

GLOBAL ENERGY FORUM



Infosys

Managing Large EPC Projects
with Data at Your Fingertips

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Houston, Texas



Global Capabilities and Expertise

- **McDermott is a leading engineering, procurement, construction and installation (EPCI) company focused on executing complex oil and gas projects**
- **McDermott is present worldwide and has been providing EPCI services for 90+ years.**



McDermott Focuses on Field Development Phase



Services from Concept to Commissioning

- Pre-development engineering services
 - Concept selection studies
 - Pre-FEED/FEED [1]
- Turnkey EPCI field development solutions
 - Offshore:
 - Fixed platforms
 - Floating production systems
 - Pipelines
 - Subsea hardware, umbilical, risers and flowlines
- Single discipline (Engineering, Fabrication, Installation) services
- Hookup and commissioning services



[1] FEED = Front-end Engineering and Design

Strategically Located Fabrication Yards

Altamira, Mexico

Area: 119 acres, 198 acres potential



Locations Served

U.S. Gulf of Mexico
Mexico
West Africa

Batam Island, Indonesia

Area: 272 acres



Locations Served

Australia
Indonesia
Malaysia
Vietnam

Jebel Ali, Dubai

Area: 154 acres



Locations Served

Saudi Arabia
UAE
Qatar
India

- Additional fabrication yards in China, Saudi Arabia and Malaysia
- Lease fabrication yard in Baku on a project-basis

Global Marine Fleet with Highly Specialized Capabilities

Rigid Reel Lay

NO 105



LV 108
(2014 delivery)



Flex Lay



NO 102

Agile



Emerald Sea



Heavy Lift/Pipelay (S-Lay/J-Lay)

DLV2000
(2015 delivery)



DB50



DB32



DB30



DB 27



DB101



KP1



DB 16



Construction Support Vessels & Launch Barges

Thebaud
Sea



Intermac
600



Intermac
650



Strong Relationships with Customer Base

Super Majors



NOCs



Others



What are the Challenges in Managing Large EPC Projects ?



EPCI Industry Characteristics

Characteristics

High Value Projects

Long Delivery Cycle

Multi-Locations Delivery:
Engineering Offices, Yards, Onshore/Offshore sites

Multiple Vendors / Subcontractors

High Visibility

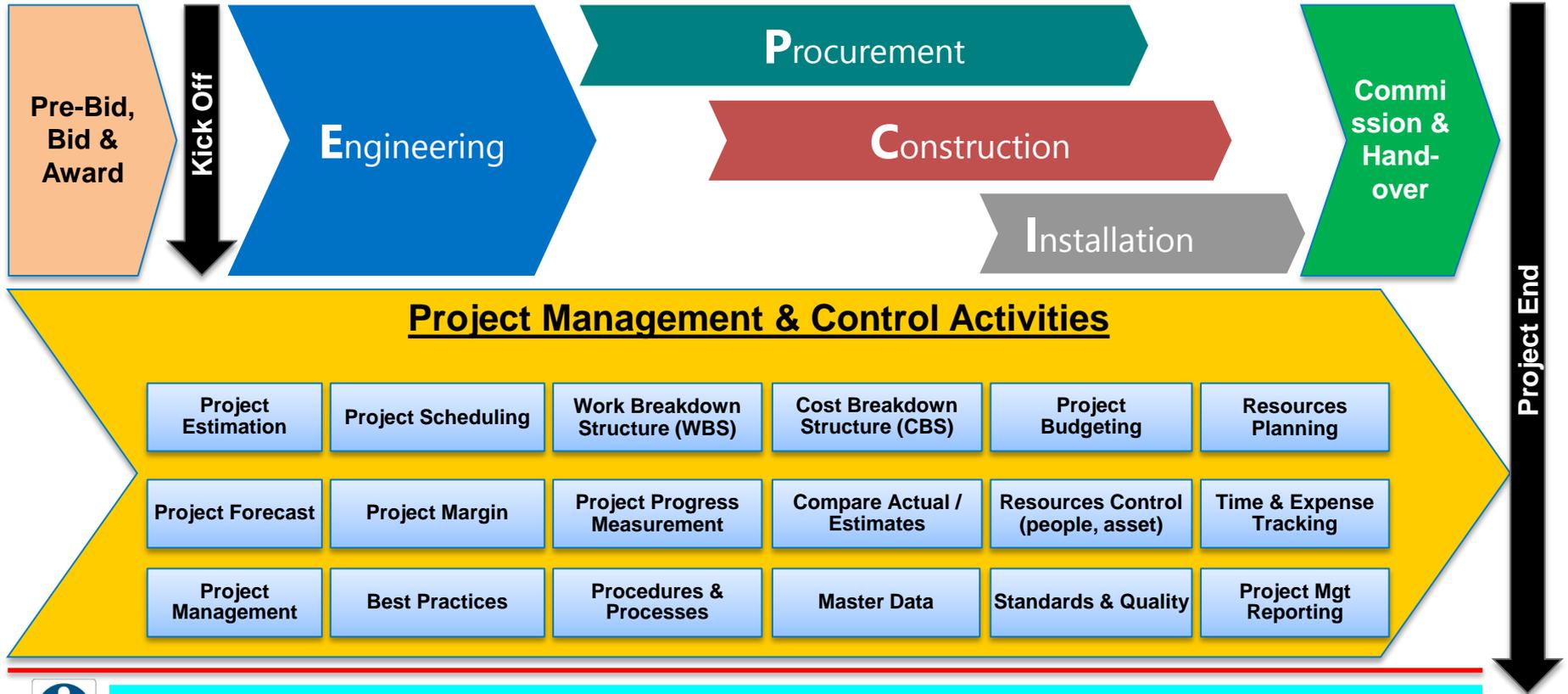
High Risk Project / Contracts



Challenges

- Manage Costs and Margins
- Project Schedule & Cost tracking through Project Phases
- Resource & Skill management
- Maintain Productivity & Quality from diverse teams
- Procurement Budget
- Timely subcontractors Deliverables
- Project Failure Impact on Company Image
- Manage Project Risk

Projects Controls in EPCI

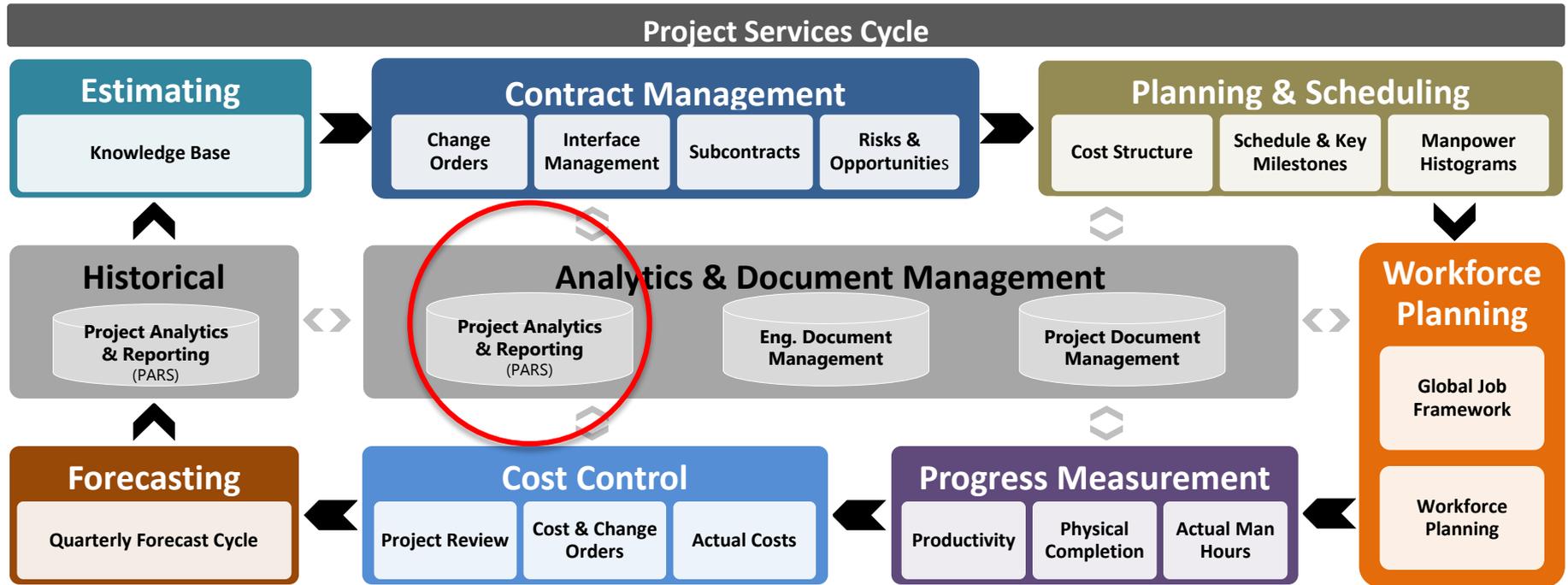


Project controls is a lifeline that connects all phases of an EPCI project!

In Search of "Few Key Data"!



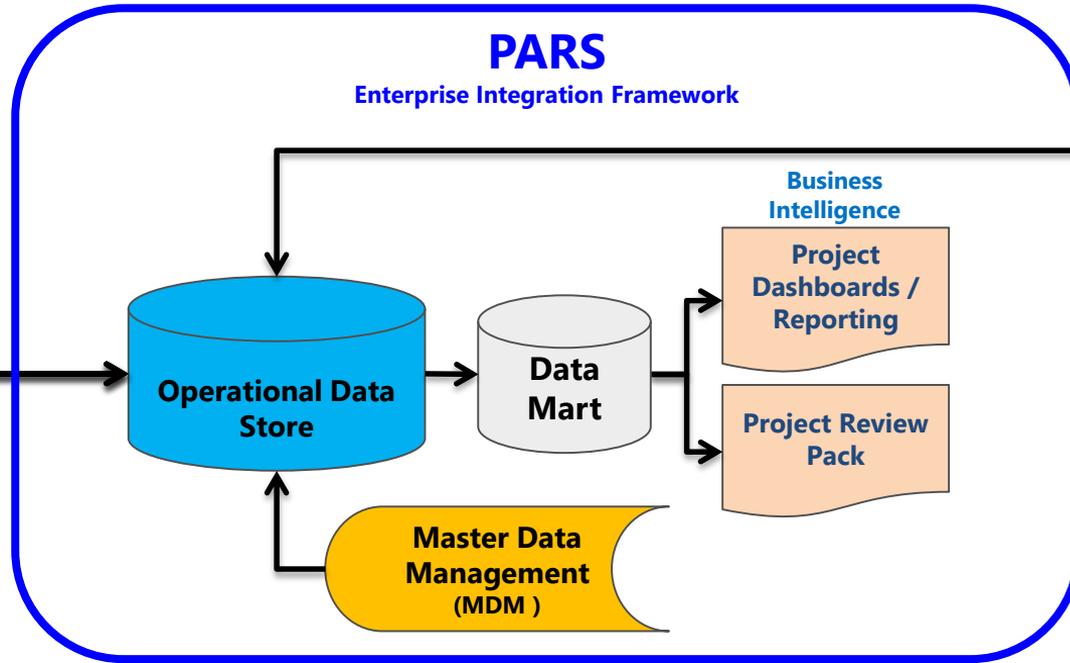
Project Management Systems



Deploy Integrated rather than "Siloed" Best-of-Breed systems!

PARS Project Scope Overview

Legacy Systems



New Systems



PARS Provides Decision Makers with Intelligent Information through Business Intelligence!

Project Information Data Repository...

LinQ Portal Resources Newsfeed SkyDrive James Beck FOLLOW SHARE

LinQ Corporate Services Business Development Operations Projects Collaborate IMS Search

RESOURCE DIRECTORY

All or [Search]

- Spot Video
- Delivering Certainty
- Code of Conduct
- Ethics Portal
- Policies
- Social Media
- Logistics
- Outlook Web App
- Calendar
- EE Directory
- PARS**
- K.now
- Lessons Learned
- Leadership
- DPM Instruction



From Here: Project Managers have the ability to analyze data across multiple projects / locations!

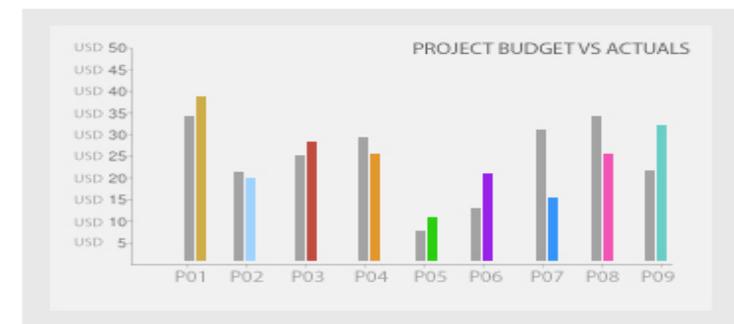
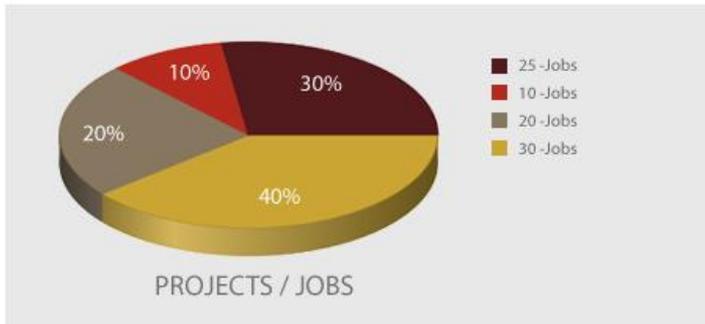
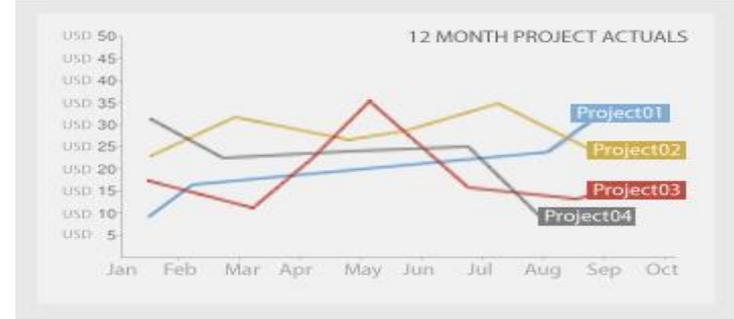
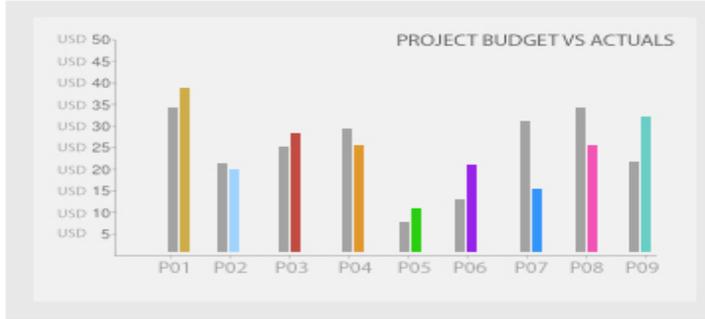


Data Analysis: Single vs Multiple Projects

Reports

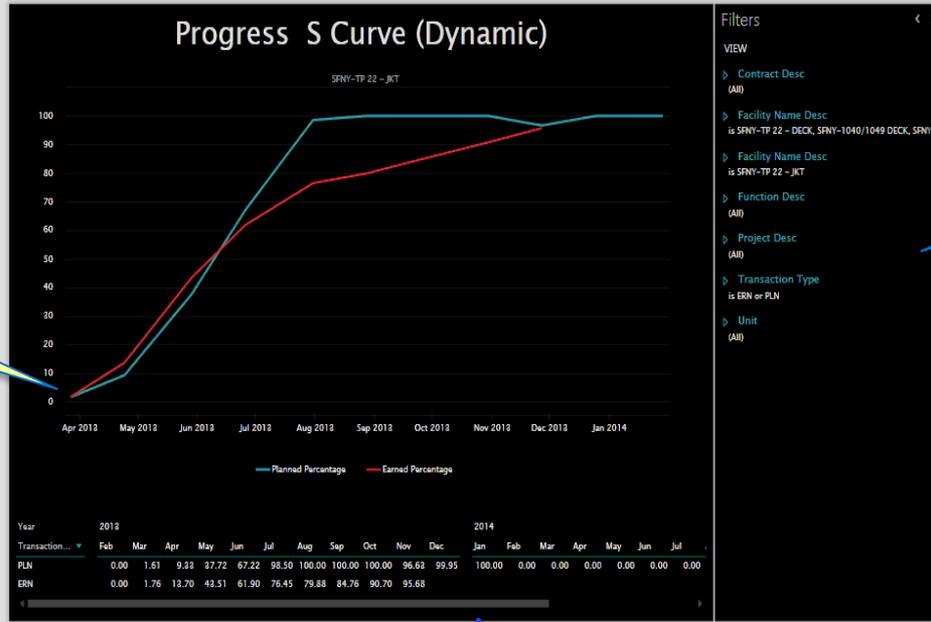
- Offshore Cost
- Offshore Units by Project
- Engineering Cost
- Engineering Units by Project
- Fabrication Cost
- Fabrication Units by Project
- PMT Headcount
- Cost Comparison by Project
- Overall Project Summary
- Cost to Go

Dashboard



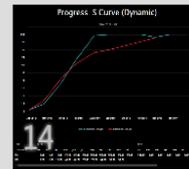
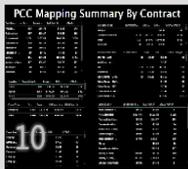
Easy Navigation Interface...

Displayed Report based on filtered queries...



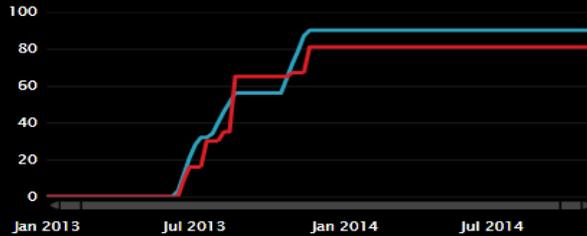
Filters to focus the data search

Ready Made Reports to Choose from...



Multiple Projects Quantity Comparison

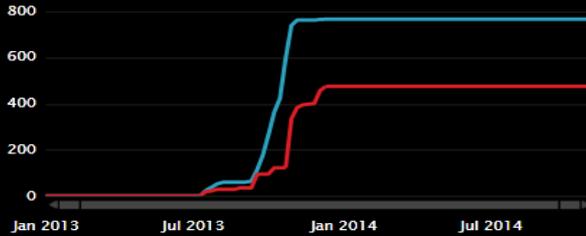
Multiple Quantity



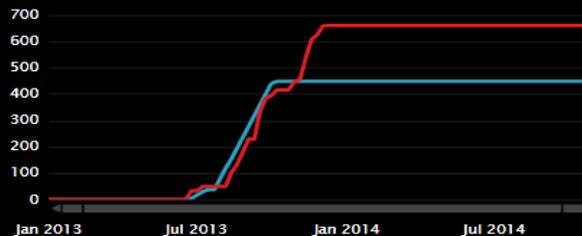
Planned Quantity Act Qty



Planned Quantity Act Qty



Planned Quantity Act Qty



Planned Quantity Act Qty

Filters

VIEW

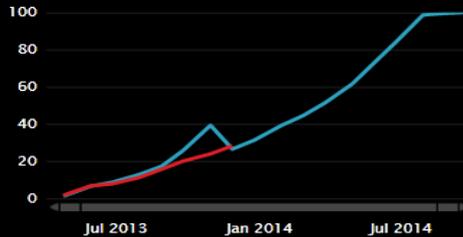
- Facility Name Desc
is SFNY-1040/1049 DECK or SFNY-TP 22 - DECK
- Facility Name Desc
is SFNY-TP 22 - DECK
- Function Desc
(All)
- Project Desc
is Safania Phase 2
- Transaction Type
(All)
- Unit
is Qty

Multiple Projects S Curve & Productivity Comparison

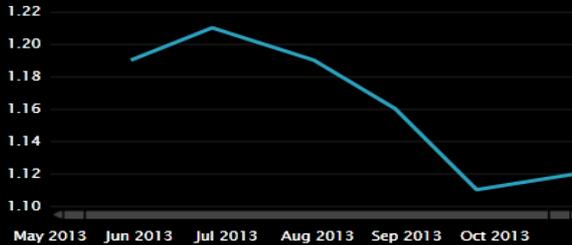
Multiple Progress and Productivity



Planned Percentage Earned Percentage



Planned Percentage Earned Percentage



Filters

VIEW

- ▶ Entity (All)
- ▶ Facility Name Desc is SFNY-1040/1049 AUX, SFNY-216/221 AUX, SFNY-TP
- ▶ Function Desc is Fabrication or Fabrication - Rolling
- ▶ Project Desc is Safania Phase 2
- ▶ Transaction Type (All)
- ▶ Unit (All)

Where do go from here?



Project Execution (EPCI) Data Analytics Roadmap

Process

- Start Scope Implementation
- Assign Line No
- Add Process Line Conditions
- Assign Drawing #

Intelligent P&ID

Develop or convert non-intelligent drawings.

Deliverables

- Pipe From / To
- Line No / Line List
- Process Line Conditions
- Inline Comp. Sequence
- Equipment Tag / List
- Instrument Tag/Index
- Valve No/Schedule
- Nozzle No/Schedule

3D Model

• Create 3D Model

Deliverables

- Isometrics
- Struc Layouts
- Electrical
- Clash Report
- Weld Info
- Piping Layout
- Lighting Layout
- Pipe Supports
- Instrument
- Tray Isos
- BOM
- Progress

Instrumentation

• Populate Inst. tags
• Add Process Line Conditions, Process & Mechanical Data

Deliverables

- Process Datasheets
- Mechanical Datasheets
- Instrument Datasheets
- Single Line Diagrams
- Cable Schedule
- Alarm & Trip Schedule

Electrical

• Cable Sizing
• Cable Tray fill design
• Equipment
• Bus Bar Design.

Deliverables

- Equipment
- Cables
- Wiring Diagrams
- Single Line Electrical Dwg
- Bus Bar Configuration
- Distribution Panel Dwgs

Procurement

• Specs
• Supply Chain / Subcontractors
• Site

Deliverables

- TBE
- RFQ
- MIR
- P.O.
- CBE
- REQ
- MTR
- Sub-Con
- Supplier Mgmt

Project Document

Vendor Document

Project Execution Data Warehouse

Adding Integrated Project Data is Key to Successful Execution!

Deliverables

- Engineering Design Basis
- Checklists
- Electronic completions
- Checklists
- Punchlist status

Completion

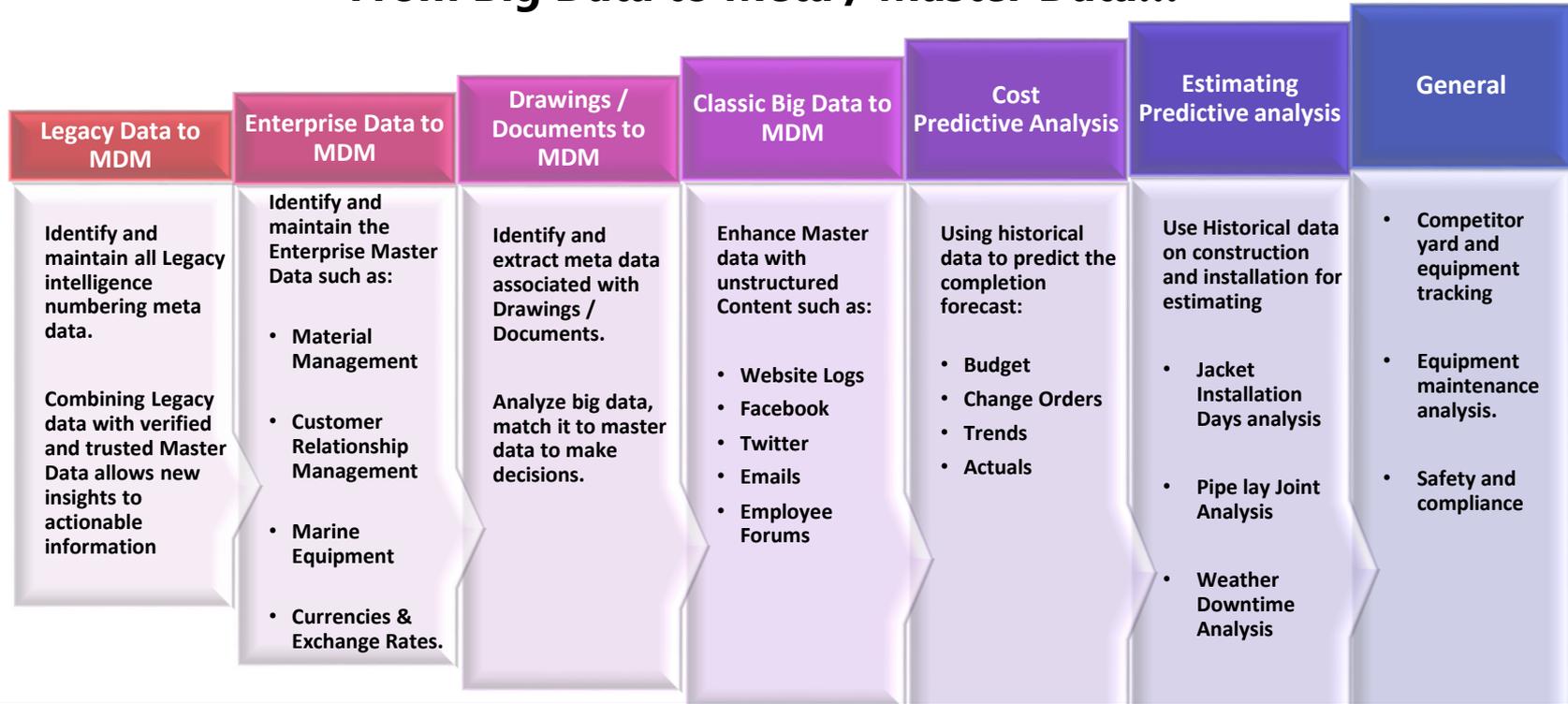
Deliverables

- Piping Work Packs
- Structural Work Packs
- Electrical Work Packs
- 4D Visualization
- Progress Management
- Ad-Hock Reporting

Construction

General Enterprise Data Analytics Roadmap

From Big Data to Meta / Master Data...



Focus on what Matters – the rest is Noise!

In Summary: The Strategic Value of Data...

Delivering Certainty through integrated IT systems and reliable data integrity...

