Deep Shift: Fundamental Changes in Enterprise Technology

A Roundtable Overview

Roundtable
on Digital Strategies

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Thought Leadership Roundtable on Digital Strategies
An executive roundtable series of the
Center for Digital Strategies at the Tuck School of Business

The Roundtable on Digital Strategies first discussed the impact of technology mega-trends in 2011, as mobile computing, social media, big data and the cloud started to infiltrate enterprise IT. 6 years later, these and other technologies permeate life and business so thoroughly that every organization has to consider what it means to become a truly "digital enterprise." What is required for success, and what are the risks of failing — or even of not moving fast enough to launch a digital business transformation? The Roundtable convened at the Tuck School of Business at Dartmouth College to share experiences from digital transformations thus far, and to exchange insights, concerns, and practical suggestions about how to ride the accelerating waves of technical change. Participants included CIOs and fellow executives from ARC, Chevron, Eastman Chemical, Eaton, Hilti, the International Committee of the Red Cross, Levi Strauss, Rocana, Tenaris, and TetraPak, along with Executive Fellows and the Directors of the Center for Digital Strategies of the Tuck School of Business at Dartmouth College.

Key Insights Discussed in this Article:

- *Technology has shifted from business enabler to business differentiator. The way for IT to keep up with P&L needs is to reduce but maintain core systems for security and infrastructure, while pushing data to the businesses for agile application development and innovation.* .... *Pages 2-3, 6, 14*

- *Incrementalism is dangerous. Companies that move in traditional, measured steps risk being leap-frogged or carved up by competitors: Digital business transformation demands moving at the speed of start-ups.* ....*Pages 3, 5, 8, 12, 14*

- *Every new technology innovation creates the opportunity to seize leadership. Predictive analytics, augmented/virtual reality, and the blockchain are the next wave of game changers. The first companies in each industry to define best practices and standards in each will win disproportionate competitive advantage.* .... *Pages 7-9*

- *Enterprises need to re-structure their relationships with risk. Anything that accelerates the pace of change has to be considered, from writing off technical debt on legacy systems to finding faster ways to work with start-ups and technologies.* .... *Pages 4, 6, 11-12*

IT Push to Business Pull

"I wasn't originally going to schedule this session on digital transformation," began Hans Brechbühl, Executive Director of the Center for Digital Strategies. "After all, we talked about this topic just 7 months ago. But digital is so swiftly becoming the baseline on which firms operate that it's timely for us to re-visit the topic:

- What does the successful IT organization of the near-future look like?
- How do we structure ourselves?
- How do we develop talent to succeed in this environment that's so wildly different?

"What's the difference on *this* wave of digitization across the company?" asked Mark Hillman, co-founder of MadDog Technology and an Executive Fellow of the Center. "For 20 years we've been applying the next-big-thing technology; we've done this stuff forever. What's new?"

"That's a really good question," answered Bill Blausey, CIO of Eaton Corporation. "In IT we *are* used to change, we're used to new technologies, we've been through lots of evolutions. We are adaptive in that regard. But the *number* of emerging and new technologies happening at one time is unprecedented. It's an onslaught of opportunities and challenges for the organization in figuring out how to use them and adapt them. And the old technologies are still applicable, too: a melding of the old and the new has to be part of the strategy."

"So does that mean that business leadership is more engaged in sorting all this out, because the context is at a completely different level than we have seen before?" Hillman followed up. "They now fully believe that they have no choice? They believe that tech is their business now, too, it's not just 'over with the IT guys?'"

"That's a perfect statement," Blausey acknowledged. "Their education level, awareness level, and fear level have all escalated to new heights, mostly around our products, and products that could take over the service space. There is a different level of engagement than I have ever seen in helping shape the direction, and understanding the impact, that technology disrupters could have on our 105-year-old company."

"Another difference with today's technology is that this is not just automation, this is actually growth, real business growth," added Mark Meyer, Head of Global Information Management at TetraPak.

> Like Eaton, we are an industrial company. When this Roundtable talked about digital transformation in the past, we talked about our *IT* organizations, and we went back to our companies and tried to drive an awakening to possibilities: Were there opportunity clusters that we could take advantage of?
>
> At TetraPak that translated into an IT strategy around a connected and mobile workforce. Then came advanced analytics, which opened the door to connected solutions, and then IoT.

IoT created digital capabilities that weren't there before, and the awareness that if we collected all the data from all the machinery that we've sold to our customers, we could sell that information as well. Now we have products based on new digital capability, which is much different from simply automating processes.

So, suddenly the C-suite has a steering committee for digital programs, and their entire focus is here. The business strategy is now about growth of our *digital* brand through performance opportunities for our customers.

"They've become tech-savvy, and that helps the conversation," Meyer finished, "Now my problem is that each of them has 500 ideas of digital things they want to do, and I have to manage all of them at the same time. But the key point is, the switch has happened: It's gone from IT push to business pull."

Alva Taylor, Faculty Director of the Center for Digital Strategies, pulled together the different threads of the discussion:

So the speed of the convergence of all the technologies has changed, as well as the individual's push on expectations. And that push isn't happening just on leadership teams — it's in the customer base as well. *Everyone's* used to being able to scroll through, to swipe and get information, to say yes or no in their consumer lives — and they've come to expect the same thing in their business lives.

And they really don't care how complicated it is to get there: They just want it to happen. If you/IT can't provide it, they'll find someone who can. And the barriers to entry for others to come into the enterprise and fill those needs are much lower than they've ever been before.

The Balance Sheet Do-Over Game

Meyer's description focused on business opportunities from digital transformation; Keith Sturgill, CIO of Eastman Chemical, explained the other side of the opportunity/threat dynamic:

As an engineering culture, Eastman has been committed for a long time to the idea of incremental improvement, to continually improving processes in how we operate the company.

With the hyper-change we're seeing now, "incremental" can be dangerous. Competitors could leapfrog us with step-change improvements: Instead of improving an area by three percent per year, they could take a completely different approach and improve it by 90 percent. So, one of our challenges is to break the organization out of incremental thinking and into asking, "How do we institute breakthroughs in every area of our business?"

Eastman creates materials. But we haven't figured out yet how to put IoT onto a molecule, so

we're starting breakthrough thinking with the least sexy area of all, the back office: "How do we fundamentally change the way we operate our back office?" Because if we're successful with that, it will fund everything else that we want to do digitally. It's not sexy, but the back office is where a lot of value lies.

"The C-suite has seen companies go away; that's not something you have to describe to them any longer," agreed Dickie Oliver, CIO of Airlines Reporting Corporation (ARC).

In consequence, IT's ability to get their attention is at a heightened level due to self-preservation. The challenge is that you have 30 or 100 years of legacy to deal with. You have to put that legacy to the side for a moment, and try to re-think and re-imagine and re-create what you're trying to do — without letting backwards integration to the legacy weigh you down and sub-optimize your solution. Otherwise it's incremental, not step-change. The challenge is that step-change costs big dollars.

"And that really puts handcuffs on IT," Hillman declared. "The typical CIO has a notion of a legacy mountain: '80 to 90 percent of my budget goes into running what I already have. It takes almost all my time, and I have no chance to really push the future. But somehow I still have to compete with all these nimble startups that might eat the market away from me.'"

"Most organizations have a great deal of technical debt accumulated over the last 20 years," Dion Hinchcliffe, Chief Strategy Officer of 7Summits, affirmed. "The cost of paying it down is so considerable that most organizations can't make the leap. It's a big point of friction, an off-balance-sheet liability that many CFOs are not even aware of. How do we get past it when our non-traditional competitors don't have these liabilities?"

"There's also the failure to recognize that companies that may disrupt you are not likely to disrupt your whole company," pointed out Patrick Wheeler, Assistant Director of the Center for Digital Strategies. "They're going to disrupt the *portion* of your business that has high value to them."

"Those are common problems," observed John Chandler, retired CMO of MassMutual and an Executive Fellow of the Center. "I play a game with senior executives called 'The Balance-Sheet Do-Over:'

"If you could take all the assets that you have today, convert them to cash, and re-build your company, what would you do?" The vast majority choose to reduce expenses and improve operations in the businesses they already know, instead of re-inventing themselves.

This is why about 80 percent of digital transformation initiatives fail. It's not because companies don't complete the projects; it's because the projects don't address whatever it is that is actually going to disrupt the companies. They stay in their comfort zones and build incremental capabilities. It's a mistake we see repeated over and over again.

"It's because there isn't agreement on the main drivers," suggested Charlotte Lindsey, Director of

Communication and Information Management for the International Committee of the Red Cross (ICRC).

> If there isn't agreement on whether transformation or continuity is the most important, or what trade-offs can be made in exchange for business transformation, then decisions get pushed to the lowest level in the organization: IT. And it's the poor IT people who must try to reconcile these very competing demands. Those are impossible decisions for them to make, and no one ever agrees with the outcomes.

The Upside of Having Little to Lose

"What is it in the emerging company mindset or culture that makes them disruptive?" asked moderator John Gallant, Senior Strategist for Ledgewood Media and an Executive Fellow of the Center. "What's fundamentally different about them, that traditional companies need become aware of, and learn to do better?"

"A start-up has nothing," answered Omer Trajman, CEO of Rocana. "The balance sheet doesn't exist: You're creating it every week. There is no default, so you have no choice but to continuously look for something new."

"In a start-up, you play with a bunch of different ideas, and you have one simple rule," Chandler added, developing Trajman's theme.

> Everything has to fit onto your platform, whatever that platform evolves to be. Add, test, and if something fails, great! Drop it. Experiment small and fail small. You can be very nimble in inventing better processes and better outcomes.

> In a big company, particularly if you follow a waterfall and traditional T-code assigned projects, you're committed to investing X months in something until you realize that after all that time and money, it didn't work. Everything gets in the way of being nimble and re-interpreting your value proposition.

"Underlying what these two just said is a fundamental assumption difference between the two kinds of culture, and they're polar opposites." Hillman summarized.

> In traditional companies, people think they know what the answer is, and they write requirements documents for what to build next? But how do they know they're even working on the right problem?

> In start-ups, the fundamental assumption is, 'I only know that I'm wrong, and that I don't know the answer.' For them it's a continuous cycle of validate, verify, validate, find the way. In big companies, people need requirements documents to tell them what to build."

"That's from the difference in risk appetite between the two types of organizations," suggested Segun Oyebanji, GM of Downstream IT for Chevron. "In our industry, when things go wrong, *really* bad things happen. There's also the history that IT projects take so long, and take so much money. We are just starting to see a few business leaders who are willing to trust the fast-paced, 'let's just go try' type of approach. They understand what agile is, they have experienced it, and they're willing to embrace it."

"If you have little to lose, you go for it," Meyer agreed.

> If you have a lot to lose, you weigh that risk. With food safety, I am not going to take many risks. On the other hand, I'm going to throw all kinds of stuff at our field service engineers, because the only risk is of missing out on the reward.

> Agile works really well for developing new apps, new insights, new pieces of data so that people can do their jobs better. But risking the configuration of a machine that's producing FDA-approved food … I'm going to do a *lot* of research first. In big companies, you have to break things into groups: "Here it's okay; here it's not."

"I fear we underestimate the risks of not moving faster in corporations," Sturgill warned.

> Pick whatever megatrend you want under the digitization umbrella: We are trying to use those trends as a catalyst for thinking differently as a company, for being able to leverage agile methodologies, to deliver minimum viable products. We are trying to improve the speed and agility of our company.

> Take the simple example of running your own datacenters versus running in the cloud: It's not a cost play, it's an agility play. How can we take that approach and infuse it into the rest of our business? The approach that we are going to move quickly, we're going to be agile, we're going to anticipate what our markets are doing and what our customers are doing, all faster than our competitors. That's the whole idea around digitization for us.

"There's a growing realization that digital technology is going to move rapidly from being a key enabler *of* our business to being a key differentiator *for* our business," Sturgill finished.

Oyebanji emphasized Sturgill's point:

> When we started to talk at Chevron about 'digital strategy,' the early feedback was 'No, we don't need a digital strategy. Digital has to be part of our business strategy.' That dialogue is now happening at the management and committee level, and it's only a matter of time before it's at the Board level.

> We're at the point where each of the presidents of our different operating companies can articulate how they are going to leverage technology to solve their business problems. It's early days yet: Some leaders are very fluent, very aware, and they're dragging IT along as we

try to catch up. There are other parts of the business where the dialogue is still in its infancy.

"And that's the big change," Oliver wrapped up.

> The last wave of technology crossed the business barrier to where it's not just about change within IT anymore, it's about change in how the business operates, how the business goes to market, how products are consumed. Technology now permeates the business model. You never run out of opportunities to take more advantage of the cloud, or mobile, or virtualization. They're just part of what you do, like storage, security, and networking. They're just more tools in the war.

Rise of the Machines

"If that's all true," moderator Gallant asked, "What are the highest-impact new technologies for your industries and your businesses?"

"Predictive analytics based on big data, the cloud, and machine learning," answered Eduardo Galindez, IT Program Director for Tenaris. "We've established a small data science team, and they are having success with pilots in predictive maintenance in monitoring product quality. Our challenge is how to scale to other issues and to other products in our facilities around the world."

"What are the key takeaways from that effort so far?" Gallant followed up.

"You have to have clear focus on the objective that you want to achieve," responded Galindez. "What is the precise outcome you are looking for? Product quality will be good or bad: It cannot be in the middle. The quality of information is also key, when you're dealing with millions of data points. The data need to be curated."

"This is clearly disruptive," he continued. "We're not *replacing* anything; we are doing a new thing. Before, we were analyzing maybe 20 percent of our information. Now we can potentially work with *100 percent* of the information coming from sensors and from reading other variables in the environment."

"Data analytics is number one for Chevron as well," Oyebanji confirmed. "We will not just have a center of excellence; we're actually talking about creating citizen data scientists, about putting data science platforms in the hands of people to run their day-to-day businesses. In one situation, simply by having a better understanding of the data we were able to bring our process in one area from least effective in the industry to top quartile. And we see that kind of transformation happening in many areas of our business."

"At Eastman, AI and machine learning are the tip of the spear," Sturgill contributed.

> That requires hiring really, really smart people, and embedding them in the business to deeply

understand the problems the business is trying to solve. Many of those are prediction problems: sales forecasting, offer management, supply chain issues. Then they develop models, and we've found that a deep AI skillset, fed with lots of data, and combined with business context has yielded incredible results. But it's hard to do, and it's not cheap.

"It sounds like across all of these situations, it's the formulation of the questions that seem to be the trickiest part, and not the technology?" Gallant suggested.

"It is," Sturgill answered, "And then refining those questions over a period of months and quarters and years."

"We are also focused on machine learning," Oliver added. "ARC has all the data elements for every flight that's booked, across the planet. How can we augment that data with machine learning that can come up with new models, and drive product value?"

Chris Clark, CIO of Levi Strauss, described a different priority for next-generation technology:

> But the next big thing for us is virtual reality. We started with a virtual stylist on our site this year: interaction with a virtual agent to get the right fit and right product for you. The next step is virtual try-on. Ultimately, it's about storytelling: If you are sitting in San Francisco, and you want to look at the Paris store, how do I help you walk through it? How do I tell its story to you?

"TetraPak is also looking at augmented reality," Meyer chimed in.

> In the spirit of a start-up, we bought a couple of hundred Microsoft HoloLenses, and started playing. The first win was pretty easy: Over-the-shoulder coaching for our own engineers, or for customers at their site, pays for everything pretty quickly when you can skip even one flight and save several days. We place one at the customer's site. They get connection to the best expertise in our company, and we monetize the add-on service capability. It's a win-win, and we have no idea how much farther it can go.

A Few Words on the Blockchain

"It appears that blockchain techology has the potential to be the number one disruptor for the services we provide," predicted Tom Casalino, CFO of ARC.

> Soon you'll be able to go online, and the offer you'll get from Airline XYZ will be customized to you. That offer needs to be locked. How are we going to create the kind of fact-based, digitized trust system that works among parties that don't necessarily trust each other? Understanding blockchain is what we're focused on: Finding the right ways to create new applications, while staying away from the crypto-currency stuff.

"I'm really curious as to why blockchain isn't talked about more among established companies," Brechbühl pondered. "At the moment, the issue is scaling. But once we get past that, the basic capability of ensuring trust in chains, or in transactions — It has such generic applicability. It's tied up in everything: payments, supply chains, voting. The potential seems endless."

"It's a move from known safety, that's similar to the transition when people started to look at the cloud, versus having their own equipment and technology on-premise," Casalino suggested. "That move from safety holds up technology advancement. Plus in the case of the blockchain, if you have a shared ledger and you're moving value, how can the accountants attest to your statements? How are regulators, particularly in financial services, going to deal with it?"

"Where blockchain has started to happen is in emerging companies where they don't have to deal with regulatory bodies," he continued. "There's an airline in Russia that's using blockchain, and they're settling their transactions in 28 seconds. Established companies take days to do the same thing."

"But going to the blockchain means that everybody has to agree to use the blockchain, and to report information to the blockchain," Galindez pointed out.

> We are organizing a pilot to trace our pipes from the moment we deliver them from our yards to the moment they arrive at the rigs. There are a lot of participants in the chain: us, the truck drivers, the couriers, the customers. And the others tell us, "Well, I'm also recording the information in my own system." The challenge is how to transition from existing systems of records: How do we convince those who have to contribute to the blockchain that it's good for them as well?

"We need to have more trust in digital systems, and blockchain is the one technology that has the promise to provide that," Hinchcliffe responded.

> There are experiments and pilots and prototypes being built everywhere. Each industry will probably end up with its own blockchain-specific features. Everyone's trying to figure out how to do it,because if you build the best blockchain, you will own that leverage point in your industry. The companies that define and design the successful ones will have an inordinate amount of influence: "We'll use that one, because that's where all the data is."

"It's another example of how each time one of these new technologies comes down the pike," Hinchcliffe finished, "It's an opportunity to seize leadership, to dominate the discussion, to influence how it's going to turn out in your industry. It's a chance to disrupt the disruptors: This is how we have to be thinking in terms of out-innovating the competition."

Scan, Try, Scale

"What's working for you and what's not, as you try to evaluate, pilot and bring emerging technologies into your organizations?" Gallant asked the group. "A lot of IT shops, and companies overall, struggle with this, and it's a skillset that's going to become increasingly valuable if we're going to be more nimble and agile and move faster."

Trajman described a model of technology adoption "that's not necessarily fast, but it seems to be very effective. It has three parts:

> The first year is about evaluation. Nothing is going to get "done:" It's all education and research, to see if a vendor or partner or technology is the right fit.

> The second year is governance and evaluation. Before they touch a piece of technology, they've said, "Here's what we need from it, and here's how we'll know if it's been successful or not." And everyone signs off.

> If it is successful, then it's funded in year three. They're not underspending, and they're not tricking anyone by bringing something through the back door. The business is behind it, dollars get allocated.

"It creates predictable and repeatable progress, and that progress can be large or small, depending on the people behind it," Trajman concluded.

"That's similar to the Fidelity model of 'scan, try, scale,'" Gallant observed. "'Scan' means to understand what's out there and what's coming down the road. 'Try' is picking some of it, piloting it, and figuring out if it will have a business impact. 'Scale' is taking the ones that really will have an impact, and making them part of the business."

"We're in the 'scan' and 'try' phases," Casalino laughed, "And our biggest obstacle is people being married to the old technology and old mindsets: 'This is how I've always done it. Why is this tool better than what I'm using today?'"

"What does this scan-try-scale approach to the consumerized digital world mean for core platforms — say, ERP — and the operating models and systems we have built to support and operate those?" Brechbuhl asked.

"Our ERP is a monster, with millions and millions of records that don't add value," Galindez lamented. "So we are re-shaping our systems of record so that they are thinner, faster, simpler, and give the people who manage the transactions what they need. Then we are building parallel systems closer to the business — customer service, production, et cetera — connected through web services and micro services."

"We call those the 'systems of innovation,'" Sturgill commented.

We have a core set of capabilities that are fundamental to delivering what we call 'the integrated enterprise:' consistent views of inventory and sales across the globe, across every one of our businesses. These are our systems of record, and they're shrinking. We are architecting the next generation so that they don't change very often. And then we'll surround that digital core with the systems of innovation that are more differentiating for the business.

"Our ERP's future footprint will also be smaller, but certain things that are outside of ERP today will move in," Oyebanji added. "A two-way movement of functionality will happen, as what you really need to do is to understand how information and data flow across your enterprise, how that drives the business value, and how you enable access for different individuals where, and when, and with the frequency they need it."

"What you need first is core processes that are standard across the globe," Clark agreed. "Then when you move from these core processes out to the edge, you get flexibility."

Gallant drilled more deeply into the trends towards IT agility and the "flexible edge:" "Are you dealing with more emerging companies, trying to manage an environment where other buyers bring in technology? What issues do you face in moving from a fairly consolidated set of strategic suppliers to a much broader set of technology supplier?"

"First of all," Casalino answered, "When you start to use suppliers in the cloud, it creates third-party data risk."

And then all of a sudden the master service agreement has 95 clauses to protect *us*, and startups don't have that mentality. We're trying to figure out how to manage that, because when you go to a start-up and ask them for indemnification clauses, or for errors and omissions insurance, they just say "Sorry, we'll go somewhere else, we don't need you." That puts pressure on Contracts and Finance. You have to segment your thinking on how to deal with them.

"So true," Hillman corroborated. "When your corporate immune system starts firing up, the start-up says, 'I don't have time: I'll find somebody who actually wants to do something.'"

"There's an all-time high in terms of the number of places that the business can go to get technology solutions," Hinchcliffe added. "IT budgets are flat, and CMOs especially gets short shrift. But their IT budgets are as big as ours now, so they wander off and buy a bunch of marketing technology that doesn't integrate with anything. Partially IT has a capacity issue, but also we are not pushing hard enough to service our internal customers with new technology."

"We're also at the point where a significant percentage of our workforces are digital natives," Wheeler observed. "They don't come from the world where IT provides technology to run the business — they just find the solution that works, and move on."

"And that's how a lot of these companies start," Chandler confirmed.

> They don't come in through the normal approval process: They find a business user who has a problem, and their application solves his or her problem. That business user becomes an advocate, and the application spreads as people find ways to do their jobs better. The struggle *for the start-ups* is to get IT to adopt this solution as an enterprise application.

"From the start-up's point of view, I understand the indemnification concerns and all the rest," said Stephen Plume, Executive Fellow of the Center. "We all know that small companies can't and won't meet those requirements. But if the big company agenda is speed and agility, and the small company agenda is speed and agility, shouldn't there be some way to meet in the middle?"

"We need to move from being 'the Department of No' to 'the Department of Helps People Solve Problems,'" Oyebanji suggested. "We may not solve all those problems using our own teams or skill sets. But we should get good at helping find what *does* solve the problem, and at bringing that in."

"But by solving one problem we can't create more problems," Galindez objected. "It's not just a matter of saying yes or no. It's a matter of finding the right balance of solutions for the company, not for that particular person at that particular time."

"So we have to be the heavy sometimes," Sturgill protested. "Take Dropbox in its early days:

> It was a horrible idea to put intellectual property into Dropbox. *Somebody* had to stand up and say, 'That's a bad idea.' Or do we just say "Great, bring your own technology," and wash our hands? *We* have to define the guardrails and define what's out of bounds, and then let people operate within the guardrails. Without them, things deteriorate to chaos.

"It's the art of the polite 'no,'" Meyer laughed. "Not everything is OK, and someone has to lay down the rules. But instead of saying 'No, you can't have that tool,' we have to say 'What are you trying to do? You know what? I know how we can solve that.'"

"But the problem remains," Trajman pointed out, "That companies with existing processes, which many have going back 100 years or more, don't organizationally know how to buy something new. Even if you set up guardrails, how do you take on a new vendor as quickly as possible? If someone asks to use Dropbox, and you tell them 'no,' how do you assure them that it's not going to take a year to bring in Box as an alternative?"

"We were losing vendors who couldn't get through our process," Clark affirmed. "So we cut our standard Master Service Agreement from 28 pages to three pages for pilot or proof of concept. The vendors still have to go through the contract lifecycle management process so that we can track everything, but with only three pages they get through very quickly."

Mr. Gallant's Time Machine

Moderator John Gallant reviewed his list of imperatives for IT mentioned during the course of the day:

> Become more agile. Be great at incorporating new technology. Skinny down the core. Get better at vendor management. Drive digital transformation. Create data from products, services from data, and products from services. Deal with shadow IT. Develop data science skillsets. Embed and integrate better with the business. Establish and maintain guardrails.

He looked up and laughed. "There's an awful lot going on here. Did I miss anything?"

"It is difficult," the ICRC's Lindsey acknowledged. "If we don't move these technologies with scale and speed, we are not going to become the organization that people need us to be."

> We are a 154-year-old legacy organization, and we're not in any vortex where digital is pulling us in and changing us. But even war is becoming digitized, and technology-based companies are starting to work in situations that traditionally have been "ours:" Airbnb is providing beds in Nepal; Tesla has put a document before the UN on autonomous weaponry and robots; Microsoft is pushing a Digital Geneva Convention.

> This is a massive change in our environment, and so we looked at what we could learn from highly disruptive companies. We found research that identifies three practices that speak to an organization's ability to adapt to these changes:

> *Hyperawareness*: How aware are you of the environment around you, and what changes in it might bring?

> *Connected decision-making*: Highly disruptive decisions need to be made based on what *must* be done, and not on what *can* be done. Remarkably few people actually spend time on the 'musts,' and so the risk is of being silo'ed in how we engage and make decisions. People spend too much time on the run, on the bits they know how to do, and not enough time on the bits that will be most transformative.

> *Rapid execution*: The ability to act with speed at scale is very complex. Our traditional backbone processes need to change in order to benefit those affected by conflict as quickly as possible.

"These all becomes 'IT issues' because that's an easy way to pigeon-hole them," Lindsey finished. "But it's actually a much bigger discussion. It's not really an IT problem, it's an *organizational* issue, and it requires *organizational* re-design."

"So if we had a time machine that could go out only five years, what will the IT organization be concerned about, if we extrapolate all these trends?" Gallant asked.

"The first thing I would do is separate the P&L component of IT," Hinchcliffe proposed.

> Most people still look at IT as a cost center, as something to be reduced, when actually we need to be investing. Our IT organizations are not designed for digital natives: They're separate functions around Marketing and Sales and Operations and Customer Care and R&D. Marketing does its job, and stops, and the sales experience takes over, with its own tools and people. Then they throw the new customer over the wall to people who actually do the work, and there's a completely different team, that doesn't know anything about what's come before, that's supposed to support that customer.

> It's a completely broken process. I would remove all those silos, and organize IT around three journeys: The customer journey, the supplier journey, and the workforce journey.

"I would split IT into two parts," Chandler counter-proposed: "The 'platform' would be common and integrated across the enterprise, and includes everything from security to accessibility to data flow. Applications would be embedded across the different business functions, with the simple rule that you can build anything you want, so long as it's accessible to everybody else on the platform, through the platform."

"The ecosystem has already evolved that way to some degree," Oliver suggested.

> 30 years ago companies stood up different ERP systems because nobody talked to anybody. Now everyone wants to move faster, and they want to cut the costs. So you move to an infrastructure on a common platform that's cared for. It's singular, consistent, and trusted. And you push the data to the edge, out to the business, and tell the business, "Here's your platform; now you go innovate." The costs will take care of themselves, because as IT gets smaller, it will outsource more of the commodity stuff, the stuff we just don't need to do.

Taylor took a different approach to Gallant's question: "Cut IT's staff and budget by 90 percent, and give every business unit their own IT function. IT's job is quality assurance, but everything else happens at the business unit level, and is integrated into business unit strategies."

Trajman argued for the most radical transformation of IT:

> Take it to the extreme: The entire strategic direction of the company is now driven by what we *must* do. If that is true, what technology exists, or needs to be created, to achieve those goals? So, flip the whole equation upside-down, and make IT responsible for determining how the company is going to operate in terms of technology; everyone else has to fall in line. Sales and Marketing don't go to IT with great ideas anymore; IT tells Sales and Marketing the technology they're going to use to sell and to market.

"Somehow we have to get to the middle, don't we?" Sturgill asked. "A lot of P&L leaders are in love with the latest technology, and they don't seem to give a flip about the business. It's now IT that

says, 'Before we invest in this technology, what problem are you trying to solve? And what outcome, Mr. P&L Leader, are you willing to sign up for *before* we buy this technology?"

"There's a balance point to find between business knowledge and the IT knowledge, between infrastructure and the digital front-edge, between innovation and experimentation, while keeping security and financial rigor and enterprise controls," Chandler agreed.

"And there's a risk of doing too little," Hinchcliffe reminded the group.

> As Keith said, "Incrementalism is dangerous." We've talked about two mindsets today: opportunity and fear. IT leaders aren't easy people to scare, but they have a lot of uncertainty around the rapid pace of change today. Companies that survive the longest preemptively seek out change: They don't wait for change to be imposed, because that's when you have the worst posture for it. In this open frontier, the future is neither clear nor set. As the quotation says, "The future will belong to those that create it."

"A year and a half ago I wrote a piece about the role of the CIO," Brechbühl mused in conclusion. "And after today's discussion of all the sea changes we are going through, whether they are permanent or temporary, I'm convinced this statement is even more true than it was when I wrote it: The CIO is the conductor of the enterprise's digital orchestra."

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