GORILLA IN THE COCKPIT

THE HIDDEN HUMAN PATTERNS OF MEGAPROJECT FAILURES AND A SYSTEM FOR SUCCESS

GORILLA
IN THE
COCKPIT

BREAKING THE HIDDEN PATTERNS OF FAILURE
IN ALL PROJECTS—MEGA AND MINI—
AND THE SYSTEM FOR SUCCESS

VIP VYAS & DR. THOMAS D. ZWEIFEL

Free Excerpt

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Praise for Gorilla in the Cockpit

The #1 derailer of major and megaprojects, and indeed all change initiatives, is the human factor. Whether you lead a company, a project or your life, *Gorilla in the Cockpit* is a smart investment.
—Scott A. Snook, Professor, Harvard Business School

I wish I had had your tools 35 years ago when I was starting out.
—Werner Brandmayer, Chairman, ConocoPhillips Europe

Gorilla in the Cockpit is a rare look behind the scenes of megaprojects by two seasoned experts. If you want to understand what really goes on in big projects, why they fail so often and what it takes for them to succeed, this book is a must-read.
—Bent Flyvbjerg, professor at Oxford and Copenhagen, principal author of *How Big Things Get Done* and *Megaprojects and Risk*.

Highly valuable for our executive board and 150 direct reports in transforming the mindset, communication, and strategic outlook in a way that led to real-world results.
—Wolfgang Pitz, CEO, SpaceTech; ex-Space Program Manager, Airbus Defense & Space

Gorilla in the Cockpit demystifies organizational failure. The book shows the tremendous impact of the Black Box effects on the oversight of massive complex programs.
—Stanislav Sheknia, Senior Affiliate Professor, INSEAD

Why do mega-projects fail so often, and at such great expense? In this highly readable and authoritative guide, Vip Vyas and Thomas Zweifel home in on the 'black box' of unstated assumptions and biases of those involved, that stymie effective decision making. If you are involved in project management -at whatever scale- they offer practical solutions to your thorniest problems.
—Julian Birkinshaw, Vice Dean and Professor of Strategy & Entrepreneurship, London Business School

Gorilla in the Cockpit reveals why so many megaprojects exceed mega-budgets and don't live up to their mega-expectations. The insights in this book are not limited to physical projects. They also apply to major changes in organization strategy and culture. This timely work is relevant and a must-read for all business leaders who share responsibility to deliver mega-results.
—Ron Kaufman, New York Times bestselling author of *Uplifting Service*

Hugely enjoyable! True leadership thinking for the 21st century. A myriad of disciplines blended in a practical way for those dealing with the complexity of mega-initiatives.
—Greg Bernarda, Co-author of *Value Proposition Design*, *Strategyzer* Series

Though mega-projects represent the greatest risk investors, businesses, or the public, will ever take, few consultants have attempted a comprehensive and practical look at what can be done to improve RoI and reduce volatility. Vyas and Zweifel have done that. With an eye on academic research, and decades of field experience, they have produced a critical synthesis of an ignored topic
—Paul Gibbons, Professor, Best Selling Author of The Science of Organizational Change, Leadership and Culture Partner, IBM Consulting

We opened the Black Box and addressed the ugly hidden patterns running one of our $700 million projects. This was the first step in creating a wholesale turnaround of performance.
—Darrel Kingan, ex-Deputy Director, Capital Works, Hong Kong Airport Authority

Gorilla in the Cockpit provides a high-octane, highly implementable approach to shifting gears on major and megaprojects**.** I would fully recommend the underlying methodology from the direct experience of working with the authors in shifting the direction of past projects and creating successful outcomes.
—Penny Hubbard-Brown, ex-Country Manager MACE, Campus Director, HKUST

Wish I would have had *Gorilla in the Cockpit* 20 years ago while serving on the team that built the Army's transformational plan for the Chief of Staff of the US Army. Vip and Thomas have added deep clarity enabling a better understanding of the critical leadership literacy of project management. This is the "new doctrine"; get it on your bookshelf!
—Joe LeBoeuf, PhD, Professor of the Practice Emeritus, Fuqua School of Business, Duke University; former Academy Professor, US Military Academy at West Point

Brilliant. The level of factual detail is astonishing and the conclusions utterly convincing. Admire the clarity of the writing.
—Michael Gates, Associate Fellow, Säid Business School, University of Oxford

Finally a book that sheds light on people power in projects—especially on the invisible and extremely important influence of neuroscience, beliefs, and bias on performance.
—Markus Hotz, Chairman, Insights Schweiz

Having worked for 35 years on mega-capital projects in over 60 countries, I learned first-hand about the power of the "black box" that splits project failures (unfortunately the norm) from successes. Zweifel and Vyas provide anyone involved in projects big or small with a clear, understandable, and accessible analysis and roadmap–though it requires leadership courage to implement. My experience on over $1 trillion in capital projects proves that their assertions hit the mark. Read this, do what they say, and lead your project to success in all measures: cost, speed, quality, and safety.
—Jay Greenspan, Founder, JMJ Associates

The book I was waiting for! All too often I have seen great projects fail despite green lights on all dashboards. The problem is that most managers see only technical, financial, and strategic indicators—but the factors that decide on failure or success of a project are the soft ones. With "*Gorilla in the Cockpit*," Zweifel and Vyas give access to a sense of power, confidence and stoic calm that comes from flying in a fully functioning cockpit and knowing which levers to push when a storm comes in.
—**Frederic Mueller, ex General Manager, ABB Switzerland; CFO, Wandfluh AG**

As chairman of a large insurance company and as a doctor focusing on patient-centered medicine, I often deal with megaprojects and large-scale change, from drug development to process integration. *Gorilla in the Cockpit* hits the nail on the head: Projects don't fail—people fail. If we are to succeed with projects of any size, we must find a way to master the human component. Zweifel and Vyas go to the source of why 65% of projects crash, destroying millions of lives and billions in shareholder value—and they offer a systematic methodology and case studies to show us how to fix the plane mid-air. An important book, a pleasure to read, and a significant return on investment.
—Prof. Dr. Thomas D. Szucs, Chairman, Helsana

Gorilla in the Cockpit is a must-read for project managers—and/or anyone who wants to get things done through other people. Self-management is already demanding; team management raises the bar pretty quickly; company and project management compounds the challenge exponentially with the number of people involved. Why? The more human beings participate in your project, the more human flaws and bias you need to align to achieve your goals or to simply avoid complete failure—since most projects fail. "Gorilla in the Cockpit" provides you with systematic tools to master your projects and unleash the full potential of its human factor to achieve your goals.
—Philippe Baeriswyl, Executive Director, Eiriz Réalisations et Immobilier SA

What causes large projects to fail? Søren Kierkegaard said: Life can only be understood backwards; but it must be lived forwards. A project has a beginning and an end. In order to measure it, you need a goal, a deadline, and a cost. But projects fail not because of the measurable "white box" goals, they fail because of the "black box" of the stakeholders. Vip and Thomas describe masterfully how to deal with these. They show a solution, the "project flight path." I can only recommend this rich book. It is based on a wealth of experience and lessons learned. If you want to cross the finish line, you MUST read this book!
—Dr. Alexander Herzog, Head of Staff, PA-FD, Financial Directorate of the Canton of Zurich; Audit Commission, Municipality of Küsnacht

Major failures in business come about because of problems in the human machinery behind the scenes of organizations. It's increasingly difficult for leaders to gain visibility into the engine. With ever more scale and complexity in global business, the machine gets more opaque, not more transparent. *Gorilla in the Cockpit* opens up the black box and provides a revealing study on the machinery and why it goes wrong. It also helps us see how to get it right.
—Chris Howells, Senior Vice President, Teneo

Gorilla in the Cockpit comes just at the right time! In the biotech and pharma industry, every project is by definition a mega-project with long durations and large investments. The sector is in permanent transformation due to a high error rate, Vip Vyas and Thomas Zweifel give us a powerful book: They encourage and empower the individual leader and his or her actions. They help all of us tackle mega-projects without fear, but with self-confidence and humility, to take responsibility, take decisive action, and ultimately achieve success.
—Dr. Erich Greiner, CEO, Cedrus Therapeutics Inc

Valuable book with many pragmatic and good concepts.
—Gaelle Olivier, Chief Operation Officer, Société Générale

A unique book with no substitute. Vip and Thomas convincingly reveal the Black Box's powerful impact on organizations. The approach made a big difference on one of the world's largest Offshore Wind Farm projects we delivered.
—Luc Vandenbulcke, CEO DEME Group

An enthralling read. I wish I had read a copy many years ago as I set out in my construction career.
—Simon Buttery, CEO Continental Engineering Corporation

Taking our business to the next level involved breaking out of the Black Box and creating a safe psychological space to make our employees feel comfortable speaking up and contributing. *Gorilla in the Cockpit* provides a strong compass for leaders to focus their attention on the areas that make the biggest difference in making shifts in thinking, behaviors, and culture.

—Ian Edwards, President and CEO at SNC-Lavalin

Kudos to Vip and Thomas in crafting an interesting and highly readable book underpinned with well-known case studies and anecdotes on infamous failures and successes of megaprojects. While most publications related to project management tends to be stereotypical and unexciting, the authors have been able to cleverly articulate their findings on the causes of megaproject failures with analogies borrowed from the aviation industry. Remedies to avoid failures through their lenses are provided with even a checklist to guide readers in mitigating disastrous consequences. I do recommend "Gorilla in the Cockpit" as a leisurely read to understand the impact of the human mindset, behavior, culture, and neuroscience on a project. The revelation should be of interest to all those desiring success while undertaking projects of any size.

—Michael K C Yam, President, Chartered Institute of Building (CIOB) & Past President, Real Estate and Housing Developers Association (REHDA) Malaysia

Finally – the ultimate "project cookbook that pulls the hidden agendas, secret motives, and dark derailers from the soft underbelly of projects to the light, so we can put them on the table, examine them, and manage them as we manage all other elements of the project. "Gorilla in the Cockpit" is refreshingly frank, open, and transparent. It gives you the recipe for managing projects with realism and success -without walking over dead bodies – by putting human agents at the center. The case studies are priceless, offering best practices from the rare megaprojects that have succeeded. A must-read

—Willi Helbling, CEO, BPN Business Professionals Network

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Prologue: The Flightdeck Reality

You are sitting in the pilot seat, hands on the control column,

eyes darting across a range of instruments in front of you.

It's a $10 billion project. By far the largest you've ever managed.

All eyes are on you.

The investors are impatient, almost ruthless, and your "crew" is nervous.

You look out the window and see a violent storm system heading your way.

You are peering directly into the belly of your project ecosystem.

The project has barely begun, but you are already behind schedule.

The Immigration Department has been slow processing visas,

and several key team members are not on board yet.

Some of the specialized equipment you need is stuck in customs.

Procurement has started, but contractors and vendors are submitting prices way above your initial estimates.

It looks like hitting the budget is already going to be a struggle.

Last week, two workers got electrocuted and are in critical condition.

The local press, a key stakeholder, has jumped onto the accident,

and the families are seeking colossal compensation.

You haven't had a good night's sleep in three days (or weeks, months?).

You are about to take a long deep relaxing breath,

but a ping from your phone snatches your attention.

It's an SMS. More bad news.

The message says that the two large engineering firms you have contracted are struggling to attract experts.

You nod to yourself and mutter,

"Not surprising. The project is in the middle of nowhere.

and the accommodation, well, it's certainly not the Park Hyatt."

You absorb the information and then remind yourself

to bring it to the next project board meeting in three days.

Welcome to the wild world of major and megaprojects.

Why This Book Matters

To undertake a project,
as the word's derivation indicates,
means to cast an idea out ahead of oneself
so that it gains autonomy and is fulfilled
not only by the efforts of its originator but,
indeed, independently of him (her) as well.

— Cieslav Milosz

We know that a full 65 percent of all megaprojects fail. Either they go over budget, over time, or both. Or they don't meet their objectives. At a current investment of $20 trillion per year in major projects, this would be like flushing $13 trillion down the drain.[1] That is the number "13" followed by 12 zeros: 13,000,000,000,000. To put the string of zeros in perspective, consider that a trillion dollars would buy you a $6 Starbucks latte every day, for the next 450 million years.[2]

Did you also know that by 2027, an estimated 88 million people will work in project management-related roles?[3] Again, this is a rather large number. What factors are driving this trend? We observe at least four. The first key is the projects and programs needed to combat unprecedented challenges facing humanity—climate change, water shortages, and global food insecurity being just three examples. A second driver is the massive Chinese "Belt & Road" and the U.S. "Build Back Better" initiatives designed to reconfigure, boost and expand the primary, secondary, and tertiary sectors of two gigantic economies battling for geopolitical supremacy. Both have already spurred enormous demand for advanced project leadership. Then there is the impact of the Covid-19 pandemic—governments worldwide are making significant investments to help their sluggish economies rebound. Last but not least is the exciting lure of emerging disruptive technologies—from the Metaverse to the Blockchain, from biotech to med-tech, from fin-tech to AI —where business angels, venture capitalists, family offices, and wealth managers are eager to swoop upon opportunities for exponential returns.

The project volume is there, but so is the risk. And we have a simple choice: We will either keep going as we always have, playing major and megaprojects like a lottery and usually (two out of three projects) failing. Or we will finally get to the bottom of why megaprojects systematically go wrong, so we can course-correct at the root cause level and put in place the critical path to have megaprojects succeed.

Whether you are a client or a project manager, the tools and technology in this book will enable you—assuming you apply them correctly—to (1) design and set a new project on a path to success or (2) turn around your existing project, steer it to success, and in the process save billions of dollars (or whatever your preferred currency).

Specifically, we have written this book for people who have a genuine interest in shaping the future, creating long-term value, de-risking investments, leading change in complex organizations, driving new levels of performance, and making big things happen with greater certainty, more efficiency and lower costs.

The very word "project" comes from the Latin *pro* (ahead, forward) and *iectum* (thrown). As Cieslav Milosz put it in the motto above, "To undertake a project, as the word's derivation indicates, means to cast an idea out ahead of oneself…." Think of a project, big or small, whether it is to run a marathon or build a transnational pipeline, that you have undertaken. What makes any project unique is that it translates your imagination into reality—it is the vehicle by which you forge, fashion, and design the future. Projects are, in essence, the agents of change and transformation.

Understanding "System for Success"

There are piles of books on project management: A recent search yielded over 20,000 search results on Amazon alone. A smaller number of specialized books cover specific project methodologies such as Prince, Agile (including Scrum), Kanban, and others. The bookshelf becomes extremely sparse in providing a ground zero, eye-level view of how large projects function in real-time. This gap stems from the fact that relatively few people have worked on complex megaprojects from initiation to final operations. An even smaller number has the time to document, analyze and articulate their experiences in

a meaningful way. And virtually nobody has deep insight into the human dynamics of megaprojects.

This is a significant gap in the field of project management. We aim to bridge that gap based on our over 50+ years of combined experience working on large projects. As will become clear in this book, many projects create an invisible "system of failure" that predictably derails the project and has it spinning out of control. By "System for Success," we don't mean a silver bullet or a complex checklist. The field of project management is already littered with tons of these, and many of them are very useful. Instead, "System for Success" is about creating a project environment, a force field that sets the project up to win, even when the pressure is on, and the circumstances look ugly.

Who Should Read This Book

Anytime you write a book, it's imperative to understand the needs of your audience. We have kept the following key stakeholders in mind:

Investors, even the best and brightest among them, might underestimate the complex risks that come with megaprojects. Why would you invest billions in a venture with a 70% chance of failure, have the project fail, and then do it again? The book aims to help investors understand, appreciate, and actively reduce the risks of their investments. Once you know the hidden risk factors, you can improve your due diligence before you sink real money into a project. And if you apply the Flight Path framework correctly, you will make better investment decisions, de-risk your investments, and maximize your returns. (No guarantees, of course.)

Boards, CXOs, and Project Sponsors, despite knowing that the buck "ultimately stops with us," might lack the experience to ask the right questions, especially when it comes to unique and colossal endeavors. The book aims to provide them with the necessary dashboard to watch and prevent potential crash landings, no matter how large the project.

Project Directors are usually technically solid and intimately familiar with the operations of their megaprojects but might get caught up in day-to-day fire-fighting and crisis management. By revealing the invisible drivers shaping current performance, *Gorilla in the Cockpit* aims to help project leaders enhance their total view of the project, show the leverage points for effective interventions, and enable decisive action.

Change Agents are strongly oriented to address the visible factors of project performance (or what we will call the White Box). They might have minimal training (in some cases zero) in tackling the complex dynamics of the hidden performance factors (what we will call the Black Box). Once change agents are conscious of these hidden dynamics and have learned how to deal with them effectively, they can interrupt the vicious cycle in which projects are caught so often and turn their megaproject around.

Delivery Teams might fall into the trap of viewing and tackling project issues with a mechanical, cause-and-effect, linear mindset. This can often solve only a tiny fraction of the challenges at play or solve the wrong problem

altogether. The book helps you detect and address the "nudging factors" that can easily knock your projects off track.

Academics & Students both represent the future resource and capability of the economy. Our Flight Path framework aims to give you an exponential leap in understanding complex initiatives and their value realization and open up new frontiers for future research and studies of megaprojects.

Ultimately, *Gorilla in the Cockpit* is for anyone with an ambitious project. Take us as an example: Writing and producing this book was, of course, far from a megaproject (although at times it felt that way). It was a speck of dust in comparison. But while this micro-project was minuscule in scale, it was every bit as complex. We live in two different time zones, Hong Kong and Switzerland. We saw each other face-to-face only once, for a summer dinner at the Baur au Lac hotel in Zurich, during the five years it took to write the book. We come from vastly different cultures. Vip, a British Indian, likes to explore issues by speaking and brainstorming with industry experts and practitioners. He loves talking and can be rather lengthy. Thomas, a Swiss, is detail-oriented to the point of being pedantic and averse to talking unless it's needed for action. This is just one dimension of the culture clash we experienced; we will spare you the others. And the project of this book had all the ingredients of a project of any size: self-leadership, checking our assumptions, building solid relationships, visioning, business model design, planning, procurement, operations, budget, etc.

Or take the project of raising a family: Anybody who has undertaken to have kids knows what a megaproject that is. OK, raising children might not cost $1 billion, more like $1 million-plus. At least not in terms of money. But in terms of opportunity costs, time, emotions, complexity, and sheer nerves, it is just as intense and costly as any megaproject. So, whether or not you are undertaking a megaproject in the strict sense of the word, this book can be your mountain guide in treacherous terrain.

Preface (Don't Skip)

It ain't what you don't know
that gets you into trouble.
It's what you know for sure
that just ain't so.

— Mark Twain

(Not sure Twain ever actually said this—but as the Italians put it, "Se non è vero, è ben trovato": Even if it's not by Twain, it's a good one.)

Seriously: If you were planning to skip this preface, this is precisely what happens in large-scale projects. People rush to the "real stuff" (the execution) and often ignore the context. So how about investing the 4 minutes it takes to read this preface? We promise it will be worth your while. So, here goes:

In the pre-Corona world, the consensus was that a megaproject like developing and bringing to market a pharma product would take ten years. The idea that we could launch a vaccine within ten months was ludicrous. But we have done it. So yes, we can, but how?

To answer that question, we have to take a step back: As the French put it, *Il faut reculer pour mieux sauter* (You must step back to leap forward better). Megaprojects are almost as old as history. Suppose we rewind the clock by thousands of years. In that case, we see that the mythical Tower of Babel was possibly the first megaproject—and the first megaproject failure, which led to multiple languages, people being spread across the world, things getting lost in translation, misunderstandings, culture clashes, and wars. Later, the Pyramids of Egypt, the 5,000 km long Great Wall of China, and the Roman Colosseum might be deemed successes since they still stand today. Others, like the Limes, the border wall meant to protect the Roman empire from the barbarians, have crumbled over time. Much later came the Eiffel Tower (1889), the Manhattan Project to build the U.S. atomic bomb (1944), and Soviet Russia's Sputnik (1957).

These megaprojects were few and far between. Today, the market for megaprojects—projects that cost more than $1 billion—is massive and growing at breakneck speed. Within the decade, megaprojects like tunnels, bridges, dams, highways, airports, hospitals, skyscrapers, cruise ships, wind farms, offshore oil and gas rigs, aluminum smelters, communications systems, Olympic Games, satellites and aerospace missions, particle accelerators, and entirely new cities will total an estimated 24 percent of world GDP.

That's one-quarter of all transactions worldwide.

The newest megaprojects are in the high-tech field: Artificial Intelligence (AI), Internet of Things (IoT), 5G, Big Data, and Blockchain. These projects are bound to disrupt or transform the very companies that commission them.

Whether or not you (personally) work on a megaproject right now, you are affected by megaprojects. We all are. Just imagine what our world would be like without airports, hospitals, satellites, bridges, freeways, and shopping malls. For better or worse, megaprojects have an outsized impact on all our lives. When they work, they make our day-to-day far more convenient. And when they fail, when they go over budget or over time, they not only become the laughingstock of entire nations, like the Berlin Brandenburg airport that went nine years over time and €2.5 billion (US$2.98 billion) over budget, in Germany of all places, supposedly a world leader in engineering and efficiency. They also cost all of us real money. German taxpayers followed the disaster with emotions ranging from stoic boredom to rage and very dark humor.

And megaprojects are getting bigger on average. Gone are the days when a project costing $10 million, $50 million, or $100 million seemed impressive. Now Azerbaijan's construction of an artificial archipelago, Turkey's urban renewal project in Istanbul, and Saudi Arabia's Masjid Al Haram each exceed $100 billion.

Big infrastructure projects can also be economically transformative. The Panama Canal accounts for a significant share of the country's GDP. Dubai's international airport is the world's busiest, accounting for 21 percent of Dubai's employment and 27 percent of its GDP. And Hong Kong would surely grind to a halt without its clean and speedy subway system, the MTR, which has enabled the densely packed city to build beyond the downtown districts. Indeed, it is almost impossible to think of these places without megaprojects.[4]

McKinsey estimates that the world needs to spend about $57 trillion on infrastructure by 2030 to enable the anticipated levels of GDP growth globally. Of that, about two-thirds will be required in developing markets, where there are rising middle classes, population growth, urbanization, and increased economic growth.

We (Vip Vyas and Thomas D. Zweifel) have been assessing and turning around projects globally, focusing on human performance for over five decades. We have worked with energy companies, power plants, iconic buildings, irrigation schemes, glitzy casinos, airports, automotive plants, satellite builds, life-saving pharmaceuticals, and mining, to name a few. We have been hired to de-risk the building of a 1,100-mile pipeline that cost $5.4 billion and employed 22,000 workers at its peak, impacting project safety, efficiency, and speed of delivery. We have assisted engineering teams, cutting 90 percent of overtime, or 4.5 years, from the time it took to deliver a satellite to the customer. We have coached the roll-out of a new chemical product in over 100 separate jurisdictions.

We have helped build and implement ATM bank machine protocols. We have worked on a joint venture between a cyber security company and a leading steel manufacturer to construct a multi-billion-euro artificial intelligence solution. We have helped test and bring a shop concept to the gas stations across Germany owned by a global tier-one energy company. We have coached project teams to enter the market in India and China and bring a diabetic diagnostic tool to the vast populations of these two most populous nations in the world. And we have helped build Hong Kong's Ocean Park, a HK$5.5 billion (HKD) masterplan. The combined value of the projects they helped speed up or turn around is over $100 billion.

We found over and over again that one thing consistently went wrong in megaprojects. One missing element, a critical ingredient that requires a radical re-think and re-boot of project management. This one thing was not the technical stuff. And it was not what was in the manual or the GANTT chart. It was the stuff in the Background[5], in the shadows. It was in what people did *not* say. Or what they did not even see, though the writing was on the wall. They ignored the warning signs. This book is based on that experience. It will show you the entire dashboard you need to maximize performance reliability.

Escape > Arrive

At the risk of being presumptuous (but after all, you bought this book for a reason), here are one or several things that might be happening in your projects:

- Despite your best efforts, too many projects have failed or are failing.
- The project goals and objectives are poorly defined, and/or the deadlines are unrealistic. Scope creep is insidious (and creepy). Risk management or assessment is wanting.
- Keeping teams on the same page seems virtually impossible. Project managers lack sufficient team skills. The result: inefficient teamwork.
- Stakeholders mistrust each other. Miscommunications cause conflicts. Contractors are unreliable. There is no genuine partnership.
- There is a culture of "Cover Your Ass" (CYA), pretense, lies, and even cheating.
- There are lawsuits by dissatisfied alliance partners or clients or suppliers.
- The project management software is not quite right. Different stakeholders might even use incompatible systems. Things fall through the cracks.
- It's not you, of course, or at least not you alone. You are merely a cog in a vast wheel with minimal influence on the outcomes. Truth be told, periodically, you feel powerless. You and/or your colleagues live in resignation. "I make zero difference."
- Some team members have gone into internal exile and demonstrate a frightening lack of accountability.
- You and/or your colleagues feel like you are suffering from the Peter Principle: You have been competent and risen to a level of responsibility that outstrips your capacity. It's unlikely you will get a more significant project.
- This significant failure rate has put a lid on the careers of all those involved, including yours. In a toxic environment of blame

games, you must constantly be on guard in a minefield of attacks and accusations.
- You are afraid you will fail ("Project Panic"). As we call it, you and/or your colleagues exhibit survival behavior. You dread going to work.

Does any of this sound familiar?

If you didn't like that list that much, how about this? This is what can happen if you apply this book in practice:

- You will be in the cockpit and steer the plane. You will have more power and control.
- Your success rate will go up by X10.
- You will be known in the company and industry as a project guru, admired, and respected by your peers.
- You will have a team actually working together, jointly delivering success.
- You will have peace of mind, ease, and grace.
- And lo and behold, you'll have fun doing all this.

What if there were one thing that if you put in place in your projects helped you get from what you want to leave behind (we call it Escape) to where you want to be (Arrive)? We offer to give you that one thing in this book. This one thing is the missing component that will provide you with access to delivering projects effectively. (You'll still have to do it yourself, though. There are no guarantees, of course.)

When megaproject expert Bent Flyvbjerg looked at what goes wrong with megaprojects, he researched extensively the political, strategic, and operational crash factors, making vital contributions to the field. In his analysis (and theory), he has also directed the industry towards human factors, such as bias. But, as Einstein is supposed to have said, In theory, theory and practice are the same; in practice, they are not. The human element, with all its facets, from blind spots to bias to culture and communication, remains a black box. We wanted to look at projects from a different angle. The angle we look from is our direct experience with projects. In this book, we open the black box. And we aim to make the human component accessible and actionable.

The Book as a (Micro-)Project

We love projects. Wait, that sentence needs rephrasing: We love to see people succeed in their projects.

This book itself is a micro-project. We live on two different continents. Vyas is based in Hong Kong, Zweifel in Zurich. We are separated by six time zones and thousands of kilometers. The Covid-19 pandemic didn't make it easier. We were prevented from ever getting together (the last time we saw each other was in July 2018 at the Zurich Baur-au-Lac Hotel). We had to communicate via Skype and email. We had to align our strategies, preferences, incentives, mindsets, and value systems. We had to walk the talk and practice what we preach. It became a laboratory of project management in action. And whether you're cooking a meal for four people or 4,000 people, it's only a difference of scale.

There are thousands of books on project management: It has become a cottage industry. What's different about this book? Most books or workshops cover the fundamental mechanics of project management. We will not cover these basic tools in this book. Projects are getting bigger, and people-based projects cannot be managed mechanistically. There is no book out there that systematically covers the hidden factors of project management: mindset, bias, and culture. But as Peter Drucker famously observed, Culture eats strategy for breakfast.

To move outside the existing paradigm of project management thinking and practices, we have taken a design-thinking approach to project management by reviewing project management through many distinct disciplines, including Behavioral Economics, Linguistics, Ontology, Social Psychology, Neuroscience, and Complex Adaptive Systems.

What you are holding in your hands is the product of that synthesis.

Overview

Each chapter in the book allows you to pass one critical milestone on the way from Escape to Arrive.

Chapter 1 tells the dramatic story of not one but two Boeing crashes that dramatically illustrate how megaproject failures are never just technological disasters. You will see the full spectrum of complexities: the interplay of political forces, financial interests, and human dynamics that underpinned the Boeing organization and led to the disasters.

Chapter 2 dives below the surface of existing project management methodologies and asks a tricky question about their effectiveness given the high observed rate of project failures.

Chapter 3 illustrates how modern project management has advanced from its roots at the dawn of civilization, where the ancients-built marvels of such scale and size that many still exist with us today. Despite the staggering accomplishments, the evolution of project management rests on a faulty foundation that crumbles as projects get larger and larger.

Chapter 4 goes to the root causes for why so many megaprojects crash and why they chronically go over time and/or over budget. The radar that project leaders currently use is inadequate, so they don't see the warning signs until too late. Much project management suffers from a fundamental flaw: a mechanistic paradigm. We need a new project paradigm that treats the human being as the vital pilot of change.

Chapter 5 offers a new model and framework for managing major projects from beginning to end, with nothing left out but still streamlined and lean. We call it the Flight Path.

Chapter 6 shows the dramatic impact invisible factors hidden in the Black Box can have on derailing big projects. The chapter draws a critical distinction between the Foreground and the Background of projects.

Chapter 7 demonstrates the destructive impact the Black Box had on important events leading up to the Deepwater Horizon disaster.

Chapter 8 zooms into the Black Box at the microscopic level and takes a deep dive into the world of the brain and neuroscience. We promise not to overwhelm you -; The chapter delves into just enough science for you to apply to your project and/or change initiative, and spot any project killers lurking unseen, invisibly sabotaging your project.

Chapter 9 gives you tools for building your own "project radar," enabling you to see the warning signs and diagnose the current state of your project more accurately.

Chapter 10 applies the model of the Flight Path and its Black Box to the first of four mini-cases, an icon of world architecture, the Sydney Opera House. While the final product is a mesmerizing piece of architecture, its Flight Path was nowhere near as dignified or smooth.

Chapter 11 (not to be confused with bankruptcy under US law, but perhaps aptly named, given its topic) focuses on an entirely different industry for the second mini-case: the defense sector and the highly controversial F-35 Strike Fighter. With program cost blowouts exceeding USD 1.5 trillion, the sheer scale of this program was too vast to ignore.

Chapter 12 shifts focus from project failures to a spectacular success: the Guggenheim Museum in Bilbao. Our third mini-case reveals key success factors that shaped the project's trajectory. As you read this mini-case, inquire into what impact applying these factors could make to your existing or upcoming initiatives.

Chapter 13 provides an example of delivering a "Mission Impossible." The fourth and final mini-case is the colossal Shell-Gas-to-Liquids (GTL) facility - the world's largest plant turning natural gas into cleaner-burning fuels and lubricants. In our mini-case study, we spotlight the depth of commitment, intelligence, and leadership displayed by Shell (and its supply chain) in creating a purpose-driven mindset supported by an array of concrete actions to achieve world-class performance.

Chapter 14 has been designed to elevate your leadership intelligence. Especially when you are being tossed and turned around inside the belly of the project's storm system, right in the "heat of the battle." We provide you with a robust framework of Principles and Practices to enable you to navigate the Flight Path with precision and potency, enhancing your leadership effectiveness along the route.

Chapter 15 weaves together the Flight Path and emerging technologies. The chapter offers a brief tour-de-force of how recent breakthroughs in Internet 3.0, AI, and the metaverse will shape and impact the future of project management.

Chapter 16 is a call to action--actions that build on the book's contents. Expand your organizational capability, hone your diagnostics skills, and impact the flight path of your projects by choosing the most appropriate next step for your business and yourself.

Acknowledgments

A book like *Gorilla in the Cockpit* cannot be produced by the co-authors alone. In many ways, this book is the product of our combined experience assisting CEOs, CXOs, project leaders, and the people we met along the way. Naming them all would require an entire book, so we will acknowledge a few selected individuals.

We thank, above all, our clients at ABB, Airbus, BP, Borealis, Cathay Pacific, Chevron, China Light & Power (CLP), ConocoPhillips, Credit Suisse, Danone, Dreamlab, Faurecia, Fiat, Glencore, Hong Kong Airport Authority, J&J, MACE, Merlin, MTR, Mubadala Petroleum, Ocean Park, Qatargas, RasGas, Sanofi, SC Johnson, Singapore Ports Authority, Sumitomo, Total, UBS, West Kowloon Terminus & M+ Museum, Wynn Macao, and many others who trusted us with their megaprojects and permitted us to do whatever was needed for turnaround.

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Bottom Line

In case you did not heed our suggestion to read the entire preface (we know who you are, you can't hide), here is the bottom line for you. You will love this book if you:

- Want to deliver projects with greater predictability, accuracy, and certainty.
- Are interested in developing an aerial view of how projects fail (or succeed).
- Want a framework that reduces the complexity of the many moving parts and focuses on those issues that will make the most significant impact.
- Want to de-risk your project by asking the right questions.
- Are keen on living a life with less hassle and greater productivity.
- This book will help you:
- Take first steps into a wider world and get a more detailed and more expansive view of what happens on complex projects.
- See the big picture of why projects fail and the patterns of failure.
- Create a deeper understanding of your project.
- Leverage your team's experience, skills, and capabilities.
- Understand what could be driving the behaviors of the various project stakeholders.
- Make the learning from other project failures more real.
- Spotlight the key actions your project should take.

OK, ready? Let's go.

Radar Alert 1

EVENTS ARE NEVER JUST EVENTS.

THEY FORM PART OF A BIGGER PICTURE AND PROCESS.

Chapter 1 > Gorillas in Action: Boeing's Flights of Horror

If you want to be a millionaire,

start with a billion dollars

and launch a new airline.

— Richard Branson

On 10 March 2019, at 8:38 am local time, Flight ET302, an Ethiopian Airlines plane, takes off from Addis Abeba for a two-hour flight to Nairobi.

What happens next is painful to read. It is an inescapable spiral toward death, akin to watching an accident happening in slow motion. The pilots struggled for five minutes with the plane's automated control system.

The Perfect Storm

At 08:38, a sensor on the pilot's side falsely indicates that the plane is close to stalling, triggering MCAS and pushing down the nose of the aircraft.

At 08:39-40, the pilots try to counter this by adjusting the angle of stabilizers on the plane's tail using electrical switches on their control wheels to bring the nose back up.

At 08:40, they disable the electrical system powering the software that pushed the nose down.

At 08:41, The crew attempt to control the stabilizers manually with wheels - something difficult to do while traveling at high speed.

At 08:43, when this doesn't work, the pilots turn the electricity back on and again try to move the stabilizers. However, the automated system engages again, and the plane goes into a dive from which it never recovers.[6] All 167 people on board are killed.

The Impact

Among the victims were 32 Kenyans, 18 Canadians, nine Ethiopians, and eight Americans, plus people from Austria, Belgium, China, Egypt, France, Germany, India, Ireland, Israel, Italy, Morocco, Norway, Poland, Russia, Slovakia, Spain, Sweden, Togo, and the United Kingdom. UN Secretary-General António Guterres described the crash as a "global tragedy." Many passengers were affiliated with the UN or had been on their way to an environmental conference in Nairobi.

Investigators ruled out wrongdoing by the pilots, who had acted flawlessly, and by Ethiopian Airlines, which is seen as Africa's preeminent airline and enjoys a highly professional reputation.

Sadly, the crash in Addis was the second crash in less than half a year. In October 2018, a Lion Air flight crashed in Indonesia, leaving 189 dead.

The U.S. Federal Aviation Administration (FAA), investigating the Ethiopian Airlines crash and the Ethiopian National Transportation Safety Board, found that evidence collected and satellite data showed both flights behaved "very similarly." "The evidence we found on the ground made it even more likely the flight path was very close to Lion Air's," said Dan Elwell, acting administrator at the FAA.[7]

Another chilling similarity: Both planes that crashed were Boeing 737 MAX.

What was the source of the crash? What went wrong?

"Software Issue": Faking Cause & Effect

Boeing claimed the crash factor was a software issue and announced it would upgrade the flight simulator software. But the company's assertion is disputed. Trevor Sumner, CEO of Perch Experience, whose brother-in-law Dave Kammeyer is both a pilot and software engineer, took to Twitter to argue that Boeing's "software upgrade" was a farce.

"Some people are calling the 737MAX tragedies a #software failure. Here's my response: It's not a software problem.

- It was an *economic problem* that the 737 engines used too much fuel, so they decided to install more efficient engines with bigger fans and make the 737MAX.
- This led to an *airframe problem*. They wanted to use the legacy 737 airframes for economic reasons but needed more ground clearance with bigger engines. The 737 design can't be practically modified to have taller main landing gear. The solution was to mount them higher & more forward.
- This led to an *aerodynamic problem*. The airframe with the engines mounted differently did not have adequately stable handling at high AoA to be certifiable. Boeing decided to create the MCAS system to electronically correct the aircraft's handling deficiencies.
- During the development of the MCAS, there was a *systems engineering problem*. Boeing wanted the most straightforward possible fix that fit their existing systems architecture so that it required minimal engineering rework and minimal new training for pilots and maintenance crews. (...)
- On both ill-fated flights, there was a *sensor problem*. The AoA vane on the 737MAX appeared not to be very reliable and gave wildly wrong readings.
- On Lion Air this was compounded by a *maintenance practices problem*. The previous crew had experienced the same problem and didn't record the situation in the maintenance logbook.
- This was compounded by a *pilot training problem*. On Lion Air, pilots were never even told about the MCAS, and by the time of the Ethiopian flight, there was an emergency AD issued, but no one had done sim training on this failure.
- This was further compounded by an additional *economic problem*. Boeing sells an option package that includes an extra AoA van, and an AoA Disagree light, which lets pilots know that this problem is happening. Both 737MAXes that crashed were delivered without this option. No 737MAX with this option has ever crashed.

- All of this was compounded by a *pilot expertise problem*. If the pilots had correctly and quickly identified the problem and ran the stab trim runaway checklist, they would not have crashed.
- Nowhere in here is there a software problem. The computers & software performed their jobs according to spec without error. The specification was just shitty. The quickest way for Boeing to solve this mess is to call up the software guys to come up with another band-aid. (...)
- When the software band-aid comes off in a 500mph wind, it's tempting just to blame the band-aid."[8]

Up to the second accident, the 737 MAX had been Boeing's fastest-selling plane in the company's history. More than 4,500 planes had been ordered by 100 different operators worldwide.

Now, scores of airlines canceled their orders. Boeing's stock value fell dramatically. One year later, Boeing asked a representative of the crash victims' families if it would be appropriate for Boeing's CEO Dennis A. Muilenburg to attend the memorial.

The response was swift. "He is not welcome here," said Zipporah Kuria, whose father, Joseph Waithaka, was killed in the Ethiopian Airlines crash. "Whenever his name is said, people's eyes are flooded with tears."[9]

Telling The Truth: Speed & Profits Trump People and Safety

Boeing fired Muilenburg after the 737 MAX calamity. But that action did little to address the source of the crashes. The writing had been on the wall for a long time. Internal documents on the 737 MAX Boeing released in January 2020 are full of late-night trash talk between two Boeing pilots who mocked federal regulators, airline officials, and suppliers and described their colleagues as "idiots," "clowns," or "monkeys."

Many of the messages are from then-737 chief technical pilot Mark Forkner, including some late-night instant message exchanges with his deputy, Patrik Gustavsson.

In one exchange, with Forkner sometimes drinking Grey Goose vodka — "I just like airplanes, football, chicks, and vodka, not in that order," he wrote — and Gustavsson preferring Bowmore Scotch, both talk loosely about their bosses and everyone else they have to deal with in varying derogatory ways.

One pilot who presented to FAA staff mocks the agency's lack of technical knowledge: "It was like dogs watching TV." In another message, the 737 MAX is described as "designed by clowns, who are in turn supervised by monkeys."

"Would you put your family on a MAX-simulator trained aircraft?" one pilot asks, then answers himself: "I wouldn't." His colleague agreed.

India's air safety authority, the Directorate General of Civil Aviation (DGCA), is "apparently even stupider" than another unnamed foreign regulator. And one pilot notes, about dealings with the FAA, "I still haven't been forgiven by God for the covering up I did last year."[10]

"These revelations sicken me," said Michael Stumo, father of 24-year-old Samya Stumo of Massachusetts, United States, who died in the Ethiopian Airlines flight. "The culture at Boeing has eroded horribly," he added. "My daughter is dead as a result."[11]

Of course, the lead pilot's lawyer dismissed the more memorable quotes as bravado, nothing more than some hard-charging guys blowing off steam after work. And Boeing disowned the communications, blaming them on a few rogue employees.

But other, more sober and more damning internal emails reveal that the pilots were under intense pressure from the MAX program leadership. They suggest a troubling culture that put speed above safety. And they point to severe problems with how the MAX was developed and certified.

Robert Clifford, the lead lawyer for the Ethiopian Airlines victims, said the documents will "be used by the families of the victims to show a jury that Boeing was reckless and put profits before safety."

Members of the U.S. House of Representatives were particularly incensed by one document showing that to avoid any need for additional pilot training, Boeing downplayed to the FAA the significance of the new flight control software on the MAX — known as the Maneuvering Characteristics Augmentation System (MCAS) — that was implicated in the two crash flights.

House Transportation and Infrastructure Committee vice-chair Rep. Rick Larsen, D- Everett, said these “efforts to characterize the MCAS software as seemingly inconsequential were a serious mistake.”

And that was not the end of it. When Indonesian carrier Lion Air in 2017 asked for simulator training for its pilots, apparently at the suggestion of that country’s regulator, also known as DGCA, Forkner scrambled to convince the airline that it shouldn’t do so.

He approached DGCA and argued that other regulators didn’t require sim training, so why should Indonesia.

This manipulation by Boeing of both its airline customer and a foreign regulator looks damning in hindsight, especially when the first crash was a Lion Air jet. Simulator training might have gone some way to compensate for the over-reliance on cockpit automation and pilots' lack of manual flying experience at some low-cost carriers overseas. This emerged as an issue after the two crashes.

Boeing conceded as much in January 2020 when it reversed course and recommended simulator training for all pilots before the MAX returned to service.

No End in Sight

Alas, that was not to be the end of the Boeing drama. A string of failures hampered Boeing 777 aircraft too. In December 2020, an engine failed during a Japan Airlines flight bound for Tokyo. Japan’s Transport Safety Board said a fan blade that broke off from the engine showed signs of metal fatigue. Another blade was broken roughly in half.

And on a weekend in February 2021, the engine powering a United Airlines Holdings Inc. flight broke apart over a town near Denver.

In another incident on the very same day, a Boeing plane dropped engine parts after a midair explosion over the Netherlands. Longtail Aviation Flight 5504, a cargo plane, scattered small metal parts over Meerssen, causing damage and injuring a woman shortly after takeoff.

There were similarities between the incident in Japan and the one in Colorado. All three involved Pratt & Whitney engines. These incidents

prompted fresh scrutiny by US, Japanese and Dutch regulators that is still ongoing as of this writing.

The Cover-Up Exposed

"Everybody I talked to at Boeing," whistle-blower "Swampy" told *The New York Times*, "is embarrassed to work there most of the time." After a sigh, he added: "It's just, 'Let's go home.'"[12]

There was pressure on the factory floor that was creating a litany of other problems, for example, debris from construction on Boeing's Dreamliner planes at the Charleston, South Carolina factory. Swampy's job was to inspect airplanes to ensure nothing was left behind inside the aircraft. "So I was called out to an airplane to look at an issue," Swampy said. "And that's when we discovered all this debris, these 3-inch-long titanium slivers laying around. It's just debris everywhere." He discovers that these metal slivers are hanging over the wires that control the plane during his inspection "The risk here is that these metal slivers will migrate into power panels, any kind of power, or any kind of electronic equipment, and short it out and cause a fire. And if it's at 40,000 feet, that's a problem."

Swampy took photos and brought the issue to his manager. In response, "I was removed from it." The manager took him off that plane and gave it to someone else to inspect. Did that plane ever get cleaned? No. "It was delivered without being cleaned." And it was not just metal shavings. Multiple whistle-blowers talked about nuts, bolts, fasteners, rags, bubblewrap, trash, tools, chewing gum, and even a ladder: A ton of stuff was left in the bowels of these aircraft.

"There's a lot of pressure to meet schedule," Swampy said. Managers get judged by their superiors based on the number of jobs they complete on an hourly basis. "And it's held against them if they create defects. So, you know, there's an incentive not to report your defect that you created because it's gonna be held against you."

Boeing vehemently denied that they put speed above safety. And to be fair, no Dreamliner has ever crashed. But the question remains, Has the company put profits above safety? Has it put its customers, and ultimately all passengers in its aircraft, in harm's way?

Making the Complexity Visible

The Boeing tragedy we have outlined is an abridged version of the volumes of in-depth crash investigation paperwork that got produced.

When mega-projects go wrong, the underlying hidden structure of the failure can be dispersed and distributed across many files making the overall comprehension of project failure foggy and obscure.

As authors, we intend to help project practitioners and those interested in projects cut through the volume of complexity.

What if we could see the entire story unfolding on a single page? What if we could reduce volume into clarity and insight. Shifting from laundry lists of risks into focussed performance attention?

Dashboard

The harrowing story of the Boeing 737MAX and its life-and-death consequences, but particularly the psychology of coverups, gave us the title of the book: *Gorilla in the Cockpit*. All too often, the pilots in the cockpits of megaprojects do not have the right dashboard to steer the plane to its destination—and to tell you the truth, we have often felt like gorillas ourselves. Sure, the consequences are not always death and destruction as in the case of the Max 37 (although at times they are, as the cases in healthcare and life sciences below demonstrate). But when project pilots don't have their hands on the engine and instruments, the real-world consequences are always dire. The *Gorilla in the Cockpit* is a metaphor for what happens in large-scale projects. They go from A to B and get into trouble along the way. And they never quite make it to their destination.

But not all of them. To fight the coronavirus, China built a 1,000-bed hospital in 10 days. It looks like a miracle, but it's not mysterious. Again and again, whether in pandemics or in war, humans can bring urgency and commit themselves to breakthroughs. If you master the human element, you can go way beyond traditional project implementation and produce performance breakthroughs.

Why are so many projects going so wrong? What's missing in megaprojects? “Everyone assumes it’s the technical skills,” said Mark Utting, country manager of Turner & Townsend Switzerland, that has helped manage over 200 projects, many of them megaprojects, on every continent except Antarctica. “It’s not. Megaprojects have super capable people technically. What's missing is an appreciation of the softer skills you need to make a team function.”

Utting distinguishes between personality types that all have to collaborate on a megaproject, like it or not: “You have architects that are usually inventive, creative, inspirational types. You have contractors who just want to get stuff done, saying, ‘Don't bore me with details and art.’ You have technical engineers who tend to want to solve problems and are intensely detail-focused. And of course, you have the client who might be authoritarian, who has the power, who has the money.” The tension and friction are built right into the structure.

Luc Gerardin, an innovation and transformation consultant, has accompanied many megaprojects, including several in international shipping. “I worked on a project with Mersk through IBM,” Gerardin said. “We had to build consortiums of stakeholders who can also be competitors, frenemies. Each stakeholder has different clients; some are even clients of others. If they are not aligned, if they don’t check their mindsets, they fail.”

Project manager William Meyer agreed. “You have to do your homework. Who is the financier? Is it private or public, or mixed-form? In the UK, for example, it's mixed-form: private financing, but for the state. You have stakeholders, banks, customers, government, and consultants. For example, the banks can withhold payments if milestones are not met, or quality is not up to their expectations.”

Meyer learned this the hard way. He oversaw projects at ABB, Hitachi Zosen, Schindler, and other multinational capital development firms. “I saw everything from big to small, from sale to handover.” His experience taught him that megaprojects never happen in a vacuum; you always have to be aware of the contextual factors that can impact performance. “These are factors we have no influence over. We did a project in the UK, an incinerator. Just from the legal system, we had constraints: They have case law.”

The keyword in Meyer's statement is *contextual factors*. Why is it that so many project managers don't see these things? To get a good answer to that question, we have to delve into a micro-history of project management and look at several misconceptions that have plagued the field for far too long.

Open the Black Box and Avoid Billion-Dollar Disasters

"A rare look behind the scenes of megaprojects by two seasoned experts. If you want to understand what really goes on in big projects, why they fail so often and what it takes for them to succeed, this book is a must-read."
Bent Flyvbjerg, professor at Oxford and Copenhagen, principal author of *How Big Things Get Done* and *Megaprojects and Risk.*

"Gorilla in the Cockpit reveals why so many megaprojects exceed mega-budgets and don't live up to their mega-expectations."
Ron Kaufman, New York Times bestselling author of Uplifting Service

Learn how to:

- **Challenge** how you see and lead projects—and change programs in your organization.
- **Expose** the hidden patterns that destroy billions of shareholder value and taxpayer money.
- **Understand** what happens in the project Black Box and why this drives 65% failure rates.
- **Explode** the myth that major project failure is inevitable.
- **De-Risk** your project flight path and boost your project success rate

"Gorilla in the Cockpit provides a strong compass for leaders to focus their attention."
Ian Edwards, President and CEO at SNC-Lavalin

"Gorilla in the Cockpit is a smart investment."
Scott A. Snook, Professor, Harvard Business School

Vip Vyas is the originator of the Flight Path Model and an international expert with vast experience in transforming the performance of complex enterprises and megaprojects. He has been a regular contributor to INSEAD Knowledge and other top periodicals

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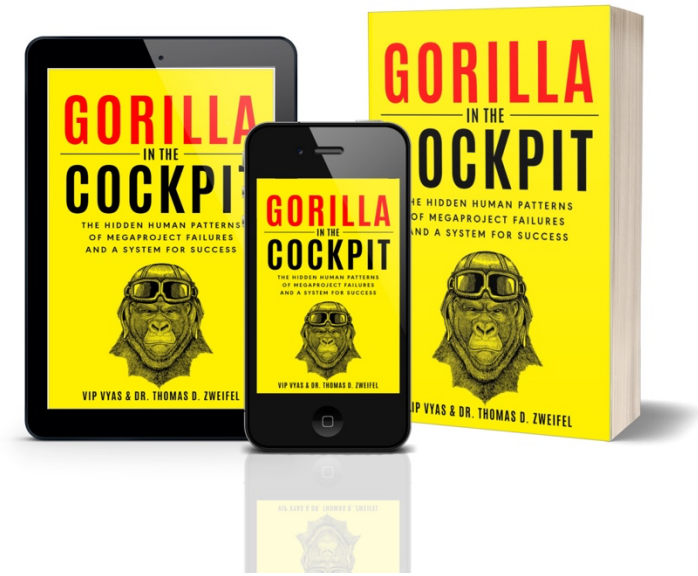

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