Strategic Approaches to Managing Uncertainty

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Many managers are deeply unhappy with the linear and often misguided projections produced by traditional forecasting and budgeting systems. The world they operate in has not only become more risky, it has become more volatile, uncertain, complex and ambiguous (VUCA). The World Economic Forum periodically publishes a long list of significant risks the world economy faces, covering economic, geopolitical, environmental, societal and technological forces. We expect that the number of surprises and their magnitude will continue to increase over time, reflecting our increased global interdependence, the accelerating march of technology, as well as heightened geopolitical tensions. Current management approaches are not well suited for these types of uncertainties, and so we need better tools.

The World of VUCA

The chart below plots the volatility of the Nasdaq by taking the high and low for a given year and dividing that range by the annual mean (to get a relative measure of spread). This long-term trend line shows a clear positive slope, meaning that the amount of unanticipated change has steadily increased over time. Moreover, the variance of this scatter plot is increasing as well (i.e., more volatility in annual spreads, apart from a rising trend line). It is important here to distinguish between uncertainties that can be anticipated (such as outcomes of political elections, business cycles, changes in regulations) and changes that leaders or even markets cannot easily see coming or time (such as the collapse of the dotcom era in 2000 or the financial crisis that erupted in 2008). The chart below suggests that the unanticipated change has been on the rise historically and that even wider swings may lie ahead.

Although our global system can handle many of the challenges identified in the World Economic Forum report in isolation, a much larger problem emerges when several of the major challenges occur at once. Most risks are not independent and exhibit covariance due to systemic linkages. Policy makers and business leaders are rightly concerned about the fragility of our financial and economic systems. Crises can spread overnight and companies can lose much value in a single weekend (as Shearson Lehman, AIG and Bear Stearns learned). How robust our circuit breakers and intervention mechanisms are remains an open question, especially since market psychology and mass hysteria can play major roles in fueling contagion and erosion of confidence.

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1 This research summary of current work draws on papers I wrote or am still writing with George Day, David Teece and Phil Tetlock about how to better manage uncertainty in organizations. Please don’t cite or quote yet.
Many companies are not ready for the turmoil ahead because they rely too much on traditional tools of management shown on the left side of Fig 2. They need to develop greater mastery of the tools shown on the right side which better suit the world of VUCA. Using only traditional tools can be devastating when there is deep epistemic uncertainty, knowledge is mostly tacit and the firm’s main assets and capabilities are intangible ones. VUCA worlds require ambidextrous organizations that master dual modes of decision making, entailing intuitive as well deliberative approaches. The latter type (known as System II in cognitive psychology) involves thinking slowly with careful analysis and fits in well with the disciplined planning tools used in most companies. This familiar approach is data driven, reductionist, optimization focused, and transparent. The intuitive approach in contrast (known as System I since it is more primary and automatic) fits the world of rapid change better: it revolves around pattern recognition, holistic thinking, situational awareness, peripheral vision, tacit knowledge, and trusting experience. Organizations need to balance these opposite modes differently to succeed short term in mastering numerous technical capabilities versus long term which calls for dynamic capabilities that enhance evolutionary fitness.

Enhancing our Tool Kit

In a static period characterized by incremental strategic opportunities, stable demand, and predictable trends, the strategy gap between ordinary capabilities and dynamics tends to be minor or perhaps vanishes entirely. But in a vibrant knowledge economy where uncertainty is high, innovations are disruptive, and reinvention is common, companies need enterprise-wide capabilities for sensing and seizing opportunities as well as transforming organizational systems. This world requires monitoring changes in the firm’s ecosystem, deeper diagnosis of the competitive challenges, bold moves at the right time, and business model redesigns that co-
create as well as reshape the environment (rather than just responding to change). A VUCA world favors a bias toward action (to accelerate learning as per "lean startups"), building flexible organizations, strategic use of partnerships, as well constant testing and updating of mental models. All this requires leaders who can function amid the fog of uncertainty.

**Fig 2. A Broad Toolkit for Stable and Turbulent Environments**

The newer tools depicted above entail the following in brief. Developing influence diagrams helps organizations visualize systemic aspects of their business environment, especially if dynamic feedback loops and multi-causal relationships are depicted. These diagrams can highlight less visible interaction effects among risk factors, unintended consequences of actions taken, as well as butterfly effects in non-linear systems. The latter can create unpredictability and surprise in systems that are deep down entirely deterministic. Scenario planning builds on influence diagrams by embedding them in compelling narratives about how future uncertainties may play out, and thereby can enhance the robustness of new strategies (via stress tests and future proofing exercises). Good scenarios will include weak signals about changes that lurk around the corner. To spot these signals requires good peripheral vision, the ability to see unexpected developments from the corners of your eyes. Whereas the human eye has ten times more cells devoted to peripheral than focal vision (i.e., rods cells far outnumber cone cells), organizations tend have an opposite ratio. Employees are usually narrowly focused on their jobs and it is often unclear who is responsible for the periphery. Day and Schoemaker (2006) provide various tools and methods to explore the wide area where the organization is not currently focused but from where unexpected threats and opportunities may arise. Scanning and
In addition to mapping out external uncertainties better, companies also need to build sufficient flexibility into their strategies to handle predictable risks as well as ambiguity, and even black swans. This means properly balancing commitment and flexibility when devising as well as implementing strategies. A powerful approach is to develop portfolios of real options that can be dynamically adjusted as the winds change. Although no single option can cover all possible scenarios, a strategically designed options portfolio should be able to cover a wide range of threats and opportunities that might materialize. For example, a company might bet modestly at first to understand a new technology or market, or share a risky investment with outside partners. There are different kinds of real options that firms can deploy depending on the degree of uncertainty in the technology and/or the market. An opportunity portfolio, as illustrated in Fig 3, is a useful way to map, evaluate and allocate resources to different types of strategic options. Different corners of this map serve different strategic purposes, ranging from scouting and protection moves to step-stone and scaling options, all of which may need to be deployed.

**Fig 3: A Well-Balanced Portfolio of Real Options**

Using an options approach is important whenever companies move away from their current customer or technology base, since the risks tend to increase non-linearly. Even when an idea reaches the commercialization phases, the risk of new products failing remains quite high. Day (2007) reports that new product introductions fail about 35% of the time when staying close to home (i.e., the bottom left of Fig 3) compared 80% failure rates when operating near the top right corner. These statistics were estimated by surveying a wide range of commercial product launches in the USA. Given such high failure rates associated with innovation, it pays to develop a strong options portfolio as well as practice total risk management. Instead of focusing mostly on losses, as in traditional risk management, upside opportunities also merit systematic
attention. Risk analysis should not be limited to quantifiable events but also include less-well defined uncertainties, both on the up as well as down-side of business. Lastly, the firm needs to handle Taleb’s black swans better, since unexpected risks that almost nobody saw coming can cause serious damage. Controlling wild cards requires a mix of broad scanning, vigilant pattern recognition, improvisation, agility, courage and bold leadership when it hits the fan.

Fig 2 lists some additional approaches and tools which can also help. The notion of idealized design, as advocated by Russell Ackoff and others, avoids being paralyzed due to risk and uncertainty by looking through the fog. Rather than obsessing about near term obstacles, this approach is about thinking big without constraints of the status quo. For example, Ackoff helped the old Ma Bell system reimagine the basic phone by ignoring regulatory and technological obstacles. He asked AT&T leaders and researchers to imagine what an idealized telephone could do, and they came up decades ago with many of the features we now take for granted. Idealized planning will naturally encounter legitimization challenges since it envisions bold futures that don’t exist yet, the way visionary entrepreneurs do. To succeed, leaders must bring others on board by aligning interests, developing trust, bridging differences, engaging in deep dialog, in order to establish legitimacy for the new strategic plan and the team executing it. Since not everything visionary leaders recommend can be analytically supported, the newer approaches to managing risk and uncertainty emphasize the important role of intuition, especially the power of seasoned intuition. The complexity of uncertain worlds requires a blend of System I and II approaches, as well as intellectual respect for advances in complexity theory since they highlight the limits of analytical reductionism when dealing with the unknown.

Overcoming Organizational Challenges

In spite of many good tools being available to manage risk and uncertainty, these approaches often need to be implemented by teams. Organizations face complex strategic choices when architecting systems that can respond well to external risk and uncertainty. Adaptive capabilities that work well for one future scenario may not work well for another exogenous scenario, and vice-versa. How specialized adaptive capabilities should be in fast moving environments is an important open strategic question. A more decentralized, “let a thousand flowers bloom” approach leads to enthusiastic but uncoordinated pursuits of fast-moving risks and opportunities. The likely consequence is that complexity mushrooms, coordinating costs escalate, scale economies dissipate and brand value gets diluted. These common problems are compounded in hierarchical organizations with rigid control systems.

A more ambitious clean-sheet approach, aimed at maintaining strategic discipline while enabling timely adaptation to external changes is another approach. But, this will require strong strategic leadership as well a supportive organizational culture. Specifically, it means overcoming two organizational rigidities that often block timely responses to risks and opportunities. The first relates to path dependency and lock-in. Successful results in companies are typically reinforcing, and repeated, until they become unquestionable routines. Unfortunately, such legacy routines often end up stifling innovation in such areas as risk management and innovation. The second rigidity is due to structural insularity. The notion of a silo is an apt metaphor for self-contained functional, country or product groups with independent operations who lack the desire to share information or work across silos. Organizational silos are common and often serve an efficiency purpose, but they also inhibit the development of deep expertise needed to build next generation capabilities. No single silo can master the new skills and disciplines, or afford to acquire them on
their own. Despite the benefits of specialization and focus, a silo organization limits the sort of cross-functional dialogue and lateral learning crucial for better risk management and innovation.

To overcome these and other obstacles to timely adaptation to outside changes, organizations need strategic leaders who are externally focused while addressing internal dysfunctionalities. Four qualities distinguish such vigilant visionary leaders compared with operational ones who tend to excel at execution. The first is openness to diverse perspectives, driven by a deep sense of curiosity. Vigilant leaders seek broad inputs from the external environment and foster wide-ranging social and professional networks. Second, these leaders and their teams exercise strategic foresight while employing a more flexible approach to strategy that incorporates diverse inputs. Third, strategic leaders foster a culture of discovery that nurtures vigilance, exploration and adaptability. This includes allowing for sufficient “slack in the system,” allowing employees sufficient exploration time outside the immediate demands of their job, and encouraging both experimentation and calculated risks. Fourth, vigilant leaders in fast moving businesses need to manage paradoxes and controversy, including perhaps taboo scenarios. The world of VUCA places a premium on leaders who are ambidextrous, meaning they can manage in the present as well as focus on the future, and who can balance exploring and exploiting well in daily life.

We are still far from having a complete validated model of how strategic leaders can best manage conditions of high volatility, uncertainty, complexity and ambiguity. One framework, depicted in Fig 4, has unpacked what it takes for leaders to succeed in a world of VUCA. This deconstruction emphasizes a strategic leader’s ability to anticipate, challenge, interpret, decide, align and learn. Successful leaders cultivate these six disciplines in themselves as well as in their teams in order to thrive in a world of VUCA.

Fig 4: Dimensions of Strategic Leadership Under Uncertainty

Assuming we remain in a period of increased upheaval and global turmoil, managers will face special challenges in controlling risks and delivering reliable results. It takes leaders with well-prepared minds and strong adaptive capabilities to handle these challenges well. Just as sea captains have to deliver their cargo without sinking the ship, even when facing violent storms,
pirates, and tough currents, strategic leaders must do likewise. It requires good navigating equipment, well-crafted maps, a well-trained crew, and the ability to change mid-course if circumstances dictate so. The invention and use of the compass allowed Venice to become a larger city than Paris circa 1400. Using this instrument, Venetian ships sailed the Mediterranean and other seas farther from shore than most dared in search of land and treasure. Likewise, companies with superior navigational ability to manage risk and uncertainty can succeed where others will fail. And in times of turmoil, the spoils can be great.

1 Schoemaker, Paul J.H., Profiting from Uncertainty, Free Press, 2002, p.8
3 Teece, David J. Dynamic Capabilities and Strategic Management (New York: Oxford University Press, 2009)
4 This section draws on Schoemaker, Paul J.H., David J. Teece, and Sohvi Leih “Behavioral Dimensions of Strategy” invited paper for a special issue of the California Management Review.
7 For a related but different conceptualization, see Ian C. MacMillan and Rita Gunther McGrath, “Crafting R&D Project Portfolios” Research Technology Management (September – October 2002) 48-59.