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The Cognitive Foundations of Visionary Strategy

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Abstract. Some strategic decisions will long be remembered for being remarkably successful, providing dramatic benefits to customers, investors, or social welfare. The individuals who make these decisions are often called "visionary." But what enables some people to be visionary? Is it a gift or skill, and can it be learned? In this paper I identify three main cognitive processes that underlie the creation of visionary strategy: abstraction, idealism, and long paths of analytical reasoning. Using a combination of examples and cognitive science, I explain how they work individually and in combination, and how they may be cultivated.

Keywords: cognition • breakthrough innovation • creativity • idealism • abstraction • leadership

1. Introduction

In the history of strategy, some strategies—and strategists—stand out as remarkable. They made surprising turns that changed the path of an industry, enabled their organizations to achieve exceptional success, and became the examples others looked to for insight or inspiration. Iconic examples include Henry Ford's work developing mass production that made automobiles economical, Bill Gates's strategies that led to 30 years of dominance in personal computer operating systems, Steve Jobs's surprising moves into portable audio systems and smartphones that changed the way people expect to interact with their world, and Elon Musk's development of rockets that are not only reusable but also a fraction of the cost of rockets developed by space industry stalwarts.

Where do such great strategies come from? What enables some leaders to create visionary strategies, and is it a skill (or set of skills) that can be tapped by leaders generally? To address this, we must begin by defining what we mean by a great strategy. First, the notion of "great" implies that the strategy should be distinctive (i.e., significantly different from strategies that are considered typical or ordinary in a given market). Second, I will argue here from the assumption that when we refer to *great* strategies, we mean strategies that are great from both the customer and the firm perspectives. That is, a truly great strategy will be defined as one that yields exceptional benefits to customers while also creating a profitable and defensible position for the firm.

A strategy is defensible when competitors either cannot imitate it (because of, for example, barriers due to path dependency or complexity) or are unwilling to imitate it because their differential expectations of the value of the strategy make it appear unattractive or because the strategy imposes trade-offs they are unwilling to bear (Barney 1986, 1991; Dierickx and Cool 1989; Porter 1996). There is already considerable work on barriers to imitation that might give one firm a competitive advantage over others, rendering competitors unable to follow; I focus here on strategies competitors are *unwilling* to follow—i.e., the cognitive factors that give a manager very different expectations about the future compared with other managers or a different perspective on the trade-offs a strategy imposes. I argue here that three of the most valuable cognitive practices visionary leaders use when coming up with great strategies are *abstraction*, *idealism*, and *long paths of analytical reasoning*.

2. Abstraction

To construct a visionary strategy—one that creates a trajectory of superior performance well into the future—requires that the strategist have a big picture perspective of how value is created in the industry and how that will change over time. One of the most important processes in achieving such a big picture perspective is *abstraction*, or the ability to free oneself from the details of something to identify a reduced set of essential characteristics such as high-level dimensions or structural elements of a problem. The process of

abstraction involves the discovery of structure or regularity of pattern in artifacts or phenomena (Welling 2007). Psychologists tend to use the term abstraction in two different ways (Posner 1970). The first refers to the selection of particular aspects of an artifact or experience as more important than others. The second refers to the classification of a stimulus into a wider or more inclusive superordinate category. Both of these uses are part of the definition used here: great strategists use abstraction to identify the most important dimensions of a given technology or market, and they then seek the larger pattern of which those dimensions are a part. Once they can see this larger pattern, they can see how its implications for aspects of the technology or market that others might overlook. Furthermore, this abstract conceptualization of their market enables them to construct theories about cause-and-effect relationships in their market that are outside of their direct experience (Felin and Zenger 2009, Spelke et al. 1992).

In many industries, the production processes and the products or services they yield are complex. They often require the contribution of multiple specialists and have evolved toward increasing sophistication over time. There may be no single individual or firm who knows how to build the entire product or production system from the ground up. Even a product that appears relatively simple (house paint, for example) is now typically manufactured in sophisticated automated factories where pumps, agitators, and conveyor belts are used to precisely mix pigments, resins, and other additives to exact formulations. Many services have also undergone this process of complexification; an insurance firm, for example, requires combining expertise in actuarial science, investing, sales, administration, claims assessment, and more. As jobs have become increasingly specialized and sophisticated, individuals have increasingly precise knowledge about how one part of the system works but decreasing opportunity or reason to think about the big picture of their market.

Increasing specialization is one of the reasons that firms tend to become increasingly focused on incremental innovation over time, but there are other reasons as well. Firms are prone to following an innovation path in which they have had success in the past (Dosi 1982, Nelson and Winter 1982), leading to core rigidities that are reinforced by multiple processes within the firm (Leonard-Barton 1992). Employees may have been initially hired and rewarded on the basis of their expertise in a given dimension, and individuals with expertise in that dimension have a vested interest in ensuring that the dimension remains central to the organization. The structure, culture, and incentive system of the organization may all become designed in a way that prioritizes one (or a few) dimension(s) above all others (Kaplan and Henderson 2005). Unfortunately, this results in a cognitive bias that makes managers overlook (or misperceive) the utility payoff from investing in other dimensions.

Products and services, however, typically offer utility to customers in multiple dimensions, each of which may have different shaped utility curves (e.g., S-shaped or concave parabolic); i.e., the payoff of investing in a particular dimension increases or decreases above particular thresholds. Furthermore, the state of technology in an industry may be such that we have moved further up the utility curve for some dimensions than others. Knowing the shape of the utility curve for a particular dimension, and where we are on it, is crucial for identifying where the highest payoff investments might be made (Schilling 2017).

For example, the utility of a mattress might be influenced by its comfort, durability, cost, weight, and ease of delivery, among other things. In 1899, James Marshall believed there was much opportunity to improve the comfort of mattresses. He invented the individually wrapped coil springs that would enable mattresses to provide significantly better support for the contours of the user's body. The isolated coil design rapidly became the worldwide standard for mattress construction. Many subsequent innovations improved mattress comfort—different kinds of foam and padding for cushioning, different covers for improving texture and breathability, etc. The 1990s saw the introduction of memory foam into the mattress market, and a subsequent proliferation of foam or latex "toppers" for mattresses, but improvements in comfort had become negligible by the 2000s. Instead, innovations began to focus on things such as allergen proofing or incorporating electronics that permitted customization to different users. Then in 2013, Philip Krim decided that one of the dimensions of utility in which there was a major opportunity for improvement was the ease of purchase and delivery. He founded a company called Casper to produce and sell mattresses online, delivered in a box. Krim's assessment of the untapped opportunity in making mattresses easy to purchase must have been correct—Casper had sales of one million dollars in its first month.

The preceding highlights the value of using abstraction to make better judgments about where investments should be made: managers who routinely focus on the higher-level dimensions of their products or technologies will be better able to see the dynamics in their markets and their implications. Rather than being trapped by the distraction of the details of current products, they will have a better sense of where the market has been and where it is likely to head in the future, helping them to make better long-term bets.[1] An excellent example is provided by Steve Jobs's "bicycle for the mind" analogy:

> I remember reading an article when I was about twelve years old. I think it might have been *Scientific American* where they measured the efficiency of locomotion for all these species on planet earth. How many kilocalories did they expend to get from point A to point B? And the Condor came in at the top of the list, surpassed everything else. And humans came in about a third of the way down the list which was not such a great showing for the crown of creation. And—but somebody there had the imagination to test the efficiency of a human riding a bicycle. A human riding a bicycle blew away the Condor, all the way off the top of the list. And it made a really big impression on me that we humans are tool builders. And that we can fashion tools that amplify these inherent abilities that we have to spectacular magnitudes. And so for me, a computer has always been a bicycle of the mind. Something that takes us far beyond our inherent abilities. (Jobs 1995).

While other early computer companies were focused on computers as machines for enhancing business productivity, Jobs viewed the computer in a way that was simultaneously simpler and grander: it was a tool that would help a human brain work far beyond its inherent abilities. That meant it had to be for everyone, and it had to be intuitive to use. Abstraction enabled him to see dimensions such as ease of use, aesthetic beauty, and reliability as extremely important—much more important, for example, than having extra ports.

When Jobs announced in January of 2007 that Apple would make a smartphone, it was a stunning decision. The mobile handset industry was brutally competitive—although sales of handsets were growing rapidly, the market was also extremely consolidated (Nokia, Motorola, and Samsung collectively controlled about 70% of the market), and extreme competition on both price and innovation was the norm. Furthermore, a large share of mobile phones were sold to a few giant phone service carriers such as AT&T, Verizon, or Sprint, who wielded considerable power to negotiate deep discounts. It was almost impossible for smaller companies to compete, and even industry giants struggled. Ericsson, once a leading handset maker, gave up the battle in October 2001 and exited the handset business. Palm, considered to be the first successful personal digital assistant, and its offspring Handspring both evaporated by 2006. Why would Apple want to enter such a competitive, consolidated industry that appeared so unrelated to its core area of expertise? Ed Colligan, the former CEO of Palm, remarked that it had taken them a few years of struggle to figure out how to make a decent phone, and "PC guys are not going to just figure this out. They're not going to just walk in" (Ritchie 2017, quoted in). Colligan turned out to be wrong.

When Apple launched the iPhone in June of 2007, the reason for the move became suddenly clear. Not only was the iPhone beautiful, with the clean, smooth lines that Apple had come to be known for, but it had a remarkable range of functionality, accessed through an exquisitely intuitive interface. In many ways, the iPhone interface emulated the advantages that had originally been introduced in the Mac computer. That interface instantly changed the market's expectations about how things should work. Furthermore, there were dozens of applications that became indispensable to people's lives, and just as with the Mac, the quality of the applications was very carefully controlled so that the user experience would always be seamless. Ryan Block, writing for *Engadget* at the time, stated, "To date no one's made a phone that does so much with so little.... It's totally clear that with the iPhone, Apple raised the bar not only for the cellphone, but for portable media players and multifunction convergence devices in general" (Ritchie 2017). The iPhone was, in essence, an evolutionary form of the Macintosh computer—a beautiful new species of the Mac that users would carry all day long and that would enhance myriad aspects of their lives. It was a bicycle for the mind people would carry with them all day long. It was so in line with Steve Jobs's vision that when we look back now it seems an inevitable move, though it certainly was not obvious to most people in 2006. Jobs was gifted at abstraction; his intense study of Eastern philosophy had conditioned him to look for the deeper symbolic meaning of things.

Howard Schultz's creation of Starbucks coffeehouse chain also illustrates the power of abstraction. In 1983, Schultz was the marketing manager at a whole-bean coffee store in Seattle called Starbucks. On a buying trip to Milan he was suddenly inspired by the integral role that coffee played in the culture of Italy. Italians start their day at an espresso bar and return with their friends later—it is "the third place," a social gathering place that complements work and home. Schultz believed that Americans could be induced to embrace cafes as a third place also. Starbucks' owners were not enthusiastic about the idea and said that they did not want to be in the restaurant business. There were many reasons to think the concept would not work in the United States. Notably, in 1983, Americans were primarily drinking a commodity-like coffee composed of Arabica beans mixed with less expensive Robusta filler beans—few had an appreciation for specialty varietals of Arabica beans. Furthermore, there were already espresso houses in most cities, but they attracted a small, niche market segment. Undaunted, Schultz wrote a business plan, videotaped dozens of Italian coffee bars, and began to look for investors. He was convinced that it did not really matter that Americans were not coffee connoisseurs; his plan was not simply about serving better coffee, nor was it about more sophisticated coffee beverages such as espresso and lattes. It was about the third place: the seductive

atmosphere of the sleek yet comfortable stores would draw customers in, and Americans might just become coffee enthusiasts as a result. As Schultz noted, "We're not just selling a cup of coffee, we are providing an experience" (Yang and Siler 1991).

Schultz opened his first coffee bar, Il Giornale, in Seattle in April 1986, and it was an immediate success. After opening a second store in Seattle and a third in Vancouver, the owners of Starbucks agreed to sell to Schultz for $4 million, and the coffee bars took on the name of Starbucks. Soon Starbucks was the undisputed world leader in specialty coffee retail, and by 2016, it had earned over $20 billion in annual revenues and had more than 24,000 Starbucks-branded cafés in 60 countries.

Abstracting away from the details of a situation to its more fundamental structural elements also facilitates an individual's ability to solve a problem through analogical transfer (Gick and Holyoak 1983, King et al. 2017, Schilling 2005). In analogical transfer, an individual utilizes the structural similarity between an unsolved problem and a problem that has been solved, and applies the logic of the solved problem to yield a solution to the unsolved problem. The creation of JustPark, ParkLet, and SpotPog provides an illustrative example. In many cities public parking is in short supply, and individuals waste a significant amount of time driving around their destinations looking for parking. At the same time, property owners often have more parking than they need on any given day. If the excess parking were always available, the owner could lease it; when space is only sporadically available, it is more challenging to make use of it in an efficient way. However, a similar problem in lodging had already been ingeniously solved: in 2004, Casey Fenton, founder of CouchSurfing, developed a web platform that connected travelers who were looking for more interesting or affordable lodging with people who had rooms they were willing to rent. Airbnb, founded in 2008, subsequently become better at monetizing the peer-to-peer lodging business model. Borrowing the logic from the peer-to-peer lodging model developed by CouchSurfing and Airbnb, companies such as JustPark, ParkLet, and SpotPog created platforms for people to rent their extra parking spaces to those who need them. At a higher level of abstraction, both markets were solving the exact same problem: connecting individuals who sporadically have an excess of a resource with those who sporadically have need of that resource.

3. Idealism

A second and related key process evident in many great strategies is *idealism*, or the pursuit of some form of perfection or archetype that is unconstrained by what others deem practical. An idealist prioritizes ideals and values over the current reality. They focus on the world as they believe it *should be* rather than how it actually is. Importantly, idealism can also give rise to lofty superordinate goals that both motivate the individual and provide long-term focus.

Although there are many books and articles on idealism as a philosophical concept, there has been remarkably little research on the role that idealism plays in motivation or strategy. An exception is work by Reiss (2004), who developed a multifaceted theory of intrinsic motivation by conducting one of the first large-scale, cross-cultural empirical studies of human motivation. Reiss identified 16 basic psychological needs that are deeply rooted in human nature, and one is idealism, which he defines as the need for social justice and the desire to help others or improve society. According to Reiss, individuals are motivated to seek a "set point" in the individual motives—i.e., most people seek a moderate degree of status, a moderate degree of social contact, a moderate degree of idealism, etc. Individuals vary in their set points; some motives will be much more important to some individuals than others. Someone with a particularly high set point for idealism will pursue idealistic goals with greater frequency or intensity than someone with a lower set point. They are likely to expend considerable energy responding to this motive, occupying energy and time to such a level that it causes them to disregard motives that other people find more important, such as the desire to interact with one's family or the desire for tranquility or leisure. Idealism can lead a manager to pursue a lofty superordinate goal that helps her prioritize her efforts. The goal may be more important to her than any personal benefit, explaining why individuals willingly sacrifice money, time, or comfort in their pursuit (Schilling 2018).

Elon Musk's seemingly disparate ventures, for example, are all organized around his higher-order goals of addressing the problem of Earth's finite resources and making humans an interplanetary species. As he noted in an interview in 2007, "When I was in college and thought about what are the things that would most affect humanity, the three areas seemed to me to be the internet, transitioning to a sustainable energy economy, and space exploration. So after doing a few internet companies I basically turned to the other two elements, and decided to focus on the space exploration problem personally and fund some other folks to help solve the sustainable energy problem with Tesla and Solar City" (Chafkin 2007).

Musk had been very disturbed to discover that NASA had no intentions of going to Mars, and he began to ponder what it would take. The major problem was not technological feasibility, he concluded, but expense. Rockets could get into orbit, but they were expensive and not reusable. He compared this to throwing away a Boeing 747 after every flight across

the Atlantic; it made space travel terribly impractical. He began to study rocket science texts such as *Rocket Propulsion Elements*, *Fundamentals of Astrodynamics*, and *Aerothermodynamics of Gas Turbine and Rocket Propulsion*. In 2002 he traveled to Russia to see if he could obtain an affordable rocket for his plans, but the Russians sent him away, telling him his plan was impossible. Undeterred, he came up with his own preliminary design for an affordable rocket (Vance 2015). Investing $100 million of his own funds, he founded Space Exploration Technologies Corp. or SpaceX, and began developing a method that would streamline the production of reusable rockets. If NASA was not going to bring humanity to Mars, Musk would do it himself.

Musk continued to pour money into the company despite several spectacular rocket failures. He pursued the venture relentlessly, even when he was on the verge of bankruptcy and close to a nervous collapse. He also refused to take SpaceX public, despite the a massive amount of wealth it would restore to him personally, because the board of directors of a publicly held firm would undoubtedly force him to make changes that would lessen the company's chances of reaching Mars. As he wrote in a letter to his SpaceX employees, "Creating the technology needed to establish life on Mars is and always has been the fundamental goal of SpaceX. If being a public company diminishes that likelihood, then we should not do so until Mars is secure" (Vance 2015, p. 377). He also noted, "For me it was never about money, but solving problems for the future of humanity" (Hoffman 2012).

Idealism plays an important catalyzing role in the creation of great strategies because it induces the strategist to challenge the assumptions that have constrained existing solutions and to seek instead a radically better solution. Whereas most managers are seduced by the efficiency of local search that leads to incremental solutions based on the firm's existing products and capabilities, idealism induces the manager to seek something bolder and to prioritize achieving the ideal over safer, more efficient searches. Idealism is a powerful intrinsic motivator that can foster relentless pursuit of a solution, even in the face of severe obstacles. Furthermore, because the individual perceives the ideal to be intrinsically important and honorable, it helps to make them more resilient to criticism.

Idealism by itself does not predict great strategies. Idealism is probably more likely to yield spectacular failures than great successes. However, most spectacular successes evince idealism. It provokes the individual to seek a more extreme position on a dimension than others seek, and thus it is a source of the requisite variety that is necessary for breakthrough innovation. It can mean the difference between a "good" strategy and a "great" one.

4. Long Paths of Analytical Reasoning

Providing exceptional benefits may seem like a great strategy from the customer's perspective, but it will not seem like a great strategy from the producer's perspective if the strategy can be readily imitated by others. A key process used by managers who craft great defensible strategies is following a *long path of analytical reasoning*. James Marshall knew his individually wrapped mattress coils provided an exceptional benefit to users. However, he also knew that others would attempt to produce the isolated coil design. He thus patented them in the United States, Canada, and the United Kingdom. Thinking still further out, he knew that his company alone would not be able to meet the demand for mattresses based on his coil design, which would create strong incentives for other companies to come up with alternative designs that did not violate his patent rights. To preempt competitors from devising alternatives, he licensed his design to other mattress manufacturers. Casper's strategy is not so defensible; there are now dozens of companies who sell mattresses in a box, including some through well-known retailers such as Macy's and by well-known mattress brands such as Sealy. The unique benefits provided by Casper arose from an ordering system and logistics, but Casper did not have a defensible advantage in ordering and logistics—other companies could access comparable capabilities from third-party providers such as UPS and Amazon. Casper has established a brand image for high quality, which is extremely important in selling a good online that typically requires trial. However, it will be a challenge to defend the business on brand alone as other well-known brands replicate its model.

The sequence of moves Bill Gates undertook in his dealings with IBM is indicative of a man with exceptional skill in using long paths of analytical reasoning. In 1980, with businesses rapidly buying Apple computers to do basic accounting or word processing, IBM was in a hurry to bring a personal computer of its own to market. IBM's managers did not believe they had time to develop their own microprocessor and operating system, so they based their personal computer on Intel microprocessors and planned to use Gary Kildall's CP/M operating system, the dominant operating system for the many software developers creating applications for Intel's microprocessor at the time. Kildall hesitated in signing with IBM, however, so IBM asked Bill Gates (who was already supplying other software for the system) if he could provide an operating system as well. Although Gates did not have an operating system at that time, he replied that he could supply one. Gates bought a clone of CP/M from Seattle Computer Products called QDOS, modified it for IBM's machines, and named it Microsoft DOS. With DOS bundled on every IBM PC (which sold more than 250,000 units the

first year), the product gained an immediate and large installed base. Moreover, the companies that emerged to fulfill the unmet demand for IBM PCs with clones also adopted Microsoft DOS to ensure that their products were IBM PC–compatible. Because it replicated CP/M, Microsoft DOS was compatible with the range of software that had been developed for the CP/M operating system. Furthermore, after it was bundled with the IBM PC, more software was developed for the operating system, creating an even wider availability of complementary goods. Microsoft DOS was soon entrenched as the industry standard, and Microsoft was the world's fastest-growing software company. As B. J. Whalen, Microsoft product manager, described, "We were able to get the technology out into the market early to develop a standard. We were effective in soliciting software vendors to write to that platform to solidify the standard. . . . Once you get it going, it's a snowball effect. The more applications you have available for a platform, the more people will want to use that platform. And of course, the more people that want to use that platform, the more software vendors will want to write to that platform" (Whalen 1996).

These moves evoke a sophisticated understanding of network externalities, long before network externalities had become a topic of management research. Gates would later wield his understanding of network externalities to edge Netscape Navigator (the dominant web browser in 1995) out of the market and to parlay Microsoft's dominance in operating systems into dominance in several other office productivity software applications (MS Word, MS Excel, MS Powerpoint, etc.).

By following the sequence of causal logic out further than competitors, managers can proactively identify potential competitor moves and identify ways to preempt them. For example, Uber undoubtedly anticipated that it would be challenged by competitors, but it probably assumed that network externalities would serve as a powerful defense: a service with more cars in an area has a big advantage in customer wait times, and a service with more customers in an area is far more attractive to drivers. At first glance, this should have yielded a strong first-mover advantage. A key part of the lock-in that can arise in a market with network externalities, however, is barriers such as incompatibilities and switching costs that induce customers and complementary goods providers to choose one technology and stick with it (Schilling 1998, 2002). What Uber did not anticipate is that drivers would sign up with multiple services—there were no problems of incompatibility or switching costs. When drivers drive for multiple services, they can accept passengers from services that offer a higher commission but then fill the rest of their shift with Uber rides to ensure they are not driving idly. Furthermore, customers face low switching costs as well—they can search for a destination using a map application and readily compare wait times and fares from multiple driving services. Had Uber anticipated this, it might have required that drivers sign exclusivity agreements and created loyalty incentives for both drivers and customers.

5. Cultivating the Capability to Be Visionary

For some managers, abstraction, idealism, and the use of long paths of analytical reasoning comes naturally. For others, the capacity and propensity to use these cognitive processes is not innate but may be cultivated. Abstraction, for example, is a skill that can be trained and practiced. Tracing a technology's path from its most primitive state through the current time, for example, can help managers see the larger patterns in its evolution (Schilling 2017). This technique takes advantage of the fact that temporal distance between an individual and a phenomena tends to induce the individual to use a simpler, higher-level construal of the phenomena (Liberman et al. 2002, Wiesenfeld et al. 2017). Using representational forms such as graphical pictures or formulas to represent a technology or its market can also help managers to identify its dimensions or structural elements. The key is to find a way to strip away details—to seek a simpler, more universal form of the problem.

Notably, this need for a simpler perspective may be one of the reasons that outsiders to a field are often those that introduce radically new innovations. Outsiders may be less familiar with (or wed to) the details or assumptions that trap industry veterans. By attempting to make sense of a situation in absence of specialized expertise, they may naturally resort to a simpler schematic of the problem or may intuitively map the problem to their own expertise, creating a problem analog. For example, Gavriel Iddan, a guided missile designer for the Israeli military, invented a revolutionary way to allow doctors to see inside a patient's gastrointestinal system. The traditional method for obtaining images inside the gut is a camera on the end of a long flexible rod called an "endoscope." This method, however, is uncomfortable and cannot reach large portions of the small intestine. Most gastroenterologists have invested in significant training to use endoscopic tools, and many have also purchased endoscopic equipment for their clinics. Not surprisingly, then, most innovation in this domain has focused on incremental improvements in the rod, cameras, and imaging software. Iddan, however, approached the problem of viewing the inside of the gut like a guided missile designer, not a gastroenterologist. He did not have the same assumptions about the need to control the camera with a rod nor to transmit images with

wires. Instead, he invented a capsule (called the PillCam) with a power source, a light source, and two tiny cameras that the patient can swallow. The camera pill then broadcasts images to a video pack worn by the patient. The PillCam has proven to be safer and less expensive than traditional endoscopy (the PillCam costs less than $500), and it is dramatically more comfortable. The PillCam is now sold in over 60 countries, and several companies now offer competing products. The camera pill is a remarkable solution to a difficult problem, and it is easy to see why it came from an outsider with familiarity in how to utilize cameras in unusual ways, instead of someone with specialized endoscope experience.

Idealism is not so much a skill as a belief system, or a way of perceiving the world. Like many belief systems, it can be nurtured, but it must be done so with care. Idealism can be costly—it can make an individual so focused on a particular goal that he or she loses perspective and ends up neglecting other important areas of concern (Schilling 2018). The story of Nikola Tesla provides a great example. Tesla was an extreme idealist and became fixated on two very lofty goals: (1) to discover a means for creating free energy that would eliminate the need for all physical labor so that humans could spend more time in creative endeavors and (2) to create a global wireless communication system that would obviate war by enabling nations to work out their differences in less destructive ways. Tesla's projects, however, required significant funding. Had Tesla been more strategic in the development of his innovations, bringing his more readily commercializable inventions such as his numerous lighting systems or remote control applications to market, revenue from these products might have helped fund his grander long-term ambitions, but details such as finance were distractions with which Tesla could not be bothered. For example, in 1901, J. P. Morgan agreed to give Tesla 150,000 dollars to build a 90-foot-high tower to transmit communications across the Atlantic, and Morgan also purchased a significant share in Tesla's lighting patents. Morgan wanted the tower to be able to report yacht races, signal incoming steamers, and send Morse code messages to England, but he also saw the more immediate commercial potential of the lighting technology. To achieve Tesla's true ambition—global wireless communication and international peace—however, required a much larger tower than the one required to fulfill the Morgan deal. Without consulting Morgan, Tesla abandoned the plan for the modest-sized transmitter and began designing a 600-foot skyscraper that would wirelessly transmit communications and energy around the world. The tower Tesla envisioned would cost $450,000—many times the investment to which Morgan had agreed. When Tesla ran out of money and went to Morgan to request more funds, the outraged Morgan threw him out of his office. Tesla never raised enough money to complete the tower, and despite the fact that he had invested hundreds of thousand dollars into the project, it was torn down for scrap by a landlord to whom Tesla owed $19,000 (Siefer 1998).

The use of long paths of analytical reasoning is in part determined by a person's working memory and executive control. Working memory and executive control are what keeps information temporarily available for immediate access and use; they include functions that control what information is attended to, how it is manipulated, and how it is acted upon. For example, working memory is what enables an individual to retain partial results of an arithmetic problem while solving it (Groome and Eysenck 2016). It is limited in capacity, and the number of "chunks" of information a person can hold in his or her working memory depends on both the person and the nature of the chunks. Individuals with exceptional working memory and executive control can hold many things in their mind simultaneously and maneuver them with great facileness; this enables them to rapidly explore many possible associations, and it may enable them to quickly move much further down a chain of associations than others would typically consider (Benedek and Neubauer 2013, Martindale 1999, Schilling 2018).

Individuals can have innate advantages in their working memory and executive control that make long paths of analytical reasoning natural for them. Both Elon Musk and Nikola Tesla have been noted, for example, for having photographic memories and for being able to do calculus in their heads (Schilling 2018, Siefer 1998, Vance 2015). However, it is also possible to learn to use long paths of analytical reasoning even in absence of such intellectual gifts. For example, an individual (or group) can write down possible paths of consequences from a given decision, making a point to consider multiple likely paths and several steps down each.[2] There is no guarantee the individual (or group) will correctly identify all possible consequences or their probabilities, but using the process is still likely to yield significantly more sophisticated decisions, and thus defensible strategies, than not using it.

Of the cognitive processes described here, abstraction and long paths of analytical reasoning are the two that are most likely to yield benefits even in isolation: having a better big-picture perspective of the dynamics in a market should help a decision maker to better prioritize investments, and using long-paths of analytical reasoning should enable a decision maker to better take potential consequences, such as competitor responses, into account. Idealism alone may not improve decision making; the benefits of taking bigger leaps depend on having a good picture of the landscape upon which one is leaping.

It should be clear, however, that abstraction, idealism, and long paths of analytical reasoning are even more powerful in combination. When an individual uses both abstraction and idealism, for example, he or she will have both a better perspective of how to prioritize dimensions of a problem or market and the motivation to move further down those dimensions than others would. If that individual also uses long paths of analytical reasoning, then he or she will have considered more potential consequences of that move and integrated those consequences into his or her choices. The combination of abstraction, idealism, and long paths of analytical reasoning thus encourages bigger and smarter bets.

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Endnotes

[1] Notably, while construal-level theory posits that temporal distance facilitates higher-level construal (i.e., abstraction) (Liberman et al. 2002), I am positing here that the reverse is also true: abstraction facilitates the ability to temporally distance oneself from a phenomenon.

[2] This is, in essence, the basis of extensive form games with incomplete information in game theory.

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