

RISK MANAGEMENT

# First Principle Thinking

*Bringing Socrates back into  
the workplace*



In a world that has been on a multi decade trajectory of ever increasing globalisation and interconnectedness, society has become addicted to efficiency. Businesses have been centralising their processes, relying on their just in time supply chains and offshoring to shared service centers to cut costs.

Redundancy, often seen as the opposite of efficiency, is perceived as a dirty word and seen as an impediment to short term profits. However, recent history showed us how fragile the systems have become that we created in our craving for efficiency and short term thinking. Cutting intensive care beds in good times because “we don’t need them”, invisibly makes you fragile to a health crisis. Shutting down nuclear power plant because “we can currently meet power demand with cheap gas”, makes you fragile to a supply shock. While chasing efficiency might improve your P&L, you are adding hidden risk and fragility. Complex systems (like organisations) need redundancy to survive and absorb shocks, hence businesses should embrace and imbed redundancy to mitigate risk and increase performance in the long-run.

The following series of articles tries to provide a different perspective on risk management by using analogies from real life which help to understand the role and importance of enterprise risk management. Also, the idea will be presented of dealing with uncertainty and randomness, propose adjustments to well-known risk management frameworks, how understanding and applying incentives is key to effective risk management, and how to use first principles when solving complex problems.

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## Introduction



## At a Glance

- Why reasoning by analogy is not suited for complex problem solving.
- First Principles thinking reveals the underlying problem you actually want to solve.
- How to avoid unintended consequences when making impactful decisions.

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*“Feed a man a fish, feed him for a night. Teach a man to fish, feed him for a lifetime. Teach a man to reason from first principles, he can teach himself to fish. Then he can invent a better fishing rod and feed a billion people.”*

### First Principle Thinking – Bringing Socrates back into the workplace

The amount of variables and data points keeps increasing each day, hence solving problems effectively becomes a real challenge. We as humans slowly evolved to have fast and efficient problem solving skills to survive the African savanna, which implies that we are not built for dealing with all these fast changing variables and complexity.

In the workplace and a business environment in general, we tend to fall back on our primal efficient problem solving nature when faced with a problem. We inductively search for similar situations we have been in and how we solved those previously including all the biases and assumptions we internalised during our career. We adjust the previous solution to fit the current situation and proceed. This is reasoning by analogy and should be used solely when speed and efficiency is the main goal.

### Thinking in First Principles

When complex problems are to be solved and innovation or real change is the goal, using reasoning by analogy gives you sub-optimal solutions at best. Instead thinking in First Principles should be your framework of choice.

First principle thinking was initially defined by the Ancient Greek philosopher Aristotle. He described it as “the first basis from which a thing is known”. However, Socrates (the teacher of the teacher of Aristotle), actually laid the foundation for this way of thinking. Socrates kept asking why and never settled for an answer until all assumptions and biases were removed and a foundational truth was established.

Nowadays, First Principles Thinking is applied by engineers and successful Tech entrepreneurs like Elon Musk:

“Physics teaches you to reason from first principles rather than by analogy. So I said, okay, let’s look at the first principles. What is a rocket made of? Aerospace-grade aluminum alloys, plus some titanium, copper, and carbon fiber. Then I asked, what is the value of those materials on the commodity market? It turned out that the materials cost of a rocket was around two percent of the typical price. I think it’s important to reason from first principles rather than by analogy. The normal way we conduct our lives is we reason by analogy. [With analogy] we are doing this because it’s like something else that was done, or it is like what other people are doing. [With first principles] you boil things down to the most fundamental truths...and then reason up from there.”

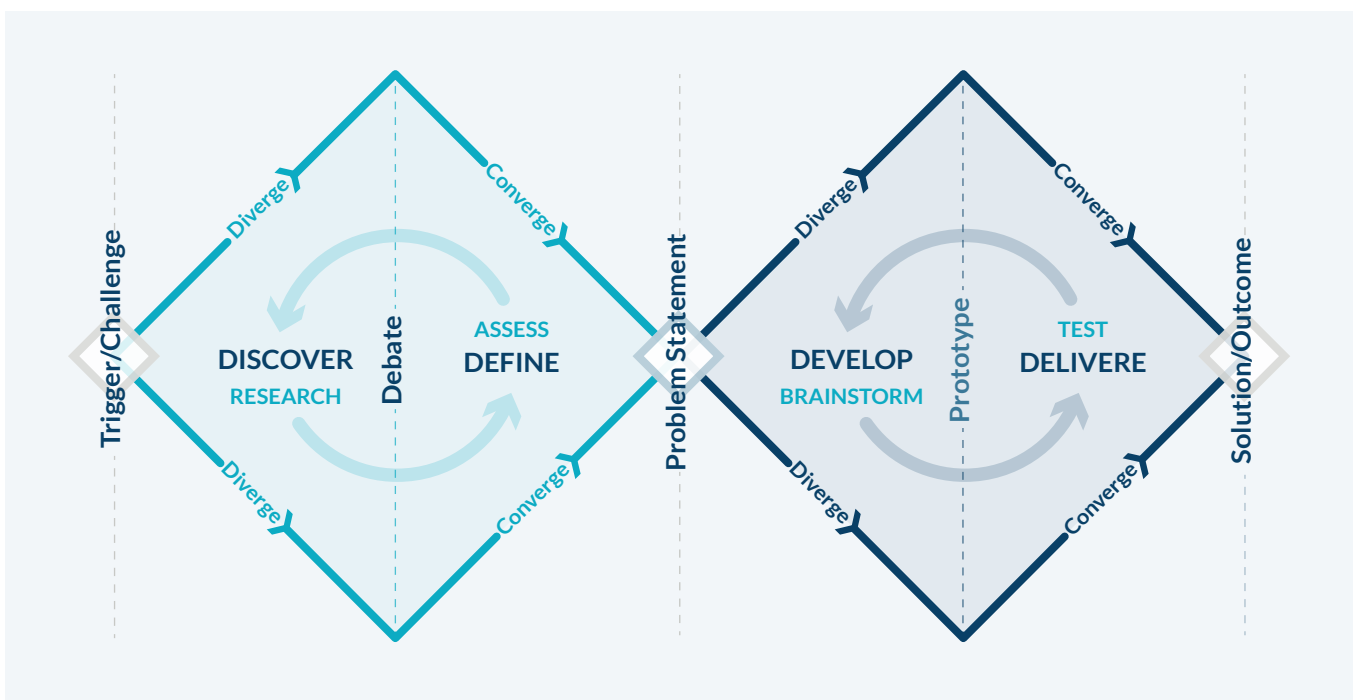
And that is how SpaceX was born. Musk did not accept generally accepted assumptions, instead applied First Principles thinking by removing all assumptions, built up from foundational truths and thereby revolutionised space travel.

## The Double Diamond

Luckily, you do not need to be an ancient philosopher or a billionaire engineer to practice First Principle thinking. A practical framework for applying First Principles, is the Double Diamond, created by the UK Design Council. It guides you through the steps of finding the right solution for the right problem.

When faced with a complex problem or situation to solve, you start in between the two diamonds. Instead of jumping to the solutions, you take a step back and invite Socrates to the discussion. You divergently research the problem environment by repeatedly asking why to remove assumptions and biases. Subsequently you convergently narrow in on the most important areas and re-define your initial problem. Only then you start brainstorming for all the potential solutions (divergently), and eventually prototype and prioritise and develop (convergently) the right solution.

- • • Double diamond model of design thinking (adapted from the UK Design Council)





You do not have to go through the entire *Double Diamond* for each complex problem, just being aware when faced with complexity and including the Socratic Questioning in your toolbox, allows you to challenge your assumptions, and gives you the nudge to think more creatively and innovate.

Tim Urban described the power of first principle thinking perfectly: *Feed a man a fish, feed him for a night. Teach a man to fish, feed him for a lifetime. Teach a man to reason from first principles, he can teach himself to fish. Then he can invent a better fishing rod and feed a billion people.*

First Principle thinking should be the standard framework used for problem solving that requires innovation and creativity. Way too often decision makers will argue being too busy to invest the time to apply first principles thinking, and missing the point of the asymmetric results it provides on the time invested. Instead, they tend to occupy themselves with generating sub-optimal solutions for superficial problems built on a wall of assumptions.

### Unintended Consequences

Besides the benefits of challenging your assumptions (*Causes*) through First Principle thinking, it is important to highlight the risk of Second- and subsequent order consequences (*Effects*). When you assume that A causes B, and then try to solve the problem (B) by redefining A, but neglect what this does to C & D, you are ignoring second and subsequent order effects.

Investing legend Ray Dalio said it well: *“First-order consequences often have opposite desirabilities from second-order consequences, resulting in big mistakes in decision*

*making. For example, the first-order consequences of exercise (pain and time spent) are commonly considered undesirable, while the second-order consequences (better health and more attractive appearance) are desirable. Similarly, food that tastes good is often bad for you and vice versa.”*

Once the number of variables and complexity increases, considering second and third order effects is essential for decision making to avoid unintended consequences that might cause harm in areas you did not expect or thought of.

Only considering superficial first order consequences is most frequently seen in politics. As an example, when politicians are faced with the problem of rocketing housing prices they typically assume a shortage in housing and real estate investors are the problem. Instead of battling the first principle issue of low interest rates in a debt laden society, they tend to implement policies for loosening loan requirements and providing tax incentives to home buyers, resulting in even higher housing price increases and more debt.

### First Order Thinking Gone Wrong

Organizations, especially complex multinationals, are constantly faced with making decisions and implementing policies to achieve a certain goal like cutting costs or changing company culture. Imagine the Management Team of a multinational, who are faced with the challenge of cutting IT development costs. A new policy is implemented stipulating that the development of any new application over 10K is subject to board approval. Great job, the development requests and costs decreased 95% in the year after!

A year later the MT is being informed that IT maintenance expense costs have quadrupled. How did that happen? With the policy of declining new projects and IT improvements, local management started building their own solutions to solve the same problems separately, instead of investing in company-wide solutions for the problems they all face which resulted in a multiplication of IT maintenance expenses.

In this case the management decision had a first order consequences of cutting IT development costs massively, but neglected the unintended second order

effect of increasing IT maintenance expenses, and the subsequent order effects of losing visibility, an increased IT landscape complexity and an increase of IT related risks.

Just as with incentive structures, impactful decisions push the organization in a certain direction. Considering 2nd and 3rd order effects when making decisions, might save you from disastrous unintended results.

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