



NAC Executive Insights

A Failure of Logic

Key Points

- This Executive Insight provides for self-assessment by project and construction managers in how they assess problems and make decisions.
- Two dozen logical fallacies encountered in the management of large complex projects are described.
- A confidence test is offered for the reader's self-assessment.
- Project leadership is all too often overconfident considering project complexity and uncertainty of large complex projects.
- Project leadership is all about people, not process.
- Project management costs are non-linear and grow with scale and complexity.
- Large projects are complex, do not try to simplify and rush to judgment.

Introduction

This Executive Insight looks at the failure of logic, or maybe better said, logical fallacies, in the conception, management, and execution of many large complex projects. We must step back and ask ourselves whether the formalism of project management training and corporate management policies, processes, and procedures are keeping us from questioning whether they are pointing us in the right direction. Separately¹²³, I have written about my view that project management theory fails at scale. We will not repeat that challenge in this Executive Insight.

Project management logical fallacies may be considered to fall into the types listed below. Although far from comprehensive, the list is intended to cause some self-examination and work as a tool for those who oversee project and construction managers.

1. Overconfidence
2. Positivism
3. Just follow the proven process

¹ Prieto, R. (2020). A Deeper Look at the Physics of Large Complex Projects; A Neo-Classical Project Management Theory is Required; PM World Journal, Vol. IX, Issue VIII, August

² Prieto, R. (2015) Physics of Projects; PM World Journal, Vol. IV, Issue V – May 2015

³ Theory of Management of Large Complex Projects; Construction Management Association of America; ISBN 580-0-111776-07-9; October 2015;

https://www.researchgate.net/publication/299980338_Theory_of_Management_of_Large_Complex_Projects

4. It's all Joe's fault
5. Incomplete picture
6. Disagreeable, but maybe not wrong
7. Our understanding clouds risk assessment
8. People are fungible
9. False dichotomy
10. Credentialed delusion
11. Linear delusion
12. Anecdotal vs empirical
13. Biased sample
14. Sunk costs
15. Inconsistent credit and criticism
16. We've always done it this way
17. The client is always right
18. Diversion from criticism
19. Unwarranted compromise
20. Consequence avoidance
21. Ignorance is bliss
22. Show me the money
23. Zero covariant correlation
24. Texas sharpshooter

Overconfidence

As we discuss these various failings of logic, we will find an element of overconfidence or the creation of misguided overconfidence in many of them. To help set the stage, let's test your level of confidence with 10 quick questions. Write your answers down. At the end of this Executive Insight you can see how you did by reviewing the answers provided. If, like most people, you will pause and ask yourself how confident you really are. I suspect your view may be challenged after you review the answers provided.

It is not unusual to see project leadership have a level of confidence completely unwarranted given the levels of complexity and uncertainty large projects entail. If reality mapped our confidence, then two-thirds of large projects would not fail.

For each of the following 10 questions, pick a low and high value for the range in which the correct answer will be. Pick the range so you are 90 percent confident that the correct answer is inside the range. When you finish, look at the answers at the end of this Executive Insight.

1. The length of the Nile River in miles

Low _____ High _____

2. The year John Steinbeck won the Noble Prize for Literature

Low _____ High _____

3. The average gestation period in days of a female Asian elephant

Low _____ High _____

4. Level of the Dow Jones Industrial Average on July 1, 1985

Low _____ High _____

5. How old Martin Luther King was when he was assassinated

Low _____ High _____

6. Air distance between London and Tokyo, in miles

Low _____ High _____

7. Weight in tons of an empty Airbus A340-600

Low _____ High _____

8. The year Mozart was born

Low _____ High _____

9. The number of books in the Old Testament

Low _____ High _____

10. The surface area of the Mediterranean Sea in square miles

Low _____ High _____

Positivism

Positivism is closely related to overconfidence. As the saying goes, "If we believe we can make it so, then it will be so." This phrase is often applied as a motivational strategy when asking the project team to do what often is impossible. Sometimes the team will succeed, but a much better motivational strategy is to be truthful and transparent. This is even better when coupled with the third "T" – Trust.

One of the corollaries of positivism is that if we have doubts, then we will not accomplish the “hard,” never mind the impossible. Self-delusion often leads to missed opportunities and imprudent risk taking.

Just Follow the Proven Process

Notionally, following a proven process is a good piece of advice. In the world of large complex projects or for that matter in any endeavor replete with numerous individuals, however, proven processes often turn out to be much less proven than represented. Religiously following the Project Management Institute’s *Book of Knowledge* or even the Construction Industry Institute’s best practices will not guarantee success. In fact, what is proven is that large complex projects fail all too often despite following best practices. People are the wild cards.

Daily, weekly, and less frequent project review meetings often follow a proven script that either obscures the realities we need to face or worse, we see the Black Elephants⁴ but fail to act. The outcome is certain: we are trampled. Large complex projects are custom made endeavors. The best approaches are also likely to be made-to-order.

It’s All Joe’s Fault

Team dysfunction is never simply the fault of one individual. That is too easy a solution and one which freezes us in place, failing to get to the real issues. We quickly seek to isolate and “deal with” the problem, failing to recognize that people problems are seldom isolated in either cause or effect. Joe may have been the original cause or trigger for a team’s dysfunction, but others likely contributed to the dysfunction.

Team alignment, in all its dimensions, is essential for project success. Team alignment is not a one-and-done process, but rather one that takes continuous work and trusted communication.

Incomplete Project

We instinctively seek to simplify complexity. In and of itself that is not a bad trait. We often do so, however, in a way that leads us to rush to judgement or over-generalize how we perceive a situation. Complexity does not lend itself to over-generalization. Remember the risk that lies in “fat tails” and the effects of extrapolating artificial intelligence (AI) training data to regimes where their insights are no longer valid.

In large complex projects, project managers and project teams must ensure the facts that are the basis of their decisions are large enough and truly representative of the nature of the decision to be made. We also must acknowledge the views of those with different perspectives. More on this later.

Do not be hasty to over-generalize.

⁴ Executive Insight, Black Elephants

Disagreeable, But Maybe Not Wrong

The fancy name is the *argumentum ad hominem* fallacy⁵ or simply *ad hominem* (that is, an argument taken against a person and not the position they are taking). In teams with various levels of dysfunctionality or where leadership comes with a heavy dose of overconfidence, it is not uncommon to attack an individual who may be regarded as a naysayer or contrarian. Valid differing views, approaches, or solutions are dismissed out of hand simply because of who generated the idea.

One of the hallmarks of successful complex projects is their ability to draw the best from a diverse team and to bring the range of perspectives that complex situations demand.

Our Understanding Clouds Risk Assessment

Is it more likely that you will be attacked by a shark or hit by a part falling off an airplane?

Most people can visualize the risk of being attacked by a shark, but have greater difficulty envisioning being hit by a falling airplane part. Tversky referred to this as the Availability Heuristic⁶. When we have difficulty understanding the causes of a risk, we tend to underestimate its likelihood. These known unknowns do not receive the attention demanded.

People Are Fungible

“Lean and mean” may contribute to failure in complexity. Complexity demands an ability to act contingently. Despite our forecasts in work-hours and full-time equivalents (FTEs), people are not fungible (mutually interchangeable). They have different skills and perform differently in different situations and settings. The ability to undertake contingent execution demands that both capacities and capabilities that may be inconsistent with a lean and mean approach be present and may actually produce overall better outcomes.

False Dichotomy

In our quest to simplify the inevitable complexity large projects have, we frame decisions as a choice between two extremes. Life, and certainly complexity, is seldom so simple. Decisions under complexity are often nuanced with neither of the mutually exclusive choices being the best way forward.

⁵ Typically, this term refers to a rhetorical strategy where the speaker attacks the character, motive, or some other attribute of the person making an argument rather than attacking the substance of the argument itself. This avoids genuine debate by creating a diversion to some irrelevant but often highly charged issue.

⁶ Amos Tversky and Daniel Kahneman examined "heuristic and biases" used in judgment under uncertainty. Prior to that, the predominant view in the field of human judgment was that humans are rational actors. Kahneman and Tversky explained that judgment under uncertainty often relies on a limited number of simplifying heuristics rather than extensive algorithmic processing.

Credentialed Delusion

They are an expert. They have the right degree from the right school. They are senior and maybe even have a track record of performance—in another context. We view them as capable of doing any project we may ask them to undertake. But context matters. The best engineer-procure-construction management (EPCM) project managers in the power and process businesses struggled to make the shift to a lump sum, risk-shifted market condition. Less credentialed project managers more able to escape cognitive lock (and longing for the past) performed better, despite their relative lack of credentials.

Linear Delusion

A common project management delusion on large complex projects begins at the planning and estimating stage. We develop various aspects of our estimates and staffing plans by saying that another large project took X and this project is five times larger (a pertinent size measure or total budget) so the required resourcing will be 5X. Even worse, we believe that we will achieve economies of scale and estimate it to be 4.5X.

Reality is different. Project management costs are nonlinear. They in fact increase with scale and complexity. Project management costs also grow with the number of potential human-to-human interactions as well as with the unseen drivers of a myriad of issues and challenges hidden in complexity. It is more likely that the right estimate might be 6X, 7X, or even more.

Anecdotal vs Empirical

We base decisions on an anecdotal view of one or a few people, often based on one prior experience or example. We simplify the anecdote to support a position not looking for, or worse, ignoring, the empirical data and evidence. There is a rush to judgement that leads to avoiding data-based decision making.

Biased Sample

In seeking to build support for a decision, we actively solicit the views of others. Our polling process, however, is neither random nor scientific. We begin by soliciting the views of those whom we know will agree with the proposed decision, followed by other senior individuals. Often this is done in a meeting setting. Having established a preponderant view in support of our recommendation, we ask an open-ended question: “Does anyone disagree?” By that point the dynamics of the decision process have suppressed other views based on a bias in sampling. Often, others who may disagree are not even asked for their views with the decision presented as “I asked six people, including Joe, Mary, and Sue, and they all agree.”

Biased samples act to support a foregone decision, but not necessarily the best decision.

Sunk Costs

This might be better titled, “knowing when enough is enough.” Having invested ourselves and our treasure in a particular course of action only to discover the investment and efforts will provide no marginal return, we fail to let go.

Take for example a very large program. At the outset, a particular rail line was deemed to require a second parallel track. The double tracking was underway, performing well, and about 50 percent complete when market conditions and overall program configuration changed, eliminating the need for the second track. Spending the effort to complete the remaining 50 percent would result in a line that never would be used. Could you walk away from the 50 percent already spent?

In this particular instance, the answer was no. The line was completed, the project performance was great, and the line was never used.

Inconsistent Credit and Criticism

A common project management failure that goes to the heart of team dynamics is the inconsistent handling of credit and criticism. Achievement is often ascribed to a singular individual while failure is a result of the staff not performing well. Both assertions are misguided. While one person can undermine team performance, seldom is high performance due to any one individual.

Performance, more often than not, derives from the selection and support of team members. That is a key role of the project manager.

We’ve Always Done It This Way

It is highly unlikely that you “have always done it this way.” If the statement is true, however, were the contexts comparable and the results acceptable? The results of large complex project performance generally are far from stellar, yet a tendency is to employ the same thinking and processes we have on other underperforming projects of scale.

“We’ve always done it this way” often signals an unwillingness to change. Instead, consider new possibilities and approaches. Put in the hard work that dealing with complexity requires.

The Client Is Always Right

The client is *not* always right. That is a level of infallibility that I will reserve to a higher power. The client does get the final say (ethics and legality aside). Large complex project management demands that we provide counsel, not just servitude to our clients. We should be the execution experts. Allow the client to be an expert on their particular business, whatever it may be.

Diversion from Criticism

There have been a series of Executive Insights that have dealt with Black Swans⁷ and Black Elephants. Diversion from criticism might be appropriately named “Red Herring.” In order to avoid criticism or critique of ourselves or our plans and decisions, we construct something completely irrelevant to the core issue and use it as distraction to obfuscate or diminish the criticism at hand. For example, criticizing a particular person because they were late to a meeting does not diminish that person’s concerns on structural integrity during the construction process.

Unwarranted Compromise

This fallacy can be related to “false dichotomy” previously described. Strong positions at two extremes are addressed by selecting a middle ground. This presumes both were equally right and that the middle ground is better than either of the extremes. This presumes a convex behavior between the extremes, when reality might be concave. Now consider if one of the extremes were the right choice. Any compromise position is diminishment. Even worse is when neither of the extremes was right. What does compromise represent then?

Consequence Avoidance

Changing a course of action means accepting that an undesirable consequence exists and is likely. Not changing a course of action allows us to ignore the Black Elephant in the room. We may see it, but wishing it did not exist will not make it go away.

Ignorance Is Bliss

Being unable to prove that something is true does not make it false. Conversely, being unable to prove something is false does not make it true. We shift the burden of proof instead of seeking a deeper truth. The failure to prove an alternative point of view should not be used as a basis to support another one.

Show Me the Money

The more expensive the piece of equipment or consultant, the better it or they must be. This is a fallacy that drives many decisions, often subconsciously.

Zero Covariant Correlation

We see two things happening at the same time and assume they are driven by similar causes. This is another simplification of complexity. In reality, each is driven by a different causation factor. The Law of Truly Large Numbers⁸ may even allow us to see this common occurrence over a period of time. The

⁷ Executive Insights, Black Swans

⁸ Executive Insight, Laws of Improbability

reality may be that the causations are completely independent of each other or mathematically, they have a covariance of zero. Our assumed correlation can lead to a rush to judgement without sufficient examination.

Texas Sharpshooter

This particular fallacy gets its name from the Texas sharpshooter who fires his six gun at the barn wall and afterward paints the bull's eye. Large complex projects have terabytes of data. It is possible to cherry pick data to support a given position. In essence, doing so is a form of bias and becomes even more important when we are training AI algorithms.

Summary

This Executive Insight presents 24 common project management fallacies. Many more exist. Awareness of these fallacies is essential for both project and construction managers and importantly those responsible for overseeing their performance. Review of these individually as a value creation topic at the beginning of management meetings is a way to call attention to many of these value-subtracting behaviors.

At the outset of this Executive Insight you were asked to test your confidence. Answers to the opening confidence test⁹ are found in the footnote.

About the Author

Bob Prieto was elected to the National Academy of Construction in 2011. He is a senior executive who is effective in shaping and executing business strategy and a recognized leader within the infrastructure, engineering, and construction industries.

⁹ In the test you just completed, you selected a range where you were 90 percent confident that the correct answer would fall within the range you selected. Were you overconfident?

1. The length of the Nile River in miles - 4187
2. The year John Steinbeck won the Noble Prize for Literature - 1962
3. The average gestation period in days of a female Asian elephant - 645
4. Level of the Dow Jones Industrial Average on July 1, 1985 - 1337
5. How old Martin Luther King was when he was assassinated - 39
6. Air distance between London and Tokyo, in miles - 5943
7. Weight in tons of an empty Airbus A340-600 - 200
8. The year Mozart was born - 1756
9. The number of books in the Old Testament - 39
10. The surface area of the Mediterranean Sea in square miles - 970,000

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