NAVIGATING DIGITAL TURBULENCE

When navigating the uncertainties of digital technologies, vigilant firms gain an edge by paying close attention to what is happening on their periphery and fostering organizational agility, so they are ready to act when the time is right. George Day and Paul Schoemaker examine three key principles that underpin organizational vigilance and show how Adobe's leaders used them to great effect.[1]

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At some point, nearly every leadership team will miss a critical signal that they could - and should - have caught. In the past, these missed warnings might have moved slowly enough to allow reactive organizations to regroup and respond. But today's environment is one of digital turbulence where change is faster, erratic, and less predictable. This condition of instability and fluctuation requires greater speed, the skilled management of uncertainty, and often transformative business models, while strongly penalizing tardy responses.

Vigilance is much more than a single individual's heightened alertness; it is characterized by collective curiosity, candor, and a willingness to play the long game which must be nurtured throughout the firm.

To successfully navigate this relentless upheaval, firms must become more *vigilant* so they can see risks or opportunities sooner and act faster.[2] Vigilance is much more than a single individual's heightened alertness; it is characterized by collective curiosity, candor, and a willingness to play the long game which must be nurtured throughout the firm. Above all, vigilance enables firms to anticipate threats, recognize opportunities sooner than rivals, and act when the time is right. Vigilant organizations deftly use market probes and experiments and then make small bets to explore emerging markets or technologies. In so doing, they create flexible options that are easy to unwind or expand as needed, giving them a head start when the fog of uncertainty lifts. Without this degree of flexibility, firms can only react to events as they go by and much of their freedom to maneuver is lost.

Adobe's digital gamble.

By 2009, Adobe's image-editing program Photoshop was so popular it had become a verb, joining the elite few like Xerox and Google. Yet its growth prospects were still sluggish and the ubiquity of smartphones soon allowed everyone to be their own photo editor. A steep drop in cloud computing storage costs, forecast to be as much as 40-50 percent a year, loomed on the horizon. Adobe could clearly spot the emerging threat, with deep-pocket rivals like Google, Oracle, IBM, or Microsoft likely to use this emerging digital capability to enter its market.

The leaders at Adobe worked quickly, redefining the threat of the cloud as an opportunity to imagine a new creative process combining desktop and mobile to offer new capabilities. In November 2011, the company moved from selling boxed software on disc, which gave the user a perpetual license to one iteration of the program, to a cloud-based subscription service for fifty dollars a month.[3] Adobe's most loyal customers were outraged by the shift to a software-as-a-service model, reluctant to rent rather than own and to store their content in the cloud.[4] But the company pressed forward and in May 2013, simply stopped providing upgrades for its boxed software; further innovations would be available only via the cloud.

Adobe's calculated gamble has been handsomely rewarded: its revenue more than doubled to $11.17 billion between 2011 and 2019, and net profits more than tripled from $832 million to $2,951 million. So how did Adobe exercise such farsighted vigilance and take advantage of this nascent opportunity before its potential rivals?

Vigilant companies like Adobe follow three principles for navigating digital turbulence. First, they direct their attention to the most vital and active parts of their orbit. Second, they instill a sense of prudent urgency throughout their organization. Finally, they build the array of skills needed to become more agile.

Vigilant companies like Adobe follow three principles for navigating digital turbulence. First, they direct their attention to the most vital and active parts of their orbit. Second, they instill a sense of prudent urgency throughout their organization. Finally, they build the array of skills needed to become more agile. Taken together, these three principles can surmount the destructive, siloed thinking that concentrates attention only on immediate tasks. Leaders who embrace them take a longer view that lets them see the future sooner.

How Digital Technologies Intensify Turbulence

Digital technologies are transforming how we process information, learn, make decisions, and interact. If we consider Gordon Moore's 1965 paper[5] on computational trends as marking a starting point, the digital, computational, and communications revolutions have been underway for more than 50 years with, to date, a roughly billion-fold improvement in performance. The dramatic improvements in digital fabrication brought about by these advances are just one example.[6]

Today's 3D additive printers are the beginning of a powerful shift in which data can be turned into objects, from food to furniture to golf clubs. The hyper-localized production of (almost) anything may one day overcome the constraints of fragile global supply chains.

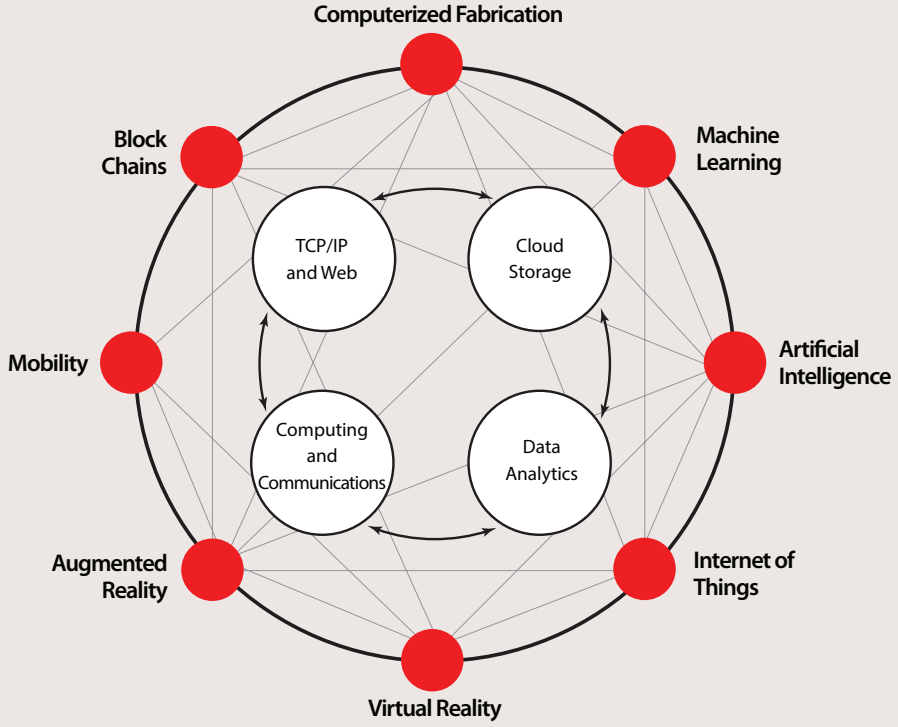
The interwoven nature of digital technologies is depicted in Figure 1 and suggests nearly endless possible combinations. The eight digital technologies shown in the outer ring as examples can be both *sources* and *products* of other digital advances, enabling further capabilities.

These new digital capabilities are themselves made possible by breathtaking advances in computer system performance, including processing, storage, communication, and data analysis, shown in the inner ring of Figure 1. For example, artificial intelligence (which comprises a set of smart technologies that can learn from their environments and take autonomous action) is fueled by rapid advances in neural networks and silicon level technology, the aggregation of storage in massive data centers, as well as a host of other symbiotic advances.[7]

These combinations of digital technology are usually complex and non-linear. When they are applied, unanticipated interactions often occur, either good or bad. Similarly, a technology that seems neither viable nor commercially useful can surprise incumbents by taking off abruptly when the stars align. Honeywell, for example, was blind-sided when Nest Labs came out with a sleek Internet-enabled unit which allowed harried commuters to remotely ensure that the house would be warm and lit when they arrived. Nest had been working on this convergence of technologies for years, often secretly and away from the prying eyes of rivals. Despite a long incubation period, some digital technologies can ignite very rapid change when everything falls into place. Honeywell eventually caught up with Nest, but it lost three years by missing the moment.

No single technology creates turbulence on its own. Rather, the upheaval stems from the simultaneous maturing and intersection of several symbiotic technologies, engendering sharp declines in cost, new functions, and shared platforms to put them to work.

Figure 1: Many Combinations of Digital Capabilities



No single technology creates turbulence on its own. Rather, the upheaval stems from the simultaneous maturing and intersection of several symbiotic technologies, engendering sharp declines in cost, new functions, and shared platforms to put them to work. The turbulence in the relevant markets is intensified by the unpredictability of these processes. One such intersection is biometrics - the use of iris scans, along with face, voice, and fingerprint recognition to securely verify an individual's identity. These systems are enabled by advances in mobility (smartphones with fingerprint scanning or facial recognition), artificial intelligence (to learn behavioral patterns), and the Internet of Things (a broad range of computing devices embedded in everyday objects). These creative combinations pave the way for even more advanced biometric applications, ranging from authenticating travelers and tracking medical data to screening

those entering stadiums and theaters.

A creative combination of digital technologies, drawing on the expertise of apparently unrelated sectors, can also spark innovation. When Callaway began designing its latest line of golf clubs, it combined advances in artificial intelligence, machine learning, and computerized fabrication to generate the best product designs.[8] Where the designers had previously been limited to trying five to seven physical prototypes from crafted designs, digital technologies allowed them to create 15,000 virtual prototypes. An algorithm then helped to select the best design based on performance parameters such as balance, ball speed, and trajectory, all the while conforming to the requirements of the U.S. Golf Association. The result was an award-winning design called the Epic Flash which helped many amateur players achieve longer drives.

Algorithmic design is likely to transform other sectors as well, enabling the rapid testing of many design options according to user determined performance objectives, materials, budget restrictions, and aesthetics. It also suggests the possibility of hyper-personalized designs for products ranging from furniture to automobiles, all ordered up as readily as bespoke clothing. Vigilant firms will be at the forefront of such markets. Yet they must still be alert, lest their virtual designs lose touch with customer needs, and designers become mere custodians of an opaque digital process.

Most leadership teams recognize that they are in the midst of digital turbulence. Yet they also tire of generic warnings of impending disruption and wonder, 'OK, but what should we do about it?' Generic warnings do not help them to anticipate what lies around the corner when:

- Digital platforms help new global players to emerge unexpectedly. China now has a considerable lead in processing mobile payments (roughly fifty times that of the U.S.). In just fifteen years, the number of Chinese firms in the Fortune Global 500 has increased by more than twenty times.

Market boundaries are blurring and dissolving... This week's competitor may become next week's supplier, customer, partner, or all three. Although Apple and Samsung compete fiercely in the mobile phone market, Apple at the same time relies on Samsung for key phone components.

- Market boundaries are blurring and dissolving. "Fintechs," or financial technologies, are changing not only how customers conduct transactions and secure loans, but also the nature of money itself. Some countries (like Bermuda and Switzerland) and companies are making big bets on cryptocurrencies, rooted in blockchain technology, which decentralize electronic exchanges of value and may hasten the obsolescence of cash. Business ecosystems are becoming more complex and difficult to navigate. This week's competitor may become next week's supplier, customer, or partner, or all three. Although Apple and Samsung compete fiercely in the mobile phone market, Apple at the same time relies on Samsung for key phone components.
- The pace of change keeps accelerating and traditional, hierarchical organizations are harder and harder pressed to keep up. In just two years, the Chinese video app TikTok, which supports the creation, sharing, and finding of short music videos, became one of the most downloaded mobile apps, just behind Facebook.

Meanwhile, organizations also grapple with continual changes in the requirements of stakeholders and customers, the strategies of competitors, the availability of talent and other resources, and the political and regulatory environment.

Because of the uncertainty of digital advances, our vision of the future may rest on unexamined and misleading assumptions. For example, the rapid acceptance of social media platforms conveniently obscured privacy concerns. Only with the 2018 Cambridge Analytica scandal—in which Facebook was revealed to have shared profiles without user permission or knowledge— did it dawn on people that their intimate digital data was being passed around in ways they never intended. As Sheryl Sandberg, Facebook COO, later admitted, "we were too slow to spot this and too slow to act. That is on us."[9]

It is ironic that digital innovators and data masters such as Facebook or Google failed, themselves, to be vigilant about broader societal issues or consumer reactions. It can be dangerous for companies to assume that an advance which improves their services or products will necessarily satisfy customers. Facebook, Google's search engine, and Intuit's Quicken all created customer value by being easy to use, saving time, reducing risk, and improving productivity. But such technologies can carry unintended consequences or blind spots.

Google Glass ran into such problems when it launched eyeglasses that included a computer display inside one lens, allowing wearers to communicate with the Internet using natural language voice commands. Although the product was admired as a technological tour de force, it lacked style and fashion appeal and set off alarms about possible privacy violations. Vigilant companies experiment broadly because they are alert to the uncertainty of markets, technology, products, regulations or societal reactions with regard to digital innovation. They learn as much as possible from pilot projects and only commit fully when the time is right.

Hacking and cybersecurity breaches present an ever-increasing risk to digital innovators, both directly and through weaknesses in their corporate ecosystems. Mastercard and Visa, for example, were hacked through their payment processor, Heartland Payment Systems, which processes about 100 million transactions monthly for thousands of vendors. This particular hack was accomplished with Russian-backed spyware and resulted in the theft of 134 million credit card numbers. Such dangers fuel the existing turbulence. Because digital technologies interact not only with each other but with outside forces, their confluences are difficult to time or predict. We can only suggest what to expect.

Bane or Boon to the Firm? Because they are endlessly combinative, digital technologies cut both ways. On one side, they force leaders to wade through an enormous volume of information—much of it irrelevant—to discover vital indications. As Nate Silver noted, "Information is no longer a scarce commodity…but relatively little of it is useful, because useless data distracts us from the truth." [10] The cybersecurity breaches at Target, AOL and several credit scoring firms were worsened by the numerous false alarms which preceded them. That boy had cried wolf before. By the time hackers discovered how to invade the entire system and seize sensitive customer data, the overload of misleading warnings had lulled frontline computer analysts into dangerous complacency.

Advances in digital technology can also accidentally nurture internal problems and allow them to fester out of sight. Customer service personnel at Wells Fargo secretly created over two-million unauthorized accounts using digital methods and existing customer data. The scheme continued for years until, by the end of 2019, the bank was facing civil and criminal suits approaching $3.0 billion. Before the scandal ran its course, Wells Fargo fired 5,300 employees, including the CEO.[11] At its root, the fraud succeeded because the bank's systems allowed customers to open accounts without going to a branch or providing an ink signature. Tellers, agents, and even automated systems, could therefore create what appeared to be legitimate accounts, selecting a "no statements" option so the new stealth accounts would not announce themselves.

But the digital sword is two-edged and can sometimes be turned on itself, fighting fire with fire. The problem of excessive cybersecurity alerts is being partially solved using artificial intelligence that filters out false alarms, allowing technicians to concentrate on genuine warnings. An Alphabet offshoot[12] called Chronicle, for example, helps organizations to defend against cyberattacks before they can reach internal networks and cause harm. Still, cybersecurity is likely to remain a cat-and-mouse game, and the computerized cats will have to become more aggressive. Vigilant leaders who wish to protect their business interests will have to learn how to harness new digital security capabilities.

Advances in digital technology can also work to the advantage of established players in other ways. Although a single blog post can shatter consumers' confidence in product quality, social media also allows direct connections with customers and can provide timely warnings when errors occur. Similarly, low-cost digital competitors may emerge from unexpected sectors or geographies, but their entry is often signaled by social media activity. Vigilant firms detect these early warning signs sooner, which gives them extra time to respond to new entrants.[13]

Navigating Digital Turbulence with Vigilance

Why are some firms adept at anticipating the opportunities and threats of digital turbulence, while others struggle to keep up? Our research shows that those who succeed have developed superior vigilance which they routinely exercise through deeply embedded organizational processes. While any organization can be blindsided at times, vigilant firms respond better. They know that thinking "it will never happen to us" is a false comfort. They may also know that weaker competitors are more vulnerable; as the joke goes, "I don't have to outrun the bear…I just have to outrun you." Strategic leaders in vigilant firms keep three navigation principles always in mind:

As Nobel Laureate Herbert Simon wrote in 1971, "[A] wealth of information creates a poverty of attention. More information is not always a good thing if it leads to blinkered thinking and analysis paralysis."

Navigation Principle 1: Paying attention is deliberate. Vigilant organizations carefully discern which of a bewildering array of external and internal information to attend to, and which to ignore. They know that attention is the scarcest of all organizational resources and how it is used is vital to understanding and responding to an array of pressing issues each day. Struggling to pay attention to everything produces much the same results as paying attention to nothing. As Nobel Laureate Herbert Simon wrote in 1971, "[A] wealth of information creates a poverty of attention. More information is not always a good thing if it leads to blinkered thinking and analysis paralysis."[14]

So, how should leaders allocate their organization's limited attention and their own? In vulnerable firms, leaders direct most of their attention toward current operations in an effort to meet short-term goals. Their scarce remaining time goes to unexpected events, unwelcome surprises, or internal political tensions. Such leaders seldom have time left to scrutinize the big picture and discuss the future. In consequence, their response to unexpected change tends to be weak, fragmented, and rushed.

When Alan Mulally took over as the CEO of Ford in 2006, the survival of the company was in question. It had lost 25 percent of its market share in seven years and was hemorrhaging cash. One of Mullaly's first moves was to bring candor and vigilance to the senior leadership team's Thursday morning meetings. Previously, those weekly meetings were reputed to be like combat zones,[15] with executives scrutinizing one another for any vulnerability and focusing on self-preservation rather than collaboration. Their presentations were carefully vetted and rehearsed in advance, to avoid surprises.

Mulally started each meeting by inviting senior executives to share their internal problems and describe any anomalies they had noticed outside the company. What troubles are you facing? What puzzles you and why? What does it mean for the company and what can we do about it? His frank approach altered the tone of the meeting so completely that at first, no one volunteered any external stirrings that puzzled them. As Mulally persisted in searching for obstacles and anomalies, candidly sharing his own concerns, he pushed the team to widen their perspective and expand their views. Over time, they become completely honest about their own experience and more open to outside ideas.

Mark Fields, who succeeded Mulally as CEO, noted that, in the old Ford culture, talking about problems was viewed as a sign of weakness. Mulally challenged this macho view, redefining discussing problems and admitting collective ignorance early as signs of strength which allowed leaders to tackle potential upsets in a timely manner. This profound change in perspective paid off for Ford. When Alan Mulally came on board in 2006, the company was facing $17 billion in losses. Three years later, the company proposed a financing plan which netted it $23.5 billion in new loans, a clear sign of Wall Street's confidence.[16]

Navigation Principle 2: Adopt a new perspective about speed. Once organizations can sense incipient change and are beginning to understand what it might mean, they need to decide what action to take. In the maelstrom of digital turbulence, speed is a useful creed, but haste is not. Delays tend to increase the damage and narrow the range of opportunities available. The sooner the company spots the situation, the more time it has to create strategic options which it can then exercise when the time is right. This extra planning time helps in avoiding hasty and irreversible investments, and in reaping the competitive benefits of moving first, whether to establish a preemptive position or forestall a snowballing scandal.[17] Just because the clock of business is whirring faster, doesn't mean leaders need to operate in haste. Being faster to act than rivals is about being ready for action at all times, and the first step is early detection and understanding by means of probing questions and exploratory forays. Only through clarity can leaders orchestrate the multiple options and contingency plans which comprise organizational preparedness. The aim of early detection is to avoid being boxed in by the actions of rivals and ensure broad flexibility later, when circumstances call for quick or bold action. The upshot is that managers can act on their own terms rather than being forced to react to someone else's initiative.

Navigation Principle 3: Vigilance fosters agility. Organizations at the bleeding edge of digital turbulence are moving from a comparatively comfortable and familiar risky environment (where goals can be specified, and probabilities calculated) toward the deep uncertainty of unknown unknowns. As Peter Drucker put it, we can navigate familiar environments by doing things right, whereas in turbulent times we must do the right things. So relying on our ordinary capabilities to efficiently carry out current processes, supply chain management, routine transactions, and delivering reliable performance, is not enough when digital disruptions strike. To navigate their deep uncertainty, mangers require the tools of vigilance, rooted in three dynamic capabilities: *sensing* change early, *seizing* strategic opportunities at the right time, and *transforming* the organization so that it stays ahead. Companies which master these three skill sets, and adroitly use the organizational systems that support them, can become truly vigilant.[18]

Which of these supporting abilities managers should emphasize most depends greatly on the situation. In exploring alternative energy sources that would make the best use of their biotech expertise, DuPont had many high-risk, capital-intensive opportunities to consider. Mastery of real-options analysis thus became an essential capability for the company. Meanwhile, organizations deploying widely available digital technologies, requiring smaller investments in tighter time frames, require different competencies. When Novartis equipped its sales representatives with interactive digital devices, so they could engage in consultative dialogues with prescribing doctors, it relied on highly tuned vigilant learning.[19] In each of these different cases, at least six supporting capabilities were deployed, ranging from peripheral scanning and real options analysis, to organizational redesign and changes in company culture, with the importance of each varying according to their circumstance.

With the right set of dynamic capabilities in place, an organization becomes agile amidst high turbulence. Agility here means the ability to quickly and adroitly move resources into higher value activities before rivals do. Agile strategies are used to form a temporary "scrum" team to tackle an emerging opportunity or address a sudden threat. A small team of three to nine people with the diverse skills needed for each issue or project can be quickly assembled. These self-managing teams follow a transparent process, using design thinking to develop and test prototype solutions, learning rapidly as they go. This approach is the antithesis of traditional, cumbersome, top-down innovation processes which require repetitive meetings, extensive documentation, and myriad other bureaucratic impediments.

Future Shock is Still Here

Few people are adept at seeing around the next corner, and even fewer know what to do about what's coming. Alvin Toffler[20] was an exception. In 1970, he predicted that the accelerating pace of society's change would initially be disruptive before becoming normal, and would continue to intensify. Toffler labeled this, "future shock…a dizzying disorientation brought on by the premature arrival of the future" and characterized by "confusional breakdowns" in every structure of society. Nearly fifty years later, it is no longer the premature arrival of the future that sickens executive teams, their boards, investors, and society: it is their own belated responses to that arrival.

The business leadership challenge of the future will be to blend big data, machine learning, human judgment, and artificial intelligence to create viable and evolving competitive advantages — and to do it in a way that is proactive, not reactive. By building an enhanced capacity for vigilance, leadership teams can stay alert, ready to anticipate potential threats and opportunities, and able to confront a fast-forward digital reality.

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Endnotes

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