Inside the Black Box Crucial to Megaproject Success

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Despite their importance to the global economy, most megaprojects fail to be delivered on budget or schedule. Here’s how managers could improve on that dismal record.

The scale of **investment projects has been steadily increasing** over the last three decades – gone are the days when US$100-million price tags impressed. Now, Azerbaijan's Khazar Islands artificial archipelago, Turkey's urban renewal drive in Istanbul and Saudi Arabia's Masjid al-Haram are just a few examples of projects set to exceed US$100 billion. NEOM, a futuristic city spearheaded by the Saudi Crown Prince, is expected to top US$500 billion.

With such heft, it is no wonder that megaprojects are vital to the global economy. According to a widely cited report by **McKinsey**, the world needs to invest approximately US$57 trillion in infrastructure by 2030 to support GDP growth. Beyond economics, megaprojects also shape our world, define our experiences and represent national identity. Yet our ability to deliver them successfully is shockingly inadequate: An influential **study** estimates that nine out of ten megaprojects go over budget.

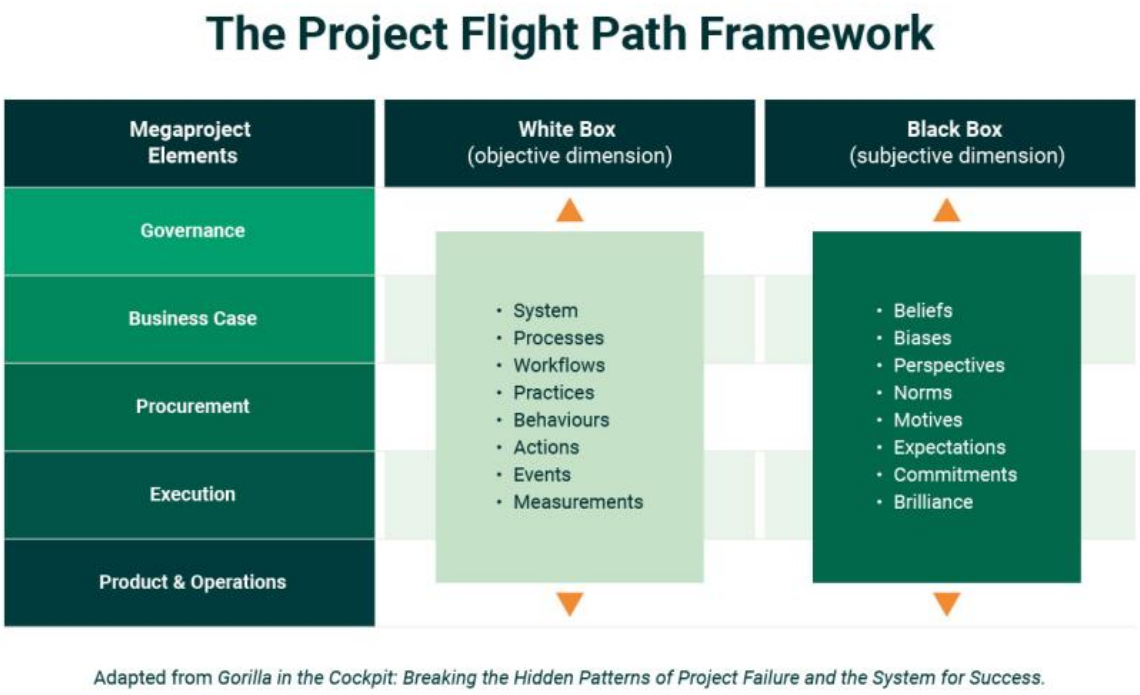
Australia's **Inland Rail**, for example, was envisioned to be a transformative national freight backbone to invigorate regional economies when completed in 2025. But as of this year the cost has nearly doubled to A$31 billion and completion delayed until 2030-2031. An independent inquiry uncovered governance failures, lack of capabilities, inadequate risk management and deficiencies in project management expertise.

Reviews of project failures, like the one for Inland Rail, typically zero in on factors such as ill-defined project scope and inadequate risk management. But human thoughts and actions profoundly impact every aspect of a project. To make better decisions, executives should holistically consider both the human and process dimensions. Here’s a tool that could help: the Project Flight Path framework.

The Project Flight Path Framework

As its name suggests, the Project Flight Path framework likens megaproject management to airplane flights, highlighting their shared characteristics of a starting point, a destination and path navigation.

The framework, detailed in the book ***Gorilla in the Cockpit: Breaking the Hidden Patterns of Project Failure and the System for Success***, consists of two interconnected dimensions: project process and people dynamics. The left panel, which we call the White Box, maps the project's key phases and procedures. It represents the known and known unknowns. The right panel, or the Black Box, reveals the subjective drivers of human dynamics influencing the project, encompassing the unknown unknowns and possibly the unknowable.



Adapted from *Gorilla in the Cockpit: Breaking the Hidden Patterns of Project Failure and the System for Success.*

Black Box factors often lead to either breakthrough discoveries or gigantic failures, or both. But traditional project management approaches predominantly focus on the White Box, neglecting the Black Box until it is too late.

Guggenheim Bilbao vs. Sydney Opera House

In the annals of iconic architecture, the Guggenheim Museum in Bilbao and the Sydney Opera House stand out as beacons of audacity, aesthetic mastery and engineering excellence**.** Each has become both a cultural emblem and a potent economic catalyst for its host city.

Their project trajectories, however, were starkly different. The underlying causes for this divergence become clear when scrutinised with the lens of the Project Flight Path Framework.

The Project Flight Path Framework: Guggenheim Bilbao

Megaproject Elements	White Box (objective dimension)	Black Box (subjective dimension)
Governance	• Political bullying minimised • Straight talk throughout the project • Key project processes managed with integrity	• Over-optimism • Leadership impact • Groupthink
Business Case	• Inspiring and clear vision of revitalising a "dying town" and economic renewal • Project estimates based on accurate numbers	• Compelling vision
Procurement	• Contracts emphasised accountability for results and costs • Costs and estimates based on final completed designs	• Commitment
Execution	• Extensive use of digital systems – focus on precision, not guesswork • Effective management of contractors and subcontractors	• Accountability
Product & Operations	• Final product had high-level stakeholder support • Political and business interests had limited impact on concept design	• Political bias

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Guggenheim Bilbao was driven by architect Frank Gehry's unwavering commitment to pragmatism over optimism bias and groupthink. Gehry's leadership also shielded the construction from political meddling while simultaneously fostering an accountability culture.

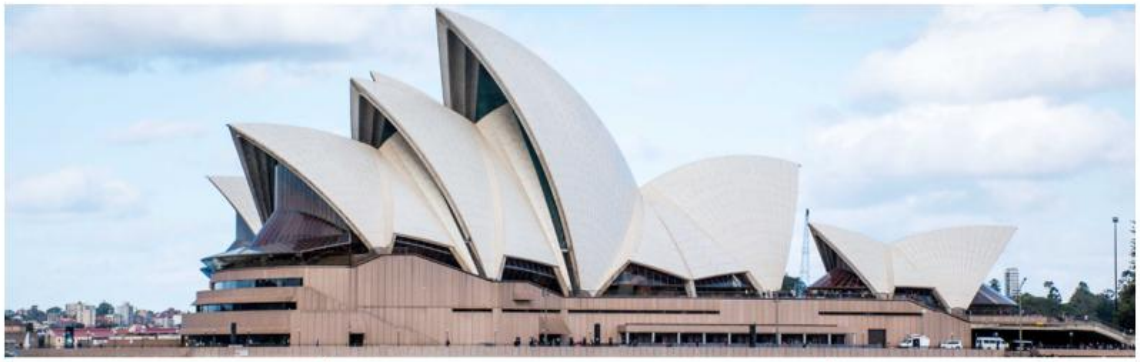
He also made sure to have solid cost estimates drawn from a fully fleshed-out design, and encouraged an ethos of open, candid communication. Gehry's approach didn't stop there – he bolstered the whole operation with

cutting-edge digital technologies, streamlining the execution process into a well-oiled machine.

The result: The museum was delivered on time, at US$3 million less than budgeted.

In contrast, the success of the Sydney Opera House was far from assured during the construction phase. Fearing that public opinion might turn against the project, the incumbent government rushed into construction with incomplete designs and unresolved structural issues.

The Project Flight Path Framework: Sydney Opera House



Megaproject Elements	White Box (objective dimension)	Black Box (subjective dimension)
Governance	• Political interests and fear of losing public funding created pressure for an early start • Executive oversight committee lacked technical expertise • Change of government in 1965 shifted oversight to the Ministry of Public Works and inhibited changes	• Egocentricity • Political bias • Groupthink • Data bias • Anchoring
Business Case	• Winning concept partially complete • Total freedom for architects to change designs without regard for time and cost • Architect lacked megastructure delivery experience	• Over-optimism
Procurement	• Withholding of contractor payments slowed the project	• Fear • Self-serving bias
Execution	• Project managers lacked qualifications and experience to manage the delivery of a complex design • Little adherence to principles and methods of project management. Construction began ahead of design completion • Bad weather and significant rework (build, demolish, rebuild) slowed progress	• Fear • Self-serving bias • Over-optimism
Product & Operations	• Elegance and quality was the unrestricted goal • Multiple significant design changes to the initial blueprint after construction started • Number of theatres doubled from two to four	• Egocentricity • Over-optimism

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Architect Jørn Utzon, a Dane, had never visited the site before submitting his design. After falling out with the Australian authorities in 1966, he resigned from the project, never to return to Australia.

The graphic above illustrates how a compounding mix of politics, over-optimism and a fear-driven culture undermined both governance and delivery of the project. Risks generated within the Black Box were largely ignored and unaddressed.

The opera house eventually opened in 1973, ten years behind schedule and 14 times over budget.

Four steps to better megaproject management

To succeed, megaproject managers must monitor both the White Box and the often-overlooked Black Box. These four interconnected steps can help them unpack the Black Box and nip potential problems in the bud:

1. Investigate: Conduct a comprehensive project assessment with key stakeholders. This in-depth investigation serves to unveil latent biases, constricting beliefs and subjective interpretations that affect project performance. It should empower leaders with a clearer understanding of the internal dynamics that drive project execution. In the case of the Sydney Opera House, such an investigation would have highlighted many invisible red flags, such as personal agendas of key players, subconscious motivations of fear, and the silent undercurrent of political bias that was driving the decision-making processes.

2. Illuminate: Once ingrained biases, unquestioned assumptions, unverified truths and fixed perceptions have been uncovered, managers should seek to address them and breathe new life into the project with clear-eyed pragmatism. Had the project leadership team insisted upon unambiguous project specifications and realistic cost estimates right from the start, it might never have run into the multiple crises that almost killed the project and deprived the world of an architectural marvel.

3. Invent: Once project stakeholders are made aware of and address blind spots in how they think and act – thanks to the first two steps – they can become more innovative and develop alternative approaches.

Take Lego as an example. During the 2000s, falling sales led many in the company to think children were losing interest in traditional toys. With input from external consultants, the company embarked on a financially disastrous diversification strategy, entering areas such as video games and theme parks in which it had no experience.

It took a new CEO, Jørgen Vig Knudstorp, to challenge the company's strategic view and direction. Knudstorp asked a simple existential question, "Why do we exist as a company?" The insight was simple yet profound: Lego customers love to create and build things.

Before long, Lego had revived itself by crowdsourcing designs and enabling fans to share creations online. By leveraging its loyal fanbase while concentrating on what made Lego unique – its iconic bricks – the company engineered one of history's most impressive corporate turnarounds.

4. Impact: Managers need to demonstrate leadership to foster commitment and shift project trajectories. They could do so by implementing high-performance processes, practices and tracking systems to address Black Box issues uncovered through the diagnostic phase.

When Tesla faced significant challenges in ramping up production for its highly anticipated Model 3 in 2018, CEO Elon Musk essentially moved his office into the factory. He reportedly kept a sleeping bag near the production line so he could personally oversee the operations and solve problems as they arose, making his personal commitment visible to the investors and his workforce. The Model 3 has since become **one of the best-selling cars** in the world.

In megaproject after megaproject, it is patently clear that while the While Box stands out, the Black Box thrives in the shadows, hidden from sight and even consciousness, silently sabotaging performance. Opening the Black Box and seeing what is inside is crucial for steering decisions involving billions of dollars and affecting innumerable lives.

Find article at

https://knowledge.insead.edu/strategy/inside-black-box-crucial-megaproject-success

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