

PRODUCTION SYSTEM DESIGN & CONTROL

James Choo, Project Production Institute

Will Swearingen, Clark Pacific

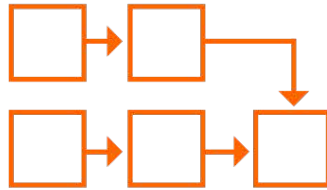


Cost,
Time
&
Cash

=



+



+



+



+



Product Design

Process Design

Capacity

Inventory

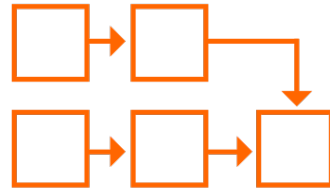
Variability

Cost,
Time
&
Cash

=



+



+



+



+



Product Design

Process Design

Capacity

Inventory

Variability

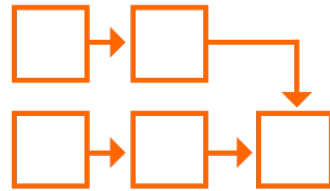
Common Focus
Toward
Industrialization

Cost,
Time
&
Cash

=



+



+



+



+



Product Design

Process Design

Capacity

Inventory

Variability

Common Focus
Toward
Industrialization

Gap

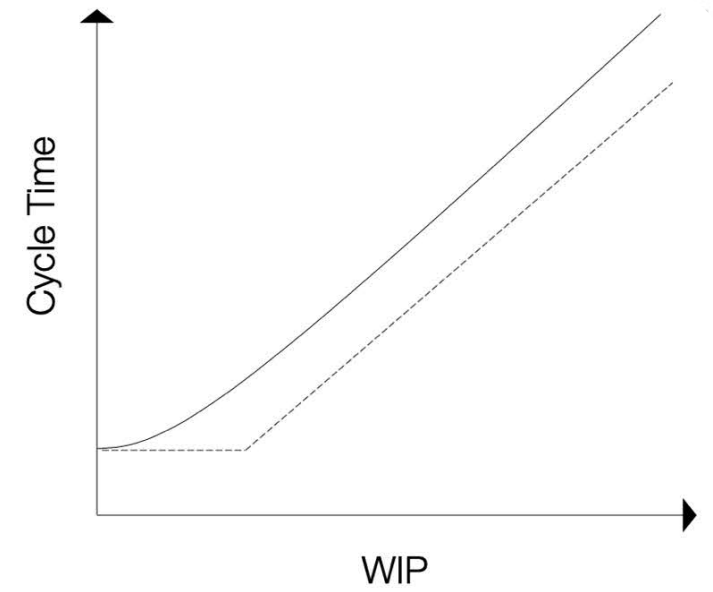
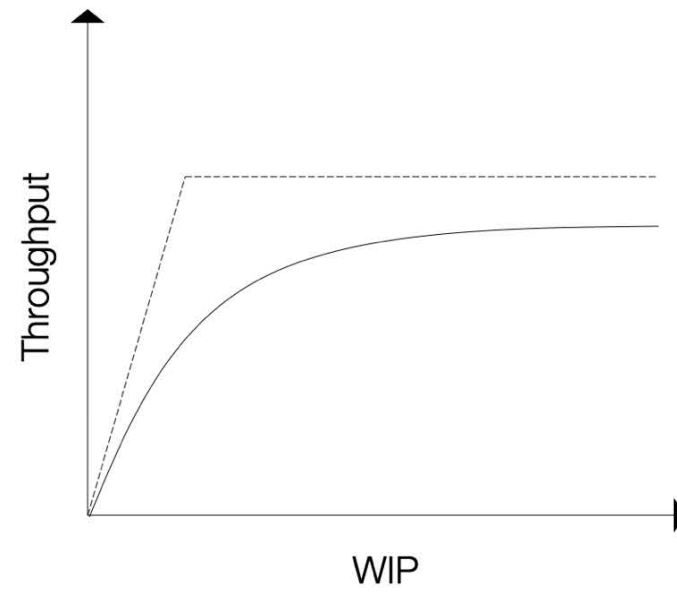
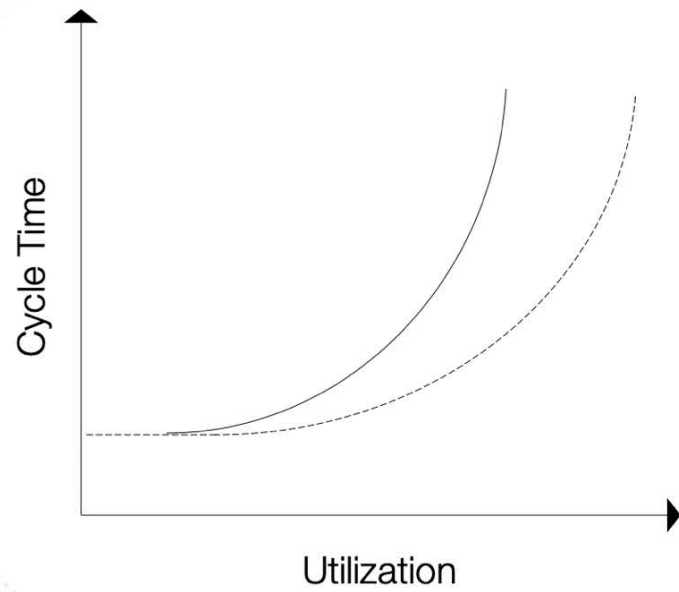
What does a Digital Twin of Production Systems look like?

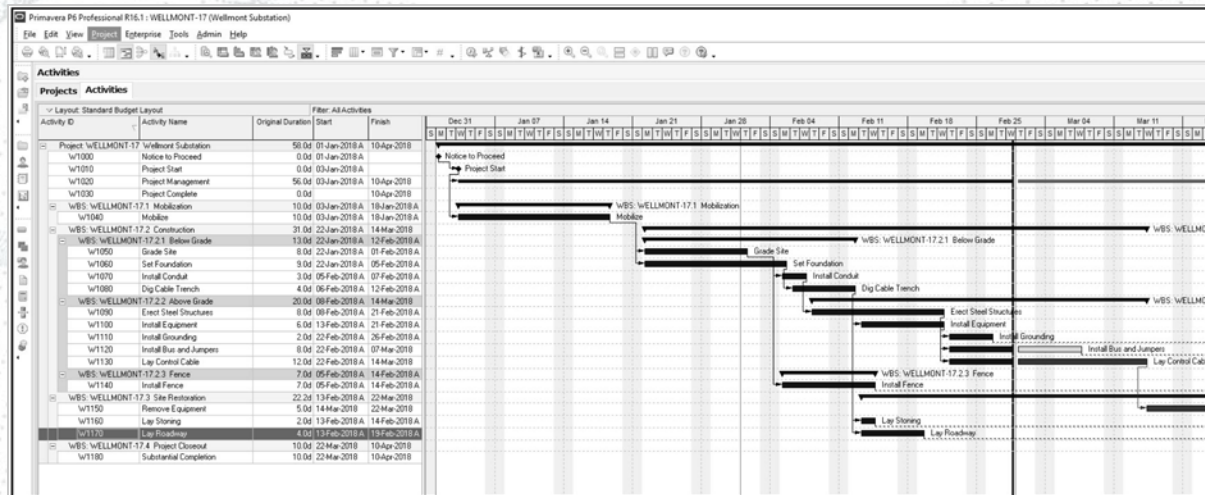
4 Verbs

5 Levers

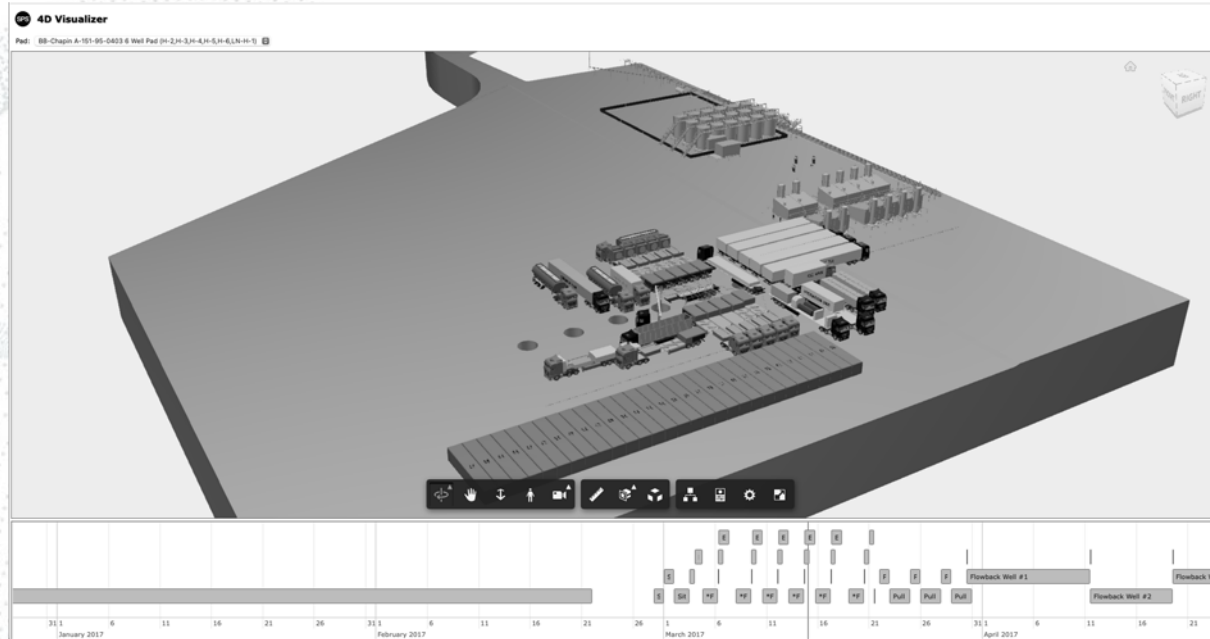
3 Curves







Digital Twin?



Digital Twin?



Digital Twin?



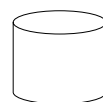
Operation



Routing



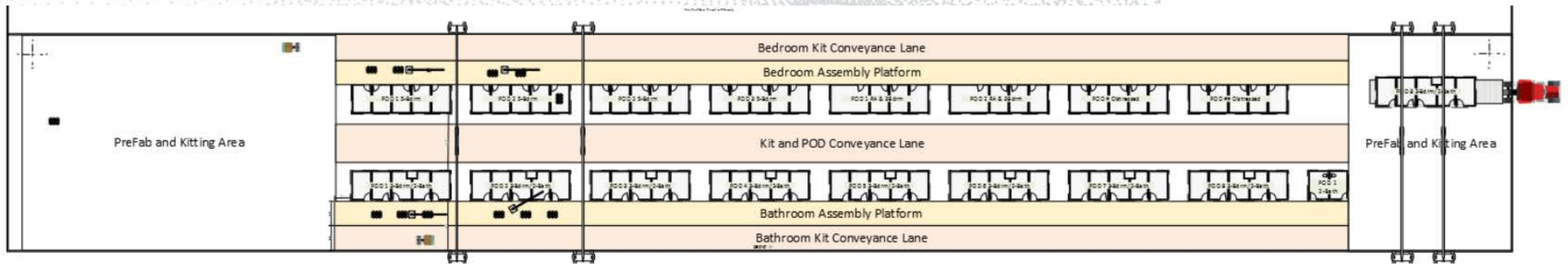
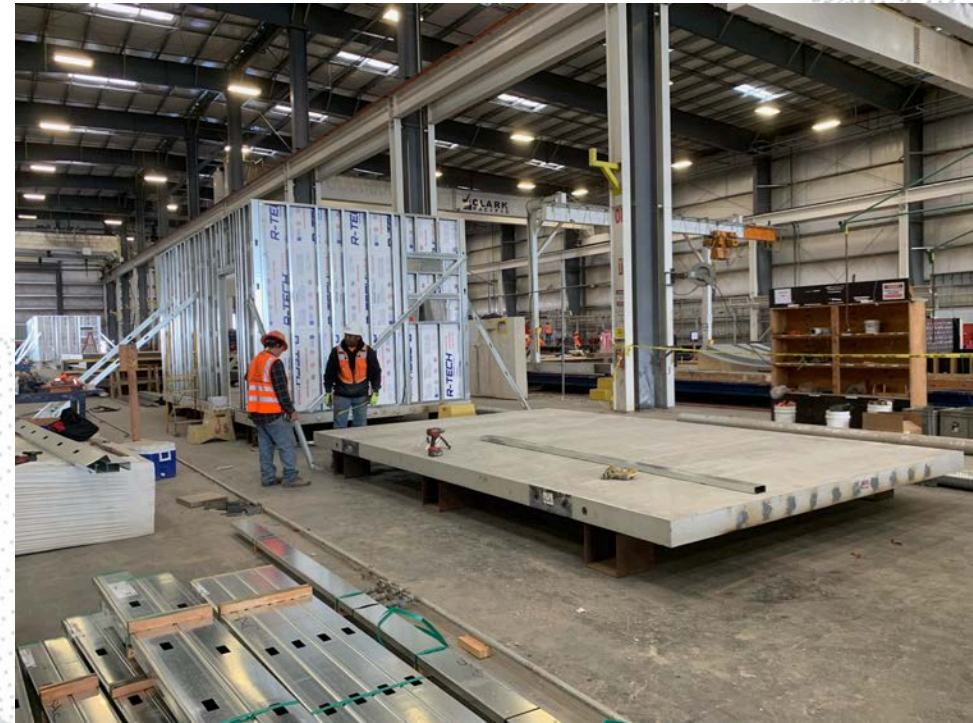
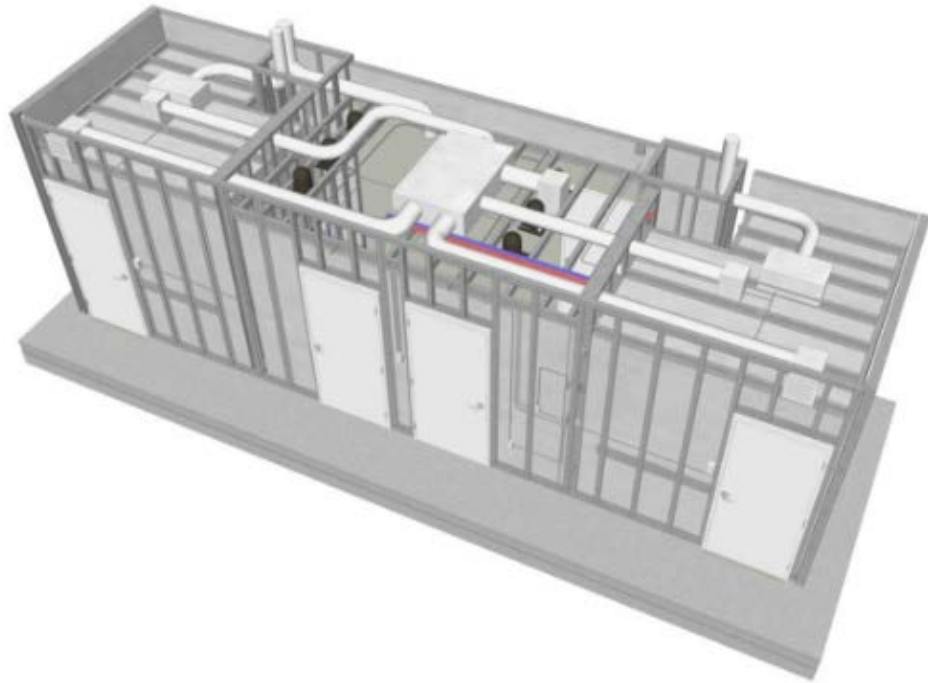
Queue

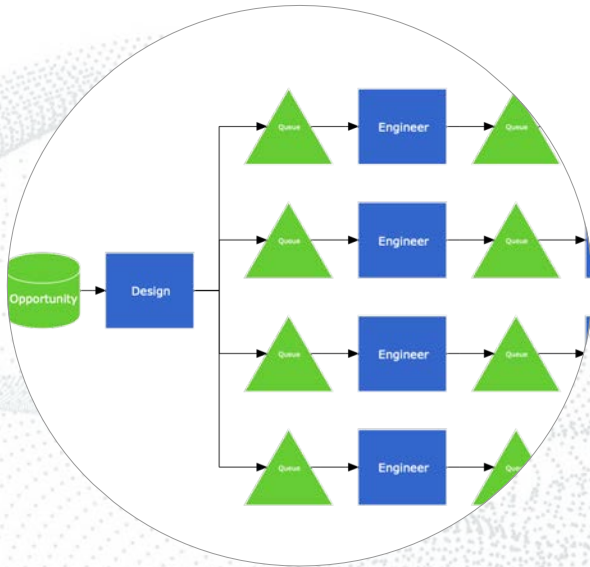


Stock

Digital Twin

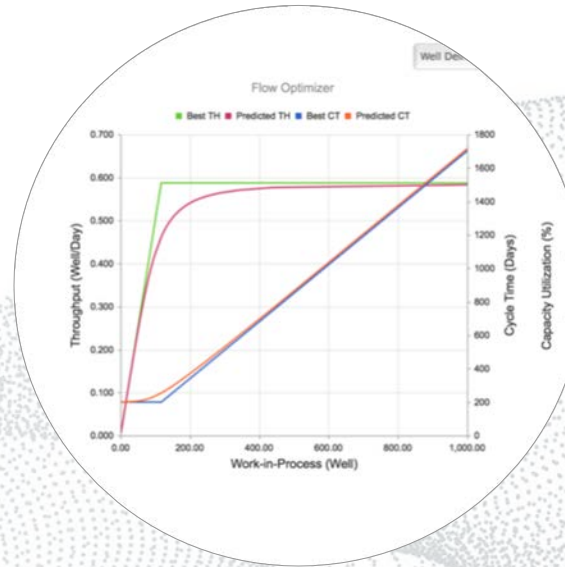
What does an optimal factory look like?



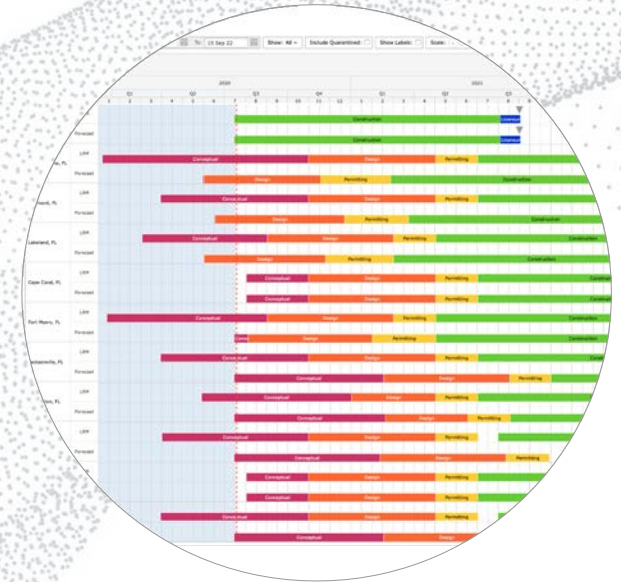


Map & Model

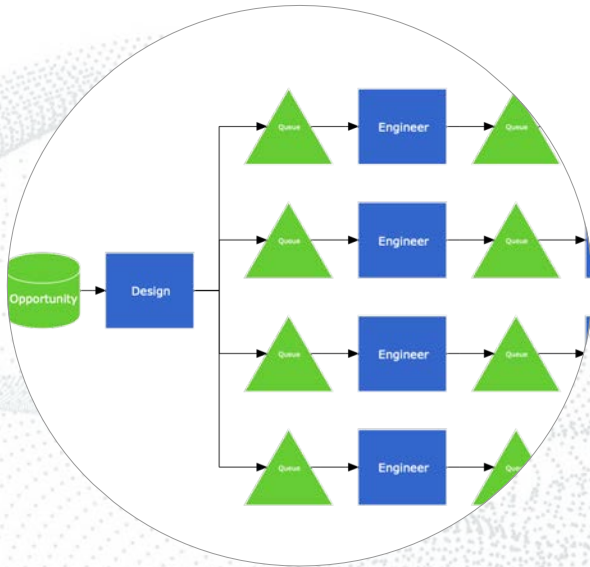
Copyright Strategic Project Solutions, Inc.



Simulate, Analyze & Optimize

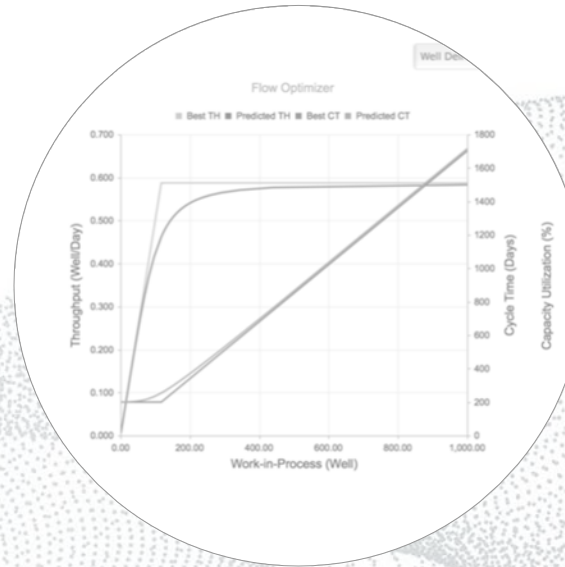


Control & Improve

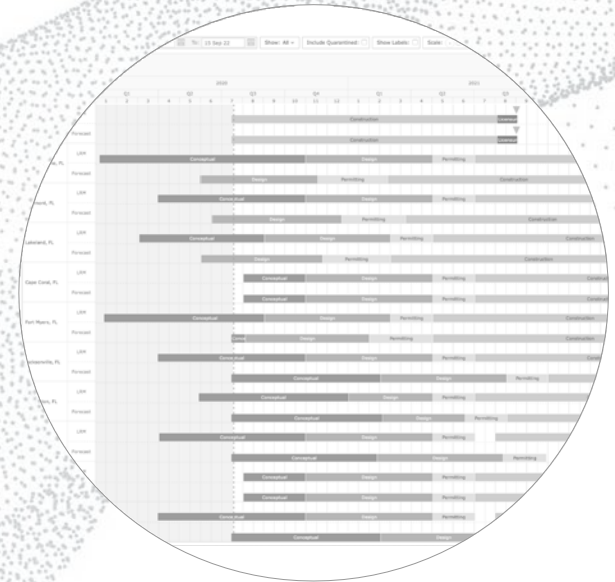


Map & Model

Copyright Strategic Project Solutions, Inc.

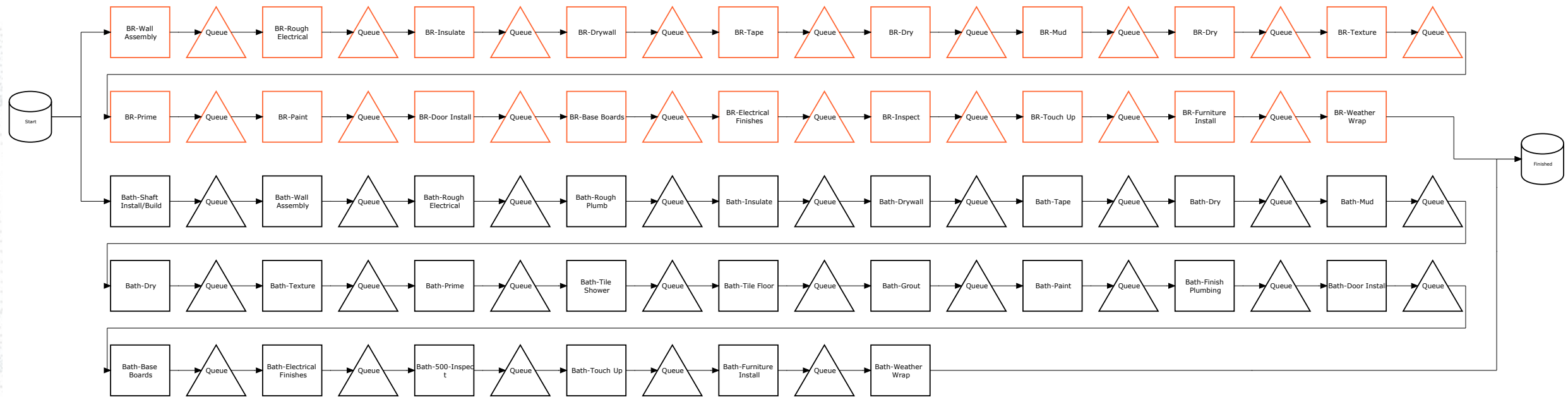


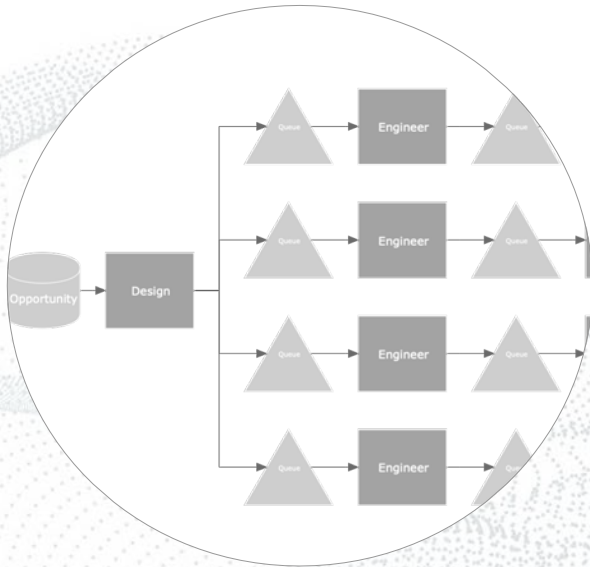
Simulate, Analyze & Optimize



Control & Improve

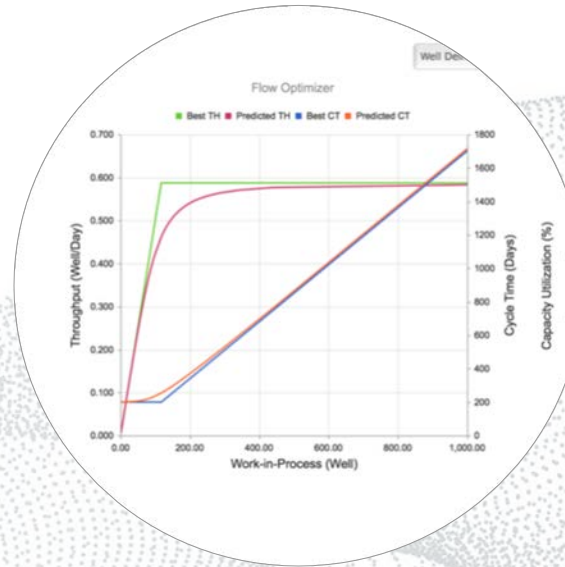
Production System Model (Digital Twin)





Map & Model

Copyright Strategic Project Solutions, Inc.



Simulate, Analyze & Optimize



Control & Improve

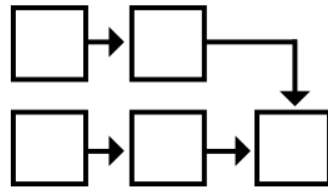
Cost,
Time
&
Cash

=



Product Design

+



Process Design

+



Capacity

+

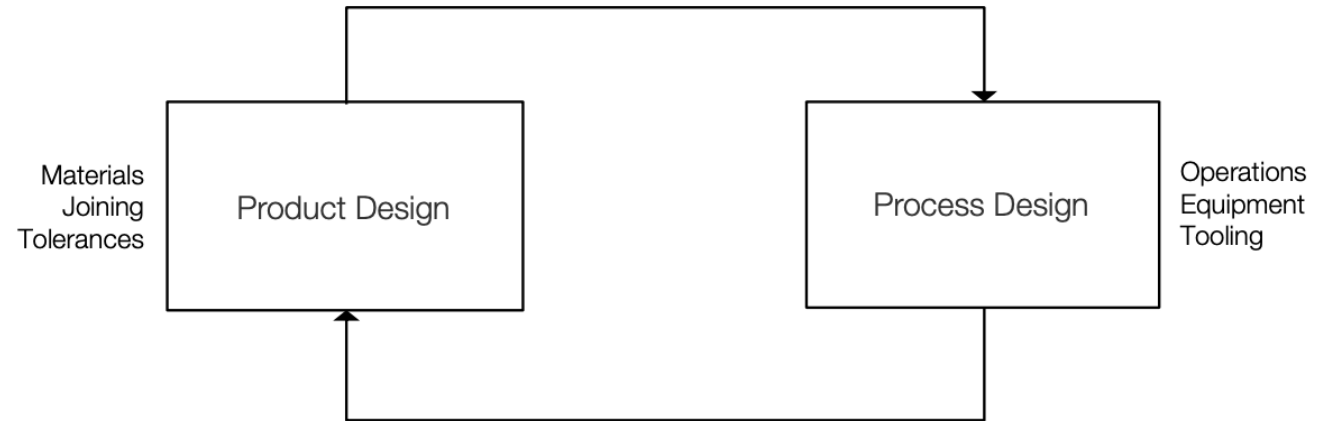


Inventory

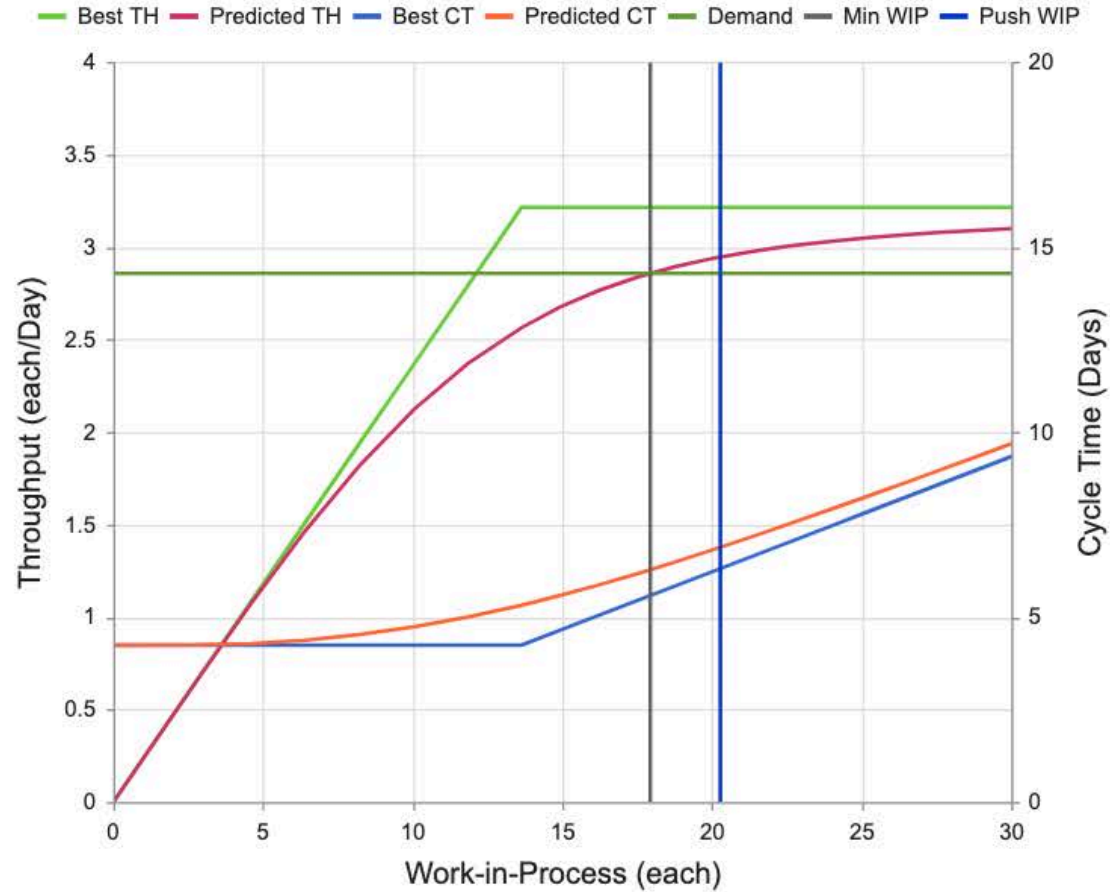
+



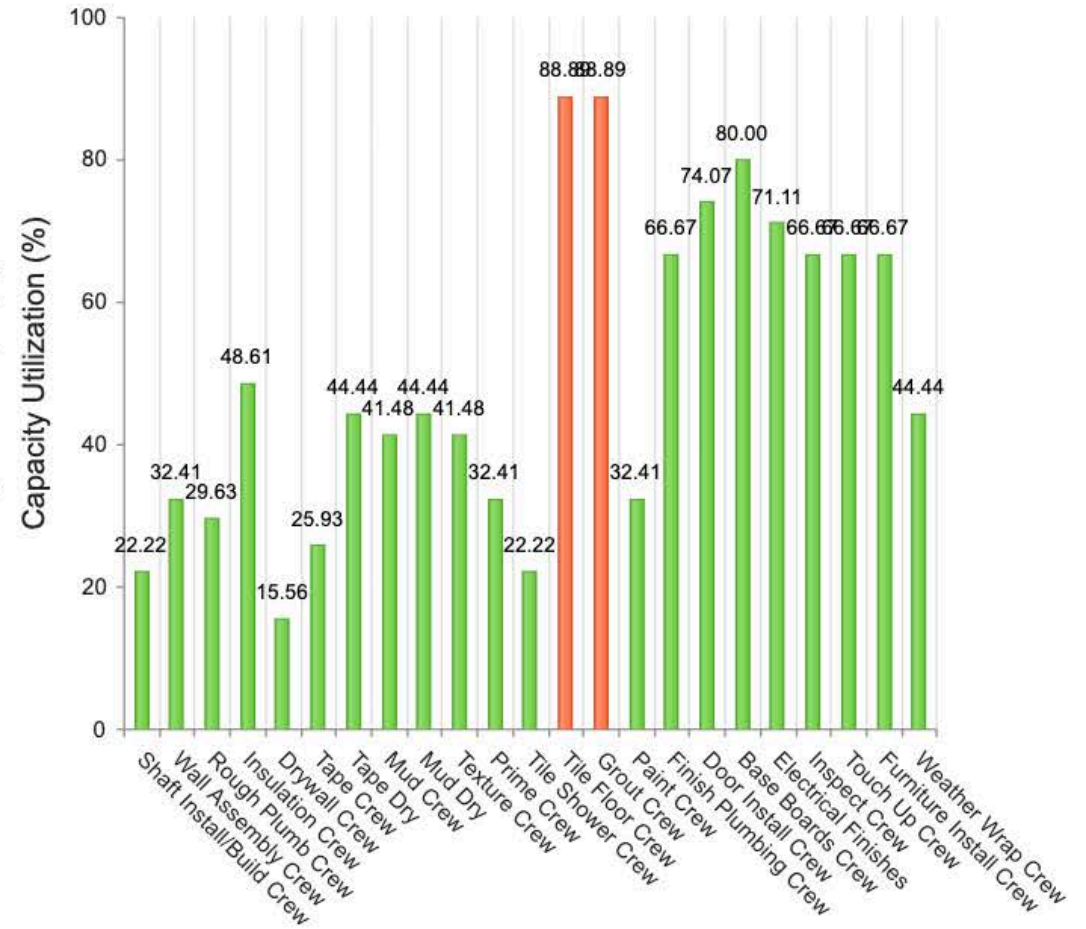
Variability



Flow Analysis



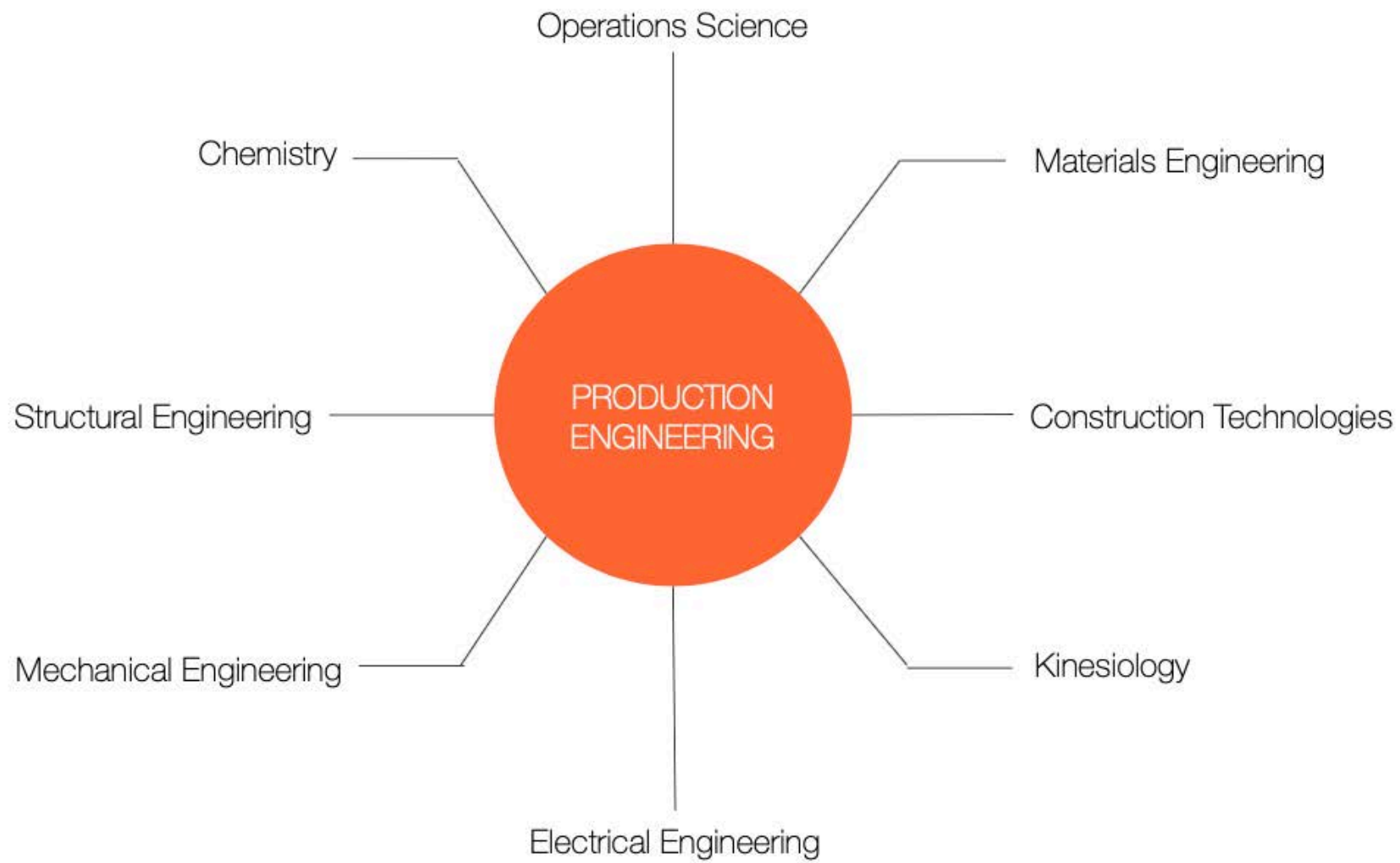
Capacity Utilization



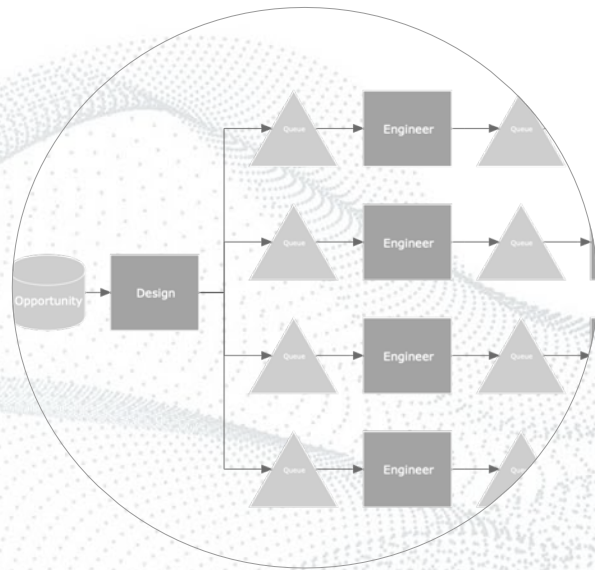
Can we meet the demand?

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

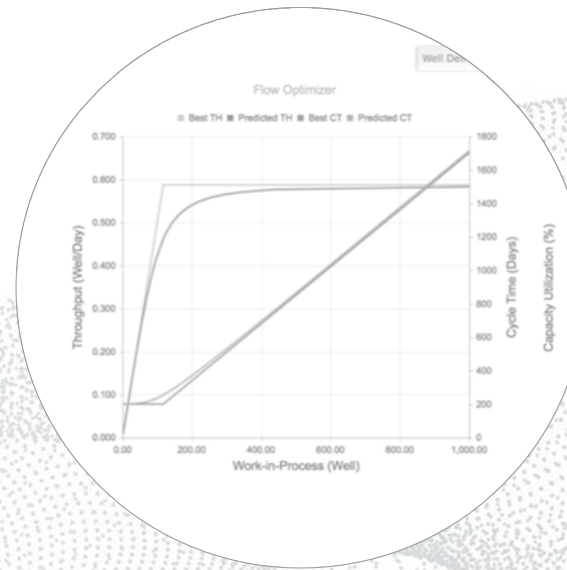
Are the bottlenecks where we want them?



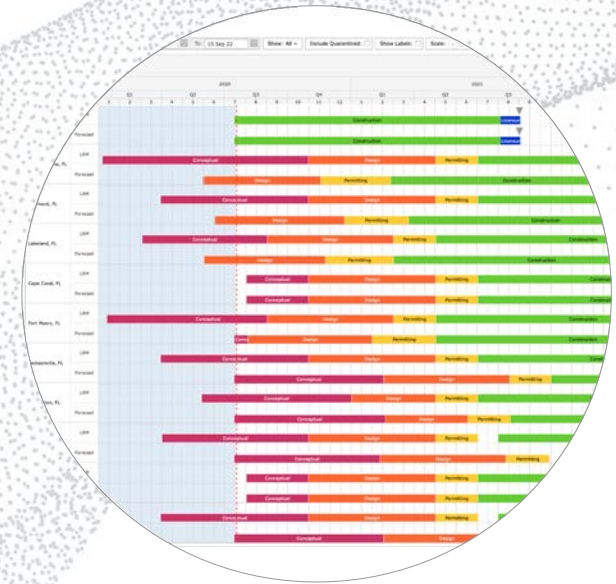




Map & Model



Simulate, Analyze & Optimize

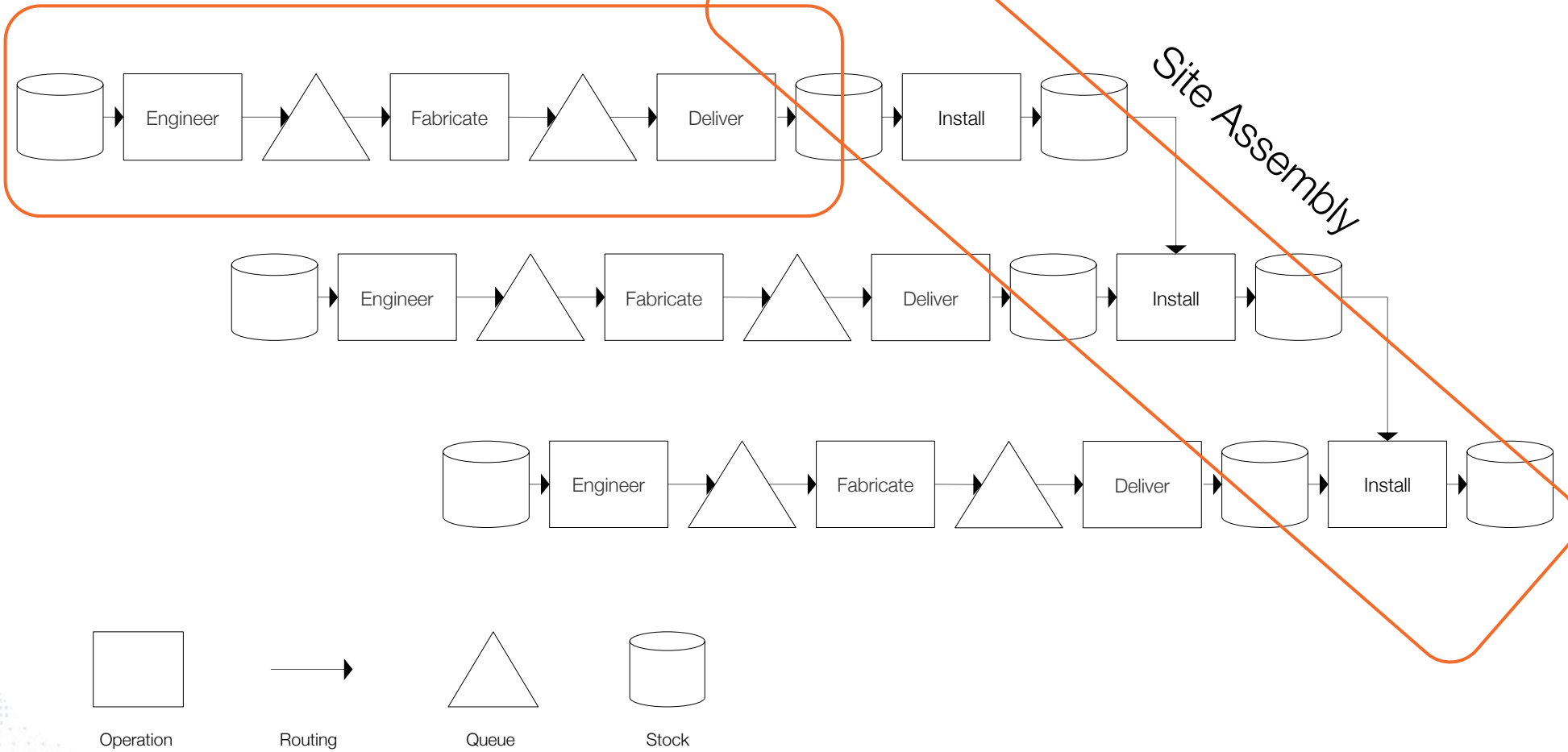


Control & Improve

Copyright Strategic Project Solutions, Inc.

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

Supply Flow

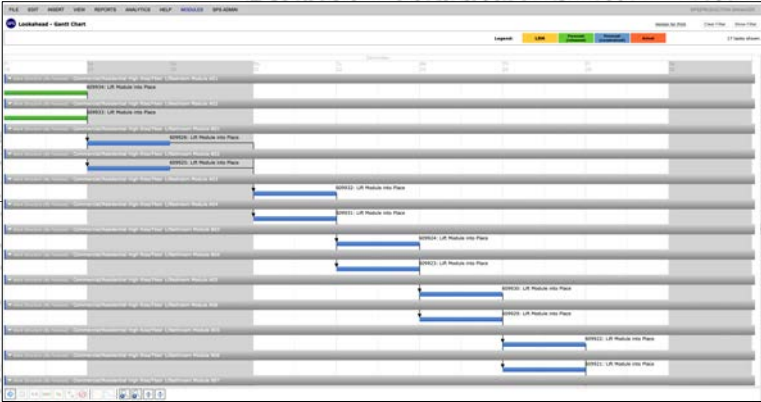


Prioritized Fabrication Demand

Materials and Logistics Manager

Item	Location	Quantity	Unit	Material Code	Order Release Date	Order Received Date	Order Confirmed Date	Order Shipped Date	Order Delivered Date	Order Confirmed Date	Order Shipped Date	Order Delivered Date
1	10	10	10	10	10	10	10	10	10	10	10	10
2	10	10	10	10	10	10	10	10	10	10	10	10
3	10	10	10	10	10	10	10	10	10	10	10	10
4	10	10	10	10	10	10	10	10	10	10	10	10
5	10	10	10	10	10	10	10	10	10	10	10	10
6	10	10	10	10	10	10	10	10	10	10	10	10
7	10	10	10	10	10	10	10	10	10	10	10	10
8	10	10	10	10	10	10	10	10	10	10	10	10
9	10	10	10	10	10	10	10	10	10	10	10	10
10	10	10	10	10	10	10	10	10	10	10	10	10

Installation Demand



SPS Materials Catalogue

Production Group: Modules

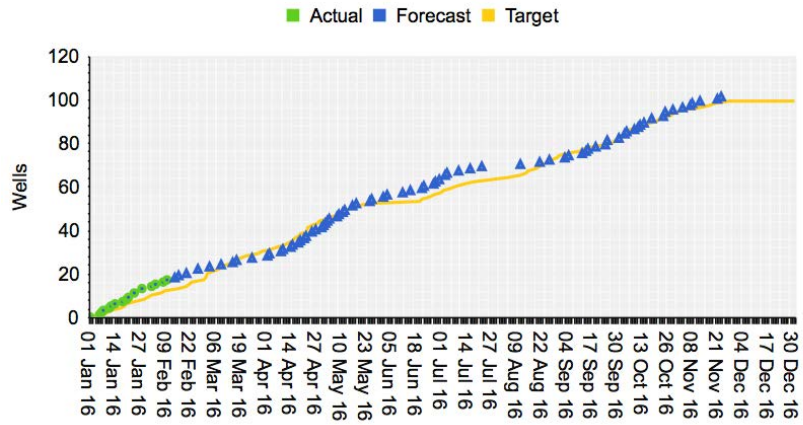
Product Family: Pods

Product Description: --- Choose ---

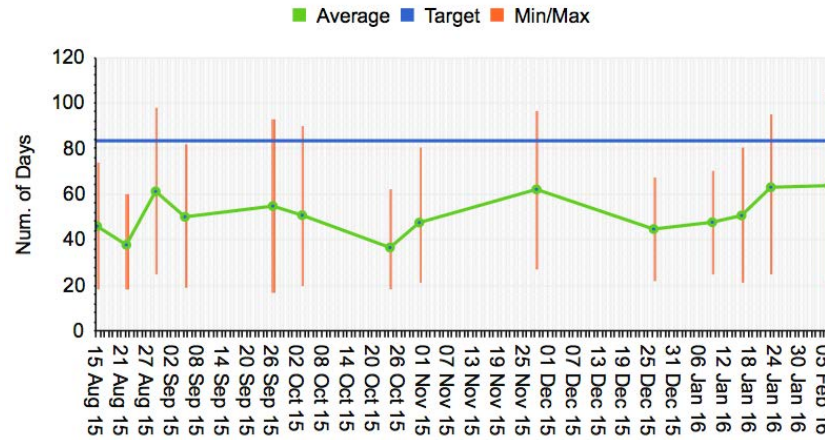
- Bathroom Pods
- Bedroom Pods
- Combination Pods
- Suite Pods
- Utilities Room Pods

Details for Selected P

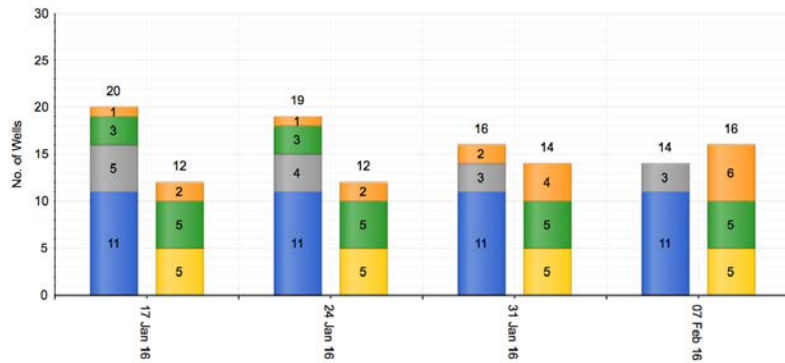




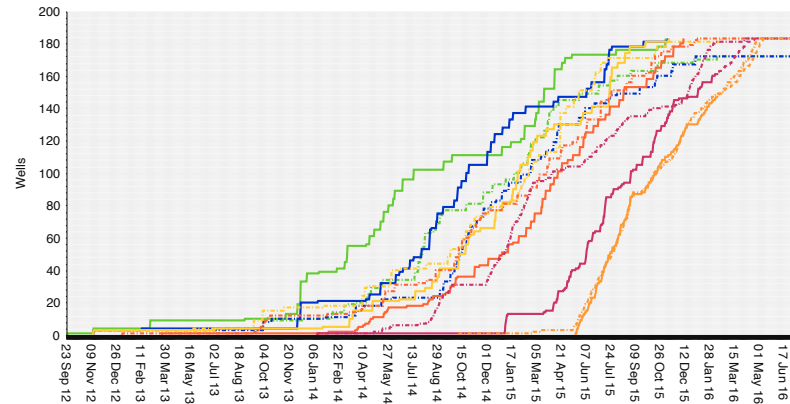
Throughput



Cycle Time

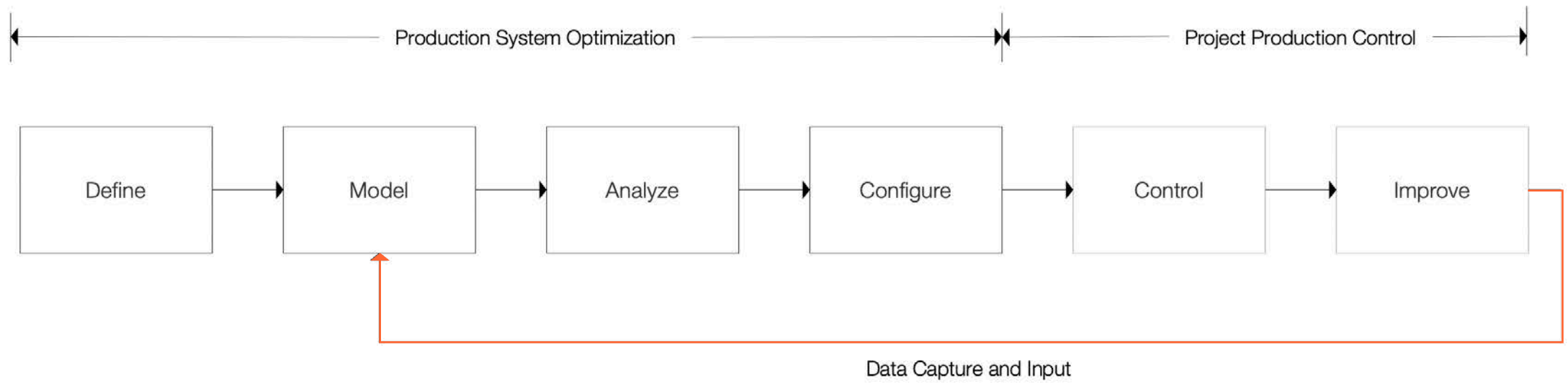


WIP



Lines of Balance

Production Control Analytics



Trial & Error or Design & Control

Choice is Yours

