

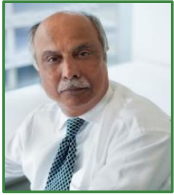
Canadian Institute of Mining's Virtual Convention - CIM 2021

The Importance of Front-End Planning and Leveraging Industry Best Practices to Minimize Project Risk

May 3rd - May 6th, 2021
On Demand Sessions



Introducing the Team



Speaker - Feroz Ashraf, Global Executive Advisor – Capital Projects, P.Eng (Ontario and Quebec)

Mr. Ashraf has extensive **experience** in the resource sector, including mining and metallurgy, oil and gas, infrastructure, power and related downstream industries. He is currently an Executive Advisor, Capital projects at PTAG Inc. He has **35+ years of EPC/EPC experience**, on over **300+ projects** ranging from **\$10million to over \$5 billion** across Canada and globally in over 25 countries. He was the Senior Project Officer, then COO and then CEO of an operating company with plants / projects in USA, Kazakhstan, Australia, and Tanzania. He is member of OIQ and PEO and is a guest lecturer on Project Management at York University- Schulich School of Mining (MBA program).



Michael Dubreuil, Managing Director, B.Math (Computer Science)

Mr. Dubreuil is the **Managing Director** for PTAG Inc., a leading global capital project/program management firm. He has 35 years of experience leading Projects and Organizations through significant development, restructuring, and process improvement. He currently serves as the **Chairman of the Sector Leadership Team of the Construction Industry Institute**. He is an Advisor to organizations on Contracting Strategies including - Industrial Integrated Project Delivery (I2PD).



Jeremy Rasmussen – Chief Technology Officer

Jeremy is a leading thinker in information and communications technology (ICT), mobile software, and open-source intelligence. With both **strategic and hands-on experience** ranging from software development architecture and networking system design for the project management sector. Jeremy is consistently on the leading edge of the role of technology in business and capital projects. He co-published and presented numerous papers on the role of mobile technology in complex industrial environments at industry conferences in Canada, the United States, and China. Jeremy is also a member of the Canadian Nuclear Associations Executive Committee and Board of Directors.

Agenda – Topics of Today’s Session

On Demand Session on The Importance of Front-End Planning and Leveraging Industry Best Practices to Minimize Project Risk

- ▶ **Opening Remarks**
- ▶ **PTAG Overview**
- ▶ **Topics for Today’s session**
 1. Failure as an Industry to Perform and Deliver Projects
 2. Top reasons why projects go off-track
 3. Front-End Planning – what, why, how ?
 4. Leveraging Industry Best Practices
 5. Why a Disciplined Stage-Gate Process is Critical
 6. Project Set-up / Project Management and Project Controls Handbook
 7. Example of Project Complexity Model and Project Delivery Model (PTAG tools)
 8. Why Defining Proper List of Deliverables and Execution Plan important
- ▶ **Summary and Conclusions**



PTAG Overview – Program & Project Management Specialists

Supporting our clients through all project phases of Major Project or Sustaining Capital Programs, PTAG Project Management experts have required experience to address complex project concerns, leverage industry best practices, provide proactive solutions to mitigate social, economic, environmental, technical and commercial concerns impacting cost, schedule, safety and quality concerns.

Our mission is to **increase project predictability and success rates** by incorporating collaborative and risk-sharing contracting strategies, foster true-partnerships focused on project objectives, proven and lean project management techniques, and state-of-the-art tools and systems adapted purpose fit for our client's projects.



- 1) Failure as an Industry to Perform!
- 2) Why Projects Go Off Track?
Underlying Root Causes.
- 3) Front-End Planning (what, why, how)
- 4) Leveraging Best Practices for Improved Front End Planning

Scoping the right **“things”** for a good design basis
the **“right product”**

Setting the stage for a successful execution
the **“right way”**

Developing an execution plan in an organized way
and...delivering the **“project”**

Failure as an EPC Industry to Perform! Mining Projects have yielded near **zero rate of return** since last 50 years.....

98%

Of projects over
\$1 Billion exhibiting
significant cost
overruns.

(Source: Brenden Bechtel, CII,
Annual Conference 2016)

65%

Of large scale
industrial projects
FAIL to meet
business objectives.

(Source: Merrow 2011)

73%

Of mega-projects
experience
schedule overruns.

(Source: Ernst & Young 2014)

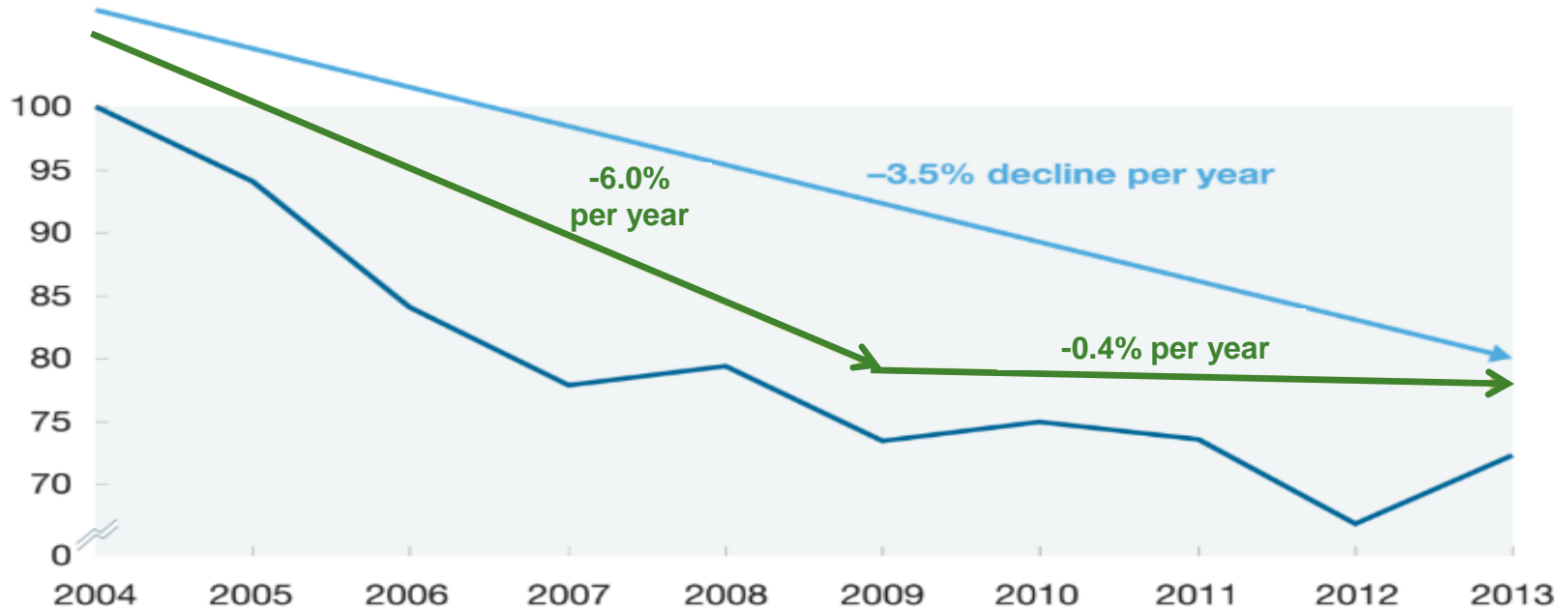
UP TO 57%

Of resources
are wasted in
construction,
compared with
26% waste in
manufacturing.

(Source: CII 2004)

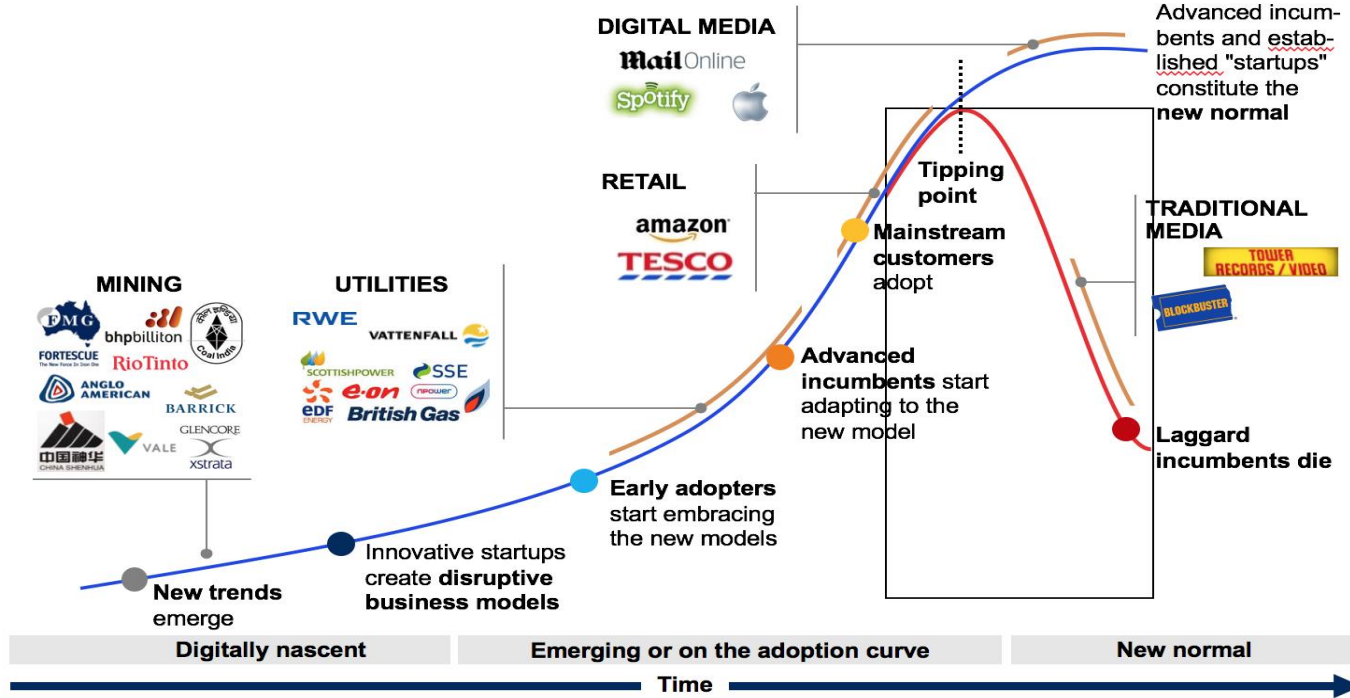
On top of COVID Impact, There has been a global decline in mining productivity over the last 15 years ...

MineLens Productivity Index,
indexed, 2004 = 100



Source: McKinsey & Company

Mining lags behind other industries on digital maturity



SOURCE: Expert interviews; McKinsey analysis

COVID Impact is also GLOBAL and FAR Reaching on EPC Industry

The COVID-19 Impacts are Real

- Industry Study concludes - Construction Productivity **Decrease of 20%** because of COVID-19
- Through open, transparent and frank communications all parties in a project can mitigate these impacts

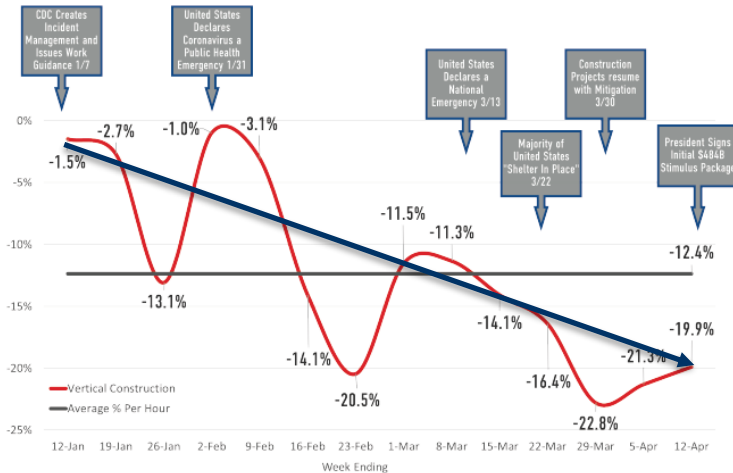


Figure 7: Vertical Construction Productivity Against Events

Pandemics and Construction Productivity: Quantifying the Impact

Figure 3 provides a table depicting the breakdown of hours collected and task coded to mitigation related activities:

	Total Hours	% of Total Hours	% of Mitigation Hours
Total Hours Available	77,205		
Mitigation Safety & Training	1,598	2.1%	29.6%
Mitigation Distancing & Access Rules	1,865	2.4%	34.6%
Mitigation Cleaning & Disinfecting	1,400	1.8%	25.9%
Mitigation Administration	532	0.7%	9.9%
Total Mitigation Hours	5,394	7.0%	100.0%

Figure 3: Hours by Task Code for Mitigation Activities

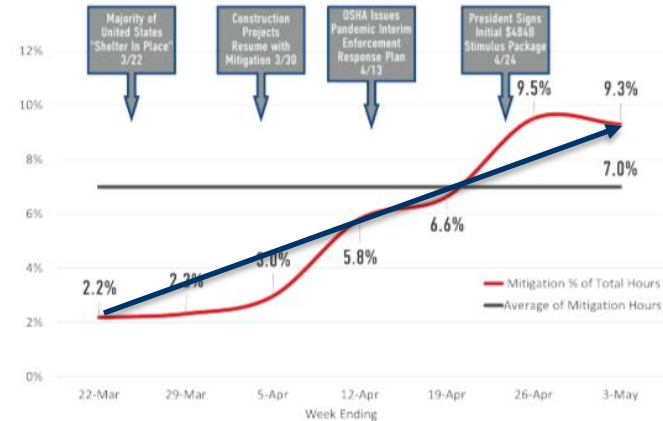
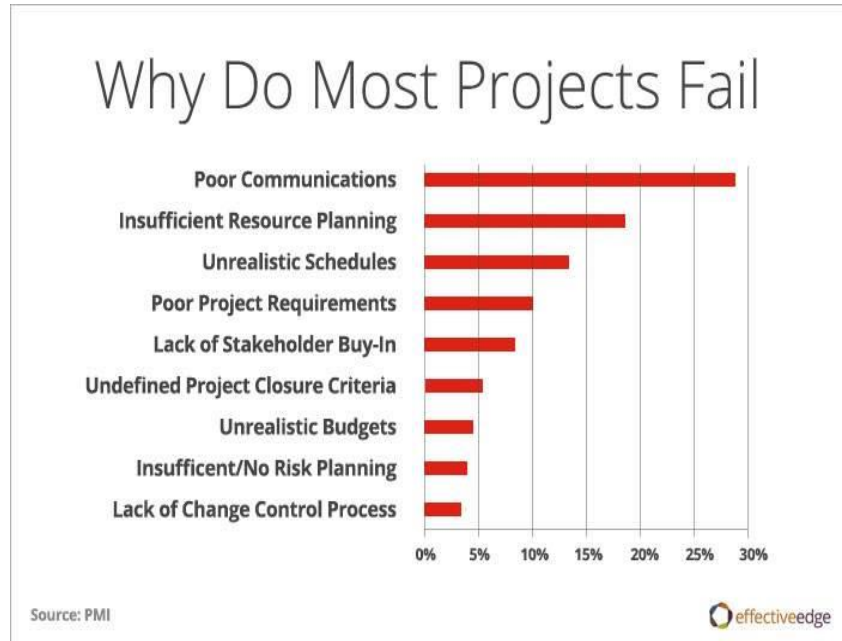


Figure 4: Mitigation Hours as a Percent of Total Hours by Week

Source: Pandemics and Construction Productivity: Quantifying the Impact By Maxim Consulting Group August 5, 2020

Key Reasons – Why Projects Go Off-Track....?



McKinsey & Company identifies the following factors accounting for poor productivity and cost outcomes:

- ▶ Poor Organization and Decision-Making
- ▶ Inadequate Communication
- ▶ Flawed Performance Management
- ▶ Contractual Misunderstandings
- ▶ Missed Connections
- ▶ Poor Short-Term Planning
- ▶ Insufficient Risk Management
- ▶ Limited Talent Management

Source: Changali, Mohammed, and Nieuwland "The Construction Productivity Imperative" McKinsey & Company. July 2015.

Mining Industry can gain 50-60% productivity over next 5-10 years by using the 3 distinct formulas



1

RECOVERY & TRANSFORMATION

Rapidly drive cost and capital productivity by instilling an **owner's mindset and a relentless execution discipline** in the organization

18-24 months | **+25-30% productivity**

LEAN MANAGEMENT

Embed a manufacturing system to **drive stability, eliminate variability, and instill a culture of continuous improvement**

18-36 months | **+15-20% productivity**

2

1. Front-End Planning
2. Disciplined Stage-Gate
3. Project Set-up
4. Project Complexity Model
5. De-Risking the Project

DIGITAL TRANSFORMATION

Enable leaner and safer operations by using **data, analytics and automation to create better insights and translating them into actions**

18-24 months | **+10-15% productivity**

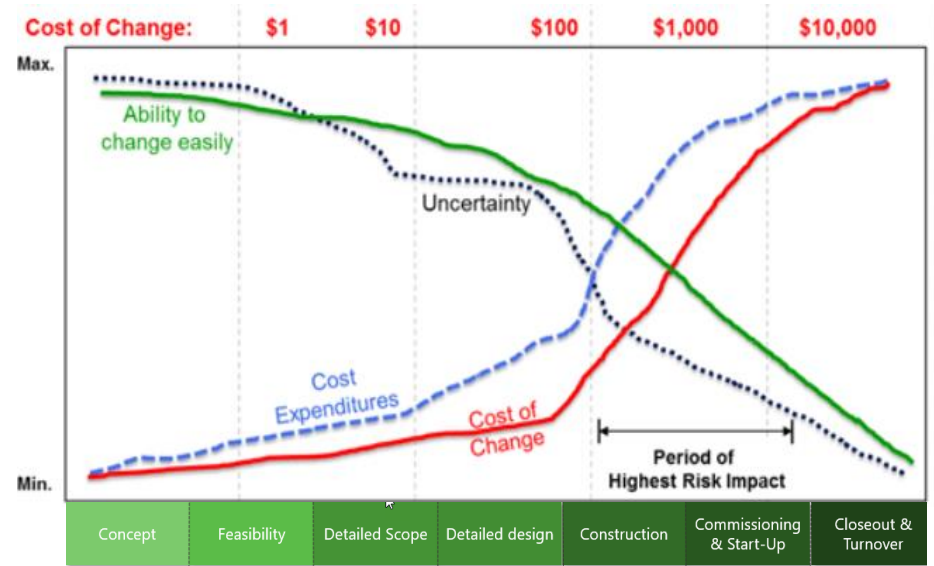
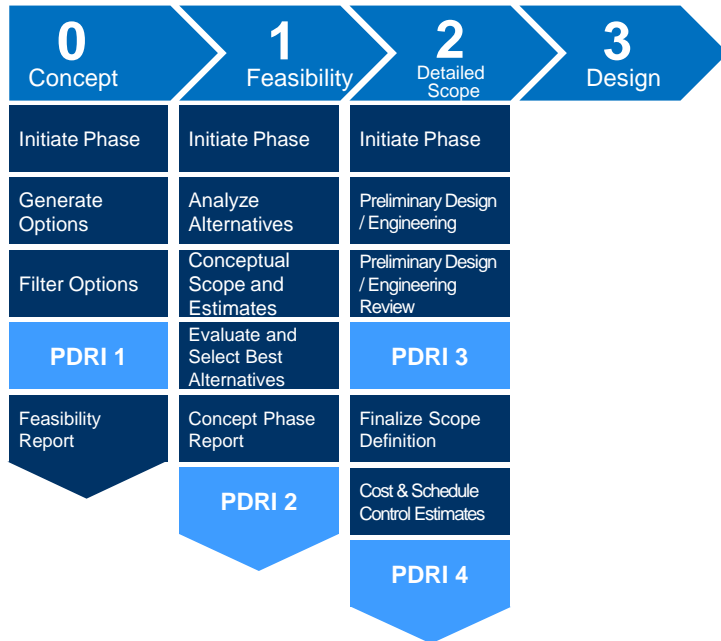
Full scale transformation
36-72 months | **+50-60% productivity**

3

Source: Google Images

Front-End Planning – steppingstone to success

Front end planning (FEP) is the essential process of developing Sufficient Critical Information including Estimates, Schedules, Scope, Execution, and support plans so that owners can assess all the elements of a project to make a fully informed decision to commit resources to execute it.

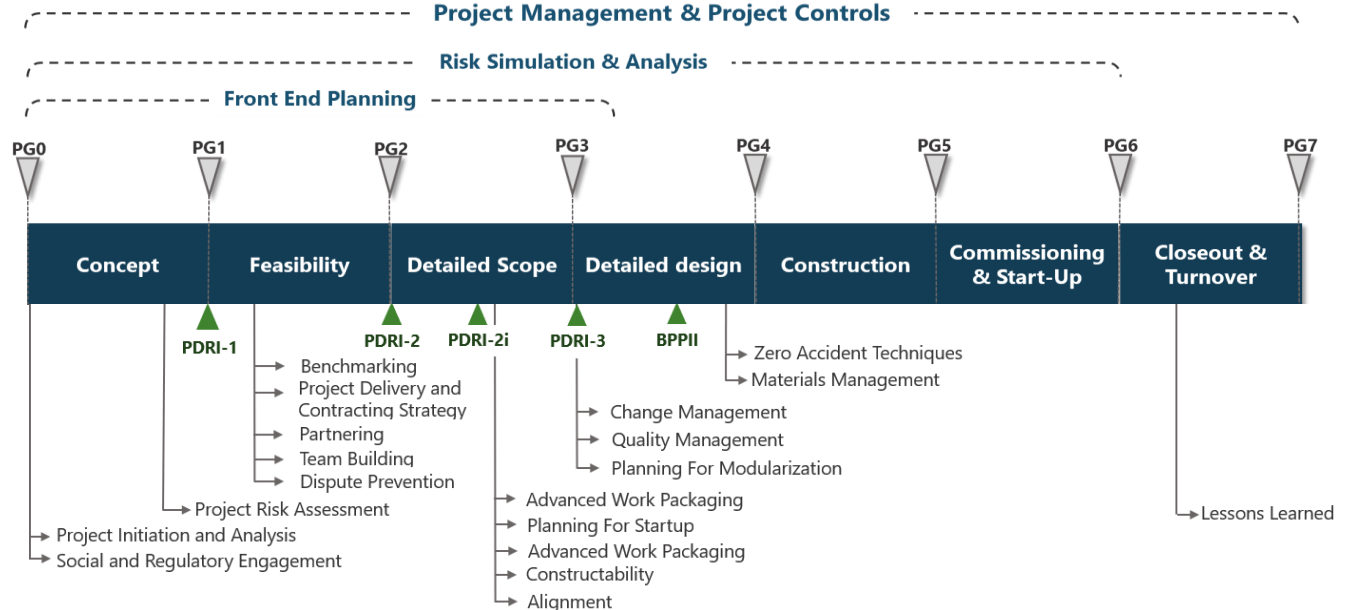


Cost of Change Increase as Project Phases Advance

Source CII

Benefits of using Best Practices in Front End Planning

- ▶ Every **\$1 spent** on Front End Planning **saves \$25** in Execution & Commissioning
- ▶ High use of Constructability results in up to **6% Cost** improvement and reduces project **Schedule by up to 7.5%**
- ▶ “Fit for Purpose” Contracting & Partnering Strategy provide Owners with up to **9% in cost improvements**



Best Practices That Support Front End Planning

Source CII Research

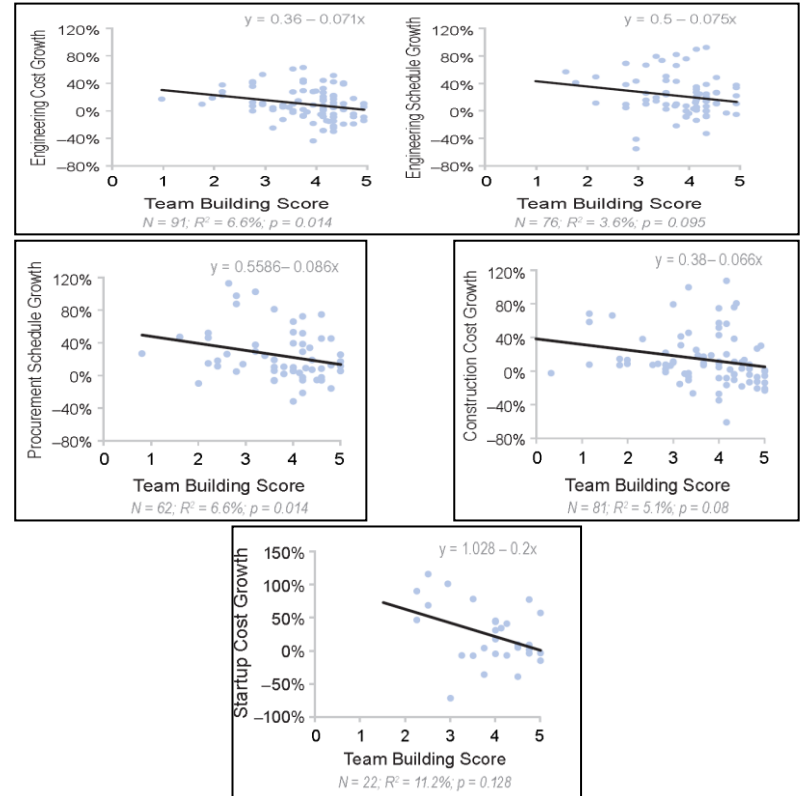
Teambuilding (Best Practice #1)

Elements

Alignment, teamwork, and team building appear to be variations of the same concept but are, in fact, three distinct concepts with different but complementary definitions.

- 1. Alignment** addresses the concern of whether all team members are working toward the same, correct goal.
- 2. Teamwork** involves team members' effective interaction, cooperation, and mutual support while working together.
- 3. Team building** is the process used to develop and enhance teamwork.

All three concepts are critical to the success of a project.

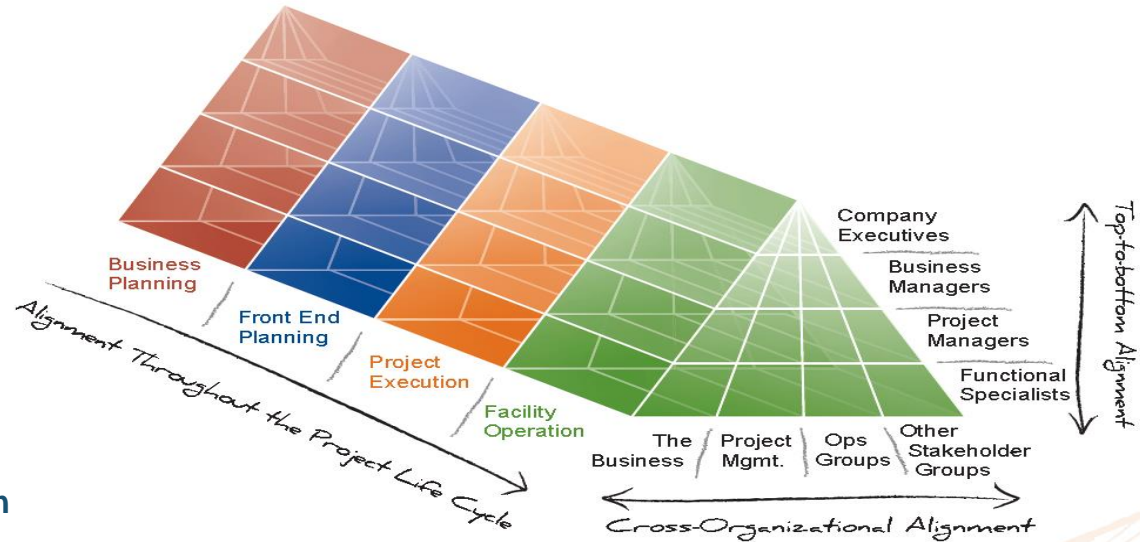


Alignment (Best Practice #2)

Elements

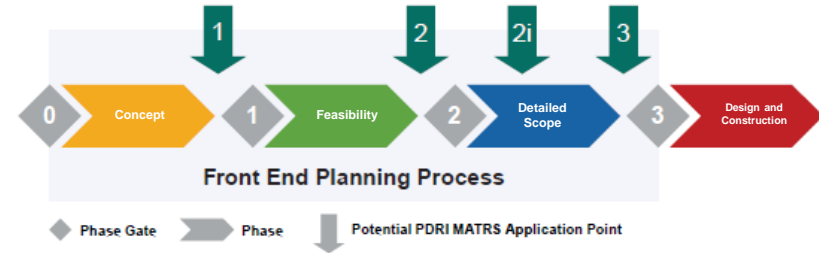
Aligning the project team involves:

- Developing **clearly understood objectives** for all team members and stakeholders
- **Gaining the commitment** from each to work toward those goals
- Include involvement from both owners and contractors.
- **Projects are successful when owners and contractors are actively** involved in the planning process and remain involved throughout the project.
- **Few owners now have the ability to plan all aspects of a project.** Contractors should never assume that the project has been adequately defined.

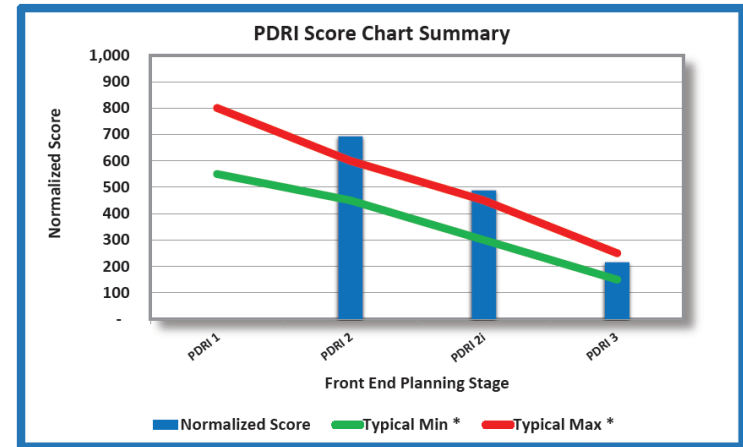


PDRI – an Easy Start and Road map to Success (Best Practice # 3)

The tool(s) widely accepted through the Industry is the **Project Definition Rating Index** (“PDRI”). There are 9 separate tools that are specific to Industry type and project size and scale.

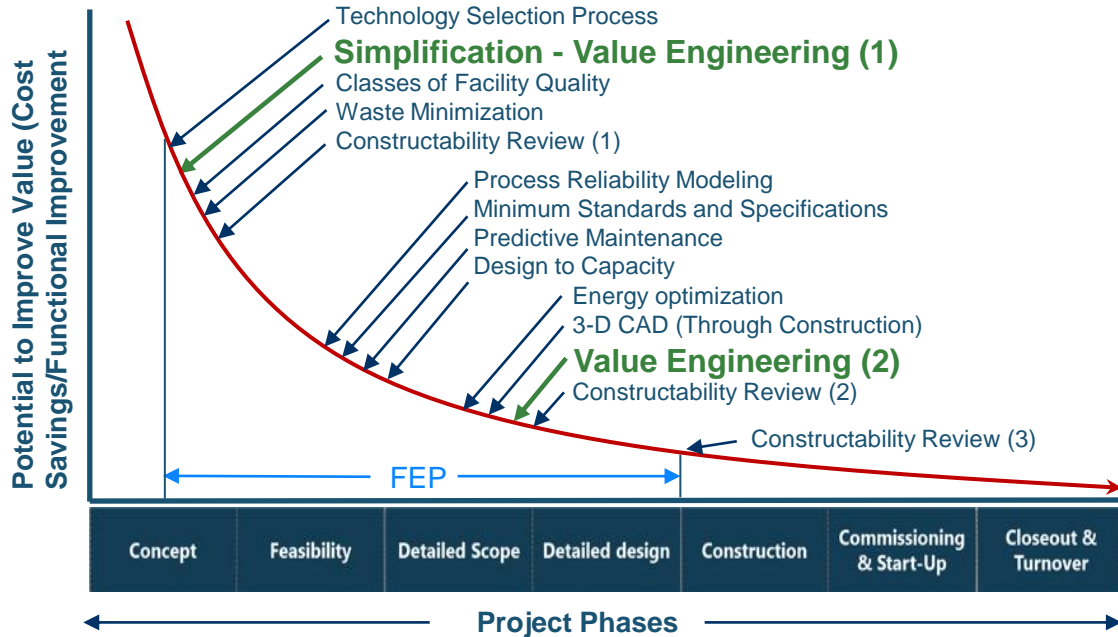


- A **facilitated 2 to 4 hour session**. With a series of Questions addressing:
 - Basis of Project Decision
 - Basis of Design
 - Execution Approach
- The output of the FEP Assessment is a **list of action items** to improve various Project Planning Elements – Designs, Plans, Permits, and Activities



Note: * Typical range of scores is based on experience on PDRI tools since 1996.

Value Engineering (Best Practice # 4)



- Value Engineering can be performed at all phases of the project
- The earlier in the project value engineering is performed the better
- Potential cost savings and functional improvement impact - decreases with each progressive phase of a project

Project Risk Assessment (Best Practice # 5)

Elements

Assessing risk is a project management activity done throughout the project life cycle.

The **relative importance of any specific risk depends** on the respective stakeholders, and could be different for different stakeholders.

It is essential to **get a broad range of perspectives** when assessing risk in order to arrive at a consensus on relative importance of risks.

- Organize and **formalize a risk management** process and keep it as simple as possible
- **Begin early** at Initiation to be most effective
- Keep a broad perspective to get the **diversified input** required.
- Undertake adequate front end planning, analysis, and engineering.
- Partner with owner and contractor management.
- Recognize that **certain projects are more prone to risk** and that experience in a jurisdiction is important.
- Risk documentation is critical.



Ranking the Opportunities and Threats

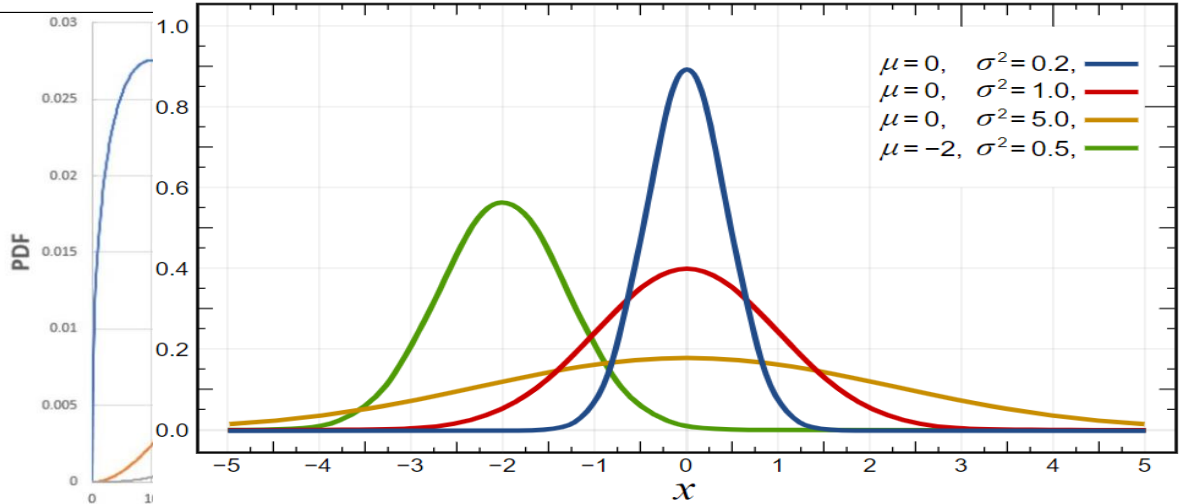
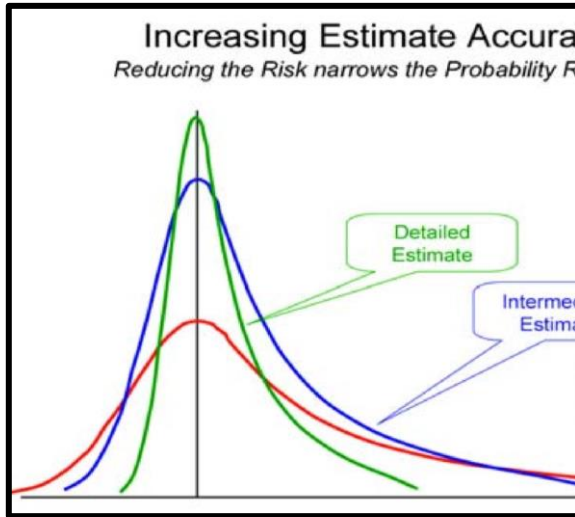
Consequence	1-Minor	2-Medium	3-Serious	4-Major	5-Catastrophic
Likelihood					
A-Almost certain	Moderate	High	Critical	Critical	Critical
B-Likely	Moderate	High	High	Critical	Critical
C-Possible	Low	Moderate	High	Critical	Critical
D-Unlikely	Low	Low	Moderate	High	Critical
E-Rare	Low	Low	Moderate	High	High

Risk Profile Improves as Front-End Planning Progresses

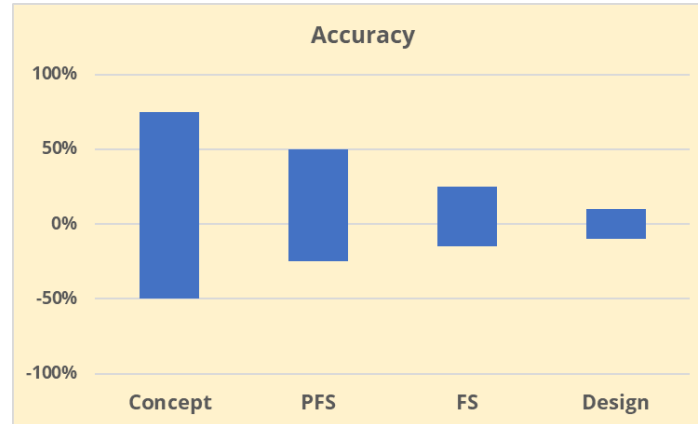
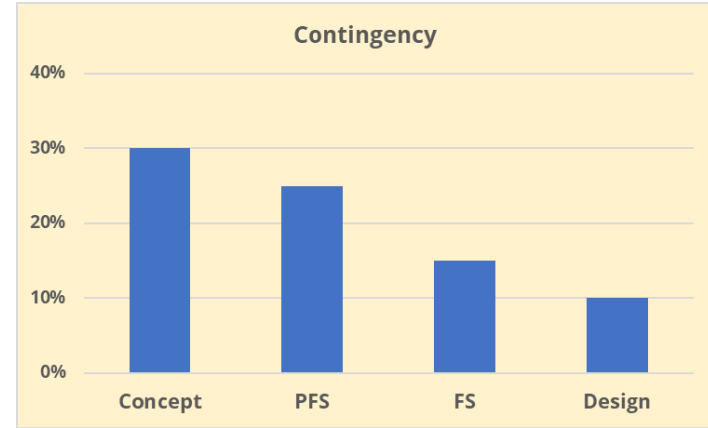
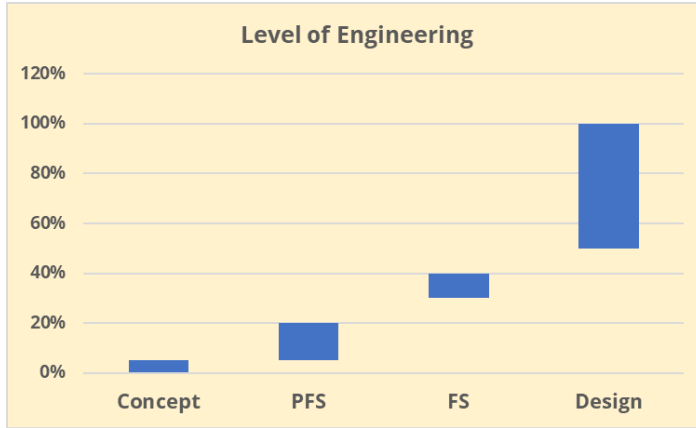
Its all about Management Philosophy & Risk Tolerance

It can be a skewed curve with low probability (skewed to left) or high probability (skewed to the right) !!

The Less Deviation the Better



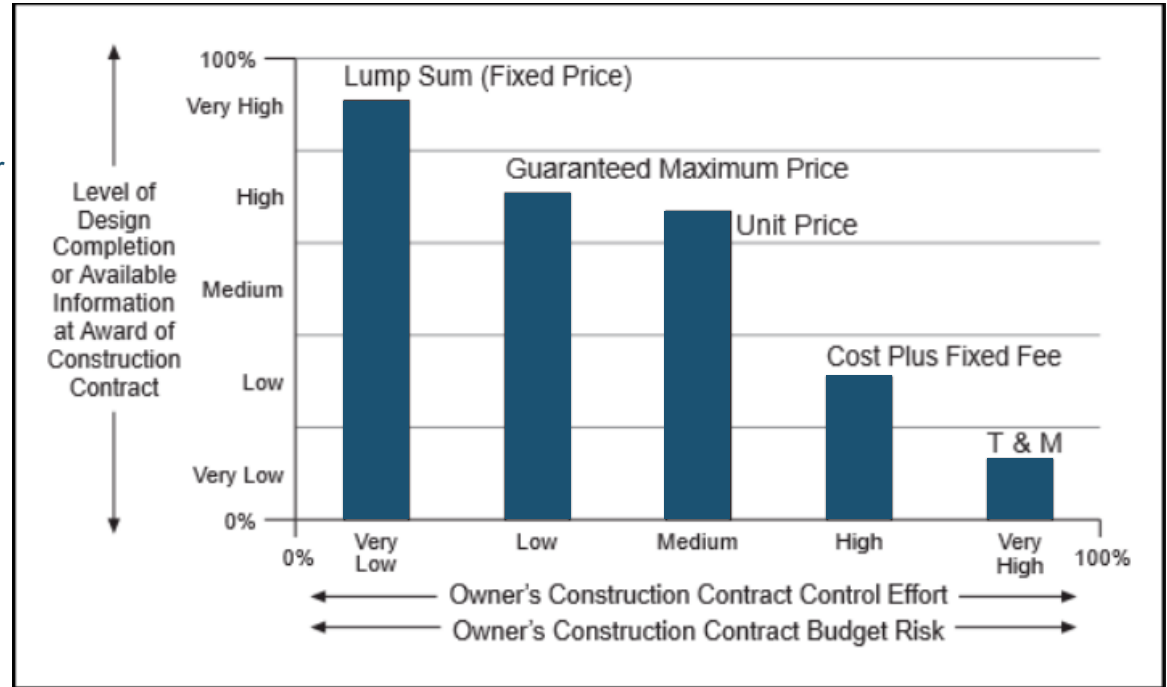
Accuracy is Improved as Project is Better Defined



Project Delivery and Contracting Strategy (Best Practice # 6)

Selecting a Project's Delivery and Contracting Strategy ("PDCS") is a core deliverable of Front-End Planning - ideally done during the Concept Phase to allow for early participation of key suppliers

- The PDCS encourages decision makers to identify and focus on the project objectives and other critical success factors early in project planning phase



The level of Engineering is one method to help select the Contract Strategy

Integrated Project Execution Plan (Best Practice # 7)

Using a Highly Collaborative an Integrated Project Delivery and Contracting Strategy allows for the development of an **Integrated Project Execution Plan (“IPEP”)** during the Front-End Planning phases

- **Project Execution Plan (PEP)** is the project baseline and governing document
- **Establishes in appropriate terms** what will be done to meet the project scope and contractual requirements
- Describes the project plan in **both a strategic and tactical way**
- **Approved** by company management prior to publishing
- **Live document** and should be updated with current and future project details as developed through project phases

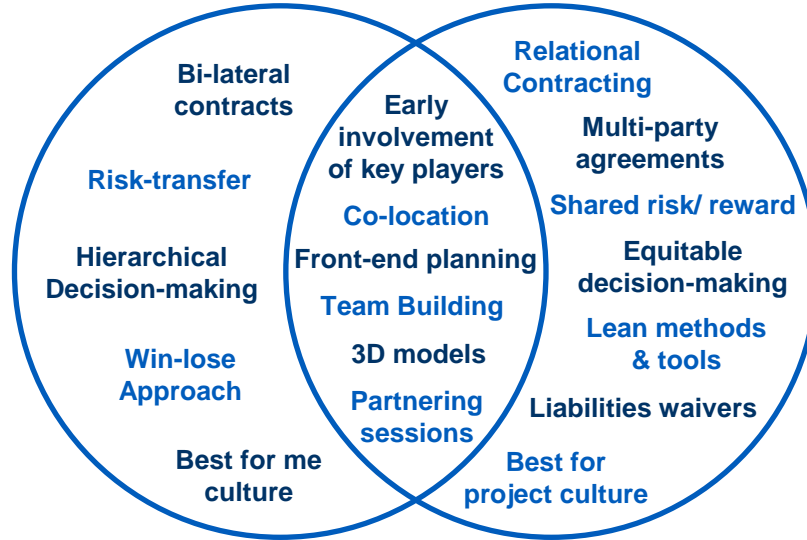
An IPEP involves all key (**Internal and External**) participants (the “Project Team”) in its development is led by the Project Manager.



What is I2PD?

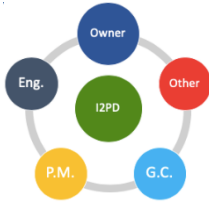
Trust, Collaboration, Integration, Open Communication

**EPC, EPCM,
DB, CMR**

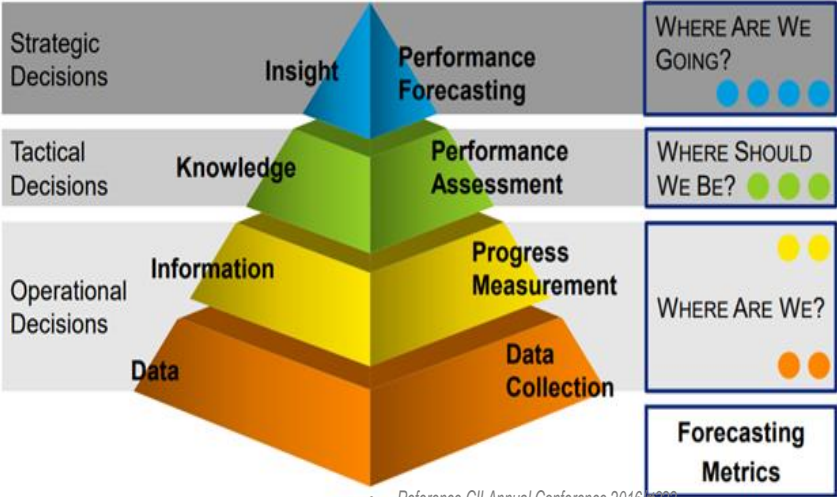


I2PD

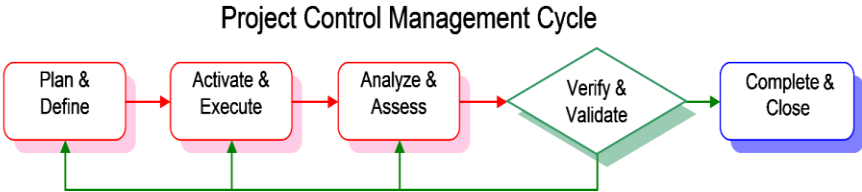
Improved Safety, Earlier Cost and Schedule Certainty, Optimized Design



Project Controls & PMIS Requirements in FEP (Best Practice # 8)

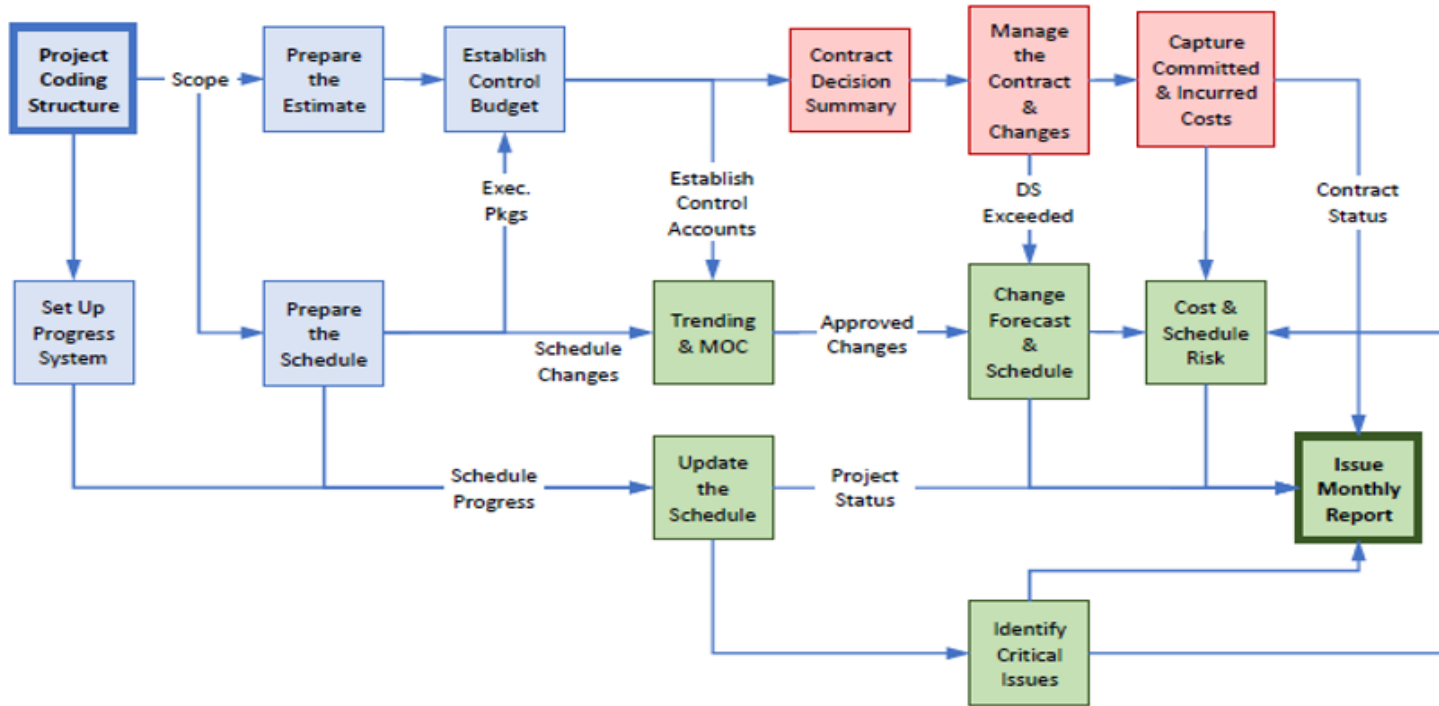


To achieve this, we need to plan the Project Controls Cycle



Inter-relationship Between Data Collection, Progress Measurement and Performance Assessment

Developing Your Workflow during FEP (Best Practice # 9)



PM and PC processes are typically not well defined in FEP

Activity Planning and Scheduling during FEP (Best Practice # 10)

• Project Scope (scope statement)	• Project Execution Plan (as required)
• Engineering Deliverables (if any)	• Key Contracts / POs (if any)
• Work Breakdown Structure (WBS)	• Key Milestones and / or Dates
• Cost Breakdown Structure (CBS)	• Logic Relationship (Start to Finish, etc.)
• Activity Durations and / or Estimates of Time	• Project Calendar (start to finish)
• Resource Requirements & Availability	• Constraints (Max Days of shutdown)
• Key Risks (Risk Register)	• Assumptions or Stakeholder Requirements
• Scheduling Tools (Primavera P6)	

The prerequisites above are required to plan and schedule key project activities at ever increasing levels of detail (Levels 1 through 3)

Simplify and Define List of Deliverables (Best Practice # 11)

Typically Project Team Follows a Fully Defined Corporate Guidelines (Problem: 1 size does not fit all)



Develop a simple Handbook (50-70 pages) with list of deliverables based on Project Complexity



Handbook – A simple guide to success (Best Practice # 11)

1 Project Excellence and Best Practices

2 Stage Gate Process & Project Framework

3 Project Set-

4 Cost Manager
(Estimation and C

5 Planning and Sch

6 Procurement
& Contracts Administration



7 Progress, Measurements and Metrics

8 Project Change Management

9 Project Quality Management

10 Project Risk Management

11 Project Analyses and Reporting

12 Construction, Operational Readiness, Handover and Closeouts

Summary

1

Project Set-up, Initiation, Kick-off,
and Alignment

2

Stage Gate Reviews,
Project Audit & Assurance

3

Team Structure & Composition
(Owners Team and Contractors)

4

Governance / Policies and Procedures +
Deploy & Invest in
Industry Best Practices (&Tools)

5

Prioritization with the Operational /
Sustaining Capital Objectives

6

Project Risk Analyses
Realization and Mitigation Strategies

7

Project Management Information
Management, Set-up & Integration

8

QA/QC Reviews, Permits and
Stakeholder Management Plan (CSR Plan)

9

Site Planning and Logistics, Technical
Issues, Operational Input & Reviews,
and Handover

10

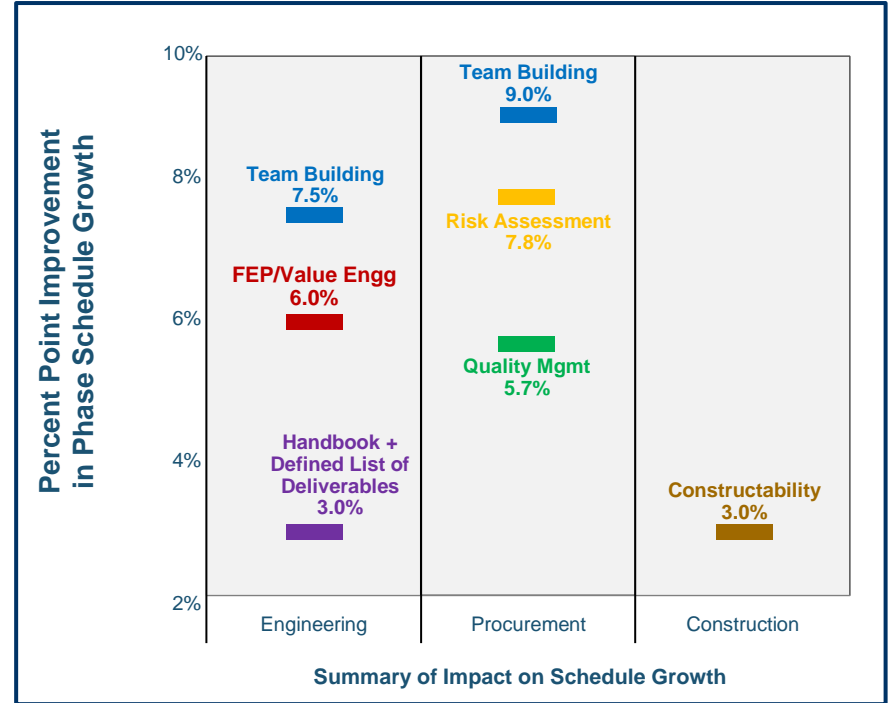
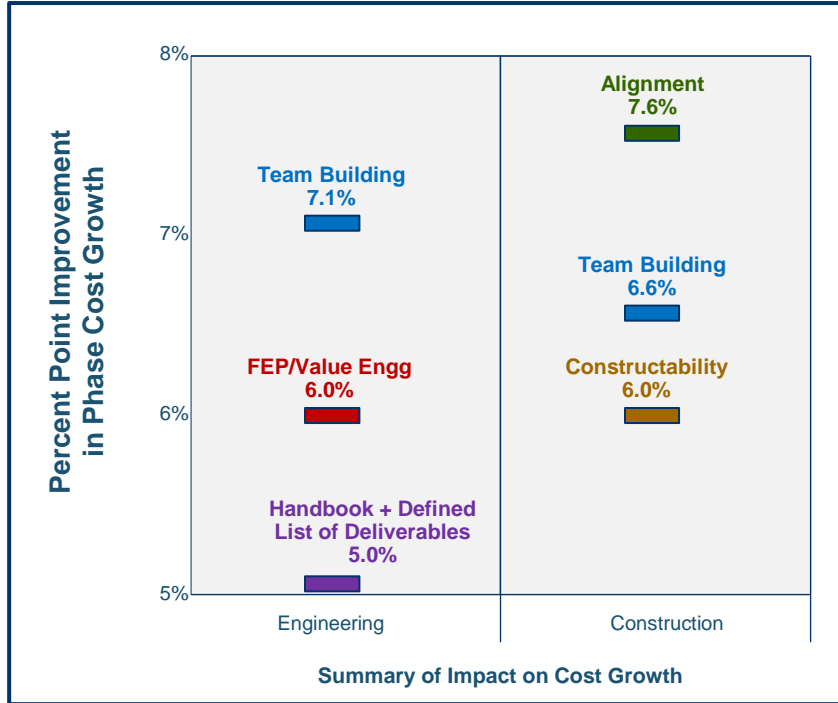
Look Ahead Plan with Project Execution
Strategy and Resource Loaded
Schedule with “pull planning process”

It is not all about technical deliverables but managing the BIG picture (from A-Z) – 10 steps approach

What are other things to consider ?

- 1) Define or minimise the **impact of force majeure and COVID-19**
- 2) Develop the **Execution Plan** based on Project Complexity Model and Deploy Suitable Project Delivery Model (PTAG's Tool to determine the List of Deliverables)
- 3) Ensure that team develops a **Robust Supply Chain** Program with close attention to delivery and fabrication
- 4) **Constructability, AWP**, Site Planning (pre-assembly and pre-fab) etc.
- 5) **Bigger Camp** Considerations due to physical distancing
- 6) **Risk sharing** and collaborative approach – remove execution barriers and duplications.
- 7) Give the team – a **handbook to align** themselves better

Value of Front-End Planning & Best Practice Implementation



Questions and Answers

Feroz Ashraf, Executive Advisor, Capital Project
Feroz.Ashraf@PTAGinc.com
cell: 416-587-8747



Michael Dubreuil, Managing Partner
Michael.Dubreuil@PTAGinc.com
cell: 416-500-3954



“ We can't direct the wind but we can adjust the sails” – T. Monson

