Managing Capital Investment Programs

Maximize Your Potential

Effective project selection and management is not a new message – some would say that the following observations are "obvious". However, the litany of recent over-budget and over-schedule oil and gas projects demonstrates that even the most sophisticated upstream companies are not able to "get it right" every time. Arthur D. Little believes that our lifecycle approach to capital investment helps to identify the causes for failure of projects and provides insight into increasing the effectiveness and efficiency of infrastructure capital.

The summer and fall of 2008 saw an unexpected and meteoric crash in oil prices from a high of $147/bbl down to below $50/bbl. This is driving a re-evaluation of capital intensive oil and gas projects as companies find their future cash flow diminishing. Early estimates predict that E&P capital spending could be down as much as 10% in 2009 – a huge difference from the 14% annual growth expected as recently as August. Capital intensive projects have been characterized by significant cost overruns and delays, mainly due to a demand-driven surge in resource and material costs. In 2007-2008, most firms have seen cost inflation of approximately 17% across labor, equipment and material categories. This year, Arthur D. Little believes that oil companies will need to look even more closely at the economic viability of their chosen projects, and work much harder to achieve their successful delivery. Project portfolios will have to be re-optimized, and only projects delivering the highest returns will be sanctioned– some projects may well be delayed as firms wait for costs to fall in line with falling oil prices, and to fit within their reduced budgets. Those projects already under execution will be further scrutinized to ensure that they are achieved within time and within a significantly-reduced budget.

Over the past five years or so, high oil prices created strong demand for resources and materials to produce more oil, which drove up the costs of specific types of labour and materials, and extended delivery dates for key equipment, thus making project management more difficult. We are now in a cost-cutting era where E&P firms will have to ensure that capital intensive projects are managed even more effectively to deliver their anticipated benefits: poor project control, retrospective base-lining of sunk costs and "point forward" economics will not be an option.

Our work shows that it is usually a combination of factors that cause capital projects to fail, with ineffective management of four key areas at the root of the problem:

- Strategic conceptualization of projects;
- Optimization of program and project portfolios;
- Initiation and management of projects / programs;
- Ensuring value delivery.

We now look at each of these key areas in more detail, before setting out a framework developed by ADL to address all of these issues together to ensure delivery of projects' maximum potential.

1. Strategic Conceptualization of Projects

Capital investment projects are developed both in response to issues an organization faces and to opportunities that arise. Often these projects are defined in isolation from the organization's corporate strategy. ADL has found that successful projects are those that align with an organization's corporate strategies from conception – rather than those whose objectives are aligned retrospectively to bolster an underperforming project's business case. Attention must be given during the concept phase to basic business case development, with particular focus on the project drivers. Without this initial clarity there is a high risk that the project will quickly unravel in later stages. This is especially true in the case of complex projects which involve several locations, multiple facilities or networks at the same time. With such clarity of objectives, project managers must then be able to translate them effectively into targeted engineering initiatives.

By way of example, North Sea upstream operators' asset strategies are focused on increasing production volumes and concurrently, production efficiency. Numerous digital oilfield program such as Field of the Future™ and SmartFields™ have aligned with these objectives and have broken down barriers through cutting-edge technology to increase collaboration on organizational and geographic levels. Sharing global expertise is now possible to solve real-time production issues, reducing shutdown times, unplanned maintenance and Personnel on Board (POB) requirements, all leading to increased production efficiency and enabling increased production volumes. Such projects effectively demonstrate the tangible benefits that can be achieved through synchronization of corporate objectives and project concepts.

2. Optimization of programs and project portfolios

Large upstream corporations now often encompass multiple business units, increasing the risk that similar investment decisions are taken in isolation: project managers may struggle to place their project within the wider context of portfolios of projects undertaken across the business. As a result, multiple projects with similar objectives can end up being undertaken in parallel, without appropriate prioritization, leading to a waste of time and resources where economies of scale might be possible.

ADL has helped clients avoid this problem by developing a prioritized portfolio of assets and production volumes, and using that understanding to develop the optimum portfolio of projects. By undertaking a sophisticated analysis of the business's objectives and issues, an effective portfolio optimization will ensure that CAPEX investment can be directed to achieve maximum returns, whether these are directly financial or reflect other priorities – such as health, safety and environmental compliance issues.

For example, a European E&P company had a very large portfolio of potential CAPEX investment projects, but insufficient funds to execute them all. ADL assisted in the mapping of expected project returns to the organization's strategic objective, thus focusing spend on the most efficient and productive assets. By creating a ranking of assets and fields, and then cross-mapping planned projects, ADL was able to identify an optimal portfolio of projects that would provide the highest investment and strategic returns for the client.

3. Initiation and Management of Projects

The extent of the challenge of the initiation and management phases of the project should not be underestimated. Organizations need clearly defined project management mechanics, processes and tools from the initiation of the program right through to commissioning of facilities. That means having an appropriately resourced team in place with the skills to manage all these aspects. While many E&P organizations have developed in-house project management and project services functions, these are often inadequate to manage the multiple demands of a high CAPEX investment project or programs. In particular, even experienced project managers often lack the full range of skills to be effective across the variety of disciplines in which they are required to operate.

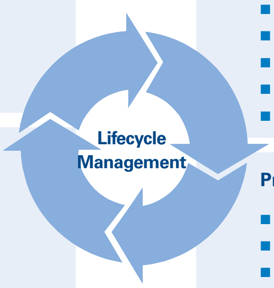
Recent literature is full of examples of CAPEX investment project failures whether they are in terms of cost and schedule over-runs or poor technical performance. However, it is difficult to isolate project management as a specific cause for these failures – both project staff and contractors are unlikely ever to admit fault. But if one takes a holistic view, the malfunction of the project management mechanisms allows poor cost estimation, contractor control and risk management to have undeniable influence on the success or failure of the project. The real causes of cost inflation and delays to major infrastructure and E&P development projects may never be fully clear to the external spectator, but we can be confident that effective project management implementation and controls reduce the impacts of other factors considerably.

Taking the case of contractor controls, firms that ADL has worked with often cite poor contractor relationships as a cause for concern, and a cause for failure within their major E&P projects. Lacking internal skills to manage complex investment projects, an increased number of cost-plus and reimbursable contracts are being let rather than traditional lump sum turn key (LSTK) contracts. This has led to a large-scale escalation of cost – with engineering contractors now demanding higher fees (as a percentage of project cost – now 10-12% of budgets) but increasingly on a risk-free basis. By reducing their accountability for project failure, contractors are disincentivized to control project schedule and costs tightly. ADL has developed expertise with upstream clients that have entered into such contracts, in building collaborative relationships and project governance structures with engineering suppliers, so as to share the responsibility for risk management and the delivery of anticipated value.

Figure 1. Project Lifecycle Management Framework

Strategic conceptualization

- Alignment to corporate objectives
- Issues analysis and scoping of projects
- Develop outline project solutions
- Project/program business case development
- Develop overall investment plan



Program/portfolio optimization

- Program definition
- Data gathering and analysis
- Solution verification
- Economic cost/benefit analysis
- Portfolio modelling and ranking
- Portfolio optimization

Program initiation and management

- Program start-up
- Definition of scope of work
- Contracting strategy, procedures and documentation for ongoing management
- CAPEX investment approval finalization
- Definition of program mechanics, tools and processes

Value delivery

- Benefits identification and quantification
- Continuous strategic alignment
- Ongoing program management/delivery
- Performance reviews
- Co-ordination with other interfacing projects
- Ensuring delivery of identified benefits and therefore value
- KPI measurement throughout and beyond program lifecycle

4. Securing Value Delivery

Even where clear objectives and strategies have been defined by an organization, a worrying number of projects fail to develop means to track benefits delivery. Unless this activity is undertaken, it will be impossible for an organization to know if, and to what extent, the project's objectives have been met. Too often, organizations are "project weary" at the end of an implementation phase and frequently demobilise project teams once it is believed that they are completed. Instead, they should spend time understanding the value that has actually been delivered by a project. Developing KPIs (Key Performance Indicators) can enable a firm to benchmark their performance against an "As-Is" state, and compare the future state (post-project) against it. A successful project should show delivery of value against these indicators – be they in terms of time saved or cost reduced throughout the project life.

In ADL's experience, firms can be reluctant to undertake a rigorous examination of project performance for fear of demonstrating areas of weakness or failure. We advise that such instances can provide valuable lessons learned for future project delivery. Continuous improvement throughout project phasing can help reinforce other areas of the ADL framework, such as strategic alignment. Such exercises must be driven from the top of an organization. Senior management must lead by example and demand from project and program managers regular progress updates against the basket of agreed KPIs. Without this, firms will create a culture where failure to track delivered value becomes acceptable, and where valuable lessons are not institutionalized.

ADL's UK project delivery team has helped secure tangible value delivery via a variety of approaches, from helping to define the KPIs in line with the organizational value chain and strategic principles to creating effective project governance structures for E&P firms across Europe and the Middle East.

Implementing the ADL framework has helped our clients focus on delivering value from CAPEX investment projects, not just on "outcomes". By advocating an ethos of continued value delivery measurement, ADL has been able to demonstrate the tangible benefits of successful projects. For example, demonstrating for one client a production increase of 2000 BOE/day (or a 2% increase in production) resulting from the implementation of asset management processes and tools, and increasing operational efficiency by ▯25m per annum from a ▯350m facilities upgrade.

Project Lifecycle Management Framework

Based on our extensive experience in the upstream oil and gas industry, Arthur D Little has developed a proven project lifecycle management framework that can holistically address these issues and help organizations deliver projects more effectively. The ADL approach is flexible, supporting CAPEX project implementation facing a variety of issues common to the oil and gas industry. The key elements of the framework are set out in Figure 1 above.

This approach has been successfully used by a number of clients who have realized significant savings and seen projects deliver their expected value. One European client faced the twin challenges of upgrading very mature onshore oil and gas fields while downsizing to reflect current production levels. Our approach was to model the risks and analyze the portfolio to prioritize projects. The benefits of this approach were seen as Arthur D Little's analysis found twice the number of viable projects, which provided significant added value and ensured that investments were directed at the most attractive opportunities and aligned with the overall strategy of the parent company.

Once that analysis was complete, the framework was used to help the client move to FEED stage and build a program-delivery focused organization. The integrated client-contractor team was provided with the capabilities to measure against KPIs – for both internal and contractor performance. By transferring our expertise to the client, we have assisted them in executing a complex capital investment project that has delivered against their strategy-focused KPIs, and which has been delivered within time and cost estimates. Finally, ADL handed over to the client a set of processes which their project teams were familiar with and capable of repeating for future projects.

In summary, one of the biggest challenges facing E&P firms is in the delivery of projects in an era of falling oil prices and constrained project budgets. Pressure to reduce capital investment in the short term will have long term repercussions, leading to possible supply capacity contraction. Investment programs commissioned in the coming months and years will face the challenges of increasing complexity in terms of the technical requirements and the wider economic deliverables expected of them. Arthur D Little's experience in capital investment projects shows that it is possible to manage and deliver these projects effectively if organizations apply the right approach. Our project lifecycle management framework shows that by focusing project teams on the requirements of each phase of the lifecycle, centering on the critical success factors and realigning with corporate objectives, firms can reduce the risk of project failure.

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Arthur D. Little

As the world's first consultancy, Arthur D. Little has been at the forefront of innovation for more than 125 years. We are acknowledged as a thought leader in linking strategy, technology and innovation. Our consultants consistently develop enduring next generation solutions to master our clients' business complexity and to deliver sustainable results suited to the economic reality of each of our clients. Arthur D. Little has offices in the most important business cities around the world. We are proud to serve many of the Fortune 500 companies globally, in addition to other leading firms and public sector organizations.

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