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CAPEX DELIVERY IN THE NEW PHARMA REALITY

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ABSTRACT

Pharma CAPEX projects have always been demanding: high technical complexity, regulatory constraints, and compressed schedules. A new dynamic is now emerging as we observe some pharmaceutical companies reassessing their investment focus toward the US. Consequently, local projects face heightened cost pressure, reduced scope, and a stronger reliance on brownfield infrastructure, while at the same time large greenfield projects with ultra-fast time-to-market requirements remain critical.
This Tech Sheet describes how to respond to both trends: challenging scope through forward-looking front-end design, selecting fit-for-purpose delivery models such as EPCM(V), Agile EPCM(V), EPC, or IPD, leveraging digital and AI-supported information management, and applying standardization.

Fig. 1: Module Based IPD CAPEX Project

FORWARD LOOKING DESIGN IN FRONT-END PHASES

The pharmaceutical industry addresses the challenge of rapidly changing decision environments by accelerating front-end design phases. A key enabler is the standardization of design approaches for large greenfield CAPEX projects. Design objects,engineering processes, and related documentation increasingly follow global standards and modularized concepts. This results in shorter front-end design phases and more robust, flexible solutions when major decisions evolve during the project life-cycle.

A second enabler is the early involvement not only of internal teams and engineering partners, but also of construction contractors and suppliers of long-lead equipment. Integrating these partners early in the front-end design phase ensures alignment with their standards and enables timely allocation of critical capacities for subsequent project phases.

In contrast, local brownfield projects are typically more cost-driven and constrained by limited resources. Clients often request targeted design solutions to specific questions in order to control costs. A future-proof design approach therefore requires a more holistic assessment of anticipated changes.

Author: Ilka Rudzio von Arx

FIT-FOR-PURPOSE DELIVERY MODEL

Pharmaceutical CAPEX projects always involve a wide range of stakeholders, including investors, engineering partners, contractors, equipment suppliers, and authorities. Project experience shows that an increasing number of stakeholders represents a higher risk potential. An ongoing trend toward early selection of the best and fit-for-purpose delivery strategy for the specific project mitigates the identified risk.
Therefore, CAPEX delivery is shifting away from fragmented, sequential planning and execution models toward more integrated delivery approaches.
The appropriate fit-for-purpose delivery model is chosen, considering the need to actively manage interfaces, align engineering maturity with procurement and construction sequencing, and ensure timely

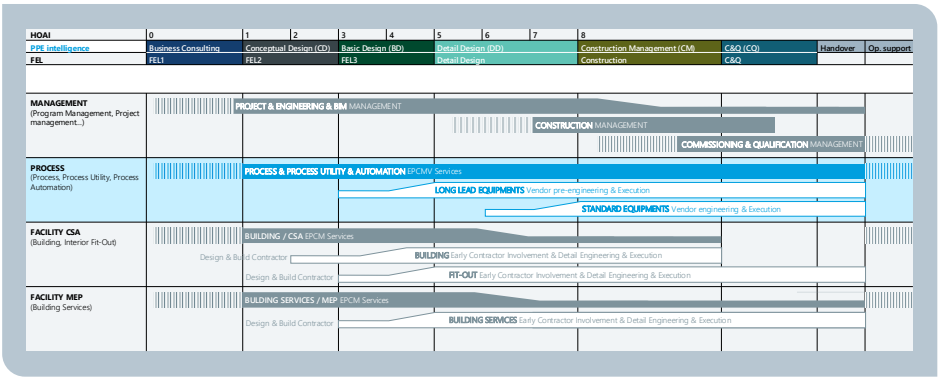

Fig. 2: Project Delivery Model — Option „Agile EPCM(V)" in Project Phases

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availability of decision-ready information. Sustainable performance depends on delivery models, planning logic, and governance structures that support integrated information flow throughout the project.
Applied delivery models include:

- **EPCM(V)**: Integrated project, engineering owner-controlled procurement
- **Agile EPCM(V)**: EPCM(V) with early contractor involvement and selective scope integration
- **EPC**: Turnkey delivery with single-point responsibility where scope stability allows
- **ECI**: Early Contractor Involvement to leverage their expertise in design, procurement, and construction planning and start constructions early

Author: Marcel Koch-Mehrin

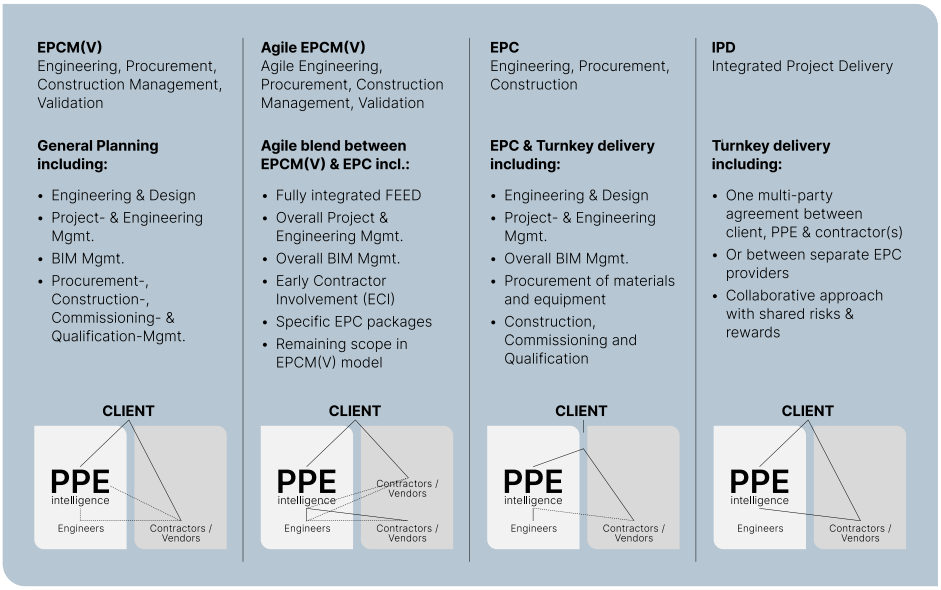

Fig. 3: Project Delivery Options

DIGITAL & AI-SUPPORTED INFORMATION MANAGEMENT

Advanced information management in EPCM(V) projects increasingly relies on specialized AI solutions that move beyond generic applications. By utilizing controlled access to structured project repositories, these systems ensure that only verified, high-quality data is used to drive decision-making.
This methodology significantly enhances coordination by identifying inconsistencies across engineering disciplines in real-time and preserving expert knowledge throughout the project life-cycle. The primary benefit is a more resilient project environment.
AI-driven workflows mitigate interface risks, automate the generation of compliant documentation, and provide the transparency necessary to proactively manage cost, schedule, and quality benchmarks in complex industrial environments.

Author: Christian Miguel-Langstrof

STANDARDIZATION AS A STRATEGIC LEVEL

Project experience shows that standardized design concepts, modular systems, and fit-for-purpose delivery models significantly reduce engineering effort, accelerate execution, and enhance both cost and schedule predictability. Typical examples include repeatable expansion modules, fit-out modules for rapid installation, precast concrete structures with consistent load assumptions and dimensions, offsite-prefabricated structural systems, pre-assembled piping and electrical skids, and containerized process units. Standardization is equally effective in brownfield environments, where constraints require reliable, proven solutions. Combined with offsite fabrication and pre-assembly, these approaches further improve quality, minimize rework, and increase schedule certainty. For investors, this translates into faster deployment, enhanced capital efficiency, and reduced execution risk.

Author: Marcel Koch-Mehrin

WHAT'S IN IT FOR YOU

Together with our clients, we define and implement the optimal delivery model including targeted site and team support – all available from a single source.
We align governance, contract structures, and information flows with the chosen approach and take responsibility in all project.

PREVIEW

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