

A TALE OF TWO MISSIONS: FROM IT MODERNIZATION TO BUSINESS TRANSFORMATION

Report

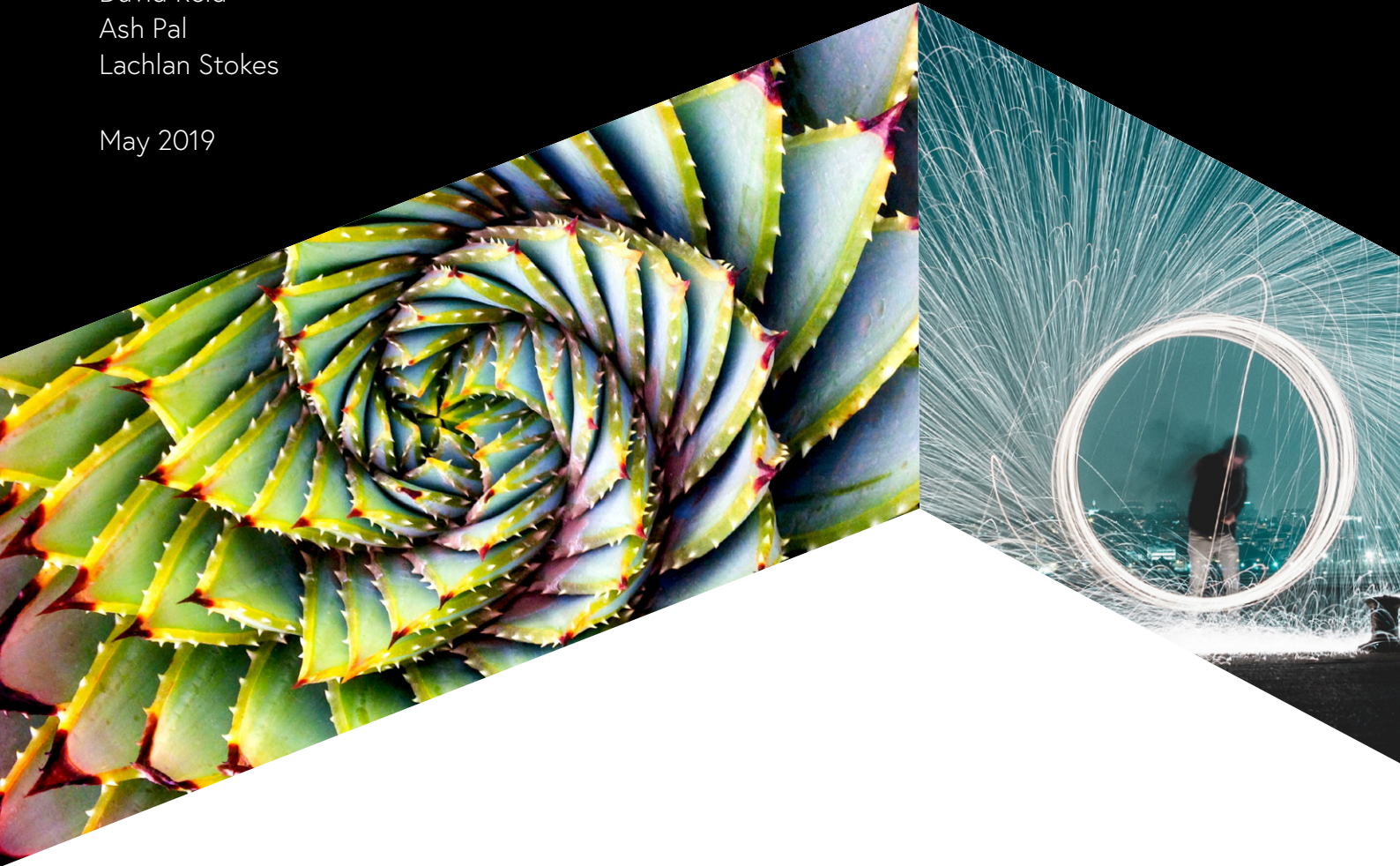
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Introduction

In recent years, the term 'digital transformation' (DT) has pervaded the business press, becoming one of those buzzwords that's almost impossible to avoid. But while it's easy to mock and dismiss the catchy phrases of the day, their rise and fall is usually telling us something about developments in the real-world marketplace. The question is: What?

For more than a decade, large organizations have been migrating to cloud computing, Software-as-a-Service (SaaS) and other internet-based services. But the technology community now anticipates a much more powerful wave of change based upon various combinations of smart products, machine learning, industry-specific business platforms, algorithmic processes, robotics, more self-service, data-driven operations and entirely new forms of business value. Taken together, these capabilities provide a vision for transformed, 21st century organizations that look much more like today's digital giants than most traditional firms do today. It's hard to over-estimate the potential of these changes.

We at LEF have long tracked the ever-expanding intersection between business and information technology, and it's clear that today's emphasis on transformation is the current stage in these developments. But in engaging with our clients, we were frequently being asked a number of practical questions

that are hard to answer: How much of this is real? Who is doing transformation well? What can be learned from others? What approaches have proven successful? and similar researchable matters.

To help our clients think through these issues, we have conducted in-depth, face-to-face interviews with digital leaders in some 30 large organizations. We have also carefully examined the vast quantity of external digital transformation research. However, this latter effort proved to be mostly a disappointing task; it soon became clear that the marketplace has struggled to assess and write about DT in a consistent and useful way, and this has only added to the overall industry confusion. In this report, we hope to clarify as many myths and realities as we can, while providing a solid steer through today's two main DT missions – *near-term IT modernization* and *long-term business transformation*.

We began our research by asking senior digital leaders some basic high-level questions:

- What does DT mean to your organization? Has this term been mostly welcomed, or is it seen as something too grandiose?
- Is DT a business priority? How does it compare to other company goals? Should DT be a matter of urgency?
- What is your firm actually doing to make the transition to more intelligent, data-driven operations? How well is this going?
- How is leadership – both senior and middle management – overcoming the inevitable inertia, politics and short-term payoff concerns?
- What role is enterprise IT playing? What is the balance between business unit initiatives, the traditional IT function and the use of external partners/suppliers?
- How is your organization handling the people issues and nurturing the required learning culture and behavioural change?

As this report will show, these open-ended questions resulted in a wide range of passionate views, from DT enthusiasts and sceptics alike. While there is no magic path forward, companies are finding a variety of ways to pursue their digital future.

Terms, definitions & attitudes



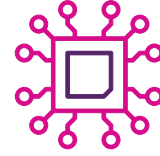
IT MODERNIZATION:

Migrating to newer, more capable, agile or more efficient technology approaches



BUSINESS TRANSFORMATION:

A **major change** in an organization's purpose, value proposition, operations, culture and/or behaviour



INDUSTRY DISRUPTION:

The **displacement** of established firms, products and/or services by a new player, technology, business model or value network

Acknowledging the sceptics

It quickly became clear during our interviews that the term 'digital transformation' is unusually divisive. For some, it's a useful way to describe their major change initiatives. Yet with quite a few others, it's seen as either vendor-driven hype that distracts them from the real challenges they face, or as potentially demeaning to the way things are currently done. Indeed, we came across more than one instance of the term 'DT' being essentially banned, as well as the purposeful removal of the word 'digital' from many job titles. As one senior executive quipped, "Using the word digital makes it all about the flashing lights and the gadgets; it's a distraction, it should be all about business change." Several participants said that they preferred the word 'transition', as it implied a continual need for evolution, as opposed to a one-time, butterfly-like metamorphosis.

In an October 2017 LEF Research Commentary, we also observed that the terms digital and digital transformation (DT) are indeed often abused, and can be as 'clear as MUD', in that they too often suffer from:

- **Multiple meanings.** Different people use digital and DT in different ways – the marketing department thinks of digital media or customer engagement; the process people of greater automation and robotics; others imagine smart cities, IoT, artificial intelligence, etc.
- **Unnecessary hype.** Digital and DT are often used essentially as exclamation marks, in order to convey modernity, innovation and excitement.

- **Digital whitewashing.** This is a more cynical tactic in which the words digital and transformation are attached to cost-cutting and/or restructuring to make them appear to be part of a necessary wave of change, much like many green IT initiatives (hence 'greenwashing') sometimes provided a dubious sustainability spin.

But the sceptics are much more wrong than right

Thus, our first challenge was to clarify our own definitions, starting with the words in the box above. While there is surely a lot of puffery in the market today (when hasn't there been?), we disagree with those who largely dismiss the terms digital and digital transformation. Virtually every traditional large organization we work with is wondering whether it will eventually need to operate much more like today's dot.com leaders, and there is great interest in what others are doing, as well as a real fear of missing out.

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Similarly, some interviewees said they prefer to drop the 'digital' and just use the term 'transformation', but this can be misleading. Digital transformation is just a subset of transformation overall – in that there are undoubtedly non-digital forms of transformation as well. Consider how genetics is transforming pharmaceuticals, and fracking the fossil fuel industry. Like it or not, to talk specifically about IT-driven change, the word digital – or an equivalent – is very much necessary, simply for clarity. Likewise, today's extensive use of the word digital should also be defended. While some scoff that digital is just another word for IT, this is largely incorrect. The reality today is that 'IT' is mostly used to describe the traditional back-office functions managed almost entirely by the central IT function. In contrast, 'digital' tends to be used to describe newer, front-of-the-firm initiatives of direct concern to the organization overall. The two terms have very different connotations, and thus tend to be used in very different ways.

To provide more tangible, working definitions, LEF segments things that are often called 'digital transformation' into three broad categories:

- **IT modernization** is far and away the most prominent form of change observed, as just about every firm wants to build a more agile and efficient digital foundation or *core* – and in its most advanced forms a *digital twin*. Much of this work is managed by traditional IT, and it is often a complex and mission-critical process of detailed change management. If one sees significant operational modernization as a form of transformation (as many people understandably do), the DT market is very large indeed. It's what most organizations are actually doing today, typically with steady success. However, some organizations are considerably farther down this road than others.
- **Business transformation (BT)** is considerably less common, as it occurs when an incumbent organization successfully makes a major shift in strategy, business model, value proposition, organization or culture. BT is how existing firms successfully adapt to major marketplace shifts. If you use only this narrower definition, the DT market is highly strategic, but considerably smaller in terms of customer spending. As BT is at the heart of making 20th century firms operate more like today's 21st century leaders, it is the primary focus of this report.
- **Industry disruption** is clearly another major buzzword of our time, and rightfully so, as the displacement of incumbent industry leaders by new technology-led rivals has already transformed some industry sectors and is a looming possibility in many others. Disruption is where the biggest strategic shifts periodically occur, and therefore it is almost always of interest to senior executives. By our definitions, industry disruption is

essentially the opposite of business transformation. In the former, the new players win; in the latter, the incumbents prevail. The overall outlook for industry disruption is discussed later in this paper.

In this report, we will use the terms *IT Modernization* and *Business Transformation* according to the definitions above, and *Digital Transformation* as an umbrella term to cover the dual missions of large-scale IT modernization and/or significant business change. This pairing seems the best reflection of how the concept of digital transformation is being used in the marketplace today.

We also observed a fourth path of change, which could be described as **pay as you go**. In this view, little value is placed on strategic digital positioning, or deep faith in an increasingly technology-driven future. Instead, tech projects are evaluated on relatively short-term ROI criteria, typically resulting in a slow and piecemeal rate of change. There are certainly many companies that – while they might not admit it – in fact do operate this way, and such firms may not like the phrase 'digital transformation' – or reports like this. But because these firms take no risks, they can never really lead. They are essentially betting against the digital future, a wager they can only win for so long.

Setting the deep sceptics aside, we simply point out that all three of the areas above face high levels of uncertainty. Many companies wonder if aggressive, rapid modernization is really required and worth the cost and effort. They aren't sure whether data, algorithms, machine learning and platforms will actually transform their current business in any meaningful timeframe. And they have heard many times how new rivals are destined to fundamentally disrupt their industry sector. These are all reasonable concerns that often require strong senior executive commitment if a sense of urgency is to be sustained. But over the course of our interviews, it was hard to avoid the gut feel – both ours and many of the participants' – that most organizations aren't moving fast enough.

In our research, we observed that most companies are trying to find a workable path through these dilemmas. Sometimes, companies pursue DT as a matter of faith, because they just 'know' this is how the world is changing. From a more evidence-based perspective, one of the more effective approaches we have seen is ploughing some or all of the cost savings from improved back-office efficiencies into more forward-thinking and speculative efforts. But the bottom line is that firms that believe in a digital future need to find some way to prepare for it. As the well-known author Martha Heller told us, "When the whole world has gone digital, neither digital nor digital transformation will be needed, but we are a long way from that."

State of play & case examples

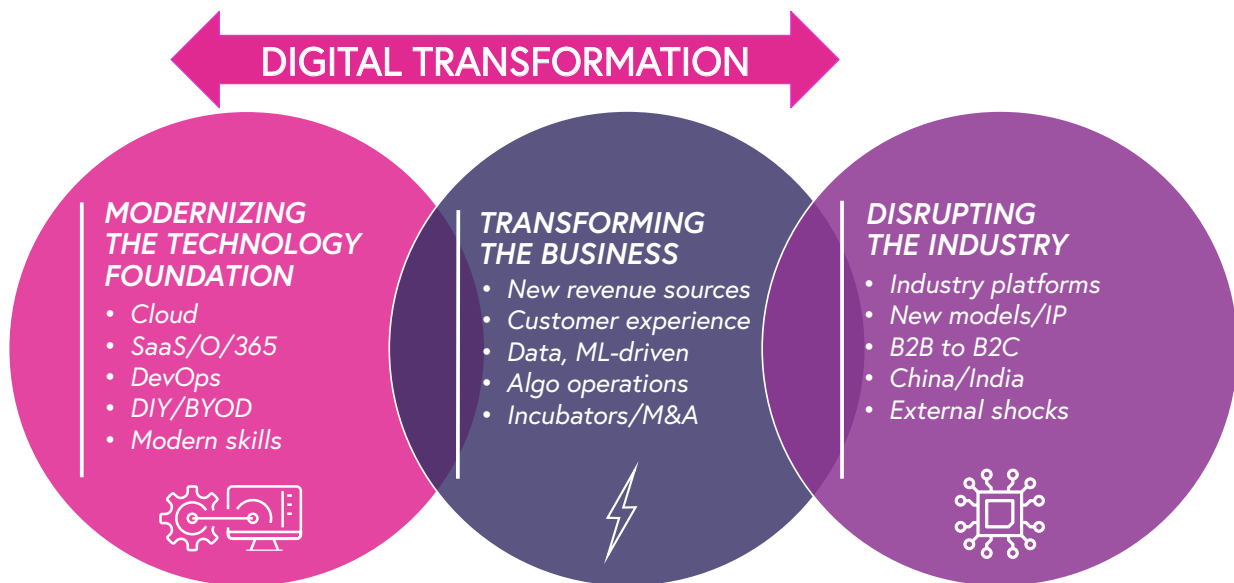


Figure 1 – The three main types of digital transformation

Today's state of play – IT modernization

As shown in Figure 1, IT modernization is mostly aimed at improving a company's underlying technology core. Clearly, the shift of commodity computing to the cloud, and productivity and collaboration applications to SaaS – often accessed via personally-owned devices – is happening in organizations all around the world. While not transformative of the business per se, these initiatives are important, even essential, foundations for wider business change. As one exec interviewee quipped, "This is just below the level I really care about".

For example, Copa Airlines views modernization as a baseline strategy to operate in what it sees as "the new normal". The company believes that a new set of expectations in terms of quality, velocity and customer intimacy has arrived, and that this demands a different set of technologies and practices. In this sense, the IT modernization job won't ever be finished because new technologies, expectations and practices don't allow organizations to stand still. DBS Bank (formerly the Development Bank of Singapore) stresses the somewhat more powerful language of becoming "digital to the core".

Many interviewees noted that IT modernization can and often should be done just to remove inefficiencies and waste, but that it is also the gateway to future innovation as foundational technology that is out of date can be a considerable source of inertia. One participant spoke of a desperate need to escape the "legacy ERP straitjacket". But, as frequently highlighted in our interviews, sunk levels of investment in this area – particularly capex – often tip into the £/\$/€ billion range, and the desire to 'sweat the assets' is understandably high. Other organizations mentioned the need for significant business-specific modernization in areas such as the factory floor, IoT, customer experience, process automation, predictive analytics and the use of more agile development processes; and these often border on being transformative.

Equally important, the workforce, mindset and IT skills required to develop, run and maintain a modernized technology estate are different from those needed to run traditional data centres and internal systems, and thus a modernized digital *culture* was often described as an equally important need – both within IT and across the firm overall. Many firms are now going through a significant process of refreshing their digital skills, typically requiring people with extensive *native cloud* experience. Such changes can be painful, and the challenges of talent recruitment and retention were a recurring research theme.

In short, virtually every organization we spoke with is engaged in IT modernization to some degree or other. There were no deep sceptics (at least none that admitted it), although perhaps that is to be expected in a self-selected LEF audience. However, there was a fair amount of hype. Both in our interviews and especially in our wider literature scan, a number of small-bore modernization efforts – such as moving to Office 365 – were described as digital transformations. This type of over-statement doesn't really do anyone any good, but unfortunately, it is much more common than we would like to admit.

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Today's state of play – business transformation

Large-scale business transformations are more difficult to find, but certainly many firms today envision a major shift in their purpose, business model, revenue sources and operations in the not-too-distant future. Sometimes this shift is almost entirely about transforming internal systems, processes and the decision-making culture. Other times it is about data monetization, transforming the customer experience and/or becoming their market's *digital leader*. While both internal and external goals are important, the latter tend to have greater competitive impact.

Some of the most powerful external examples are in the tech sector. Consider the way Microsoft has changed from a seller of Windows-based software to an innovative cloud computing supplier, once again at the forefront of global technology advances. In his book *Hit Refresh*, Microsoft's CEO Satya Nadella describes the total re-examination of the purpose of the organization, its role in the world and his own role as a transformative leader. Similarly, AT&T has had to rapidly transform itself from a wired to wireless telecom provider, as Dell has shifted from selling consumer PCs to a mostly large enterprise focus.

But outside of tech, widely recognized large-scale business transformations are more spotty. Few companies feel they are deep into the journey, with many saying that they are only 10 to 20 percent of the way there, reinforcing our view that we are looking now at BT initiatives and processes that will span much of the 2020s. In the general press, Capital One is often cited as being among the furthest along. Among the interviews we conducted, DBS appears to be among the most advanced (see Appendix B).

In a highly visible transformation initiative, GE tried to reinvent itself as a software company, creating an entire business unit (GE Digital) to build an IoT platform for the world's internet-connected machinery. While the venture had some successes, the story is more a cautionary tale of how difficult real change can be. In December 2018, GE announced plans to spin off its digital business into a separate IoT company. Similarly, GE's competitor Rolls Royce through its R² Data Labs is also attempting to monetize its jet engine data by using it to help its airline customers optimize their flight operations. The goal is to add value and become less dependent on new engine sales.

Likewise, the Dutch company Philips, with a history in many ways similar to GE's, has also been transforming itself, spinning off its traditional businesses to focus on healthcare technology, and this notion of aligning digital with a sharper strategic focus appears to be working. As Jeroen Tas, Chief Innovation and Strategy Officer, said in his interview with us: "It's about transforming while performing. If you do only one or the other, you won't be successful. If leaders only focus on performance, you have an imbalance in leadership. You need to be able to make explicit trade-offs between the next quarter and performance over three to four years." (See case study in Appendix B.)

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Likewise, John Deere, the US-based heavy equipment manufacturer, has been seeking to transform itself from a provider of tractors to a leader in the growing *smart farming* movement, experimenting with alternative business models that involve products and services fuelled by data rather than gasoline. The goal is to put its equipment at the centre of the agricultural ecosystem – seeds, fertilizers, drones, irrigation, harvesting, etc. The resulting platforms and services, should they reach critical mass, would act as both a moat to protect the tractor product line and a foundation for future innovation. But as in many industry sectors, orchestrating the players, managing data ownership and reaching a tipping point remain challenging. Bayer Monsanto also talked to us about transforming agriculture, emphasizing the internal changes needed to address the complex data challenges involved.

Looking ahead, we believe smart farming may prove to be a leading business transformation sector, since today's industrial agriculture system appears to be approaching *burning platform* status due to growing societal concerns about industrial farming, fertilizers, antibiotics, waste, pollution, water usage, safety, climate change, labour availability and other factors. The sector may also prove to be a good test of whether incumbents such as Deere and Bayer will hold their positions, or whether newer firms will take the lead.

In virtually all of these cases, a common theme is the desire to become more *data-driven*. People see how today's digital leaders are powered by algorithms, and utilize data and machine learning in ways that traditional organizations do not. For example, in a recent LEF Study Tour visit to Facebook, one of its engineers told us that some 80 percent of its engineering workforce now use ML (machine learning) as part of their day jobs. Closing the huge gap between today's digital giants and the traditional large firm is clearly a long-term DT goal, but as of now, the gap is still widening. As one client noted, "We have been trying to be more data-driven for a decade, and feel we're only about 20 percent there."

Incubators proliferate

Another frequent DT strategy mentioned in our interviews was the use of *digital incubators* or small start-up teams to explore and experiment in new ways. While often a reaction to the 'must be more innovative' challenge, such groups are essentially an acknowledgment that either the existing business model isn't conducive to entirely new approaches, or that the entrenched culture would likely stifle the creativity needed. As Piyush Gupta, CEO of DBS Group, told us: "DBS's talent strategy is to 'grow its own timber.' To do that, the bank needed to fix its environment and equip employees with the tools to learn new skills and experiment."

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One such example is the German chemicals firm BASF, which has created BASF 4.0 – a small but high-profile unit reporting to the COO, led by a CDO and unconstrained by the traditional approaches of the existing business. While not explicitly declaring itself to be in charge of digital strategy, the unit is pushing many new technology initiatives across BASF's business units and geographies.

We saw many similar experiments in our research, across a variety of sectors from consumer goods to commercial real estate, and even the US Air Force attempting to leverage the external market to increase its velocity of innovation. While every sector is searching for its X-Tech (MedTech, FoodTech ...) holy grail, companies are also using these incubators to explore adjacent business models and markets, and to gain more experience with machine learning. Almost all were successful in generating ideas, pilots and knowledge, yet most also struggled to be broadly adopted and/or to scale up. This seemed a particularly strong pattern in financial services, with a wide range of lab-style operations under way in many major banks.

Other organizations reported acquiring start-ups mostly for their IP, expertise or products, essentially as a way of conducting research and developing a better sensing function. One interviewee described such activities as "tinkering at the edges" of the organization, and thus a prelude to future transformation. But as an interviewee from the energy industry told us, you "have to approach proof of concepts and pilots with the mindset that we have to scale it out". The catch is that this usually requires significant enterprise IT involvement, which can seem the very opposite of the incubator model. This speaks to the need for a strong business/IT partnership, as discussed later in this report.

"Approach proof of concepts and pilots with the mindset that we have to scale it out."

A more curious finding was that such incubator groups are set up mostly as a PR and recruitment strategy. Generating the company image needed to attract top talent and be perceived as a modern organization was cited on several occasions, and speaks to the importance of talent and skills. One major European manufacturer pointed to 45,000 vacant IT positions in its home nation market. In this environment, positioning the firm as interesting and progressive is seen as a necessary recruitment differentiator. Whether recruits can be retained with this approach is another question altogether.

Today's state of play – future industry disruptions

Almost by definition, industry disruptions stem mostly from the external world. While we typically think of disruptive change as coming from new digital rivals such as Uber or Netflix, it can also come from new players, perhaps from China and India, or from potential external shocks such as military conflicts, climate change, trade wars, natural and human disasters, or major political/regulatory shifts, and the new mandates, opportunities and challenges such shocks might initiate. China will likely be involved in many such disruptions and controversies, with recent debate around Huawei likely a sign of things to come. One vivid quote came from DBS's CEO Piyush Gupta who arranged to meet Jack Ma to better understand the challenge Alibaba presented: "I knew I needed to think like them and be like them. Now I try to get everyone in the bank to ask: 'What would Jeff Bezos do?' not 'What would Jamie Dimon do?'"

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It became clear during our interviews that digital platforms, platform business models and platform economics remain major sources of potential disruption, as we explored and assessed in our 2018 report *Liberating Platform Organizations*. Of course, the word 'platform' is also one that is heavily hyped and often used in confusing ways. But as explained in our report, major new *business platforms* substantially reorganize an existing market space in a way that dramatically improves the customer experience – as Uber, Netflix, eBay, Amazon and others have clearly done in their respective sectors.

While thus far mostly a B2C story, we believe that the next generation of platform disruption is likely to affect industries that are currently B2B. Consider pharmaceutical companies and how little they interact with the patients who use their products. As one pharma executive told us, "Nike knows more about the people who wear its sneakers than we do about the people who take our cancer drugs." In a future world of wearables, IoT and much more directly connected customers, these dynamics could – and should – change.

Entrepreneurial CIOs who are able to look over the competitive horizon are sometimes taking this B2B to B2C shift into their own hands. For example, the CIO of one pharmaceutical company, which mostly distributed its

product through a traditional big-box retailer, spun up a direct-to-consumer business using Amazon, and turned it into a multi-million-dollar P&L. According to the CIO, the primary driver of this strategy was the changing nature of customer behaviour and the subsequent need for greater brand control.

Other potentially powerful business platform possibilities include car companies, insurance firms, appliance and medical equipment makers, and pretty much anyone who sells through dealers, brokers or similar entities. While still early, these areas are now being carefully watched, as the moment when such traditional B2B models 'crack' will have vast strategic implications. As Martha Heller noted, "Customer-centricity is the single most important form of digital transformation in the market today." We certainly agree, which is why the formation of new customer-centric platforms is such a major focus of our ongoing research.

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While largely outside of the LEF's normal research scope, many experts have also forecasted that environmental challenges and various green technologies will ultimately disrupt or transform sectors as diverse as energy, transportation, agriculture and urban development. The potential of these external shocks was a major theme of our November 2018 Executive Forum *Old Models, New Models within Western Economic Thinking*. It's an excellent example of why the terms 'transformation' and 'digital transformation' are not synonymous. DT should be seen as a subset of transformation overall.

Fuzzy boundaries

But as suggested by the overlapping circles in Figure 1, the real world doesn't always align perfectly with these definitions. There are clearly IT modernization efforts that are so vital to the business that they are also transformative in nature. Consider the use of technology platforms designed specifically to support advanced analytics and machine learning. Similarly, and as we will see later in this report, sometimes incumbent firms can disrupt themselves and their industry, so that the boundary between business transformation and industry disruption can also get fuzzy. Nevertheless, these broad definitions and spheres of activity generally hold, and proved very useful in shaping our discussions.

Transformation or disruption? Scenarios for the 2020s

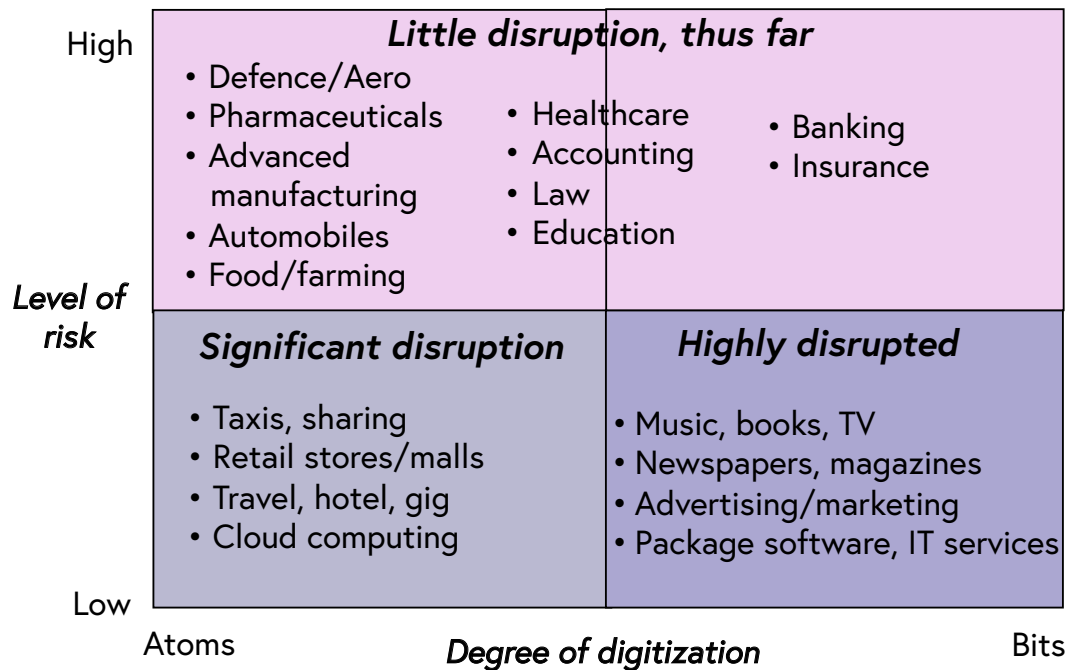


Figure 2 – What will happen in the top half of this figure?

Having observed the patterns of industry disruption since internet usage took off in 1995, we have long used various versions of the 2x2 framework in Figure 2. The X-axis shows to what extent the products of an industry are physical (*atoms*) as opposed to digital (*bits*). The Y-axis compares the relative risk (security, liability, regulatory compliance) profile faced by that industry. The *professional sectors* – healthcare, law, accounting, education – have significant bits (information) and atoms (human delivery) dimensions, and are thus placed in the middle.

It is important to understand that the placement of each industry in the figure is not based on whether that industry has been disrupted or not. Each industry's position is determined entirely by its atom/bits and risk profile. However, plotting each sector in this way reveals the overall pattern of change thus far.

The lower right quadrant (low security, digital businesses) has been by far the most disrupted sector, followed by the lower left quadrant (low security, physical businesses). This suggests that bit-based businesses tend to change faster than atom-based ones.

More importantly, the industries in the upper half of the figure have experienced far less change, suggesting that the level of risk has thus far been the dominant disruptive barrier. So, the key disruption question going forward is simply: What will happen in the top half of the figure? Will these industries be transformed from the inside, disrupted from the outside, or stay more or less as they are?

As in the long run the last option seems unlikely, business transformation and industry disruption seem to be the main two strategic paths going forward. And while the ultimate balance between these two scenarios is still highly uncertain, one thing is clear: establishing a strong, agile, modern IT foundation will leave firms much better prepared for whatever changes are to come, and it is this realization that is driving many DT efforts today, as shown in the short case examples below.

Case example 1

Self-disruption in professional services

In a particularly insightful interview with an executive from a well-known professional services firm, the three-tier model in Figure 3 was used to clarify the firm's digital transformation strategies. The three levels are regarded as *strategic*, *tactical* and *operational* – from top to bottom. They closely resemble our *modernization*, *transformation*, *disruption* spectrum of activity.

At a business model or strategic level, the recognition that existing revenue streams in tax, audit and assurance will eventually dry up is driving the need to disrupt this business through automation before competitors do. Gaining a first-mover advantage and establishing an early edge is seen as an urgent company need. Given the firm's stated goal of having quality permeate everything it does, and with a prominent brand that needs to reflect that, being seen as 'up to date' is also very important. While highly successful overall, the company sees transformation as a way to guard against complacency, as it expects that many of its markets will look quite different five years from now.

Instead of emphasizing over-arching company DT goals, specific business divisions are pursuing various digital opportunities, and the company has more than enough resources to fund such efforts. This approach highlights the importance of strategic context. As will be discussed more fully later in this report, we always stress the importance of situational awareness and the specific context for change. A one-size-fits-all approach to digital transformation is unlikely to yield positive, sustained results. It can easily become a formula for hype, waste, disappointment and proving the deep sceptics right.

Readers can use the digital assessment in Appendix A of this report to understand their current state and to help identify their best future course of action.

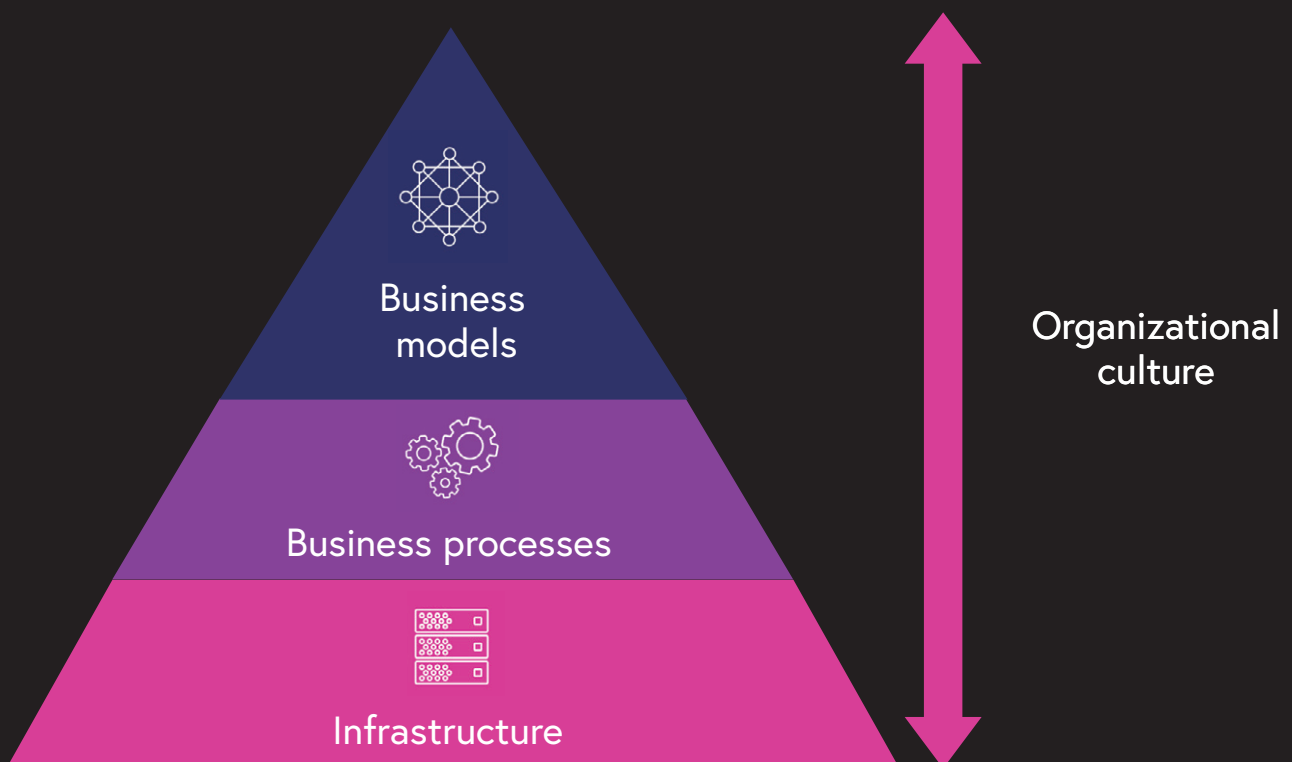


Figure 3 – Transformation can take place at multiple levels

Case example 2

Internal process transformation for analytics – Oil & Gas

A focused approach was also emphasized by the CDO at a major oil and gas firm. 'Digital' is certainly not a new term in this industry. High-performance computing has been used in exploration for many years, but the systematic and effective use of analytics across the rest of the industry is anything but the norm. The firm we interviewed has long spent heavily in these areas. But because proof-of-concept (PoC) and pilot projects had proliferated, it determined that its effectiveness could be greatly increased (and spending reduced by 20-30 percent) through a more coordinated approach. By transforming isolated activities into a common innovation methodology, the group was able to systematically evaluate hundreds of active PoC projects in terms of their Net Present Value potential, as well as their effort vs. benefit.

Crucially, the leaders and sponsors of this significant governance and cultural change had to come from the business. The initial proposal was presented by IT to a curious but sceptical executive committee whose "buy-in was essential". The thinking was that only after the senior leaders have reached sufficient comfort can they change the mindset of the rest of the organization. While the CDO succeeded in selling the size of the potential prize to most of the executive committee, one of the top leaders had to be persuaded (through extensive 1:1 meetings) to buy in more strongly.

With senior support in place, the company told its analytics community that it needed to work, make decisions and govern itself differently. For example, it shifted the PoC review process to two-week sprints, thus breaking the old model and changing the traditional decision-making culture. Previously, decision review boards took place every three months, and senior leaders needed to dedicate substantial time to this. By shortening the cycle, they built momentum that could be carried over to other teams. As the company's CDO noted: "Looking back, the biggest challenge was beating the clay layer/permafrost/frozen middle. While there is no simple answer to this, internal motivations had to be changed. The power of demonstration is important here, as people need to see things before they believe."

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Another important decision was stopping the digital team at PoC and pilot stage – so each initiative either died (no strong business sponsor to drive it on), iterated back to the digital team (more learning required), or was handed over to IT to become a company project. Interestingly, the company also reshaped the business/IT relationship by creating digital product managers (in LEF's lexicon we'd describe these as 'settlers') to take pioneer innovations and shepherd them into the IT organization.

Getting the right team for all this turned out to be hard, as the company's HR and learning people were seen as too operational; and the organizational excellence and design folk weren't close to this either, as their knowledge was too far behind. As the CDO noted, "Many organizations believe they have all the expertise they need, that 95 percent of what they need to do can be done internally, and that getting outside help is a bad thing". While this company knows that its major technology partners have their own change agendas and, in many ways, "resemble the problem", it also feels that significant external help is still absolutely necessary.

The CDO summarized its overall DT experience as follows: *"Digital transformation is not about technology, it's about people, mindsets and data. First, people need to have an **open mindset**. Second, we need the right **capabilities**. We have no shortage of ideas; we just need to stop some of the hobby projects, as excitement can create a lot of waste. How to scale things up is very important. Third, you need to pay attention to **data**, or it will slow you down. You need a platform strategy around data, you need to get organized around the data. Most incumbents simply aren't set up this way. Most companies have a problem with enterprise IT and a poor impression of it in the business. IT can't often be trusted to do digital. At our firm there was real nervousness about IT, a lot of push back. They needed to be brought in earlier. Architecture is the best angle to do this."*

Case example 3

Ecosystem cooperation & risk-sharing – for blockchains

Some of the most important future forms of business transformation will require unusually high levels of industry collaboration and inter-operability. Consider how self-driving cars will need clear standards so that vehicles can easily and reliably communicate with one another, or the way blockchains will require the cooperation of key constituencies in most of their key shared-ledger applications – be it supply chain, financial clearing or various forms of authentication.

VAKT has been set up as a privately-owned digital platform and ecosystem for trade processing. It uses a blockchain-based system for the trading of oil, with

organizations at every stage of the value chain involved. VAKT investors include giants such as BP, Shell, Chevron and Total, as well as the Norwegian energy firm Statoil, trading houses such as Gunvor, Koch Supply & Trading and Mercuria Energy Group, and banks including ABN AMRO, ING and Société Générale. All these firms now have both skin in the game and incentives for cooperation. It's often the only way to transform – and manage the risks in transforming – entrenched trading systems.

Anticipating technology & cultural shifts

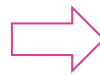
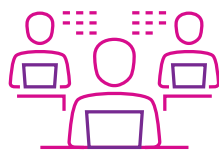
Without exception, every organization we spoke with was on some sort of journey from the left to the right of Figure 4. Whether it be a shift from 'oldco to newco' or to a more citizen-centric digital government, there is undeniable movement.

But it is equally undeniable that for most firms, rapid, comprehensive digital transformation remains unrealistic,

with most of today's changes limited to specific projects or parts of the organization. Nevertheless, ongoing technological pressures and change will eventually lead to most of the aspirations on the right being fulfilled. To see why, we need to look more closely at the nature of today's technologies and their likely timing and evolution.

20TH CENTURY ORGANIZATIONS

- Data centres
- Sales-driven
- Capex
- Organizational silos
- Gut feel
- Human decisions
- Organizational learning
- Proprietary
- Innovation vs. efficiency



21ST CENTURY ORGANIZATIONS

- Cloud computing/SaaS
- Customer experience
- Opex
- Fast, agile teams
- Data-driven
- Algorithmic operations
- Machine learning
- Strategic openness
- Innovation & efficiency

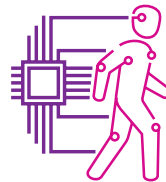


Figure 4 – What does digital transformation look like?

1993-2005 – WEB/ECOMMERCE

- Email
- Free media
- Browse/search
- Choice/convenience
- Retail/payments

2006-2016 – SOCIAL/MOBILE/CLOUD

- Mobility/apps/location
- Cloud computing
- SaaS
- Social media/P2P
- Open source/sharing



2017-2030 – POST-CLOUD INTELLIGENCE & AUTOMATION

- Machine learning
- Speech/image processing
- Agents/bots/algorithms/RPA
- IoT, sensors, 3DP, serverless
- Vehicles, drones, robots, 5G
- Smart products/systems
- Wearables/implants, AR/VR
- Biometrics/brain interfaces
- Blockchains, digital cash
- GPUs, custom, quantum

Figure 5 – Technology drives the transformation agenda

While technology investments must always be evaluated in a business context, there is widespread acknowledgment by our interviewees that the current DT emphasis is being driven by major advances in technology, especially IoT and machine learning. As depicted in Figure 5, we are in the early stages of another major wave of change – one that we believe is even more powerful than those we have already experienced. We say this because intelligence and automation applications are generally higher up the value chain than the commerce and connectivity capabilities that the digital world has leveraged thus far. Consider the shift from browsers (phase 1) to touch-screen (phase 2) to conversational (phase 3).

But, as mountaineers like to say, never mistake a clear view for a short distance. It's important to bust the myth that technology change is happening faster than ever before, and that major market shifts are right around the corner. While the previous eras of web/eCommerce and social/mobile/cloud enabled very rapid growth, the current wave of intelligence and automation hasn't seen nearly the same speed of adoption, or the rapid emergence of major new players. One reason is that many of these technologies require extensive ecosystem cooperation and coordination, unlike the previous B2C eras.

While we expect that virtually all of the technologies listed above will ultimately proliferate and prove to be truly transformative for businesses, governments and entire industries, until then the market will remain in a state of relatively high uncertainty, as technologies of great promise seek to reach a still-elusive critical mass. It's one of the reasons why DT strategies and their Rol are often still a bit vague, requiring faith in the importance of

long-term positioning. Many of the capabilities may well take most of the 2020s to come to their full fruition, and in this sense the maturation of technology and the clarity of the digital transformation process can be seen as two sides of the same coin.

"It's important to bust the myth that technology change is happening faster than ever before, and that major market shifts are right around the corner."

This underlying near-term uncertainty is also why we recommend that digital leaders develop and nurture their sensing capabilities so that they can help their organizations better determine when a new technology is ready for widespread adoption. This sensing ability is more important now than ever, as almost all of the innovation in the areas listed above is taking place outside the walls of any one organization, and often outside of traditional suppliers and partners.

"We recommend that digital leaders develop and nurture their sensing capabilities so that they can help their organizations better determine when a new technology is ready for widespread adoption."

Our recent report on *The Matrix Mindset* expands upon this thinking, as do our annual Study Tours. Similarly, our *21st Century Human* practice is focused on helping organizations embed a digital learning mindset in their cultural DNA. Most strategically, our *Wardley Mapping* methodology can help firms anticipate when new technologies are reaching their transformative mass market phases, as explored further in the next section.

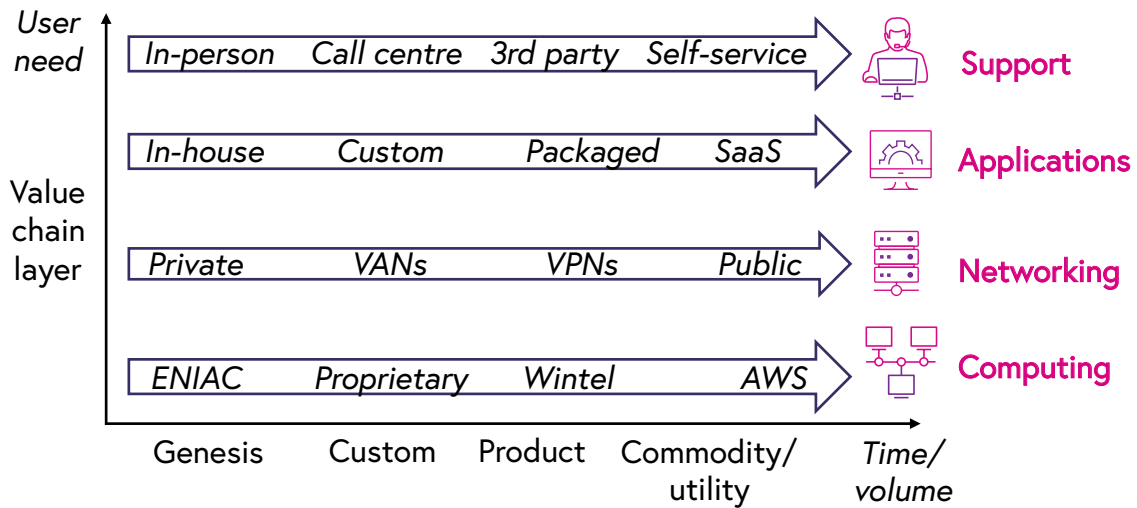


Figure 6 – Technology lifecycles are an important transformation driver

Figure 6 suggests that the lifecycle of a technology is almost as important as the technology itself. It depicts four examples of how new technologies have evolved through four distinct phases – from their initial *genesis* through *custom builds* to *product* and eventually a *commodity* product or *utility* service. It also shows how market leadership and practices have changed during each phase. Indeed, each shift is essentially a form of disruption and/or transformation, and in this sense, DT is built into the very nature of how technology typically evolves.

"The lifecycle of a technology is almost as important as the technology itself."

While each of the phase shifts shown above is clearly important, the transitions from custom to product and from product to commodity almost always have the most market impact. Consider the way the proliferation of cloud services such as Amazon AWS or Microsoft Azure disrupted the traditional private data centre approach, while also enabling many new practices higher up the IT value chain, including DevOps, machine learning, serverless and all manner of new applications that

would never have happened without the 'pay by the drink' capability that the cloud provides. In contrast, consider how virtual reality headsets have struggled to get past the custom application stage.

Ultimately, most organizations adopt largely the same underlying technological foundations, some forced by obsolescence and others by a desire to tap into new capabilities earlier than their competitors. In other words, some organizations ride the various technology curves faster than others, and this can be an important source of competitive advantage. Our Wardley Mapping methodology helps companies apply this lifecycle analysis to their particular company value chains, to better anticipate and respond to the likely patterns of technology-driven change, as explored further below.

"Wardley Mapping methodology helps companies apply this lifecycle analysis to their particular company value chains, to better anticipate and respond to the likely patterns of technology-driven change."

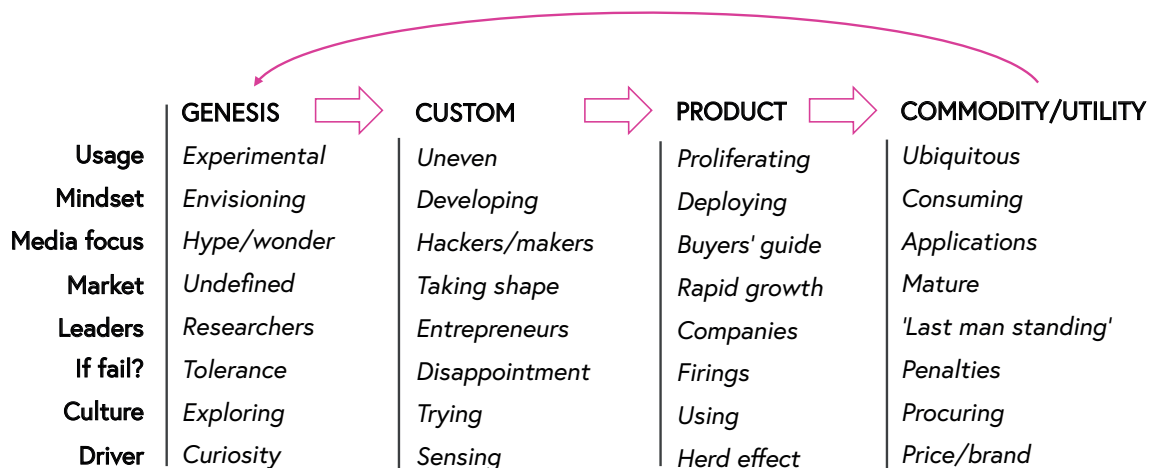


Figure 7 – During each phase, market dynamics are transformed in predictable ways

This same lifecycle perspective can help us understand the need for ongoing cultural transformations as well. Given the importance of timing, we put a heavy emphasis on trying to systematize the anticipation of transformative change. By closely observing technology usage – and especially by paying particular attention to the 'media focus' line in Figure 7 – it is possible to anticipate when the various stages of change will occur better than people who don't use this approach. This technique can also help ensure that the right methodologies and mindsets are deployed for each phase.

During our interviews, we heard many variants of the phrases 'we need to be more agile' and 'we need to learn to fail fast'. But as we can see in the Figure 7, the notion of failure is typically only tolerated in the early phases of a technology's evolution. Failure at the product or utility stage typically ends badly for those responsible. Consider a bank where failure might be acceptable in a blockchain experiment, but not when an infrastructure outage prevents customers from executing business-critical transactions.

From an HR perspective, the phases also require different types of talent. Many organizations know that they need to experiment with technologies when they are in the earlier phases of their evolution simply as a way to attract – and retain – top people. Employees also know that they must continually modernize themselves and ride the technology curve, lest they too become obsolete. This means that companies and employees alike can use the same lifecycle techniques to keep their jobs and careers on track. We will return to the importance of this *personal transformation* later in this report.

In our research, we saw many firms struggling to move effectively through these phases. Most are able to initiate new projects, pilots and PoCs (genesis), but typically struggle to scale or adopt this work more widely. This often occurs because the pilot takes place within an individual business unit, with little thought for the challenges of enterprise-wide – let alone ecosystem-wide –

deployment. Such product or 'settler' challenges usually require extensive enterprise IT and/or business partner involvement. Balancing an organization's need for both experimental and commodity IT work is explored further in our recent paper – *Pioneers, Settlers and Town Planners*.

The simplified graphic in Figure 8 was quickly sketched by a prominent IT industry executive to conceptualize how an organization can work once it has a modernized foundation that effectively leverages commodity services. In this case, the company is able to put most of its focus on its customer-facing operations. To do this, it leverages a vast array of commodity services – such as AWS, Salesforce, Workday, SAP Concur, Office 365 and others.

While most traditional firms have legacy systems that are not so easily modernized, the goal is to leverage commodity platforms to the greatest extent practical. This is what many CIOs mean when they talk about 'modernizing their core', or 're-platforming' their operations. However, it's important to recognize that these changes won't always save money; they might even cost more, but they develop modern skills, and position the organization to more easily leverage future industry innovations, especially machine learning.

Of course, such migrations can take considerable time and effort, given the large – and sometimes unwise – investments in earlier approaches. Consider the many firms that built proprietary data centres just before the widespread use of AWS and Azure. As some of these data centres now have relatively low utilization levels, in retrospect those investments look like an avoidable spend. Indeed, many companies now realize that they have fallen behind the commodity curve, and now face substantial modernization challenges that make it difficult to focus fully on more strategic and customer-related concerns. As one former executive told us, for better or worse, most firms tend to "get the IT they deserve". This realization is driving many of today's IT modernization efforts.

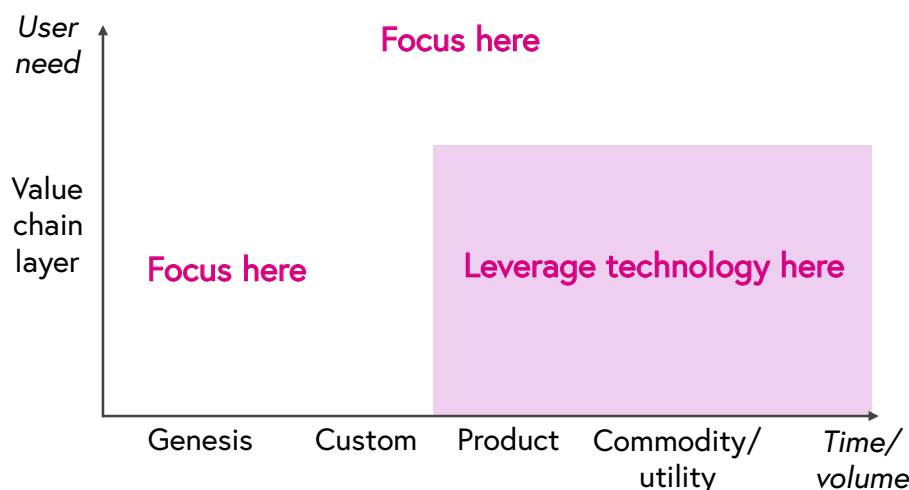


Figure 8 – IT modernization requires leveraging commodity services

Challenges, leadership & the role of IT

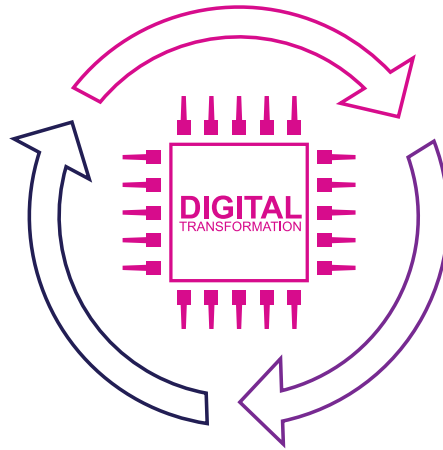
Usually not the most pressing short-term business issue

Mission & goals are often vague, high-level & futuristic

Payoff is often uncertain & often hard to measure

Organizational & customer inertia can be hard to overcome

Initiatives tend to cut across existing organizational silos



Motivation & commitment can be hard to sustain

Legacy/ERP – technologies can be hard to modernize

Service provider mentality in enterprise IT

Real & imagined regulatory concerns

Transformational leadership, ownership & politics are complex

Which suppliers/partners can help?

Figure 9 – There are many reasons why digital transformation is hard

Virtually everyone we talked to mentioned how difficult both modernization and business transformation can be, with the list in Figure 9 summarizing the ten most common reasons. This helps us understand why, although most companies can easily imagine a highly transformed digital future, day-to-day priorities, politics and norms tend to get in the way. Organizational silos, excessive duplication and the logjams of matrix management were also cited repeatedly as major barriers to change.

And of course, there is also the cost. As modern businesses are understandably focused on their results this quarter or this year, it can be very hard to build consensus around the need for sustained digital investment and change, where the payoffs are often uncertain or perhaps years in the future, when many of the current executives may not be around. DBS was one of the few organizations we interviewed that thought it had the right financial metrics in place to overcome this challenge.

Enterprise IT faces similar financial constraints. Most IT organizations see themselves as under tremendous budget and workload pressures, and thus find it difficult to pursue major agendas that don't have a relatively quick payoff. Even if the money is there, the people and skills often aren't, which is why so much of the heavy lifting of IT modernization is now assigned to business partners/suppliers.

The challenges around data are equally daunting. Unlike today's dot.com leaders, most firms are not designed around their underlying data flow. Instead, information is often locked in silos, where it is difficult – or even illegal – to assemble into the sort of data sets that machine learning systems need. A notable exception to this is the broad field of predictive analytics for machine maintenance and repairs, where the data flows are generally easier to capture. This is why this type of transformation has generally moved faster than other machine learning uses in many large industrial firms. Large-scale trading, pricing and reservation systems are another important exception.

One interviewee, the CIO of a major airline, highlighted "people issues" as the common denominator in these challenges. Within IT there is a need for better technical skills, especially in data science, but this is difficult to fill. The cause, he suggested, is the rural location of his organization – something we hear frequently. But he also emphasized that the skills and behaviour across the entire organization are an even bigger barrier that requires changes in company recruitment and training. Unsurprisingly, some business units within his firm are changing faster than others. For example, groups operating in the commercial space, especially with customers, are more receptive to change, while those associated with rigour and process – i.e. operations – are often difficult to bring along.

So how are companies overcoming these challenges?

We have identified at least six main ways to cut through today's DT inertia. Arguably, the most immediate path is leveraging a *burning platform* – a situation grave enough that major changes are clearly required. Think about how in a world of internet, IoT, mobile and social technologies, Microsoft could no longer successfully build itself entirely around Windows. As noted earlier, smart farming might also soon reach the burning platform stage due to growing societal concerns about industrial farming, fertilizers, antibiotics, waste, pollution, water usage, safety, climate change, labour availability, animal treatment and other factors. As the politicians say, a crisis is a terrible thing to waste.

However, not every industry has a burning platform. Indeed, most of the companies investing heavily in DT are actually thriving: they can afford it, and want to be seen as market leaders. The John Deere, Bayer, professional services, and oil and gas examples in this report all fall into this category. While one often hears that the companies that are most advanced in their IT usage are also the most successful, it's very difficult – arguably impossible – to separate correlation from causation. All we know for sure is that successful firms have more *money to invest* in various transformation initiatives.

For companies where money is tight (i.e. most), perhaps the most effective technique we have seen is negotiating a bargain. We know of several CIOs who have proposed to management that they can cut current IT operational costs, but they would like to do it with the proviso that all or some of these *savings be ploughed back into more futuristic areas*. When successful, this approach can

generate broad-based buy-in and prepare the firm for the future, while motivating and developing key digital leaders and staff.

A more strategy-driven approach is for companies to embrace *markets that are more inherently digital*. This certainly is the case in the examples in Appendix B. Philips has shed businesses such as lighting and focused on the more intrinsically digital world of healthcare. While this approach isn't practical for every firm, it reinforces the view that some businesses are much more digital than others. Similarly, DBS is committed to *being a digital leader* because its senior management deeply believes that it needs to operate much more like Amazon and Alibaba than a traditional bank.

Last, but not least, *strategic alliances or acquisitions* can also be an effective way to jumpstart DT efforts beyond what internal start-ups and incubators might do. Consider the way the US supermarket chain Kroger has looked to Ocado, the UK grocery delivery company – and technology platform innovator – for order fulfilment. Ocado also handles home deliveries for the UK supermarket firm Morrisons.

But even when the six strategies and approaches summarized in Figure 10 are used effectively, business transformation remains a long-term journey that will run far into the 2020s. We have seen no real shortcuts.

"Business transformation remains a long-term journey that will run far into the 2020s. We have seen no real shortcuts."

- Strong commitment to being the market's digital leader
- Strategic focus that is more inherently digital
- Burning platforms that demand change
- Large resources that can fund the desire to be a leader
- Use of IT savings & cost cuts to fund new initiatives
- Strategic incubators, acquisitions & alliances

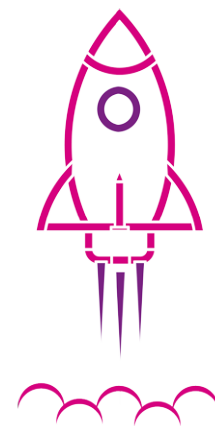


Figure 10 – Transformation accelerators

Cultural resistance – a metaphor

One senior finance executive from a global airline cited G.R. Stephenson's famous, if somewhat apocryphal, experiment of 1967 which focused on how rhesus monkeys develop behavioural responses (see box). The parallels of this story with business culture and employee behaviour are obvious. Most companies can see that they have a 'this is the way things are done around here' mentality, and that too often those who challenge this mindset are pulled down, and eventually give up.

"The power of inertia – the fixed habits of people and processes up and down the organization – remains among the biggest transformation barriers of all, and was cited by just about every interviewee."

The power of inertia – the fixed habits of people and processes up and down the organization – remains among the biggest transformation barriers of all, and was cited by just about every interviewee.

Scientific accuracy aside, we think the wet monkey theory is a useful analogy to communicate the difficulties of cultural change in many large organizations today.

The Wet Monkey Theory

Five monkeys are placed in a room with a ladder that has a banana at the top. However, once any monkey begins to climb the ladder, the others are sprayed with water. Pretty soon, the monkeys are actively preventing each other from climbing the ladder, as none of them wants to be sprayed again. After enough time has passed, the water spraying is ended – but the monkeys do not learn this, as they refuse to allow any monkey to climb the ladder and find out. They remember being sprayed all too well, and do not want to endure it again.

Soon, one of the monkeys is taken out and replaced with a new monkey. This one sees the banana and begins to climb – but the other monkeys jump on the new monkey and drag it down. The new monkey quickly learns: anyone who tries to climb the ladder is pulled down. It learns not to climb, and to pull down any others who try. But, importantly, it does not know why – this is simply the way things are done.

This process is repeated until, one by one, all the original monkeys have been replaced. The room is now populated by monkeys who will refuse to climb the ladder, and will not allow any others to climb. And not one of them knows why.



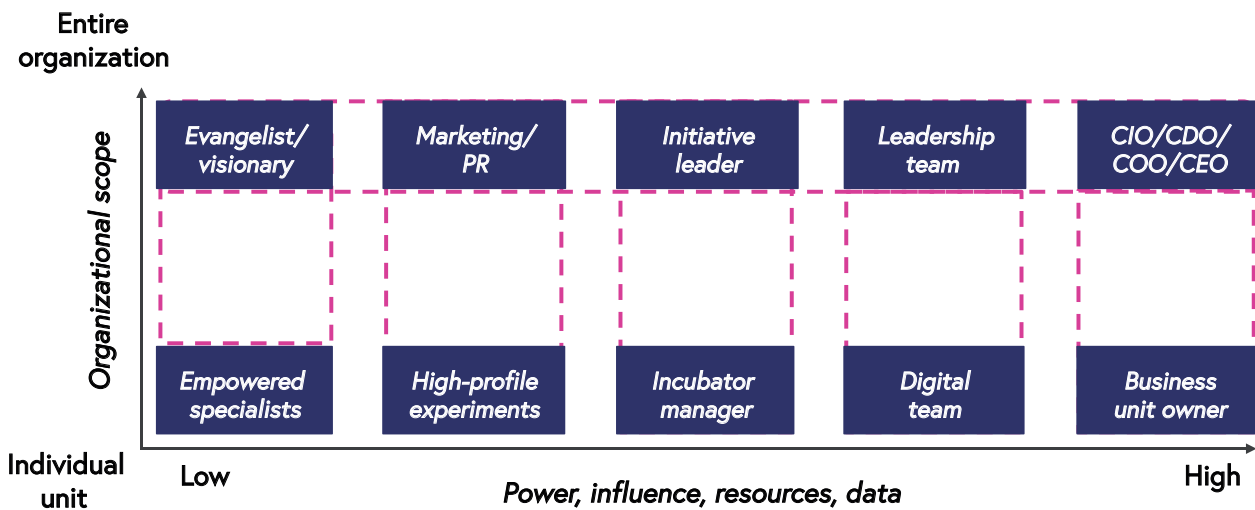


Figure 11 – Every organization must choose its own digital transformation leadership model

Given all the challenges on the previous pages, it's not surprising that the need for strong leadership was another overriding theme in our interviews. But what kind of leadership? For several years, we have used the figure above to talk about the various transformation leadership models that can exist at both business unit and enterprise-wide levels. As Martha Heller confirmed in our interview: "There is no clear leadership pattern". But we do believe that over time, the more team-oriented approaches will be more prominent than the individual CDO-type approaches, as digital becomes part of everyone's job.

"Over time, the more team-oriented approaches will be more prominent than the individual CDO-type approaches, as digital becomes part of everyone's job."

Nevertheless, we believe that all ten of the approaches in Figure 11 are used in the market today, and we encourage clients to use this framework to better see and shape their own situations. We also believe that no matter which model(s) one chooses, there is a common set of leadership traits that are often required. Among these are: clear purpose and related stretch goals, ideally driven by CEO and supported by the CIO/CDO; a bias for action; a collaborative/team-centric work style; an outside-in mindset; continuous learning; and aspirations for order-of-magnitude performance improvements.

One successful DT leader spoke of three main phases:

1. **Build the case for change.** This often requires hard-edged leadership that is willing to bulldoze existing management structures, deliver a strong dose of reality, ask the uncomfortable questions, and showcase where things are going wrong.

Tough leadership is often the only way to overcome entrenched organizational inertia and scepticism. It is often brought in from outside because internal people can be reluctant to follow through on the deep changes that are needed, especially when they affect long-term colleagues.

2. **Build the coalition, change the players.** Once it is recognized that change is needed – and sponsored and funded – companies need to build a coalition of the willing and isolate the outliers. This often involves visibly removing numerous executives – and other formerly key employees – so that the change has an air of inevitability about it. Everyone is either on board, greatly diminished, or fired. As one interviewee noted, "We must not only sell speed but also momentum and inevitability". In cases of burning-platform urgency, changing out the people can happen quickly, often cutting through several management layers. But the goal is to have everyone fully on board with the new company direction. It is not enough that the CEO has commitment and vision if the supporting team isn't in place.
3. **Get the change to stick.** In this final phase, the leadership style moves to more of a 'warm embrace', with less confrontational behaviour, as new norms and metrics broadly take hold. Traditional management compensation, evaluation and HR services return to normal.

Very few individuals possess the traits and skills to be good across all of these phases, which can easily take three years or more to play out. It may well be necessary to introduce new leaders and approaches at different stages. Indeed, we see this all the time at the most senior levels of firms where certain execs are brought in to shake things up, followed by others better suited to taking the new organization forward. The DBS case in Appendix B provides some good examples of the language, mindset and cultural changes required across all three leadership phases.

The need for personal transformation

For many years, LEF has emphasized the value of becoming a *double-deep* professional – one of those individuals who not only has a deep understanding of their profession, industry or function, but who also embraces the technology that's relevant to their role, as well as the required skills and learning that come with it. The idea that technology is someone else's job has long been outdated, but too many employees – at all levels of the organization – still act as if it isn't.

"The idea that technology is someone else's job has long been outdated, but too many employees – at all levels of the organization – still act as if it isn't."

In our interviews, there were numerous efforts to develop double-deep executives. One national government

we worked with has established a Digital Champions Programme for leaders across the public sector. Over 150 leaders have been immersed in a five-day programme to demystify technology, examine the art of the possible and drive collaboration across groups. Such efforts represent an acknowledgment that digital transformation isn't the role of a central IT or digital group, but a collective, organizational challenge. Many companies now have such learning initiatives, often spending surprisingly heavily in this area. They recognize that digital organizations need digital people.

Our friends at the consultancy Imagine-Talent have taken the executive development challenge one step further. They bring together heads of strategy, marketing, HR and other areas at *different* blue-chip firms to help drive dialogue, learning and change. As noted earlier, cooperation among diverse ecosystem constituencies will be increasingly needed to help new industry-specific platforms such as blockchains and self-driving cars reach a critical mass of investment and support. We see this type of systematic industry-wide cooperation as an important source of future learning and innovation.

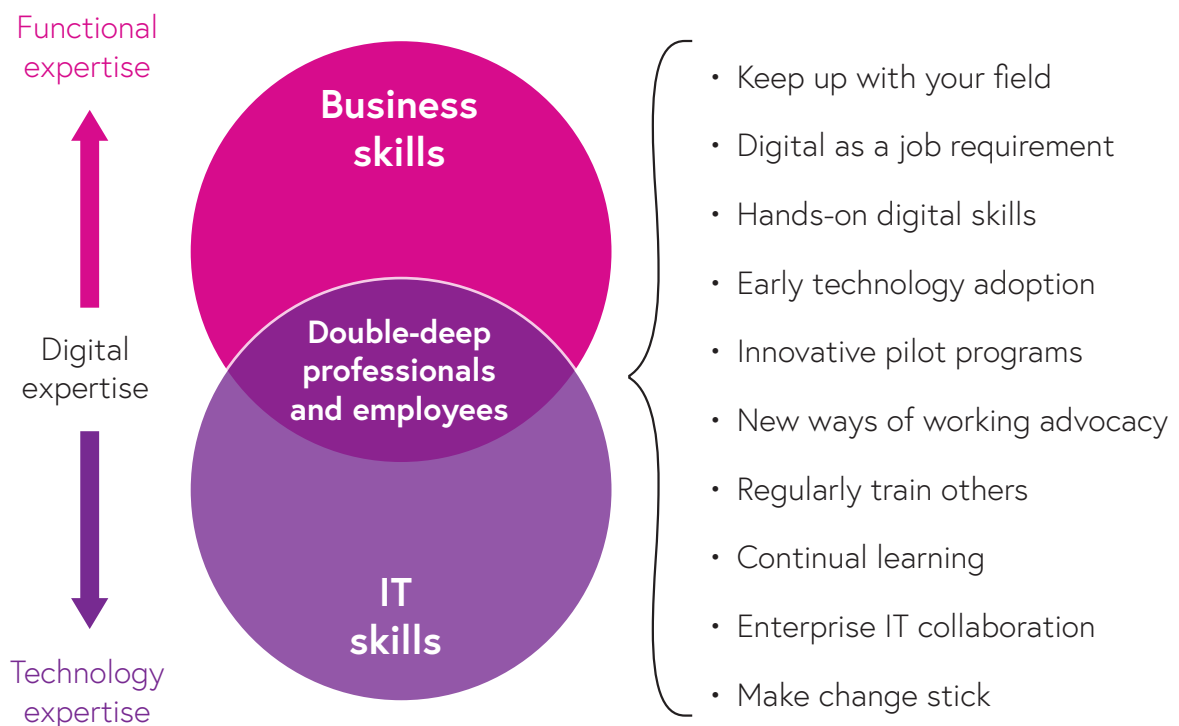


Figure 12 – Double-deep employees can be important transformation leaders

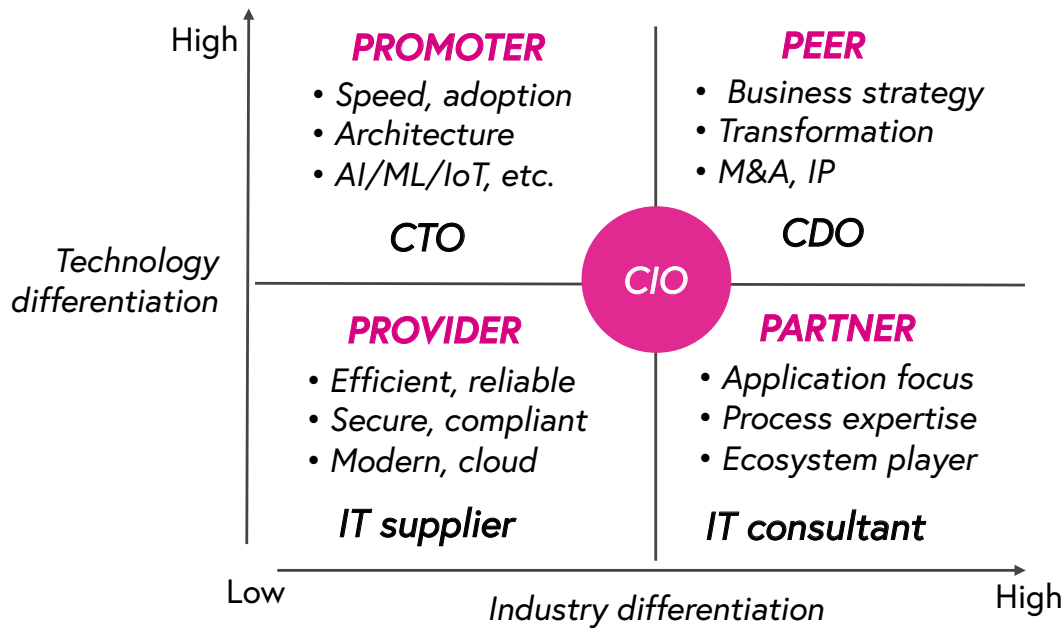


Figure 13 – Enterprise IT must go through its own 4P transformation

Not surprisingly, during our interviews there was a great deal of discussion about the role of the IT organization in the overall digital transformation process. While it's clear that IT must take the lead in the modernization of the organizations' underlying technology foundations, its role in business transformation is mixed. In the ideal case, IT acts as a 'peer' and 'partner' to enable the organization's broader objectives and imperatives. We heard numerous times that IT had to be closely involved if new ways of working are to be deployed at scale across the organization.

"In the ideal case, IT acts as a 'peer' and 'partner' to enable the organization's broader objectives and imperatives."

As shown in Figure 13, we think our long-standing 4P model can help clarify these challenges. The goal is always to expand beyond the basic 'provider' mode, and participate significantly in the other three quadrants. While most IT organizations do play all four roles to at least some extent, too often the provider mode dominates, and when this happens transformational leadership is inevitably left to other parts of the organization. Much of the LEF's digital leadership and business/IT relationship management work is designed to accelerate and deepen this 4P evolution.

Of course, being an effective provider is a necessary first step. One regulator in the UK described its situation, where the CIO has led a successful 'modernization' of the technology foundations within IT and is now tasked with driving transformation across the broader organization. Unfortunately, as in many cases, enterprise IT is still struggling to be seen as an effective, efficient and modern provider, and this is a major barrier to playing a more strategic and transformative role.

Finally, many interviewees mentioned that they need to work more effectively with external organizations. Here too, the words are revealing. While most companies like to talk about working closely with their business 'partners', others bristle at this term, believing that anyone they are paying a lot of money to should be referred to as a 'supplier'. Although there was a lot of the usual complaining about partner/supplier hype, over-promising and high fees, underneath it all was the recognition that few if any firms can modernize their foundations and move to new data-driven models entirely on their own. Most organizations just want to get more value from their partners/suppliers. But as one participant warned: "If you show up like a supplier, expect to be treated as one."

Strategies, support & action plan

DIGITAL TRANSFORMATION

While the term digital transformation is used widely, there is no agreed-upon market definition.

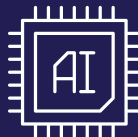
LEF observes two distinct activities that are often called 'digital transformation': the modernization of an organization's underlying IT foundation, & the transformation of its business model through machine learning, process automation, smart products or other advances. Depending upon which definition(s) you use, digital transformation is either a huge market that is happening today or more of a long-term goal and vision.



Both IT modernization & business transformation require sustained leadership to overcome inertia, politics, cultural resistance & short-term ROI concerns. Most firms know they are in the early stages of what will be a difficult, many-year change management process.



Among the key business transformation strategies we have seen are: a stated commitment to digital leadership, the leveraging of burning platforms, a sharpened focus on inherently digital markets, the use of incubators & targeted acquisitions, & the ploughing back of IT cost reductions into forward-thinking digital initiatives.



Although business units & government agencies find it easy to launch interesting new digital initiatives, making change stick at scale usually requires both extensive enterprise IT & strategic partner/supplier engagement, as well as a sustained multi-year commitment.



Figure 14 – Concluding messages & key findings

How LEF can help

Virtually everything that LEF does can help clients along in their transformational journey. The five areas below are particularly relevant to the challenges described in this report:

- Our Wardley Mapping methodology can help firms better anticipate transformative technology and market shifts, and their likely business and cultural consequences.
- Our business platform research is designed to help firms build, participate in and/or respond to potentially transformative industry platform developments.
- Our business/IT relationship management programmes are designed to help IT to expand beyond the provider role and become a digital leader across the organization.
- Our 21st century human programmes are aimed at developing the digital workforce that companies will increasingly need.
- Our digital leadership and executive education services can help senior executives assess and respond to their firm's digital transformation challenge.

For more on any of these topics, or anything else in the report, please contact your local LEF representative.

Concluding thoughts

1. Establish visible C-level advocacy, commitment & participation
2. Communicate a clear & specific mission, need, purpose & funding model
3. Acknowledge & leverage any burning platforms
4. Assure a modern technical, & especially a modern data, foundation
5. Improve company sense-making & situational awareness
6. Recognize that transformation will likely cut across existing organizational silos
7. Continually develop 21st century executives, leaders & employees
8. Embrace a strategic set of ecosystem partners & suppliers
9. Keep close track of actual & expected costs and benefits
10. Expect a long journey that will change course often & in mid-flight



Figure 15 – A ten-step DT action plan

In the end, successful digital transformation requires a considerable amount of faith, confidence and perseverance at the highest levels of the organization. While some industry and technology forecasters have better track records than others, no one really knows how societal tastes and pressures will change, how quickly machine intelligence will advance, what new platforms will emerge, how China and India will alter the competitive playing field, or how different the organizations of the future will ultimately be. No amount of data can answer these questions.

"Successful digital transformation requires a considerable amount of faith, confidence and perseverance at the highest levels of the organization."

What we do know is that information technology has already transformed or disrupted huge parts of the global economy. We also know that the current wave of automation and intelligence technologies holds at

least as much – and we think even more – potential than anything we have seen thus far. While there are many uncertainties regarding timing, it's hard to bet against these developments over the long course of the 2020s. Today's digital business leaders understand this intuitively.

It is this tension between highly significant expected changes and highly uncertain timing that shapes the digital transformation mission today. As shown in Figure 15, we recommend an integrated strategic, technical, organizational, leadership and cultural DT agenda, pursued in two main phases: First, companies need to modernize their core IT foundations so that they are prepared to respond to market changes whenever they come. They also need to sharpen their sense-making and anticipatory skills so they can gauge the rate of change better than than rivals.

But, more fundamentally, they also need to believe that over the next decade, digital technologies are likely to reshape just about every industry, as data, intelligence, connectivity and automation are brought to bear on virtually every business and human activity. And once an organization embraces this view, the phrase 'digital transformation' is no longer just a glitzy buzzword; it's the term we use to describe the process through which 21st century global market leadership will eventually emerge.

"Companies need to modernize their core IT foundations so that they are prepared to respond to market changes whenever they come. ... They also need to believe that over the next decade, digital technologies are likely to reshape just about every industry."

Appendix A: Digital Transformation Self Assessment

	Strongly Disagree		Strongly Agree		
	1	2	3	4	5
1. Our company has a clear strategic digital vision and purpose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Our leadership, organization, business processes and IT organizations are closely aligned with this vision	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Our company believes that automation and machine intelligence will have profound effects on our industry and company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. We have the internal technology capacity and skills we need	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. We work with the right set of ecosystem customers, suppliers and partners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Our internal systems and operations have the agility we need to respond to fast-changing events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. We have a strong culture of innovation, experimentation and risk-taking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. We have good cost and benefit metrics for our major digital initiatives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. We can effectively fund and sustain experimental digital initiatives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. We are sufficiently aware of what our competitors are doing in advanced digital areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. We have a strong executive and employee learning culture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. We collaborate well – both internally and within our industry ecosystem	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

How well did you score? There is a maximum total of 60 points. Anything over 50 is impressive; anything over 40 pretty good. The average is 30, so anything under 25 is probably a real cause for concern. How have these numbers been changing in recent years?

Appendix B:

Case studies – DBS & Philips

DBS: Using all the levers of Digital Transformation to build the "world's best bank"

DBS Group (formerly the Development Bank of Singapore) is a 51-year-old mid-sized financial services group headquartered in Singapore, operating across 18 markets in south-east Asia, greater China and South Asia. Its CEO Piyush Gupta has been on a long-term push to revitalize and digitalize the bank and replace the old perception of DBS as "Damn Bloody Slow".

When he started in 2009, DBS had the lowest customer satisfaction rating of its major competitors. Through an initiative called RED (Respectful, Easy to deal with, Dependable), DBS saved 250 million customer hours and a million employee hours of waste by 2013. While impressive, Gupta's perspective is that this was just the start. Gupta believed that banks needed to look beyond traditional financial services, in order to be successful. To do so, it needs to function more like its digital competitors such as Alibaba: "I knew I needed to think like them and be like them. Now I try to get everyone in the bank to ask: 'What would Jeff Bezos do?' not 'What would Jamie Dimon do?'"

Building on RED, DBS evolved a mission of *Making Banking Joyful*. The mission reflects the DBS belief that in the digital era, banks need to deliver services that are simple, seamless and invisible to the customer. RED focuses on three core values:

1. Be digital to the core

DBS took a two-phase approach to becoming more digital. The first phase was modernization – fixing the basics. The second phase focused on reinvention of what DBS could be from a technology perspective with the goal of increasing velocity and enabling better exploitation of new technologies. In visiting digital exemplar companies, DBS learned that phase 2 was much more about the experience or the mindset it needed to create than acquiring a functional capability (e.g. DevOps or agile).

DBS extended GAFAM (Google, Apple, Facebook, Amazon) to create a transformation programme it called GANDALF (see box). According to its CIO, David Gledhill, "It was a powerful way of signalling ambition and the peer group DBS aspired to be part of. GANDALF has driven a massive change in perception about who we are [and] how we build our products and systems." In November 2017, DBS launched what it claims to be the world's biggest API platform for banking. To date, 90 partners have connected over 350 APIs across 20 categories.

G: Using open-source software like Google

A: Running on Amazon's cloud platforms

N: Using automation to scale, and provide personalized recommendations like Netflix

D: DBS as the digital and data bank of Singapore

A: Design like Apple

L: Be a learning community like LinkedIn and push for continuous learning

F: Become more collective like Facebook

2. Embed DBS in the customer journey

In looking at its customer journeys, DBS could see that many of its customer touchpoints (e.g. paying for a taxi, getting money from an ATM) should be frictionless. This triggered a design principle to *make DBS invisible* in many of its customer journeys. Although DBS already has teams studying specific customer journeys, it wanted to expand this approach to the entire organization to build stronger alignment and sponsorship. Most of the top 200 leaders have now learned about customer journeys and journey mapping which has helped cement it as a foundation company competence. To date, DBS has created 595 specific customer and employee journeys.

3. Create a 27,000-person startup

According to Gupta, DBS's talent strategy is to "grow its own timber. To do that, the bank needed to fix its environment and equip employees with the tools to learn new skills and experiment."

DBS's '27,000-person startup' idea has been brought to life by emphasizing five core values:

- i. **Customer-obsessed.** This is driven by the start-up's need to "Embed ourselves in the customer journey."
- ii. **Data-driven.** DBS uses the term 'instrumentation' (made popular by Amazon) to describe how it puts in place the sensing (e.g. from customer and other processes) to allow it to measure performance. According to Gupta, "While digital customers are more costly to serve, they bring in more revenue for the bank. If you can digitally engage customers, they are likely to use more of your products and services."
- iii. **Take risk and experiment.** Gledhill is a proponent of haptic learning, or learning by doing. He recounted a story where he built a mobile app to learn more about modern application development. He said: "it sets the attitude that everyone in the organization had better be learning about how to be a leader in the digital space."

"Everyone in the organization had better be learning about how to be a leader in the digital space."

- iv. **Agility.** By reframing the competition as the digerati (Alibaba, Tencent, etc.) DBS leadership changed the ambition of the organization towards what Singularity University describes as *Exponential Organization performance* – output (or impact) disproportionately (10 times) larger than its peers because of the use of innovative organizational techniques that leverage exponential technologies. For example, creating a ten-times increase in release speed.
- v. **Be a learning organization.** Implicit in DBS's approach was the idea of haptic learning and treble-deep leadership. Gledhill wants to reinforce habit-breaking behaviours, such as using the Amazon press release process to talk about 'How DBS has changed the way it learns'. DBS also has a multiyear plan (and budget) to transform 10,000 employees into a 'digital workforce' using its DBS Horizon learning tools and experiential (haptic) learning via what its group head of human resources, Lee Yan Hong, describes as "innovative and immersive continuous learning programmes."

Other learnings

- **Compelling communications.** We found DBS's digital vocabulary (e.g. RED, GANDALF) to be vivid and powerful. Of particular interest is the care DBS took to design new rituals, processes and vocabulary to change behaviours. According to Chief Data and Transformation Director Paul Cobban, DBS identified ineffective meetings as a performance and behaviour blocker in its goal to become a '27,000-person startup' due to unclear agendas, unreliable meeting times and unequal share of voice. To address this, a process called MOJO was created: the MO is the meeting owner, the JO is the joyful observer (a play on the bank's goal to make banking joyful). At the end of each meeting the JO provides blunt feedback to the MO on how the meeting was run.
- **DBS has also found ways to measure return.** According to *Euromoney*, "DBS is perhaps the only bank that does a good job of quantifying what tech means for profitability. It can dissect to a minute degree the performance of digital versus traditional customers, on return on equity, income, frequency of transaction, cost to service and a host of other metrics¹."
- **Partners.** DBS maintains very strong external connections both to keep current and for sensing. However it believes that it needs to build digital competencies across and down into the organization and not create a dependency on a small cadre of internal 'experts'. It uses methodologists (e.g. IDEO on Design Thinking) to seed rather than to do, but believes it is important to create differentiated internal capabilities rather than external dependencies.

Philips: Transforming itself from a product company into a healthcare technology & services pioneer

Over the past eight years, Royal Philips (Philips) has gone through a radical transformation from a highly diverse electronic products business encompassing healthcare, consumer lifestyle and lighting products to one focused on healthcare technology and services. While Philips has attempted to change itself many times over decades (forays into and out of TVs, PCs, etc.), the previous efforts all foundered to a greater or lesser degree. What sets this effort apart appears to be the clarity of the goal that has been set and the process and discipline Philips followed to achieve its transformation. We've been tracking this work since the beginning and were able to speak with Jeroen Tas, Chief Innovation & Strategy Officer, to get deeper insights.

1. www.euromoney.com/article/b163mv0dk41x45/dbs-top-of-the-digital-class?copyrightInfo=true

Drivers for change

One of the key drivers of the transformation was the perception by leadership that Philips was losing its way as an innovator. While it has long seen itself as an 'innovation company' (e.g. in its heritage area of lighting, consumer electronics and in newer areas such as diagnostic imaging), Philips CEO Frans van Houten didn't see it as focused on having a society- and market-changing impact that addresses "problems that need to be solved". Philips also had structural challenges, with too many undifferentiated product and service offerings, high costs and complexity, and numerous time-to-market and operational issues.

From Tas's perspective, "When Frans discussed his vision for the future of Philips with me, I saw a great opportunity for consumer solutions and applying digital technologies to disease diagnosis and treatment, and patient care. It prompted me to think about how I could apply my expertise to solve some of these complex and intricate challenges. I wanted to have a real impact on the lives of others. My passion and motivation came from my family and from listening to other people who experienced similar things."

Much of Tas's motivation came from his personal experience (and frustration) of dealing with his daughter's type 1 diabetes. "Information doesn't flow along the care-path, putting the burden on the patient to be the data aggregator and care coordinator. It struck me that, although healthcare is such a vital industry, information technology wasn't being used to its best advantage.

"While everything in my world of finance was becoming connected, the question at the top of my mind was: how can we take the benefits of connectivity and interoperability to gain better insights and put patients at the centre of care? From my perspective ... healthcare needs an IT infrastructure on which stakeholders can innovate, similar to today's global payment networks, which have spawned seamless ways to pay and mobile solutions to manage one's finances."

Focusing Philips

"One of the most important things in the transformation has been getting clear on purpose. This has been a big shift. Philips has always been a technology company looking for applications, e.g. light bulbs leading to innovation in X-ray tubes and to TV tubes. We've now flipped it. We've identified a core application area –

health – and seek the right technologies to drive better healthcare access and outcomes. This created a clear purpose for us." (See also the formal definition used by Philips, below.)

Philips Healthcare target and enablers

Philips now focuses on the 'quadruple aim':

1. Improved consumer/patient experience
2. Better health outcomes
3. Improved staff experience
4. Lower cost of care

Each proposition needs to be articulated in the context of these aims and evidence provided for the associated claims. Innovation, sales and marketing and the supply chain are supported by a clear model of the Philips business system and statements of the Philips purpose, behaviours, transformation principles and delivery principles, as described below:

Purpose

"Working at Philips is more than a job. It's a calling to create a healthier society through meaningful work, focused on improving 3 billion lives a year (by 2030) by delivering innovative solutions across the health continuum."

Behaviours

Having well-defined goals, capabilities, processes, KPIs, organization structure and incentives is not sufficient; the leadership culture, behaviours and values should be clear. For Philips they can be summarized as:

1. Customers first
2. Quality and integrity always
3. Team up to win
4. Take ownership to deliver fast
5. Eager to improve and inspire

Transformation principles

In order to guide the transformation, the following principles are applied:

1. **Deliver products and services at speed.** According to Alpna Doshi, Group CIO: "Everyone was conducting root cause analyses and designs over and over again. ... I suggested we just get started – based on experience and instinct – and thought about how we could move to a focused, results-oriented approach."

2. **Deliver a seamless customer and partner experience.** Addressing the duplications, complexities and disconnections in how Philips historically provided its experience.
3. **Make sure that what we do is relevant to those customers and partners.** Innovating with a purpose; being clear on who the customer is and what they need.

Delivery principles

1. **Capabilities.** Invest in capabilities differently according to whether they are *differentiating, critical or common to the business*.
2. **Process transparency.** Be transparent on processes and make them visible. Integrate and optimize end-to-end.
3. **Use the right technology for the right job.** Be clear on the capabilities required and how they will be delivered. Use platforms for key processes (e.g. ERP, Product Life Cycle Management, Manufacturing, Supply Chain, Configure-Price-Quote, eCommerce ...). Be clear on the process used to deploy them; only customize if it provides sustainable differentiation.

The process Philips followed

To address the need to simplify and clean up Philips IT and business estate, Philips had to address the historic and chronic issue of process and business model proliferation that resulted in the mass duplication of processes and business models.

Philips evaluated its IT and non-IT processes using the Business Model Canvas (BMC) and APQC (American Productivity & Quality Center) Process Classification Framework, assessing whether each process was differentiating, critical or common. Through this evaluation, Philips realized that it operated over 70 distinct business models.

To rationalize them, it used the learnings from BMC and APQC to create the Philips Business Process Framework, a standardized way to evaluate and create new processes and business models. Basically, it classified core activities as Idea to Market (I2M), Market to Order (M2O) and Order to Cash (O2C). All Philips businesses are now required to adopt these standardized approaches. The goal is to increase IT's connection to core business processes, tie IT investments more tightly to business goals, drive further automation and radically reduce landscape complexity and cost.

Talent

Philips recognizes that it has not been a natural magnet for digital talent but is making a concerted effort to become more appealing to talent at different levels (beginner, experienced hire, executive, etc.). Rather than treating recruitment as a transactional task to fill vacancies, it has moved more of its hiring in-house and created engaging recruitment vehicles such as a 'Talent Tribe' to grow awareness of Philips and its purpose-driven work. It has even gone as far as creating a micro-site with testimonials from existing executives to attract leader talent. From a cultural perspective, Tas noted that "by fostering a culture in which individuals can exercise entrepreneurship, while working towards a common purpose within a well-defined framework, organizations can find their sweet spot."

Partners

In talking about the Philips '5 Ps of healthcare' (personalization, precision, productivity, prevention, partnerships), van Houten talks about partnerships as a key ingredient: "We can't do this on our own." 60 percent of Philips R&D people are now in software and data science and Philips recognizes the need to be plugged into the value chains within which it operates. Interestingly, it has also set up an external-facing group, Philips Innovation Services, to support its ecosystem. This goes beyond standard incubation and extends to outsourcing of development projects, sample engineering and prototyping, technology and industry consulting, and providing specific competencies for team extension.

Performance expectations

Tas strongly believes that successful transformation requires an artful skill in blending short- and long-term results and investments. "It's about transforming while performing. If you do only one or the other, you won't be successful. If leaders only focus on performance, you have an imbalance in leadership. You need to be able to make explicit trade-offs between the next quarter and performance over three to four years."

Characteristics of successful transforming organizations

Tas makes an interesting distinction between stable 'machine' organizations (environment is known, determinate, stable and static) and organizations as 'organisms' (environment is not fully knowable, dynamic and emerging). In his view, "a machine model of the world is fine when the environment is stable. In a digitally transforming world it is insufficient and a more dynamic, emerging model will be more appropriate."

Time to transform

Tas acknowledges that it's been hard for people to move from a machine model of an organization traditionally based on rules, KPIs, processes and strictly defined roles and responsibilities, to a model that is more like an organism for new-to-market propositions. "Are we there? No. Over time we are moving towards a more fluid 'organization as organism' view of the world. But this takes years. I was naïve about it. I thought we could do it faster, but we cannot."

Standardization vs. innovation

In his role as Chief Innovation and Strategy Officer, Tas has a primary mandate to enable creation of new capabilities in Philips. However, he has some sage words on how to blend the old with the new: "The more we standardize on things, the better we can innovate. We said there are some mandatory things which we need to standardize (e.g. one IoT data platform, one information language, one design language to drive experiences, and some centralization such as four innovation hubs, a drive to create an integrated automated supply chain including 'industry 4.0' capabilities). The intent is to create a base layer that is largely automated with a layer on top that allows innovation. While we have built our HealthSuite IoT platform on AWS, we are platform deployers. We want to be a floating platform where we float up with the capabilities of the underlying IT infrastructure. In some areas this should be portable (e.g. cloud to cloud). Our goal is not developing an IT platform. Our goal is a business platform, enabling efficient care which can be deployed to enable an ecosystem."

Other learnings

Executive team chemistry is important. Van Houten brought in Tas as an enabler (he came in as CIO to initiate and drive IT's previous Accelerate! programme) and a driver for action, creating a 'hurry up' mentality. Tas also provided a personal role model of someone who was deeply invested in the purpose of the transformation because of his daughter's medical experience and his frustration with the way so many healthcare processes operate. Philips has also refined its horizon-planning and process for establishing situational awareness. According to Tas, "Our annual operating plan and strategic plan of records were way too linear. We launched our Vision 2025 as an outside perspective, making hypotheses about emerging customer needs and competitive moves, which helped us assess and build on our capabilities, assets and positions, while identifying portfolio white spaces. We have now developed much stronger sensing mechanisms that operate faster and we've developed scenarios. We now assess strategic progress quarterly. But it still takes leadership to make the judgement on what these mean to the organization. Data and data-driven insights provided by BI and AI are important in developing situational awareness, but leaders ultimately have to make the call and lead the charge."

"Data and data driven insights provided by BI and AI are important in developing situational awareness, but leaders ultimately have to make the call and lead the charge."

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