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LEVERAGING ADVANCE ANALYTICS TO DRIVE EFFICIENCY & PREDICTABILITY IN EPC PROJECTS

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AGENDA:

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- Technology Advancement in EPC Projects
- EPC Industry Performance trend & Adoption of Digital Technologies.
- Challenges in Adopting to Organizational Digitalization strategy/Upcoming Technologies
- Advanced Analytics as a Catalyst for Digitalization
- Analytics Landscape in EPC Projects
- Precursors to Advanced Analytics – Data/Work Process Standardization & Digital Integration
- Advance Analytics Use cases in EPC Projects.
- Traditional Benchmarking Vs Execution Analytics
- Leveraging the learnings of Past
- Connecting the dots with Fluor's "Watson" Big Data Analytics
- What is **EPHD**^{SM}
- Demo Video **EPHD**^{SM}

USE CASES OF TECHNOLOGY ADVANCEMENTS IN EPC PROJECTS

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- **AI in Design** can completely transform the Engineering Industry. Some Examples include Optimizing design basis, Generating Engineering Deliverables with AI , Detecting/Resolving and communicating clashes during modelling etc.

- **Robotics** are also gaining traction in Construction, Example Boston dynamics Robodog performing various construction activities like Lase Scanning, Quantity surveying etc.

- **AR/VR** can simulate construction environments and scenarios, offering a safe and controlled space for training construction workers. A company could train thousands of construction workers on details much more efficiently using this technology.

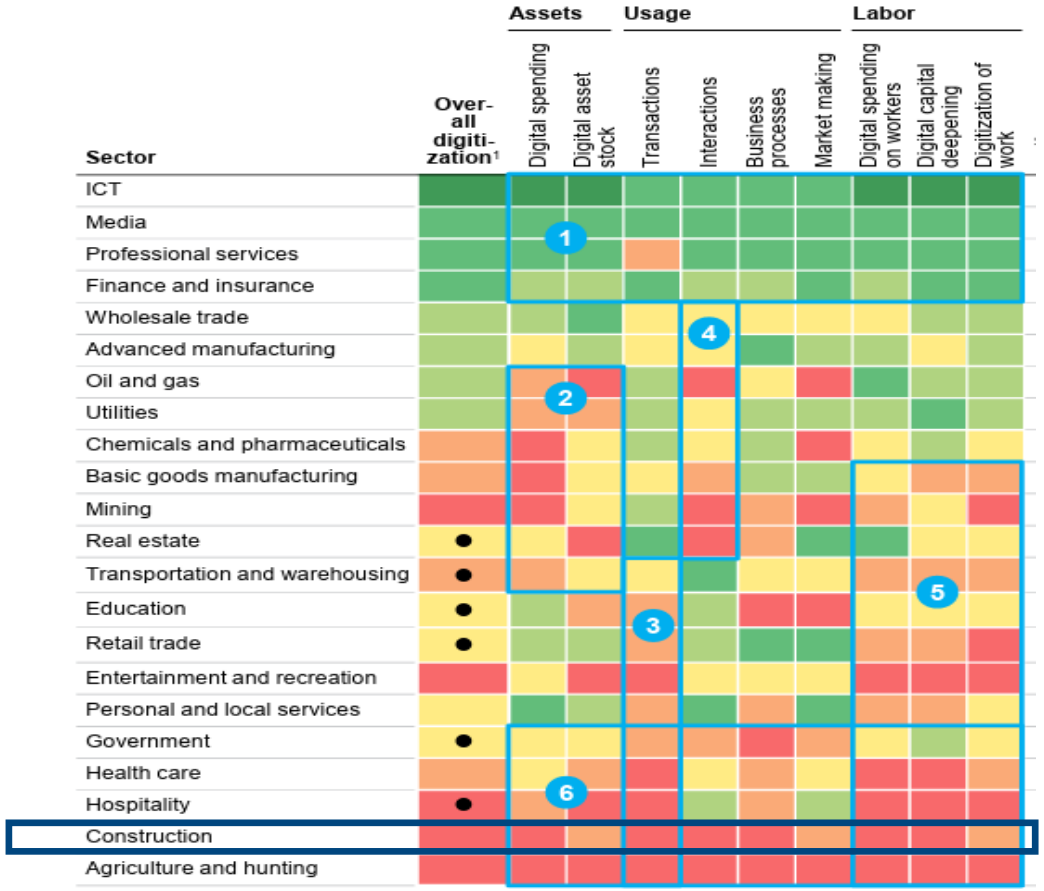
- Integration of VR with digital twins allows for detailed planning and troubleshooting before the actual construction begins.

- AI can help managing workforces on Construction site, which is especially important for getting maximum productivity out of a limited skilled-labor workforce.

- **Gen AI** can reduce the cost of creating software that can further improve productivity, and which could mean that EPC firms will start to develop their own custom-tailored software.

REALITY CHECK: INDUSTRY PERFORMANCE

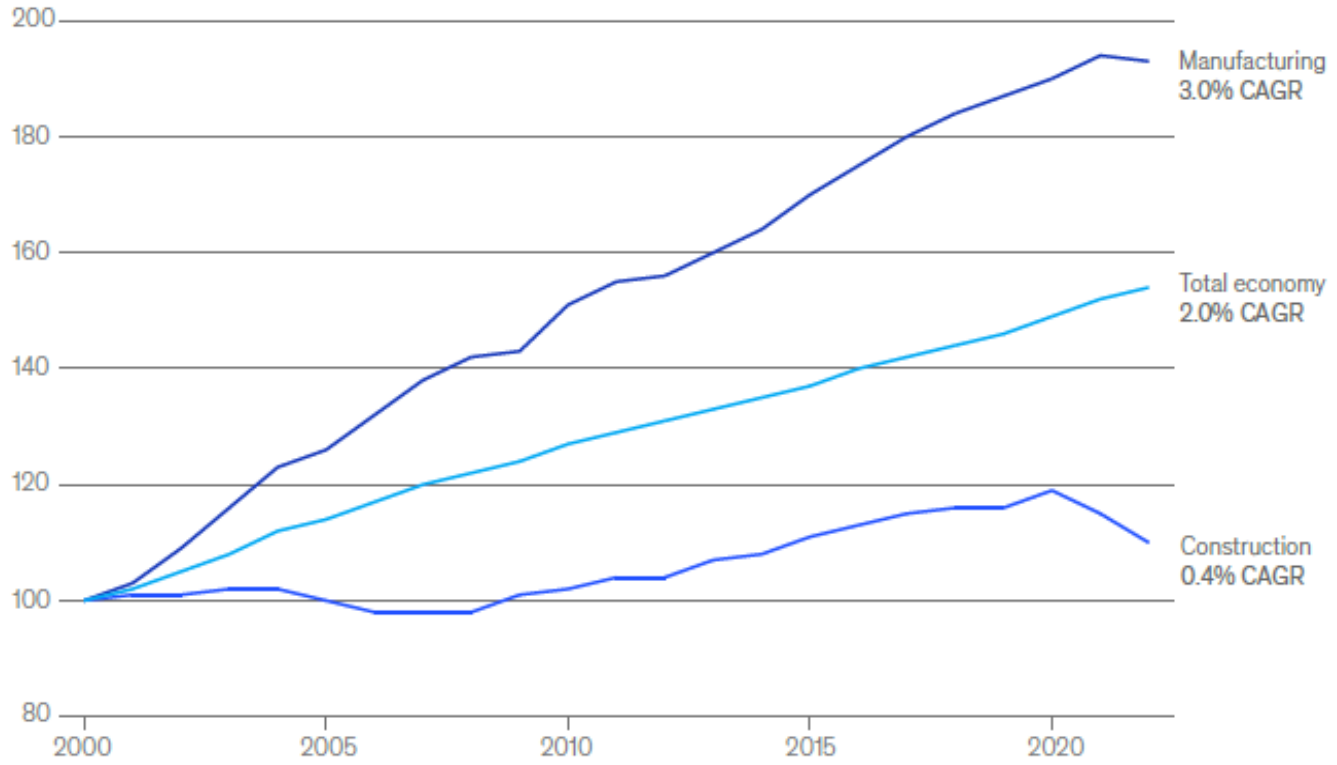
The MGI Digitalization Index [1]



Barriers to the Digital Adoption- Top 3 [3]

32%	31%	25%
Lack of Digital Skills	**High Cost of Technologies**	Lack of Technology Providers

Real Gross Value Added Per Hour (Global) [2]



Source:

1) **Mckinsey Global Report: Digital America: A tale of Haves & Have Mores, Dec 2015.**
2) **Mckinsey & Company Operations Practice - Delivering on construction productivity is no longer optional, Aug'2024.**
3) Deloitte Access Economics based on construction and engineering business survey (2025)

CHALLENGES: WHY THE TECHNOLOGY ADOPTION IS LOW, PITFALL, SOLUTIONS?

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- **Digital transformation of an organization is a multiyear, multimillion-dollar effort.**
- **Difficult to justifying the funding for these projects**, highlighting the value added and return on investment on these projects.
- Key challenge in these circumstances is to get the organization's stakeholders onboard by **demonstrating the benefits of digital transformation at the start of a project.**
- Unlike other product-based organizations where there is a continuous influx of revenue for R&D purposes, almost all the **focus and priority for EPC organizations is the execution of these multiyear**, often multibillion-dollar projects that are the building blocks of the revenue stream for them.
- One of the key tangible benefits of digitalization is through **Value driven through Data-Analytics.**
- Building up & implementing **Advanced Analytical capabilities to begin with** can aid the digital implementation team showcase value incrementally as well as building Digital Infrastructure incrementally.
- An EPC organization can start in a **phased manner with Data standardization, Digital integration of core project systems and develop some advanced analytics capabilities** through the EPC project lifecycle that helps their current projects execution performance with data-based decision making and supports their case for complete digital transformation by serving as a **proof of concept (POC) of value driven** .

ANALYTICS LANDSCAPE: EPC PROJECTS

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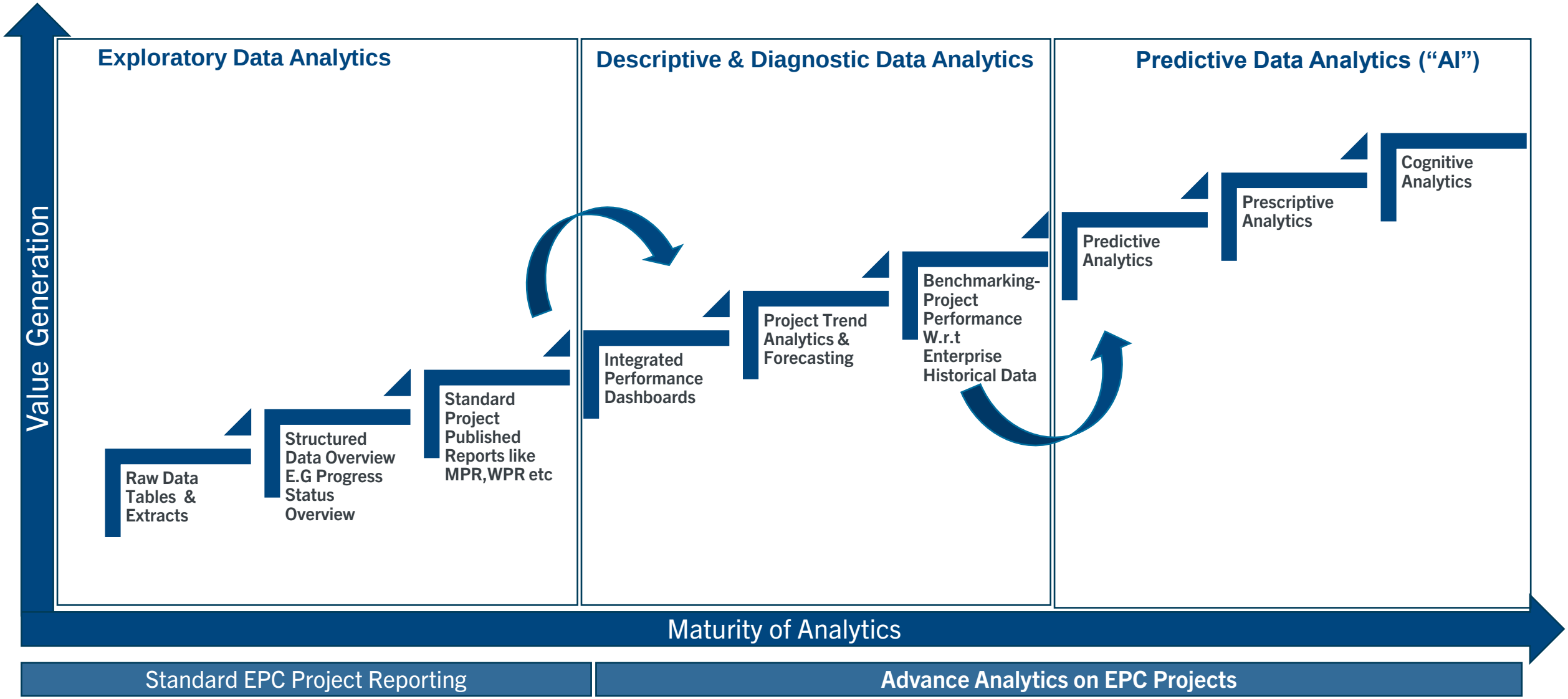

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‘Data is the new Oil’

Clive Humbly, Mathematician , 2006

What most of us understand:

- Just like Oil, Data is Valuable

What is important to Understand:

- Just like Oil , If Unrefined, It is only a burden and of no use.
- Just like Oil needs to be changed into Gas, Plastic, Chemicals and other products to make it Valuable, Data needs to be **Cleaned, Structured and Rationalized to create Value** .

PRECURSERS OF ADVANCED ANALYTICS

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Data Standardization:

- Enables operational consistency across projects, offices and regions.
- Drives quality across the organization through Automated flow of Data and Consistent reporting.
- Empowers organization through Reuse of Historical data for training Predictive analytics models.

Standard Work Practices:

- Create efficiencies by not ‘Reinventing the Wheel’.
- Support Data Standardization.
- Support Digital Integration.

Digital Integration:

- Multiples applications in sync (Orchestration) with each other creating efficient Digital ecosystem.
- One of the biggest challenge is number of different data environments used by construction businesses to collect, manage and share project-related data

DIGITAL INTEGRATION:

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Data Standards/Definitions
Standard Work Practices Library

Standard Execution Work Procedures

Data Standards for Project Systems Setup

Integrated EPC Systems Environment

Engineering Design/3D Modelling Tools

Estimating Tool

Scheduling System

Material Management

Cost & Cash Flow

Enterprise Resource Management(ERP) System

Change Management System

Subcontract Management

Progress Management

Risk Management

Resource/Staffing Management

Engineering & Supplier Document Management

Other Misc. Project Databases/ Systems

Construction Database Like Welding, Punhlisting, Turnover Etc

Central Repository/ Datawarehouse

Data Governance/Quality Control

Data Transformation for Analytics

Structured Data for EPC Project Analytics

Advanced Analytical Charts, Metrics, Features, Predictive Models for organization wide users for data driven decision making

ADVANCED ANALYTICS USE CASES: EPC INDUSTRY

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FRONT END ANALYSIS

> Estimate Benchmarking Analytics

> Class 5 Estimate development based on Historical Data

> Go-No Go for Project Bidding/ Financial Investment Decisions

EXECUTION ANLYTICS

> Project Current Execution trends

> Project Forecast validation w.r.t execution data of similar projects at similar stage

> Prediction Models to foresee the project outcomes

> Risk identification & Validation of mitigation Strategies

> Scenario/Whatif Analysis

CLOSE OUT ANALYTICS

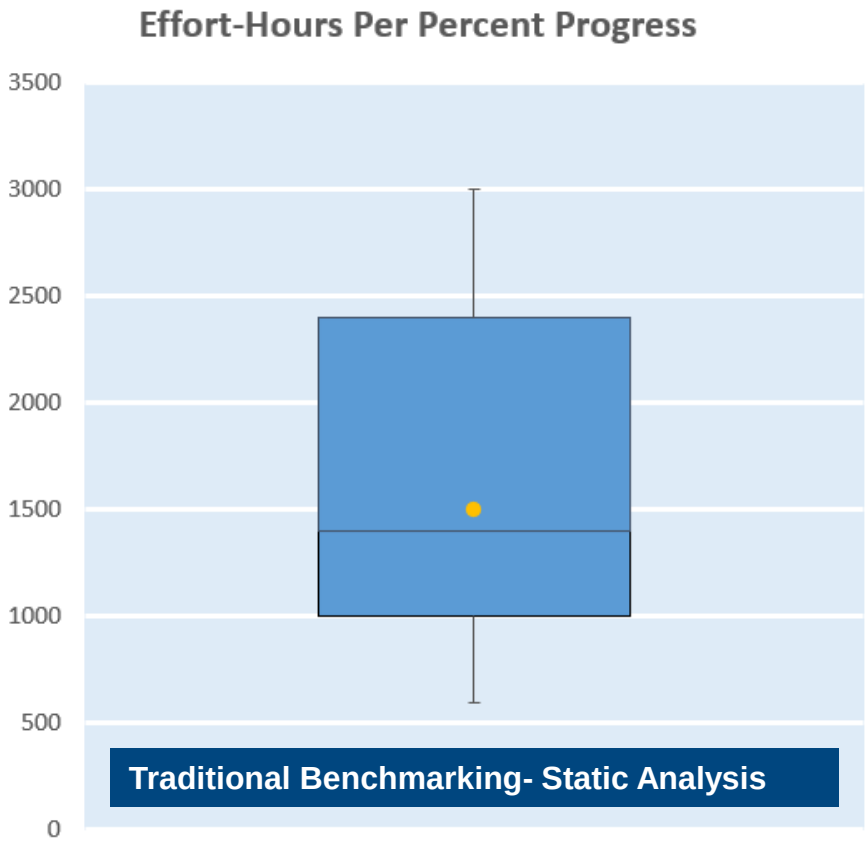
> Lessons Learned studies for Future Projects

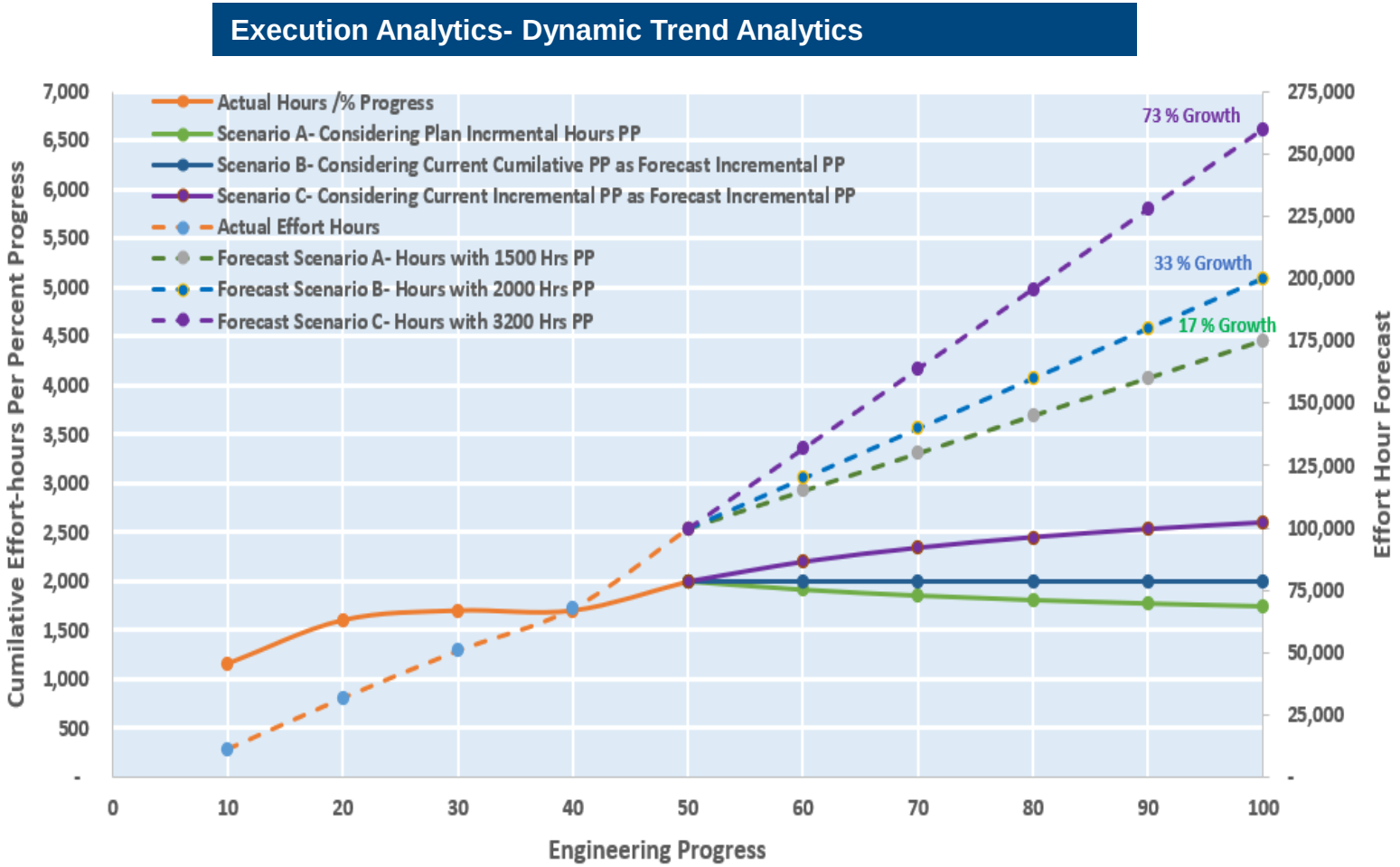
> EOT Support

> Subcontractor Claim support

> Other Forensic (Post-Mortem) Analysis

DIFFERENCE IN ‘EXECUTION ANALYTICS’ & ‘TRADITIONAL BENCHMARKING’





LEVERAGING THE LEARNINGS OF PAST

Bringing in reference class perspective in Analytics

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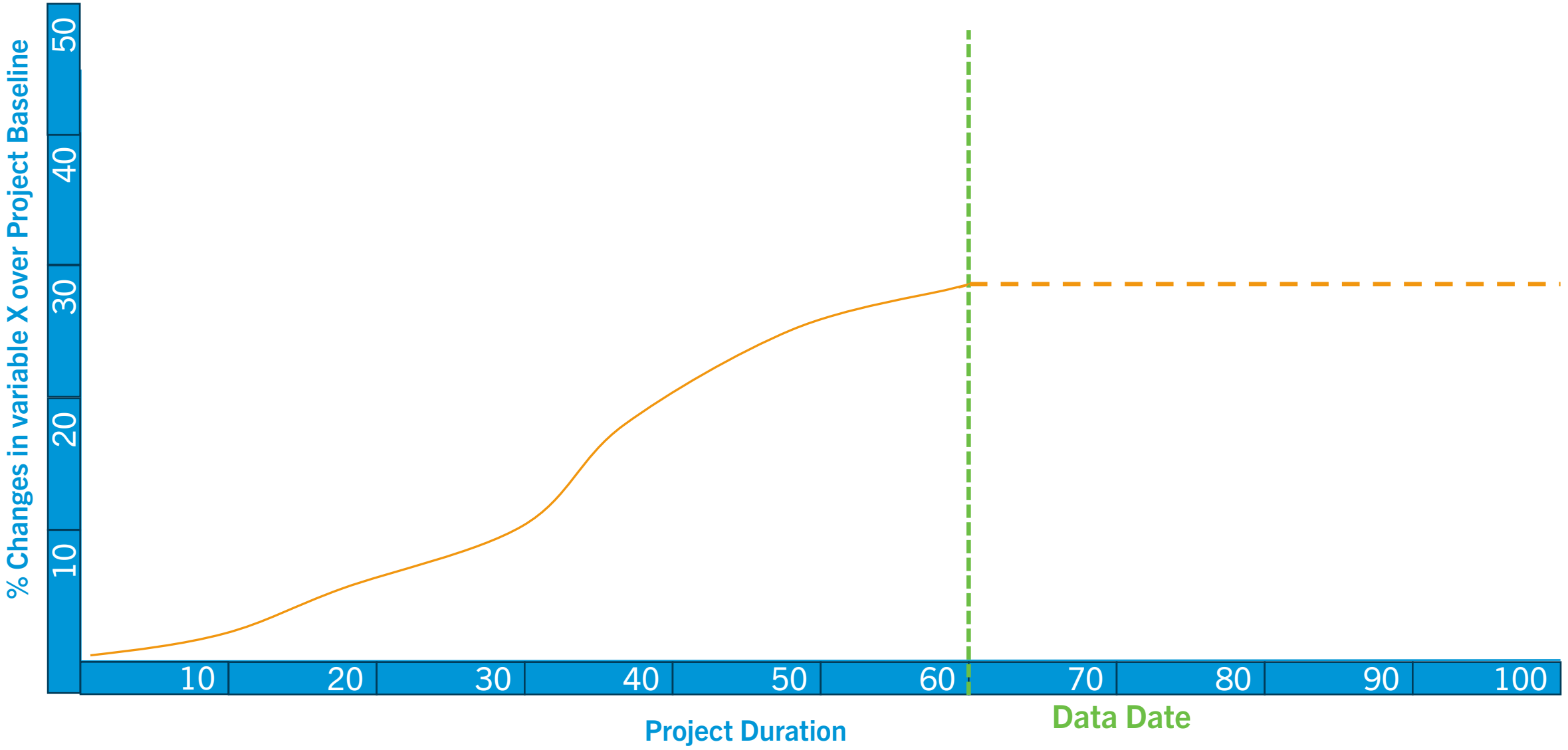

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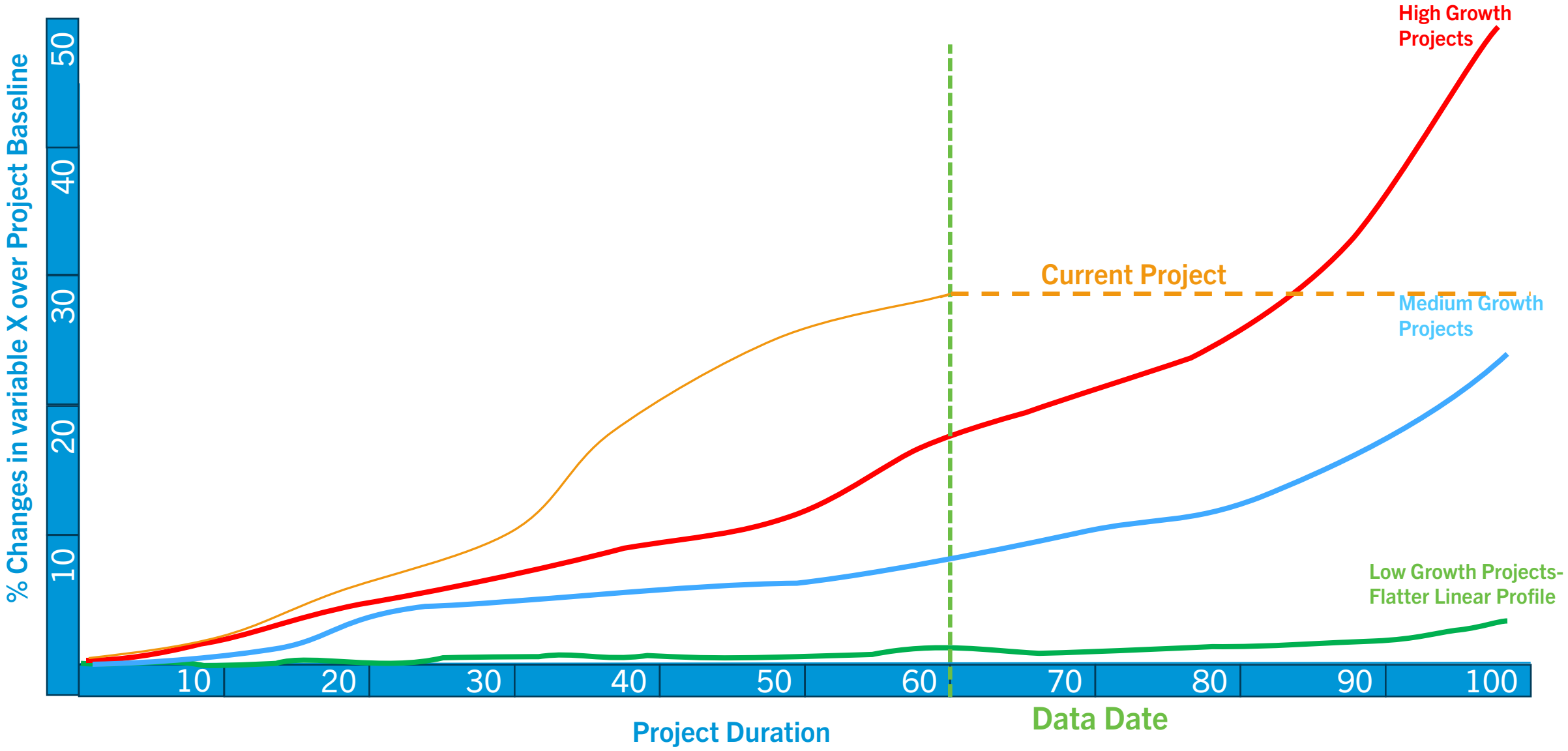

CONNECTING THE DOTS WITH FLUOR'S "WATSON" BIG DATA ANALYTICS – LEVERAGING EPHD℠ VALUE WITH PROJECT DECISION SUPPORT

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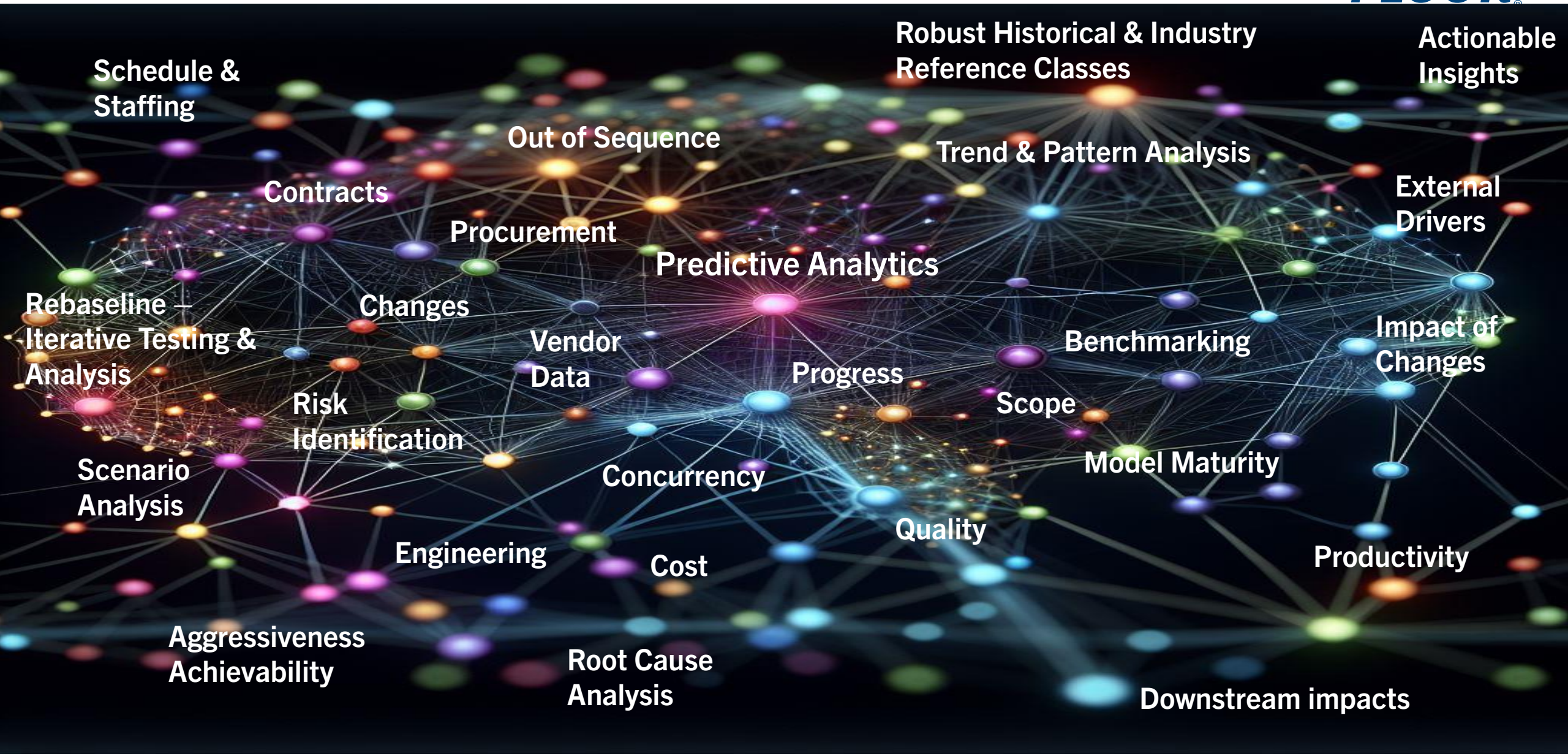

FLUOR'S "WATSON" EPHD℠ = EPC PROJECT HEALTH DIAGNOSTICS

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- Fluor Internal Reference Tool for Project Management decision making and support, used for Select Internal Projects as well as few Key External (Non-Fluor Perform) projects for Fluor Clients.

- Fluor's EPHD℠ Analytics is a First-of-Its-Kind technology platform, delivering early & actionable Health Status & Risk indicators thru state-of-the-art smart graphic Visualizations and Predictions on Various project execution Parameters.

- Empowering PM's and Key Project team members with capability to systematically examine and monitor the project vitals on monthly basis, e.g., Current Issues, Root Causes, Early Warning Indicators, Potential cascading impacts on future productivity and performance, ability to aggregate related features together to predict the overall Delay and performance at each stage of project.

Key EPHD℠ Metrics

300 +
Completed EPC Industry Projects Data

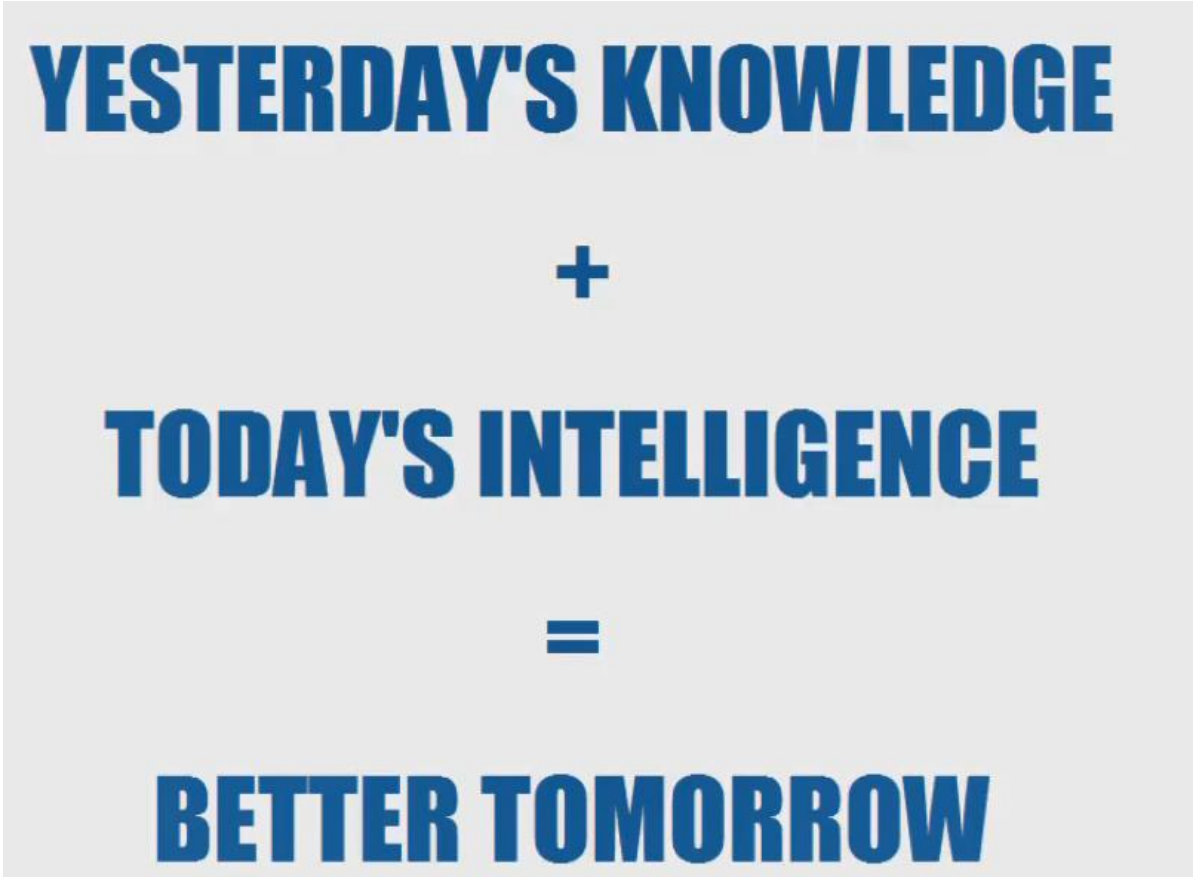
25
Years of Historical Project Data

20+
Live Projects Being Monitored and Analyzed

250+
Projects with Monthly Project Data trends

6+
Auto Extraction/Ingestion of Project systems/ Reports

90%+
Data coming from Project standard systems/ Report



THANK YOU!