RETHINKING

CAPITAL PROJECT DELIVERY

Agentic AI-Driven Strategies for the New Era

Edward Abramowich

With Foreword by Dr. Jeff Sutherland

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Foreword

When I first encountered *Rethinking Capital Project Delivery*, I recognized a familiar pattern - the same one that emerged when we first created Scrum: the collision between rigid, outdated systems and the unyielding complexity of the real world.

Edward Abramowich has written more than a book on engineering or project delivery. He has articulated a new operating philosophy for how humanity builds. The frameworks that once powered our industrial age—command-and-control hierarchies, sequential workflows and rigid milestones—are now the very bottlenecks holding us back. What replaces them is not chaos but *adaptive order*: self-organizing systems guided by feedback, learning and flow.

Edward's insight is deceptively simple: the same principles that make Scrum work for software teams can—and must—be applied to the largest, most complex capital projects on Earth. The same iterative cycles that help a small startup thrive can enable a refinery, a power plant, or an offshore platform to learn and adapt at speed.

That may sound revolutionary, but it is not new. It is the rediscovery of something ancient.

Like Scrum itself, the thinking in this book is rooted in a lineage of practice that long predates modern management

theory. Both Edward's and my own intellectual journeys trace back to the *way of motion*—Aikido. I studied under Kinai Sensei (8th-degree black belt) and Gaku Homma Sensei (5th-degree black belt), both direct students of Morihei Ueshiba, the founder of Aikido. From them I learned that flow is not achieved by resisting force, but by harmonizing with it—redirecting energy, not blocking it.

That same realization inspired Scrum's design. The Sprint is a dojo for continuous improvement. Each ceremony—Sprint Planning, Daily Scrum, Review, Retrospective—is a kata: a disciplined practice for reducing friction and aligning energy. *Rethinking Capital Project Delivery* takes that dojo into the realm of steel, energy and concrete, showing how industrial systems can move with the same grace as a martial artist.

Edward's collaboration with Austin Davis Ciporin, himself a student of Gakku Homma, extends that living tradition. The Aikido principle of *aiki*—the union of energy and intention—resonates throughout this work. Here it manifests as the integration of human intelligence with *Agentic AI*: machines that learn from feedback and adapt in real time, amplifying rather than replacing human creativity.

What you hold in your hands is not a management framework; it is an *awakening of practice*. It bridges disciplines that have long been separate—physics, biology, neuroscience, Lean manufacturing and Agile systems design—into a single continuum of flow.

The structure of the book itself mirrors the **Agile Technology Stack** I introduced in *First Principles in Scrum*:

- **Physics** – the foundation of energy, entropy and motion.

- **Biology** – the human factor: sustainable pace and energy balance.
- **Neuroscience** – prediction, feedback and the minimization of surprise.
- **Complex Adaptive Systems** – emergence and self-organization.
- **Scrum and Scrum@Scale** – frameworks for collaborative flow.
- **AI** – intelligence embodied as Agentic feedback loops.

Each layer builds upon the one below it. Together, they form the architecture of the new industrial era—what Edward rightly calls "Agentic AI-Driven Delivery."

I believe this book will be to capital project management what *The New New Product Development Game* was to product innovation: a catalyst for a generation of thinkers and builders ready to discard outdated methods and embrace adaptive flow.

If you work in any field where complexity meets consequence—energy, infrastructure, construction, or technology—read this book with care. Reflect on its models. Then go to your own genba—your real place of work—and test them.

Scrum was born at the intersection of science, systems and spirit. *Rethinking Capital Project Delivery* stands squarely in that tradition. It is not just a guide for faster projects; it is a blueprint for intelligent evolution.

Jeff Sutherland Ph.D.
Inventor and Co-Creator of Scrum and Scrum@Scale

Foreword

Almost a decade ago, when I joined one of the large, respected integrated oil companies as a Lean Continuous Improvement expert, I faced the classic polite but firm response of 'not relevant here' from the experienced capital project engineers and managers. "Great story, but we don't make widgets on a conveyor belt," they told me.

It took some time to change the narrative within the project's community. I had to translate the advantages of Lean and Agile methods into terms they could relate to. The breakthrough came when I presented the benefits in their own language, which had locked the project engineers into their paradigm. True, every project is unique, with its own location and complex requirements, but you know what is on the conveyor? Your EPC and subcontracted teams. There is a continuous flow of engineers from various disciplines, each with their own technical language, expertise and standards, through a stationary project. Guess what? Every time a new team rolls through the conveyor of a stationary unique project, there is a significant productivity loss at the interface of teams transitioning in or out. This is one of the biggest contributors to budget and schedule overruns.

This language resonated with the project engineers. Over the next few years, we introduced Lean and Agile ways of working as a common operating and delivery mechanism. We called these practices 'repeatable elements' of productivity in

otherwise unique projects. These lessons were integrated into the Standard Project Delivery Academy to coach the new generation of project engineers.

Edward's book builds upon the core concepts we had learned, with more clarity and conviction. His detailed analysis on the repeated failure points should be red flags for anyone trying to analyse and improve any project performance. The amazing case studies included show the agnostic nature of these practices. Edward also illustrates how AI should and will become the core enabler of efficient deliveries in the future, using data and culture as the key enablers.

Leadership and government bodies responsible for allocating billions towards key capital projects should ensure that project management and contractors clearly demonstrate their way of working, which ensures delivery with AI and a collaborative team culture. Do not look for front-end loaded detailed stage gates, as they are unreliable in today's uncertain world.

I hope you enjoy this book and share it with all your leadership and project teams.

Sanchay Roy
Global Operational Excellence
Shell

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Part I: A Changing Reality

CHAPTER 1

The Capital Project Delivery Revolution

"Adaptability, not efficiency, must become our core competency."

General Stanley McChrystal [1]

The frameworks that built the modern world are now holding it back.

Traditional capital project delivery, with its detailed upfront planning, milestone based control and sequential logic, was designed for a predictable world. What once enabled the engineering and construction of refineries, offshore platforms and power plants has become the greatest barrier to progress when speed and adaptability matter most.

We often ask senior leaders a simple question: What would it take to deliver your next mega project 75% faster, at lower cost, with fewer resources?

Most are intrigued but sceptical. Multiyear timelines and chronic overruns have become so normalised that they're no longer seen as failures, just facts of life in capital intensive industries.

But what if that's wrong? What if the entire process could be reimagined from the ground up?

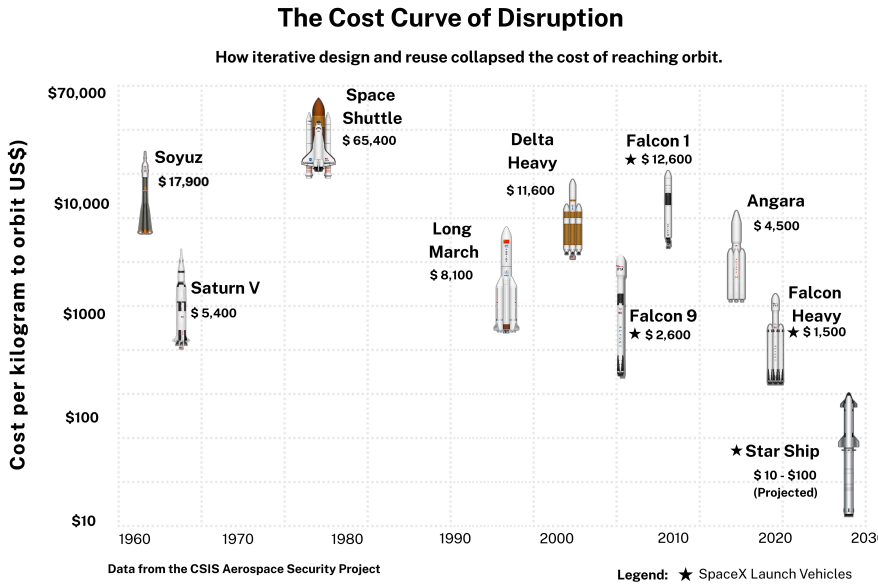

Figure: The Cost Curve of Disruption. Iterative design, modular reuse and rapid learning cycles collapsed the cost of reaching orbit by more than 99 % in two decades.

The Crisis is Real

The numbers tell the story. A recent survey [2] of 300 capital project leaders found that 85% struggle to scale improvements in their delivery models. McKinsey [2] reports that 98% of mega projects exceed budgets by more than 30%, while 77% run at least 40% behind schedule. These aren't isolated problems, they're systemic failures.

The financial cost is staggering. A high capacity natural gas facility generates roughly $18 million per day. A single year's delay erases $6.57 billion in value. Multiply that across a project portfolio and the stakes become clear.

Now consider the inverse: What if you could compress a five year timeline to just over one year? This isn't just about speed, it's about unlocking four extra years of revenue while dramatically improving capital efficiency.

This level of acceleration might sound impossible, but it's already happening in other industries.

Speed at Scale

SpaceX launches rockets that once took NASA years to design and build. The company can now design, test and launch complex systems within 24 hours when needed. They didn't just improve existing processes, they created an entirely new model built on rapid iteration, modular design and continuous learning.

Tesla can redesign and validate new vehicle components in hours where traditional automakers need months or years. SAAB Aerospace flight tests sixth generation fighter systems using digital twins well before final aircraft assembly.

The transformation isn't limited to aerospace. Advanced manufacturers across sectors are achieving similar breakthroughs by abandoning linear workflows in favour of adaptive, AI-enabled systems.

SpaceX has slashed launch costs from NASA's Space Shuttle era rate of $54,500 per kilogram to under $2,700 today, with projections as low as $20 per kilogram in the coming years. That 99.96% cost reduction didn't come from optimising old processes, it came from reimagining how complex systems are designed, built and delivered.

The Energy Opportunity

Energy companies are beginning to recognise similar opportunities. Shell's recent Whale deepwater project in the US Gulf was delivered 20% faster than comparable developments by deploying agile, asset-aligned teams, adaptive delivery approaches and integrated digital workflows. Equinor's Johan Sverdrup platform achieved first oil six months ahead of schedule through similar approaches.

These aren't isolated successes, they're early signals of what becomes possible when organisations embrace adaptive methods, integrate teams, break down functional silos and treat data as a strategic asset rather than an administrative byproduct.

Consider a typical Engineering, Procurement and Construction (EPC) firm with decades of global experience across offshore rigs, floating production systems, LNG terminals and nuclear facilities. Traditionally, the engineering data from these projects gets archived and forgotten. But forward thinking firms are now treating this data as their most valuable competitive asset.

Most mega projects aren't truly unique. While each faces specific constraints, the vast majority of systems and subsystems have been built many times before. Competitive advantage doesn't come from novelty, it comes from superior execution speed and the ability to learn from past experience.

From Linear to Adaptive

The traditional cornerstones of capital delivery, long term planning, sequential milestones and linear execution, are

fundamentally misaligned with how AI operates. AI learns, iterates and adapts in real time. It doesn't follow predetermined sequences rather it responds to new information instantly.

This creates an opportunity to reimagine project delivery entirely. Instead of starting each project from scratch, imagine beginning with a digital twin of similar assets, fed by real time operational data from comparable facilities worldwide. Engineering teams wouldn't start with blank sheets, they'd start with living, learning systems that continuously optimise based on new data.

Physical construction becomes the final assembly step in a process that's already been tested, validated and optimised in the digital realm. Tasks that once required weeks of engineering analysis can be completed in minutes through AI assisted design tools.

These capabilities aren't theoretical. Leading technology companies already operate this way and these methods are rapidly moving into capital-intensive industries.

The Path Forward

The question isn't whether this transformation will happen, it's whether your organization will lead it or be forced to catch up. For companies entrenched in legacy systems and traditional processes, the transition won't be simple. But it also doesn't require a complete overhaul overnight.

There are strategic entry points that allow organisations to evolve their delivery models progressively, reducing risk while building capabilities for larger transformations. The

playbook exists, drawn from the world's most agile, high performing sectors and adapted for capital project realities.

The future of capital delivery isn't coming, it's already here. The only question is whether you'll shape it or be shaped by it.

This book will show you how to choose the former.

Traditional project delivery was built for predictability. The future demands adaptability.

Rethinking Capital Project Delivery challenges decades of rigid, stage gated project methods that have led to overruns, delays and frustration. Drawing on lessons from aerospace, automotive and technology, this book shows how Agentic AI and adaptive delivery models can transform the way we build. With vivid examples, practical frameworks and a playbook for leaders, this book equips capital project professionals, executives and policymakers to thrive in an era where adaptability matters more than predictability.

About the Author

Edward Abramowich has delivered capital projects across five continents, from refineries to offshore mega assets. A trusted advisor and transformation specialist, he helps industries rethink how they engineer and deliver complex infrastructure. At the forefront of a new era in project execution, he brings bold, practical strategies to the world's toughest delivery challenges.

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