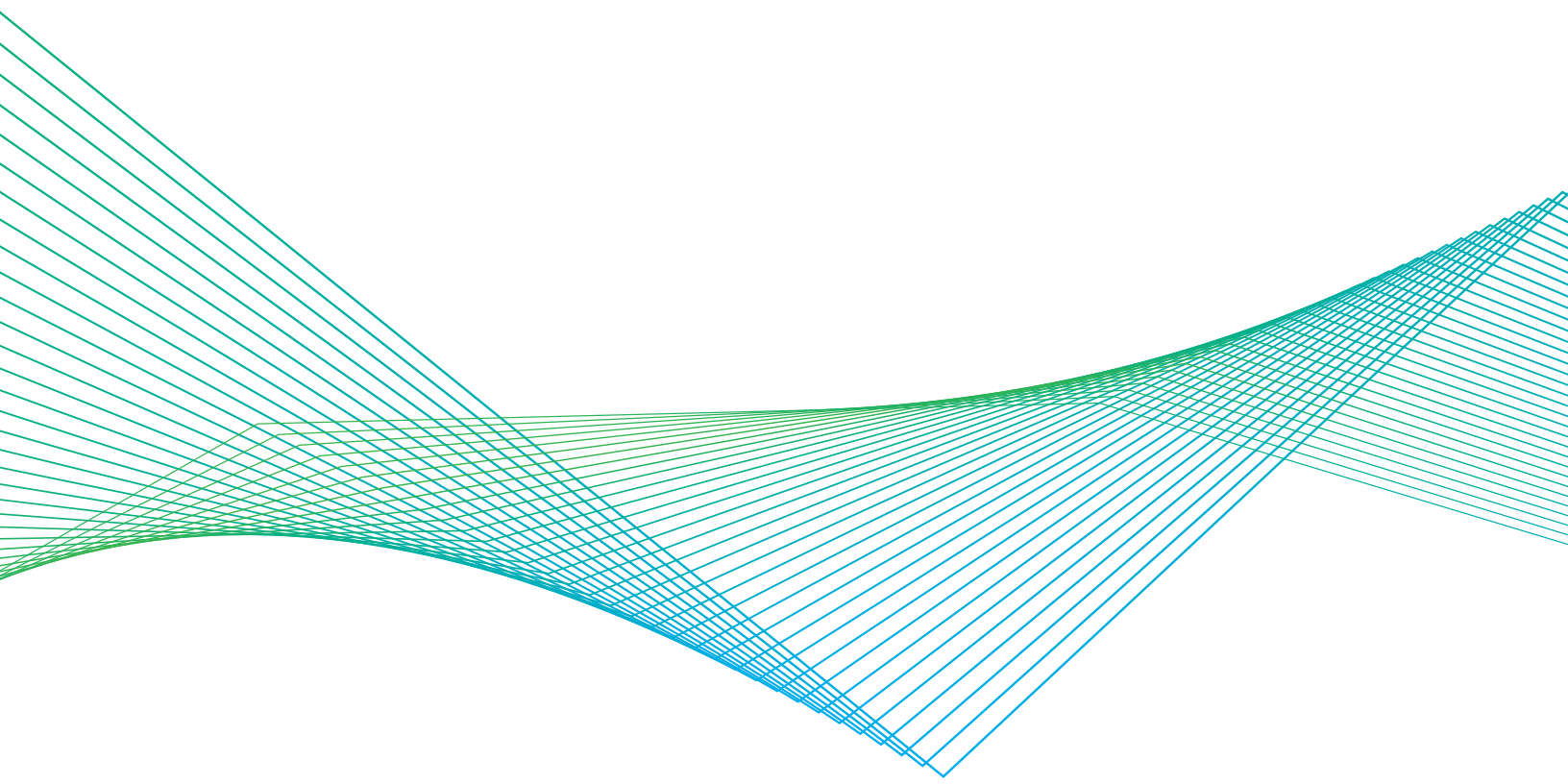
Cognizant

RELEARNING LEADERSHIP IN THE SECOND MACHINE AGE

Leadership behaviours forged over the last century clearly need updating for the digital age. Our recent research reveals three key roles for leadership as data, AI, algorithms and the science of "meaning making" dominate business for the foreseeable future.

By Euan Davis

Center For
The Future of Work



Executive Summary

Many of today's leaders find themselves hampered by legacy business models, excessive cost structures and workforces unable or unprepared to deal with the blistering pace of change. Our work with many of the top brands worldwide – amplified by insights gleaned from our recent Work Ahead research – confirms we are now in the midst of a major economic shift, one in which business value increasingly accrues at the intersection of the digital and virtual worlds. In this new competitive landscape, a new "machine" for work is emerging, powered by data, algorithms, automation and artificial intelligence.

Now is the time to ask what it takes to lead an established company through this shift. We see some leaders sensing the opportunity, while others are buckling under the pressure of fast-changing technology, intensifying customer expectations and waves of hungry start-ups snapping at their heels. The role of the leader has never been this complex, difficult, uncertain – or important.

Given these shifts, changes in leadership approaches are mandatory. Many companies are doing just that: reorganizing the way they work to embrace the new machine – and unleash waves of economic value.[1]

To understand what it takes to lead in these uncertain, challenging and potentially thrilling times, Cognizant's Center for the Future of Work teamed up with Oxford Economics to conduct in-depth, qualitative interviews with 26 of Europe's top business leaders (see methodology on page 20). The insights from these discussions with executives across a range of industries with differing degrees of digital maturity provide clear direction on how leaders can marshal their organizations into the future.

Here are our top takeaways:

1 **Shift to a platform mindset.** Platforms are layers of software that gather and synthesise data to link assets, products and partners together with customer demand. These platforms can take many forms – like a car, a home or even a process. Build one, buy one or join one, but driving platform-style behaviours into a culture requires strong visionary leadership underpinned by mechanisms that share data, enable collaboration and integrate work practices.

2 **Hyper-scale innovation.** Compared with more nimble and collaboration-oriented competitors, traditional companies need to boost their metabolism for generating and absorbing new ideas and innovations to survive. Power and decision-making dynamics found in many companies today simply won't work in an era that demands speed, agility and innovation. The time has come to disrupt the status quo with a bold reorganisation that creates flatter, more open and more dynamic team structures and rewires power to improve coordination and speed. Tools that help stakeholders align, iterate and innovate are critical.

3 **Extend customer value.** It's not enough to use technology-based approaches to understand customers; tools that increase empathy with customer issues are also hypercritical. Leaders need to pivot their companies around the voice of the customer, using both data and human insights to reveal heightened sensitivity to customer needs, wants and desires. New skills are needed to visualise and explain what a customer experiences or to narrate the meaning of rich streams of product data.

HOW TO CAPTURE VALUE IN THE NEXT FIVE YEARS

We've all enjoyed our digital "fun" over the last decade through our Facebook likes and Twitter spats. But until recently, digital developments have mainly, as technology writer Kara Swisher has said, been driven by *big minds chasing small ideas*.[2] We believe we're now entering an era of "big brains focused on big ideas" – using technology to transform how we're educated, fed, transported, insured, medicated and governed.

The next wave of value will come from more established companies in more traditional industries that can see and seize the opportunities ahead. Entirely new market sectors are emerging that blend talent, disciplines and technologies in a super-charged wave of innovation – connected cars, social insurance, smart homes, digital health – the list goes on.[3] Value is increasingly generated by the virtual. Four of the top 10 companies by market value in the Fortune 500 create their value substantially or entirely via software, and the ability to flex a new machine for work is emerging as a critical enabler of value. [4]

Leadership Misses the Shift

Q: What do you see as the biggest mistakes that companies are making in regards to digital transformation?

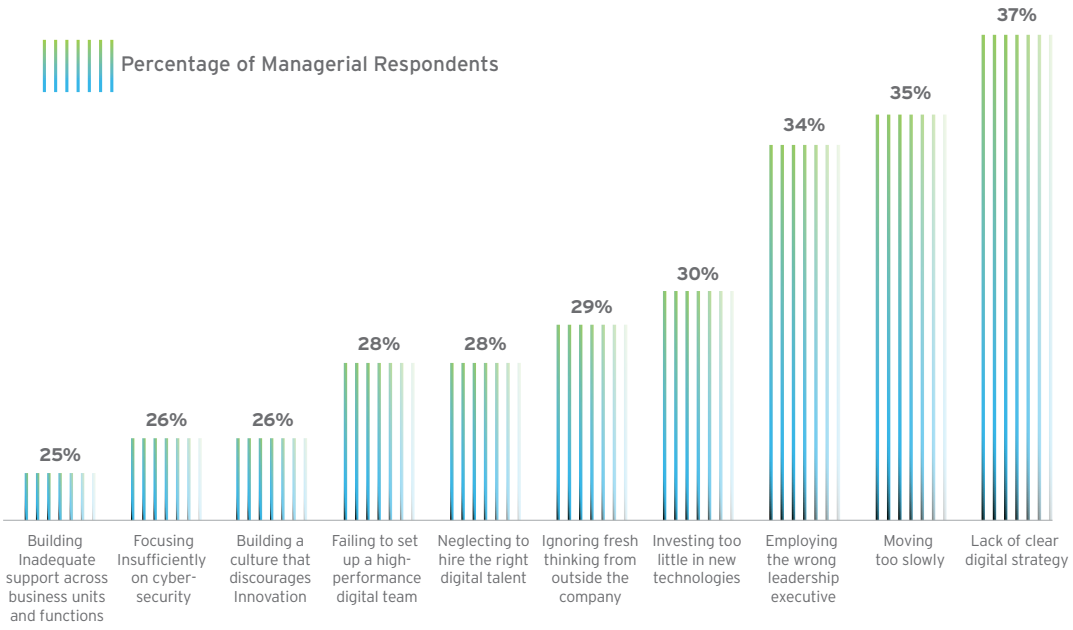


Figure 1

No industry is immune. The insurance industry is now awash in data spawned by wearable devices that are used to generate individual health profiles and customised premium quotes; moreover auto policies can now be based on actual driving performance gathered by in-vehicle telematics devices.[5] As a result, traditional businesses need to change their approach to work and optimise and deploy their workforce talent, as we detailed in our Work Ahead research series and our Future of Talent report. However, critical changes need to start from the very top. Leaders have a critical role in shaping their company's destiny.

Leadership Is a Tough (and Lonely) Role

Results from our Work Ahead study point toward a generation of leaders finding the digital shift difficult: Are they able to persuade, cajole and drive the CFO and the board to make the investment needed before a tech innovation from a competitor or start-up rips their business model to shreds? When we look at the responses that managers (not executives) gave to our survey, it isn't good news (see Figure 1).



The next wave of value will come from more established companies in more traditional industries that can see and seize the opportunities ahead.

Our data shows a worrying lack of clarity about digital strategy at the top leadership levels (37%), as well as a lack of urgency (35%). Worse, one-third of our European managerial respondents don't believe they have the right executive leadership in place to do what needs to be done. Insufficient technology investments (30%), a reluctance to explore new ways of working (29%) and failing to install the right talent (28%) are reflective of an executive class uncertain of what to do and how to do it.

Leadership behaviours forged last century clearly need updating. In our recent qualitative interviews, we asked European executives to imagine what successful leaders in the future will do. Not surprisingly, the concepts of "analytics," "data," "technology," "adaptability" and "innovation" stood out (see interviewee quotes below). These contrast strongly with traditionally perceived strong leadership qualities ("control," "power," "authority," "all-knowing").

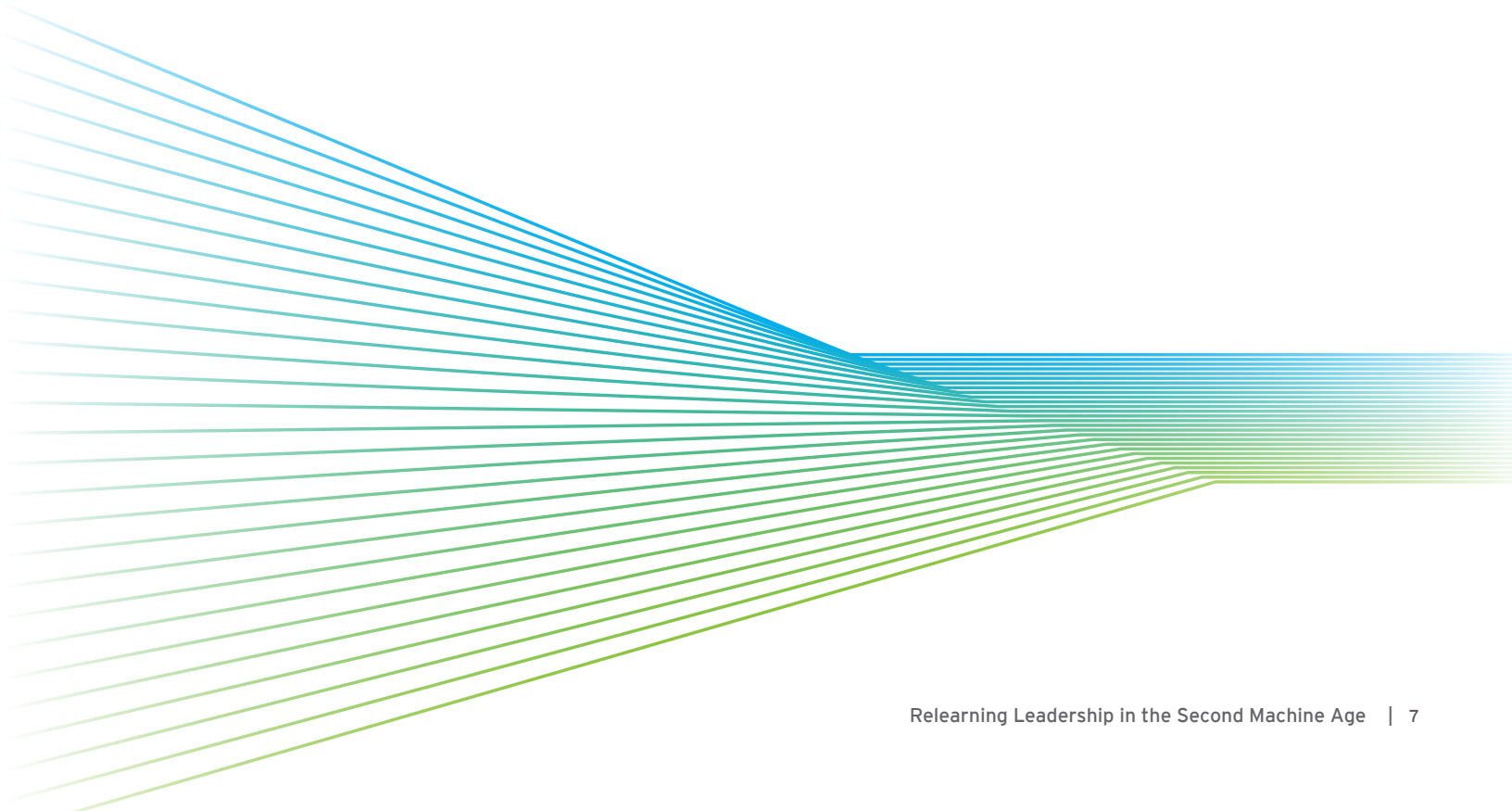
IN THEIR OWN WORDS

"In 2025, a leader will need strong analytical skills for data interpretation, as well as an ability to forecast future trends – technological awareness and knowledge about emerging trends will be of critical importance."

CHIEF DATA OFFICER, SWEDISH RETAILER

"Successful leaders should be more flexible in their outlook and be aware of the market. They need to be an innovative thinker and adaptable to change, bringing new technologies into their organization."

COO, EUROPEAN FINANCIAL SERVICES FIRM



REFRAMING THE ROLE OF THE LEADER

The challenge for leadership isn't simply an intellectual one – many, if not most, executives can see the forces of disruption around them. The real challenge is motivating workers to embrace visions of change and manage its execution. We see three key roles for leadership emerge as the world of data, algorithms and the science of "meaning making" (i.e., finding meaning in and taking action from the addressable oceans of data) dominate business for the foreseeable future.

Leadership Role 1:

Accelerate a Platform Mindset

1 The starting point for business model innovation begins with a platform – layers of software that gather and synthesise data to link assets, products and partners together with customer demand. They take many forms – like a car, a home, a policy or an R&D process – but at their core, they use data and algorithms to make meaning. This is clear when you look at companies such as Alibaba, Amazon, Google, Spotify or Uber, whose platforms have spawned cultures and leadership styles that differ markedly from legacy organizations.

Amazon has codified a set of leadership principles across its organization (invent and simplify, learn and be curious, hire and develop the best, etc.), while Spotify organises teams into squads, chapters and guilds. These methods frame leadership values and behaviours. However, the good news for leaders is that this new platform culture doesn't belong exclusively to digitally native companies. Established companies are working their big-company advantages to build and organise knowledge work around platforms, while adapting their leadership styles to stay in synch. Leadership behaviours that inculcate a vision and engage workers to reshape a market or industry are critical.

Cases in point are Bosch, GE and DHL, three large, mature organization whose leaders have pivoted their research and development, production, marketing, sales and competitive futures around the rich flow of platform data generated across their processes. In fact, the future of these companies is focused on transforming into software powerhouses. Take GE's innovative analytics platform Predix, which applies process data to redesign workflows created by a disparate customer base. As such, it is instrumenting end-to-end value chains and, in its wake, bringing an entire industry ecosystem behind it.[6]

Bosch's Software Innovations (BSI) group, meanwhile, provides a flexible Internet of Things (IoT) platform to help businesses rapidly enable IoT activities.[7] For its part, DHL hopes to disrupt the logistics industry with its CILLOX freight platform, which provides digital transport services for shippers and carriers, such as search and quote capabilities, online contracting, secure payments and real-time alerts for shipments.[8]

Platforms enable leaders to develop entirely new value propositions and business models. They marshal data around a value chain and generate significant competitive advantage for platform owners, as well as for third parties that decide to join and participate. To understand the potential, look no further than the autonomous, self-driving car, which serves as a platform for innovation and opportunity based on the interactions of the entertainment and tech sectors.

Platforms enable leaders to develop entirely new value propositions and business models.

How Platforms Change the Leadership Mandate

Our previous research demonstrates that successful digital business models pivot around a platform. Leaders need core sets of activities that define what their company does (is it technology? the product? the service?) and do whatever it takes to make those activities fundamental to customers and their market. It could mean designing a frictionless Web experience in the supply chain, embedding a payments engine for customers or building an open architecture so the supply chain can plug in simple lines of code to more complex applications.

Teams need to reorganise around these activities and apply Agile software development to begin virtualizing them. These moves explain why leaders at Spotify organise into "squads," "chapters" and "guilds" to promote teamwork, collaboration and ownership because, for all intents and purposes, Spotify's algorithm is in charge: It directs the work to be done, product development synchronises with it, and the algorithm tracks how successful a team's creativity and performance is.[10]

The problem is, algorithms don't make good leaders, and the strain is starting to show. Look at how many of Uber's drivers are attempting to unionise as a haze of negative press now surrounds the company's leadership style and "data-first" approach to decision-making. Algorithms need to be managed.

Teams need to reorganise around core sets of activities and apply Agile software development to begin virtualizing them.

What Leaders Should Do

The first step for leaders is to recognise there are many routes available to building a platform. The least risky option is to partner (or invest) and take a stake in a digital platform that is already well established. A more ambitious plan is to build an open platform where third-parties can plug and play and add value to an ecosystem they control, taking a slice of the action and mining a rich seam of interaction data for meaning. This is what DHL is now doing with CILLOX.

The do-it-yourself approach is perhaps the toughest path to follow, as it requires high levels of organizational flexibility and an open and experimental culture. But the prize earned from owning a hyper-scaling industry-wide platform is so tantalizing that it's difficult to dismiss.

Leaders would be wise to navigate the road ahead according to the cultural constraints of their organization, and then build the mechanisms that drive a platform mindset across the enterprise. They can start by determining how the operational shift to data and algorithms would be perceived internally. Trust us, no one wants to be managed by an algorithm if it's only going to undercut human potential, but imagine what could be achieved if these new tools could augment work. Leaders need to inspire, elevate and expand human potential. Algorithms and what they reveal about work make the role of a leader even more necessary.

Vision matters, but even more critical are the day-to-day activities that leaders engage in to build the mechanisms that drive the right behaviours. For example, to enable innovations that drive business advantage, it's vital to build an application programming interface (API) factory to encourage budding co-creation ecosystems with a start-up community, academia or other third parties across a value chain. The factory could promote the continuous exchange of data and information about products and services that can be mined for meaning across the organization.

Companies could then extend the reach of their existing services and assets and provide new revenue streams as the workforce acclimates to new behaviours and business expectations. Such a move would empower teams around the organization to iterate and experiment with product data, or figure out how to upgrade the customer experience. Leaders will then see how the cultural focus moves from inside the organization to the possibilities surrounding it.

It's vital to build an API factory to encourage budding co-creation ecosystems with a start-up community, academia or other third parties across a value chain.

Leadership Role 2:

Hyper-scale Innovation

If there's one lesson for leaders to heed, it's the inevitability that their market or industry will be upended. Leaders must increase their organization's level of innovation and adapt to the unprecedented pace of change. Otherwise, their business could fade into irrelevance or find itself fighting for its very survival.

Our analysis sees the intersection of automation, artificial intelligence, analytics and changing business models as a recipe for innovation and a dire threat if ignored. Two quotes from our interviews sum up the relentless pressure leaders now face:

IN THEIR OWN WORDS

"The key to success today is innovation, and whoever is good at it wins the race."

CHIEF DATA OFFICER, NORDIC RETAILER

"(Our) customers are becoming more and more inclined towards automation due to digital technologies ... and the manufacturing sector is now linked to every other sector with new and unconventional ideas emerging."

HEAD OF INNOVATION, EUROPEAN MANUFACTURING COMPANY

Rapid advances in artificial intelligence are one important innovation impetus. One look at your tablet or phone reveals this very human-like AI in action. Banks and financial services organizations increasingly deliver automated wealth management advice on devices in real time and in small doses – and this type of "nudge" can change behaviours much more effectively than limited, in-person sessions, and at much lower cost.

Moreover, insurance industry leaders are injecting AI and its sub-components (e.g., machine learning, neural networks, decision theory, etc.) into the algorithms that produce actuarial models and premium quotes. The challenge for leaders is to move at speed and experiment with these technologies and get the timing of their introduction spot on.

We believe that the data deluge for all companies – if properly captured, visualised and analysed – creates an entirely new mechanism for speeding innovation. The sheer growth in volume, variety and velocity of process data means that leaders can instrument entire value chains and drive an entrepreneurial ecosystem of start-ups and partnerships around it. What often stops them are the forces found within their own organization arranged against them.



How Fast Innovation Changes the Leadership Mandate

The power and decision-making dynamics found in many companies will not work in an era that requires speed, agility and innovation. Although most companies actively seek stability through established hierarchies, approval processes or even hiring decisions (cultural fit vs. diversity, for example) leaders need to rework how power courses throughout the organization, and how it impacts decision making. Established business units working like powerful cantons can crush new ideas and concepts that are perceived to be a threat when, in fact, they could radically change the course of a company for the better. Clayton Christensen's famous theory of disruptive innovation still applies today, 20 years on.[11]

The rank and file has a large role to play in an era of super-charged innovation. Simple methods can champion desired behaviours, but bolder approaches that drive innovation at scale are needed. Specific skills and capabilities must be sourced beyond the labour pools that HR teams traditionally scour – teams need assembling (or at least augmenting) with diverse views and perspectives.

Digital pioneers such as Netflix and Google, as well as traditional companies like Microsoft and Siemens, deploy more dynamic structures and collaborative approaches to growing and leading their teams. Smaller functional teams are arranged to cut across business lines and disparate market segments because they are easier to marshal and lead. This requires flatter structures to elevate each employee's level of responsibility, improve coordination and speed communication between staffers, which is critical to accelerating innovation.

> The power and decision-making dynamics found in many companies will not work in an era that requires speed, agility and innovation.

What Leaders Should Do

Our previous research on the future of talent unveiled a new architecture for work, with the proviso that the internal silos which have risen up over decades need tearing down to improve the flow of concepts and ideas inside and outside the business. (For more on this topic, read our report "People – Not Machines – Will Power Digital Innovation.") Leaders need to rethink how to deploy a team and consider reconfiguring a business unit into smaller multidimensional teams, with co-located sales, marketing, service, product development, production and technology staff focusing on a single customer segment or functional need.

Business leaders should also experiment with locating innovation teams away from the mothership for a period of time; one idea is to join a co-working space like a WeWork for a couple of quarters and connect with others that share and work in the same space. These spaces are characterised by a thriving start-up scene, with a younger, diverse workforce buzzing with ideas that could uncork an experimental business process or push the needle on a next-generation customer experience.

If slicing and dicing the organization is a step too far, then a solid first step is to build an internal company accelerator around a specific problem or challenge, such as:

- How can we make this process more intelligent?
- How can we innovate with AI so our customers interact and buy more of our services?

The accelerator concept could help drive alignment between internal stakeholders and their teams to foster cooperation across the company, but they also work to rapidly develop and scale innovative ideas and concepts. Leaders would do well to view such an initiative as a centre of excellence to promote collaboration and knowledge exchange across the organization and renew its focus every six months. Additionally, they should give it a mandate and funds to experiment with virtual reality, IoT, AI or another digital technology. If that works, they could consider investing in a lab as a "play-space" to facilitate breakthrough thinking and what-if scenarios.

For example, what can a company learn from other industries? ("What if manufacturing was done by Airbnb? The sharing-economy hospitality provider might consider variables such as access to on-demand machine time, long-term or micro-leasing of equipment and driving higher machine utilization rates through sophisticated matching algorithms). A leader's curiosity and questioning will help inspire innovation, collaboration and ongoing experimentation with new approaches and services that can be brought to new markets.

Business leaders should experiment with locating innovation teams away from the mothership for a period of time; one idea is to join a co-working space for a couple of quarters and connect with others that share and work in the same space.

Leadership Role 3:

Extending Customer Value

3 Customer obsession is Amazon's first leadership principle. It's now well established that the next-generation digital (or omnichannel) customer experience needs to be a key focal point for all businesses. Personalization, convenient transactions across channels and anytime/anywhere service are all necessities in the always-connected consumer world. The sophisticated technologies that consumers interact with every day serve as the benchmarks that businesses must now aspire to or surpass as they obsess over customers. As one senior leader told us:

IN THEIR OWN WORDS

"Customers tend to control you now. They have become quite impatient, and they need their requirements fulfilled at the earliest. Improving customer experience is now directly related to revenue success."

CHIEF STRATEGY OFFICER, EUROPEAN FINANCIAL SERVICES PROVIDER

Most companies have poured kings' ransoms of investment into the front-end customer experience, but leaders can't stop there. As competitors replicate your customers' experiences, your existing investments begin to lose their value. Do you remember when chat-based assistants or real-time delivery tracking or "click and collect" were high-value innovations for customers? Now, each is table stakes, raising the bar on service innovation.

Look at the rapid success of Alexa and Siri, which have put AI into our pockets while they work as our de facto personal assistants.[12] Watch as more companies start to weave speech analytics into their mobile apps and other customer touchpoints to drive higher levels of service personalization. The rapid pace of business change calls on leaders to continuously reinvent customer experiences and even their products – wait until drones reach critical mass or when virtual reality moves mainstream or IoT comes to full fruition and instruments our homes and our spaces. The pressure is relentless, as another senior leader explained:

IN THEIR OWN WORDS

"We're focusing majorly on integrating our knowledge expertise with the Ocular Rift technology. The reason is we are trying to meet the demands of our customers as early as possible."

CHIEF STRATEGY OFFICER, EUROPEAN FINANCIAL SERVICES PROVIDER

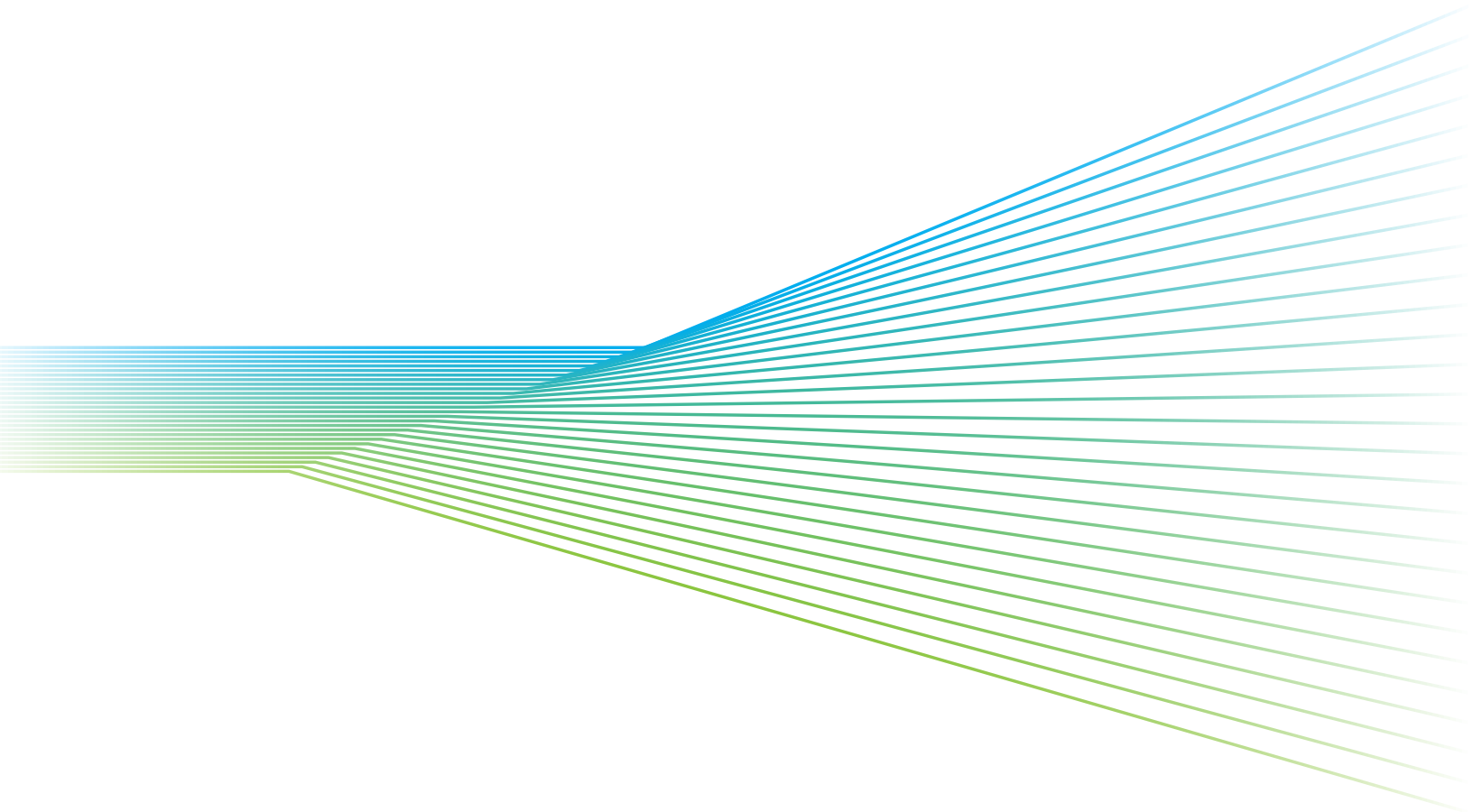
Leaders know technology has a huge role to play, but a deeper understanding of human behaviour is also critical. This need for human understanding emerged multiple times in our interviews:

IN THEIR OWN WORDS

"Engaging customers means being empathetic towards their issues ... responding to expectations is the most challenging task."

CHIEF STRATEGY OFFICER, FINANCIAL SEVICES FIRM

Customer analytics and customer service systems shine some light on human behaviours, motivations and needs. Take Amazon: At last count, the company had over 21 data science systems running from supply chain optimization systems, inventory forecasting tools, a sales forecaster, a profit optimization engine and a recommendation engine (the list goes on.) Amazon's systems are closely linked together, and its processes are triggered automatically; however, it's Amazon's human strategists – people – who play a vital role in designing real-time experiments and reviewing data traces, tweaking the online giant's formidable machine to work better for its customers.





How a Customer Focus Changes the Leadership Mandate

Technology is undoubtedly vital in helping businesses understand the customer, but it only goes so far in building empathy with the issues they face. Single customer views are an aggregated, consistent and holistic representation of the data an organization collects on its customers, but they're only useful up to a point. Yes, customers expect all their interactions with a company to reflect a consistent understanding of their history and preferences. However, putting all faith into data and a master data management strategy that ties together disparate interaction points will not provide the empathetic view that a leader and his or her organization needs. Leaders that don't have the funds for an Amazon-style technology makeover have to view customer value through a different lens.

Look at your customers first and foremost as people, and work to understand the issues they need to solve. Leaders need to marry rich human insights with key emerging technologies like artificial intelligence or process automation toolsets, and then experiment, iterate and work on extending value.

For example, addressing the stress a patient faces when self-medicating led one pharma company to experiment with smart tags to enable remote monitoring of a self-injected medication device; the company then gamified compliance through a reward system, and it's now licensing the solution and generating a new stream of revenue.[13] Customer value arrives in many forms, but it's not all about the technology; it's about understanding what customers/people want and the issues they need to solve.

> Putting all faith into data and a master data management strategy that ties together disparate interaction points will not provide the empathetic view that a leader and his or her organization needs.

What Leaders Should Do

Placing technology in the background and focusing on customers as people first and foremost is job-one for successful leaders. It's key for leaders to focus on developing customer empathy across the organization to avoid implementing a shiny new app or whizzy software with a "take it or leave it" approach that lacks appreciation for what customers might want, need or like.

Leaders should seek fresh approaches and frameworks that drive deeper insights about why customers transact in the way that they do. An emerging approach is to map out behaviours and journeys with anthropological and ethnographic techniques or human design-based principles to uncover what really drives customer behaviour and use those insights to frame strategic product and service development. These techniques will cost money and time upfront, but the longer term savings from avoiding a gimmicky technology implementation with no real application is well worth it.

Leaders need to carefully calibrate their teams to balance the interplay between real customer needs and the potential of any new technology. Business units need to pivot around the voice of the customer using data married with human insights. Achieving consensus on who leads, who follows, who analyses, who advises, who consults, who authorises, who manages, who maintains — across these multifunctional areas — is often challenging. But achieving consensus and then allowing leaders to lead is top priority.

New job roles and skills need to be created, with capabilities such as data visualisation and interface-building to delight a customer or tell the story of what product data means for a business and translate it into meaningful strategy. Financial and business modelling skills are needed to predict how cost and revenue flows could potentially shift. Leaders will need catalysts (or mobilisers) in their orbit who can build consensus on a customer-obsessed culture. These are persuasive individuals who can help others recognise the opportunity and see the dangers of ignoring it – they are your agents for change.

An emerging approach is to map out behaviours and journeys with anthropological and ethnographic techniques or human design-based principles to uncover what really drives customer behaviour.

BUILDING THE BLUEPRINT FOR A MODERN LEADER

The level of success that leaders realise in playing these new key roles – leading on platforms, boosting the speed of innovation and relentlessly focusing on the customer – will be determined by their ability to rethink how work gets done.

This analysis and our previous research reveals how leaders are prioritising investment, time and energy around these three central roles to capture future value. However, the ability to rewire machines for the work ahead is fundamentally important for success. The new machine must infuse knowledge work with intelligence and meaning. The hard work revolves around getting people to focus on the tasks that drive the most human value.

Paint the best picture you can of the future: how employees will work, where they will work, what skills will be needed and how your firm will capture value. Identify the top 100 people in your organization to buy into it. They are your catalysts. They will help you lead the change.

Here are five ways leaders can start the journey and rebuild organizations for the future:

1 **Vision really matters – nail it.** The flows of data in and across your business are changing everything. Are your people prepared? Do they embrace the concept of the platform and the growing power of the algorithm? Perhaps your organization needs new skills that add an edge to your teams – a data visualiser? An automation specialist? A Twitter wrangler!?[14] Is your organization set up to make meaning from the volume, variety and velocity of process data, and change the way products are made, customers are served and risk is managed? In short, does your business have a vision of what it could be, and what it will take to realise it?

2 **Engage the vision and break down those silos.** In companies where "software is the brand" – where "the business is IT, and IT is the business" – creating new organizational structures (with leaders aligned to lead) is crucial work that cannot be botched or fudged or undermined by office politics and turf wars. Leaders must be given the mandate and resources to lead, lauded when they succeed and held accountable when they don't.

3 **Power counts.** The dynamics of the 20th century organization – command and control structures, elongated decision cycles and silo-based mentalities – will kill the speed and agility organizations now need. Consider experimenting with flatter and more fluid types of organizational structures and – perhaps more importantly – rotate staff among teams to avoid the silos. Set up smaller teams around a specific product or customer niche and collocated away from the "mother ship."

4 **Knowledge of technology is super-critical.** Remember, a new machine for work is emerging: After an extended gestation period in research labs, AI is rapidly becoming a very real tool for those who recognise its power to solve the next set of business challenges presented by huge volumes of data. And as the IoT comes to life, almost everything will become intelligent, and when tech is everywhere, transformation can come from anywhere. It's time for leaders to make friends with start-ups, wherever they maybe.

5 **Fight the zombie organization.** It's all too easy to underestimate institutional inertia. Cultures that have grown up over decades can be large, unwieldy and complex – even, at times, paranoid and complacent. We call them zombie organizations, and they must be fought at every turn. Paint the best picture you can of the future: how employees will work, where they will work, what skills will be needed and how your firm will capture value. Identify the top 100 people in your organization to buy into it. They are your catalysts. They will help you lead the change.

Study Methodology

We carried out detailed interviews with 26 European businesses across different sectors and at different stages of digital maturity. Each respondent was asked to identify the two areas of greatest importance to their business, the actions they are taking and the implications for business leadership. Taken together, their responses present an up-to-date snapshot of how firms are adapting to new digital technologies and ways of working, as well as their perspectives on the effectiveness of different leadership styles.

Footnotes

[1] The Work Ahead is a research series providing insight and guidance on how business – and jobs – must evolve in an economy of algorithms, automation and AI. The economic data shows that new fortunes will be built, and others will recede, because how we work to create value is evolving. For the full report, see "The Work Ahead: Mastering the Digital Economy," https://www.cognizant.com/whitepapers/People-Not-Just-Machines-Will-Power-Digital-Innovation-codex1850.pdf.

[2] John Kennedy, "Kara Swisher: 'In Silicon Valley, There Are a Lot of Big Minds Chasing Small Ideas,'" Silicon Republic, June 24, 2015, https://www.siliconrepublic.com/start-ups/kara-swisher-in-silicon-valley-there-are-a-lot-of-big-minds-chasing-small-ideas.

[3] An event in Berlin hammered home the wave of disruption about to hit the car industry. The CEOs of Uber and Daimler shared the stage and articulated a vision of driverless cars; our cities free of gridlock; and "hybrid" business and economies that marry together "virtual" and "physical" worlds. For more on this topic, see "People – Not Just Machines – Will Power Digital Innovation," https://www.cognizant.com/digital-workforce-of-the-future.

[4] Four of the top 10 companies by market value on 2015's Fortune 500 create their value substantially or entirely via software and the ability to flex a new machine for work. Others on that list, including Exxon Mobil, GE, Johnson & Johnson and Wells Fargo, are from industries likely to soon change beyond recognition by the introduction of pervasive software. As software becomes a critical asset of every modern business, the traditional acquirers of software start-ups increasingly find themselves competing for every deal with industrial giants, retailers and pharmaceutical companies eager to build the new machines.

[5] Long regarded as something of a sleepy backwater in the business world, the $5 trillion global insurance market is in the early stages of fundamental change that will upend business as usual. For more on this topic, see our full report, "Seven Key Trends Shaping the Future of Work in the Insurance Industry," https://www.cognizant.com/whitepapers/twa-seven-key-trends-shaping-the-future-of-work-in-the-insurance-industry-codex2472.pdf.

[6] GE even runs its own developer conference "Predix Transform." The second annual gathering this year will bring together 2,500 industrial app developers, solution architects, machine learning experts and control engineers to build solutions for the IoT space.

[7] Bosch IoT Suite, https://www.bosch-iot-suite.com/.

[8] Jennifer McKevitt, "DHL Plans to Disrupt Freight Forwarding with CILLOX Platform," Supply Chain Dive, Jan. 24, 2017, http://www.supplychaindive.com/news/dhl-cillox-digital-freight-forwarding-disruption/434563/.

[9] The autonomous, self-driving car is triggering an industry mashup way beyond the disputed entertainment interface of Android Auto and Apple CarPlay. Car makers are in a race to build the supporting ecosystems; Audi, BMW and Daimler recently acquired "Here" from Nokia to develop a platform for connected mobility services.

[10] Spotify's algorithm determines a lot of the work done and music served up. Product development is synching more and more with the algorithm's guidance. The discover playlists, for example, are morphing into personalised cover art.

[11] Disruptive innovation describes a process by which a product or service takes root in simple applications at the bottom of a market initially and then relentlessly moves up market, eventually displacing established competitors. For more on this topic, see "Disruptive Innovation," Clayton Christensen, http://www.claytonchristensen.com/key-concepts/

[12] Google's voice recognition technology, for instance, improved to 98% in 2014 from 84% just two years earlier. Facebook's DeepFace technology now recognises faces with 97% accuracy. As for IBM's Watson, its technology is 2,400% "smarter" today than when it achieved its Jeopardy victory in 2011. Voice recognition systems, themselves, now perform tens of millions of online searches every month. For more on this topic, see Donald Brown, "How AI Is Improving Consumer Engagement and Customer Experience," *Network World*, Nov. 6, 2015, http://www.networkworld.com/article/3002308/uc-voip/how-ai-is-improving-consumer-engagement-and-customer-experience.html.

[13] The collaboration between West Pharmaceutical Services and HealthPrize Technologies led to a GPS/IoT tracking mechanism that enables remote patient monitoring of self-injected medication. For more, see our report "How Data and Digital Mastery Will Usher in an Era of Innovation and Collaboration," https://www.cognizant.com/whitepapers/the-work-ahead-how-data-and-digital-mastery-will-usher-in-an-era-of-innovation-and-collaboration-codex2628.pdf.

[14] Five years ago, would a Twitter wrangler have been someone's job description for customer management processes? For more insights, see our report "The Robot and I," https://www.cognizant.com/InsightsWhitepapers/the-robot-and-I-how-new-digital-technologies-are-making-smart-people-and-businesses-smarter-codex1193.pdf.

About the Author



Euan Davis
Associate Vice-President

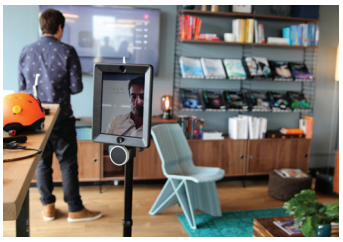
Cognizant's Center for
the Future of Work, EMEA

Euan Davis leads Cognizant's Center for the Future of Work in EMEA. A respected speaker and thinker, Euan has guided many Fortune 500 companies into the future of work with his thought-provoking research and advisory skills. Within Cognizant's Center for the Future of Work, he helps ensure that the unit's original research and analysis jibes with emerging business-technology trends and dynamics in Europe, and collaborates with a wide range of leading thinkers to understand how the future of work will look. Previously, Euan held senior analyst, advisory and leadership positions at Forrester Research, IDC and CEB.

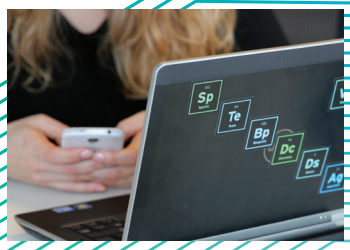
Euan can be reached at: Euan.Davis@cognizant.com

LinkedIn: uk.linkedin.com/in/euandavis


INFORMATION
STUDENT SPACE
CAFÉ







Cognizant

Cognizant (NASDAQ-100: CTSH) is one of the world's leading professional services companies, transforming clients' business, operating and technology models for the digital era. Our unique industry-based, consultative approach helps clients envision, build and run more innovative and efficient businesses. Headquartered in the U.S., Cognizant is ranked 230 on the Fortune 500 and is consistently listed among the most admired companies in the world. Learn how Cognizant helps clients lead with digital at www.cognizant.com or follow us @Cognizant.

World
HEADQUARTERS

500 Frank W. Burr Blvd.
Teaneck, NJ 07666 USA
Phone: +1 201 801 0233
Fax: +1 201 801 0243
Toll Free: +1 888 937 3277
Email: inquiry@cognizant.com

European
HEADQUARTERS

1 Kingdom Street
Paddington Central
London W2 6BD
Phone: +44 (0) 20 7297 7600
Fax: +44 (0) 20 7121 0102
Email: infouk@cognizant.com

India Operations
HEADQUARTERS

#5/535, Old Mahabalipuram Road
Okkiyam Pettai, Thoraipakkam
Chennai, 600 096 India
Phone: +91 (0) 44 4209 6000
Fax: +91 (0) 44 4209 6060
Email: inquiryindia@cognizant.com

© Copyright 2017, Cognizant. All rights reserved. No part of this document may be reproduced, stored in a retrieval system, transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the express written permission from Cognizant. The information contained herein is subject to change without notice. All other trademarks mentioned herein are the property of their respective owners.

Codex 2748