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Why Capital Project Systems Succeed or Fail

By Allison Aschman, IPA Director of Capital Solutions

When IPA began evaluating project systems 30 years ago, the most common problem found was that projects followed no systematic common work process. Project success and failure was largely determined by particular circumstances such as the experience and expertise of the project leader. “Fixing” those systems was easy; companies developed stage-gated work process systems. Markedly better capital project outcomes resulted.

Today, although IPA still encounters the occasional project system without a decent work process, most companies embrace the gated system as a necessary ingredient in project success. However, too many companies struggle to improve their capital investments' performance.

Not long ago, IPA Founder and President Edward Merrow took an in-depth look at 33 Industry Benchmarking Consortium (IBC) member companies' project systems. IBC membership is contingent upon a company's commitment to continuous improvement of capital processes through measuring and comparing performance metrics. Merrow found that more than half of these IBC member companies had project systems in place failed to achieve the goal of continuous improvement. As the illustration on page 2 shows, either the company's project system performance degraded over time or it had *leveled out*—project planning and performance was not deteriorating, but it also wasn't getting any better.

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Merrow followed up with business and project organization leaders at IBC companies included in his project systems study to find out what differentiated successful project systems with improving or excellent performance from the failing ones. In particular, he wanted to better understand what barriers stand in the way of project system improvement and how companies with successful systems overcame those barriers. From these candid interviews and based on IPA's earlier quantitative research into project system performance, he identified four key modes of failure. Each failure mode is described below.

FAILURE MODES

#1 Organizational Traps

There are two major forms of organizational traps: highly decentralized systems and horizontally fragmented systems. Neither of these organizational models can achieve excellence.

Highly Decentralized Systems

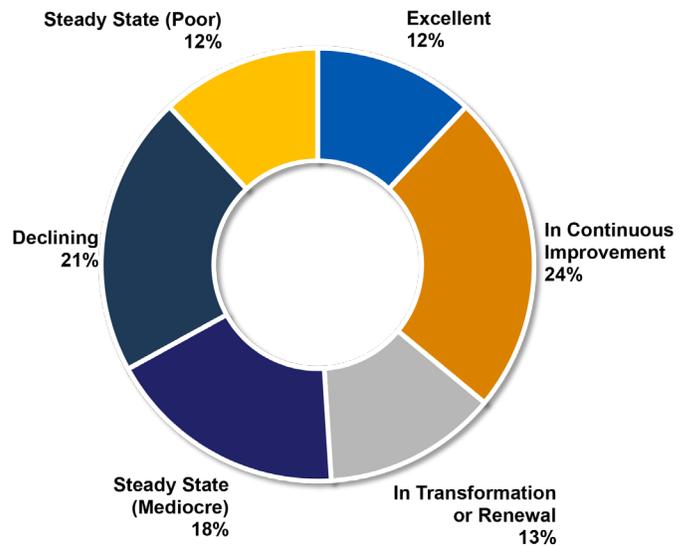
Highly decentralized project systems lack a single (central) organization responsible for essential project system activities such as (1) hiring, training, and managing the careers of project professionals; (2) deploying project professionals to projects; (3) defining, improving, and enforcing a common work process; (4) organizing the gatekeeping process; (5) checking Front-End Loading (FEL) deliverables; and (6) measuring project system performance. In decentralized systems, most of these functions are maintained by the company's various sites and/or business units instead.

Project system centralization does not ensure success, but a decentralized system is incapable of success. The decentralized system cannot maintain a common work process or develop a coherent career path for project professionals. A decentralized system cannot deploy resources in a rational way and cannot maintain project infrastructure such as estimating tools and databases, scheduling expertise, and controls. Improvement at one site or business unit is not easily passed on to the company's other sites.

Horizontally Fragmented Systems

Some project systems divide various parts of the project process into separate organizations, each with its own management and each with its own turf to defend. In other words, project development and ownership (i.e., accountability) is fragmented across project development and execution.

Current State of Capital Project Systems



Failing Project Systems: Project systems performance deemed declining, steady state (poor), and even steady state (mediocre) are considered failures.

For projects done in horizontally fragmented systems, each hand-off is an opportunity for problems. Accountability is extremely difficult to enforce, and project managers have little authority because they are essentially following the direction of each phase *owner* rather than taking responsibility for the project holistically.

#2 The Predictability Trap

Variability in cost outcomes is a fact of project life. But variability is dampened by excellent estimating practices and context-sensitive contingency setting. Nonetheless, even with excellent practices, considerable variability in project cost outcomes will remain. The trap arises when a project team knows it will be *punished* for project cost overruns. The team, reasonably, will include excess contingency in estimates, inevitably degrading competitiveness. If project teams come to rely on padded estimates to succeed, then benchmarking of competitiveness becomes the enemy. Basic project personnel competency is eroded because competence and success are progressively unrelated.

Project teams should be encouraged to *prize* cost estimate accuracy. Their focus should be on improving the quality of deliverables that provide the basis for the cost estimate and

avoiding business or project decisions that add unnecessary risk to achieving cost targets.

#3 The Schedule Trap

For some projects, time-to-market is a paramount driver of business success. When projects have clear speed-related objectives, projects are almost always delivered on a fast schedule. Lack of speed is the single most common business complaint about capital project systems. And yet those businesses are usually part of the problem. We find the largest consumer of cycle time is FEL durations extended by unclear and changing objectives from the business. Furthermore, the desire for speed almost always means that other project outcomes suffer. Across Industry, schedule-driven projects are on average 15 percent less cost competitive than non-schedule-driven projects. Trying to consistently fix business decision-making problems by driving schedules ultimately leads to system failure.

#4 The Tick-the-Box Trap

Tick-the-box occurs when prescribed practices are followed in form rather than substance and intent, creating the illusion that projects are following good practices when in reality they are not. This is the only major *trap* for project systems that does not involve the businesses as part of the problem.

The tick-the-box trap occurs for a number of reasons. In some project systems, *the process* is seen as a substitute for competence and hard work. Following the process

seemingly carries a cloak of immunity from accountability, even when decisions are made that common sense cannot support. This trap is virtually guaranteed when internal or external groups are developed to provide assurance that *the process is followed* rather than assessing the quality of what is produced.

In some cases, the project manager does not buy into the work process. These project managers may have been successful as a *one-man show* although often their experience has been confined to fairly simple large projects or smaller projects in which work process formality is not as important. In very few cases, teams that tick the box are lazy, cynical, and indifferent to the project system and project outcomes.

Assurance processes (forms of quality control) are supposed to correct the *tick-the-box* trap, but they often only work in the short term. Assurance processes almost immediately become bureaucratic and routine and may not even uncover all issues because personnel do not want to call out colleagues for incompetence. Ultimately, too much QC undermines accountability for quality. If work has been checked and re-checked and checked again, then it is “one of those checkers who is responsible, not me.”

FIXING THE TRAPS

Companies face key challenges as they confront the four project system failure modes and try to drive improvement. Almost all project system managers cite resources—number and competency—as a concern. However, as

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IPA improves the competitiveness of our customers through enabling more effective use of capital in their businesses. It is our mission and unique competence to conduct research into the functioning of capital projects and project systems and to apply the results of that research to help our customers create and use capital assets more efficiently.

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this issue is common across most systems, it does not necessarily distinguish between the successes and failures. In Merrow's discussions with project system managers, systems struggling to succeed cite three key challenges:

1. Generate appreciation of how projects actually work: senior management and the businesses need to be educated in the basics of projects such as what drives schedules, the role of FEL in success, and the importance of clear business objectives for projects. They also need to become familiar with what constitutes normal variation in outcomes and which project outcomes are controllable and which are not. However, attempts to educate the businesses about project work process (i.e., how to generate *good* projects) often do not work! Education should be tailored to the particular types of decisions the businesses make in the company that lead to poor project results (i.e., how to meet business requirements).
2. Confront business management distrust for the projects organization and processes: businesses may believe the project process undermines the *agility* needed for business success. Project systems can be described as bureaucratic, slow, non-entrepreneurial, and risk averse. The solution to this challenge is to diagnose and discuss such misnomers. Unfortunately, the necessary in-depth conversation with the businesses usually never happens.
3. Fix the governance structures that create accountability for capital: project system managers cannot solve capital governance problems. They can, however, play a very useful role in defining the governance issues for corporate management to redress.

Fixing a project system for it to be successful requires understanding and cooperation from others in the company—from corporate management, from manufacturing, and from the business management. If project system managers are going to be successful in getting that cooperation, the problem must be framed in a way that resonates with the others. That means all involved in the project systems need to see the problems from the others' point of view.

Consider a real-life scenario in which a new project system manager joined a company with the assignment from the CEO to “do something” about the company's

absolutely poor projects. In this company, the businesses are completely opposed to “all that project process stuff.” They don't understand it, they don't like it, and they do not see much use for it.

The project system manager told the businesses “Every change I make will be business justified in terms that you as business leaders care about. If I put something in place and you don't agree that it provides the business results that I promised, I will immediately withdraw it.” He then did just one thing. He installed a strong FEL 2 gate, which is the business decision gate after scope closure and development of a factored cost estimate based on conceptual design. The project system manager knew installing a *real* FEL 2 gate was not nearly enough to fix all the issues. But he also knew that if he installed this gate, many problems would immediately become apparent, and indeed, that is exactly what happened.

A consistent and rigorous FEL 2 gate provided an objective basis for business leaders to assess project value and to drop projects that did not make sense. And, as an added benefit, the quality of projects that got through the gate was much better. Because the project system manager was able to show business value, he obtained almost immediate moral authority to—step-by-step—put in a full gated system. And, by documenting the business justification for each element of the process, he has ensured its longevity.

Addressing the project system failure traps and key challenges to installing a project system that drives success for project systems often requires transformational change. Truly transformational change requires truly transformational leadership. As Merrow and co-author Neeraj Nandurdikar write in IPA's latest book, *Leading Complex Projects* (Wiley, 2018), “In a complex project, the leader cannot demand compliance from recalcitrant stakeholders. Leadership is the art of getting full cooperation from those who are not forced to comply.” The same applies to project system leadership. A transformational project system leader understands who the stakeholders are and, crucially, what they value. Improvements are then framed in a way that explains, and measures, that value—that is, *the case for change*.

To learn more about how IPA Capital Solutions can work with your company to install a capital project system that drives capital project performance improvements, please contact Allison Aschman at aaschman@ipaglobal.com.



Improving the Effectiveness of Capital Project Organizations

By Sarah Sparks, IPA Product Champion, Organizations and Teams; Lucas Milrod, IPA Research Team Leader, Organizations and Teams; and Justyna Kaczmarczyk, IPA Associate Project Analyst

IPA has observed that few companies have project organizations that consistently support project excellence. In fact, many companies seem to be constantly reorganizing in search of better performance. Why do so many companies struggle with creating project organizations that can really improve capital project effectiveness? Also, what can companies do to create an effective project organization that does not need to be reorganized every few years?

Why Business Organizations Struggle With Supporting Projects

Organizing to support capital projects is challenging because the typical business organizations that most are familiar with, and often attempt to emulate, are not capable of effectively performing the core roles required by a project organization. To better understand why, we need to first consider a typical business organization. Many businesses are organized as a hierarchical pyramid. In the lower hierarchical tiers,

companies are typically organized into specialized functions. Examples of these specialized functions include marketing, contracting, legal, human resources, and operations. These are important business functions, but the work performed by such groups can often be performed independent of the others. Such functionally based organizations are often good at executing repeatable tasks that require consistency in application. Work is performed independently within departments and then aggregated as needed.

In stark contrast, the nature of capital project organizations renders functionally based organizations ineffective for two key reasons:

1. Capital projects require extensive collaboration across functions within the owner company and with external organizations (e.g., contractors)
2. No two projects are exactly alike, meaning project work does not lend itself to the repeatable, consistent tasks that functionally based groups are designed for

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Consequently, to optimize the capital project organization, a primary focus must be how to drive effective communication and information flow within project teams.

In traditional business organizations, cross-functional (or lateral) communication involves long *top down* or vertical channels. This is not something that must occur frequently, so this may be acceptable in the business world. However, in the world of capital projects, similar communication channels are not effective because, as demonstrated below, the process is slow and information often gets conveyed incorrectly. What is more, accountability for a project is obscured. For example, consider the following scenario:

A project is organized by function, as shown in **Figure 1**. The engineering group has identified an error in the drawings that requires a significant change to the piping design. This information must be communicated to estimating and procurement as more pipe of different specification is required. Rather than communicating this information directly, because the project is organized by function, the technical information must flow vertically up through layers of management and laterally to other management before making its way down vertically to the intended recipient. Clearly, this process is slow and risks transmitting misinformation due to lack and shared world-view of the management layers conveying the information. The process is akin to the game of telephone.

Given the technical complexities that exist within capital projects, a structure that encourages lateral flow of information is much more effective, like that shown in **Figure 2**. Vital project knowledge is more easily shared and understood.

Five Steps for Planning the Right Project Organization Structure

Unfortunately, no single structure can be effective for every project organization. A project organization’s optimal structure should be tailored to company-specific characteristics and to support the company’s strategic objectives. Although there is no universal way to structure a project organization, companies should consider certain elements of design to foster the aforementioned collaboration and information flow required on projects and to promote accountability. For example, should your project organization be centralized, distributed throughout business units, or is there a better solution in between?

Fully centralized project organizations, for example, deliver improved capital project performance. Such organizations offer the strongest and clearest means of project accountability. However, a fully centralized structure is not likely best suited for organizations with very small project portfolios with projects involving work performed at several disparate global sites. The cost of maintaining such a model may be much higher than the gains.

Figure 1

Flow of Information in a Functionally Based Project

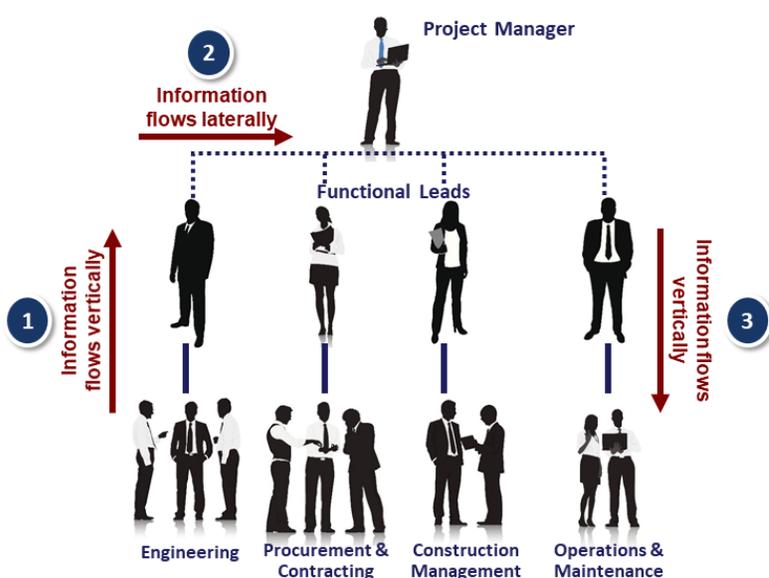
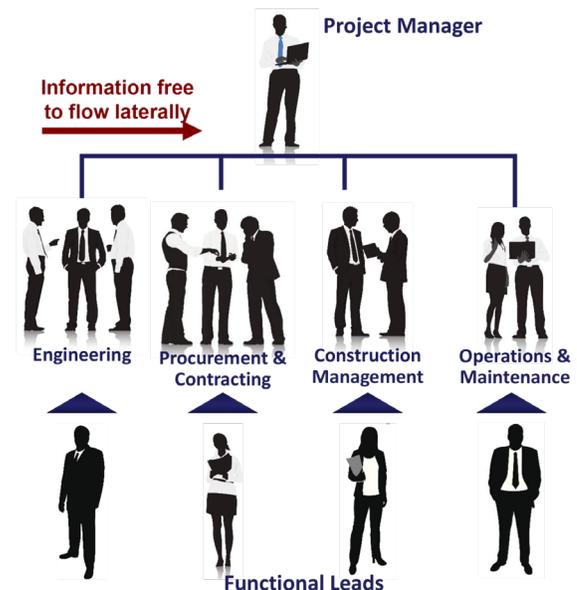


Figure 2

Ideal Flow of Information In a Capital Project





So how do you identify the *right* structure for your organization? Here are some basic steps for determining what is right for your organization:

1. **Define the goal of the organization or what you are trying to achieve.** Gather stakeholder input and use corporate directives to identify the organization's core objectives. By the end of this step, you should be able to clearly answer the question: What does the organization exist to do?
2. **Identify the key factors that will drive decisions.** Evaluate the corporate culture and structure and use that as a foundation to identify the parameters/boundaries for decision making. Also, identify key elements that will drive decisions such as strength and size of business units, size, stability, and portfolio diversity.
3. **Define the alternatives.** Identify the various structural approach options and evaluate each against the pre-defined goals and decision factors. Weigh the pros and cons of each alternative to determine how likely each is to achieve the objectives while working within the parameters and key drivers.

4. **Choose a structural approach.** Select the approach that strikes the best balance across the objectives and drivers but is also aligned with the needs of the current and future project portfolio.
5. **Outline a change management plan.** Consider the current state of the company and organization against what is needed to implement the chosen approach. Account for matters such as resourcing, capability, and processes.

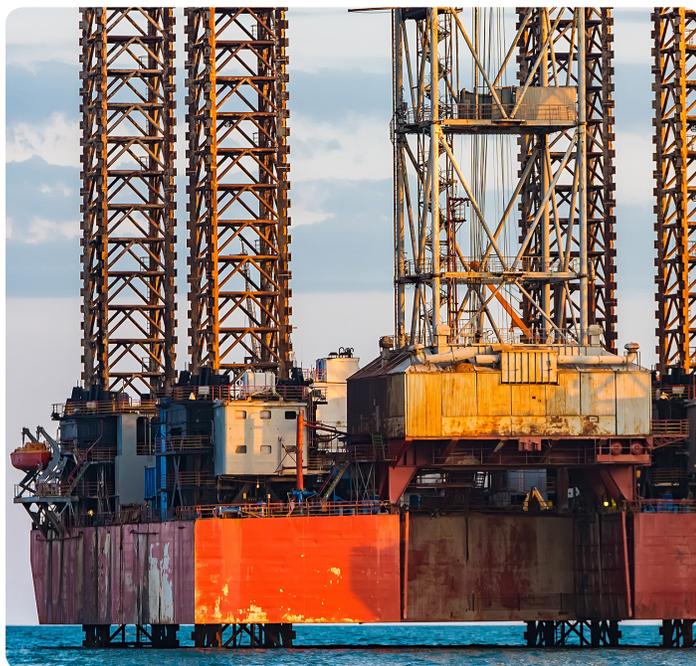
Creating the *ideal* project organization is hard work. When a new structure is not giving us the results we were hoping for immediately, companies are quick to reorganize and try something new. As anyone who has gone through multiple reorganizations knows, the process is very disruptive—to the people in the organization and also to progress and improvement. To avoid this disruptive cycle, companies need to be clear about what their goals are for improving capital project effectiveness, and then they can follow a process for establishing an effective project organization.

For more information about how IPA can help your company establish project organizations and teams that drive capital effectiveness, please contact Sarah Sparks at ssparks@ipaglobal.com.

Oil & Gas Industry Leaders Reconvene for UIBC 2018

Oil and gas industry leaders—supermajors, nationally-operated companies, and independents—returned to the Upstream Industrial Benchmarking Consortium (UIBC), November 12 to 14 in Northern Virginia to get an up close look at how well their efforts to improve capital efficiency in a lower oil price environment compare with their peers. During the UIBC 2018 meeting, member companies also reviewed the latest industry research on pressing issues altering the upstream industry landscape. The UIBC is a chartered voluntary association of owner oil and gas companies facilitated by IPA.

UIBC member companies, whose large asset developments and smaller asset-based projects have been evaluated by IPA through the last year, reviewed their individual capital project system performance metrics and trends and also gained insights into how their capital project system performance stacks up against Best-in-Class performance. Through capital project research and knowledge sharing, companies belonging to the UIBC are able to strengthen their project systems. Industry average system performance outcomes for safety, cost, duration,



and production performance are presented during the 3-day annual meeting. Disciplined approaches to capital project spending are recognized industrywide for helping companies remain competitive in the marketplace. From high to low oil price swings and back again, companies are continually rewarded for pursuing asset development system effectiveness improvement.

Several new research studies were presented at UIBC 2018. All UIBC research findings are derived from data in IPA's proprietary upstream projects database.

The new research studies address the following topics:

Comparing Shale and Offshore Investments on a Full Asset Basis—Efficiency and well productivity gains realized in U.S. shale over the years have been well studied. These gains were triggered by a rapid learning process, optimization of completion techniques and well configuration, and high grading of drilling locations and equipment. Although most oil and gas efficiency gains are focused on U.S. shale, the latest trends in the U.S. offshore are often overlooked. With offshore companies trying to minimize their project design and develop to cost, the deepwater break-even is coming down rapidly. This study takes a close look at shale investments relative to offshore capital projects on a full asset basis.

The Efficacy of Unusual Contracting Approaches—In light of the oil price downturn, contracting has become a significant area of focus for E&P owner companies. The complex nature of E&P projects makes strong accountability of contractors much more difficult, even with strictly fixed-price full wrap contracts. With more focus on capital efficiency, owners are being more creative in their approach to contracts. However, contracting is subject to very strong opinions that are often based on project outcomes often incorrectly ascribed to the contracting approach. This study evaluates the effectiveness of contracting forms, such as functional specification and design competitions, from a statistical perspective and examines the various trade-offs associated with each contracting approach.

Understanding the Interface Role on Large E&P Projects—Large E&P capital projects typically have multiple interfaces to manage. Therefore, interface management is an important area of concern. Interface management, according to the independent group Interfacemanagement.org, is “the process used to identify and close gaps between responsible parties and drive interface issues and queries to closure.” All



projects perform interface management, but only some actually assign a full-time interface role to the team. In this study, IPA looks at how E&P companies approach interface management and what drives the decision to staff a role dedicated to interface management. The study also examines whether there are benefits to having this dedicated role on project teams.

Site & Sustaining Capital Organizations—Focusing on People to Support Improvement: in 2017, IPA identified four common approaches non-E&P organizations employ to develop and execute their site-based capital project portfolios. This has proven to be an extremely useful framework to support effectively determining a site's resource requirements. During this presentation, IPA presented research to assess whether this framework is equally useful in understanding how E&P SSC organizations staff, or should staff, to support their site-based capital portfolios.

In addition, IPA presented updated past UIBC research covering long-term production performance and effective management of site and sustaining capital projects. Several UIBC member company representatives also delivered presentations detailing their successes and shortcomings in improving capital project system performance. The UIBC meeting provides attendees with many knowledge-sharing opportunities and actionable ideas to support their capital project improvement journeys.

To learn more about UIBC 2018, please contact (U)IBC Director Andrew Griffith at agriffith@ipaglobal.com.

E&P Opportunity Assessment Toolkit

An Online Tool for Unbiased Decision-Making for Early Oil & Gas Sector Asset Investments

Business decisions in the early stages of exploration and production (E&P) developments (M&A, farm-in, strategic opportunities, progressing opportunities, etc.) rest on inherently uncertain information. Opportunities with the most optimistic (and unrealistic) cost, schedule, and production estimates appear on the surface to be better investments than well-defined opportunities with grounded targets.

This optimism bias promotes portfolios where underperforming assets crowd out better developments. To combat this tendency the Opportunity Assessment Toolkit (OAT) equips investment decision makers with unbiased cost and schedule benchmarks in the critical early phases:

- Before cost and schedule estimates exist for an opportunity (during exploration, appraisal, or farm in/farm out evaluations)
- When cost and schedule targets are immature or rely on limited data (FEL 1 stage economic feasibility and early FEL 2 concept selection)

Benefits

In less than 15 minutes, OAT can provide a full set of key decision metrics (using data from thousands of actual E&P projects), including charts, to compare individual opportunities in a portfolio. This enables decision makers to:

- Quickly assess the viability and marginality of upstream opportunities during bidding, exploration, or early development
- Understand an opportunity's true development costs
- Ensure only the highest return opportunities receive increasingly scant capital funds

To learn more about OAT and request a free demo, please contact Neeraj Nandurdikar, IPA Oil & Gas Practice Director, nnandurdikar@ipaglobal.com.



Project Data Show Declining Performance Trends for Pulp and Paper Sector Capital Projects

By David Mead, IPA Project Analyst and Client Engagement Leader

Pulp and paper sector capital projects have lost their competitive edge in the areas of cost and schedule performance over the last decade. These downward capital project performance trends should give the sector's business and project organization leaders pause.

Ten years ago, just as the Global Financial Crisis hit, pulp and paper companies were largely successful at delivering cost competitive and schedule advantaged capital projects, including the construction of paper mills and facility upgrades. But market demand has changed. Graphics paper consumption has declined while demand for paper-based products used by online retailers for packaging and deliveries has increased substantially. Demand for hygienic goods to meet the needs of growing world populations has risen also. Meanwhile, companies across the pulp and paper sector have been consolidating. Even as the pulp and paper landscape has changed, apparently so too have companies' abilities, or commitments, to implement Best Practices in capital project preparation and execution.

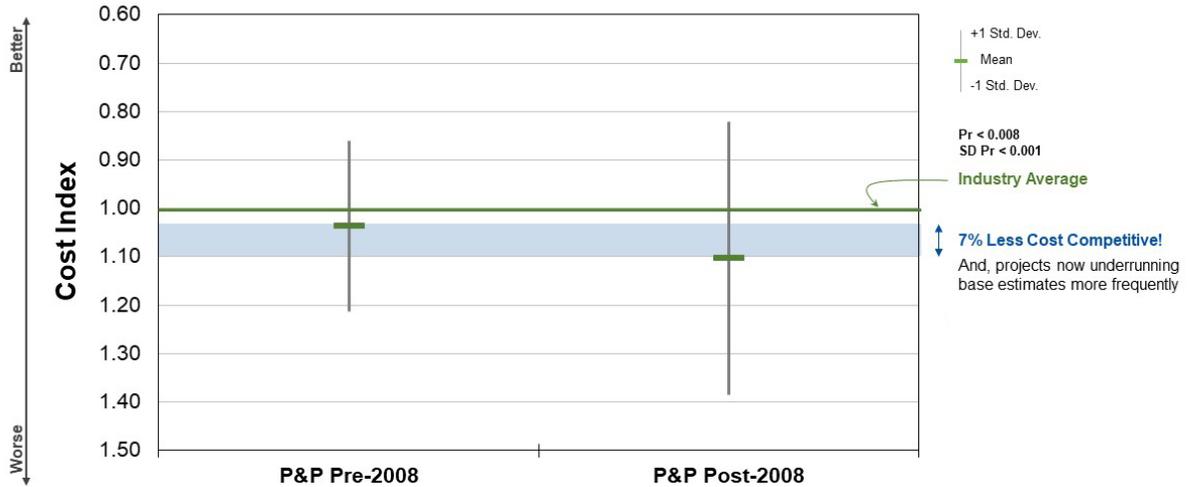
Understanding the drivers of performance difficulties and implementing IPA data-derived Best Practices in capital project preparation and execution are crucial to mill operation improvement. IPA recently examined pulp and paper sector project data to better understand what is driving the declining project trends. IPA used data from its proprietary database of 20,000 capital projects collected over the last 30 years, including data on more than 500 projects executed by 18 different pulp and paper sector companies, for its research. All project types are represented in the database—greenfield, colocated, revamp, expansion, and add-on—ranging in cost from less than \$1 million to more than \$1 billion.

The database is invaluable in helping evaluate pulp and paper sector performance and changes in performance over the last decade and diagnose the drivers of this performance. It can also help project systems or project teams focus on improving projects using statistically developed Best Practices. IPA found that the actual cost index for pulp and paper sector projects is less

continued on page 12

Figure 1

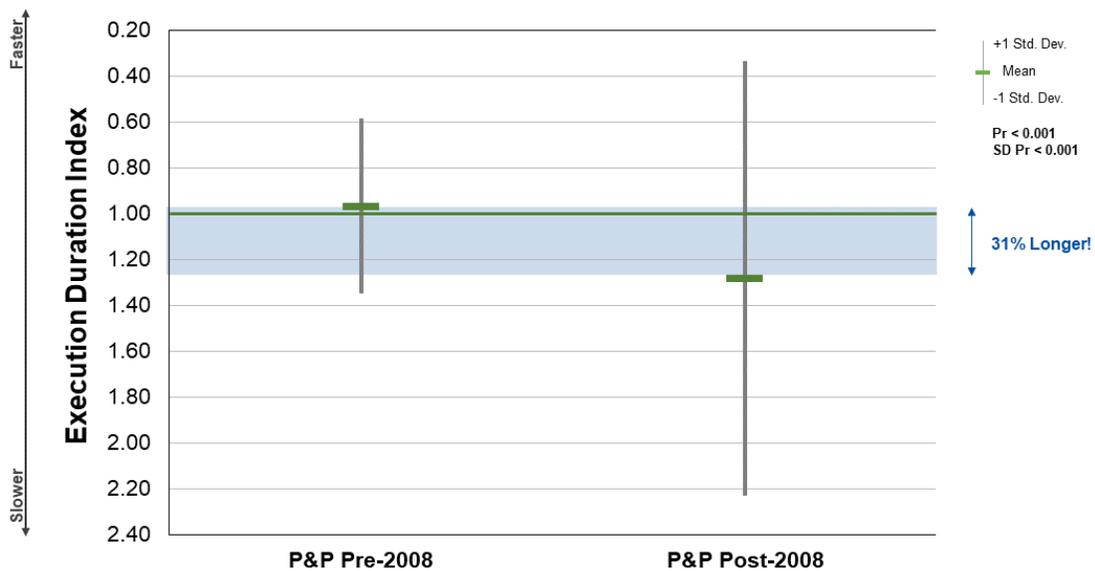
Pulp and Paper Project Cost Competitiveness Has Eroded Over the Last Decade



Probability that means are same: $\Pr(|T| > |t|) = 0.008$
 Probability that variances are same: $2 * \Pr(F < f) = 0.001$

Figure 2

Pulp and Paper Project Execution Schedules Have Gotten Longer During the Last Decade



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competitive than the Industry average for comparable capital projects (**Figure 1** on page 11). The sector has seen a significant decrease in competitiveness over the last 10 years; more recent projects are 7 percent less competitive than earlier projects and 10 percent less competitive than industry average.

The story is similar for execution schedule performance. Execution schedule durations,¹ compared with similar industry projects, have also degraded over time. More recent projects average 31 percent longer durations with durations 28 percent longer than industry average, as shown in **Figure 2** on page 11.

The graphs clearly show the decline in average cost and schedule performance in the past decade. Another key takeaway from these graphs is the recent projects' increase in variability. Increased variability means that while some projects have competitive costs or schedule outcomes, poor performing outliers skew the average. These bad actors fall far short of the intended return on investment.

Project Execution Weaknesses

So what happened? Why has the pulp and paper sector's average performance at delivering cost competitive and schedule advantaged capital projects floundered over the last decade? IPA found two drivers of these performance declines: (1) turnover of key project personnel, including the project manager, lead engineering, and construction manager roles and (2) diminishing use of proven project control methods. Let us first examine turnover of experienced project personnel in key functions.

Recent IPA research finds that turnover is a growing concern in this era of inexperienced project personnel. Historically, the pulp and paper sector has maintained a competitive advantage in this key metric, demonstrating a lower turnover rate. But the industry has given up this advantage. IPA research determined that turnover across all processing industries adds an average of 3 percent cost growth to pulp and paper sector projects.² However, the effect is even more marked for pulp and paper sector projects completed in the last decade. The cost of projects grows by an average of 5 percent when teams have turnover.

Now let us consider project controls. IPA measures the functions and activities that enable owners to understand the status of their projects in real time. Pulp and paper sector projects do worse than industry average in project

controls, with this sector's projects completing estimate validation, physical progressing, and progress reporting statistically less frequently than other industrial sectors. Pulp and paper sector projects also assign fewer in-house owner controls personnel to projects. This is important for pulp and paper sector projects because having better project controls reduces field labor cost growth by an average of 5 percent and decreases engineering schedule slip by an average of 8 percent. Based on these data, project controls is a good investment, with the project control function adding an average of only 1.3 percent to project costs.

Another notable area business leaders and project professionals in the sector should pay extra attention to during the project development process is late changes. As part of its project evaluations, IPA measures late changes—deviations from the planned configuration of a project that occur after authorization. The rate of changes has increased over time, with the average number of late changes per project more than doubling in the last decade.

Maintaining team continuity and implementing project control Best Practices present opportunities to improve the performance of pulp and paper sector projects. The industry has shown its ability to catch up to industry average project performance targets before, notably in an area that is unquestionably the most important performance area—safety. Compared to other industrial process sector projects, the pulp and paper sector has seen significant safety incident rate improvements. OSHA recordable injuries reported on pulp and paper projects were significantly higher than the entire process Industry (industry average) a decade ago. During the last decade, the average for safety incidents in the pulp and paper sector decreased by almost two-thirds and is now at industry average rates.

As capital activity ramps up for pulp and paper companies, emphasis on project planning and execution discipline is the only path to realize expected return on investment. Only IPA possesses the project data, capability, and experience needed for pulp and paper companies to drive improvement in capital project outcomes.

Contact David Mead at +1 703 554-8834 or dmead@ipaglobal.com for more information on how IPA can help pulp and paper companies improve their project delivery systems.

¹Execution is measured from the start of detailed engineering to the end of construction (mechanical completion).

²Statistics are after controlling for project size and other project drivers.

The Business of Supporting Our Communities

Social and ethical responsibility to our customers and our community is one of IPA's main Principles of Operation. IPA employees regularly participate in charity events that raise awareness and proceeds for community members in need of assistance. In 2018, much of the money raised during IPA Community Services events was donated to charity groups dedicated to helping homeless individuals and families. As in past years, IPA staff also made donations to services groups to aid the victims of natural disasters and to brighten the holiday season for children and their families. Below are several of the events and charities the IPA team supported in 2018.

North America, Corporate and Regional Office (Ashburn, Virginia)

Chili Cook-Off: An annual event at the North America office, this year 11 cooks heated up their favorite chili recipes for their work colleagues to judge. Money collected as admissions to the event was given to Mobile Hope of Loudoun.

Cake-Off: Seventeen bakers entered a battle royale for best cake honors, as voted on by staff who donated to Friends of Loudoun Mental Health to sample the different cakes.

Other fundraising events included an indoor yard sale, a pancake breakfast, a pumpkin carving contest, a bake sale, and the office's annual toy drive in support of The Marine Toys for Tots Program.

Latin America Regional Office (Curitiba, Brazil)

Bonés (Ball Cap) Day: Putting their own twist on Woolly Hat Day, the Curitiba staff wore baseball-style caps—more suitable to the southern hemisphere in January—in signifying their support for charity. Curitiba staff donated towels, bed sheets, and blankets that were delivered to FAS-Fundação de Ação Social de Curitiba (Foundation of Social Assistance), which maintains a number of shelters for homeless people.

ACAI Risotto Dinner: The Curitiba office hosted a Risotto Dinner in September in benefit of ACAI, a local organization that assists poor elderly members of the community, and

their families, in vulnerable situations. Mrs. Sônia Seidel, ACAI's current administrator and daughter of the founder Mr. José Seidel, spoke at the event.

EMEA Regional Office (Reading, United Kingdom)

Woolly Hat Day: The Europe, Middle East, and Africa (EMEA) regional office promotes Woolly Hat Day annually to raise money for St. Mungo's Homeless Charity. The symbolism behind the charity initiative has been embraced by IPA's other regional office Community Services Programs.

Food Collections: Gathering food for a local foodbank during the holidays has become an annual tradition at IPA's EMEA regional office



Harvest Raffle: EMEA's Community Services team put together a raffle, the proceeds of which were donated to a local group working to support members of the community in need of assistance.

Other charity events sponsored by EMEA staff in 2018 include an Easter Hamper Raffle and a Step-a-Thon to collect money for other charity groups.

Asia-Pacific Offices (Singapore and Melbourne, Australia)

Employees in IPA's Asia-Pacific offices participated in the *Light of Hope Run* to raise public awareness of the social stigma related to depression and mental health. Like its sister offices, IPA staff in the Asia-Pacific region also raised funds in the fight against homelessness in the region. IPA's Singapore office has contributed to campaigns to eliminate discrimination against women and girls and support empowerment of women across the region and globally.

IPA Events and Presentations

Major Projects Association

January 24, 2019
London, United Kingdom

IPA Capital Solutions Corporate Director Allison Aschman will participate in a debate about whether an over-reliance on certain tools and techniques (Agile, Waterfall, etc.) can degrade capital project effectiveness. Aschman will draw on some of IPA's recent research on project leadership and speak about what it means to take responsibility for project outcomes. The debate is hosted by the Major Project Association and will take place at the Institution of Civil Engineers headquarters in London. Sir David Higgins will chair the event.

Industry Benchmarking Consortium (IBC)

March 18-21, 2019
Lansdowne, Virginia

Facilitated by IPA, the IBC is a voluntary association of owner firms in the chemical, petroleum, minerals processing, food and consumer products, pharmaceutical and biotech, and forest products industries that employ IPA's quantitative benchmarking approach. The members have agreed to support the continuous improvement of capital processes through measuring and comparing performance metrics. For more information, contact IBC Director Andrew Griffith at agriffith@ipaglobal.com.

Upstream Cost Engineering Committee (UCEC)

June 13, 2019
The Woodlands, Texas

The UCEC strives to improve upstream project and business results by providing metrics for better cost engineering. Member company representatives gather once a year to learn about and review new UCEC metrics packages prepared by IPA. The upstream metrics packages are used by companies to compare their upstream project cost and schedule outcomes with industry cost and schedule norms and, in general, boost business project estimate assurance and evaluation quality. Contact Jonathan Walker at jewalker@ipaglobal.com for more information.

Cost Engineering Committee (CEC)

September 24-25, 2019
McLean, Virginia

The CEC is a working subcommittee under the Industry Benchmarking Consortium (IBC) that assists cost engineers by providing metrics and tools that offer an unbiased snapshot of industry cost and schedule estimates and trends. The CEC focuses on all aspects of cost (or investment) engineering, including cost estimating, scheduling, and project control practices and metrics, with the goal of expanding the owner cost engineer's capabilities. The primary vehicles for accomplishing these objectives are validation metrics, Best Practices research, and practice sharing. Contact IBC Director Andrew Griffith at agriffith@ipaglobal.com for more information.

2019 Public Course Schedule

Visit www.ipaglobal.com/public-courses to view full course details and to register.

Delivering Value Growth Through Effective Oil & Gas Asset Developments
 April 2, 2019
 Kuala Lumpur, Malaysia

Best Practices for Mining Projects
 April 3, 2019
 Belo Horizonte, Brazil

Complex Projects - Concepts, Strategies, and Practices for Success
 April 9, 2019
 Houston, Texas

Best Practices for Site-Based Projects
 April 23, 2019
 Paris, France

Best Practices for Mining Projects
 May 7, 2019
 Toronto, Canada

Project Management Best Practices
 May 8, 2019
 São Paulo, Brazil

Best Practices for Site-Based Projects
 May 14, 2019
 Perth, Australia

Project Management Best Practices
 June 4, 2019
 Seattle, Washington

The IPA Institute is a Registered Education Provider (REP) of the Project Management Institute (PMI).



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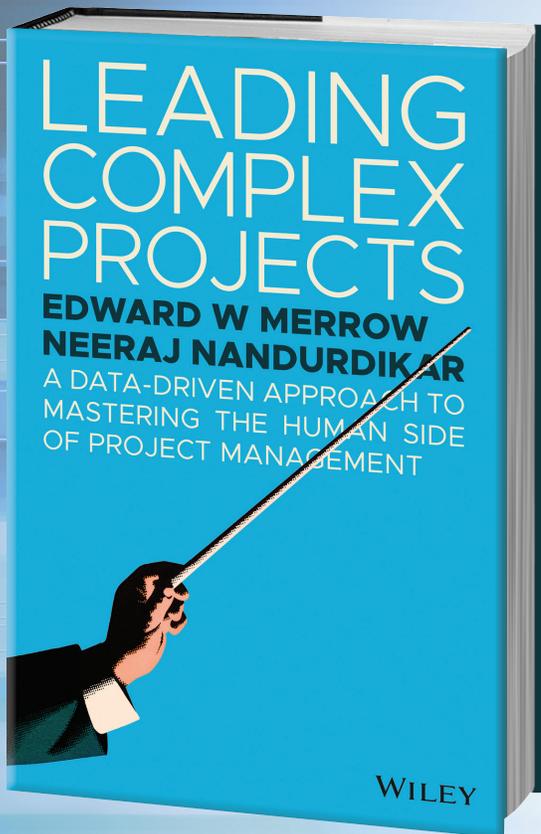
IPA Celebrates 20,000 Capital Projects!

On Tuesday, December 11, 2018, the 20,000th project was entered into the IPA database!

- Our database now features over 21 million data points spanning the entire project life cycle
- We capture specific sets of business and technical information, as well as project documentation from owner project teams
- Our database is supplemented by an extensive catalog of client documentation
- Data are acquired directly from owner project teams, project management organizations, and business leadership
- IPA uses this information to study what drives success and failure in capital projects



UNDERSTANDING PROJECT LEADERS THEIR BACKGROUNDS, PERSONALITIES, HABITS AND HOW THAT EXPLAINS PROJECT SUCCESS OR FAILURE



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There are literally thousands of books on project *management*. But there are almost no books on project *managers*, the people who actually organize and lead projects to fruition. *Leading Complex Projects* fills that void and takes a unique approach to examine the leaders to whom we entrust our most important capital ventures. For the first time personal leader characteristics are quantitatively linked to project outcomes through a major global study investigating the role of the leader in the success and failure of complex industrial projects. Using hard data on early years, backgrounds, education, experience, personality and temperament, and habits of mind the authors connect the dots between project leaders and project success. They then dive into detailed profiles of 7 of the best leaders who share their stories of development and success. This book will help organizations learn what to look for in future complex project leaders and how to screen for and select future leaders to improve chances of successful projects.

The role of leadership is to generate *followership*—genuine cooperation from those who are not required to follow—to deliver a vision and successful outcomes. This means using their personality, emotional intelligence and prior experience to focus on the right tasks to generate successful outcomes. This book provides a wealth of practical, empirical and field proven insights to help current or future leaders to hone their skills to generate the followership necessary for successful outcomes.

- Understand the shortcomings in our current leader selection models
- Examine and learn from the personalities, experience, background, and habits of mind and tasks of over 100s of project leaders
- Understand the causal pathway of how a leader's personal characteristics and traits translate into the tasks they do (or choose not to do) and how that links to outcomes
- Get to know 7 very successful leaders from 6 global organizations through their detailed profiles

Drawing a database of complex industrial projects from around the world, this book provides a solid basis for a quantitative understanding of the human side of project management — the role of the leader. Although a majority of the complex project data is taken from projects in the petroleum industry, the insights gleaned from the analysis are widely applicable across industrial sectors for current or future leaders and organizations of any stripe. *Leading Complex Projects* provides clear, data-backed improvement guidance for anyone in a project leadership role.



EDWARD MERROW is the founder and CEO of Independent Project Analysis, Inc., the world's leading consulting firm, evaluating billion-dollar "mega-projects" of national and international oil, chemical, pharmaceutical, and major mineral companies, benchmarking their cost, schedules, safety, startup and

operational performance. Before founding IPA in 1987, Merrow was a research analyst and later the director of the Energy Policy Program at the Rand Corporation.



NEERAJ NANDURDIKAR is currently Director of IPA's Exploration and Production (E&P) global advisory business. Neeraj has spent the past 15 years providing strategic advice to EVP's, VP's, Heads of Projects, and Functional leaders of more than 30 different oil and gas operators around the world ranging in topics

from reservoir and well construction best practices, to portfolio optimization, to organizational design and work process improvement to optimizing production performance.

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