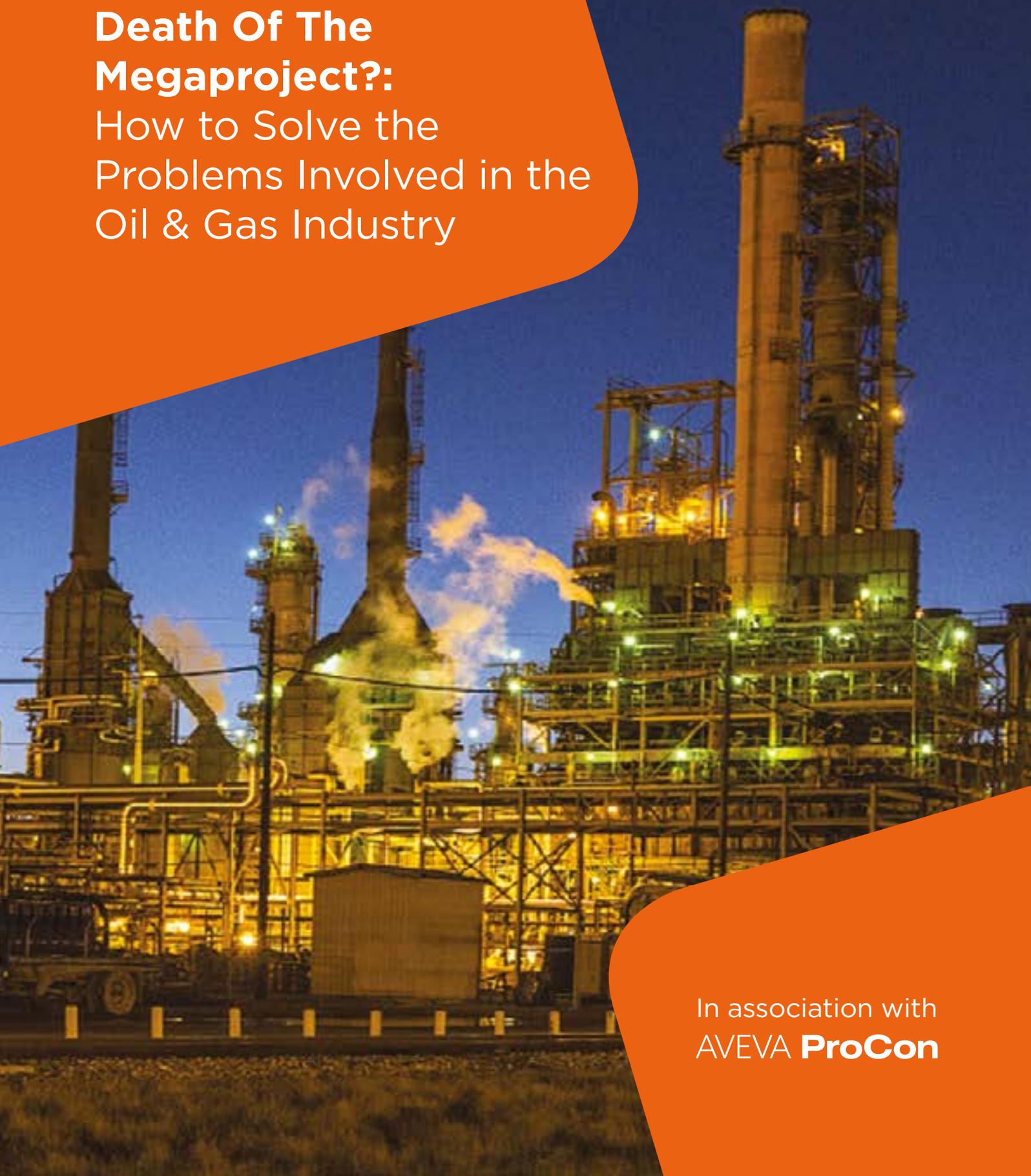


Oil & Gas **iQ**

Death Of The Megaproject?: How to Solve the Problems Involved in the Oil & Gas Industry



In association with
AVEVA **ProCon**



INTRODUCTION

The headstone of the oil and gas megaproject is being etched as you read these words...

In a world that has seen the price of a barrel of the Black Gold nosedive by more than 60 per cent in two years, the reality of infrastructure megaprojects in the energy fold makes for much grimmer reading now than in 2014. Even in the halcyon days of \$100 oil, four out of every five were doomed to failure.

Oil discoveries have plummeted to 60-year lows, meaning that the number of developments that cost more than \$1 billion - the fundamental definition of a megaproject - are set to dwindle concomitantly.

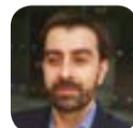
But were we going to see the end of the megaprojects era even if Brent crude had stayed at record highs? Was it sustainable even for an industry awash with cash to continually fund capital projects that were seemingly fated from their inception for catastrophic cost creep, scheduling overruns, and, ultimately failure?

Not only have 78 per cent of megaprojects in the oil and gas sector completed in the past decade failed in terms of cost and schedule, but two-thirds of these also fell short of production-attainment goals. More specifically, half did not achieve at least 50 per cent of the targeted production slated for their first 24 months of their operational lives.

According to analysis completed by multinational professional services firm, EY, the Middle East was the region suffering from the highest percentage of projects facing both cost overruns and schedule delays, at 89 per cent and 87 per cent of projects respectively, whilst South America was seeing average project budget overruns of a chastening 102 per cent.

In the midst of an oil price depression and with a track record of project delivery abject in its efficacy, the future looks far from bright for the vital energy infrastructure developments that are taking shape in the present day. Yet as the epitaph of their demise is being carved, there is still time to knock the mason's chisel from his hand.

In association with AVEVA ProCon, Oil & Gas IQ have undertaken a wide-ranging analysis of the project landscape and asked those intimately involved in the delivery of large capital projects in the hydrocarbons sector exactly where their pain points and concerns lie in these testing times. What follows is a breakdown and dissection of their challenges and grievances, and where we think that opportunities for improvement exist on the front lines of the oil and gas world.



Tim Haïdar,
Editor In Chief,
Oil & Gas IQ

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What commonalities exist in your most successful large capital projects?



“My view is that project stakeholders still underplay the relative importance of building a strong relationship with the contractor.”



Clare Colhoun
AVEVA ProCon

Here, we can see that some of the softer, non-technical aspects of project management are very critical to the success of projects. For example, a clear process for getting things done so that the decision making process runs smoothly. This ranks slightly ahead of a well-defined scope. I wasn't surprised at all that the really important things are around information and organisation and communication.

If I look at those numbers, I feel the scoring for “good working relationships with contractors” and “managed contract change” are low and expected them to have been higher.

My view is that project stakeholders still underplay the relative importance of building a strong relationship with the contractor. While we believe,

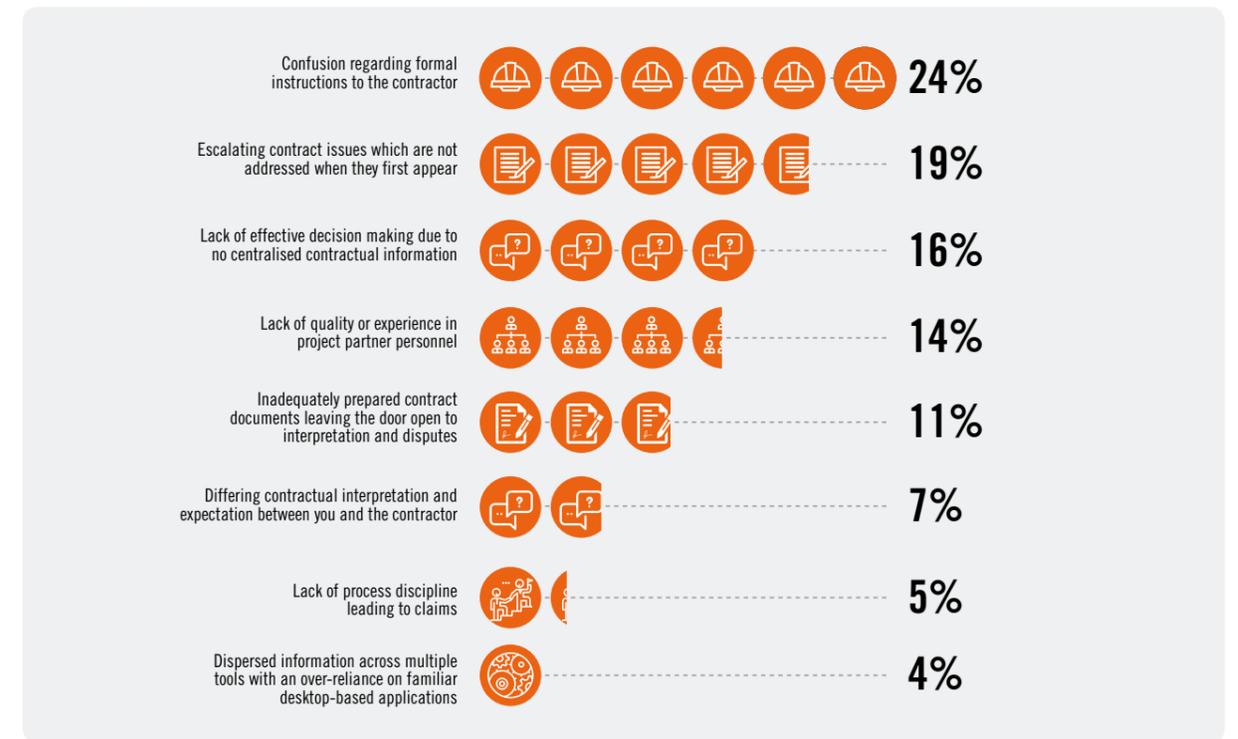
based on our stats, that actually, building and maintaining an excellent relationship with the contractor is fundamental to the project success. It is also critical to have a well-defined, structured process for managing contract change but we do not always see this in the projects we support.



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I wasn't surprised, exactly the same as you, that those were the highest priorities for people, but I was a bit more surprised that “clearly defined processes” was very low. Surely, that's interlinked with good working relationships, for example, and then scope creep. I expected it to be double what it was.

What weaknesses have you identified in your least successful large capital projects?



“We're in an industry that's characterised by inadequate systems to support contractor engagement.”



Clare Colhoun
AVEVA ProCon

I think that this clearly highlights the advocacy for a formal mechanism rather than an informal mechanism for instructing the contractor. This is why, over time, as projects have gotten more and more complex and larger, our underlying systems and processes for dealing with that incremental complexity haven't really kept pace.

We're in an industry that's characterised by inadequate systems to support contractor engagement.

Large projects have thousands of communications being issued between contract parties, and it's essential to distinguish between casual communications or observations and actual contractual instructions to the contractor to take an action on something. Particularly if it's outside of the original contract scope.

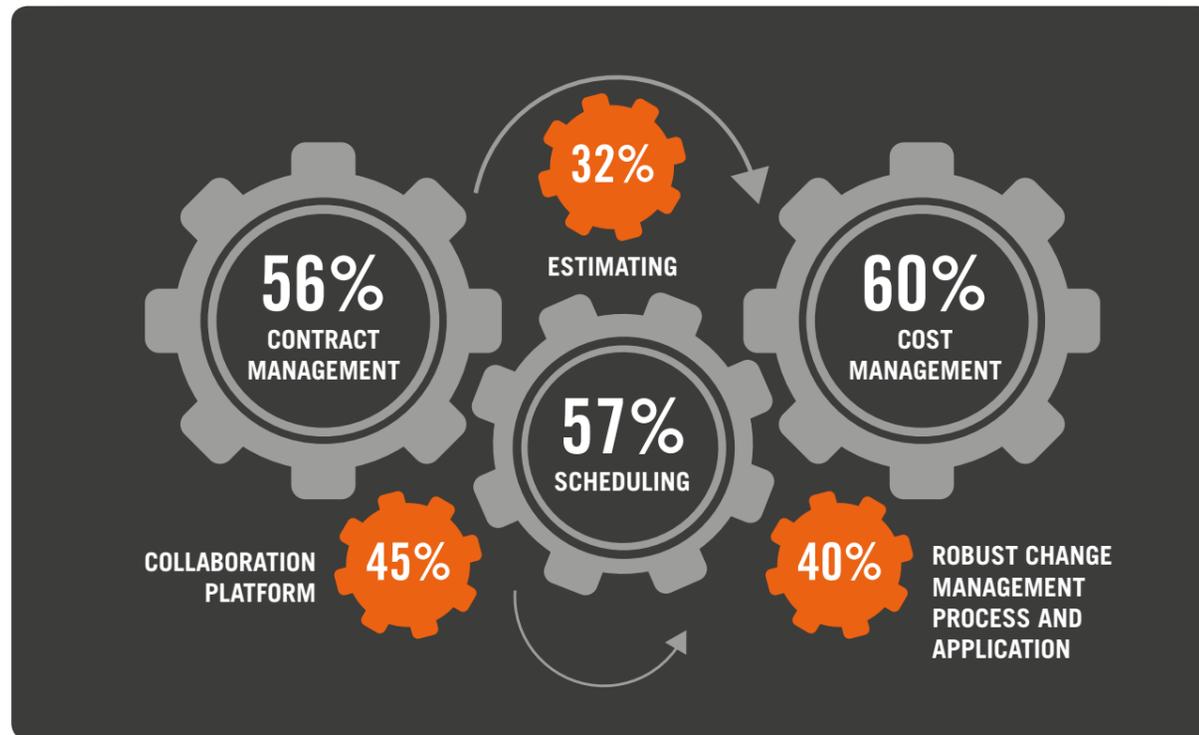


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There is a contradiction between what we see in the first element and then one of the main reasons that we see in the second. Here we're saying that formal instruction with the contractor is of great importance: a quarter of people believe it's not working. And yet in a previous question, the relationship is not rated highly.

Experience shows that if you have a strong relationship with a contractor, you actually build the formal instructions based on that relationship and you know how to communicate with them. So, the people element here and the trust dynamic on both sides, is of great importance.

Please select the top THREE critical applications that you think make large capital projects



“ Quite simply, being in control of the contract means being in control of change. ”



Clare Colhoun
AVEVA ProCon

This highlights the fact that controlling the project means controlling the execution of the contract as well as controlling the schedule and the costs.

Unfortunately, the industry has traditionally prioritised investment in cost and scheduling tools over a fit-for-purpose contract management software solution.

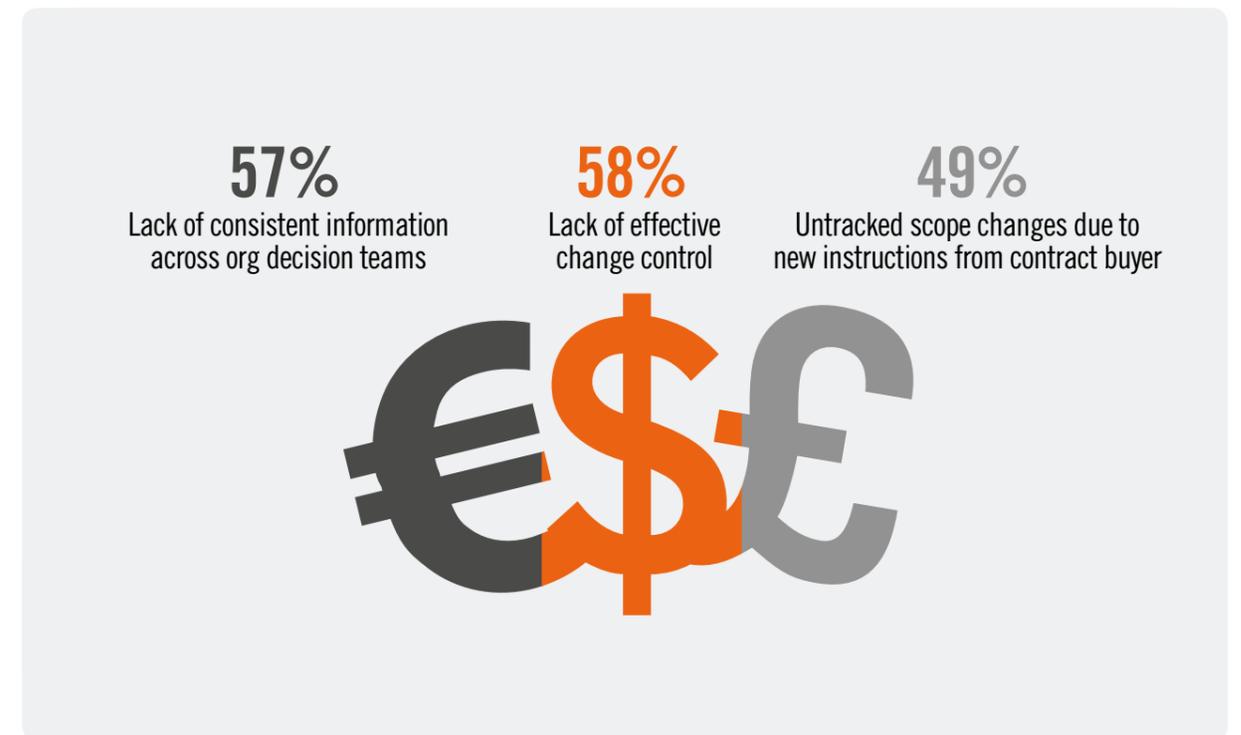
We know that project contracts are prone to a significant amount of change, so it's simply quite difficult to foresee with 100 per cent clarity the final scope of Capex projects at the outset. Managing these projects will require a significant amount of interaction between the contractor and the owner or operator. So there is a clear case and a clear need for a fit-for-purpose contract management solution to manage all of this interaction.

I think that the “robust change management process and application” is actually an inherent part of the

contract management solution itself, I wouldn't see them as separate. I think that once you get into execution mode, controlling and managing change really falls under the umbrella header of contract management. A lot of what happens once the contract is signed on Day Zero is going to have changed as soon as you get to Day One. Quite simply, being in control of the contract means being in control of change.

The whole domain is very complex and there are a lot of IT products that are positioned as point solutions to address specific areas. The challenge that customers have is bringing all those products into their new projects, integrating them, learning new technologies, new user interfaces, and making them work together.

What are the top THREE reasons for budget overruns?



“ Change control and managing change is becoming the key priority. And that's where firefighting starts. ”



Clare Colhoun
AVEVA ProCon

In general, coordinating decision making in project teams can be extremely challenging. How do we make sure that all stakeholders are looking at the same information in order to make critical decisions?

You can address that at a theoretical level but people revert to type and tend to huddle in functional silos.

It's a complex area as well because with a lot of projects, a new project team is put in place to deliver the project. People are thrown together in teams who don't have a history together and you are being introduced to a project organisation structure where processes are not yet formalised or proven.

Change control and managing change is becoming the key priority. And that's where firefighting starts.

In the last two years, how many times have projects you've been involved in experienced budget overruns of over 10%?



“When news of cost overruns is made public, there is a downward pressure on share price of the Investor/Operator partner in the project.”



Clare Colhoun
AVEVA ProCon

I am actually surprised that there are people who have never experienced overruns, given how endemic they are across the industry. A recent IOC sponsored study of major oil and gas projects undertaken between 2007 and 2010 found that only eight per cent of projects came in on time and on budget. So that's maybe just another contrasting study.

When news of cost overruns is made public, there is a downward pressure on share price of the Investor/Operator partner in the project. Therefore, the increasing incidence of overruns is finally beginning to get the attention of CFOs. And my own hope is that CFOs will be some of the champions of pushing for better processes, better systems and better analytics so that we can have better advance warning indicators of potential overruns and trends before they actually hit the project bottom line and hit the share price of the companies that are involved.

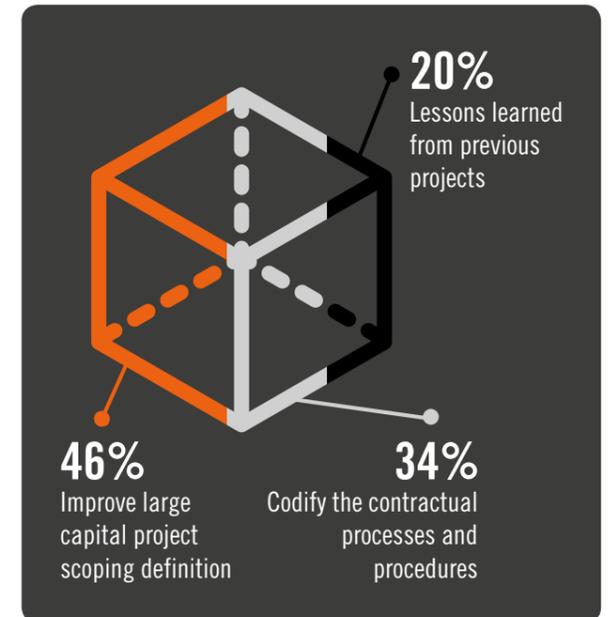


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Personally, I believe that 12 per cent we see here is fallacious. I can't believe that there are people who have been working in megaprojects over the last 24 months that haven't experienced overruns.

The question then becomes “why has that 12 per cent chosen not to be so honest about it?” Is it because it would reflect badly on them or their organisation? It would be interesting to delve deeper into the reasoning behind this segment of respondents.

What is your strategy to ensure that you mitigate such budget overruns for future large capital projects?



Clare Colhoun
AVEVA ProCon

Companies are becoming so risk averse in terms of overruns that they're tending to review their project portfolio with the aim of finding a higher volume of smaller, less risky projects where they can use repeatable processes and they can use repeatable designs, cutting down the costs of having to redesign and reengineer each project from scratch.

They are trying to get out of the cost overrun spiral by reducing the risk profile of the kind of projects that they're involved with. And this is evident right across the industry as we see several of the IOC's move in this direction, away from the riskier megaprojects.

I think the shale revolution, where companies can use the same techniques over and over again and can apply lessons from one well to the next, is a case in point. Operators see that getting into shale, which is dominated by smaller projects, has a certain appeal and attraction in a world of declining oil prices and a fear of cost overruns.

If you look at the link between cost overruns and credit ratings, a lot of these projects need to get project finance, and the cost of project finance is inextricably linked to the risk profile of a project.

For example, there was a recent project at Sabine Pass in Louisiana where they raised a \$1 billion note to fund the project. And they got a very favourable credit rating. And that credit rating was directly linked to the fact that they had had a good history up to that point of not having cost overruns. But that came with the caveat that this could change in future. then the credit rating would change.



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I would add to that, I guess, that only a fifth of people talked about incorporating lessons learned from previous projects. Having done quite a lot of work here on the Great Crew Change that's looming imminently, I can understand why more than a third of people would want to codify the contractual processes and procedures.

However, I wonder if lessons learned from previous projects and recording those is going to be more important going forward, given the fact that there is going to be such a dearth of qualified professionals in this space. I wonder if only a fifth of people saying that as a major objective is quite short-sighted.

“Companies are becoming so risk averse in terms of overruns that they're tending to review their project portfolio with the aim of finding a higher volume of smaller, less risky projects where they can use repeatable processes and they can use repeatable designs, cutting down the costs of having to redesign and reengineer each project from scratch.”

Many companies mitigate capital leakage by having a clearly defined Application for Payment (AFP) process to approve the work delivered before the invoice submission. This enables the Contracts team to ensure that the work delivered matches the amount on the AFP. Do you follow a similar process?

Is this process systemised or carried out manually?



Clare Colhoun
AVEVA ProCon

I'm surprised to see any project or company not following a structured application for payment process because these payment approval applications are horrendously complex and detailed. So much so that the large consulting companies, have actually made a business out of providing a service to the oil and gas projects whereby they audit the historical invoice payments at the handover stage of a project, and find all of the erroneous payments and take a % of the savings as their fee.

Those adopting a manual process is very high at 40 per cent. The cost of manual processing is so high on megaprojects, where you may have thousands of invoices coming daily, so it is surprising that you would find diligent individuals able to approve the work that has been done, or identify work that hasn't been done, and correctly pay hundreds or thousands of subcontractors. There is a real need here for education around the cost savings that can be made through automation.



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Editor In Chief,
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It seems nonsensical, potentially dangerous to the bottom line of a company, to put such a laborious and intensive process into the hands of a team of individuals that could then leave a company due to attrition or otherwise.



What percentage of invoice leakage do you think you have?



Clare Colhoun
AVEVA ProCon

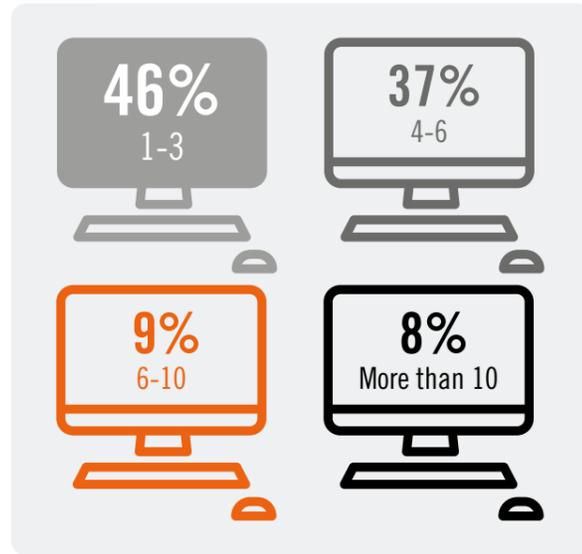
These statistics tell of damaging costs to the industry, even to have 1 per cent leakage is going to be a big cost in an industry that's investing north of \$900 billion a year on capital projects.

It's something that we just quite simply need to get better at because the project stakeholders have entrusted the executive team to manage this process.

There really shouldn't be any invoice leakage, and there's probably no need for there to be invoice leakage either in an age of technological sophistication. We just need to get our act together on this.

“ There really shouldn't be any invoice leakage, and there's probably no need for there to be invoice leakage either in an age of technological sophistication. ”

How many systems do you need to work across to get the information you need?



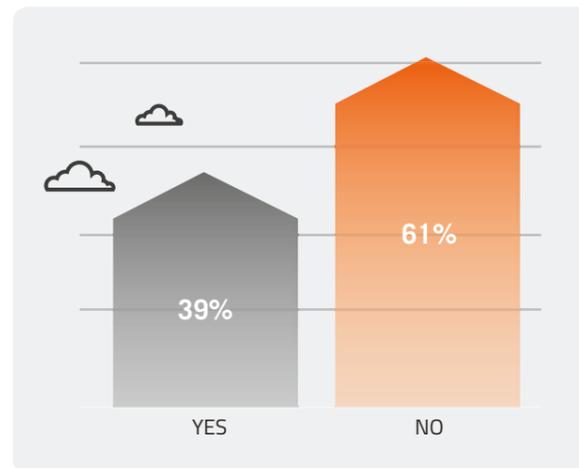
Clare Colhoun
AVEVA ProCon

These stats do not surprise me. Traditionally, a lot of oil and gas organisations would have centralised supply chain departments. From inception until the time of contract award, most of the contract related business processes are supported by central supply chain systems. Then when the contracts are awarded, because they're being executed in remote areas of Africa or Kazakhstan or Russia, the contract management responsibility is handed over to a geographically remote team. This team may not have access to central systems, and/or the latter may not be fit for purpose for actual contract execution.

Now combine that with the fact that, until recently, the project based contract team often didn't really have their own system. When they wanted to get

“Traditionally, a lot of oil and gas organisations would have centralised supply chain departments.”

Do you have a single system which is able to easily provide management with reports about contract obligations, contract KPIs, variation management and negotiated cost savings?



information on how things were going on the project, they went to the scheduling team to get a progress update on the project schedule, or they went to the cost management team to find out about changes to the budget or the forecast etc. So the project contract team ends up pulling information from central head office systems, and then from project-based tools that sat outside of their own organisation.

A lot of the contract professionals just relied on a bunch of unwieldy spreadsheets and emails and Word documents. I would say that the figures we have here represent a fair reflection of the state of the industry. It is not an aspirational state for the industry, but certainly a true-to-life snapshot of the status quo.

It is critical to ensure that contractual decisions made in earlier phases are easily available to all subsequent phases. With that in mind, from which of the following would you say is your main challenge when handing over critical contractual decisions?



“We're still frequently seeing an ad hoc approach as each new project comes on board, rather than repeatable processes that are embedded into the systems and made available to project teams.”



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AVEVA ProCon

The fact that the overwhelming majority of people, almost double the next statistic, said that there was no audit trail or tracking of decisions really highlights the lack of good processes and systems during the execution phase of the contract.

We're still frequently seeing an ad hoc approach as each new project comes on board, rather than repeatable processes that are embedded into the systems and made available to project teams. The industry is suffering from a lack of continuity as the project team leaves the project and they head off on to the next venture. The project is handed over to the operating team and the operating team is bereft of

insights into what happened during the early phases of the project.

It's a big problem and a big challenge for the industry. As these projects became more and more complex you need robust systems and well defined business processes.

The lack of a clear audit trail and process is one of the reasons why we see problems escalating through the life of the project, culminating in very expensive claims. We know there are still organisations out there managing big projects with spreadsheets.

At a time when projects, in certain industries, are losing skilled and experience professional due to the downturn, do you believe that delivering processes via a system can help bridge the experience gap and reinforce best practice processes?



Clare Colhoun
AVEVA ProCon

I am surprised that 100 per cent of respondents didn't say "yes" to this question.

Clearly, there must be an imperative for enhanced processes in an industry that's experiencing a demographic time-bomb, a "Silver Tsunami" as it has been called, where the percentage of industry veterans is getting older all the time. Common sense would indicate that we need better processes embedded in systems so that we can mitigate against that loss of skills.

“ Clearly, there must be an imperative for enhanced processes in an industry that's experiencing a demographic time-bomb, a "Silver Tsunami." ”



Conclusions

I don't think the results of this survey are telling us anything new that we haven't already found in working with the industry. But it reaffirms for us that there are a lot of process improvements and underlying system enhancements that are needed in the industry to really get it to start emulating other industries like manufacturing where they have embraced process improvements.

I think there's plenty of upside out there to be had from better processes, better systems. And I think, strangely enough, of late, because of the squeeze in the margins, it has forced a bit of a wake-up call in the industry to pay attention to some of the basic groundwork.

We shouldn't be an industry that's more focused on the rocket science of horizontal or deep water drilling, these amazing feats of engineering, whilst neglecting some of the more basic competencies. In lean times, the fundamentals get the attention and then, hopefully, as prices rise, you've got an industry that's better placed and stronger to be able to grow from it.

Now, in a downturn with the current oil prices, we think that many organisations are scrutinising every cost element within the organisation, and the drive for cost efficiency is underway. We've seen some stats showing that while the manufacturing industries' profitability nearly doubled in the last 15 years, the productivity in the oil and gas was static. People are starting to learn from this.



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