Design +  Process Design +  Capacity +  Inventory +  Variability

Common Focus Toward Industrialization

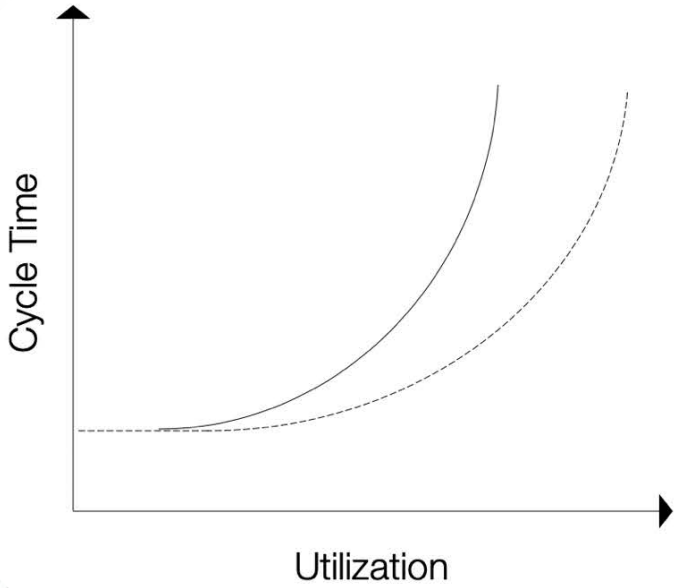
Gap

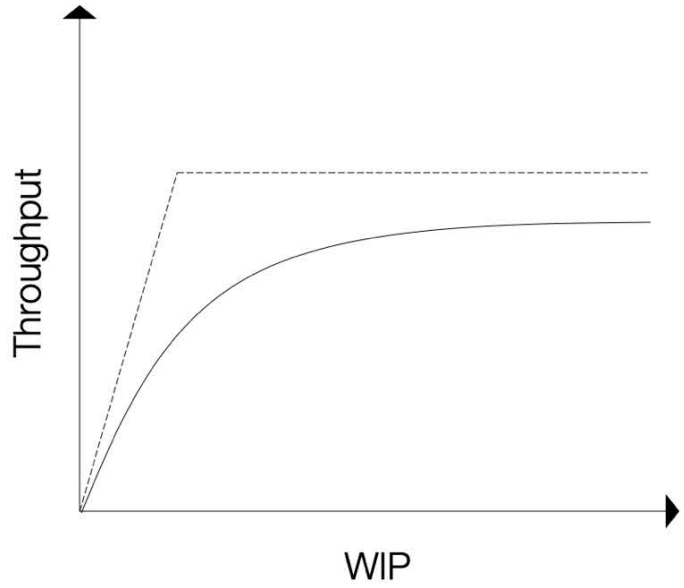
What does a Digital Twin of Production Systems look like?

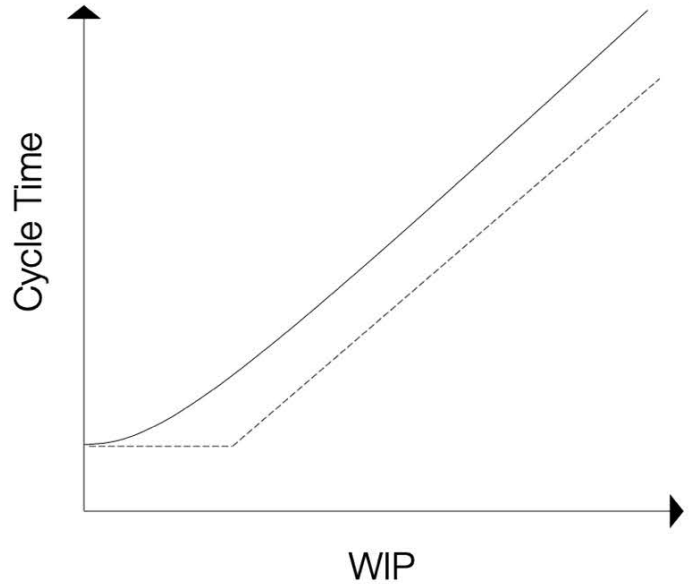
4 Verbs

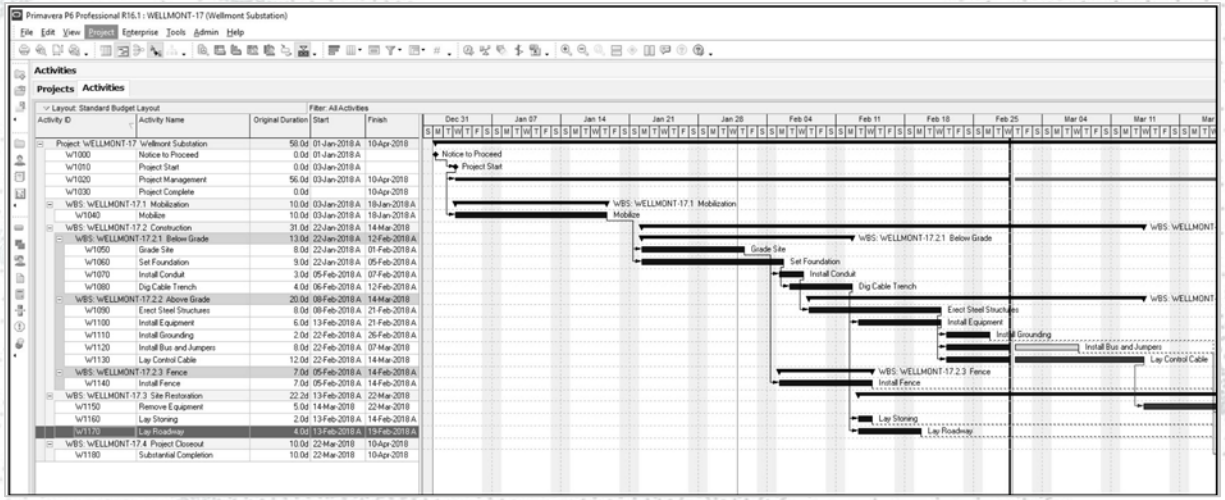
5 Levers

3 Curves









Digital Twin?

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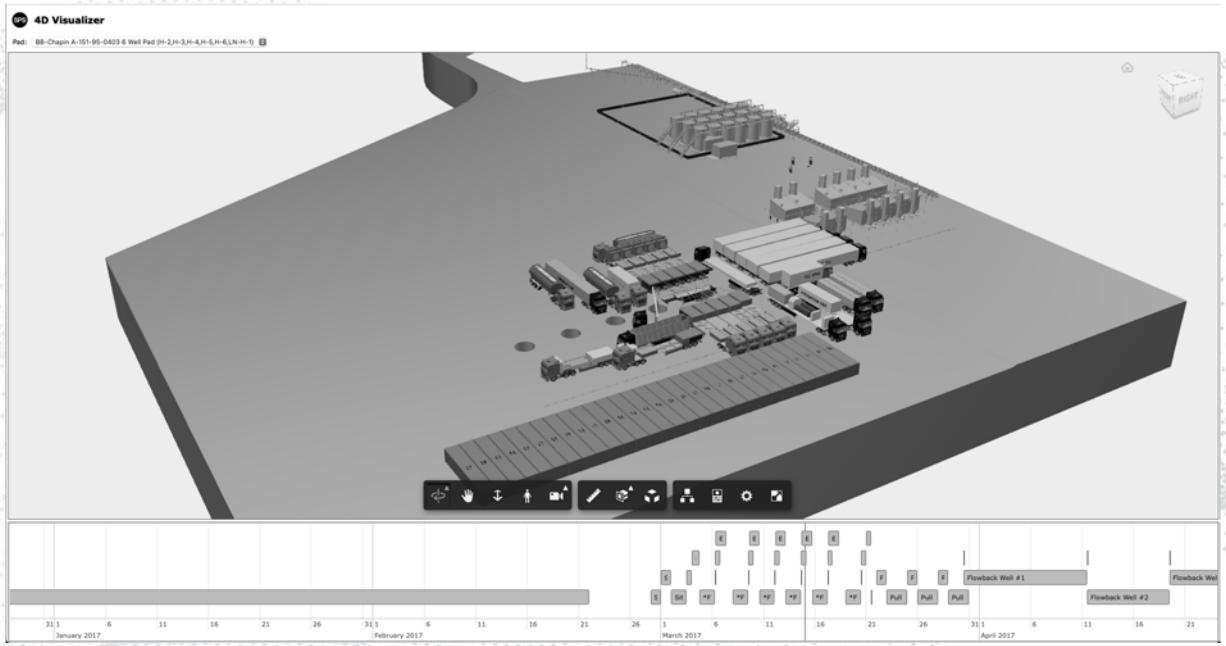

Digital Twin?

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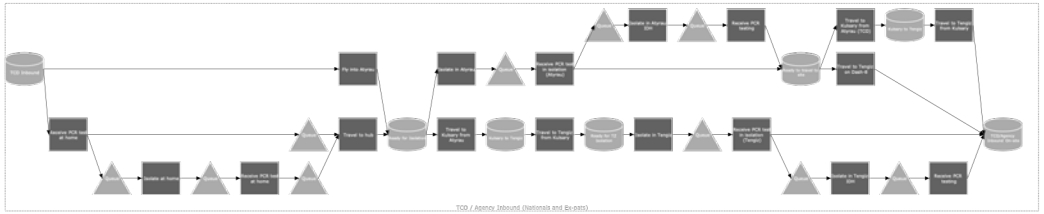
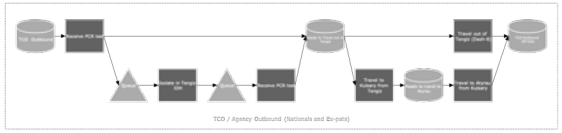
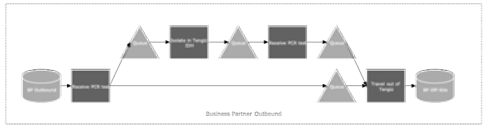
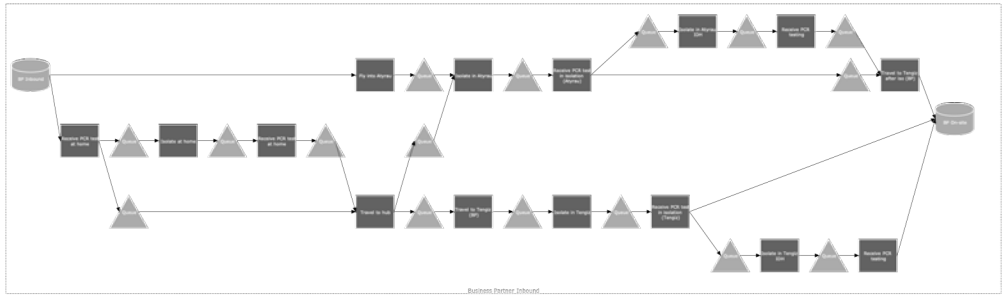
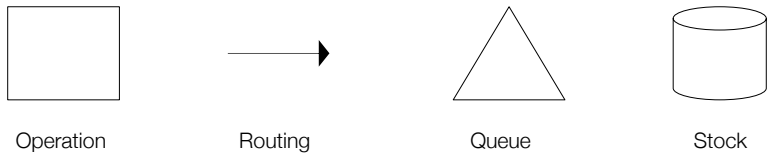
Digital Twin?











Digital Twin

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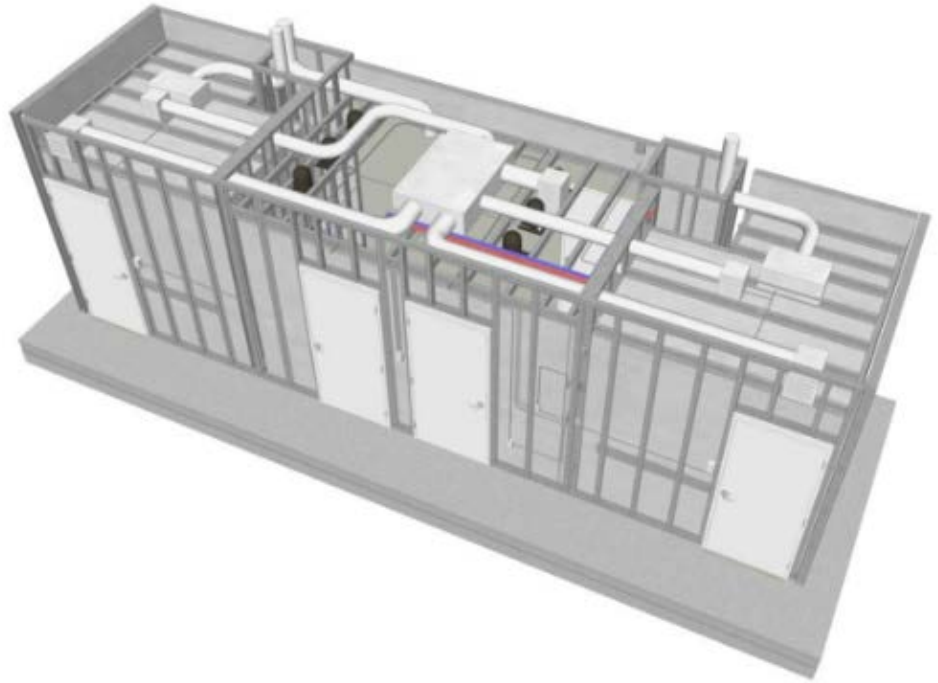
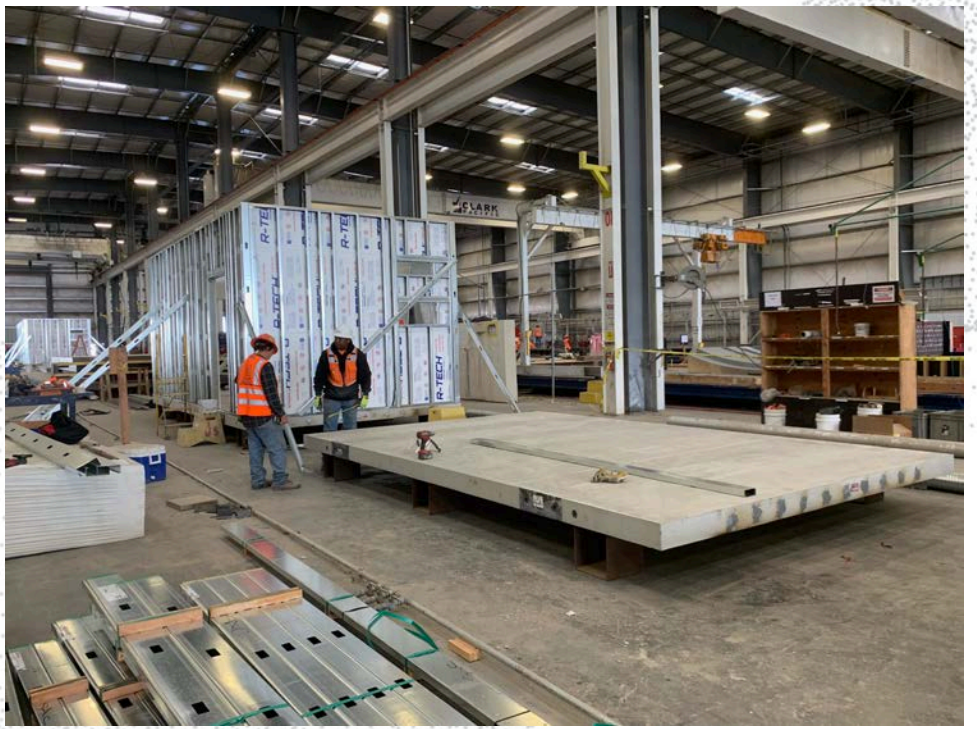
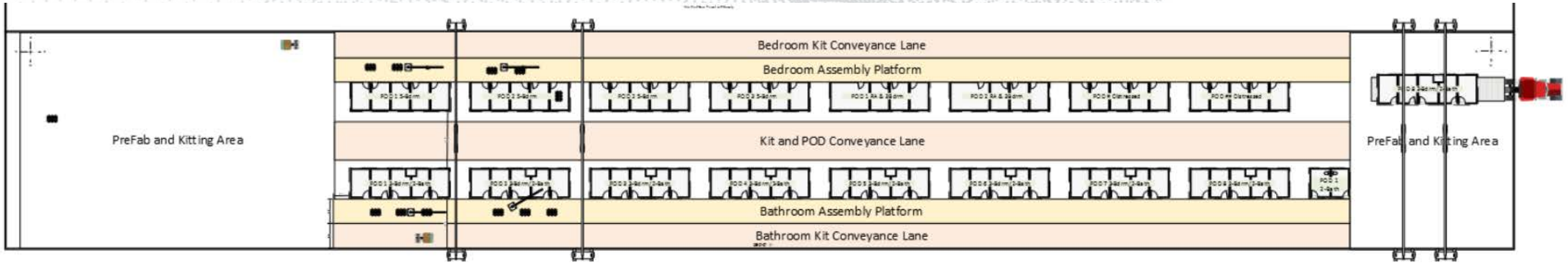
What does an optimal factory look like?







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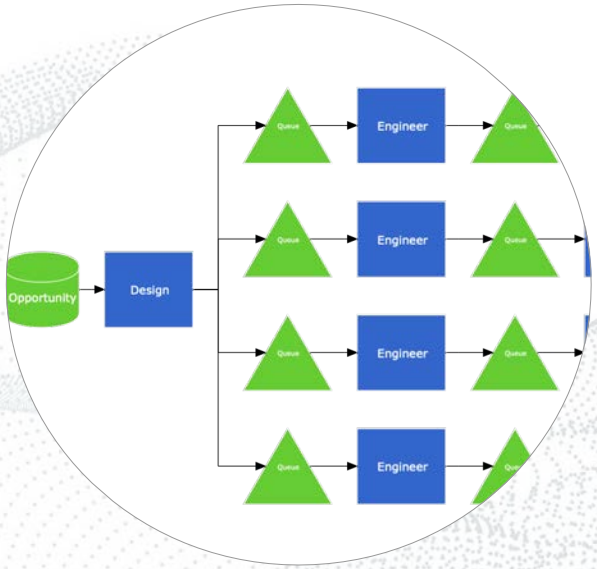

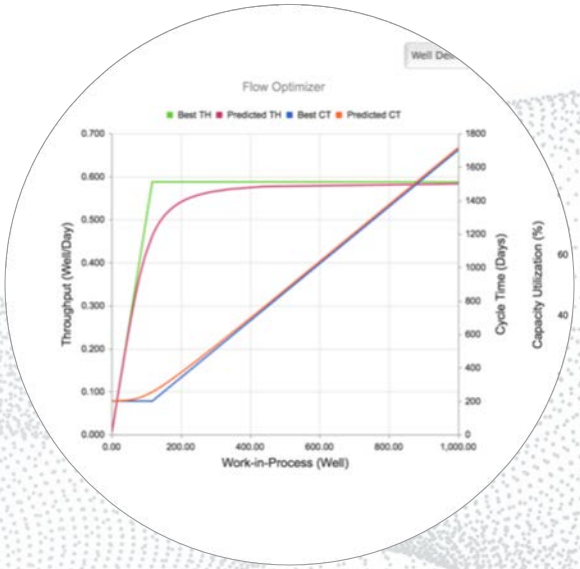

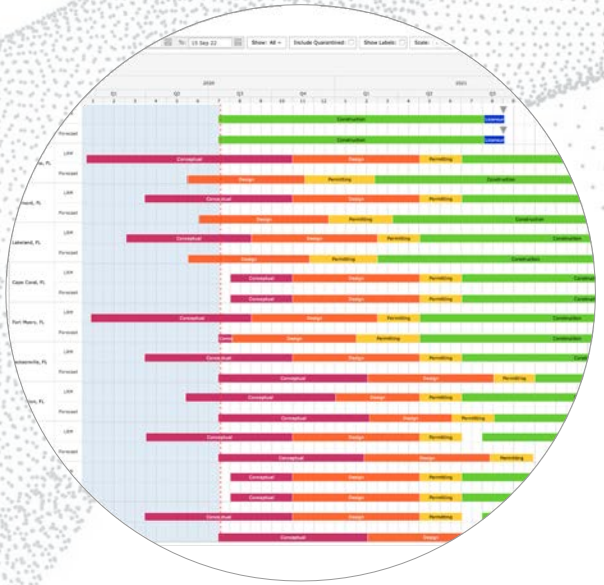

Map & Model

Simulate, Analyze & Optimize

Control & Improve

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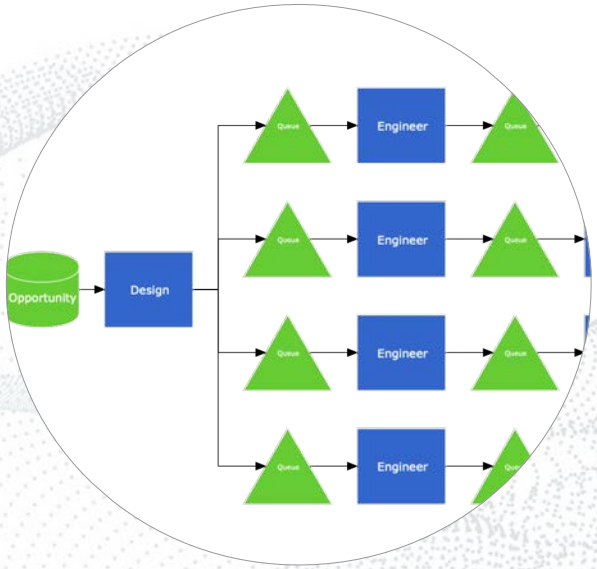

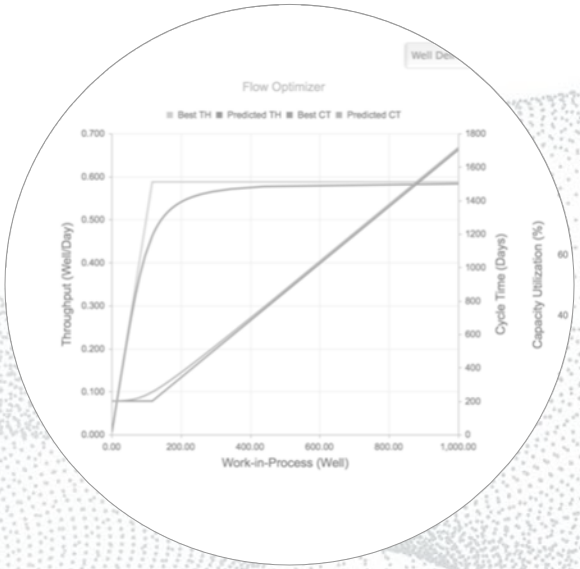

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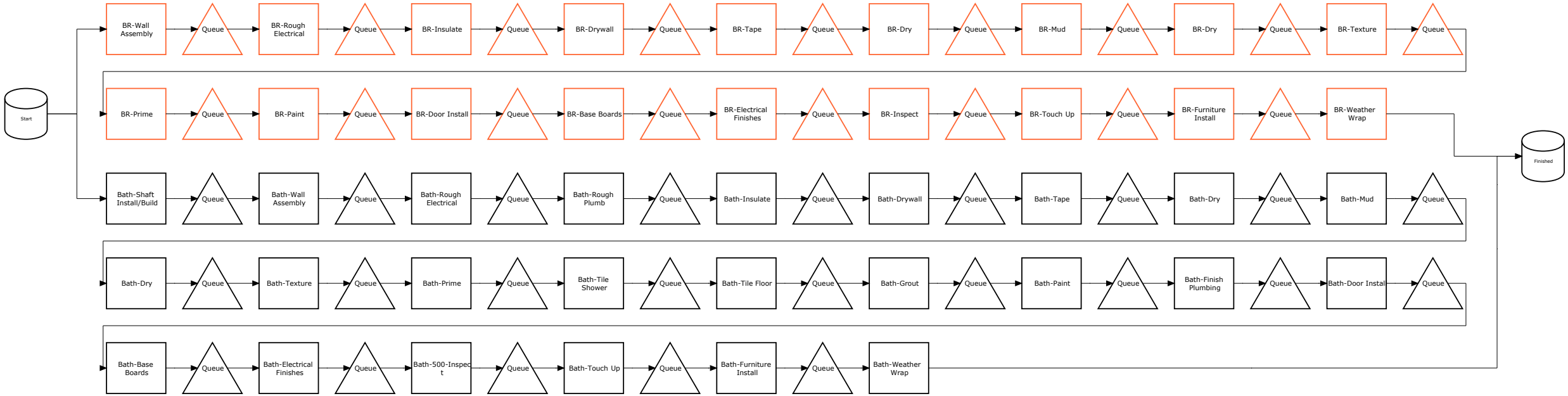
Production System Model (Digital Twin)



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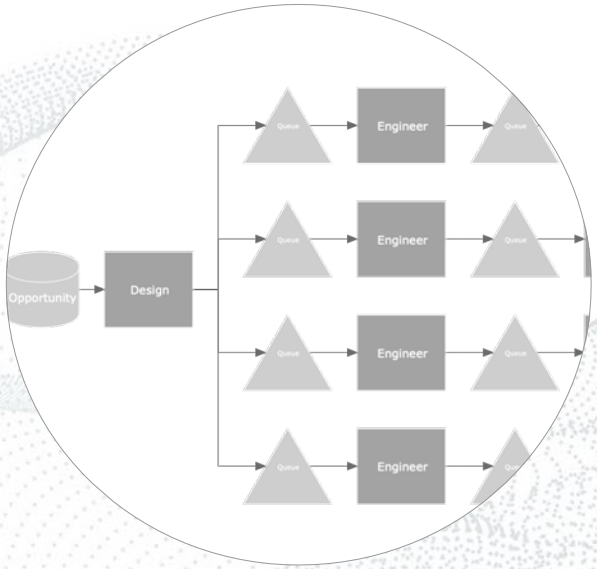

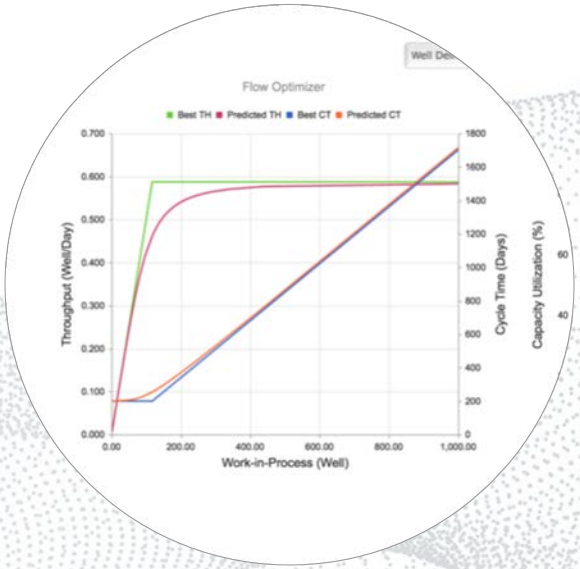

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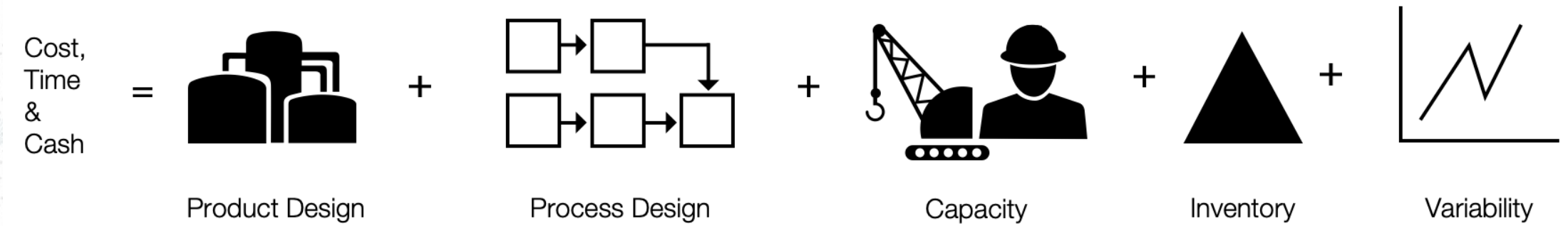
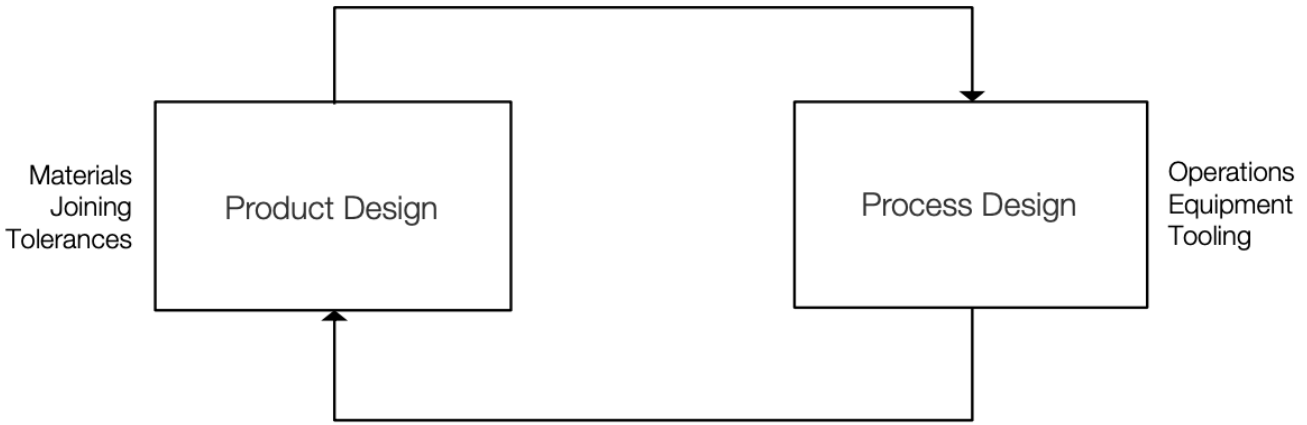
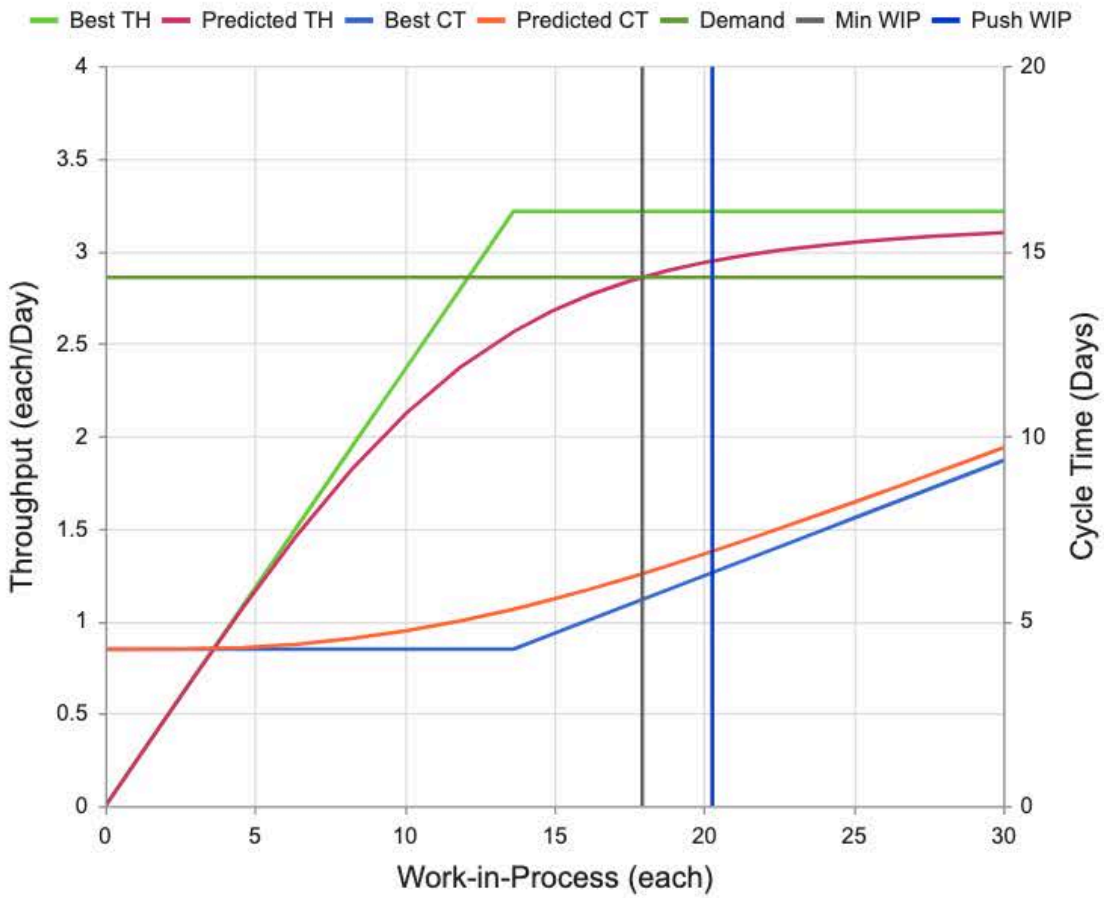
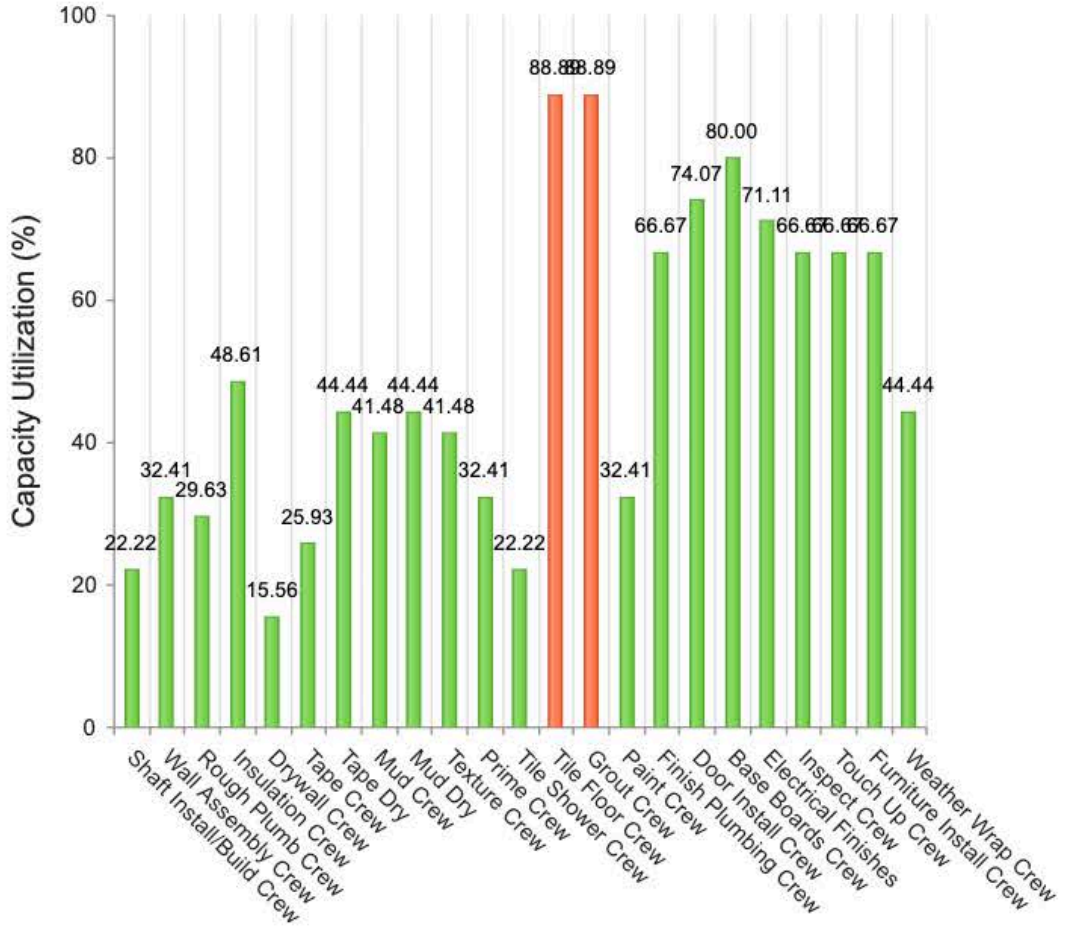




Flow Analysis



Capacity Utilization



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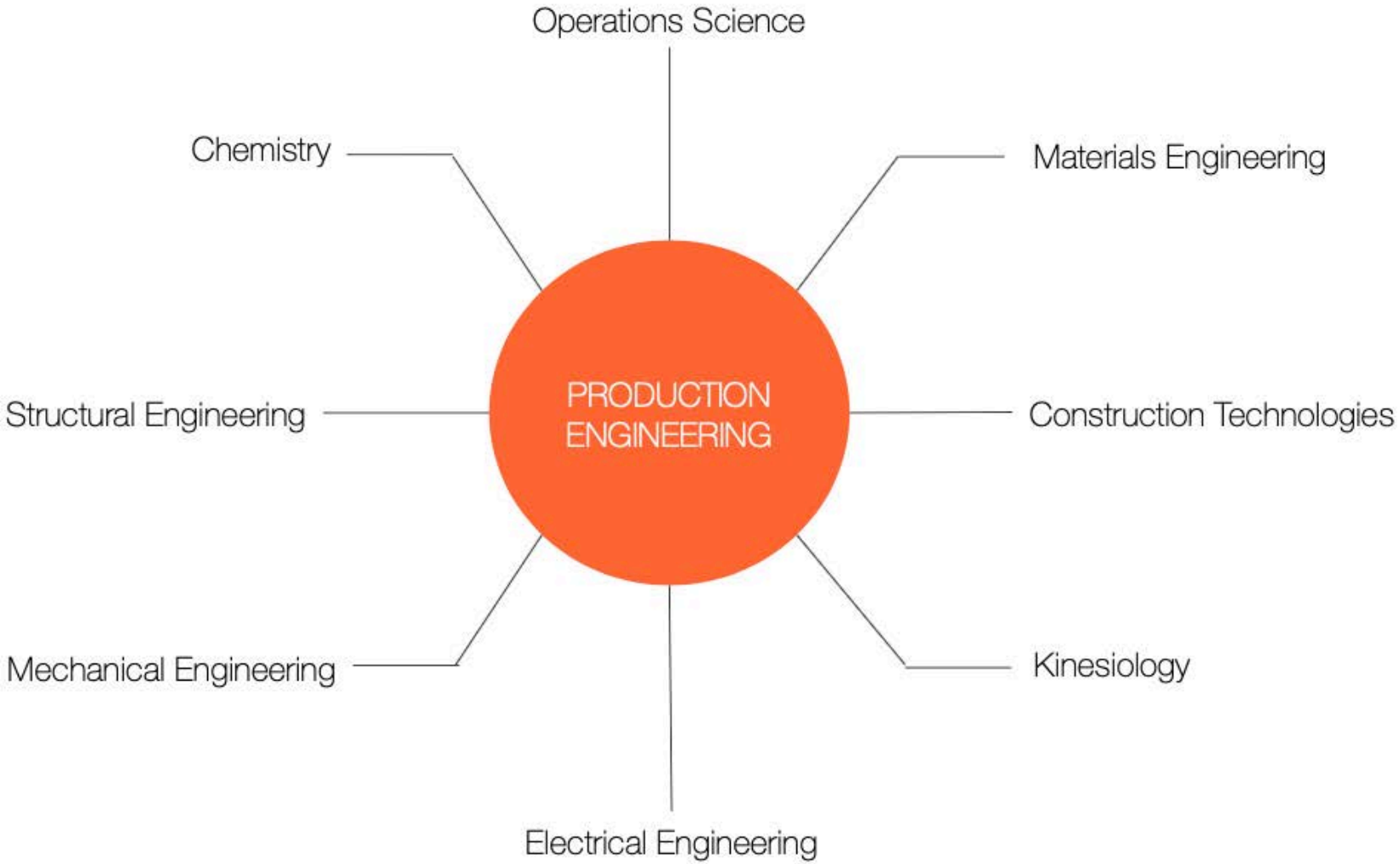
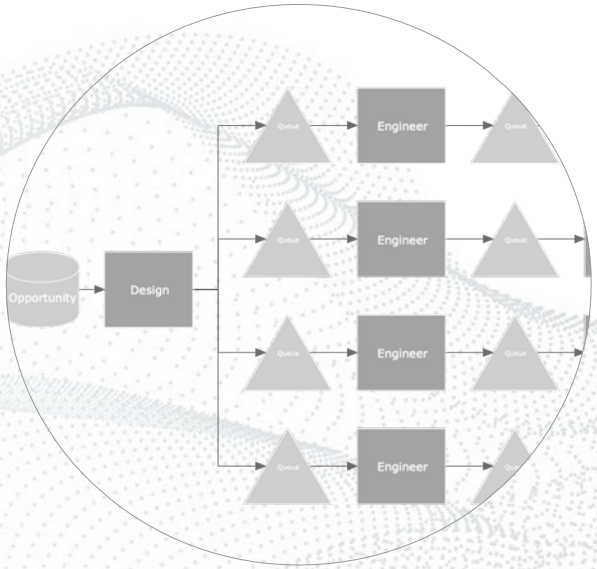
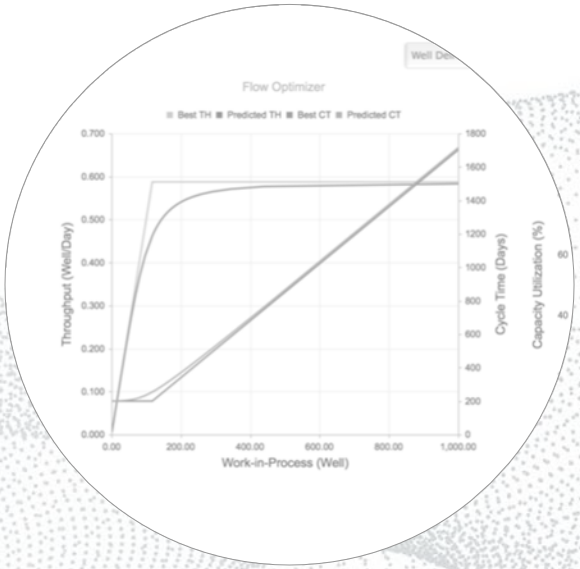
Can we meet the demand?

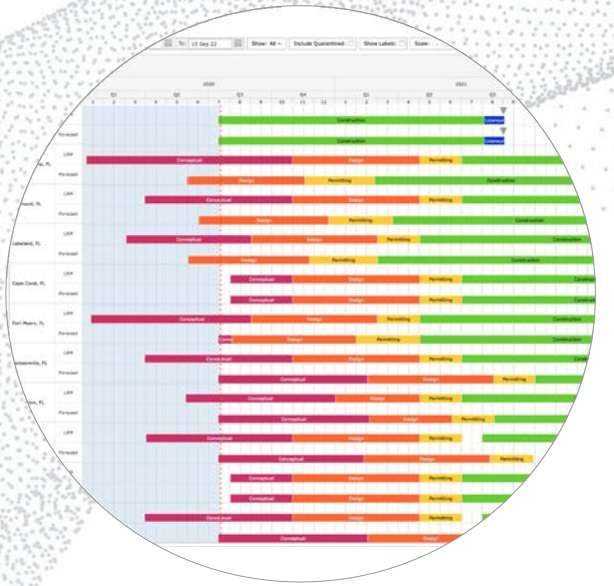
Is the cashflow (work-in-process & cycle time) acceptable?

Are the bottlenecks where we want them?









Map & Model

Simulate, Analyze & Optimize

Control & Improve

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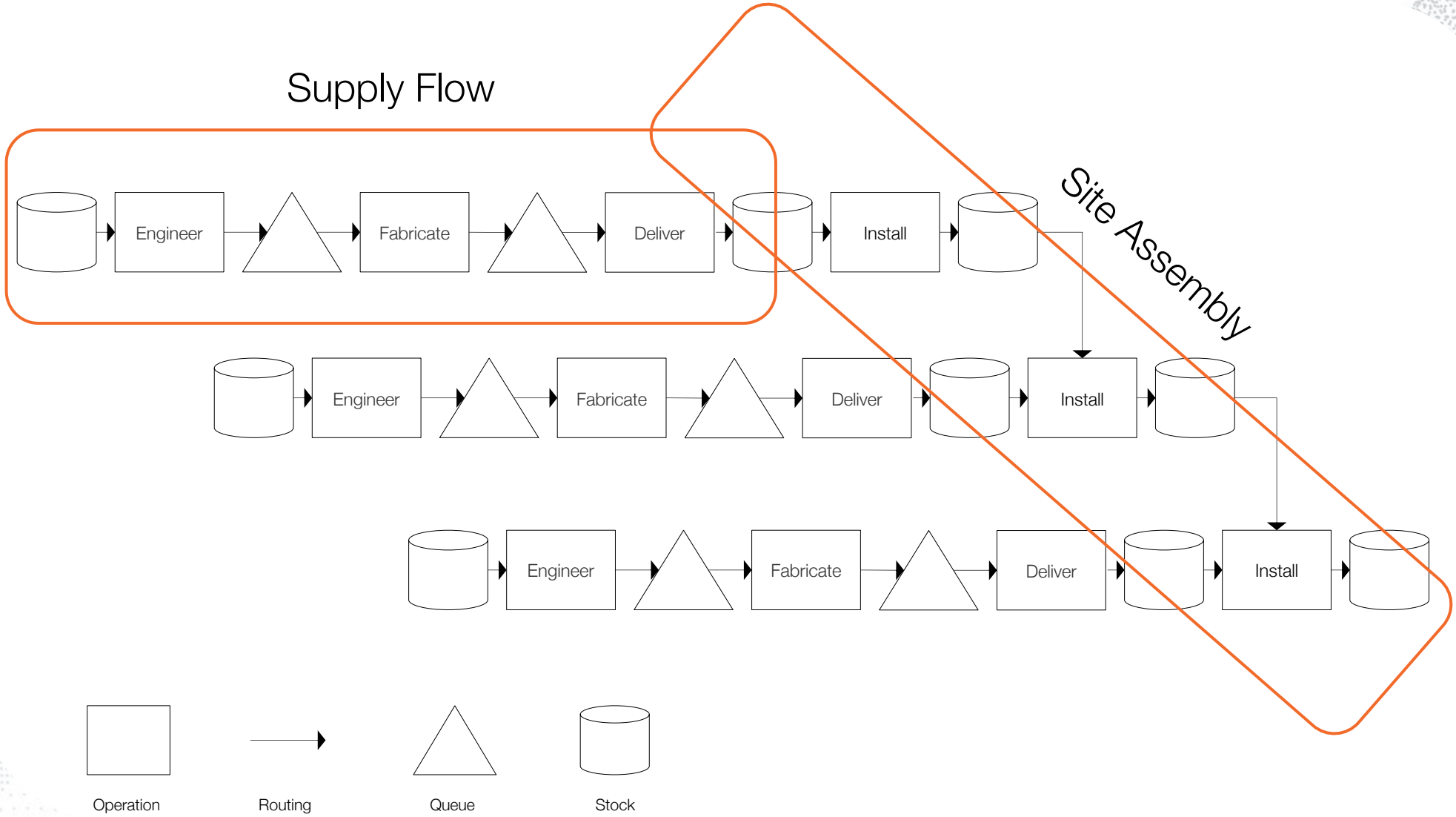
How to have pods we need at the right time and not have ones we don’t need?



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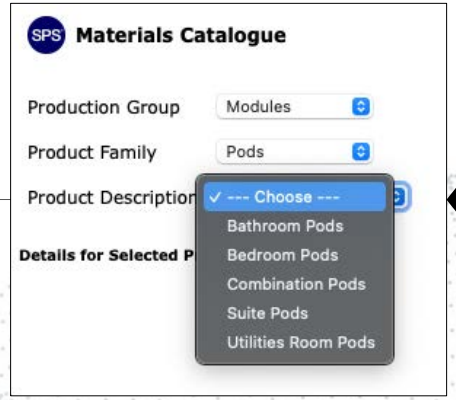
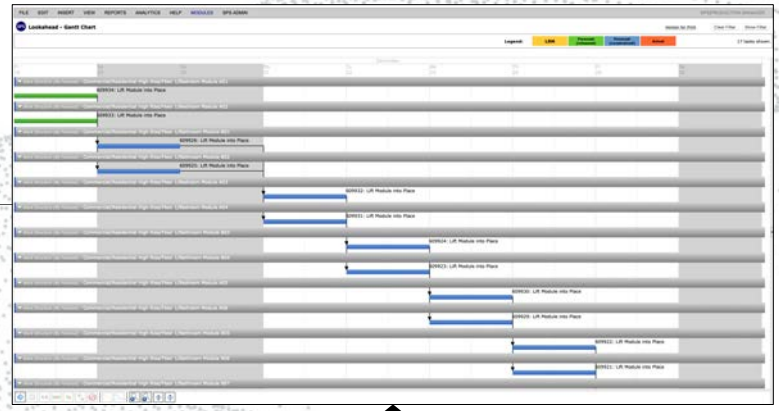
Prioritized Fabrication Demand

Installation Demand





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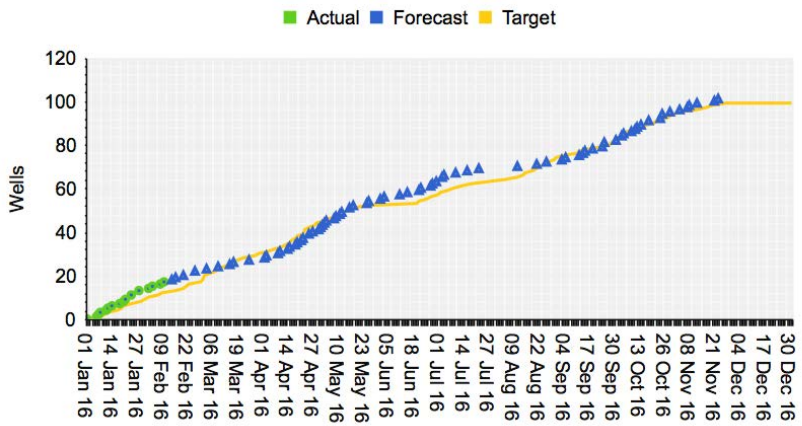
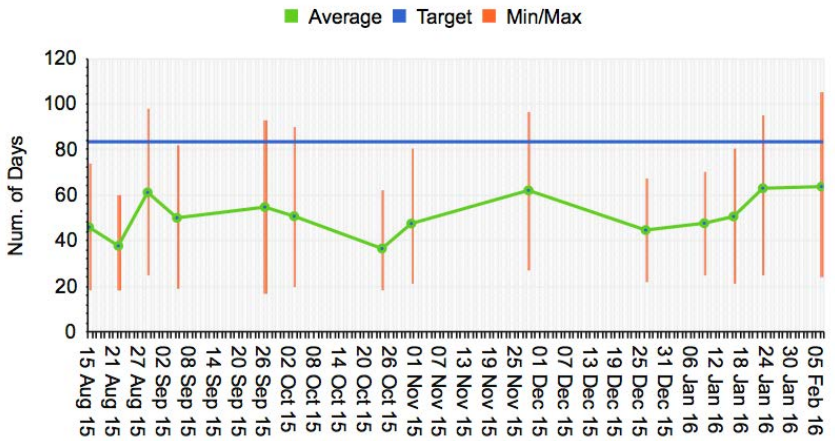
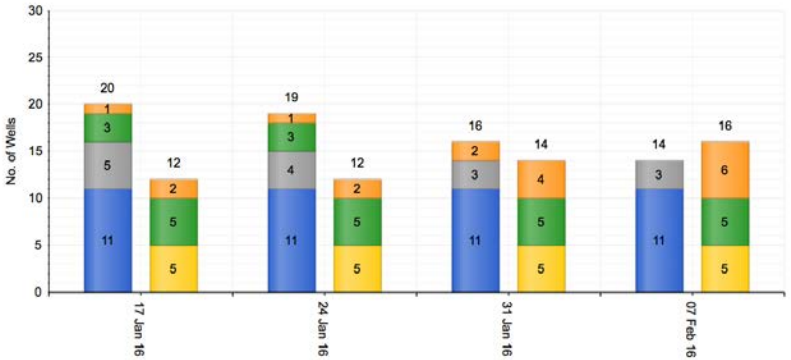


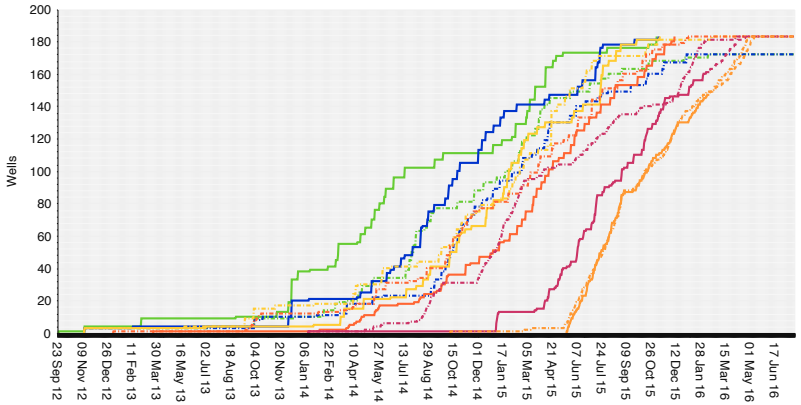
Throughput



Cycle Time



WIP



Lines of Balance

Production Control Analytics

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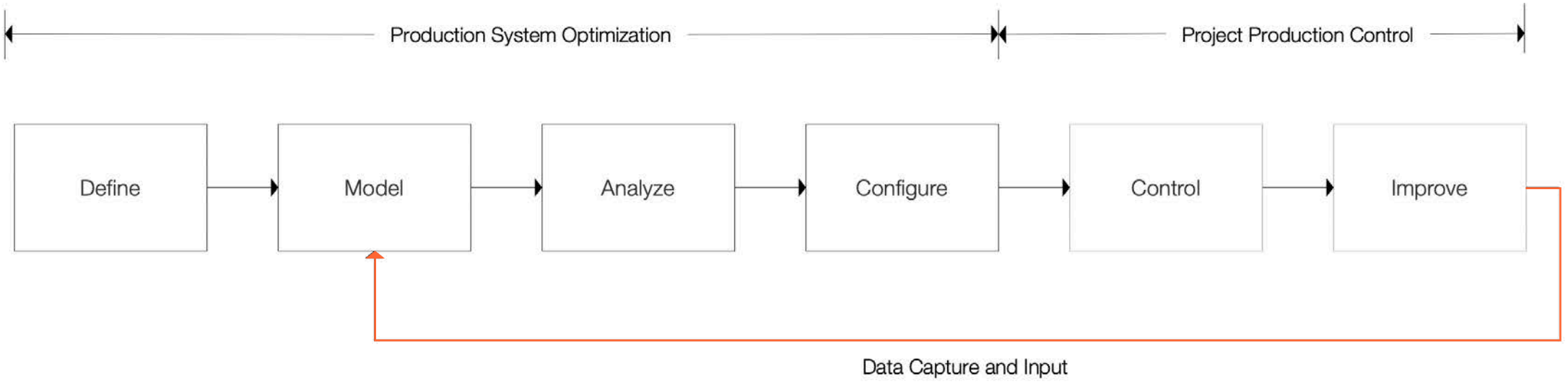

Trial & Error
or
Design & Control

Choice is Yours