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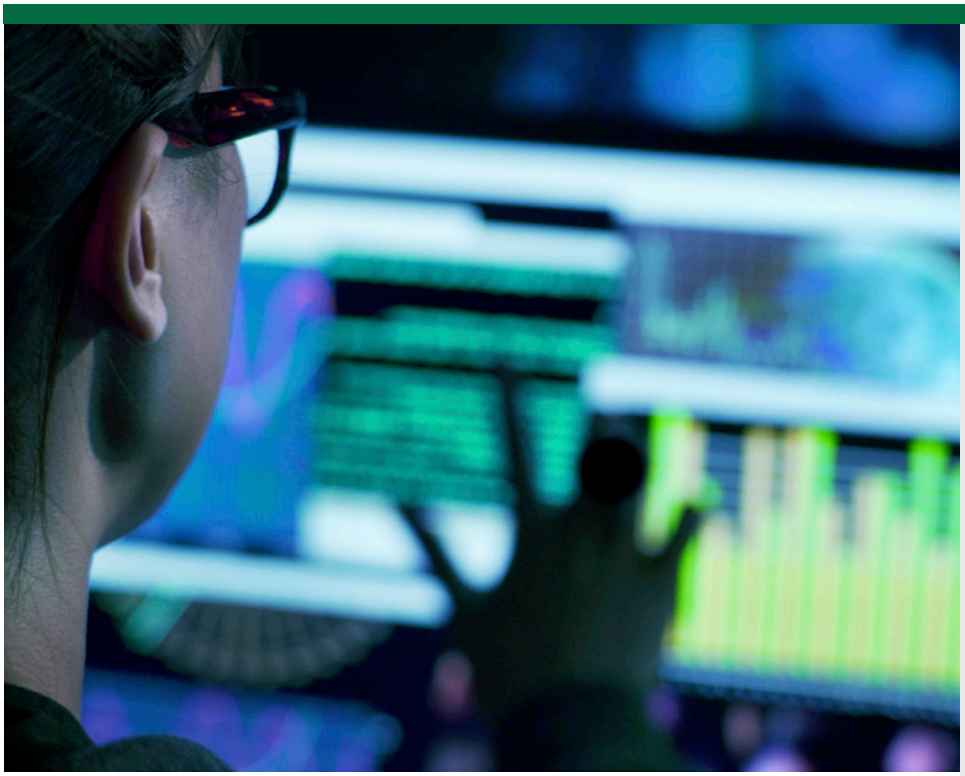
IPA Newsletter



In this Issue:

Capital Projects Struggle to Implement Digitalization

By Greg Ray and Luke Wallace

Companies in capital intensive industries are embracing digitalization and leveraging exciting new technologies to increase personnel and environmental safety, promote production efficiencies, attract fresh talent, and more. The proven benefits of more powerful design engineering tools, less expensive and multifunctional unmanned systems, and advanced plant troubleshooting capabilities are difficult to ignore. Artificial intelligence and machine learning technologies are advancing on a daily basis and promise to usher in revolutionary change. Fighting to realize the benefits of digitalization are owner organizations and project teams responsible for ensuring the competitiveness of capital investments.

We recently reached out to Independent Project Analysis (IPA) clients to understand why digitalization tools are so burdensome for projects organizations to implement. For certain, there is no lack of interest and support for digitalization. Representatives from all project organizations we surveyed and interviewed responded that they were implementing some form of digitalization (or some digital technology to improve business*). Most indicated that they are frustrated with their individual company's current data

**The definition of digitalization varies but is generally ascribed to the process of using digital technology to transform the way we do business.*

Independent Project Analysis, Inc. is the preeminent organization for quantitative analysis of capital project effectiveness worldwide. At IPA, we identify Best Practices to drive successful project outcomes. **www.ipaglobal.com**

IPANewsletter
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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.

IPA
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capabilities (Figure 1). Indeed, these project professionals generally expressed enthusiasm and excitement about the potential of transferring, exchanging, and storing their company's capital project data using digital technologies. And why shouldn't they?

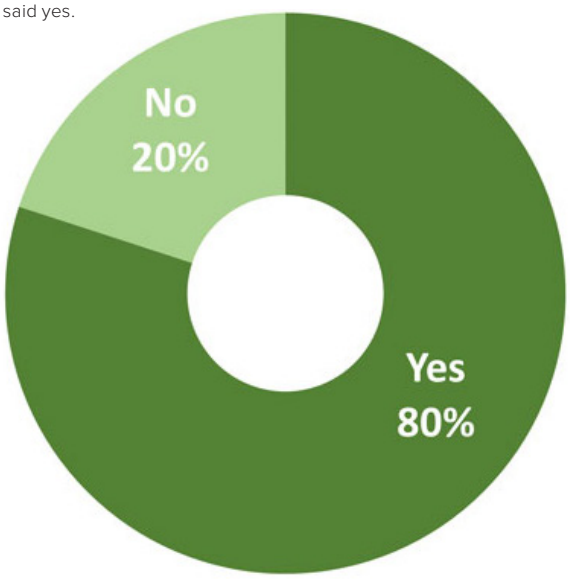
A variety of new data-driven technologies have demonstrated value creation in other phases of a project's lifecycle. For instance, augmented reality (AR) allows for remote safety and Constructability Reviews, all from the comfort of the office. Aerial and other unmanned robotic systems can perform everything from equipment factory acceptance testing (FAT) to safety auditing and sensoring and surveillance for progress measurement. But the same kinds of value-added data integration successes are uncommon in early phases of capital project planning and development. The sheer volume of information generated on projects and the lack of data-focused information management systems have been major roadblocks. Many project professionals we spoke with said their owner organizations are trying to sort out the types of digitalization tools that fit or should fit into their delivery system.

Most project groups are only now developing a process through which data transfer between internal and external systems can be at least semi-automated. IPA clients explained to us that legacy systems and processes are mostly manual, i.e., the project team records the data by hand (typically using a spreadsheet). By and large, these manual methods of collecting and analyzing project data to produce meaningful metrics and actionable insights have been unsuccessful. As a consequence, many owners said they gave up on data integration. Owner companies, though, should not expect their project groups to simply give up on digitalization. Companies that fail to sponsor well-conceived data integration initiatives risk deteriorating capital project competitiveness within the next few years.

Getting Started on a Business Case for Digitalization

Some might argue the projects industry has been slow to adapt and adopt the data-driven mindset we see in other industries. However, that argument

Figure 1: When asked if they were frustrated with the capital project data capabilities available to them, 80 percent of company representatives said yes.



assumes transition of data into actionable knowledge is comparable among all industries. As a broker of project data, IPA can attest to the difficulty of capturing information on projects. It takes a lot of people who know what data are important, who know how to organize it, and who know how to extract insights from it. Adding the right people with the skills to do this can be expensive.

Naturally, for a project organization unaccustomed to leveraging project data to feed decision making, a change to get digital is a hard pill to swallow. But the onus is on the project organization to explain to business what the return on investment is going to look like. That is a fair business expectation. The question we must, therefore, ask is: *What would a value proposition look like for this kind of transition to digitalization?* The answer to this question has been diffult for many organizations to quantify.

The first step in creating the value proposition should be to determine what data best support this decision. From IPA's perspective, those data typically include detailed cost information, detailed schedule information, engineering data, and project team information (as well as basic project information such as location). With this information, we can better understand what a competitive project should look like—what the design should look like, how long it should take, how much it should cost, and who we need to run it. Data needs will vary by company, but these data are empirically associated with the biggest gains in internal rates of return.

These suggestions are not particularly clever, and most project teams already endeavor to get this information. The issue is that these data are hard to get. So, what prevents them from getting the data?

Enabling Digitalization Efforts

Most organizations do not have the people, infrastructure, or work processes to get necessary project data. Let us take a look at each of these issues.

Data Professionals: When it comes to people, half of the organizations we talked with had no data people at all. Some companies are looking for data people, but others are being asked to go digital without a budget for expanding the team. This approach will not work. Data analytics requires a unique set of skills to do it right. Much of the benefit of digitalization is being able to move numbers around efficiently (i.e., automatically). This requires people who know data structures, who know how to integrate between systems, who know how to perform the analysis, and who know how to program all of this. Like engineering disciplines, these are unique skills that cannot simply be picked up by project professionals on the job or in their free time.

Data Flow Processes: In addition to people, we need tools and processes to ensure we get the data we want and that it flows efficiently. On the process side, many companies we interviewed have a process, but it requires the project team to gather and record data manually at the end of the project. Most companies we talked with explained the process has had limited success. At closeout, a lot of information is missing and disorganized, and the project team is looking to move on and, thus, disinterested in data entry.

Data Infrastructure: In contrast to the majority of companies we interviewed, there were a few already companies using automated systems. Information transfer between accounting, scheduling, and cost management software was completely automated. More importantly, contracting systems, e.g., the code of accounts, were mapped to the owner systems. Though only a handful of companies had progressed this far with an infrastructure, the gains were significant. For example, one representative said: "Progress reporting was always a month late and involved a team of people re-entering data into our system; now it is instantaneous."

There Is No Silver Bullet Approach

The conclusion of our preliminary investigation into digitalization was that each organization needs to approach this transformation on its own because there is no simple, one-size-fits-all solution for Industry. The starting point for individual companies is to establish clear objectives for what they hope to accomplish with project data. Once these objectives have been solidified, companies should perform a detailed examination of the processes being deployed to collect, clean, and store the data, and what can be done with this data, before embarking on any renovation, expansion, or even greenfield program.

At the end of the day, more data should mean better decision making. The project development work process so many organizations follow is about generating enough information to decide whether or not a project is worth doing. Companies that manage to integrate digitalization into their process should experience a comparative advantage in the delivery of their capital projects, but that all depends on how efficiently they can get their hands on the right data.

So What Can IPA Do to Help?

IPA has developed Best Practices and standardized methodologies for the collection, cleaning, storage, access, and use of extensive databases. This

information is used on a daily basis to provide actionable insights to improve project outcomes. Our experience and learning can be used to help your project organization maximize the value of its data. Contact IPA to discuss how we can work together to:

- Consult with senior stakeholders to determine what the business objectives for owner data are—thus determining what data are necessary to collect and store
- Perform a detailed investigation into existing database(s) and provide recommendations for using current data
- Evaluate the current data collection system and provide recommendations for improvement based on industry Best Practices
- Develop tailored databases to capture detailed project information
- Develop customized tools for all aspects of data integration and visualization

Greg Ray is a Senior Project Analyst and Luke Wallace is a Senior Research Analyst. Both work in IPA's North America office in Ashburn, Virginia.

Cost Engineering

Bolstering the Industry's Cost Engineering Competencies

IPA helps owner companies improve their cost engineering capabilities at both the individual project level and project system level. IPA's contributions to the field of cost engineering have been recognized by the Industry's leading trade associations.

- Estimate Risk Analysis & Schedule Evaluations
- Cost Engineering Committees
- Cost Engineering System Tools & Services
- Capital Projects Market Intelligence

To learn how IPA can help your organization, contact Aditya Munshi, Deputy Director, Cost Analysis Group, at amunshi@ipaglobal.com.

Re-Evaluating Owner's Cost KPIs and Cost-Cutting Strategies: **When Is Enough *Enough*?**

By Katya Petrochenkov and Tom Mead

The oil price drop in 2014 exposed several weaknesses in the E&P Industry. Development solutions had become over-designed and the supply chain had been stretched and strained to meet demand. Importantly, the industry also came to realize that the one expense growing faster than supplier prices was owner's costs. Since the 2014 downturn, E&P companies have put significant effort into cutting costs, especially owner's costs. Less effort, if any, has gone into investigating the effect such cost cutting measures have had on project performance and whether owner cost thresholds, which are usually a simple ratio of owner's costs as a percentage of total installed costs, are actually appropriate (Figure 2).

Misplaced Pressure to Reduce Owner's Costs?

Although many companies have adopted simple owner's cost Key Performance Indicators (KPIs) and do-not-exceed thresholds, it is time to pause for a moment and remember what owner's costs are actually capturing. The details of the code of accounts for owner's costs vary across the industry, but at the most basic level, these costs cover money spent on owner personnel, studies, permitting, and other costs in support of planning and executing projects. Invariably, it is those owner personnel, or project team costs, that make up the largest proportion of owner's costs. When project leaders and teams are under pressure to reduce owner's costs, team resources are the first to go. As anyone involved with capital projects knows, the required size and composition of a given project team is dependent on the project's context and complexity. The team required to achieve success on a subsea tie-back to a local host, for example, looks very different from the team needed to handle a complex new development in a frontier region. Other than perhaps those companies that have truly mastered the art of standardization and repeat supply chain projects, it is hard to believe a single owner's cost or team size metric could truly be relevant across a portfolio of projects.

IPA research has revealed the folly of adhering to a single owner's cost KPI to reign in project costs. For example, a design competition contracting strategy might succeed in increasing a large capital project's cost competitiveness compared to the industry average for similar projects. But consider the owner's costs involved in carrying out a design competition. How much does it cost for owner project team personnel to review Front-End Engineering Design (FEED) packages delivered by multiple contractors? What are the chances that the owner's cost wrapped up in this contracting strategy would exceed a single KPI intended to keep the owner's costs in check? What about new technology? Many tout the potential of new technology to improve capital project cost outcomes. In some cases, maybe it is possible. But what is the effect on owner's cost? Perhaps more spending on studies or permitting is necessary. Could the total asset cost advantages predicted with a new technology outweigh the likelihood of exceeding owner's cost thresholds?

Moving Beyond Simplistic Owner's Cost KPIs

Holding projects to simple owner's cost or owner team size KPIs is an overly simplistic approach. Such metrics do not account for the relative value return on owner's costs in different contexts and provide no guidance on how resources should be effectively dispersed across a project

portfolio. IPA's research has demonstrated countless times that strong teams are essential to project success and, when asked, most owners agree. In an environment in which E&P companies are focused on maximizing project value and optimization exercises, we cannot afford to underestimate the value our people bring to projects. No longer can we think about owner's costs and project teams in isolation.

IPA has launched the next step in our series of research into owner's cost to help companies understand and manage these costs in a more holistic way. The objective of this study is to better understand how E&P organizations can pursue better project staffing strategies—strategies that leverage owner competencies, suit the project context, balance owner costs, and ultimately promote project success. These insights will equip owners with the ability to make smart decisions around staffing projects and optimizing resources across their portfolios, while maximizing the competiveness of owner's costs for a given development.

Achieving this objective requires that we understand the strengths and weakness of various project staffing models employed by owners and the relationships between these staffing models, owner's cost, and project outcomes. This understanding will allow us to explore questions, such as:

- When are lean teams appropriate and how can they achieve success?
- When are more robust teams with higher owner's costs more cost effective at the project level?
- What owner cost KPIs give a more nuanced assessment of a system's health?

Our study approach is collaborative, combining IPA's expertise on E&P projects, research design, and analytics with close interfacing between IPA and study participants to share early findings in real time, gather feedback, and ensure study results are highly contextual. The result will be a customized report for each participating client, detailing insights generated through the study analysis and a system diagnoses aimed at answering the following questions:

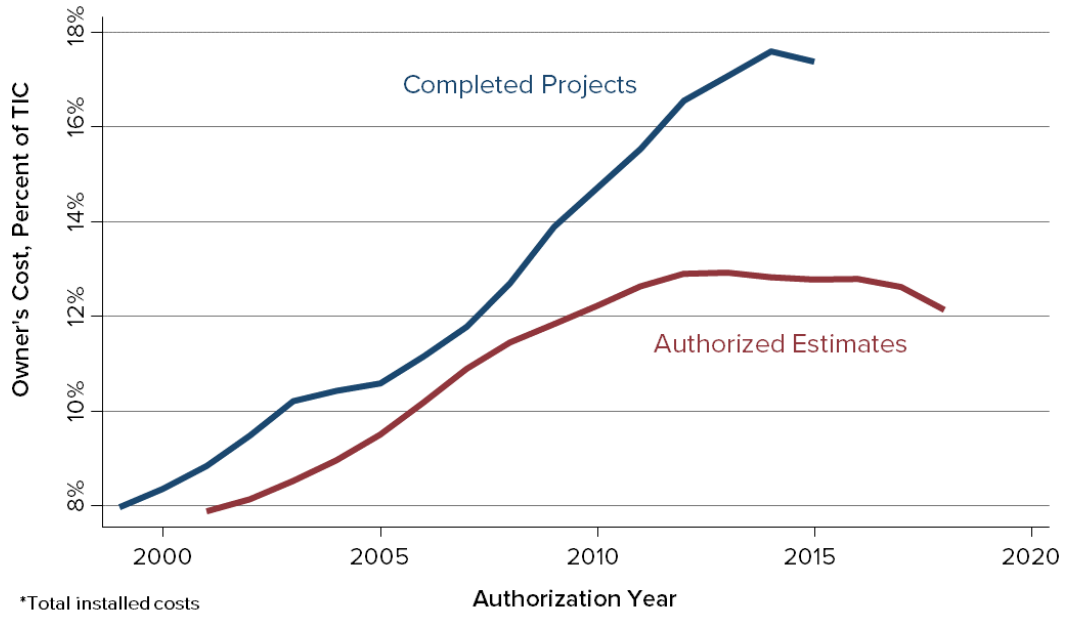
- Is your project system using the most suitable staffing models?
- Are you maximizing the effectiveness of the staffing models you use or missing out on key points of leverage?
- Are you leaving money or performance, or possibly both, on the table? Given the constraints and context of your system, what action can you take to close these gaps or activate value levers?

For more information on how you can participate, please contact the study's principal investigators Katya Petrochenkov (kpetrochenkov@ipaglobal.com) or Tom Mead (tmead@ipaglobal.com).

Figure 2

Recent Owner Cost Estimates as a Share of TIC* Have Fallen

But Is This Enough? Too Much? Too Little?



*Total installed costs

The Challenges of Pipeline Projects in North America

By Chris Mullaly and René Klerian-Ramirez

Unconventional oil and gas plays in North America continue to fuel demand for regional pipeline construction projects. According to industry observers, insufficient pipeline capacity is a persistent impediment to North American energy sector production and revenue growth. Indeed, oil distribution bottlenecks are common at critical junctures, including at points within the U.S. Permian Basin and the Canadian oil sands regions. In Canada, for instance, such bottlenecks have caused oil reserve buildups, forcing Canadian oil prices lower as a result.[1]

Although demand for pipelines in North America is strong, pipeline companies are encountering project planning and execution challenges on several fronts. While federal and state permitting rules and regulations have largely remained unchanged for many years, pipeline companies are increasingly having a difficult time predicting when, and if, construction permits will be issued. Public opposition and interest groups' efforts to stop pipeline projects through the courts only add to the uncertainty. Meanwhile, as pipeline companies work with various stakeholders and wait to begin construction, commodity prices, labor availability, and drilling and production schedules are subject to change. By and large, pipeline companies are facing an increasingly difficult environment to expand and rebuild an aging and strained network of oil and gas pipelines across North America. The key for pipeline companies to succeed in this increasingly challenging environment is to get a firmer grasp on their projects' cost and schedule predictability, while remaining safe and competitive.

IPA's Pipeline Database and Expertise

IPA is uniquely positioned to help project teams develop and define their pipeline projects for success. IPA's database contains more than 1,000 pipeline projects worldwide. The projects represented in our database include traditional pipeline companies and pipelines executed by midstream and major integrated oil companies.

For each pipeline in our database, we have captured up to 2,000 data points. We collected technical information like pipeline length, diameter, wall thickness, types of terrain, line pipe metallurgy, the number of spreads used for construction, and crossings information. We have their cost and schedule histories and understand project team structures, the appropriateness of their targets, and the quality of project development and definition at full-funds authorization. This leaves us with a robust understanding of the effect of pipeline-specific project practices on pipeline-specific project outcomes.

Our pipeline database also addresses a wide range of technical characteristics. IPA has in its database pipelines that range in length from less than a kilometer to more than 1,000 km; pipeline diameters that range from 3 inches to 56 inches, and pipeline wall thicknesses that range from 0.1 inches to 1.5 inches. These projects use every imaginable construction technique. We also have pipelines with a wide range of crossing characteristics. IPA measures crossing length as a percentage of total pipeline length for road crossings, rail crossings, river crossings, mountain crossings, and wetlands crossings. A company considering building a pipeline project will almost certainly find that the project fits within the parameters of IPA's dataset and expertise.

IPA's Pipeline Tools

From this historical database of more than 1,000 pipeline projects, we have created several pipeline-specific tools to benchmark various project types. With these tools, IPA can benchmark the costs and schedule competitiveness of pipeline projects and quantify the effects of uncertainties as they have played out in other projects.

[1]Haley Zaremba, *Pipeline Bottlenecks Cost Canadian Producers $20 Billion*, Oilprice.com, published May 4, 2019.

- Pipeline Cost Model: used to develop an industry average total engineering and construction cost (and range around that industry average) based on technical characteristics like pipeline length, diameter, and crossings information; the cost model can be used by companies to calibrate early expectations around the cost of a potential pipeline; the cost model can also be used to increase cost predictability (i.e., the likelihood the final project cost resembles the cost used in establishing the full-funds authorization estimate)
- Cost Ratio Analysis: used to examine categories of estimated or actual project cost (e.g., detailed engineering cost to line pipe cost) and compare those of the project being benchmarked against those of past, similar projects; can be used to identify in which estimate line items a project is likely to overspend or overrun
- Pipeline Construction Duration Model: used to develop an industry average construction duration based on technical characteristics like pipeline length, diameter, and crossings information; companies can use the model to calibrate early expectations around the schedule of a potential scope
- Pipeline-Specific Front-End Loading Tool: used to quantify the status of project readiness at the end of feasibility (FEL 2) and define (FEL 3) stages for pipeline scopes; the tool measures the status of planning deliverables common to all projects (engineering drawings, geotechnical information, permitting, cost estimate, schedule, execution plans, etc.); it also incorporates pipeline-specific considerations (e.g., status of Rights of Way, community relations issues, etc.); the independent quantification of project status better positions decision makers to answer questions like, "Is this project opportunity ready to move into the next phase or does more work need to be completed to allow for making a good business decision?"

Conclusion

Pipelines are becoming more difficult (and expensive) to build, and, yet, in the foreseeable future, the demand for pipelines in North America is not dissipating. This leaves pipeline companies in a tough position.

In this challenging environment, access to data to better plan future pipeline projects becomes that much more important. Pipeline owners need to predictably and effectively execute their pipeline scopes, and IPA data help them do that. Not only do IPA project assessments identify potential gaps relative to our pipeline Best Practices, they also help calibrate cost and schedule assumptions. This is useful as a measure of readiness/feasibility at the full-funds decision gate. It is also helpful earlier in the lifecycle when deciding what pipeline opportunities to prioritize.

Chris Mullaly is a Senior Project Analyst and René Klerian-Ramirez is a Senior Project Analyst. Both work in IPA's North America office in Ashburn, Virginia.

E&P Capital Project Industry Trends and Forecasts Showcased at UCEC 2019

Members of IPA's Upstream Cost Engineering Committee (UCEC) met June 13, 2019, at The Woodlands, near Houston, Texas, to bolster their cost engineering capabilities with the latest capital project metrics available to the E&P Industry.

The UCEC, an Upstream Industry Benchmarking Consortium (UIBC) subcommittee, strives to improve upstream project and business results by providing essential metrics for better cost engineering. Member company representatives gather once a year to learn about and review new UCEC metrics packages prepared by IPA. Companies use these upstream metrics to compare their upstream project cost and schedule outcomes with industry cost and schedule norms and, in general, boost project estimate assurance and evaluation quality.

Featured at the UCEC 2019 annual meeting was a new study showcasing a historical look at important E&P industry trends including capital spend, rig utilization rates, and contractor backlog data. The study then delivered an initial forecast of these cost engineering trends. Other IPA presentations delivered at the meeting reviewed research on the state of industry project controls and also fast-paced subsea tie-back and carbon pricing. All UCEC research is based on actual E&P industry capital project data from IPA's proprietary databases.

For more information about UCEC, contact Jonathan Walker (jewalker@ipaglobal.com), Senior Research Analyst and E&P Team Lead.

Project Leader Workshop: Understanding and Honing Your Individual Leadership Capabilities

Leadership is one of the most influential factors in determining the success or failure of large, complex capital projects. Because complex projects fail more than twice as often as smaller capital projects, strong project leadership is non-negotiable. Attend this workshop to gain the knowledge and skills to tackle the most common challenges faced by project leaders:

- Establishing a large, multi-functional organization from scratch
- Making complex decisions quickly
- Managing a diverse set of stakeholders effectively
- Addressing conflicts at the interpersonal, contractor, and third-party organization levels
- Succeeding under extreme pressure

In this workshop, you will learn how your leadership profile compares to the best, test your decision-making skills, and develop an action plan to become a successful complex project leader. You are afforded opportunities to continue leadership development through progress reviews with instructors and sharing experiences with peers.

The inaugural *Project Leader Workshop* is scheduled to take place October 1 to 2, 2019, in Houston, Texas. For more information, please contact Sarah Sparks, Organizations & Teams Product Development Leader, at ssparks@ipaglobal.com.

THE IPA INSTITUTE

Visit www.ipaglobal.com/events to view details and register

PUBLIC COURSES

JUNE

24-25 Best Practices for Site-Based Projects
Perth, Australia
All seats filled

26-27 Project Management Best Practices
Lima, Peru
All seats filled

AUGUST

21-22 Best Practices for Site-Based Projects
Salvador, Brazil

SEPTEMBER

17-18 Project Management Best Practices
Arlington, Virginia

24-25 Best Practices for Site-Based Projects
The Hague, Netherlands

25-26 Project Management, Cost Estimating, Planning, and Controls Best Practices
Rio de Janeiro, Brazil

OCTOBER

1-2 Project Leader Workshop
Houston, Texas

8-9 Best Practices for Site-Based Projects
New Orleans, Louisiana

8-10 Megaprojects: Concepts, Strategies, and Practices for Success
Perth, Australia
Instructed by IPA Founder and President Edward Merrow

22-23 Gatekeeping for Capital Project Governance
Shanghai, China

NOVEMBER

12-13 Practices for Site-Based Projects
Santiago, Chile

IPA Week 2019: **Innovate. Integrate. Celebrate.**

IPA's regular business operations helping clients improve the effectiveness of their capital projects were momentarily paused last month. Instead of interviewing and collecting data from project teams and conducting project evaluations and research into what drives project performance, IPA's entire global staff participated in a retreat at the Lansdowne Resort in Northern Virginia.

IPA Week 2019 united the capital project analysts, researchers, managers, and corporate personnel from IPA's four global regions—North America, EMEA, Latin America, and Asia-Pacific. During the May 20-23 event, IPA employees partook in a variety of collaboration and team-building activities, each focused on one or more of IPA Week 2019's three themes: innovate, integrate, and celebrate.

Throughout the week, global colleagues attended workshops highlighting the breadth of IPA's products and services. Staff then weighed innovations that could make IPA's client offerings more valuable. In addition, team-building events were organized to introduce or reintroduce colleagues from offices on opposite sides of the globe and promote functional integration and collaboration. IPA staff also celebrated more than 30 years of contributing to positive changes in the capital projects Industry.

In keeping with IPA's commitment to give back to local communities, the company wide retreat also featured a charity miniature golf activity on Red Nose Day USA on May 23. At the conclusion of the activity, a large shipment of home and grocery goods went to a local charitable organization.

Procurement & Contracting Committee

Exclusive research group for IBC member companies dedicated to developing and applying procurement and contracting Best Practices

Procurement professionals have the ability to affect capital project cost and schedule performance beyond securing lower unit costs for project materials and services. The Procurement & Contracting Committee, a sub-committee of the Industry Benchmarking Consortium (IBC) and Upstream Industry Benchmarking Consortium (UIBC), is a continuous improvement initiative focused on quantifying the links between industry procurement and contracting practices and capital project performance. IPA conducts research and develops metrics in support of this mission, under the steering committee guidance.

PCOM Membership Benefits

- **Research on Best Practices** that can be incorporated into your contracts, procurement, and overall continuous improvement efforts
- **Metrics and tools** to apply as KPIs to manage your vendors, suppliers, and other supply chain elements.
- Access to IPA's **procurement and contracting expertise and data** through access to professionals and webinars throughout the year
- **Network** with other procurement and contracting professionals

Key Questions Answered

- How can work practices and processes drive better project performance?
- What practices could strengthen the prequalification, selection process, and management of contractors?
- What project data could procurement groups collect to aid project teams in establishing better long-term relationships (and performance) with contractors and vendors?
- What can be learned from other industries?

How to Become a PCOM Member

All IBC member companies are eligible to participate. To learn more about PCOM membership, fees, and planned research topics and metrics, contact Michael McFadden, Director, IPA Project Research Division, at mmcfadden@ipaglobal.com.

IPA PCOM

ANNUAL MEETING
December 3-4, 2019
The Woodlands, Texas

IPA Events and Presentations

Brazilian Construction Law Institute Congress

August 29-30, 2019
São Paulo, Brazil

Astor Luft, IPA Director, Latin America, is scheduled to speak at the seventh annual Brazilian Construction Law Institute Congress. The event brings together experts, practitioners, and scholars to discuss trends and issues affecting the infrastructure and construction market in Brazil, and this year Luft will participate in a discussion on contracting strategies. View more event information at ibdic.org.br.

European Airports Project Benchmarking and Research Consortium

September 9-10, 2019
London, United Kingdom

Airports in all regions of the world are authorizing large amounts of capital for the construction of new and improved assets to address increasing passenger demand, changing technological capabilities, and aging infrastructure. Unlike other capital-intensive sectors, there are few opportunities to network within the airport projects community. Therefore, IPA is assembling a consortium of Europoean airport project organizations to provide opportunities to discuss key project practices that drive capital effectiveness and cost savings.

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 Aditya Munshi, IPA Deputy Director, Cost Engineering, at amunshi@ipaglobal.com for more information.

SPE Annual Technical Conference & Exhibition

September 30-October 2, 2019
Calgary, Canada

IPA Energy Practice Director Neeraj Nandurdikar will participate in a panel discussion on socially responsible engineering on Wednesday, October 2 at the Society of Petroleum Engineering (SPE) Annual Technical Conference & Exhibition (ATCE) Conference in Calgary. The 2019 ATCE will focus on using data to improve productivity and safety in the exploration and production (E&P) industry. View the event's technical program at www.atce.org.

Upstream Industry Benchmarking Consortium (UIBC)

November 18-20, 2019
Lansdowne, Virginia

The UIBC is solely dedicated to the exploration and production (E&P) industry. It provides an independent forum for each participating company to view key metrics of its project system performance such as cost and schedule, Front-End Loading (FEL), and many others against the performance of other companies and share pointed and detailed information about their practices. The consortium highlights Best Practices, reinforcing their importance in driving improvements in asset development and capital effectiveness. Contact Kelli Ratliff, IPA Deputy Director of Consortia Membership and the IPA Institute, at kratliff@ipaglobal.com for more information.

Procurement & Contracting Committee (PCOM)

December 3-4, 2019
The Woodlands, Texas

The Procurement & Contracting Committee is an IBC sub-comittee that focuses on quantifying relationships between industry procurement and contracting practices, as well as capital project performance. Like members of the IBC and UIBC's cost engineering committees, PCOM member companies benefit from metrics and research developed from IPA's proprietary database of more than 20,000 capital projects. For more information, contact IPA Director, Project Research Division, Mike McFadden at mmcfadden@ipaglobal.com