CRENGER.com: Executive Summary

Business

Infrastructure mega-projects, preferably for water treatment and desalination, with prices above US$ 100 million.

Problem

Out of nearly 40 companies qualified for mega-projects today, only 3 - 5 may prepare bids within 6 months. What is prepared focuses on the final destination - the plant. The journey - how bespoke mega-project execution will meet the customer requirements on quality, risks, and the time frame – is never explained. These challenges hide even the bigger one – how to operate and maintain the plant.

Bidders don't know how to do this within the limited budget, time, and resources on the one hand, and modern project engineering and management (PEM) paradigms originated from expensive and high-revenue Oil & Gas projects on the other hand. The latter disregards the water industry constraints.

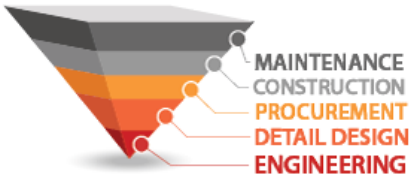
Journey through uncharted territory at zero execution transparency always ends up inside the three-failure triangle: mega-project budget, schedule, and quality.

Software

What makes mega-project unique is a combination of disciplines and execution phases: engineering, detail design, procurement, construction, and maintenance.

Any known software tool that may be potentially used in mega-project space is locked inside a specific discipline or phase. Adding a new tool means creating a new silo and exacerbating the problem of information interoperability. In most cases, these drawbacks question the tool's usefulness. (Exception is 3D software dominating in mechanical design and accounting for roughly 20% of the mega-project workload.)

The best illustration of non-holistic approach consequences is Computerized Maintenance Management System (CMMS). Over 80% of its numerous implementations fail. Ditto for commissioning and project scheduling software.



The overturned pyramid explains why this happens – each next phase up has a higher weight in the project-plant life cycle, but its success depends on the previous one.

Inadequacy of the available software tools makes companies stay with such general-purpose programs like WORD, EXCEL, and AUTOCAD and away from digital transformation.

Solution

All the mentioned problems lose their uniqueness if viewed from the holistic approach perspective. The way to do it is through information modeling. It is a single point of entry into the digitization of complex systems like the desalination mega-project.

In contrast to 3D modeling, Crenger implements Business Process (BP) modeling. It is a collection of abstractions and their relationships describing the project-plant lifecycle.

BP modeling creates a no-silo space partitioned by neither disciplines nor project phases.

The BP layer – the business consolidator - hosts multiple domain-specific applications (over 50) and synchronizes their interaction and information exchange. Applications automate the business process. This leads to 10X speed in the project bidding and execution and makes the PEM practice meet theory. Bidding takes about 50 hours instead of 8 – 16 months.

Another dramatic outcome of automation is the change in destination from building plants to creating a virtual circle of know-how mining.

The current version of Crenger is stable and ready for commercial use.

Future impact

Any emerging technology should be analyzed from 2 different perspectives. The first is near-term pragmatism. It tries to fit the new technology into the working space of the old ones it intends to replace and assess the differences. The second is the long-tailed technology-amplified discovery of new services and products. An example is the computer operating system (OS). It paves the way and hosts thousands of technologies that did not have a chance to emerge without OS.

Plants stock. The 10X speed of plant engineering and the design auto-scaling will urge companies and freelancers to create stocks of ready-for-execution plants. They may be re-used or re-shared. Design auto-validation removes any difference in the plant engineering details authored by a company or a freelancer. Stocks effectively remove non-profitable Engineering (E) from the EPC companies, leaving them with Procurement and Construction.

Stocks will impact the feasibility studies as they always include the plant preliminary design. Engineering consulting will lose the design guidance and standards compliance functions as stocked plants are already validated.

SCADA & HMI. Their current poor design is a compound effect of a number of fundamental problems identified and solved by Crenger. New "control language" contains all the elements needed for future SCADA scripts and HMI screens auto-generation. It will lead to low-cost SCADA dominance over DCS.

Procurement. B2B eProcurement has not yet reached mega-projects. Crenger effectively solves this task by introducing an online procurement hub for Original Equipment Manufacturers (OEM) to submit their products. The hub turns into a huge catalog of B2B products serving many projects simultaneously. The hub's standard interface for product description is the basis for the quotes comparison automation. The speed and transparency of bidding, and the possibility to learn the process will attract more OEMs and will lead to lower prices and better quality.

Advertising. Crenger manages a hybrid business process - a sequence of tasks executed by humans or by software. Understanding the human task makes Crenger a perfect advertising and eLearning platform.

Artificial Intelligence. Mega-projects produce big volumes of data about engineering, procurement, commissioning, and operation and maintenance. It may be used for selecting the best project team, trend analysis, predictive maintenance, etc.