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# Three Games of Strategic Thinking

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**W**hich of the following three games of chance would you prefer to play? In the first, you have the opportunity to make 40 blind draws from an urn containing 75 red balls and 25 black balls. You have to pay US\$400 (\$10 per draw) up front to play; you earn \$20 for each red ball you draw but nothing for black.

The second game also offers you the chance to win \$20 on each blind draw from an urn with red and black balls. In this case, the mix of red and black is unknown: It could range from 100 red and no black to 100 black and no red. But you pay only \$5 per draw and you can bet on either color with each draw. You can

stop anytime you want or draw up to 50 times.

In the third game, you pay only \$1 per blind draw from the urn and there are no limits on how many times you can play. This urn may contain red balls and black balls, but it might also contain yellow pyramids, diamond rings, dollar bills, or used bubble gum — in short, just about anything. In this game there is no bet and no cash payoff. You simply get to keep what you draw.

Each of these games matches a different strategy paradigm reflecting a different mind-set. All three paradigms draw upon a rich base of mathematical probability theory and extensive research into business strategy. And each has proven useful for different companies at different times. The first captures a model

we call Planning and Positioning, in which managers make bets about the future based on information that provides insight into the degree of uncertainty faced. The second model, Organizational Learning, sets up managers to dynamically respond to unfolding events when the degree of uncertainty cannot be predicted. Both of those models assume that strategic decisions should simply respond to external events. The third model, Constructive Transformation, is different because decisions are not just responses to the environment (which is random) or efforts to predict it, but instead focus on leveraging the player's resources and events to shape the environment.

So, which game would you like to play? Your preference probably reflects a combination of your risk-taking profile and your business training. More importantly, which urn sounds more like your business environment? The sense of familiarity you felt for each game likely indicates the maturity of your industry — or at least your company's role within that industry.

The first game (and its urn with relatively predictable contents) represents an expectation that many managers are trained to have, at least at the beginning of their careers, about the way decisions are made. But it doesn't quite fit the way business works anymore. The second game (with a predictable process but unpredictable results) represents the way that many managers make decisions today, especially in mature companies with developed product lines. The third game (with a chaotic business environment and a high level of strategic intent) represents the style of decision making best suited to entrepreneurial managers. When you understand your predis-

position to the different decision-making games and then skillfully match the appropriate paradigm to your circumstances, you can improve your odds of success in an uncertain world.

### Planning and Positioning

To appreciate the roots of these three strategy paradigms, it is instructive to look more closely at probability theory and its history. Mathematicians and philosophers have been offering up urn experiments since the time of the ancient Greeks. (Why else would we be drawing from urns?) But the first written description of an urn model did not appear until the early 18th century, when mathematician Jacob Bernoulli published a text articulating the emerging science of probability

about Michael Porter's famous "Five Forces" model of business strategy and receive training in the quantitative methods of decision analysis and discounted cash flows. In short, they learn how to play the first urn game: Understand the industry context, measure the uncertainty, and pick markets with the structural characteristics likely to yield a positive return on the investment.

A prototypical example of a company under this model was the International Telephone and Telegraph Corporation (ITT) under the leadership of the hard-charging Harold Geneen from 1960 to 1977. Geneen transformed the midsized maker of telephony equipment and services with sales of \$760 million into a global conglomerate with \$17 billion in sales, operating in dozens

nal and reliable reality.'... Once 'true facts' were uncovered, management decisions became easy."

If your formal business education occurred in the 1980s or earlier, this may be the only strategy model you have explored. But if you've been in business in the decades since, the other two paradigms will undoubtedly resonate with your own experience more closely, even if you did not receive formal training in them.

### Organizational Learning

University of Chicago economics professor Frank Knight challenged the logic of classic urn problems in 1921. Knight pointed out that the notion of *risk* as addressed by the science of probability and statistics was "radically distinct" from the idea of true *uncertainty*. Knight used the term *risk* to describe a situation in which the underlying probability is known, as in the first urn above. Traditional statistical tools offer useful insight into the range of possible outcomes from repeating an event — such as drawing a single ball — given a known distribution. However, what has become known as Knightian uncertainty in academia captures the risk of an uncertain distribution, as in the second urn option.

Building upon Knight's insight, and drawing upon his own doctoral dissertation in economics at Harvard, Daniel Ellsberg popularized the notion of ambiguity avoidance in the early 1960s. (Ellsberg, a Rand Corporation consultant to the Department of Defense, may be best known outside academic circles as the vocal critic of the Vietnam War who leaked the Pentagon Papers to the *New York Times* in 1971.) Ellsberg identified a paradox in human behavior in a series of urn experi-

## MBA's receive training in decision analysis; in short, they learn how to play the first urn game.

and statistics. Bernoulli's tools provided the capstone to the scientific revolution by allowing explicit hypothesis testing to discern the truth in the face of uncertainty. Rigorous quantification in the scientific revolution in turn laid the foundation for the methods of the Industrial Revolution. In 1900, the Tuck School of Business offered the first graduate degree in commerce, forerunner to the MBA, first offered by Harvard's graduate school of business administration in 1908. Today more than 100,000 MBAs, known for their analytic training, graduate each year from more than 1,000 institutions in the U.S. alone.

All of those graduates learn

of countries. Unconstrained by a core mission, Geneen gobbled up more than 350 companies in industries that included auto parts, cosmetics, hotels, insurance, and semiconductors. Trained as an accountant, Geneen famously traveled the world with multiple briefcases stuffed with financial reports, meeting with his business unit managers. He gave them wide leeway in making strategic decisions, but held them to tightly controlled financial measures. According to Bruce Wasserstein's profile of Geneen in *Big Deal: The Battle for Control of America's Leading Corporations* (Warner Books, 1998), "In Geneen's mind, facts were incontrovertible, an expression of 'fi-

ments. He offered up the option of betting on an urn with a known 50/50 mix of red and black balls versus one with an unknown mix. Most people are indifferent about choosing between red and black in either case. But if asked whether they would rather bet on red from the known mix or on red from the unknown mix (or on black from the known versus the unknown), the majority chose to bet on the second urn — implying a belief that the mix in the second urn was not 50/50. Ellsberg found that when given more complicated choices, people behave in ways inconsistent with this belief. Based on his analysis of this behavior, he postulated that most people make choices that appear logically inconsistent because they prefer to avoid ambiguity — a finding known as the Ellsberg Paradox.

Such challenges to the supposedly rational behavior defined by probability theory contributed to the new field of behavioral economics. Observations of real decision making allowed an integration of psychology and economics that

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yielded new predictive insights, as well as a Nobel Prize for Daniel Kahneman for the work he did with Amos Tversky in the 1970s.

As is often the case, thinking in the more pragmatic field of business strategy drew inspiration from the hard sciences. By the mid-1980s, scholars had begun to articulate a

to Amory Houghton's investment in a small glass company in the town of Corning in upstate New York in 1851. The Houghton family, which continued to play an active role in managing the company into this millennium, held a near-religious belief in research and development. From the beginning, the company

## Corning's technological capabilities have responded to a world of Knightian uncertainty.

strategy paradigm involving organizational learning that parallels the second urn. In a business world full of Knightian uncertainty — that is, unknown probability distributions — the tools of Planning and Positioning offer little comfort. Rather than expending effort predicting the future and positioning themselves within it, companies should employ an “emergent strategy.” This term was coined by Henry Mintzberg in a 1985 paper titled “Of Strategies, Deliberate and Emergent.” Although Mintzberg did not dismiss the need for “deliberate strategy” as articulated in the Planning and Positioning paradigm, he asserted that managers needed a different approach when faced with the second urn option. “Emergent strategy itself implies learning what works — taking one action at a time in search for that viable pattern or consistency.” In other words, take a guess on red or black, but then adjust your guesses as you see the results of the individual draws.

Corning Inc., an often-referred-to example of a learning organization, predates the scholarly articulation of the paradigm. The origins of the company trace back

invested in advancing the science of glassmaking to avoid competing with low-cost producers. Starting with its first patent for a superior signal glass for the maritime and railroad industries, Corning produced a string of innovations from its deep knowledge of glass and ceramics. In 1880, for example, Thomas Edison turned to Corning to make the glass bulb for his new invention, and the company created a process for high-speed lightbulb manufacturing that delivered a sustained advantage for the company for decades.

Other innovations included Pyrex, which was introduced in 1915; processes for mass production of TV tubes in the 1940s; ceramic substrates for catalytic converters in the 1970s; fiber optics, which scaled in the 1980s; and most recently, Gorilla Glass, which now dominates in the smartphone and tablet market. However, the technical origins of these innovations typically dated back decades before their successful commercialization. For example, the fusion process that Corning uses for Gorilla Glass dates to the company's 1960s efforts to make glass both thinner and stronger for motor

vehicles. When automakers rejected the glass for cost reasons, despite its superior performance characteristics, Corning shelved the technology until 2006, when Apple CEO Steve Jobs contacted Corning CEO Wendell Weeks in search of a scratch-resistant, lightweight screen for the iPhone. Gorilla Glass now appears poised to be Corning's next major growth engine.

Long before C.K. Prahalad and Gary Hamel articulated the concept, Corning management intuitively understood the need to continuously invest in "core competencies." Corning's technological and process capabilities have responded to a world of Knightian uncertainty for more than 160 years. The company has played the second urn game exceedingly well.

An Organizational Learning model probably resonates with managers having a liberal arts education, in which students are trained for nothing, but educated for anything. Planning and Positioning adherents predict how the industry will unfold and place bets accordingly, and the learning organization dynamically responds to the unfolding environment. But both of these strategy paradigms assume that the external environment defines the strategy. The third paradigm applies for individuals seeking to shape the future environment rather than predict or respond to it.

### Constructive Transformation

In contrast to the Ellsberg Paradox — which states that most people prefer to avoid ambiguity — some, often those with an entrepreneurial bent, *prefer* ambiguity. Steve Jobs was a visionary entrepreneur who famously inspired John Sculley to leave PepsiCo and join Apple by ask-

ing, "Do you want to spend the rest of your life selling sugared water, or do you want a chance to change the world?" Jobs would probably have rejected any of our urn games — and instead made up his own. (See "The Steve Jobs Way," by Jon Katzenbach, *s+b*, Summer 2012.)

However, most entrepreneurs don't have a single-minded vision, probably because those who do rarely succeed. Successful entrepreneurs tend to follow a paradigm of Constructive Transformation: They don't just reactively learn and respond, but instead use the vagaries of fate to help them proactively shape their environment. They love drawing from the urn of unknown contents and figuring out a way to use the results to build a business.

Saras Sarasvathy, coauthor of this article, laid the foundation for the strategy of Constructive Transformation in her 1998 dissertation, supervised by Nobel Prize-winning

First, the paradigm starts with means-driven rather than goal-oriented action. Rather than beginning with a clear vision or even product idea, entrepreneurs using effectual reasoning consider who they are and what they know and then engage their network of potential stakeholders, seeking opportunities to collaborate. A strategic vision may coalesce as new combinations are discovered and engineered, but the vision does not drive the process; means, opportunities, and stakeholders do.

Second, the paradigm applies an affordable-loss approach to evaluating opportunity, rather than an approach based on expected value. In other words, since the future is inherently unpredictable, the entrepreneurial decision maker spends no time predicting it or calculating the expected value, as the players in the first two urn games do. Instead, the entrepreneur seeks to structure experiments wherein failure will not

## Successful entrepreneurs believe the future is unpredictable but nonetheless controllable.

behavioral economist Herbert Simon. Drawing from cognitive science-based research on 27 founders of companies that ranged in size from \$200 million to \$6.5 billion, Sarasvathy found that successful entrepreneurs believe that the future is fundamentally unpredictable but nonetheless controllable. This mind-set, which she described as effectual reasoning, offers a fundamentally different approach to strategy-making through application of four core principles, described here as they apply to Constructive Transformation.

destroy the enterprise. Such repeated experiments — only \$1 per draw from the third urn in our analogy — produce opportunities for valuable new combinations and accordingly shape the path forward.

Third, leaders employing the mind-set of Constructive Transformation seek to make use of surprises rather than avoid them. (For this reason, we sometimes refer to this as the effectual mind-set.) These decision makers accept that the future is unpredictable and the ultimate path unknowable. Accordingly, they

remain flexible and leverage contingencies to revisit means and goals. Each time they metaphorically reach into the urn and encounter an unpredictable event, they ask: Does this surprise open new opportunities? Even when faced with a negative surprise, they simply do not allow it to squelch their enthusiasm: When they draw a lemon from the urn, they cheerfully look around for sugar to use in making lemonade.

Finally, the Constructive Transformation paradigm encourages managers to surround themselves with others willing to join their urn game. They form myriad partnerships, often recruiting initial customers to become partners; initial suppliers to become investors; and initial investors to become customers, employees, or anything else. Ultimately they form a “crazy quilt” of stakeholders — investors, customers, suppliers, employees — who share a commitment to working together to co-create the venture and its environment.

For an example of the Constructive Transformation paradigm in action, consider the digital media company RealNetworks Inc. Founder Rob Glaser left Microsoft in 1994 after a decade of higher and higher executive roles that had made him a millionaire. Drawing upon a long-held avid interest in progressive political issues and his deep knowledge of technology, in 1995 he started Progressive Networks to use the nascent World Wide Web to broadcast his liberal views, much as televangelists had leveraged cable TV in earlier decades.

But when his exploration led him to an examination of the early Web browser Mosaic, he concluded that the channel could be more important than the message. Gla-

ser also quickly determined that the limited bandwidth of the early Web would constrain the channel to audio, so he decided to put plans for video on hold. Applying the affordable-loss principle, he converted Progressive Networks into a software developer, which created RealAudio 1.0 in less than a year, largely using his own financial resources. RealAudio initially broadcast progressive content from ABC News and National Public Radio, and was soon released as part of the Navigator Web browser package from then-dominant Netscape. RealAudio served as a general-purpose channel, adapting broadcast media to the

Constructive Transformation, RealNetworks has grown to provide a collection of software products encompassing audio and video streaming, mobile applications, and gaming, which together generate some \$400 million in revenues annually.

### Picking Paradigms

Each of the three models of decision making works best under different circumstances. Most managers have a preference based upon their own experience and success in applying a given strategy paradigm. The long dominant Planning and Positioning model has lost favor in parallel with the decline of the highly diversified

## RealNetworks formed partnerships that allowed it to survive the constant power struggles of the Internet economy.

computer; it was a precursor to the audio download models of Apple’s iTunes music store in 2003 and Amazon MP3 in 2007.

In December 1995, Glaser learned that a two-person startup in San Francisco was forging ahead with an Internet videoconferencing tool developed while RealNetworks had been focusing on audio. Rather than letting this negative surprise upset his plans, Glaser simply encouraged the founders of the company to join RealNetworks, which led to the next product, RealVideo.

Throughout its history, RealNetworks has formed a network of partnerships that allowed it to survive the constant power struggles of the Internet economy. And, by following the effectual mind-set of

conglomerate. For example, though Harold Geneen built ITT into a global behemoth during his 17-year reign, his successor, Rand Araskog, spent the next 16 years divesting many of the far-flung business units and restructuring the company into three more narrowly focused businesses in hospitality, insurance, and industrial products. The first was ultimately acquired by Starwood, the second was spun out as the free-standing Hartford Insurance Company, and the third retains the ITT moniker, with revenues of \$12 billion per year — significant but well below its peak from 35 years ago, even without adjusting for inflation.

Despite the Organizational Learning model’s long and successful history at Corning, the stock

market does not always appreciate it. Many analysts still argue for the focus and predictability of Planning and Positioning because they can alter the portfolio to diversify for changing risks over time. For example, Corning faced a near-death experience only a decade ago. Because the company had doubled down in the telecom sector during the Internet bubble, its stock rose from less than \$10 per share in 1998 to more than \$100 in 2000, before crashing back to less than \$1.50 per share by 2002. But, with the help of the Houghton family, the company recovered from the mistake — and retained the senior management team, under the premise that they had learned to avoid making a similar mistake in the future.

And although many entrepreneurs have succeeded with Constructive Transformation, that approach does not lead to unquestionable success. For example, during the same period of irrational exuberance faced by Corning, RealNetworks achieved a stock price in excess of \$350, nearly 50 times its current valuation. It is true that Rob Glaser's net worth has grown by many multiples since the founding of RealNetworks, but it is far below the \$5 billion peak he achieved during the bubble.

So open your mind to this broader range of paradigms for your tool kit. Is your future predictable or not? Can you control it, or will the environment control you? Know the game you are playing and how to apply each model, ideally with enough flexibility that you can switch from urn to urn, and game to game, when circumstances demand it. +

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