

From parts to projects: The evolution of capital project delivery with asset lifecycle management

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Overview

The pitfalls of traditional PLM

Greater project transparency with ALM



Overview

In a 2023 survey of leaders in engineering and construction companies, respondents reported that only half of capital projects were completed on time.¹ As capital projects grow more complex and project demands intensify, the need for smarter, more integrated approaches to engineering has never been more critical. To meet the demands of today's complex engineering environments and increasing regulatory pressures, project directors and heads of engineering must not only balance quality, stakeholder management, and cost but also drive efficiency and collaboration across teams. Traditional document-focused approaches often fall short. Teams working on large, complex capital assets have also in some instances been tempted to appropriate tools taken from discrete industries, such as product lifecycle management (PLM), often also with undesired and expensive outcomes. Traditional PLM can leave teams struggling with fragmented processes, outdated information, and a lack of transparency.

This ebook will explore how the latest data-centric, industryappropriate approach to asset lifecycle management (ALM) is transforming the landscape, offering streamlined processes, realtime data access, and enhanced visibility to ensure projects are delivered on time, on budget, and are useful well into the future.

¹KPMG. (2023). Global Construction Survey 2023. Retrieved from assets.kpmg.com/content



Overview

The pitfalls of traditional PLM

Greater project transparency with ALM



The pitfalls of traditional product lifecycle management

Traditional product lifecycle asset management has been a cornerstone of discrete project delivery for decades. The user experience in traditional PLM is typically designed with discrete manufacturing in mind, meaning it's optimized for industries that produce distinct items (e.g., automobiles or aircraft) rather than for continuous production industries. Because PLM was designed to focus on individual parts rather than the overall product or system, design changes are typically managed at the part number level or tied specifically to assemblies.

This can be problematic in industries where projects are complex and multifaceted, particularly when an asset's lifecycle spans decades. The lack of flexibility in desired change granularity can lead to inconsistencies and frustrations across project asset data. Further, PLM systems often integrate poorly with CAD systems, delivering underwhelming value for large, long-term projects.



The pitfalls of traditional PLM

Greater project transparency with ALM



Greater project transparency with asset lifecycle management

There's an industry-wide need for more comprehensive management tools that can handle the complexity and scale of today's projects, which often involve multiple stakeholders and require adherence to stringent regulatory standards. Engineering, procurement, and construction (EPC) firms are increasingly searching for fit-for-purpose asset lifecycle systems to better meet the demands of modern capital project delivery.

Asset lifecycle management provides a digital thread that extends through the design and construction phase of a project to the operational and maintenance phases and all the way into decommissioning. The integrated approach of ALM not only helps in tracking changes and maintaining accurate records but also ensures that all modifications are seamlessly incorporated, reducing errors and inconsistencies. ALM enables engineers to benefit from digital insights and capabilities throughout the entire lifecycle of an asset, improving that asset's overall reliability and longevity.

Enhanced traceability and integration Scalability and flexibility

Rapid time to value



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Greater project transparency with ALM (continued)

- Enhanced traceability and integration: ALM ensures that every modification—whether in design, construction, operation, or maintenance—is recorded and seamlessly integrated with the project environment. This not only improves decision-making but also enhances the integrity and reliability of the asset over its entire lifecycle. By maintaining a continuous, detailed record, ALM eliminates the common pitfalls of missed updates and discrepancies that can affect asset performance and safety.
- Scalability and flexibility: Unlike item-centric PLM, data-centric ALM adapts to the size and complexity of any project, providing scalable solutions that adapt to the needs of organizations and their projects. This flexibility is crucial for multi-organizational capital projects that require collaboration across various stakeholders. Furthermore, the system's capability to update the project model and the underlying software without disrupting ongoing operations means the model can evolve with technological advancements and changing project needs. The data-centric approach allows for dynamic management and tailored views for different stakeholders, enhancing usability, transparency, and relevance across different project phases.



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Greater project transparency with ALM (continued)

• Rapid time to value: One of the most compelling advantages of ALM is its rapid time to value. Many organizations see value within the first year of implementation. Because libraries and reference projects are created as part of ALM development, users can start working right away without needing to set up or customize their own templates and libraries. The pre-established libraries streamline software implementation, while still allowing users the flexibility to make necessary customizations. Moreover, ALM's ability to seamlessly integrate with multiple CAD tools commonly used in capital projects accelerates the return on investment. This makes ALM a critical solution for organizations aiming to reduce delays, improve collaboration, and capture value as quickly as possible.

By maintaining a single source of the most up-to-date data, ALM enables the formation of a digital counterpart that mirrors the physical asset. This digital twin allows for advanced monitoring, simulation, and analysis, which means stakeholders can anticipate issues, streamline maintenance, and optimize asset performance throughout the asset lifecycle. With full visibility into every stage of the project, from design to operation, engineering teams can not only track progress but build stronger relationships between stakeholders, contractors, and eventual operators.



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The advantages of ALM in capital projects





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Conclusion

To stay competitive, organizations need streamlined processes that foster collaboration, centralize engineering information, and provide easy access to up-to-date asset data. Yet, many teams remain bogged down by traditional approaches that can lead to costly delays or budget overruns.

ALM enables greater project transparency, reduces costs, mitigates risks, and sets up projects for on-time, on-budget delivery. The transition from traditional product lifecycle management to advanced asset lifecycle management systems marks a pivotal shift in how capital projects are managed and executed.



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