NAVIGATING DIGITAL TURBULENCE

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Abstract

When digital turbulence is the new normal, vigilant organizations prevail by following three navigation principles. First, the leadership team effectively allocates their scarce attention resources to ensuring a long-run focus. Second, this team adopts a different perspective on speed that emphasizes being ready to act when the time is right, and third, they foster agility by mastering the dynamic capabilities of sensing, seizing and transforming. When these principles are not followed, firms become vulnerable, lose their strategic degrees of freedom, and can only react to events and trends.

At some point in time, nearly every leadership team will miss a critical signal that could—and should —have been caught. In past eras, the slower pace of these missed threats might have allowed reactive organizations time to regroup and respond. But today's environment of digital turbulence—with its defining features of increased speed, greater uncertainty and transformative business models—increasingly penalizes tardy responses.

To successfully navigate this relentless turbulence firms need greater *vigilance*.[1] Vigilant organizations see risks or opportunities sooner and position themselves to act faster to address them. Vigilance is much more than a single individual's heightened sense of alertness. It draws on dynamic capabilities that firms must nurture, and is characterized by curiosity, candor and a willingness to play the long game. Above all, vigilance is about anticipating serious threats, recognizing major opportunities, and then acting when the time is right. Vigilant organizations gain flexibility and time with careful market probes, making small bets early to learn about emerging markets and technologies and running trial-and-error experiments. These activities create flexible options that are easy to unwind at any time but also give the firm a head start in scaling when the fog of uncertainty lifts. Without such built-in flexibility, firms are forced to react to fast-moving events and lose important degrees of freedom to maneuver.

Adobe's digital gamble. By 2009, Adobe's image-editing program Photoshop had attained the rare status of a product that was also a verb, like Xerox, Kleenex or Google. Yet growth prospects were sluggish and the ubiquity of smart phones meant everyone could be their own photo editor. Looming on the horizon was a steep drop in cloud computing storage costs, forecast to be as much as 40-50 percent a year. This presented an emerging threat to Adobe, should deep-pocket rivals like Google, Oracle, IBM or Microsoft use this emerging digital capability to enter their market.

In response, the leadership team of Adobe reframed the cloud as an opportunity to reimagine the creative process by combining desktop and mobile with new capabilities. In November 2011, they moved from selling boxed software on a disc, which gave the user a perpetual license to use the program, to a cloud-based subscription services for fifty dollars a month.[2] This move to a software-as-a-service model was met with outrage from their

most loyal customers, who didn't like the idea of 'renting" rather than owning, and then storing their creative content in the cloud.[3] In May 2013, Adobe stopped providing upgrades to their licensed software users; further innovations would only be available via the cloud.

Adobe's calculated gamble has been handsomely rewarded: revenue doubled to $9.0 Billion between 2011 and 2018, and net profits tripled from $832 million to $2,590 million. How did Adobe exercise such farsighted vigilance and launch this nascent opportunity ahead of its potential rivals?

Vigilant companies like Adobe follow three principles for navigating digital turbulence. First, they direct their scarce attention resources to the most important parts of their periphery. Second, they instill urgency throughout their organization. While speed is essential, it only pays when done prudently. Finally, vigilance requires building the multiple organizational capabilities needed to become more agile. These three approaches taken together can surmount the destructive tendencies toward siloed thinking that concentrates attention on the immediate tasks. These principles allow leaders to take the long view.

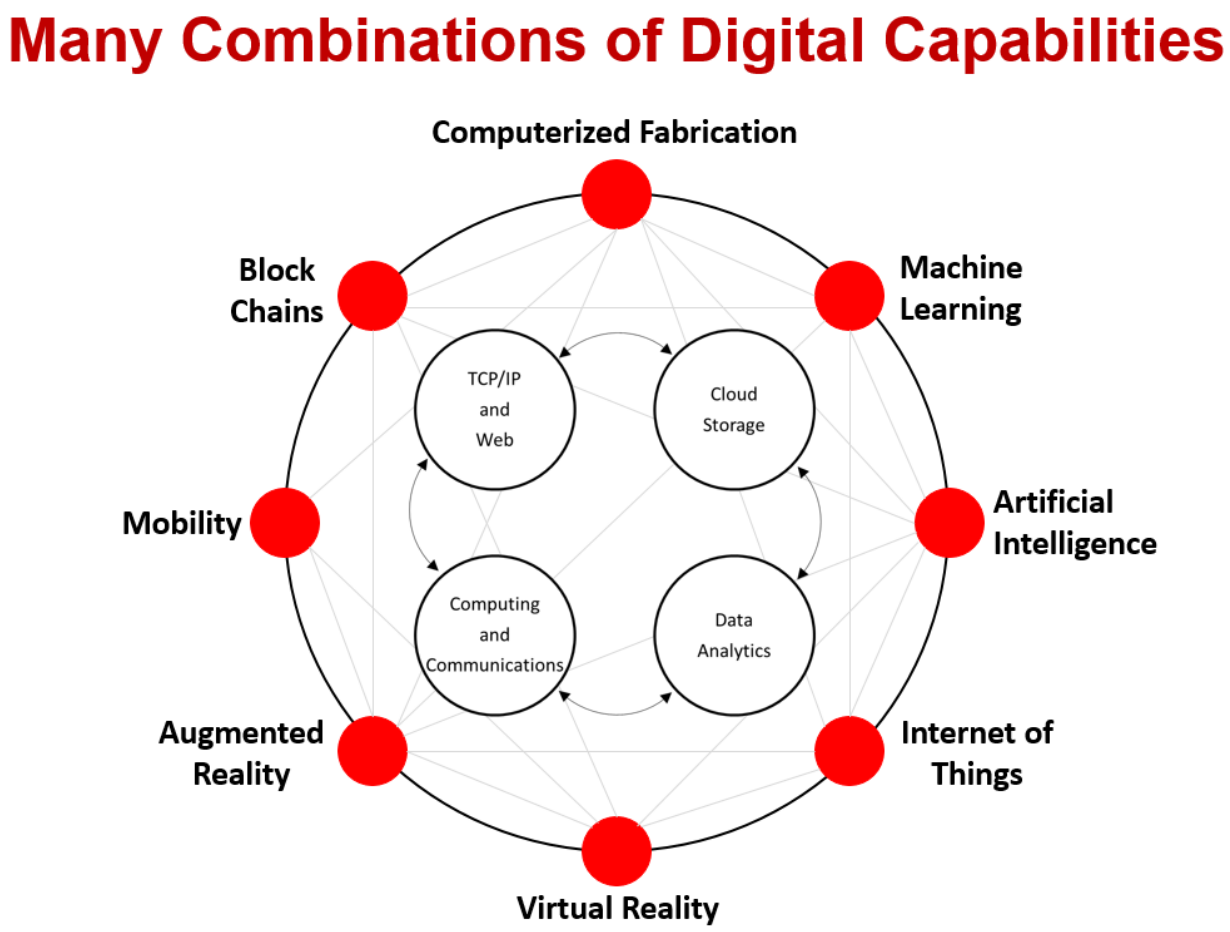
How Digital Technologies Intensify Turbulence

Digital technologies are transforming how we process information, learn, make decisions and interact with each other. If we take Gordon Moore's 1965 paper[4] on computational trends as the starting point, the digital, computational and communications 'revolutions' have been underway for more than 50 years, and we are now seeing the consequences of a billion-fold improvement in performance. As just one example there are dramatic improvements in digital fabrication capabilities enabled by these advances.[5] Today's 3D additive printers presage a powerful shift to turn data into any kind of object, with applications for making everything from food to furniture. The possibility of hyper-localized production of (almost) anything may one day overcome the constraints of long, global supply chains.

The interwoven nature of digital technologies is depicted in Figure 1 and suggestively highlights the numerous possible combinations of digital capabilities. This

illustrative 'ball of yarn' schematic has eight digital technologies around the outer ring. Each is both a *source* and a *result* of other digital advances, that enable further new capabilities.

Figure One



These new digital capabilities are themselves enabled by breathtaking advances in computer system performance, including processing, storing, communicating and data analysis, as depicted by the inner ring of Figure One. For example, artificial intelligence (which comprises a set of very "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 accessible via the cloud, and a host of other symbiotic advances.[6]

These combinations of digital technologies are typically complex and non-linear, with often unanticipated interactions when they are applied. A technology that seems non-viable or commercially distant can suddenly take off when the stars align and surprise

incumbents. For example, Honeywell was blind-sided when Nest Labs came out with a sleek Internet-enabled thermostat allowing harried commuters to remotely activate their home system so that the lights would be on and the house heated when they entered their house. This convergence of technologies had been in the works for years, secretly at times or outside the purview of rivals. Even though the incubation period of some digital technologies can be long, they can produce very fast technological change when all the pieces align. Honeywell eventually caught up with Nest, but lost three years.

No single digital technology 'creates' turbulence on its own. Rather, it stems from the simultaneous maturing of multiple parallel technologies, sharp declines in their costs, new functionalities, and the emergence of new platforms to put them to work. The unpredictability of these processes is what intensifies the typical turbulence associated with emerging markets. One example of the interacting combinations of digital technologies is biometrics - the use of iris scans, plus face, voice, and fingerprint recognition, to securely verify an individual's identity. This capability is 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 category including computing devices embedded in everyday objects). These creative combinations open up possibilities for even more advanced biometric applications, ranging from authenticating travel documents, tracking patients medications and hospital treatments to permitting secure admission into stadiums and theaters.

A creative combination of digital technologies, drawing on expertise residing in unrelated sectors can spark innovation. When golf company Callaway began designing their latest product line they combined advances in artificial intelligence, machine learning and computerized fabrication technologies to generate the best product designs.[7] Previously the development of a new golf club was an artisanal process with designers limited to trying five to seven physical prototypes. With digital technologies, they were able to create 15,000 virtual prototypes.They used an algorithm to select the best design based on performance parameters such as ball speed, while conforming to the rules of the U.S. Golf Association. The payoff was an award-winning design called the Epic Flash which lets many amateur players drive their ball farther.

Algorithmic design will likely transform other sectors, by enabling the rapid testing of many design options based on user inputs about performance objectives, materials,

budget restrictions and appearance. This offers the possibility of hyper-personalized designs for products ranging from furniture to automobiles, each of which may become bespoke like clothing. Vigilant firms are more likely to be at the forefront of such data-driven, automated and efficient designs. They must be alert to the risk, however, that such virtual designs lose touch with latent customer needs, if designers become simply the custodians of an opaque digital design process.

Most leadership teams recognize they are in the midst of digital turbulence. Some are already tired of generic warnings of impending disruption and wonder, 'OK, we get the message; what should we do about it?' Despite many generic warnings, they still struggle to anticipate what may lie around the corner when:

- Digital platforms help new global players to emerge in unexpected ways**.** China now has a large lead in the ability to make mobile payments (roughly 50 times the U.S.). In just 15 years, the number of Chinese firms in the Fortune Global 500 has increased by more than 20 times.
- Market boundaries are blurring and dissolving. Fintech, or financial technologies, are altering the nature of money itself, including how customers transact and secure loans. Big bets are being made by countries (e.g., Bermuda and Switzerland) and companies on blockchain technologies that enable cryptocurrencies for the decentralized electronic exchanges of value, possibly hastening the obsolescence of cash.
- Ecosystems are becoming more complex and difficult to manage or navigate**.** This week's competitor may be next week's supplier, customer, partner or all of the above. While Apple and Samsung compete fiercely in the mobile phone market, Apple relies on Samsung for key components for its phones.
- The pace of change keeps accelerating**.** With the compression of time, the gap between the rate of change and the ability of traditional, hierarchical organizations to keep up is widening. In just two years, the Chinese video app TikTok, which fosters the creation, sharing and discovering of short music videos, became one of the most down loaded mobile apps, just behind Facebook.

Meanwhile, organizations are also grappling with continuing changes in stakeholder and customer requirements, competitor strategies, access to resources, and the political and regulatory environment.

The uncertainties created by digital technologies can obscure our vision of the future because it may rest on unexamined and misleading assumptions. For example, the rapid acceptance of social media platforms glossed conveniently over privacy concerns. Following the Cambridge Analytica scandal in 2018—when it surfaced that Facebook profiles were shared without user permission or knowledge—it dawned on people that their intimate digital data could be 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."[8]

It is ironic that digital innovators and masters of data, like Facebook or Google, are not necessarily vigilant themselves about broader societal issues or consumer reactions. A potentially dangerous assumption is that a digital technology advance, in service or product improvement, will necessarily satisfy customers. And yes, Facebook, the Google search engine, and Intuit's Quicken all created customer value by being easy to use, saving time, reducing risk and improving productivity. But there may also be unintended consequences or blind spots, as Google Glass experienced when it launched eyeglasses that display computer information inside the right or left lens and lets users communicate hands-free with the Internet via natural language voice commands. Even though it was admired as a technological *tour-de-force*, it lacked any sense of style or fashion appeal and set off alarm bells about potential privacy violations. Vigilant companies fully respect the uncertainty of digital innovations, in terms of market, tech, product, regulatory or societal reactions, and thus experiment broadly. They learn from set-backs in their pilot projects and only commit fully when the time is right.

An increasingly important risk to digital innovators stems from hacking or cyber-security breaches, and indirectly through eco-system limitations. Mastercard and Visa, for example, were hacked indirectly through their payment processor Heartland Payment System which serves thousands of vendors adding up to about 100 million monthly transactions. This particular mega-hack was accomplished with Russian-backed spyware and resulted in 134 million credit card numbers being stolen. Such uncertainties feed the whirls of turbulence. We can only suggest

what to expect, because digital technologies interact with each other as well as with other forces in complex ways and these confluences can be hard to time or predict.

Bane or Boon to the Firm? Due to their recombinant nature, digital technologies cut both ways. As a bane, leaders need to wade through a far larger volume of information—much of it noisy and irrelevant—in order to uncover relevant signals. As Nate Silver has noted, "Information is no longer a scarce commodity…but relatively little of it is useful, because useless data distracts us from the truth." [9] The cyber security breaches at Target, AOL and credit scoring firms were made worse because numerous false alerts of systems breaches had occurred but finally hackers gained sufficient know-how to compromise the entire system and capture sensitive customer data. The overload of misleading warnings eventually desensitized front-line computer analysts.

Advances in digital technology can also nurture internal problems and allow them to fester in the shadows. The scandal at Wells Fargo—in which customer service personnel created over two-million unauthorized accounts for existing customers using digital means—is instructive. The misbehavior continued for years in the firm's retail banking and credit operations. The bank was facing civil and criminal suits approaching $2.7 billion at the end of 2018, and fired 5,300 employees including the CEO. [10] The problems festered because bank systems allowed customers to open accounts without going to a branch or providing an ink signature. Tellers, customer agents, and even automated systems, could create what appeared to be legitimate accounts. They could also rig account preferences so that customers didn't receive statements and thus no signal that a new account was added.

Digital technology advances can also be a boon for established players. Although a single blog post can shatter confidence in a firm's product quality, this same social media also allows for broader and deeper direct connections with customers—as well as timely corrections when errors occur. Low-cost competitors may emerge from Malaysia, Pakistan or Israel, but whenever they strongly appeal to customers they also offer a clear market signal for a truly vigilant organization, giving it time to respond to this new market development.[11]

The vexing problem of an overwhelming number of cybersecurity alerts, for example, can be solved with artificial intelligence that filters out false alarms so that technicians can concentrate on genuine warnings. An Alphabet spin-out[12] called Chronicle is part of an

immune system to help organizations defend against cyberattacks before they can infiltrate internal networks and cause damage. Cybersecurity will likely remain a cat-and-mouse game, and computers will have to play the role of cat more aggressively. Vigilant leaders will have to learn how to harness these new digital capabilities and protect their business interests.

Navigating Digital Turbulence with Vigilance

Why are some firms more adept at anticipating the opportunities and threats from digital and market turbulence, while others struggle to keep up? Our answer is that the winners have developed superior vigilance capabilities that they routinely exercise through deeply embedded organizational processes. Even though nearly every organization will be blindsided, the vigilant firms are better prepared to respond. They know that the narrative "it is not going to happen to us" offers false comfort. Still, they may tell themselves that weaker competitors are more vulnerable to digital turbulence, or as the tale goes, "I don't have to outrun the bear…I just have to outrun you." To avoid the trap of complacency, strategic leaders in vigilant firms keep three navigation principles in mind:

Navigation Principle 1: Paying attention is a deliberate act. Vigilant organizations carefully manage which of the bewildering array of external and internal issues they need to attend to, and which can be ignored. They know that attention is the scarcest of all organizational resources since it constrains the capacity to focus on, and respond to, pressing issues each day. To pay attention to everything is equivalent to 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."[13]

So, how should leaders allocate their organization's limited attention, including their own? Within vulnerable firms, leaders direct most of their attention toward current operations to meet short-term performance targets, using any scarce remaining time to react to unexpected events, unwelcome surprises or internal political tensions of the moment. These leaders seldom have time left to reflect on the bigger picture and discuss what really matters in the future. Hence, their response to unexpected change tends to be weak, fragmented and rushed. This is why canvassing the bigger picture ahead of time truly matters.

When Alan Mulally took over as the CEO of Ford in 2006, for example, the survival of the company was in question. It had lost 25 percent of its market share in the prior seven years and was hemorrhaging cash. One of his first moves was to bring a strong dose of candor and vigilance into the weekly Thursday morning meeting of the senior leadership team. Before Mulally took over, these weekly meetings were reputed to be like mortal combat zones.[14] Executives looked for points of vulnerability among their peers and emphasized their own self-preservation over collaboration. Each carefully vetted and rehearsed their presentations in advance, so there would be no surprises.

Mulally changed all that. He started each meeting by inviting senior executives to share their internal problems as well as any anomalies they were noticing in the external environment. What troubles are you facing? What puzzles you, and why? What does it mean for us and what can we do? This frank approach so completely altered the tone of the meeting that at first, no one volunteered to share any faint external stirrings that puzzled them. As Mulally persisted in surfacing obstacles and anomalies, and shared his own concerns, he pushed his leadership team to widen their lenses and expand their viewpoints. In due time, they became brutally honest about their reality and more open to new ideas from outside.

Mark Fields, who succeeded Mulally as CEO, noted that talking about problems was viewed as a sign of weakness within the old Ford culture. Mulally challenged this macho view and argued it was actually a sign of strength to recognize problems, including collective ignorance, early so leaders can tackle them honestly. This profound change in perspective paid dividends at Ford, which was facing a $17 billion in loss in 2006 when Alan Mulally came on board. Three years later, the company approached Wall Street with a financing plan and bankers gave them $23.5 billion in new loans as a clear sign of confidence.[15]

Navigation Principle 2: Adopt a new perspective on speed. Once organizations have sensed an incipient change and are starting to understand what it could mean, the question becomes, what action to take? In the maelstrom of digital turbulence, speed is an especially useful creed. Firstly, delays usually increase the damages, and narrow the opportunity range if someone gets to them sooner. Second, seeing sooner gives more time to create strategic options to be exercised when the time is right--thus avoiding hasty, irreversible investments. Finally, there are well documented competitive benefits from moving first, in order to establish preemptive positions or forestall snowball effects when scandals break.[16]

Just because the clock of business is whirring faster doesn't mean that leaders must operate in haste. 'Acting faster' than rivals is about being ready for action when needed, and this starts with early detection and learning through probing questions and exploratory forays. Only after sufficient clarity has been achieved about key issues can leaders orchestrate better organizational preparedness in the form of multiple options and contingency plans. The aim of seeing sooner is to have more degrees of freedom later, when quick or bold actions are called for, without being boxed in by rivals' moves. Most managers prefer to act on their own terms rather than be forced to react to someone else's initiative.

Navigation Principle 3: Vigilance capabilities foster agility. Organizations at the bleeding edge of digital turbulence are moving from a comfortable and known risky environment (where decision outcomes can be specified, and probabilities calculated) toward the deep uncertainty of unknown unknowns. Familiar and predictable environments can usually be navigated by "doing things right", and using ordinary capabilities for the proficient execution of current processes, such as supply chain management, executing routine transactions, and delivering reliable performance. To navigate deep uncertainty, in contrast, requires a more vigilant toolkit based on three dynamic capabilities: *sensing* change sooner than rivals, *seizing* opportunities more effectively, and *transforming* the organization as needed to stay ahead. Vigilance results when companies master these three dynamic capabilities by operationalizing them through a host of sub-capabilities.[17]

Which dynamic sub-capabilities to emphasize depends on the situation. When there are many high-risk, capital-intensive opportunities to consider, such as DuPont faced when exploring alternative energies that could leverage their biotech expertise, a mastery of the real-options analysis sub-capability, was essential. But when deploying digital technologies that are widely available and require smaller investments within tight time frames, leaders must emphasize different sub-capabilities. For example, when Novartis equipped its sales representatives with interactive digital devices, so they could engage in consultative two-way dialogues with prescribing doctors, they needed to rely on a highly tuned vigilant learning sub-capability.[18] In the two examples above, at least six multiple sub-capabilities were used in each case, ranging from peripheral scanning and real options analysis, to organizational redesigns and culture changes. But the relative weights given to each component varied by circumstance.

With the right set of dynamic capabilities, an organization becomes agile when turbulence is high. Agility here means being able to move quickly and adroitly shift resources to

higher value activities sooner than rivals. For example, agile strategies are activated when a scrum is formed to tackle an emerging opportunity or address a recent threat. A small team or scrum of three to nine people is quickly assembled with all the diverse skills needed to carry out the initiative. They essentially function as self-managing teams, following a transparent process, using design thinking methods to develop and test prototype solutions and learn quickly. These features are the antithesis of cumbersome, top-down innovation processes with repetitive meetings, extensive documentation, and other impediments to progress.

Future Shock is Still Here

Few people are adept at seeing what's coming around the corner, and even fewer know how to act effectively on this information. Alvin Toffler[19] was an exception. In 1970, he predicted that society's accelerating pace of change would initially be disruptive, then become the new 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" throughout every structure of society. Nearly 50 years later, it is no longer the premature arrival of, but their belated responses to, the future that sickens executive teams, their boards, investors and society.

The leadership challenge of the future will be to blend big data, machine learning, human judgment and artificial intelligence in ways that create a semi-sustainable competitive advantage— in a way that is proactive, not reactive. Developing an enhanced capacity for vigilance enables a leadership team to stay alert, ready to anticipate potential threats and opportunities – and face a fast-forward digital reality in real time.

NOTES AND REFERENCES

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