IT Projects Break all the Rules

How complexity demands different Risk- and Project Management

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In my 30 years working in consulting, helping large organizations to navigate the challenges of large-scale software development, I've learned a hard truth:

Managing IT projects with traditional project management and risk frameworks does not work. No matter how much rigor you apply, no matter how many "good practices" you adopt, IT projects stubbornly defy predictability.

The only way I've seen real progress is by embracing Agile—not only as a software development method, but as a paradigm for how to manage the entire project or change, from governance to risk to stakeholder engagement. Years ago, I found a powerful lens in Dave Snowden's Cynefin framework, which taught me to treat IT projects as complex systems, not as complicated ones. Very recently, reading Bent Flyvbjerg's 2025 paper, "The Uniqueness of IT Cost Risk: A Cross-Group Comparison of 23 Project Types," I was struck by how deeply the data confirms this view.

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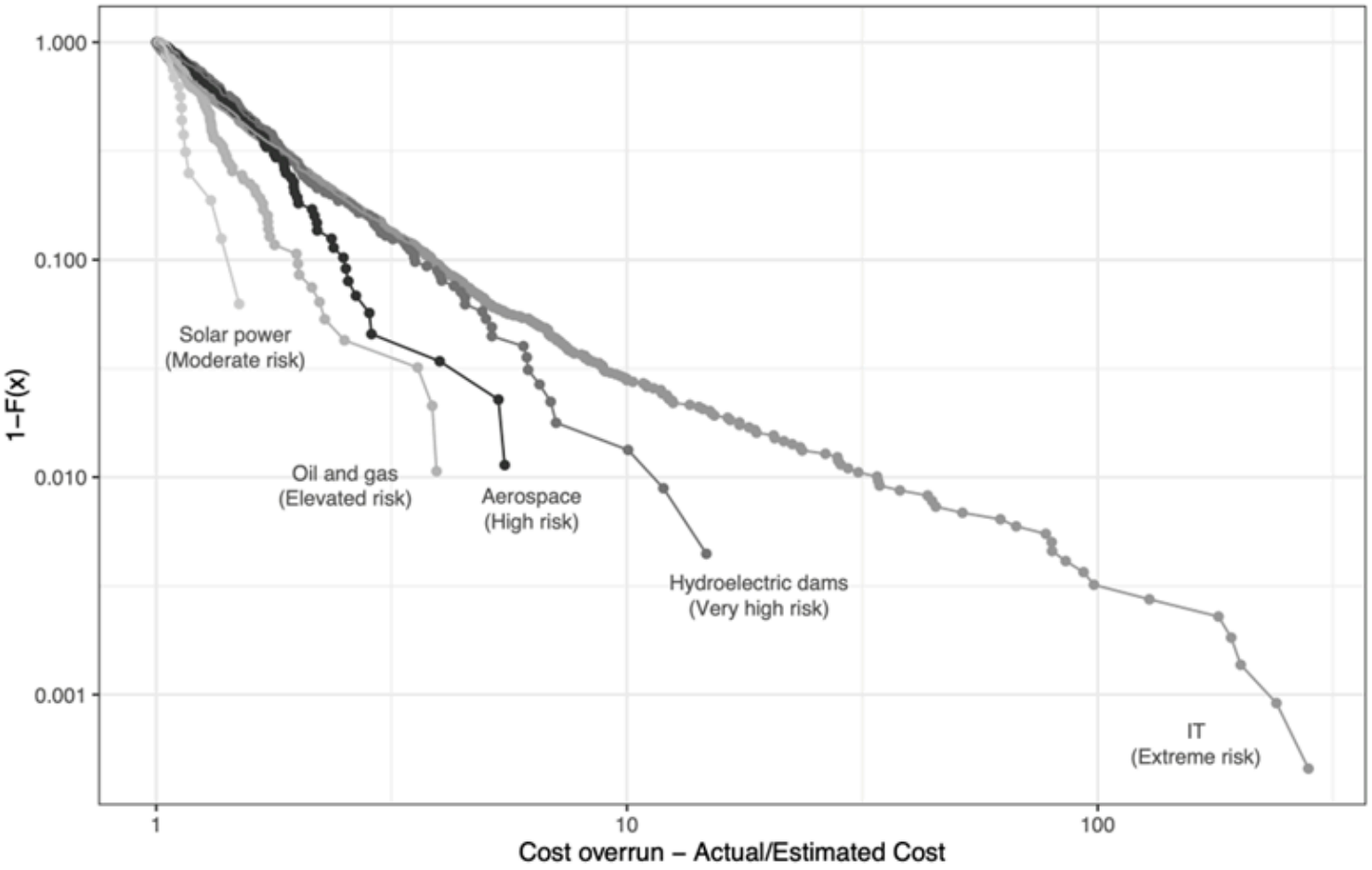
Why IT Projects Are Uniquely Risky

Flyvbjerg's research is the first to systematically compare IT projects to 22 other major project types—ranging from nuclear power to the Olympics—using a massive dataset of over 11,000 projects. The results are stark: IT projects are in a risk class of their own. Statistically, only IT projects exhibit a "fat tail" so extreme (with a Pareto 1 tail parameter $\alpha < 1$) that both the mean and variance of cost overruns are infinite. In simple language: no average cost overrun can be reliably calculated, and no amount of historical data will ever make IT project forecasts safe. The risk is thus not just high, but fundamentally unpredictable and unbounded.

Over the years, research has identified a wide range of factors that contribute to the unpredictability and risk of IT projects—spanning technical, organizational, behavioral, and contextual domains. No single cause can fully explain the challenges; rather, it is the interplay and combination of these diverse elements that create the perfect storm. In IT projects, small changes or misjudgments can interact and amplify each other, leading to cascading effects and, at times, catastrophic overruns.

From Bent Flyvbjerg's 2025 paper, "The Uniqueness of IT Cost Risk: A Cross-Group Comparison of 23 Project Types," Illustrating the extreme risk of IT projects compared to other project types, using cost overrun as an indicator of risk.



The x-axis shows the actual ratio of project cost overrun—how many times the final cost exceeded the initial estimate—ranging from 1 (on budget) up to 100 times (on a logarithmic scale). The y-axis shows the probability (also log scale) that a project's cost overrun will be at least as large as the corresponding x-axis value. The analysis is based on a dataset of 11,011 projects across 23 project types.

Complicated vs. Complex: The Cynefin Perspective

This is exactly what Cynefin describes as a complex system. In complicated systems—like building a bridge—experts can analyze, plan, and execute with a high degree of certainty. The system is 'knowable', even if difficult. But complex systems, as Snowden describes, are characterized by unknown unknowns, emergent behavior, and non-linear interactions. Cause and effect can only be determined in hindsight. The only way to navigate this is to probe, sense, and respond—to experiment, learn, and adapt as you go.

IT systems themselves may be complicated, involving deep technical expertise and intricate architectures. But when you develop or implement these systems within a project—bringing together diverse teams, stakeholders, users, and shifting organizational goals—the project becomes complex. People, behaviors, interests, and politics enter the equation, creating feedback loops and unpredictability that no Gantt chart or risk register can capture.

Why Agile Is the Only Way Forward

This is why Agile principles should not only be adopted as a basis for a delivery method, but applying Agile principles are a necessity for managing IT projects at every level. Agile's iterative cycles, constant stakeholder feedback and openness to change are not just convenient—they are the only rational response to the fundamental complexity and unpredictability of IT projects.

Risk management too, has to become Agile: instead of trying to predict and mitigate risks up front, teams must be focused on sensing emerging risks, focussing on resilience and adapting course when needed. Governance should focus less on enforcing adherence to initial plans and more on enabling fast learning and adaptation.

Flyvbjerg's findings make it clear: traditional project management, with its reliance on averages, forecasts, and linear planning, is doomed to fail in IT. The law of regression to the mean does not apply; instead, we must expect regression to the tail—where rare but devastating overruns dominate outcomes. The antidotes Flyvbjerg suggests—modularity and "think slow" decision-making—fit perfectly with Agile's emphasis on small, decoupled deliverables and reflective, data-driven governance.

Conclusion

IT systems itself may be complicated, but IT projects are complex. The interplay of technical, human, and organizational factors creates a level of unpredictability that sets IT apart from every other project type. Flyvbjerg's data and the Cynefin framework converge on a simple truth: managing IT projects as if they were merely complicated is a recipe for disaster. Only by embracing complexity—through Agile principles, modular design, and adaptive risk management—can organizations hope to deliver value and avoid the infinite risk that lurks in the fat tails of IT project outcomes.

References

Bent Flyvbjerg, Alexander Budzier, Jon Aaen, Mark Keil, and M. Zottoli, forthcoming (2025), "The Uniqueness of IT Cost Risk: A Cross-Group Comparison of 23 Project Types," accepted for publication in Project Management Journal.

Kurtz, C. F., & Snowden, D. J. (2003). "The new dynamics of strategy: Sense-making in a complex and complicated world." IBM Systems Journal, 42(3), 462–483.

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