OPPORTUNITIES TO CAPTURE VALUE THROUGH INTEGRATING CPEC'S PROJECT DELIVERY SYSTEM IN THE PROJECT LIFECYCLE

THE POWER OF REAL-TIME INSIGHTS WITH CPEC

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This decade may witness an unprecedented surge in capital deployment across various sectors, driven by net-zero objectives, enhancements in global living standards, and efforts to address supply chain disruptions caused by geopolitical issues. Given the rapid transformations in these domains, there is an urgent need for an accelerated pace in the development and delivery of capital projects. The construction industry is not only racing against time but also grappling with a historically inadequate approach to project execution. This approach is characterized by deficient front-end project definition, misaligned incentives, resource constraints, and entrenched practices. Without substantial changes, the essential capital projects might not be completed within the anticipated cost and time parameters.

The imperative for change is glaringly apparent, as the execution of capital projects in every sector consistently yields unsatisfactory results. Projects routinely exceed their timelines and budgets, falling short of delivering the expected outputs.

A 2022 McKinsey study analyzed more than 500 projects around the world, each with a total project value of at least $100 million; 62 percent of the project sample

were “megaprojects” valued at $1 billion or more. The analysis found that cost overruns, on average, ran at least 79 percent relative to initial budget estimates, while delays averaged out to 52 percent compared against initial time frames. This highlights obvious challenges in delivery but also points to poor cost and schedule estimates at project approval.

Opportunities to capture value through integrating four foundations in the project lifecycle

At CPEC, we believe that there are **four foundations** every project must get right across the project lifecycle to maximize risk-adjusted NPV:

Foundation 1: **Selecting and onboarding winning project teams and contractors, valuing transparency, data and knowledge sharing**

The initial goal for project owners should be to build a team of business- and technical-focused leaders, ensuring alignment between project requirements and desired business outcomes. Notably, a project team with prior collaborative experience often outperforms a team composed of individual stars, emphasizing the importance of cohesive teamwork in mitigating significant value loss often observed when expertise and collective experience are lacking.

Foundation 2: Defining an optimized contracting strategy, including delivery model and right level of data collaboration with partners and key suppliers

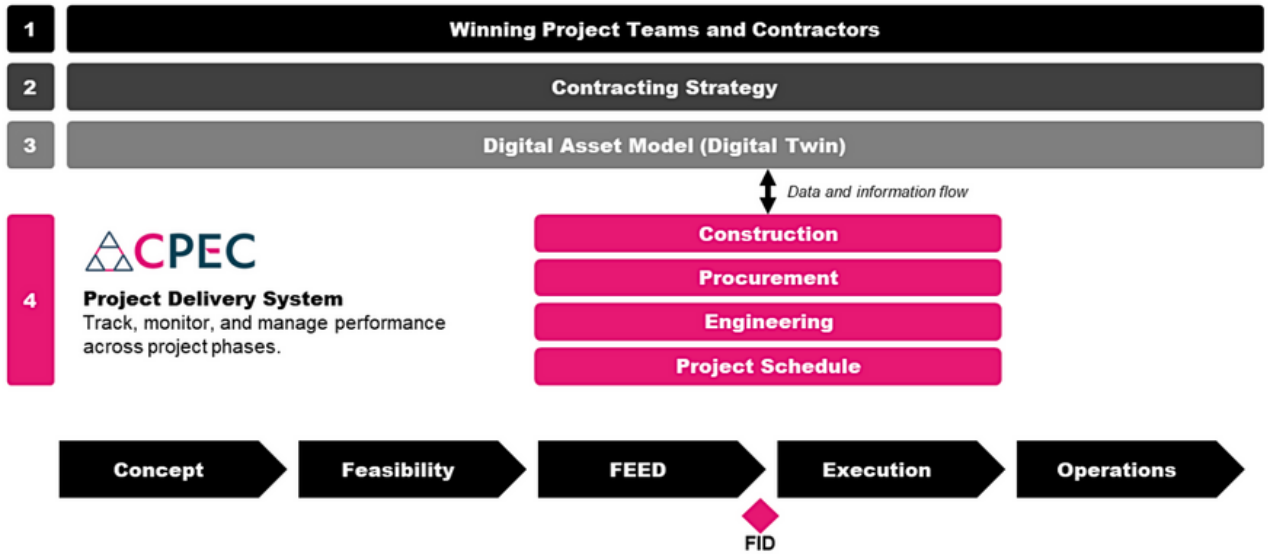
Contracts can be shaped early in project development phases with win–win outcomes and aligned objectives to increase transparency and prevent disputes later in delivery. Project delivery partners and contractors should be rewarded for data and knowledge sharing. Key contract clauses to include centre around what data should be shared and how often, who the owner of the data is and audit, verification and resolution of data sharing disputes.

Foundation 3: Using a single-source-of-truth digital asset model , often known as a digital twin, from FEED through to operations and maintenance

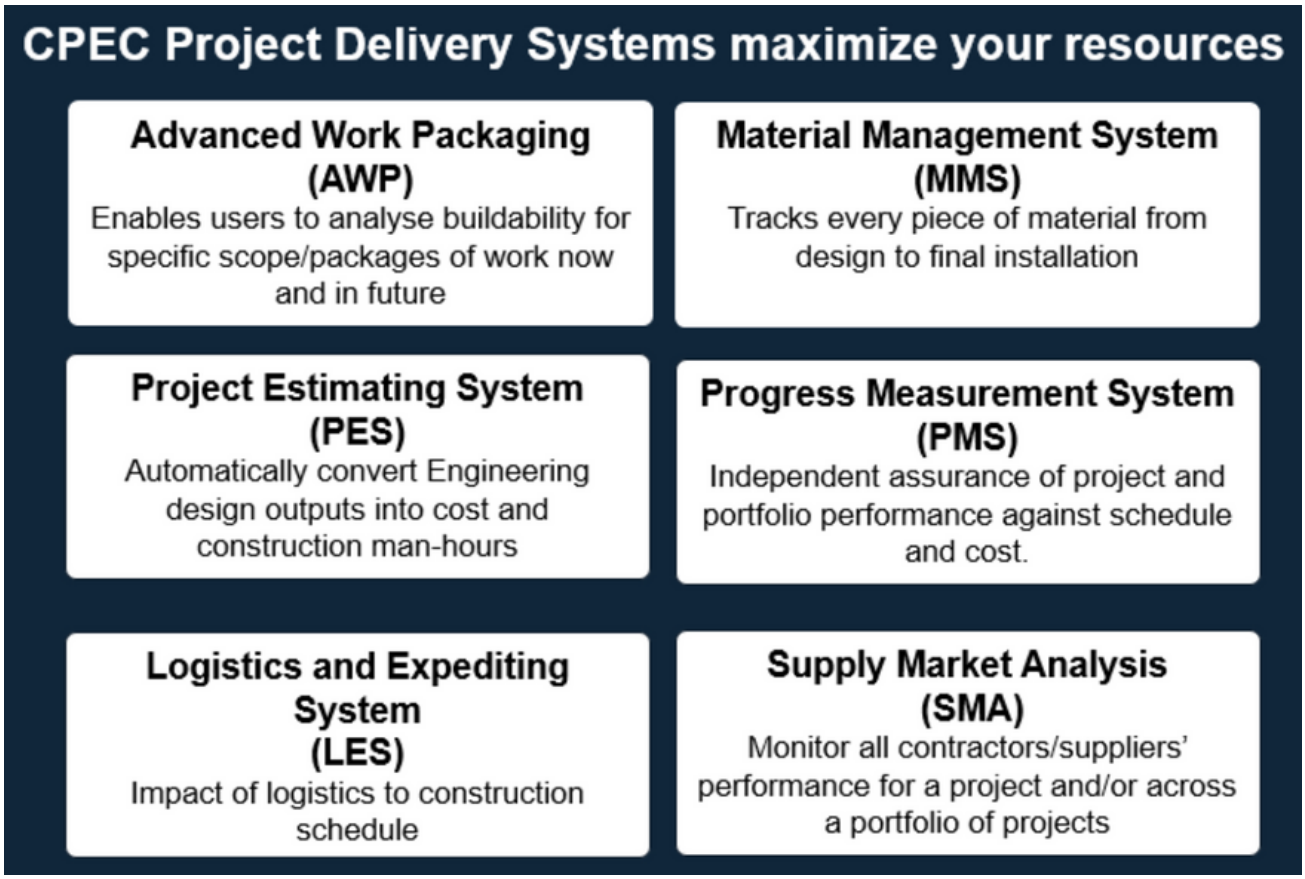
For Foundation 3, a digital twin, or single-source-of-truth digital asset model, is crucial for project success, providing an integrated view of the asset from front-end engineering design (FEED) to operations. It ensures efficient collaboration among multidisciplinary teams, supports real-time monitoring, and allows for the integration of diverse data, including specifications and maintenance schedules. The digital twin's adaptability to changes and continuity across project phases contribute to informed decision-making, cost optimization, and regulatory compliance throughout the asset's lifecycle.

Foundation 4: Establishing a transparent project delivery system (CPEC) in the project lifecycle

A project delivery system encompasses the processes, data, and systems to track, monitor, and manage performance across project phases. Capital Project Effective Control (CPEC) have developed an innovative project delivery system, which has been tried and test on capital projects ranging from $10m to $10bn in CAPEX size. It is a cloud-based analytics tool that analyses project data for real-time cross-functional interface impacts between project teams and their activities, enhancing project management and portfolio decision-making.



How?: CPEC methodology is to integrate the 1) project schedule (e.g., P6), 2) engineering (e.g., digital twin, 3D models and 2D drawings), 3) procurement, and 4) construction data during project phases. CPEC is system agnostic, and can integrate in to existing project environments and the systems already being used. By tracking every element (e.g., material, equipment) from design to build, CPEC's project delivery systems can identify cross-functional impacts of team's activities on each element. For example, once a pipe has been designed, the material can be tracked in procurement systems and supply chain data, before being finally installed by construction teams. By taking this bottom-up approach, this enables real-time proactive project control, identifying potential issues and risks to the project schedule and cost in advance, based on real performance data and evidence (and not monte-carlo simulated predictions).



CPEC's project delivery systems create a transparent and standardised view of performance for project stakeholders, enabling them to answer:

- **Portfolio and Project performance** - How is my portfolio of project performing? Which projects are at risk and why?
- **Engineering performance** – How does my design impact cost and schedule? Is there a cheaper way to design? What is the current productivity of my engineering teams?

- **Procurement performance** - What materials do I need to buy based on stable designs? Which materials or equipment are facing shipment delay, impacting the project schedule? How well are my vendors performing?
- **Construction performance** – how many man-hours of work have engineers created for construction and when should construction start? When should construction finish based on current productivity? Have procurement bought enough material for me to start construction? What are the constraints in the supply chain that will impact the construction schedule?

By taking a bottom-up approach, stakeholders can assess performance and generate insights against multiple dimensions including work packages, disciplines and areas of construction.

In conclusion, the success of capital projects is contingent upon establishing and fortifying four foundational pillars throughout the project lifecycle, as emphasized by CPEC. The initial foundation involves the strategic selection and onboarding of project teams and contractors who prioritize transparency, data, and knowledge sharing. The second foundation underscores the importance of crafting an optimized contracting strategy, fostering collaboration with partners and suppliers, and incentivizing data sharing. The third foundation highlights the pivotal role of a single-source-of-truth digital asset model, or digital twin, from FEED to operations, facilitating efficient collaboration, real-time monitoring, and adaptability to changes. Finally, the fourth foundation focuses on implementing transparent project delivery systems that consider both current and future work in real time. CPEC's innovative cloud-based analytics tool exemplifies this fourth foundation, providing real-time insights to enhance project management and decision-making across a diverse range of capital projects.

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Feel free to reach out to the CPEC team to understand how we can support you in delivering your projects using our data-driven solutions.