Next Generation Project Management

Solving The Gap Between What *Should* Happen On Paper

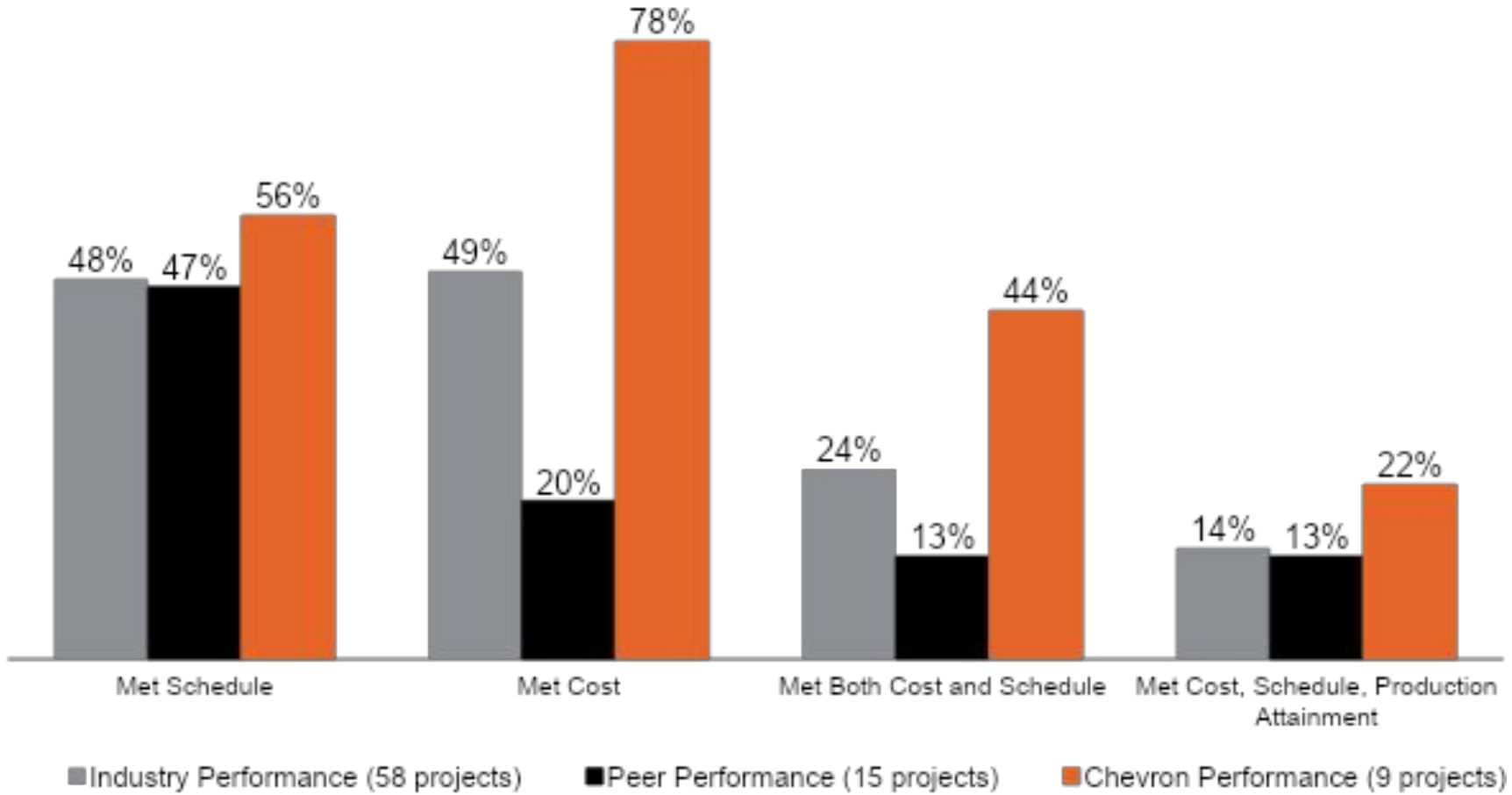
And What *Does* Happen In The Field

04 May 2023

TEXAS A&M UNIVERSITY

PROJECT PRODUCTION INSTITUTE

Current project management systems are best practice based, intended to drive predictable outcomes



Data from IPA 2018 UIBC: MCPs AR 2010+ with cost, schedule, and production attainment data

Something has to change

Underlying Basis of Current Project Practices

1

ERA 1 – Taylorism

Getting more out of workers

ERA 2 – Predictability

Critical Path Method (CPM) scheduling and project controls

Front End Loading

3D CADD

Advanced Work Packaging

0

0 1

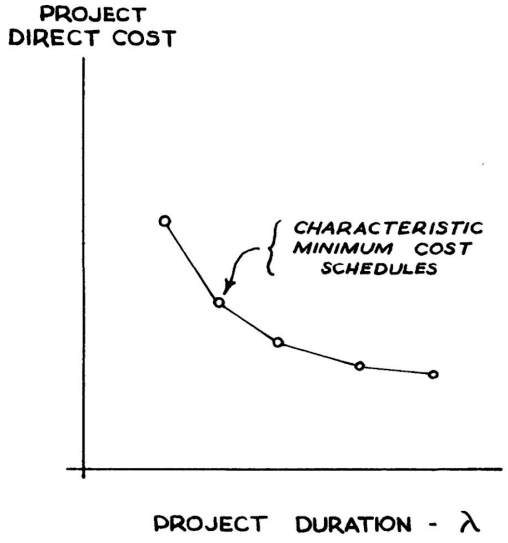
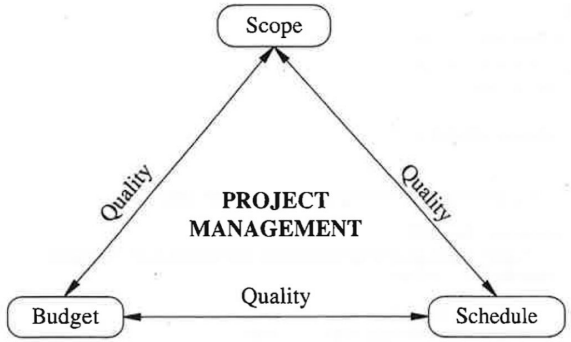
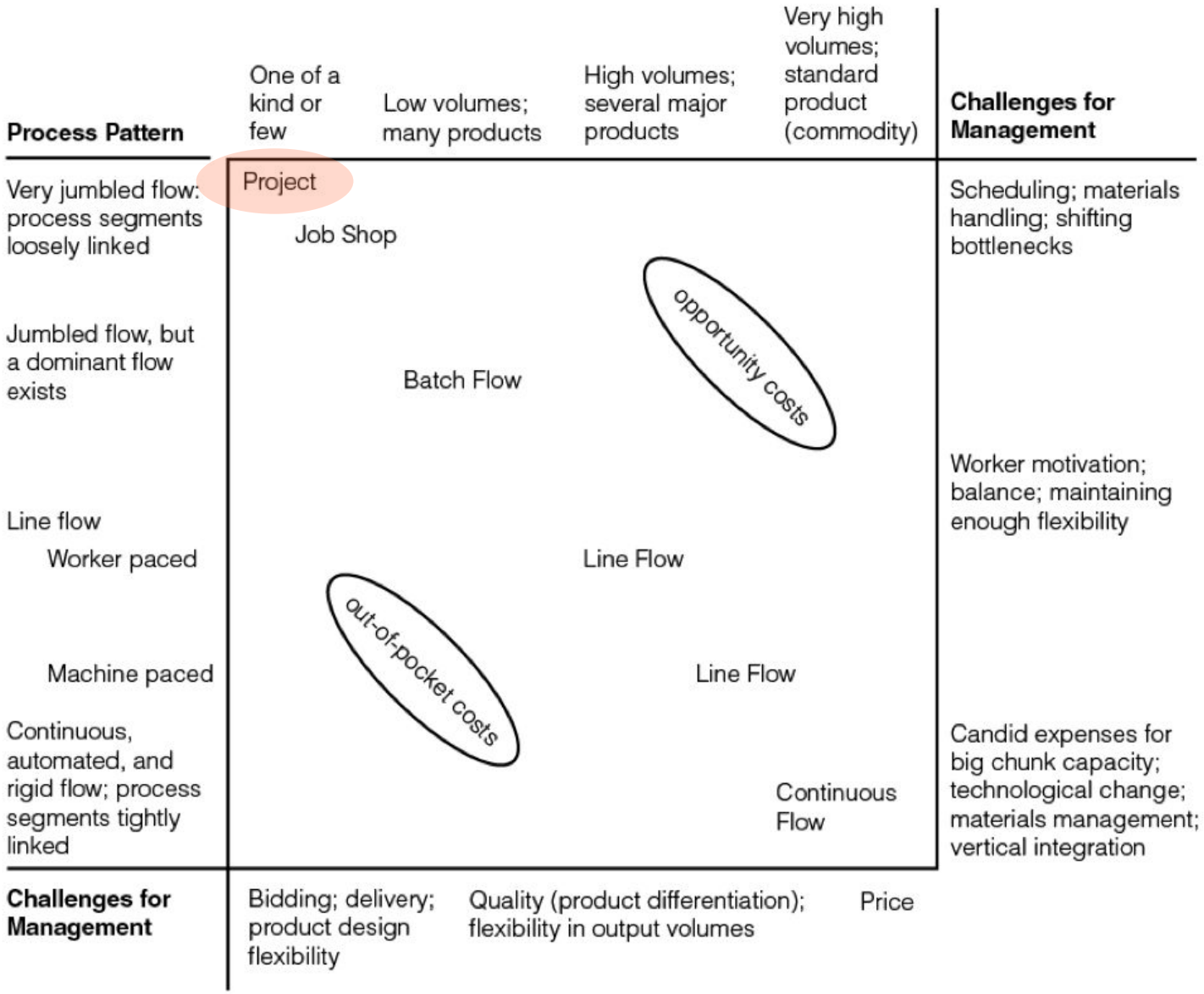


Fig. 3—Typical project cost curve.

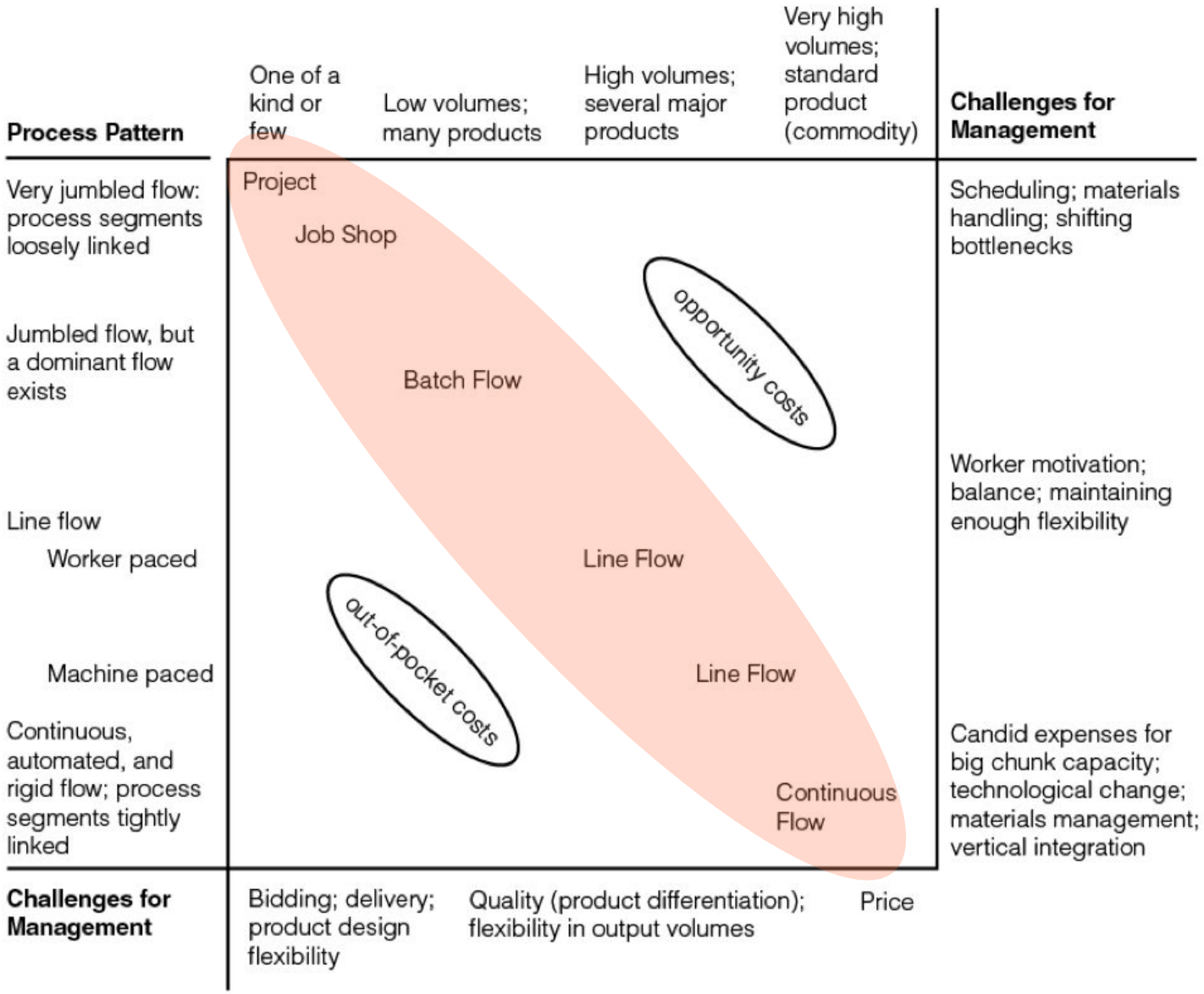
Critical Path Planning and Scheduling Kelley & Walker

Garold D. Oberlender, Ph.D., P.E.
Professor of Civil Engineering
Oklahoma State University



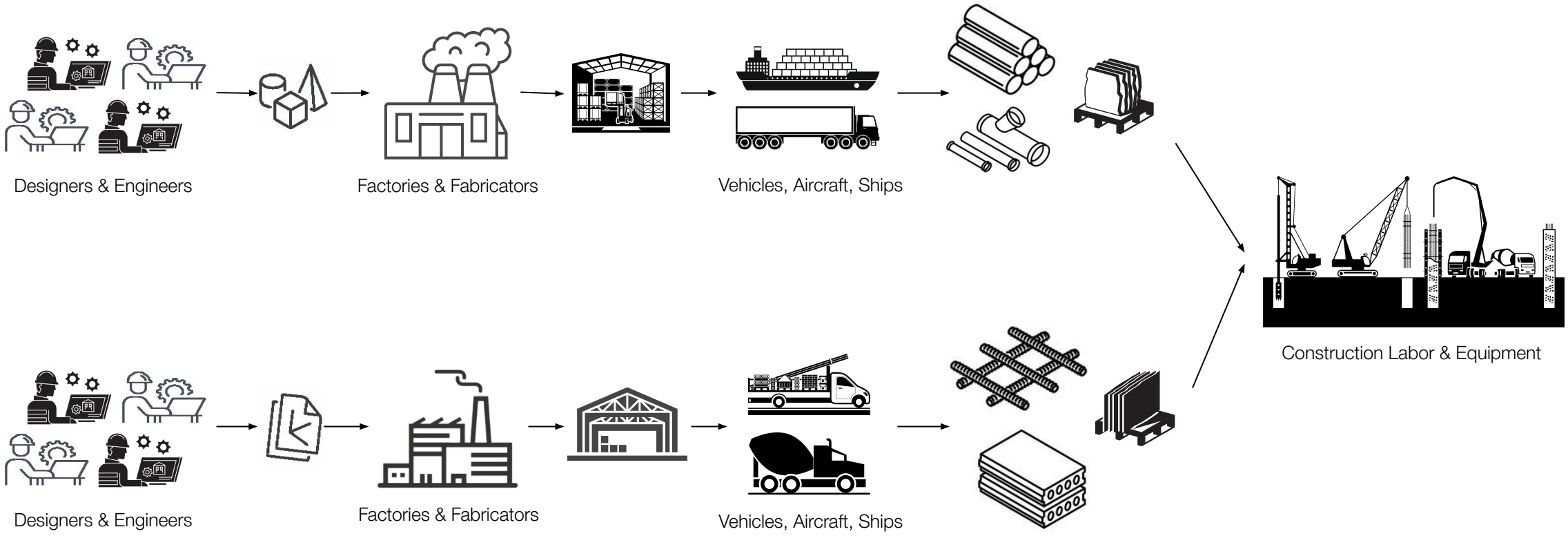


Projects previously seen as a distinct type of production system



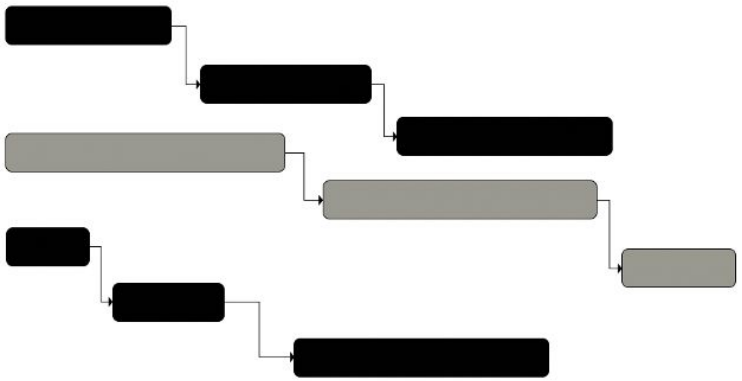
Project supply network consists of all types of production system

In construction, work flows through production systems

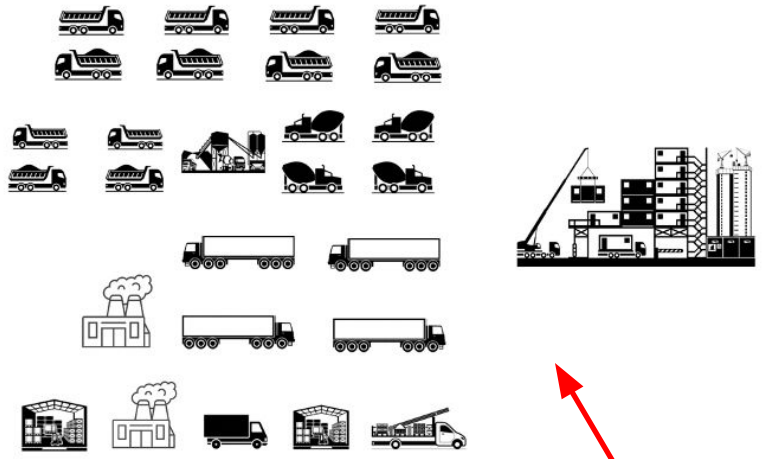


How these systems are designed has a major influence on the project outcome, i.e., cost, schedule, cash & emissions

Schedule = Should Happen



Production System = Can/Will Happen



Dates & Progress

SYMPTOMS

Rates / Throughput

CAUSES

We tend to spend a lot of time tracking these….

…without understanding how these work

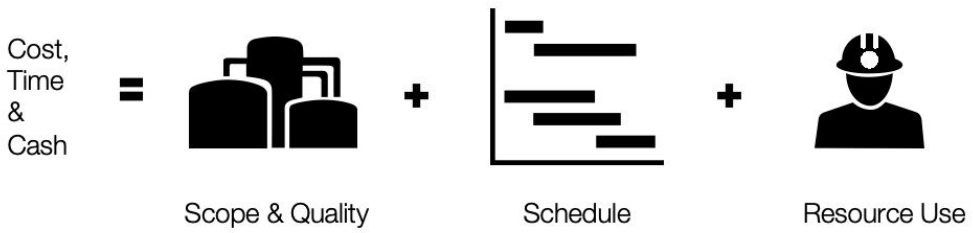
Operations Science governs the performance of Project Production Systems

4 5 3

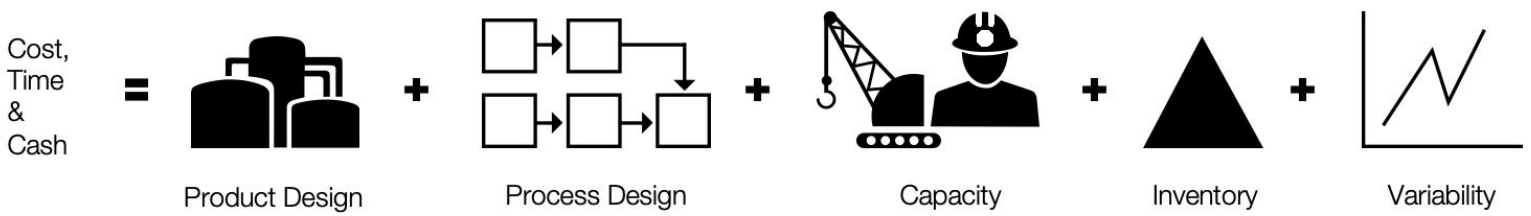
DESIGN MAKE TRANSPORT BUILD

Five Levers

PROJECT MANAGEMENT

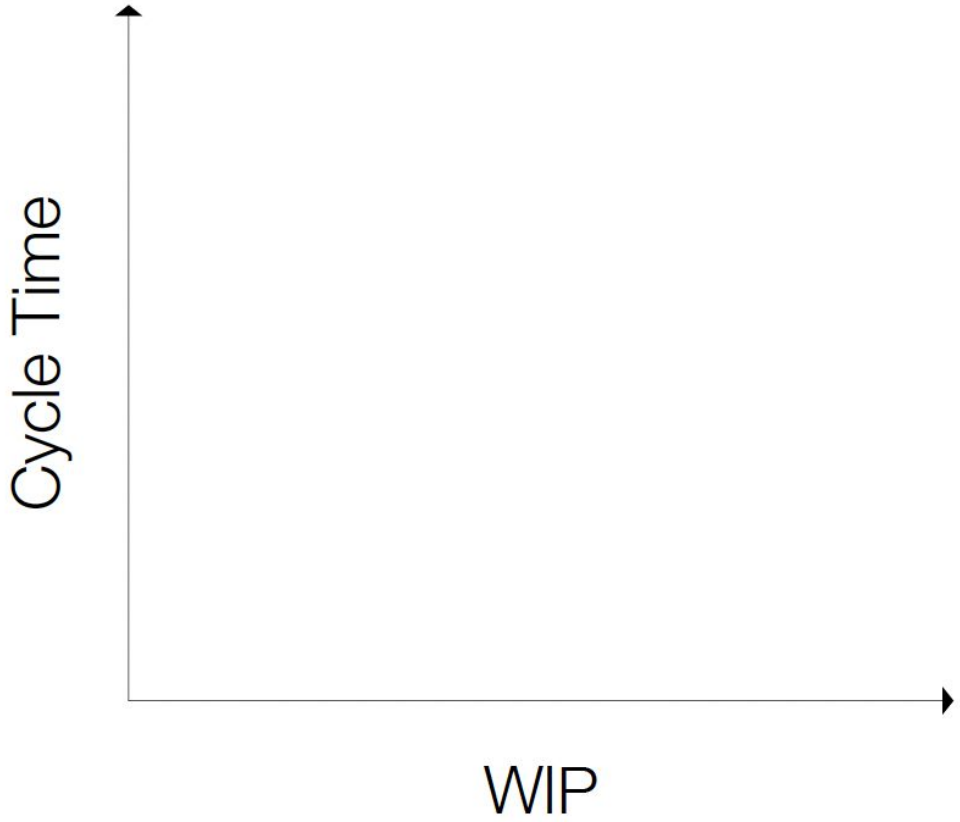


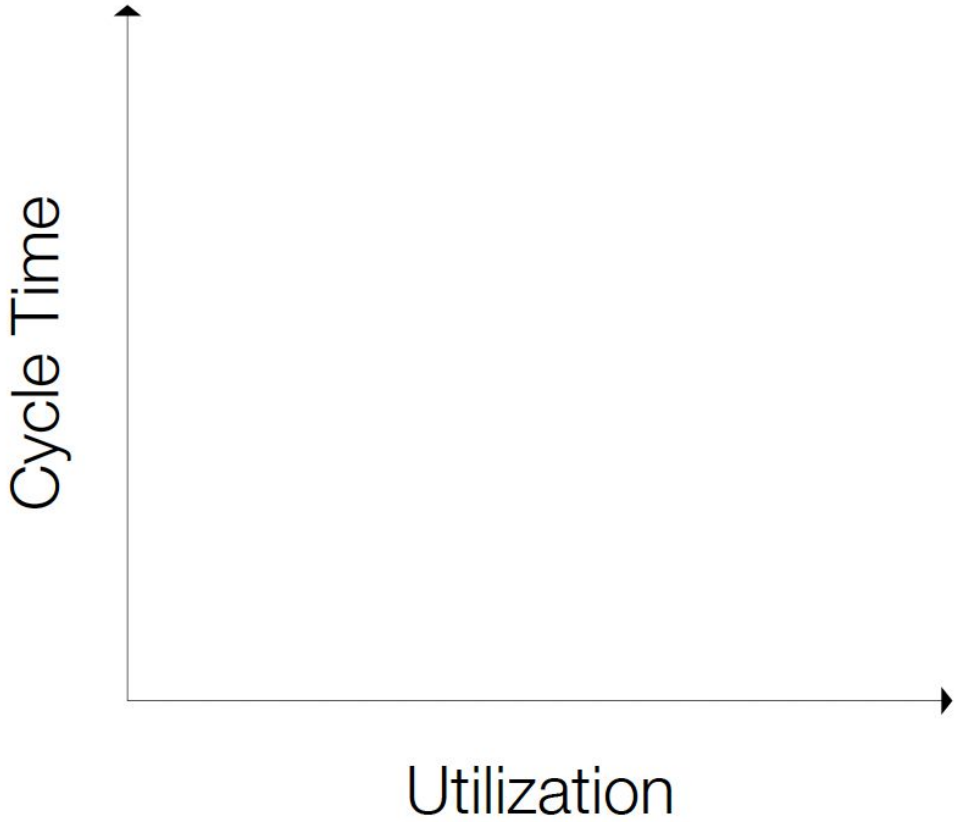
PROJECT PRODUCTION MANAGEMENT



Three Curves

Quiz

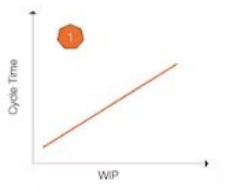
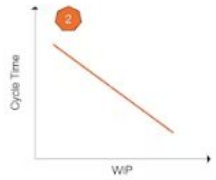
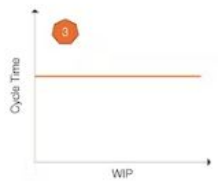
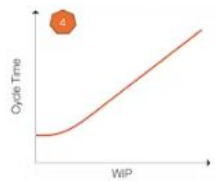
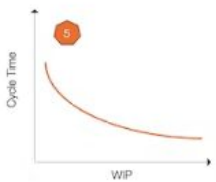
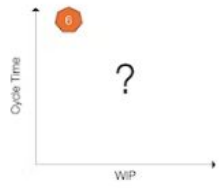

Cycle Time
WIP

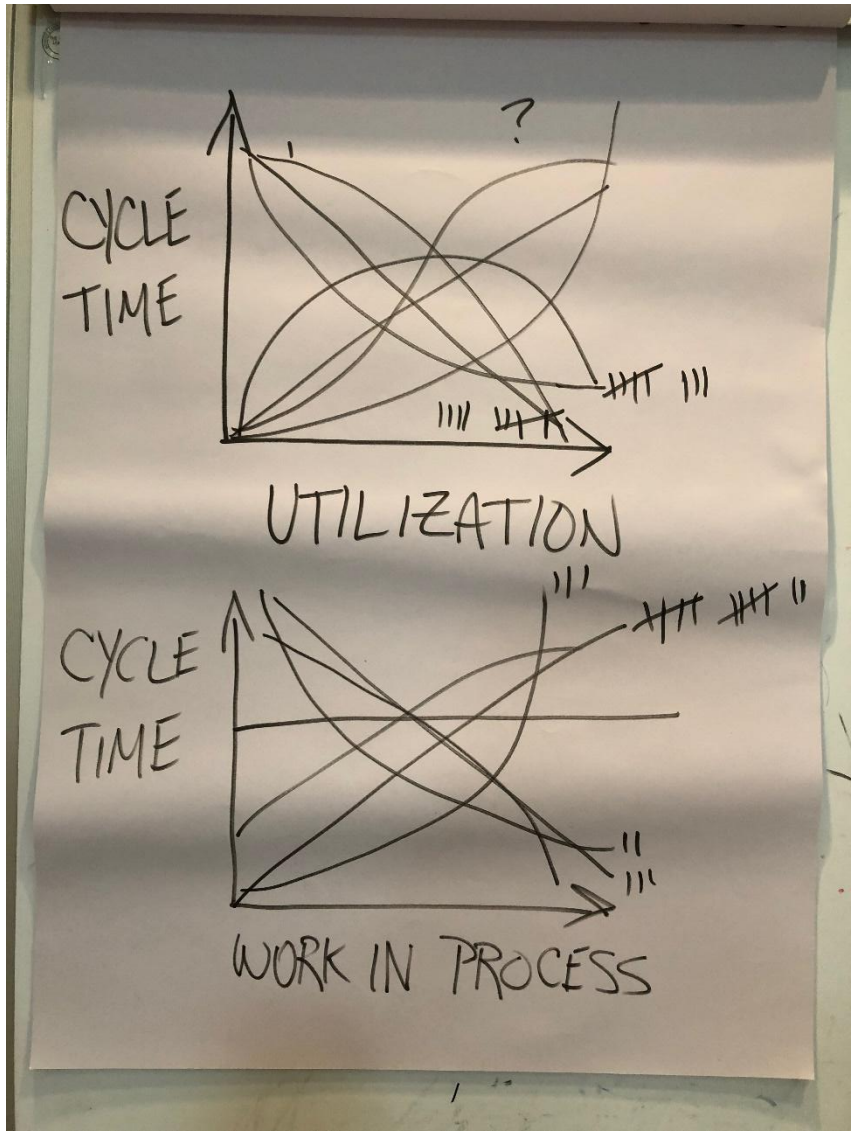

Cycle Time
Utilization

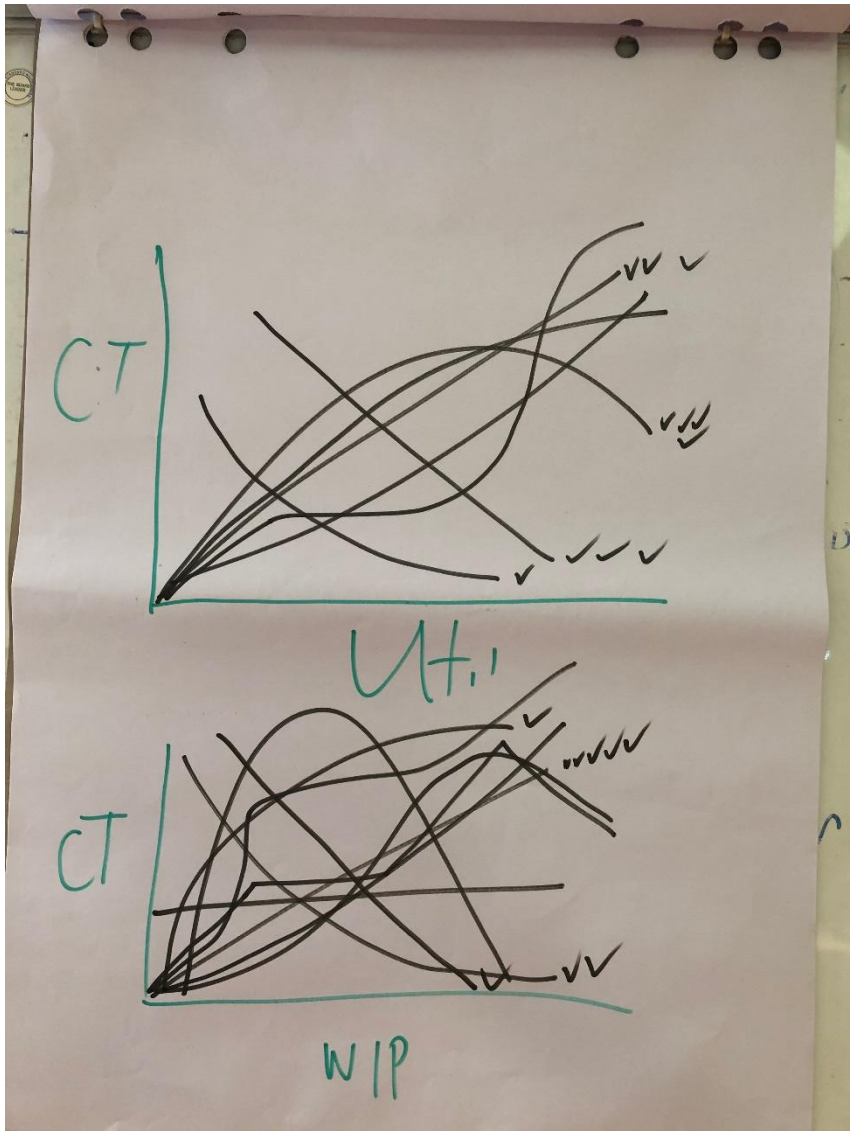
Go to **www.menti.com** and use the code **3904 3803**

What's the relationship between WIP and Cycle Time?

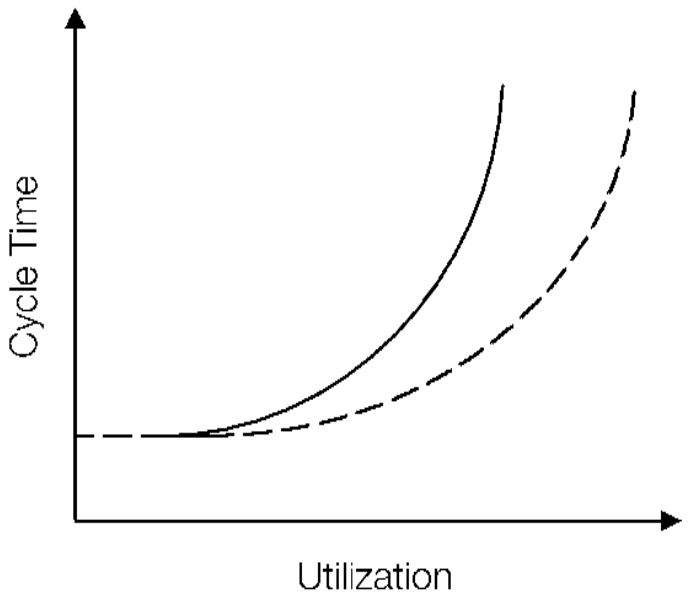
GO TO
menti.com
ENTER THE CODE
3904 3803
0

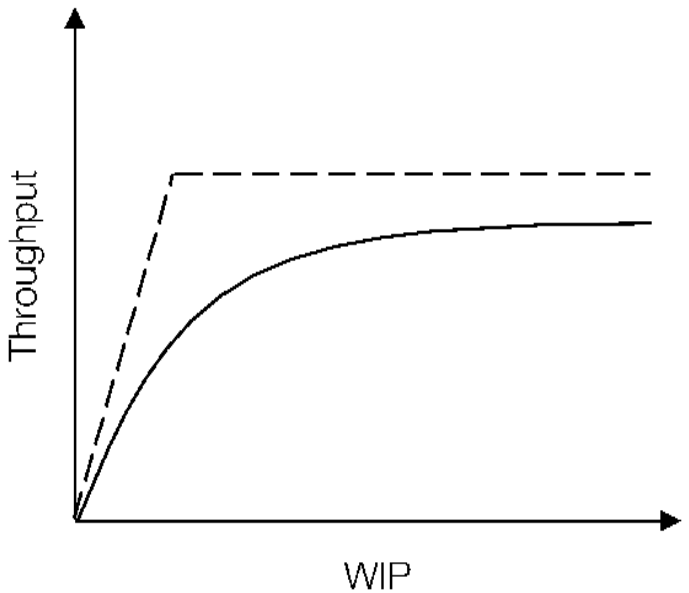
Option 1	Option 2	Option 3	Option 4	Option 5	Option 6
0	0	0	0	0	0
					

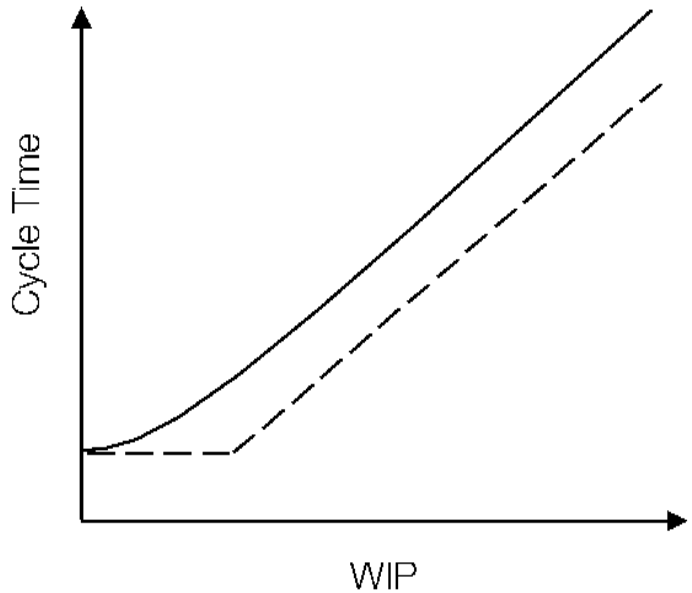

CYCLE TIME
?
UTILIZATION
CYCLE TIME
WORK IN PROCESS


CT
UTIL
CT
WIP

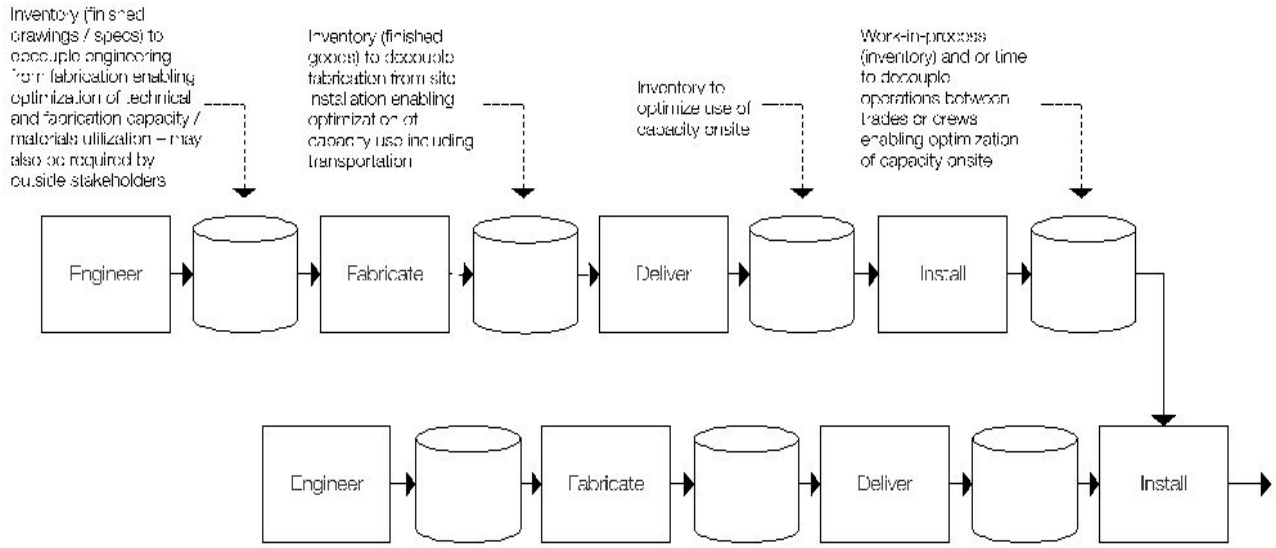
Three Curves







Projects Naturally Deal with Variability by Protecting Each Step in the Process with Inventory



IMPLICATIONS:

Work In Process (Inventory) = More Time

More Time = More Cost

More Time + More Cost = Lower ROI

Next Generation Project Management:

In Action Now

Piling - A Real Example of This

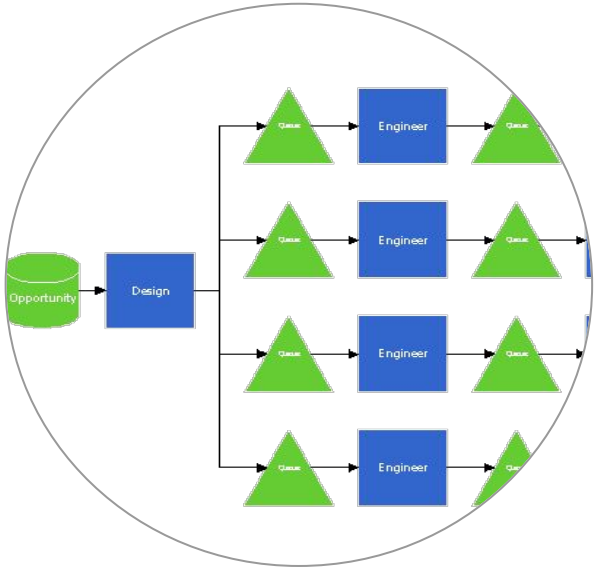
Unit rate contractor to drive 20,000 piles on the project in the first six months of construction, planned completion of foundations in two years

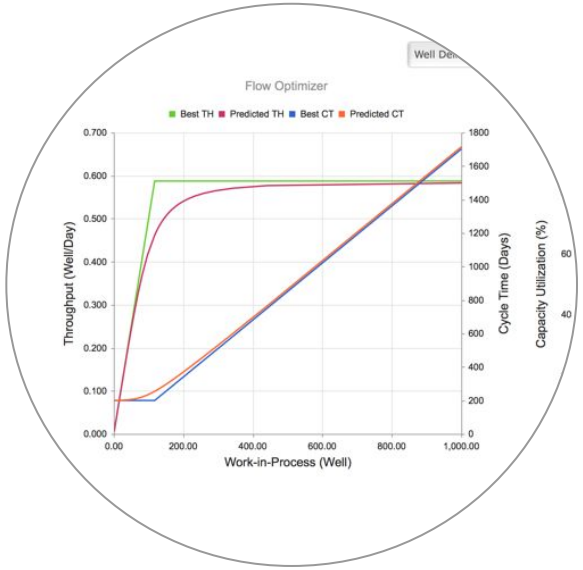
An excellent piling contractor was hired and delivered as promised for $8.9MM on a unit rate contract – big win

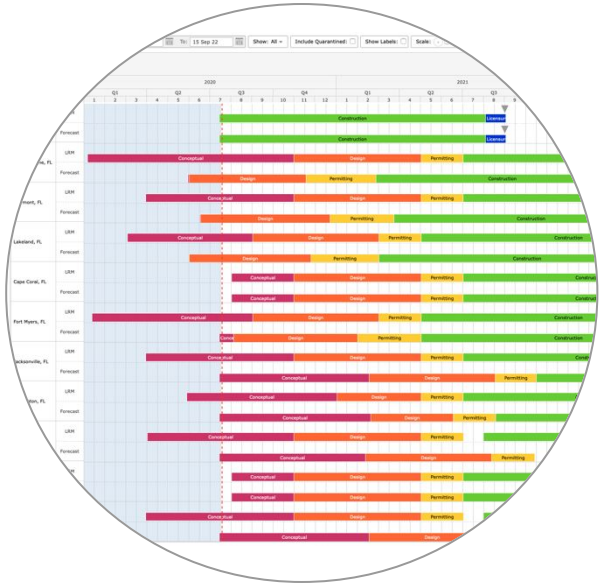
Success?

Finished Piling – Waiting for Foundations

A science-based approach to close the performance gap







Map & Model

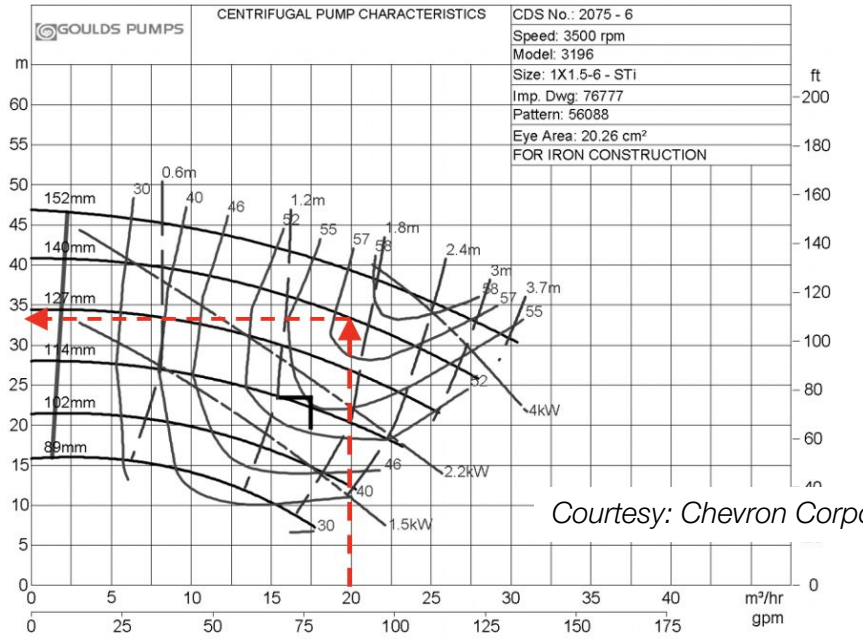
Simulate, Analyze & Optimize

Control & Improve

Operations Science Moment

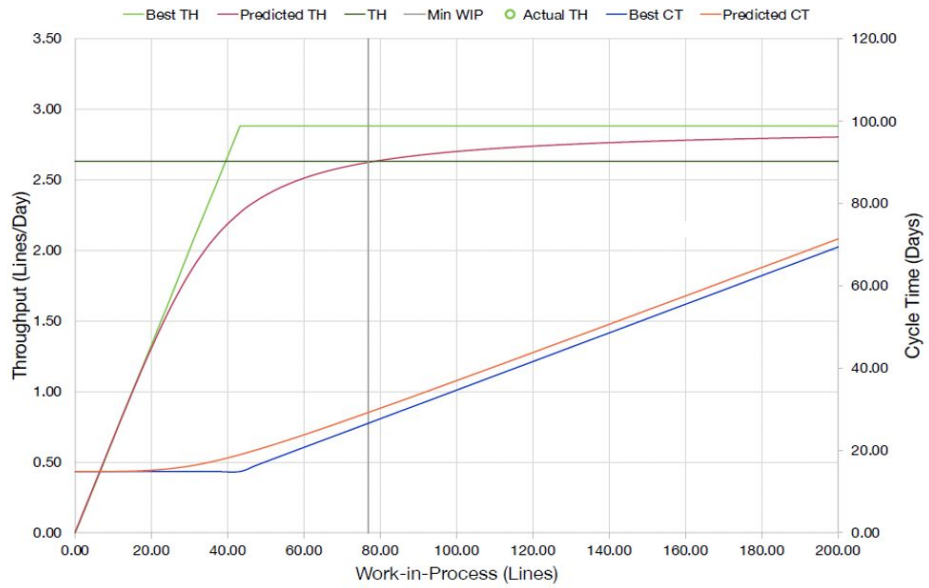
How do we control production?

Pump curves describes the behavior of a pump with a given impellor.



Courtesy: Chevron Corporation

Operations Science describes the behavior of a production system with given parameters (e.g., resources)

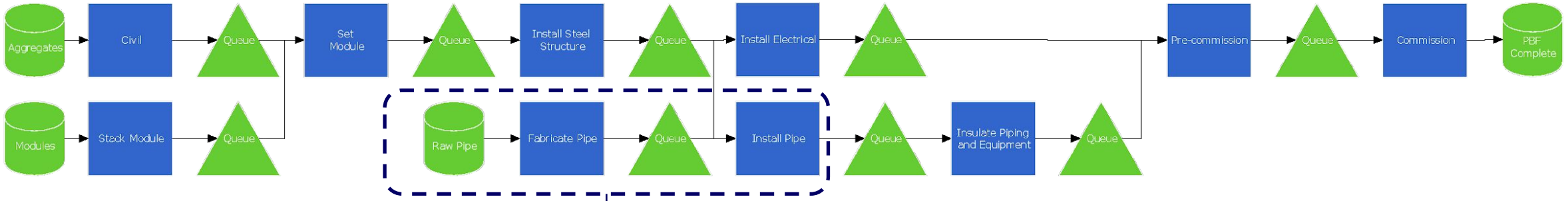


Model considers 6 Designers and 3 Engineers at a maximum capacity utilization of 90%

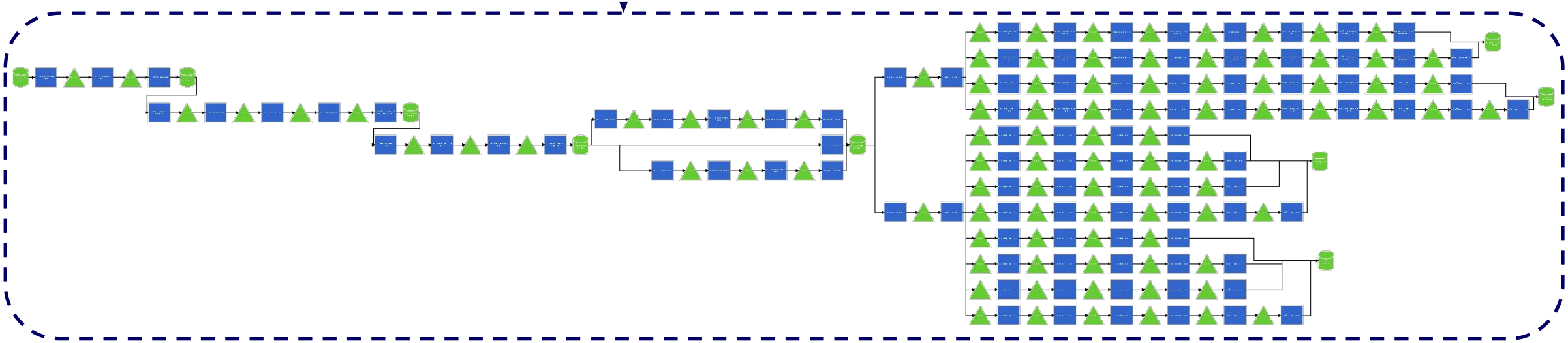
- Operations Science describes the behavior of a production system (e.g., pipe erection) with given parameters, in much the same way that pump curves describe the behavior of a pump with a given impellor.
- Production System Optimization (PSO) can identify parameters required to achieve and/ or improve schedule (e.g., throughput/ cycle-time).
- By utilizing a Operations Science mindset (controlling WIP, identifying and removing variability) we can assist in meeting required schedules

Typical Map of a Projects Production System

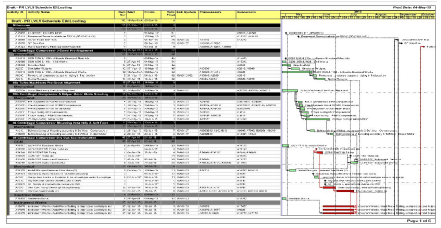
High Level Map



Detailed Map



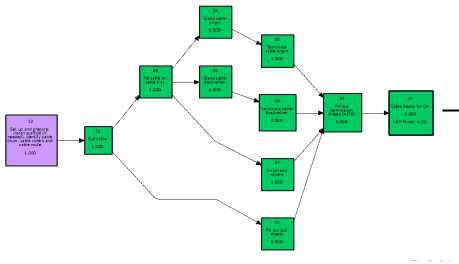
Project Production Control



Should Do

Project Controls

Project Production Control



Standard Processes

Production
Scheduling

Can Do

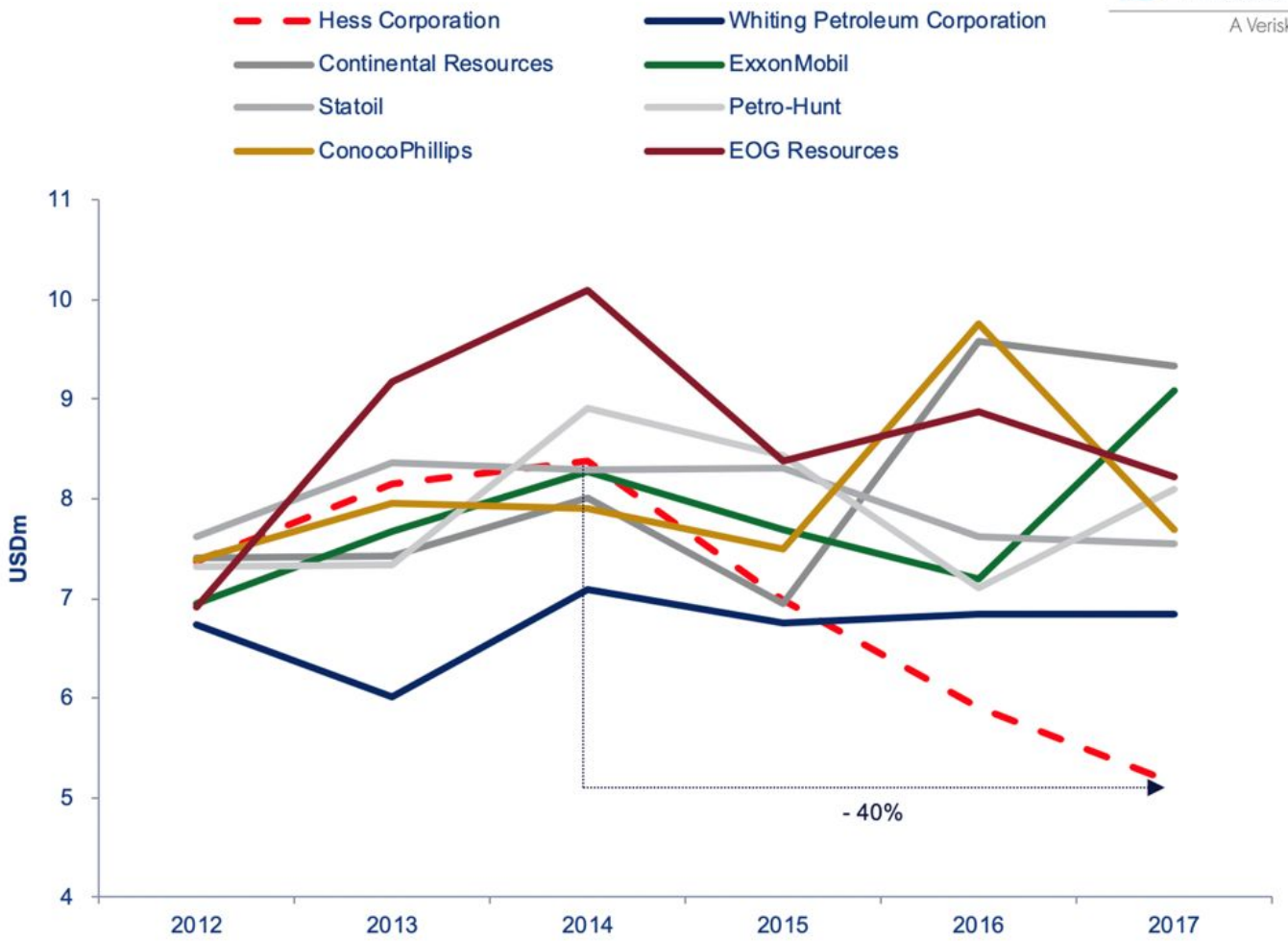
Production
Planning

Will do

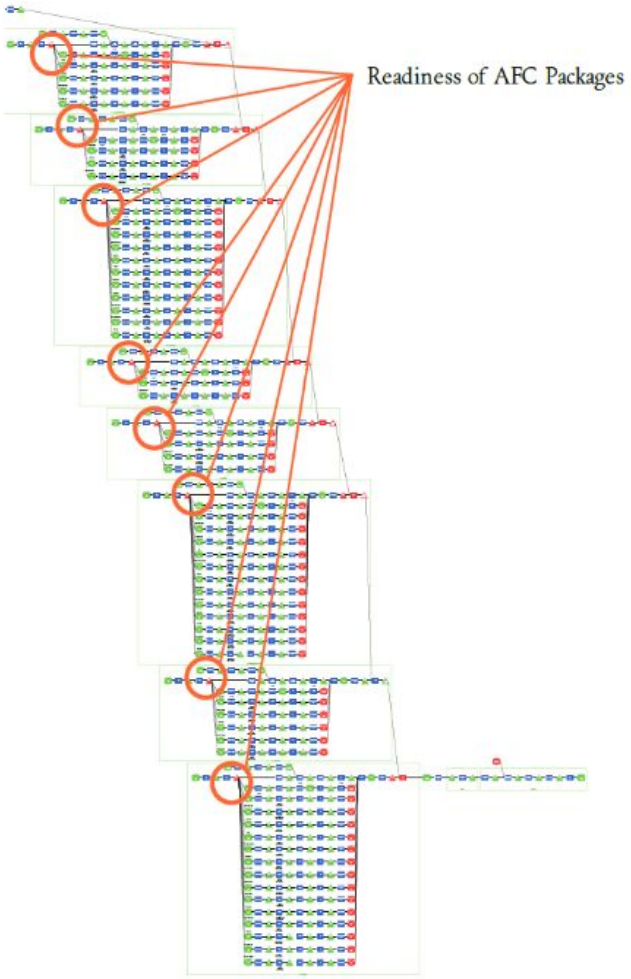
Execute work
as per production plan

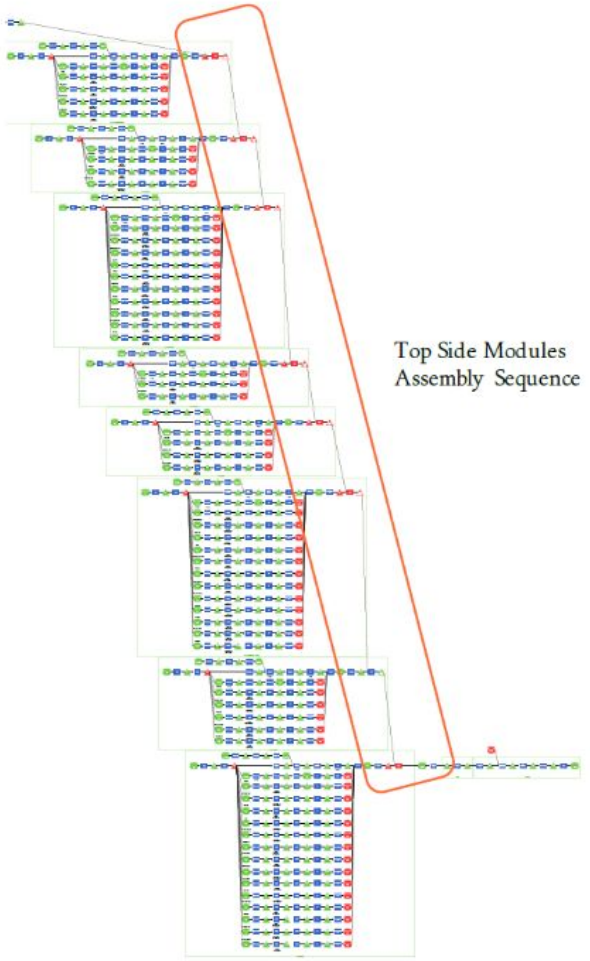
Did or Did Not Do

Average well costs (USDm) by operator for similar wells, 2012-17



Production System Optimization Applied to a Complex FPSO





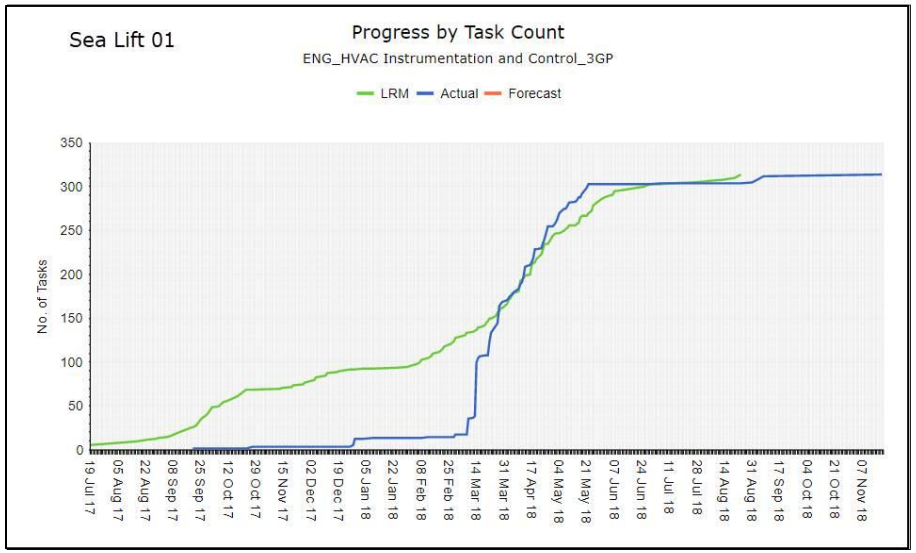
Impact of Project Production Control – Engineering

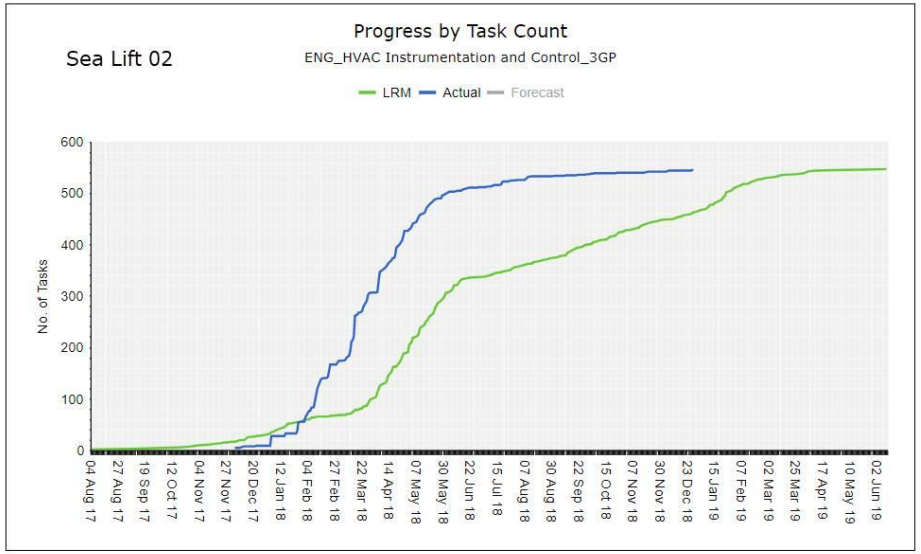
IMPACT

Schedule recovered through standard work processes, right priorities and managing variability

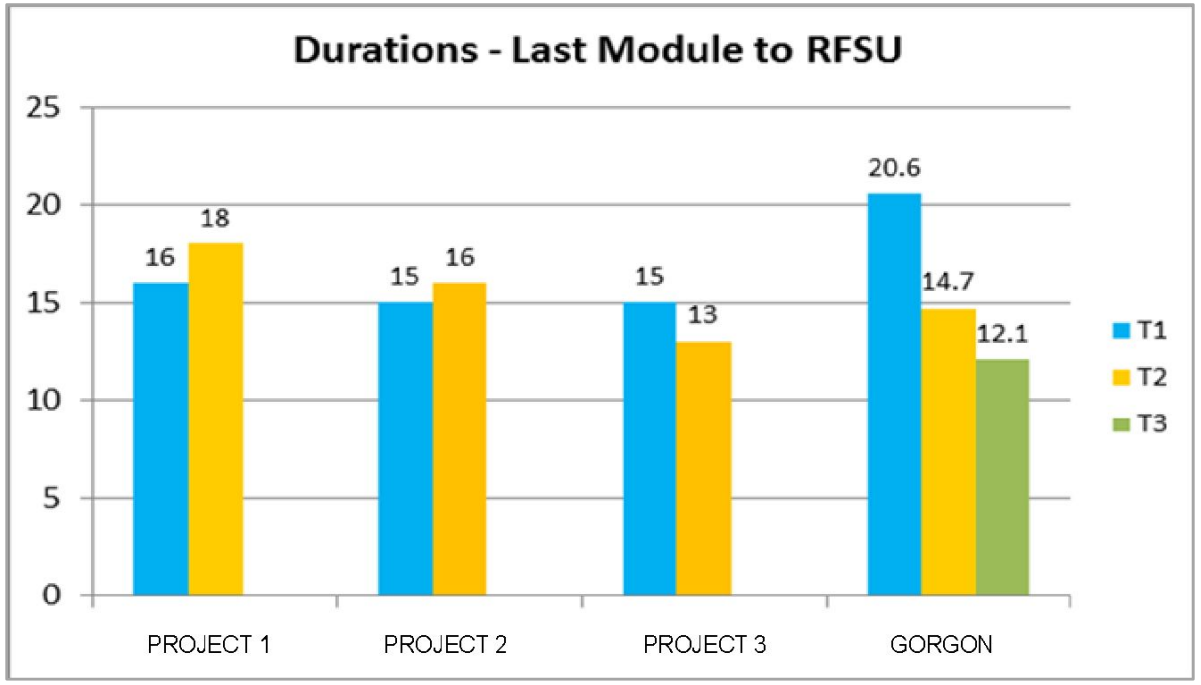
Resources better utilized

Discipline interfaces not previously identified were incorporated into the plan





Courtesy: Chevron Corporation



Compressed schedule by 8 months, saving ~$540 MM and accelerating revenue generation

Courtesy: Chevron Corporation

PPM Requires A Change In Mindset

If you don't start, you can't finish

Earn and burn

Economy of scale exists

Cash flow doesn't matter

Bigger batches give shorter cycle time

More open work fronts are better

A good productivity factor means we are meeting project objectives

We have a schedule and those executing work will use it

Schedule is a plan

Workface planning improves performance

Better looking at it than for it

Behind schedule? Add more capacity – planners, craft, equipment

"I Already Do Project Production Management"

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Learn How To Integrate Project Production Methods With Existing Project Management Tools

25 - 26
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INVESTMENT: $1500

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Next Gen Engineering (1 CEC)
Engineering Capstone Project
LEVEL 2 Certificate
Next Gen Procurement (1 CEC)
Procurement Capstone Project
LEVEL 2 Certificate
Next Gen Construction (1 CEC)
Construction Capstone Project
LEVEL 2 Certificate
LEVEL 3 PPM MASTER CERTIFICATE