Content-Process Fusion: Collaborating for Project Efficiency and Effectiveness

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Overview

Companies engaged in large, capital-intensive projects have extraordinary needs for managing project initiatives across a broad range of users, partners, and stakeholders, both internal and external. These needs span the entire life-cycle of their large-scale projects, from initial bids and project design to execution, project close-out, and on-going maintenance. Regardless of the vertical industry – engineering and construction, oil and gas, life sciences, manufacturing, or transportation, among others – most companies' current software environments lack specific, out-of-the-box functionality and IT resources to support the business processes and personnel involved with managing complex documentation and related data in a truly collaborative, on-line environment. This requirement spans a wide range of companies and company sizes, from the design firms, architects, and agencies managing large projects on behalf of enterprise clients to the enterprise client itself.

This automation gap has a particularly significant impact on the ability of capital-intensive enterprises to make the best use of the information resources at their disposal. What is needed is an alignment of business-critical information with the essential processes that define a company's business success – now commonly referred to as *content-process fusion*, a term coined by the Gartner Group in 2003. By bringing content and processes together, organizations are able to tap the unrealized value of information and improve their process execution.

The Case for Improving Capital Intensive Project Execution

Capital-intensive projects have by definition an innate complexity that makes management and execution particularly challenging. These large-scale projects typically involve the deployment of many resources, including development, design, engineering, construction, and manufacturing, across multiple organizations and in multiple locations. Synchronization and collaboration are key: Most of these projects are highly collaborative efforts that involve the coordination of partners, contractors and sub-

contractors in multiple geographies and time zones, with enormous requirements for modifications and updates that must be synchronized between all relevant stakeholders. This makes the effective marshaling and management of resources – the project execution – to be as much, if not more of a challenge than the project itself.

Challenges and Opportunities: Project Content

One of the areas in which project management and execution must be as fast and flawless as possible is in the exchange of project documentation and related data. Whether the project involves building a pipeline, a mass-transit system, or a new manufacturing plant, the quantity of documentation and data that must be exchanged, updated, and distributed by project managers can seem incalculably large. Represented as paper-based documents, the quantity and complexity of the document and data management task for large-scale capital-intensive projects is stunningly complex. The fact that a Boeing 747, with a cargo capacity of more than 140 tons, is not large enough to carry hard copies of all the documentation needed to build and maintain the jumbo jet is indicative of the scope of the problem faced in most capital-intensive projects.

Key Issues for Project Execution: Processes, Data, and Documentation
• Accuracy and Consistency
• Collaboration and Synchronization
• Change Management
• Project Lifecycle Support
• Enterprise Software Integration

Key Business Benefits from Project Execution Improvements
• Improved Process Management and Coordination
• Improved Project Accuracy, Execution and Time to Completion
• Lower Costs for Project Logistics
• Better Regulatory Compliance
• Lower Training and Knowledge Transfer Costs
• Lower Overall System, Data and Document Management Costs

Merely shifting the tens of thousands of documents and reams of data needed for capital-intensive projects from paper to digital formats, however, only creates another set of problems. The mix of applications used by project participants to create, manage and store digital documents and data typically runs into the dozens, with each application having its own format and data requirements. This makes it difficult if not impossible for every project participant to be able to see, much less modify, project documentation and data. The result is a veritable tower of Babel of conflicting and incompatible formats that can erase any efficiency the project may obtain by through digitization and other technological attempts at improvement.

Further complicating this task is the fact that the requirements for data and documentation usage are constantly evolving throughout the lifecycle of the project. A given set of documents and related data can be expected to be both heavily modified throughout the course of a project, and also have multiple uses – and users – as the project unfolds. Thus, for example, documents and data must be updated to meet on-going project changes, modified in a slightly different format for regulatory review, and be further modified to support maintenance or end-of-life project status. Keeping track of all these changes – and ensuring that accuracy and accountability are maintained despite a project's shifting priorities and goals – makes the data and documentation management side of project management a potentially weak link in overall project execution. These problems highlight the fact that the project owner is not the only one with an automation problem: the rest of the stakeholders in the value chain are also vulnerable to the inefficiencies in data and document management.

Challenges and Opportunities: Project Processes

The business process management requirements of project execution are closely related to lifecycle and value chain issues. The constantly evolving nature of large-scale project work means that the key business processes – and the role individual users have in their success – need to be closely managed and tracked. This is particularly germane to project documentation and related data: changes, modifications and approvals have to be routed to an ever-shifting set of individuals, depending on the project's status. A process

management system that provides the context for action related to specific documents and data – and which supports the fusion of business process and content – is essential to improving overall project efficiency.

The final level of complexity comes with the need to share data and processes with existing business applications, including ERP and other resource planning systems. Many of these systems already store and manage key project information, particularly with respect to financial and capital equipment-related data, although the ability of these applications to provide the level of project execution support outlined above is limited.) This makes it imperative that, for a comprehensive project execution solution, the exchange of data, documentation and process information with existing enterprise applications is as seamless as possible.

Success Factors for Content-Process Fusion

While a large amount of data and documentation relevant to project execution may already be part of an existing software implementation, most of these systems cannot provide the required content-process fusion needed to significantly improve execution and overall efficiency. And, typically, those enterprise systems that can provide some degree of content-process fusion support cannot do so without engaging in a costly and time-consuming customization project.

A solution that provides content-process fusion would be able to lower costs, streamline operations, improve collaboration, and greater assist in the successful completion of complex, capital-intensive projects. These capabilities are based on seven success factors for content-process fusion solutions.

1. **Link existing documents and their data attributes in a single file.** The lifecycle requirements for capital-intensive projects include the addition and use of data and metadata that must be linked to the relevant documents. A content-process fusion

solution must be able to tie these data to the documents while managing both data and document changes separately.

2. **Provide a central storage facility for all project data and documentation.** These projects can succeed only if there is a reliable and accurate "single version of the truth" for the project's documents and data. The best way to achieve this in a cost-effective fashion is to have the solution centered around a single central storage model that can be accessed via the Internet or a virtual private network. Offering this service in a hosted model can impart additional reliability and cost savings.

3. **Provide support for hundreds of data formats.** This is a key requirement for supporting a widely disparate user base scattered across headquarters, field offices and project sites. In particular, this capability must be provided without requiring the local desktop applications in which each document has been created. Users must be able to look at and collaboratively work on documents from any desktop without requiring that the source application be running on the desktop system.

4. **Support a truly collaborative work environment.** Support for the collaboration of the many stakeholders involved in project execution is essential to improving operational effectiveness and overall project efficiency. This support has to be centralized, easily managed by project leaders, and should ideally be accessible through common desktop productivity applications and tools familiar to most enterprise users.

5. **Provide a sophisticated management, audit, and archiving system.** This requirement not only satisfies internal management and audit needs, but can also be essential to meeting regulatory compliance in a wide variety of vertical markets.

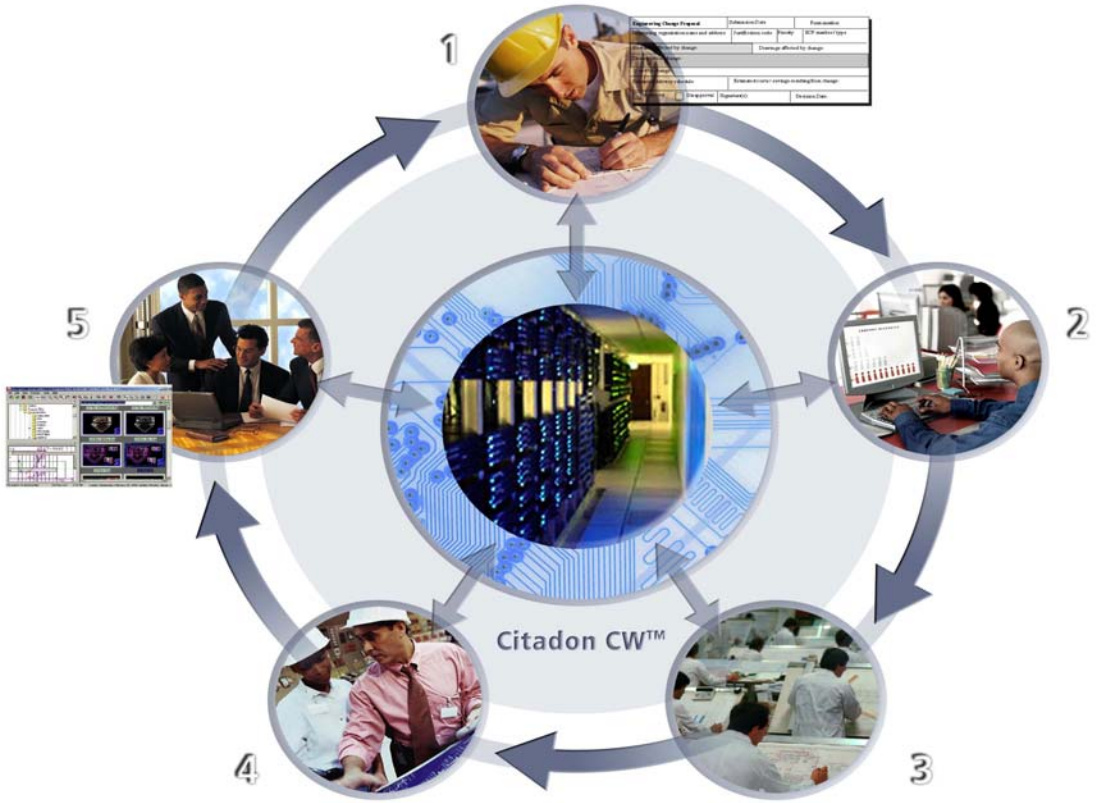
6. **Support secure, multi-tiered access.** The centralization of project data and documentation brings with it the problems of increased vulnerability, particularly to information that may be highly sensitive or classified. Being able to provide a high-level of security, at the user and organizational level, is an absolute necessity in these environments.

7. **Support multiple systems and links to the ERP suite.** Having a set of well-established links to the existing enterprise software suite can be an essential part of the technology requirements for project execution excellence.

Taken together, these technical and business requirements define the mandate for excellence in capital-intensive project execution. As we shall see in the next section, Citadon is well-suited to play the role of a highly functional packaged solution with an implementation time and overall cost significantly lower than can be expected by most customization projects.

Meeting the Needs of Content-Process Fusion: The Case for Citadon

Citadon's product offerings are made up of four main components that cover document management, collaboration, business process management, and knowledge management, and which are delivered on-demand . These components allow Citadon to meet the requirements of a packaged content-process fusion solution that minimizes the customization requirements while maximizing the use of existing enterprise applications and their data. Figure 1 provides a typical example of collaborative interaction in a capital intensive project environment.



1. **Field Engineer**
   Requests change to design, logs change request and records proposed drawing change by creating redline comments in the browser.
2. **Engineering Manager**
   Checks in new drawing revision, notes changes, requests project cost data from finance. Sends notification to finance and design engineer.
3. **Design Engineer**
   Reviews changes in field request to ensure compatibility with other project designs, imports cost information from ERP system and sends changes to project manager.
4. **Project Manager**
   Reviews estimate and design change, then either returns with comments or routes to finance manager for budget approval.
5. **Finance Manager**
   Approves and exports cost information back into ERP system, rejects, or returns for additional information.

Figure 1. The Citadon Enterprise Execution Environment

Source: Citadon

Citadon Collaboration Workspace (CW) combines business process management with a comprehensive document management and team collaboration system. It provides a secure online environment in which project team members from multiple organizations can share and collaborate on documents and participate in business processes, regardless of location or time zone. Citadon CW offers users a choice of familiar user interfaces including a browser-based interface, a rich Windows-based client, and an optional extension to Windows File Explorer. This latter interface allows users to share, review, and collaborate with other team members directly through Windows File Explorer as if the information were available on a local or networked hard drive.

Citadon CW provides users with the means to organize and manage their documentation and related data into a central set of folders that represent the key life-cycle requirements for a project. These folders are then managed by project team members according to permissions established through an intuitive security structure. The information in the folders can be viewed either by the native application (such as AutoCad) or through a Citadon viewer. Citadon CW also manages the actual use of the documents through typical document management functions including check in/out, copy, move, download, lock/unlock, version management, and other functions.

Team members share information in the form of documents and data and interact through processes defined in Citadon Business Process Designer (BPD). Managers control the administration, security and access regimes for the project members within the collaborative environment. Citadon CW not only stores and manages the data and documents, but also provides a viewing environment that allows users to view over 250 different document formats within a web browser.

Citadon CW also supports dashboard views of key data and business process information in real-time. It allows users to access content and follow business processes using applications such as Outlook, MS Project, Lotus Notes, and other email and productivity tools. Time-sensitive information related to scheduling and process flow, as well as

relevant documents, can be displayed inside desktop applications as part of Citadon's workflow, event management and notification support.

Citadon Business Process Designer (BPD) is the tool used to design business processes and project workflows. These can be linked to project documents and related data in the Citadon CW and Citadon Velocity. Citadon provides a set of pre-defined workflows – such as requests for information (RFI) – but also allows the user to define processes specific to a given project.

ProjectNet Small Team Edition (STE) is designed for managing documents and collaboration among members of a smaller project team. With ProjectNet STE, project teams can get started right away and leverage many of the advanced collaboration and document management capabilities available in Citadon CW. Users can share, organize and manage more than 250 types of documents in a secure, easily accessible, online environment. Advanced search capabilities make it easy for users to find specific documents, and built-in collaboration tools, such as document redlining, and automatic revision tracking accelerate the project review and decision-making process. ProjectNet STE is a hosted solution that requires no software installation, and can be readily upgraded to an enterprise-wide solution as needed.

Conclusion: Using Content-Process Fusion to Support Project Execution Excellence

EAC believes that the benefits that Citadon can bring to a company in the form of improved project execution, lower costs, and better coordination with the project value-chain can help usher in a change in how large-scale, capital intensive projects are managed and executed. Importantly, the experiences of Citadon's customers show that this kind of content-process fusion need not be part of a massive software implementation project or a long-term customization project. Filling the automation gaps in project execution, using a product like Citadon, can be both cost-effective, and provide value for all the stakeholders involved.

