



Expert's Corner Paper 2019-02

Five Principles of Capital Project Agility

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This white paper discusses the key five principles of Agility in the Oil and Gas Capital Projects, how they are needed in the current business context, resulting in profound transformation of ways of working. It also briefly exposes a methodology for measuring their application and beneficial use.

Introduction: What is Agility and How does it fit in Capital Projects?

Let's commence by listing some project organization behaviors and expectation, in the context of introducing Agility in their project life cycle execution approach:

- It is simplification of a complex scope of project work into nimble work components
- These components are synchronously & cohesively managed in achieving the work requirements
- The accompanying project systems & teams are continually adaptive to address market needs
- A reduced level of effort is required to deliver the project
- Agility enhances the project team performance

Let's explore, on why has Agility become necessary in the age-old business of Capital Projects.

In the beginning of this decade (post 2008), the Oil & Gas industry witnessed historic levels of high Oil and Gas prices providing a surplus capital flow. This naturally prompted a flurry of mega capital project awards with higher pricing, bigger scopes, larger equipment, and complex installation.

It was largely believed that the existing project teams could manage this wave of new work with automated systems and by leveraging their in-house standard company execution practices. Organically the project systems were intensified with more rigor and controls around assurance i.e. tracking, analysis, automated visibility and reporting.

In a few years it was realized that more two thirds of the projects went way over budget and schedule, and billions of dollars were wasted, and the existing industry approach was not effective. Post 2014 Oil and Gas price crash & the industry downturn, the availability of surplus Capital in the market was significantly constrained and clients became aggressively selective in sanctioning new projects.

Since 2014, the Clients project expectations have forever changed¹:

- The average lead time from FID to production has reduced to 10 years (from 14 years)
- The average project payback has reduced to 6 years (from 13 years)
- Suppliers are expected to provide performance guarantees and partake additional risk

In general, Clients expect continually improved supplier performance on subsequent awards. This has prompted a visitation to the drawing board to re-set the performance benchmarks.

The relevancy and success of Capital Project companies depends on their ability to pre-emptively take a fresh and nimble look at the components of its project execution. Agility is the way to longevity and the five principles in this paper provide guidance

The traditional project management approach (i.e. breaking the project in distinct sequential phases where each phase is linearly performed upon fully completing the preceding phase) needs a transformational change.

Agility has now become a foundational part of project execution whereby faster delivery, execution pace, supply performance guarantee, lean, frugality, & innovation are generic expectations of any project team.

Five Agility Principles

In this section, we shall discuss the five key design principles of an Agile Project Execution approach.

The five agile design principles are instrumental in achieving the afore-mentioned generic client expectations of suppliers innovatively delivering faster / leaner / frugal work with higher performance guarantees.

1. Converging Practices

It is important that all the project systems (processes and tools) used in project life cycle execution are seamlessly connected (tiered and linked) to maximize the project outcome. This can be achieved by considering the following:

- Efficiently identifying main practices during project life cycle that are essential for project success and serve as the key performance Check Points, where a guidance review can be performed.

¹ Wood Mackenzie Aug 2018 report 'Better Project Delivery' is used for the source data in this section

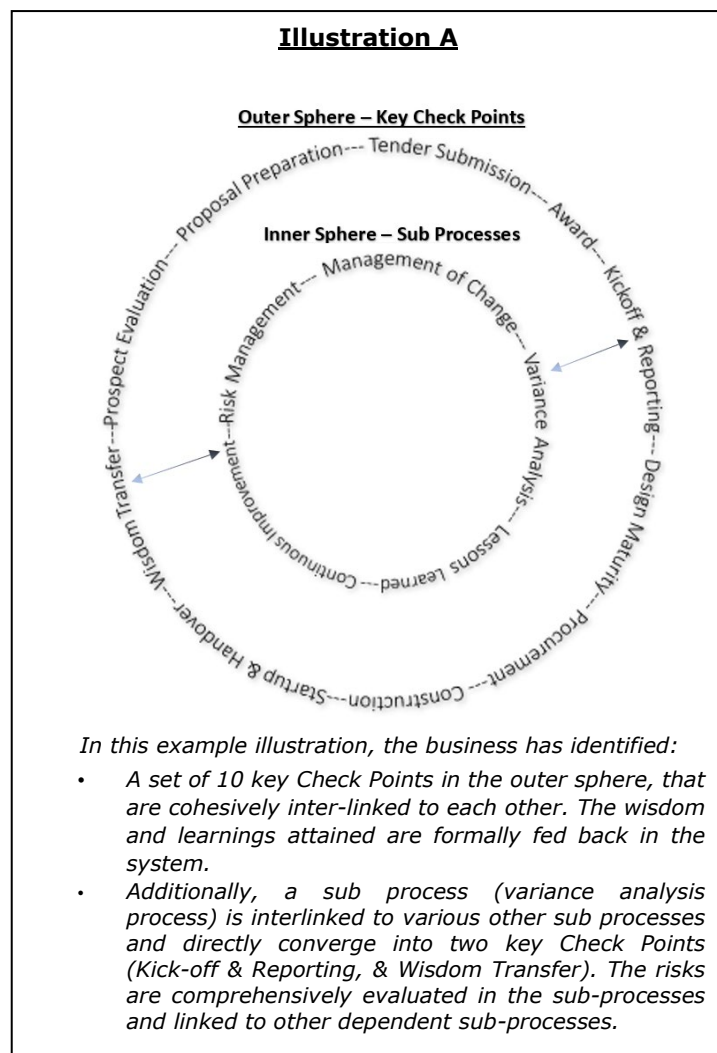
- b. Linking these key Check Points in a closed loop circuit provides a directional work flow of work through the full project lifecycle.
- c. These looped Check Points may vary based on the company's project portfolio and are formally documented as the company's project lifecycle road map.
- d. The sub processes supporting these key Check Points are connected to them, and simultaneously linked with other sub processes in a similar closed loop circuit.
- e. The idea is that a sub-process loop distinctly converges into a single (or multiple) key Check Points, whilst establishing linkages with other related sub-processes. The company internal sub-process procedures can elaborate on the aforesaid links and convergence (see Illustration A).
- f. All project transactions are interconnected (through Check Points and sub-processes) enabling the team to synergistically perform work.
- g. Once the above is internally established, the evolution here is to link these key Check Points and sub-practices with clients and suppliers' internal practices.

2. Optimal Assurance

A notion in the traditional project execution approach was that higher assurance is driven by tracking, reporting, and control which correlates to better project delivery. While high-risk projects have a higher intensity of these same assurance activities. However, it is worth contemplating that if the project team expends a week or more in monthly reporting & assurance, then it is disruptive.

In the Agile approach, the project assurance effort is optimized with a focus on action (information application versus information creation). Below are some items that are worth considering:

- a. Build trust in the team's competency as a corner stone to project assurance by:
 - Investing & train the team in the required skills to manage and perform.
 - Manage team careers for a holistic experience (comprehensive project life cycle exposure).
 - Stimulate team instincts & gut feeling about project status, and their abilities to outperform.
- b. Simplify project reporting (including management reports) into primary measures such as:
 - report at a higher work breakdown (instead of detailed granular breakdown).
 - show progress on key schedule milestones (instead of individual activities).
 - report top risks and opportunities highlighting where management support is much needed.



- c. Forthwith use expert reviews or deep dives when any metrics show early signs of stress.
- d. Use optical indicators (automated traffic lights) as main project health checks, using regularly in project communication. The premise is the team is continually aware of project status, and not dependent on a periodic statistical report.

3. Dedicated Governance

In an agile execution approach, a structured project governance engagement (collaborative guidance) is necessary to complement management's assurance of the team performance. The governance practice allows management and project teams to mutually interact at the above discussed key Check Points, whereby management can ensure / steer the project team progress is always on the best success course. The below considerations are useful for designing an effective governance model:

- a. Project teams benefit from management's macro visibility, knowledge, and support during the entire project life cycle through:



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- Strategic support during the early phases of the project life cycle – design & sell the best solution to clients.
 - Management guidance & inspiration post project award – synergize with other ongoing corporate efforts to efficiently execute the project.
 - Resource & effort reinforcements during project operations in achieving the desired outcomes.
 - Wisdom & learning accumulation and incorporation back into the process
- b. Regular validation that the project is aligned towards the company's vision & objectives.
 - c. Build an interactive culture of transparency, communication ease, and mutual trust.
 - d. Management support's project team development for future leadership by enforcing the desired team behaviors.

4. Contemporaneous Systems

An agile design requires the use of modern systems such as software tools & technology. These systems possess capabilities of process automation, data processing, and information access that enhance the teams' focus on applying effort towards a productive solution. Certain benefits of such a system are as follows:

- a. Automation & validation – Systems are configured to:
 - Automate standard work activities e.g. per the client tender needs, the system automatically proposes a selection of standard design, pricing, & execution.
 - Work validation – a system generated output is used to cross reference teams work e.g. an optimized norm-based system output (with improvement suggestions from pasts risks, errors, waste) is used to validate the newly developed tender costs and schedule.
- b. Ease of use – The project team accesses recent and accurate information via digital cloud application and live data monitoring e.g. the Team Member application in the newer Primavera planning tool versions allows activity owners on site update their work scope schedules through their mobile devices.
- c. System Interfaces – new tools can be efficiently linked with other corresponding tools with pre-designed interfaces (example Primavera Inspire interface with SAP). This allows teams to comprehensively see the impacts of single transaction on the overall project.
- d. Off the shelf application – with flexibility to process adjustments, new tools (off-the shelf) can be re-configured for compatibility with other tools, thereby avoiding expensive & disruptive tool customizations and future in-house maintenance.
- e. Upon maturely achieving of the above, the evolution here is to link a company's internal tools with their stakeholders (clients and suppliers) and reap the

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benefits of single system approach throughout the delivery value chain.

5. Lean and Adaptive

The Agile approach is about achieving frugal effort consumption (reduced resource requirements), simple work flow (easy to grasp and apply by all stakeholders) and robust design (continually evolve with the changing market needs). Some design characteristics of this approach are:

- a. Lean – the mindset (people, process, and technology) here is that the status quo is always challenged for waste reduction by the following design criteria:
 - Simple – the approach should be easy to understand and apply. The inputs and outputs of each process should be clear along with process owner and responsibility. Idea here that workflow is straightforward and understood, with no disruption during application.
 - Reduce Redundancy – limits a single process to accurately perform a single task and consistently use that output throughout the project life cycle (minimize waste) – e.g. one application computes schedule float and others consistently use it.
 - Process scalability - all projects in the portfolio use the same principles of the agile approach. The complex / risky projects can add additional bolt-on functionalities for certain enhancements (example add a separate application for pipe tracking, etc.).
- b. Adaptive – the mindset here is the approach is nimble to continually improving from feedback and remains relevant to the market needs. The below design criteria apply here:
 - Risk Detection – this approach stimulates the behavior of courage in the project teams & processes in terms of risk identification and mitigation i.e. team members are incentivized to consider what can realistically go wrong and how to innovatively mitigate it (courageously try new solutions).
 - Dynamic Monitoring – the approach is designed to monitor all risks and break the risks down into various sub-tiers (with early warning signs and multi-tier intervention) e.g. an equipment failure risk, monitors the sub-components and raises flags for any component replacement needs, thereby mitigating equipment failure.
 - Intelligent Learning – the agile approach fosters continual learning from past experiences and failures, and cumulatively incorporates the acquired knowledge for application on subsequent work scopes e.g. procedures are updated for use of a better sub-component material to minimize the equipment failure.



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Measure and Benefits

In this section we shall conceptually discuss about:

- The measurement process of above five Agility principles
 - Application benefits of an agile design
1. Using an automated tool, the above 5 principles are expanded into several Measure Items, which are distinct performance characteristics of these principles and are tied to an empirical measurement.
 2. Per the internal company project portfolio, a company to select between three (3) to five (5) Measure Items for each Agility Principle (refer to Illustration B).
 3. An internal company definition and scoring criteria is established for the above. Each of the Measure Items to be individually scored and then aggregated into a Principle score rating ranging on a scale from 1 to 5 (starting from a beginner level 1 to an advanced level 5). The aggregated Principle score is to be mapped on an Agility Radar Chart (refer to Illustration C).
 4. A periodic self-score of 3 (or higher) on the Agility Radar indicates a proficient Agile level and shall be validated by an independent team, and a lesser score shall cause the generation of an improvement road map.
 5. A proficient Agile team earns a high degree of confidence on their abilities to:
 - Knows the stakeholders – their drivers, requirements, organization
 - Is risk astute and transparently performs the work
 - Continually applies learning and adapts
 - Delivers the promised and expected performance results
 6. An Agile team is empowered with higher autonomy:
 - Tendering work with aggressive pricing and execution strategies
 - Flexibility in negotiating and committing to external parties (e.g. clients, suppliers)
 - Less scrutiny on approval (expenditures, bids, performance)
 - Development and application of innovative solutions
 7. With consistent use (three and more iterations), a company can assess the effort required to improve a team's maturity rating and correlate to an expected performance improvement. The expected trend is that an agile team innovatively delivers consistent performance and requires lesser supervision.

Conclusion

As discussed, the changes in market conditions have necessitated the need to transform Capital Project execution. The relevancy and success of Capital Project companies depends on their ability to pre-emptively take a fresh and nimble look at the components of its project execution. Agility is the way to longevity and the five principles in this paper provide guidance in this undertaking, by:

1. Converging of all processes into a cohesive solution output
2. Optimizing assurance with building trust in the project team and expanding their work focus
3. Governing the work by directionally influencing the project team towards maximum success
4. Using modern systems for automation and seamless information interface
5. Continually focusing on lean (waste reduction) & adaptability (evolving execution)

Contact

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