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Breakout: Predictive Project Analytics for Projects: The Next Generation is Here

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9:45 – 10:45 a.m.
AGENDA

WHAT KEEPS YOU UP AT NIGHT?
History and trends of project management

REST EASY
How can analytics help enhance delivery confidence?

WHAT HAVE WE DONE?
How are we turning hindsight into insight, and moving towards foresight?

THE CASE STUDY
What a large mining organization did differently

DASHBOARDS & ADDITIONAL OPERATIONAL USES
What we have heard and learned

BACK TO THE START
Mock test results and Q&A
WHAT KEEPS YOU UP AT NIGHT?

History and trends of project management
Lots of investment in methodologies, standards and processes...are we getting the right ROI?
While project failure rates remain stubbornly high, common challenges include:

- Obtaining the “right” people and the “right” logistics
- Managing materials and related sequencing to reduce bottlenecks
- Lack of experience in managing unconventional (non-routine) projects
- Limiting exposure to reputational risk, penalties and litigation
- Lack of alignment between engineering and fabrication requirements
- Project efficient supply chain management
- Basic assumption that projects will always be over budget and late
- Reputational risk for both clients and EPC or advisors
- Excess of optimism and gates that have become a “checklist” point
- One size fits all methodologies and governance structures that are rigid rather than scalable and flexible

65% of mega capital projects around the world fail

54% of capital projects are completed on time

54% of capital projects are completed on budget

69% of executives were not confident that their organization was optimizing return on investment capital for industrial projects

“Insanity: doing the same thing over and over again and expecting different results.”

- Attributed to Albert Einstein
THE COMMON CHALLENGES FOR ENGINEERING & CONSTRUCTION PROJECTS

Lack of Clear Strategy & Poor Business Case Evaluation
• Misalignment between corporate and Program strategy
• Business case does not fully consider all project requirements resulting in budget issue before even starting
• Program / project strategy unclear resulting in inefficiencies later

Inadequate Governance
• Absence of stage gate process to contain/control critical phases
• Undefined roles and responsibilities of key team members
• The risk management framework and process is not designed or implemented according to business requirements

Inefficiency of Capital Allocation
• Inefficient funding or tax structure results in sub-optimal outcome
• Inefficient processes
• Controls may be weak resulting in overspend and unnecessary risks
• Absence of benchmarking or value for money analysis

Lack of the right skills
• Staff capacity of capability issues including core commercial skills required to let and manage contracts
• Absence of incentives for staff to achieve high performance
• Cultural differences in supply chain can result in issues e.g. differences in the health and safety approaches can lead to issues

Lack of quality data to inform decisions
• Absence of robust information and data to inform quality decision making
• Contractor data and KPI’s in the Program not linked to and driving successful outcomes
• Decisions made using anecdotes rather than hard facts
• Time and cost monitoring not visible to management

Delivering an Asset not just an Operation
• User acceptance does not occur due to lack or consideration of their requirements
• High occurrence of defects
• Poor project close-out reviews
• Unresolved disputes and significant claims
• Operating and maintenance information not comprehensive
IS SOMETHING MORE GOING ON THAN JUST POOR MANAGEMENT?

Ignoring unknowns & Optimism bias
Teams scope and plan what they can foresee and ignore unknowns.

Anchoring intuitive benchmarks
Early day estimates or executive directives can establish unreliable and spurious anchors becoming mental reference points in subsequent planning.

Confirmation bias
People disproportionately seek and weight evidence that supports their world view / hypothesis

Over reliance on expertise
Subject matter expertise can be dangerously confused with delivery expertise.

Under reliance on benchmarks & Historical reference models
Analogous comparisons rarely sought and unfavorable comparisons frequently ignored or rationalized away “we won’t repeat their mistakes, it’ll be different for us”.

Sunk cost fallacy & Loss aversion
People don’t want to face into a failure or have to admit a bad decision.

Source Daniel Kahneman – Thinking Fast & Slow, and * Bent Flyvbjerg – Megaprojects and Risk: An Anatomy of Ambition
REST EASY

How can analytics help enhance delivery confidence?
HOW ARE A LEADERS USING ANALYTICS TO BREAK THE TREND?

Analytics is making project management execution better through:

**Unlocking & Simplifying Existing Data Through Visualization**

**Tailoring Delivery Approaches Based on Project Risk & Complexity**

**Using New Elements to Make Better Decisions Based on Learned Intelligence**

**Maintaining the Link Between Decision Analysis and Project Execution**

**Linking Complexity, Controls, Confidence, Competency**

Asking the right questions, to the right people, at the right time.
Enhance Investment Decisions
Quantifying the impact of project complexity and risk to enhance investment decisions

**Results:** With the Complexity enhanced NPV and investment decision process organizations will have a stronger foundation to optimize capital efficiency for decision making.

Improve Execution Success
Ensure appropriate level of governance and performance execution levels to maximize benefits realizations

**Results:** Leverage the established Complexity Profile to ensure the appropriate governance and project execution performance levels are applied to the selected capital investment.
WHAT HAVE WE DONE?

How are we turning hindsight into insight, and moving towards foresight?
WHAT IS PPA?

- Complexity Analysis
- Controls Review
- Competency Scan
- Pulse Check
- Dynamic Risk Monitoring
WHY PREDICTIVE?

When we are able to really understand complexity, together with key risks, set up the right level of controls, and assign the right team the likelihood of success is higher. We complement it by measuring confidence, ensuring compliance and benchmarking where possible. If the pillars are unbalanced the likelihood of success is lower – wrong team, wrong controls, wrong risks or not fully understanding the project will certainly decrease the likelihood of success. Our objective is to use analytics to access better intelligence, that will result in making better decisions.
HOW WAS PPA DEVELOPED?

Project Predictive Analytics was developed through years of research jointly conducted by a government-funded private research institute, educational institutions and the private sector. The result is a powerful algorithm that correlates project complexity factors to detailed project execution characteristics that is uniquely tailored to each project.

Key inputs used to develop the algorithm:

- Thousands of projects within a broad range of sectors, looking for success
  - Finance   |   Telecommunications   |   Infrastructure   |   Defense PS E&R CB
- Methodology & capability reference groups
  - PMBOK /MSP/PRINCE | SEI | Capital Projects Mining | Oil & Gas | IT | Government

Research and theories

Through the rigorous development process previously outlined (PPA Background), the PPA algorithm was established and functions based on a statistical inference engine that correlates universal complexity characteristics to project execution characteristics to identify the required level of control and performance.
COMPLEXITY ANALYSIS: WHAT MAKES PROJECTS DIFFICULT TO SUCCEED?

Decision Making
- Assesses the complexity of decision-making related to the type of decisions, number of stakeholders and their interests

Behavioral Change
- Assesses the challenges for the project associated with (human) change management

Uncertainty
- Assesses the challenges related associated with uncertainty and risk

Technical Risks
- Assesses the challenges associated with the required technical or system changes (engineering, telecommunications, production, controls etc.)

Delivery Management
- Assesses the challenges linked to planning, project management and execution of project activities
### Controls: What Control Areas Are Critical?

<table>
<thead>
<tr>
<th>Control Domain</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Governance</td>
<td>The section concerns the decision making framework for the project— that the correct decisions are made, in the correct timeframes, by the correct individuals or groups to ensure successful delivery.</td>
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<tr>
<td>Ownership</td>
<td>This section assesses the provision, alignment and clarity of organisational ownership – particularly at the Executive level. Clear project ownership within an organisation is key to ensuring strategy and direction are aligned.</td>
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<tr>
<td>Delivery</td>
<td>This section concerns the mechanisms put in place to help the project deliver against its objectives, timelines or budget – key control measures common throughout the project lifecycle such as plans, schedules, issue resolution, and stakeholder management are considered.</td>
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<tr>
<td>Change Management</td>
<td>This section assesses the level of control imposed by the project to manage change, and the strategic and tactical support the project receives from the wider business units and whether this level of control is appropriate for the overall level of change.</td>
</tr>
<tr>
<td>Resource Management</td>
<td>The section concerns the provision of sufficient organisational resources for successful project delivery. In particular, the selection, planning, skills, experience, commitment, and performance management of project resources is assessed.</td>
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<tr>
<td>Risk Management</td>
<td>The section concerns the management of project risk. Successful understanding, management, and mitigation of key risks to the project is a vital activity to ensure the project objectives are delivered without compromise to time, quality, or cost. Risk categories assessed include strategic, tactical, reputational, contingency, budgetary, and technical.</td>
</tr>
<tr>
<td>Contract Management</td>
<td>This section assesses the ability of the project to manage its vendors and that the appropriate contracting approach has been taken. Consideration is given to areas including vendor management, contracting approach and structure, supplier selection, intellectual property, administering the contract(s), and contract deliverable tracking.</td>
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COMPETENCY SCAN: DO WE HAVE THE RIGHT TEAM IN PLACE?

• Provide insight in project management and project management team abilities matched against complexity of project.

• Competency analysis is based on same complexity profile as is used for controls reviews. These two analysis complement each other perfectly when setting up a project.

• The competency analysis is especially useful in portfolio management, supporting resource allocation decisions.
PULSE CHECK: WHAT HAPPENS IF WE DO NOTHING?

- Analysis based on quick and anonymous poll, project stakeholders (segmented) indicate their "sentiment" on project success
- Will provide trends over time and differences in perception on project success between stakeholder groups
- The pulse check provides guidance on where a deep(er) dive and action will be useful

"Chaos is merely order waiting to be deciphered."
- Jose Saramago
DYNAMIC RISK MONITORING: WHICH RISKS DO WE NEED TO CLOSELY MONITOR?

Dynamic risk monitoring is developed to engage key stakeholders of project to provide their view on key project risks.

- Provides possibility to conduct measurements and trends on an interval basis to identify and monitor trends.
- User friendly and fast insight in risk appetite, profile of project and attitude of stakeholders towards risks.
- Premise: Everyone must manage and monitor risk.
THE CASE STUDY

What a large mining organization did differently
Pilot Scope:

As part of a Predictive Project Analytics review, Deloitte was engaged to work with the client’s Internal Audit team to conduct a PPA assessment on an operational project currently in the execution phase.

Project profile: ~$900MM Phase X operation expansion

Pilot Findings:

Complexity Profile

- Complexity was 6.5 on the 10-point Complexity Scale.
- Projects with this level of complexity typically involve multiple disciplines/functions and typically have Board-level attention.

Performance Profile

Pilot Key Findings:

- Risks were adequately assessed and modeled at project outset, but have not been re-modeled and added to contingency based on actual events. The project has already used $58MM of contingency.
- Sub-contractors did not have sufficient governance processes in place to ensure issues and risks are adequately reported to the broader project organization.
- Core accountabilities within the project were not at the level that would be expected for a project of this complexity.
- Stakeholders and change impacts may not be managed at a level commensurate with a project of this complexity.

Opportunities:

- PPA evaluated a broad range of project factors - social/political, stakeholder and subcontractor relationships, ambiguity, and project execution factors that complemented and enhanced existing Internal Audit project review audit approaches.
- PPA identified a number of areas that impair the ability of the project to deliver as expected, and that may have an impact on budget increases and schedule slippage challenges experienced on the project.
- The analytic nature of Predictive Project Analytics allowed Internal Audit to supplement their findings with objective insights into project performance.
- Objective and data based findings also offered specific and tangible recommendations to enhance project performance.
DASHBOARDS & ADDITIONAL OPERATIONAL USES

What we have heard and learned
ADDITIONAL OPERATIONAL APPLICATIONS OF PPA

What we have learned from our clients

• Analytics can improve capital efficiency with tangible ROI for various stakeholders.

• Analytics are a flexible and scalable solution to supplement existing project management methodologies and control functions.

• Provide additional quantitative and defendable data points to drive project/program management decisions.

• Insight into level of manageable project complexity and risk given organization’s current capabilities.

• Improved transparency and integration amongst Project Control Functions.

• Provide analytical based findings with quantitative risk data decreasing subjective element from project reviews.

It’s time to use analytics in unconventional ways to predict future project outcomes and drive execution excellence.
PROJECT DASHBOARDS: VISUALIZATION IS NOT ANALYTICS... BUT ONE OF ITS OUTCOMES

Providing in the future advanced insights...

The need to layer-in new perspectives...
Dashboards should be answering questions of value creation by projects.

Leveraging market experience and innovation...
BACK TO THE START

Demo Results
and Q&A
OUR RESULTS: TODAY’S PULSE CHECK

Sentiments on:

1. When will this project be completed compared to original timelines?

2. Where will this project land compared to its original approved budget?

3. When this project is finished, what percentage of your intended benefits (ROI) will you realize?

Stakeholder groups (Project size):

A. Less than $150 million
B. $150 – $500 million
C. More than $500 million
OUR RESULTS: TODAY’S PULSE CHECK

Benefits

More than $500 million

$150 to $500 million

Less than $150 million

Negative Neutral Positive

Schedule

More than $500 million

$150 to $500 million

Less than $150 million

Negative Neutral Positive

Budget

More than $500 million

$150 to $500 million

Less than $150 million

Negative Neutral Positive