

TECHNOLOGY VISION 2017



AMP LIFY YOU

TECHNOLOGY FOR PEOPLE

The Era of the Intelligent Enterprise


accenture

We are extremely pleased to share the Accenture Technology Vision 2017, our annual prediction of the technology trends that will shape the future of companies in the next three years.

How will the future unfold? What we know unequivocally is the digital revolution is here. It's cascading across every industry, causing wide-scale enterprise disruption and wholly redefined customer expectations. Adaptability and a company's ability to quickly rotate to the new has been critical – both for companies striving to become digital leaders, and for employees who are moving beyond the digital culture shock.

We are now entering an exciting, unprecedented time in technology – with the pace of change and innovation continuing to accelerate. We are poised to drive the biggest change since the dawn of the information age. Technology will continue to transform the way we work and live, raising many questions about both opportunities and challenges. Accenture believes that these innovations are a force for positive change, because the power lies squarely with people to bring great benefits to business and society. While there are risks, as there are with any technology, we are in control. We can shape technology so that it adapts to us, elevating our ability to create a future that fits our needs.

With the theme 'Technology for People: The Era of the Intelligent Enterprise,' the Accenture Technology Vision 2017 builds on the 'People First' theme we introduced last year. Our Vision details the powerful business potential that companies can realize by using technology as a catalyst. This is all about how technology can augment and enhance our human skills to listen more closely to customers and employees, connect to them on their own terms and partner with them to achieve personal goals.

Taking a People First approach to business and technology requires deeper intelligence at all levels of the enterprise – from strategy through operations. Every decision about technology implementation, ecosystem relationships, workforce enablement, behavior design, and industry expansion must be made with people in mind – both on an individual and societal basis. Our report highlights the companies forging ahead in each of these areas and providing inspiration to us all.

We urge leaders in every industry and around the globe to read the trends in the Accenture Technology Vision 2017 and consider the core message: Technology is for the people in the era of the intelligent enterprise. As leaders, we have the power, influence and responsibility, to bring the future to life in a human fashion, using technology FOR people.



Pierre Nanterme,
Chairman and CEO



Paul Daugherty,
Chief Technology and Innovation Officer



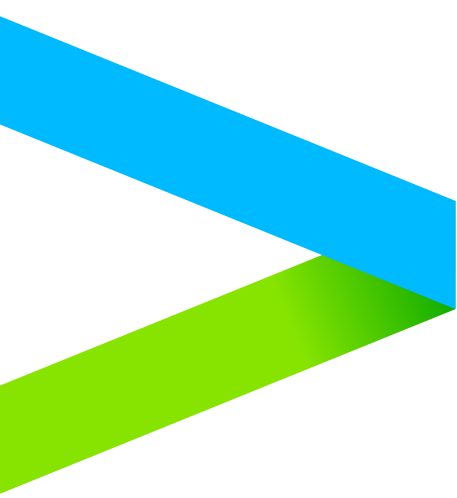
From the Internet to the advent of smartphones, the last three decades have seen people change the way they work and live to adapt to each new technology capability coming to market.

AMPLIFY YOU

Today, changes are still all around us, and are coming faster than ever. The key point is that we are in control. It's no longer people who are adapting to technology – rather, the technology is adapting to us. In fact, every time an experience is personalized, or technology anticipates people's needs and wants, we are being placed in the driver's seat to realize them. As technology becomes more sophisticated, it's not the technology itself that's driving change – it's us. We're putting technology to work to disrupt ourselves.

The digital revolution we're part of today isn't a cold, dystopian future of robots controlling the world. Rather, it's an age of human empowerment. It's about us designing technology that conforms itself to people, putting us firmly in control of our own fate. No longer are we waiting and wondering how the latest advances will change things; we're shaping the world to fit our needs, large and small.

**More than ever before,
we as humans control our
own destiny. But the reasons
why may surprise you.**



At work, we collaborate with artificial intelligence (AI) and machines to do our jobs better: Rhizabot, for example, simplifies business analysis by listening to a question in natural language and then translating it into queries that can be run across multiple datasets.¹ We use sophisticated communication and collaboration technologies to work with colleagues on the other side of the globe, whether they're human or not, many of whom we'll never meet. We see organizations partnering with competitors to create entirely new ventures using platform technologies, like Philips and Qualcomm Life working together to expand a joint connected health offering.

Areas of practice that once seemed impossible to digitize are fundamentally changing because of the impacts of AI, Internet of Things capabilities and big data analytics, which have many potentially positive implications for society. The company known for creating the Roomba, iRobot, is now working with marine conservationists to launch an ocean-patrolling intelligent robot to hunt and manage invasive species, protecting native fish populations.² And evolved industries like precision agriculture are ramping up to help meet the food demands of our increasing population.

It's not just businesses that are being transformed; technology is empowering people. Look at the way the evolution of video has changed both our view of the world and how we interact with it. Early television broadcasts were carefully scripted to present a highly curated picture, forcing us to not only share a common worldview, but also to watch on the creators' terms. In less than a century, we've transitioned to an online world with billions of viewpoints, coming from governments and businesses, and, more importantly, from people. We now have a truly live culture where technologies like Periscope and Facebook Live mean anyone can broadcast what they want, and tune in when they want – on their terms.³

The digital age isn't just giving us new tools. As we look toward a future where quantum computing's near-unlimited processing and algorithmic power will solve difficult problems in entirely new ways across multiple industries, to robots and AI that will work side by side with people in every discipline, we are reshaping our entire world and ourselves within it. And with this tremendous and ongoing change, companies have an opportunity to establish their place in the next evolution of society.

TECHNOLOGY IS STILL THE ANSWER, **BUT TO A NEW QUESTION**

Technology holds the key to shaping the world around us. It's also giving companies that do it right an opportunity to weave themselves into the new digital society. What's the next step forward? Use the power of technology to improve our world.

One company that exemplifies this is CVS Health. The healthcare company has transformed from the corner store that fills prescriptions to a provider of affordable basic healthcare services, deeply embedded in their customers' lives. CVS Health is taking a comprehensive approach to healthcare to enable this shift, deploying technology to put the individual's health at the center of their focus. With the company's smartwatch-compatible mobile app, customers can set personalized reminders for taking their medication, snap pictures of their prescriptions to expedite refills, and scan their insurance card so that store clerks are prepared with up-to-date information.⁴

At the CVS Health-operated Minute Clinics, customers can receive treatment for minor illnesses, flu shots, cholesterol screenings, and more than a dozen other medical services – all of which can be booked and paid for online. For people who can't make it to a physical location, CVS Health is also partnering with various telemedicine services like Teladoc, so patients can receive care via phone or video chat.

And CVS Health is even moving into preventative care: the company is partnering with IBM's Watson for data analysis to predict when a patient will need urgent care.⁵

Technology has empowered people throughout history, from the printing press to smartphones. But this time, we're using it differently. We aren't just incorporating technology into our lives; as it becomes exponentially more sophisticated, we are embedding humanity into the technology itself.

Think about the technology we use today compared to that of just a few years ago: it's increasingly interactive, as touch displays, mixed reality, and natural language processing make it feel more like us. Advanced technology is now capable of learning, with contextual analysis, image recognition, and deep learning algorithms that make it seem to think more like us. And, perhaps best of all, technology can now adapt – by constantly aligning itself to our wants and needs.

This more human technology is paying off for businesses, both in the workforce and in customer relationships. London-based IntelligentX Brewing Company has developed an AI system to continuously collect and incorporate customer feedback, which the system itself uses to brew new versions of the company's beers.⁶ "Our AI can have a conversation with all of our customers, and that gives us the feedback that allows our beer to evolve," says Rob McInerney, co-founder of IntelligentX. "You can talk to the algorithm whenever or wherever you're drinking the beer."

"People's tastes are changing faster than ever before...and AI is the perfect way to respond," says the beermaker's co-founder Hew Leith. This is how businesses will grow their role in people's lives, and establish a place in the future of society: by being more than just a provider of products and services. With technology that truly responds to people based on their wants and needs, companies can become their partner.

As technology aligns to what we want, and even interacts with us in ways that are naturally human, it's making the world a more human place. Rather than machines defining our world, they're putting us squarely in the driver's seat. It's delivering unprecedented potential that is enabling us to shape our lives, our industries and our society to fit our needs. What could be more human than that?

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THE PATH TO **PARTNERSHIP**

Going Big and Small

Companies are increasingly enabling people via technology, to build on opportunities that are both grand and granular. The power of the hyper-personalization that technology now makes possible drives goals both at the level of entire industries, and the level of individuals. The digital leaders of the world are already starting their journey to make the big plays; Philips is looking to transform healthcare to a connected, comprehensive experience that's both intertwined and accessible throughout people's lives. They'll succeed by focusing technology on individuals and their specific needs, responding to people on a human level, and helping guide them toward personal goals.

From the eyes of patients, connected healthcare isn't an improvement because of the technology itself. The draw is the empowerment it gives individuals over their own health, in an industry long associated with impersonal interactions and untenable wait times. Companies like Philips and CVS Health are leading because their technology strategy focuses on the needs of the individual patient, on their terms. Through apps and connected devices that integrate into people's lives, these companies allow doctors and nurses to live alongside each patient, build a closer, more personal relationship, and provide comprehensive – not just reactive – care.

**The path to leadership is in
amplifying people, on a global
and individual scale.**



By empowering people with more human technology, businesses will transform the relationship with them from provider to partner. Through this process, they'll also transform internally. By helping people reach their goals, these new partnerships will help companies cement a place in the next evolution of society. The path to leadership is in amplifying people, on a global and individual scale.

As a business, becoming a true partner to people – both customers and employees – starts with technology. But there will be big challenges along the way, starting with trust: barely half of the public say they trust businesses to do what's right, with even fewer considering business leaders a source of credible information.⁷ For people to value these new partnerships, companies must work to gain and keep trust at every interaction – and putting the power in the hands of customers and employees is the best way to do it.

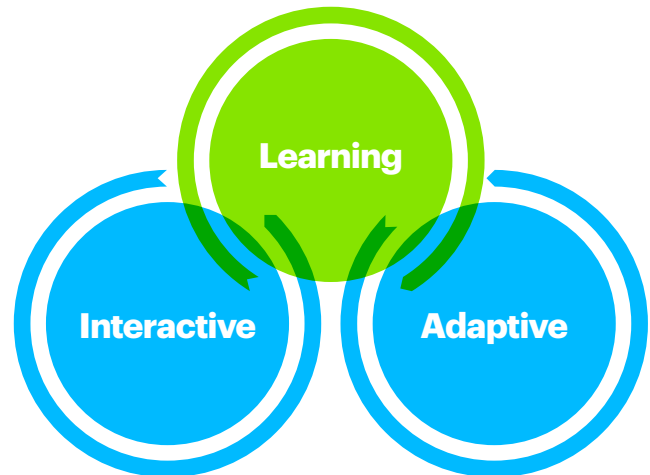
Changing the relationship with people in a digital age means changing their relationship with technology. If companies are to be partners, and technology is how companies will empower people, then the goal is to design technology to be on their side. But making this happen also means changing the way companies think about their business models, and their relationship with both customers and employees.

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THE FIRST STEP TO EMPOWERING PEOPLE **PROVIDING TECHNOLOGY THAT WORKS WITH THEM**

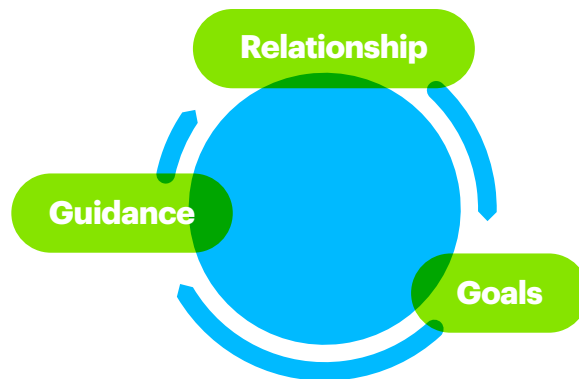
Adapting technology to people

The first pillar of partnership is designing technology that works for people, not because of them. That means putting an end to technology tools with power that is only unleashed when customers and employees adapt to them. No longer: technology's great new strength is in its growing humanity. Tools that interact with people, learn from those exchanges, and adapt for future interactions make the experience of using them all the more human. That's the first step to empowering people – providing technology that works with them.



Aligning goals to people's goals

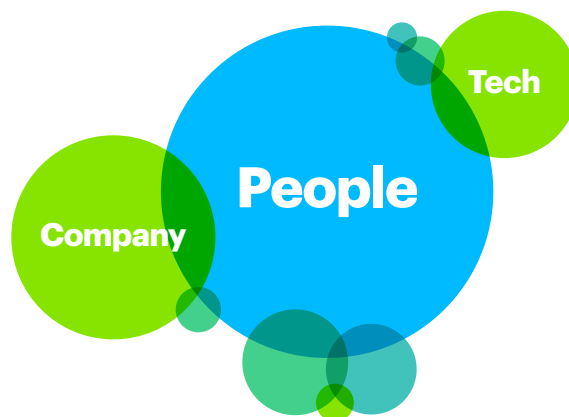
To put these new adaptive technologies to use, businesses must adopt people's goals as their own. This is a sea change for companies that have long sought to maximize each opportunity for profit: from the analog business's perspective, the ideal relationship is one where every interaction with a customer results in an immediate sale. But these relationships are only as strong as the customer's need for products and services.



A partnership, by contrast, is much more powerful – and enduring. To become a true partner, companies will need to shift their thinking, and replace the immediate sales goals of the past with the goals that customers and employees have for themselves. Doing so will change the game: the more goals a company helps people achieve, the more confident they will be in the partnership, and the relationship will grow stronger with each interaction. When it's established that a company truly wants to help people reach their goals, they'll come to the company first for as many of the goals that can be addressed. And when people succeed, so does the company.

The People First approach to business and technology

Making all of this work means dedication to a People First approach. Whether it's customers or employees, their goals and needs must come first. Companies will meet this demand with their technology, which becomes inherently more focused on helping people as it becomes more human. More than ever, technology is an agent of change – and now it can empower people in an interactive, collaborative way, on each individual's own terms.



When companies truly enable people, they're contributing to growth at both the individual level and the societal scale. Leaders have always strived to solve big problems. But the digital age brings opportunities to attack larger challenges than ever, by combining the strength of enterprise with the passion and power of individuals. Technology that works for and with people means it's possible to have it both ways: companies can empower the individual and the group at the same time.



**CHANGING
GOALS**

MEANS

**CHANGING
ROLES**

As technology becomes a trusted colleague, the line between business and personal endeavors fades. Companies will become partners with customers and employees, and with the rising ecosystems of businesses beyond their own walls.

With these reimagined relationships, success is tied not only to the success of products and services, but also to the success of partners. Relationships are no longer about keeping customers or employees happy as the company guides them toward a goal; they will be about walking with people on a path that they define, and designing technology to help them navigate it as they choose. Leaders will empower people – customers and employees – by transforming technology from tools they must learn to use, to a powerful partner that will work with them rather than just for them. When people reach their goals, so does your company – because they're now the same. The reimagined relationship isn't business. It's personal.



2017 VISION TRENDS **TECHNOLOGY FOR PEOPLE**

Every business is digital. But today, our biggest innovations will not be in the technology tools themselves, but in how we design them with people in mind.

In this year's Technology Vision, we've identified five trends that underscore the importance of focusing on 'Technology for People' to achieve digital success. Tomorrow's leaders are taking these trends on board and executing strategies to secure their clear digital advantage.

TREND 1

AI IS THE NEW UI**Experience Above All**

Artificial intelligence (AI) is about to become a company's digital spokesperson. Moving beyond a back-end tool for the enterprise, AI is taking on more sophisticated roles within technology interfaces. From autonomous driving vehicles that use computer vision, to live translations made possible by artificial neural networks, AI is making every interface both simple and smart – and setting a high bar for how future interactions will work. It will act as the face of a company's digital brand and a key differentiator – and become a core competency demanding of C-level investment and strategy.

TREND 2

ECOSYSTEMS AS MACROCOSMS**Unleash the Power of Us**

Companies are increasingly integrating their core business functionalities with third parties and their platforms. But rather than treat them like partnerships of old, forward-thinking leaders leverage these relationships to build their role in new digital ecosystems – instrumental to unlocking their next waves of strategic growth. As they do, they're designing future value chains that will transform their businesses, products, and even the market itself.

TREND 3

WORKFORCE MARKETPLACE**Invent Your Future**

The future of work has already arrived, and digital leaders are fundamentally reinventing their workforces. Driven by a surge of on-demand labor platforms and online work management solutions, legacy models and hierarchies are being dissolved and replaced with open talent marketplaces. This resulting on-demand enterprise will be key to the rapid innovation and organizational changes that companies need to transform themselves into truly digital businesses.

TREND 4

DESIGN FOR HUMANS**Inspire New Behaviors**

What if technology adapted to people? The new frontier of digital experiences is technology designed specifically for individual human behavior. Business leaders recognize that as technology shrinks the gap between effective human and machine cooperation, accounting for unique human behavior expands not only the quality of experience, but also the effectiveness of technology solutions. This shift is transforming traditional personalized relationships into something much more valuable: partnerships.

TREND 5

THE UNCHARTED**Invent New Industries, Set New Standards**

Businesses are not just creating new products and services; they're shaping new digital industries. From technology standards, to ethical norms, to government mandates, in an ecosystem-driven digital economy, one thing is clear: a wide scope of rules still needs to be defined. To fulfill their digital ambitions, companies must take on a leadership role to help shape the new rules of the game. Those who take the lead will find a place at or near the center of their new ecosystem, while those who don't risk being left behind.

COMPLETING THE PICTURE

The current three-year set of technology trends relating to Accenture's Technology Vision includes these reports from 2016 and 2015:

Accenture's Technology Vision comprises a three-year set of technology trends. While each year we highlight the latest trends, it's important to recognize that each trend represents just part of the picture. As companies continue their journey toward becoming digital businesses, they will need to keep up with the latest

evolutions in technologies, and continue to master those that have been maturing. These technologies are quickly becoming the base for how enterprises build their next generation of business, as well as the catalysts for many of the trends that we discuss this year.

2016



INTELLIGENT AUTOMATION

The essential new co-worker for the digital age.

Leaders will embrace automation not just to take advantage of the breakneck pace of digital change, but also to create a new digital world where they hold competitive advantage. Machines and artificial intelligence will be the newest recruits to the workforce, bringing new skills to help people do new jobs, and reinventing what's possible.



LIQUID WORKFORCE

Building the workforce for today's digital demands.

Companies are investing in the tools and technologies they need to keep pace with constant change in the digital era. But to achieve their ambitious goals, leaders are refocusing on an often overlooked factor: the workforce. They are looking at technology as not just a disrupter, but also an enabler to transform their people, projects, and entire organizations into a highly adaptable and change-ready enterprise.



PLATFORM ECONOMY

Technology-driven business model innovation from the outside in.

Industry leaders are unleashing technology's power by developing not only new technology platforms, but also the platform-based business models and strategies they enable. But the technology changes are only the beginning.



PREDICTABLE DISRUPTION

Looking to digital ecosystems for the next waves of change.

Fast-emerging digital ecosystems – think precision agriculture, the industrial Internet or smart cities – create the foundation for the next big wave of enterprise disruption. Digital ecosystems like these, and the businesses that power them, are already straddling markets and blurring industry boundaries.



DIGITAL TRUST

Strengthening customer relationships through ethics and security.

To gain trust in the digital economy, businesses must possess strong security and ethics at each stage of the customer journey. And new products and services must be ethical- and secure-by-design. Businesses that get this right will enjoy such high levels of trust that their customers will look to them as guides for the digital future.

2015



INTERNET OF ME

Our world, personalized.

Forward-thinking businesses are creating highly personalized experiences that engage and exhilarate consumers without breaching their trust. The companies that succeed in this new 'Internet of Me' will become the next generation of household names.



OUTCOME ECONOMY

Hardware producing hard results.

Intelligent hardware is bridging the gap between the digital enterprise and the physical world. As leading companies master the Internet of Things, they are uncovering opportunities to embed hardware and sensors in their digital toolboxes. These 'digital disrupters' know that getting ahead is no longer about selling things – it's about selling results.



PLATFORM (R)EVOLUTION

Defining ecosystems, redefining industries.

Digital industry platforms and ecosystems are fueling the next wave of breakthrough innovation and disruptive growth. Rapid advances in cloud facilities and mobility not only are eliminating the technology and cost barriers associated with such platforms, but also are opening up this new playing field to companies across industries and geographies.



INTELLIGENT ENTERPRISE

Huge data, smarter systems – better business.

The next level of operational excellence will emerge from the latest gains in software intelligence. Business and technology leaders must now view software intelligence not as a pilot or a one-off project, but as an across-the-board functionality – one that will drive new levels of evolution and discovery, propelling innovation throughout the enterprise.



WORKFORCE REIMAGINED

Collaboration between humans and machines.

The push to go digital is amplifying the need for humans and machines to do more together. Advances in natural interfaces, wearable devices, and smart machines will present new opportunities for companies to empower their workers through technology.

AI IS THE NEW UI

**Experience
Above All**

Artificial intelligence (AI) is about to become a digital spokesperson for companies. Moving beyond a back-end tool for the enterprise, AI is taking on more sophisticated roles within technology interfaces.

From autonomous driving vehicles that use computer vision, to live translations made possible by artificial neural networks, AI is making every interface both simple and smart – and setting a high bar for how future interactions will work. It will act as the face of a company’s digital brand and a key differentiator – and become a core competency demanding of C-level investment and strategy.

Imagine having a conversation with a friend and asking them a question, only to have them stare at you silently for three seconds before answering. Would the conversation feel natural? Or would you feel awkward, like you’d done something wrong? Most importantly, would you do it again?

Today, more than three million people happily chat with Amazon Echo’s conversation-based assistant, Alexa.¹ But when the Echo was under development less than five years ago, voice recognition technology suffered an average delay in response time of almost three seconds. Amazon’s team set a goal of two seconds for Echo, and was eventually able to bring it down to below 1.5 seconds before launch – a critical factor in the success of a device that has no screen or other interface to fall back on. Either people can talk to Alexa as they would a person, or the device is a failure.²

Alexa’s success shines as just one example of AI playing an ever more capable role across user interfaces (UI). As AI matures, many of the problems that hindered adoption in the past are disappearing. It’s now consistently being used to add frictionless intelligence to people’s interactions with technology, creating opportunities to make

any interface both simple and smart – driving wider, faster adoption of technology, and providing better outcomes for people. According to our global Accenture Technology Vision 2017 Survey of more than 5,400 IT and business executives, 79% agree that AI will help accelerate technology adoption throughout their organizations. In short, AI is poised to enable companies to improve the experience and outcome for every critical customer interaction.

AI already plays a variety of roles throughout the user experience (UX). At the simplest level, it curates content for people, like the mobile app Spotify suggesting new music based on previous listening choices. In a more significant role, AI applies machine learning to guide actions toward the best outcome. Farmers are improving yields by implementing AI-enabled crop management systems: Blue River Technology’s tools combine computer vision and machine learning with their robotic systems to apply plant-by-plant fertilizer wherever needed. Using advanced algorithms means ‘LettuceBot’ not only takes care of pesky weeds among the lettuce crop, but also addresses growing conditions that are less than optimal – like identifying sprouts that are too close to each other, and removing the one least likely to thrive.³

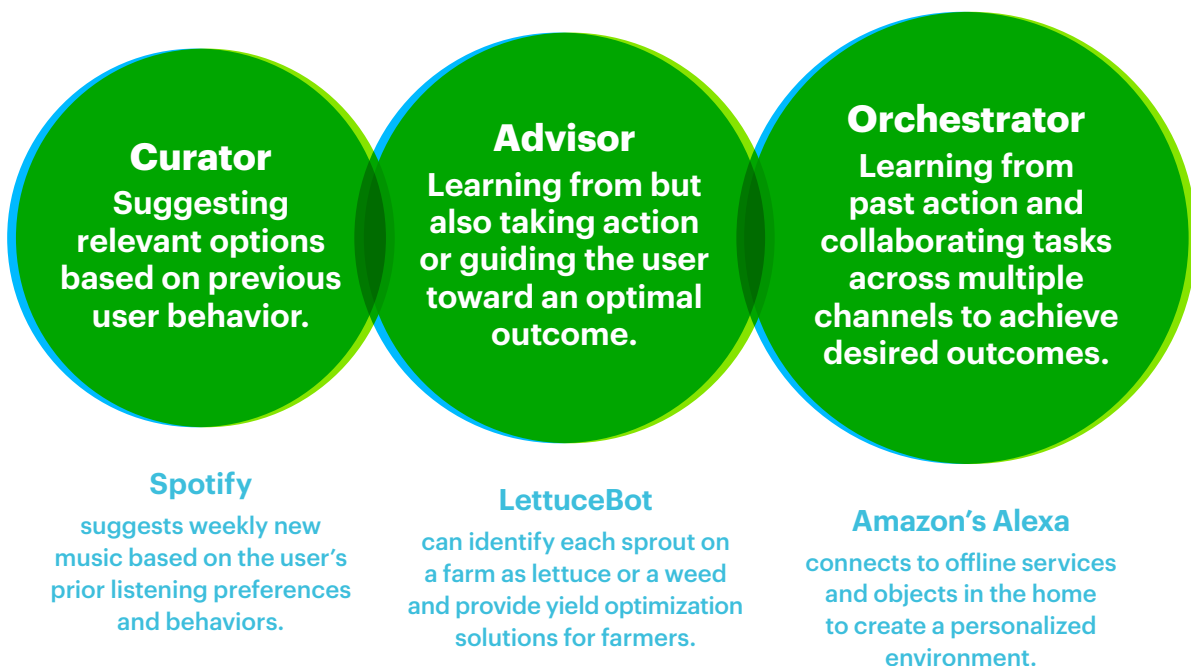
And at the height of sophistication, AI orchestrates. It collaborates across experiences and channels, often behind the scenes, to accomplish tasks. AI not only curates and acts based on its experiences, but also learns from interactions to help suggest and complete new tasks.

AI already plays a variety of roles throughout the user experience.

Yet these sophisticated, intelligent experiences are the result of interactions that are simpler than ever: an Echo acts as a personal DJ, manages schedules and the home as a butler, or orders a car for a trip – and throughout all of it, people simply talk to Alexa.

Good for consumers? Definitely. But these smart interactions also drive big wins for the enterprise. Echo owners not only spend half of their online dollars at Amazon, they also spend more. After customers start using Echo, their buying occasions increase by 6%, and spending increases by 10%.⁴

In the workplace, AI also helps companies make complicated technologies approachable, unlocking new capabilities. Rhizabot, for example, uses natural language interfaces to translate complex business analysis questions. Instead of people struggling to create queries that the technology can read, AI listens as a human asks a question in natural language, then generates queries that can be run instantaneously across multiple massive datasets. It completes the interaction by orchestrating back-end connections to provide the relevant results.⁵





SIMPLIFYING NATURAL INTERACTIONS

Despite skepticism of AI as just another technology buzzword, its momentum is very real. 85% of executives we surveyed report they will invest extensively in AI-related technologies over the next three years.

It's not a fluke that AI is growing so pervasively; its reach reflects the value it brings to interactions, making each one more natural and simple. Advances in natural language processing and machine learning, for example, make technology more intuitive to use, like telling virtual assistants to schedule a meeting instead of accessing scheduling software to find a time, create an event, and type the details. AI is transforming the look and feel of the enterprise software industry too, with headlines for AI acquisitions and new offerings appearing every day – from Salesforce Einstein, to Microsoft Azure Cognitive Services, to the Google Cloud Platform.

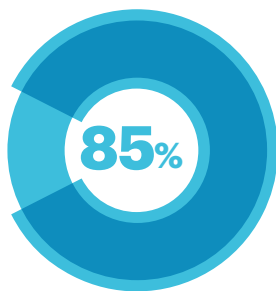
Key to all these offerings is how natural interactions are displacing traditional ones. In search technology, voice searches skyrocketed in 2015 from 'statistical zero' to more than 10% of global searches; just a year later, Bing reported that 25% of Windows 10 taskbar searches were made via voice, with Google announcing similar numbers (20%) for mobile Android searches in the US.⁶ And Stanford researchers recently showed that voice recognition completes searches three times faster than typing on mobile, increasing accuracy as well.⁷ With its ease of use and performance outpacing traditional interfaces, AI is setting new expectations for how future interactions will work.

Further accelerating AI's adoption is the fact that many of the core technologies are available for free. Open source AI tools have

proliferated over recent years, from Google's TensorFlow to Intel's Trusted Analytics Platform. Caffe, a deep learning framework developed at the University of California, Berkeley, was the basis of the DeepDream project Google released in 2016 to show how their artificial neural networks viewed images.⁸ Pinterest's app uses Caffe in training steps that help power their Related Pins functionality, which is based on both individual curation and rankings from convolutional neural networks.⁹ The combination of intuitive, natural interactions and the ready availability of open source tools paves the way for big changes across the interface.

As a gateway to simple and smart experiences, AI adoption is spreading across industries, too. In the auto insurance industry, adjusters use Tractable's deep learning systems to simplify the triage process after a car accident. Instead of manually scanning pictures, they use machine-trained estimates for repair costs, enabling agents to accelerate a claim past triage and into repair, salvage, or appraisal.¹⁰ And in oil and gas, vendors of one of the world's largest oilfield services companies seek online help from IPsoft's Amelia cognitive agent. This provides freedom to chat when convenient and reduces the need to wait for live customer service agents to be available.¹¹

As the way people interact with technology becomes a primary point of competition and distinction, the enterprise faces a new universal imperative: to add AI to enhance critical customer interactions.



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This means thinking of AI as more than just a technological tool, and giving it the priority and investment that matches the role it's about to take over within organizations – the face of the brand.

Getting started can be as simple as using AI to bring more human-like interactions into existing interfaces. But if businesses want to do more than just keep pace, there's no time to waste. In 2016, Elsevier CTO Dan Olley noted that, "If CIOs invested in machine learning three years ago, they would have wasted their money. But if they wait another three years, they will never catch up."¹² The early adopters are already pulling ahead, but many of the necessary tools are openly being shared. The question to answer is simple: What could a company accomplish if every interaction with technology was an intelligent one?

Using AI as the UI between machines: People are deploying AI to change the way machines interact with other machines as well.

In automated driving, IHS's Automotive Electronics Roadmap Report found the install rate of AI-based systems in new vehicles was just 8% in 2015, with the vast majority focused on speech recognition. However, that number is forecast to rise to 109% in 2025, as there will be multiple AI systems of various types installed in many cars.¹³ Gartner predicts there will be a cumulative production of 220 million connected cars that are equipped with data connectivity by 2020, allowing vehicles to communicate with each other and the infrastructure around them.¹⁴ Computer vision is creating an interface between cars and their environments and enabling autonomous capabilities that simply didn't exist before.

AI is changing interfaces for manufacturing logistics as well. The movement of products from one area of a warehouse to another is critical, yet highly laborious; automating it with AI robots is a surefire win for enterprise. In their Russian factories, Samsung deployed robotic driverless electric vehicles by RoboCV, enabling warehouse vehicles to move around autonomously, which is expected to streamline 80% of the production process. By using vision sensors to see the environment around them, the system builds a mathematical model and makes decisions on the preferred route with obstacle avoidance maneuvers.¹⁵



AI DEFINES **FUTURE CUSTOMER EXPERIENCE**

As AI takes over more of the user experience, it grows beyond just an intelligent interface. With each customer interaction becoming more personalized, powerful, and natural, AI moves into an even more prominent position: your digital spokesperson.

And by taking on this role, AI will eventually become your digital brand. In the same way that iPhones are synonymous with the term smartphone, Alexa may become more recognizable than the parent company, Amazon.

Thanks to its powerful simplicity, customers may soon spend more time engaged with a company's AI than talking to their people. That comes with a challenge: each interaction means another customer will be basing their opinion and interest in a company on the AI, just as they now judge by their experiences with human employees. In the same way that a customer can be delighted or angered based on a customer service representative, an AI system will represent a company's brand and can leave a lasting impression.

Consider that in the US alone, businesses lose an estimated \$1.6 trillion annually due to poor customer service. In addition, 68% of consumers report they will not go back once switched.¹⁶ But get the customer experience right, and there's a much larger opportunity.

Instead of interacting with one person at a time like a human representative, an AI system can interact with an infinite number of people at once, based on the skills built for it. Not only can AI create and maintain a powerful, 100% consistent brand experience through every interaction, but it can also use learning capabilities to tailor that experience to each individual, and rapidly evolve the experience to react to any new product or strategy the enterprise wants to implement. This is a level of control that businesses have never had over their brands – with a new dimension of flexibility as well.

AI WILL TRANSFORM THE ARCHITECTURE

Accenture research on the impact of AI reveals that in changing the nature of work and creating a new relationship between man and machine, AI could double annual economic growth rates by 2035.¹⁷ Already, AI enables a workforce that's increasingly virtual: IPcenter's Virtual Engineers use AI to mimic the work of human engineers, providing a first line of resolution for infrastructure issues. They automate the interaction between all of the different tools and people in an IT environment. For a New York-based investment bank, that translated to a 93% reduction in average resolution and fix time (from 47 minutes to 4 minutes).¹⁸ AI is not only becoming the digital brand for enterprise and a critical pipeline for customer satisfaction and loyalty, it's also key for employee engagement and operational efficiency, as well as revenue growth.

To bring to life the promise of AI across an interface, businesses must redesign their existing systems to support its features and technical dependencies. First and foremost, that means developing AI capabilities within UX/UI teams, and training them to take advantage of existing AI toolkits. Companies can't develop AI expertise overnight, but the UI team can combine their expertise with the jump-start that open source and open application programming interface (API) tools provide.

As a key enabler for an organization's next generation of experiences, AI turns enterprise architecture on its head. On the back end, giving AI the resources it needs means changes to business processes and infrastructure. Organizations will need to develop the necessary connections between systems and interfaces, and then between

different points of interaction. Robust sets of data are needed from every channel – not only to initially train the AI to interact with customers and employees, but also for it to continuously learn how those interactions should evolve over a lifetime. AI-based relationships transcend traditional transactions by building on the context of each separate interaction. That only works if the system is designed to support a long-term relationship from the start, with reinforced feedback loops at each touchpoint.

**AI could double
annual economic
growth rates
by 2035.**

THE NEXT LEVEL OF RELATIONSHIP **MULTIDIMENSIONAL INTERACTIONS**

With AI in place, interactions with customers will move from straightforward transactional models to multidimensional conversations spanning a variety of complementary channels. AI-supported relationships can exist and grow across interfaces and communication styles: text-based chats, spoken conversations, gestures, or even virtual reality. This encourages longer, stronger relationships and better customer service, which translates to direct business value. Case in point: 61% of customer service professionals credit delivering more effective online customer service support for increased sales volume, and according to a February 2016 study, 98% of US digital buyers said that it's likely or very likely they'll make another purchase if they had a good experience.¹⁹

These more natural interactions can also help solve an accessibility gap that's pervaded technology for years, letting organizations make all of their services accessible to everyone. And simply by extending personal preference to each interaction, it opens the door for richer, more satisfying interactions for individuals based on their situational context. People can choose how much and what kind of interaction they want to have with the company at any given time.

FOCUS ON THE CONVERSATION AND THE TECHNOLOGY DISAPPEARS

AI-enabled interactions are ushering in an era of disappearing technology. Deploy AI well across company interfaces, and customers no longer need to understand complicated technology to use it: they can simply talk to, gesture at, or touch the AI that controls it. In deploying contextual intelligence to an interface to make it truly intuitive, companies should aim to make the technology it's supporting disappear. That opens doors to greater adoption of complicated tools, just by providing access to them through a simpler AI-enabled experience. Google Maps is now packed with algorithms supporting on-the-fly updates to navigation routes in response to traffic delays, which are automatically offered to people via simple spoken prompts. These tools are so seamlessly integrated into the smartphone experience that they're taken for granted as essential functionality today. Put simply, invisible technology gets more use.

Intuitive interfaces have many uses in business and society as well. Accenture is applying AI to the problem of surveying palm fields in Indonesia, helping a leading forestry company identify the most efficient and effective ways to support new forest growth. This has boosted business productivity, reduced deforestation, increased sustainability – and hidden the technology that helps to accomplish it all behind an AI engine. The company's employees no longer have to compare and analyze geographic information system results, water table and soil data, historical inventory, and work orders; they simply consult the AI engine and get the same answers – in minutes instead of 36 hours.²⁰

TREND 1

The time and cognitive effort that humans must devote to get machines to accomplish tasks is steadily shrinking.

What were once dumb machines are becoming smarter and smarter – enough for people to communicate with them on a human level. By collaborating with companies, and with other systems on their behalf, AI makes everything it touches smarter – and by learning as it goes, it continues to accelerate its own usability.

For businesses to capitalize on AI-powered and enhanced interactions, the conversation must start inside the organization. Leaders will begin with existing channels and make them smarter. From that point, they will need to ask fundamental questions about interactions with customers and employees, and consider them in a new light. Current interfaces are based on UI design with a universal limiting factor – a screen. It will be important to train the UI team to take advantage of AI technology, and re-think interfaces without screen limitations. From experimenting with existing channels, companies can develop an approach to multidimensional conversations.

It's time for the C-suite to fundamentally re-examine how people interact not just with technology, but also with their business. That approach will be critical as AI takes on the primary role of interacting with both your customers and employees. AI will be a key point of distinction for your business versus competitors, and so must be considered a core competency demanding of C-level investment and strategy. Much more than just another technology tool to help increase efficiency or generate value, AI is no longer about how your company does things – it's who you are.



100-DAY PLAN

- 1** Rank in priority order your customer interactions by how critical they are to your current revenue and future growth.
- 2** Pick the top three to five interactions and work with your service and product teams to streamline customer engagement with your most valued products and services. This process will help identify areas where AI can improve future interactions.
- 3** Identify what information and insights you lack that would help you improve the customer experience. Design your AI tools to help access, use, and provide key insights to you and your customers.
- 4** Develop AI personas that fit your brand and communicate your brand voice.
- 5** Begin adding sophistication to your digital interactions. Consider piloting AI in roles like content curator (for personalization) or interaction advisor (for intelligent automation). These new roles should accompany the end-customer along their various journeys.
- 6** Identify communication channels and platforms for integrating conversational experiences with your brand. Consider internal as well as external interactions.
- 7** Gather and review existing key performance indicators (KPIs) for customer success. Ensure these KPIs account for the benefits of simplified interactions.

365-DAY PLAN

1

Implement increasingly sophisticated AI personas that not only curate or advise, but also aim to orchestrate as much as possible – among your brand and ecosystem stakeholders – for key customer interactions.

2

Develop analytics that take account of front-end customer insights and back-end business intelligence to better understand key customer interactions. Make these analytics a driver for how you make business process changes for customer support.

3

Develop and pilot a training program for AI teams and UX/UI teams to cross-train on implementing AI to improve and simplify key customer interactions.

4

To further improve customer service, design a new customer journey where AI serves as your frontline brand ambassador for customer service interactions, communications, and engagements with customers.

TREND 1 PREDICTIONS

1

In five years, more than **half of your customers** will select your services **based on your AI** instead of your traditional brand.

2

In seven years, **most interfaces will not have a screen** and will be integrated into daily tasks.

3

In 10 years, digital assistants will be so pervasive they'll keep employees productive 24/7/365, **operating in the background** for workplace interactions, like creating video summaries right after an important meeting.

ECOSYSTEMS AS **MACRO COSMS**

Unleash the Power of Us

Companies are increasingly integrating their core business functionalities with third parties and their platforms.

But rather than treat them like partnerships of old, forward-thinking leaders leverage these relationships to build their role in new digital ecosystems – instrumental to unlocking their next waves of strategic growth. As they do, they're designing future value chains that will transform their businesses, products, and even the market itself.

As more companies join the Platform Revolution, the way leaders choose to build their portfolio of digital partners is more important than ever. To provide increasingly innovative services and better outcomes for both their business and customers, enterprises across industries are integrating mission-critical activities with digital platforms. As a result, core business functions – from customer service to machine maintenance – now not only include, but also heavily rely on a complex network of digital partners, reaching far beyond the walls of a single organization.

While some companies see these new relationships as simply an evolution to existing value chains, tech-savvy leaders realize that these decisions portend a much deeper strategic shift: to new multidimensional ecosystems that are redefining industries. And, critically, each time an enterprise leverages a third-party platform to support aspects of their business, they are, in fact, choosing the alliance partners they will count on when building their next generation of services.

To remain competitive in the long run, every business must begin moving their thinking beyond the short-term gains that digital platforms provide. They must embrace a more holistic strategy that balances tactical IT decision-making with fostering and investing in the digital ecosystems that will encompass their long-term growth. In doing so, businesses will lay groundwork for building their future digital value chains – and better position themselves at the heart of the emerging digital markets that will determine tomorrow's leaders and laggards in every industry.

Some companies are already taking bold steps. General Motors kicked off 2016 with a \$500 million investment into ride-share platform Lyft. The move gave GM the inroads to launch their Express Drive service, an exclusive offering for successful, but car-less, Lyft driver applicants to rent a car directly from GM and get to work right away. The program was remarkably successful in the short term, opening a new line of business for GM: by July, 30% of new Lyft drivers were requesting an Express Drive vehicle in their sign-up.¹

But far beyond the immediate success of Express Drive, GM is using Lyft's platform to join an entirely new digital transportation ecosystem – one that connects a traditional auto manufacturer with leaders in ride-sharing and autonomous vehicles. In addition to partnering with Lyft, GM also made a \$1 billion-plus acquisition of the autonomous vehicle software company Cruise Automation, and another billion-dollar investment in building an autonomous vehicle testing facility in Detroit.

The moves GM is making to grow Lyft's platform, letting it expand into new markets today, are the first steps in fostering the larger ride-sharing ecosystem – the success of which will give GM a vector to put their eventual autonomous vehicles to work. Can you imagine an automated fleet of GM vehicles acting as public transit for an entire city? GM can, and is working to make it a reality.

And it's not just the transportation companies that are changing. Enterprises in every industry are beginning to define their next generation of value chains. Consider the partnership between Whole Foods and Instacart. The Instacart platform lets customers shop from grocery

stores like Acme and Costco, and even pet stores like Petco. Place an order and Instacart shoppers will go to the stores, purchase the items, and deliver them at a convenient time. Whole Foods, a leading US-based market with a focus on natural and organic foods, made an investment into

Instacart, deepening an existing relationship between the two companies.² Customers can use Instacart to place a Whole Foods order that's assembled and packaged for quick store pickup, or get home delivery of Whole Foods products through Instacart's same-day delivery platform. Why would Whole Foods entrust a key component of their business to a third party, to the point of making a significant investment in the company – especially when it places Whole Foods side-by-side with grocery competitors like Safeway and Costco in an industry with operating earnings as small as 2–3%?³

The answer: access to a powerful new digital ecosystem. With a rapidly expanding market for grocery delivery, nearly all grocery chains are trying to enable home delivery via online ordering – especially in the face of competition from new entrants like Amazon Fresh. Whole Foods unlocks a competitive advantage from access to Instacart's robust and mature same-day delivery experience. More importantly, in addition to the cost savings gleaned by not having to build their own delivery services, Whole Foods grows their business by gaining access to a huge pool of customers for whom Instacart's platform is already the gatekeeper.

New digital ecosystems, from the connected home, to precision agriculture, to connected health, are still small. But companies are choosing both their partners and their roles in these ecosystems now. Whole Foods and GM are early movers, both acting deliberately to work toward their long-term business strategies. Across the board, companies are inadvertently picking both long-term partners and the ecosystems they'll be participating in as they make tactical decisions on technology providers.

Those who begin acting deliberately will use these collective strategies to do far more than they ever could alone, moving from improving their products to building themselves as leaders in a transforming market. Whether it's via the platforms and services created by infrastructure providers, customer gatekeepers, or industry partners, these are the decisions that will define a company's future digital value chain, and continue to redefine businesses in shifting industries. Who will your company be in 10 years? It depends on the digital value chain choices made today.

Why would Whole Foods entrust such a key component of their business to a third party? The answer: access to a powerful new digital ecosystem.

PLATFORMS LEAD THE WAY

Platforms are rapidly becoming the central hubs for the rich and complex digital ecosystems that companies want to access.

Consider the rise in companies like Airbnb and Uber, whose platforms comprise their entire business, or the fact that 70% of 'unicorn' startups are platform companies.⁴ These digital-born companies carved their roles in fragmented or saturated markets by aggregating services into a single, convenient point of access. Like Instacart does for the grocery market, or Expedia for hotels and flights, just the act of simplifying decision-making can help third-party platforms build a waiting and willing customer base. In the UK, digital platforms aggregating private insurance account for 60–70% of new business premiums.⁵ As they mature and grow their audience, other businesses congregate around them, looking for inroads to new customers. Those businesses integrate their services with the platform, which grows and draws more new customers, and the cycle repeats.

As companies look to expand into the next generation of digital ecosystems, some businesses are building platforms themselves

and creating new ecosystems with their business at the center. Consider Pegasus, a mobile payments platform. In East Africa, mobile network operators give citizens robust purchasing power via mobile wallets, but these payment types are not integrated with all the businesses looking to accept mobile payments as an option. Pegasus handles integration with utilities and other service providers, so that customers can pay service bills with wallets from a range of mobile operators. The service now oversees 200,000 electricity payments per month, totaling \$10 million in pass-through value.⁶

But not every company needs to be the platform provider. While some organizations may have this opportunity, most will find it cheaper and faster to leverage existing platforms as their means to enter new ecosystems. Regardless of whether they are providers of platforms or participants in others' offerings, all companies will have to excel at leveraging the strength of platforms in their ecosystem to maximize their success.



FORGING NEW VALUE CHAINS

As platforms become the new normal for how business is done, companies must seize this opportunity to begin to build a new digital value chain.

Already, more than a quarter (27%) of the executives we surveyed report that digital ecosystems are transforming the way their organizations deliver value. The mandate for leaders is to capitalize on new relationships, building a network of digital partners that will not only enhance their existing business, but also allow them to forge their way into newly emerging digital ecosystems.

The disruption consumer-facing companies are experiencing exemplifies this demand. Ecosystems of customers are aggregating around several new digital platforms, and businesses are more motivated than ever before to take advantage of these entry points. Communication platforms like WeChat and WhatsApp, and AI intermediaries like the Google Assistant, Alexa, and Siri represent distinct ecosystems delivering unprecedented access to customers – and businesses are flocking to them.

Hyatt Hotels uses Facebook Messenger to let guests do everything from booking and checking existing reservations to ordering room service during a stay, while Capital One bank developed a 'skill' for Amazon Echo's Alexa, allowing people to check their accounts and pay credit card bills via the Echo device.

These platforms give companies rapid access to pools of customers and, in the process, can drive more sales, improve customer service, or create a better customer experience. But in doing so, they also transform businesses' value chains in a way that challenges traditional thinking. In leveraging these entry points, businesses are no longer driving customers to many of the traditional touchpoints used to build strong relationships, like their own apps, website, and even retail locations. Rather than fighting this change, forward-thinking companies are taking steps to strengthen their future roles within this context – like making APIs a key part of growing their brand.

BBVA Compass recognized the power of an API, and put it to use to solve a common delay problem in processing financial payments. Instead of being limited to payments processed through the traditional Automated Clearing House approach, with delays as long as 24–48 hours, BBVA partnered with Dwolla. Via BBVA's API Market, this partnership enables real-time payments to BBVA Compass/Dwolla partnership users, 24/7.⁷ Emphasizing APIs to support platform-era brand growth across a distributed customer base is just one example of how companies are reprioritizing to support the transformation of their value chains.

This trend isn't restricted to consumer-facing companies; consider other industries that are transitioning to digital ecosystems, like connected healthcare, precision agriculture, and autonomous transportation. These vast market shifts will bring new digital value chains – and every business must find where they fit into a disrupted industry. To get there, each organization must decide which ecosystems to join and what role to play.

Take Qualcomm Life and Philips, two companies building healthcare platforms. Rather than compete for the entire value chain, the companies recognized the strengths in each other's platforms and entered a strategic partnership to create a more holistic approach to connected medicine.

Now, patients and providers using the Philips HealthSuite have access to the range of connected medical devices running on Qualcomm Life's 2net platform.

Companies like Philips, Qualcomm, and General Motors are building new value chains that will position them as the foundational leaders of emerging, transformative digital ecosystems. Businesses of all types must begin taking note of these partnerships – and better yet, forging their own. The competitive advantage of tomorrow won't be determined by one company alone, but by the strength of the ecosystems chosen, and the company's plans to help the ecosystems grow.

Organizations must decide which ecosystems to join and what role to play.

FIRST STEPS ARE **ALREADY IN PLACE**

Many companies, whether they realize it or not, have already taken the steps to embed themselves into ecosystems – and have done so for some time.

In the 2016 State of the Cloud survey, 95% of respondents reported using public, private, or hybrid cloud technology; and the CIO Strategic Partner Index run by IDC reports that 29% of IT leaders are spending more than half their IT budget on external providers.⁸ Individually, these investments are tactical operational moves, based on short-term functional gains and cost savings. But in aggregate, they represent a much larger set of strategic decisions. In other words, companies' infrastructure decisions directly influence the ecosystems they'll join, and the network of partners they will leverage to bring their future strategies to life.

Take AT&T, for example. With the rise of smartphones, mobile networks saw data traffic explode by an astounding 150,000% from 2007 to 2015. Anticipating an additional tenfold growth in network traffic by 2020, AT&T is using OpenStack to cloud-enable and virtualize 75% of its

network architecture.⁹ In the short term, this transition solves speed and agility issues and decreases cost; in the long term, AT&T now has a vested interest in the continued development and success of OpenStack's open source community. To facilitate their own growth, AT&T isn't just using OpenStack, but actively fostering its success. Today, AT&T is dedicating resources to make sure OpenStack's

technology keeps improving – building the product alongside an ecosystem of corporate partners like Intel, Hitachi, and Comcast.¹⁰

As businesses like AT&T and others increasingly rely on platforms and software-as-a-service to support bigger pieces of their technology, they are inherently investing in larger ecosystems that will impact where the organizations will grow. Consider that few of these client-vendor relationships are one-to-one, but one-to-many: in the Strategic Partner Index study, more than half of IT leaders reported that their technology vendors bring in startups or additional niche

players on projects.¹¹

These ecosystems of technology vendors are rapidly coalescing, and the entire C-suite must understand that what may appear as an off-the-shelf or monthly subscription investment for a company is, in fact, a deep commitment to a network of current and future partners.

Each platform commitment means easier future engagement with other companies on the platform using the same infrastructure.

Similarly, each platform commitment means easier future engagement with other companies on the platform using the same infrastructure – and more difficult partnership with those companies that have committed to other platforms. Essentially, by choosing a cloud platform provider, companies are likely selecting the pool that their future digital partners will come from.

TREND 2

More than ever, the digital partnerships companies make today have long-term implications for their future.

Whether it's accessing new customer touchpoints or building new markets with industry partnerships, the external platforms that companies rely on throughout their enterprise are becoming the gateways to new digital ecosystems – and the pillars of an evolution in their value chain.

It's time to look beyond the short-term gains of tactical vendor and partner relationships and consider them in the context of the larger opportunities – and challenges – for your company's future. The race is on, as companies across industries begin to forge the relationships that will drive their next waves of unprecedented growth. An explosion of collaborative ventures between industry leaders is on the horizon, and the success of these endeavors is what determines who will lead new digital markets, and who gets left behind.

Every company needs an ecosystem strategy to move forward, one that prepares them for a future where they are not involved in just a single ecosystem, but many. How your company selects and fosters the right ecosystems for your business goals will define prospects for the future: competitive advantage depends on the strength of the partners and ecosystems you choose and your plans to help them grow. Ultimately, ecosystems are redefining how companies do business, and your company would be wise to start forging these relationships today.



100-DAY PLAN

1

Conduct an audit identifying how many internal and external platforms your company is using and the goals for their use. Identify and address unnecessary overlaps.

2

Determine the platforms your organization most relies on, as well as those that most depend on you. These are the ecosystems where your organization should hold its strategic and market strengths.

3

Expand the conversation: have a strategy summit with your closest partners to understand their goals for the future. Uncover shared goals and commit to developing a strategic plan for achieving them together.

4

Consider your organization's future through the lens of the biggest disruptions shaping your market, from inside and outside your industry. Craft the ideal role of your company in this future, and develop a shortlist of partners who can help make it a reality.

5

Develop metrics to quantify the results of ecosystem participation. These may include sales growth, API requests, customer satisfaction, growth of new partnerships, and others.

365-DAY PLAN

1

Extend a significant portion of a core business function to a third-party platform or digital aggregator. Use the opportunity to build a bigger stake in an emerging ecosystem, bringing its strengths (such as access to new customers) into your organization.

2

Use an existing partnership to pilot building your own ecosystem. Make your selection based on complementary strengths, like mature platforms or digital services. Start with one joint offering, such as combining services into a single point of access.

3

Prepare a foundation for expanding your ecosystem by making a significant investment in either a startup or a joint venture that will establish a foothold in an area critical to your organization's transformation (for example, what GM has done with car-sharing).

4

Appoint a cross-functional team and C-suite sponsor to guide long-term ecosystem efforts. Key responsibilities include aligning ecosystem and company strategies, developing skills and technical assets to drive growth, and orchestrating regulatory and policy engagement between internal and external stakeholders.

TREND 2 PREDICTIONS

1

In five years, the majority of customers will be **purchasing goods or services through a digital 'middle man'** – such as messaging platforms, connected devices, or smart assistants.

2

Five years from now, 80% of the S&P 500 will be **engaged in multiple industry ecosystems**, and most will have made public statements about increasing their reliance on ecosystems for future revenue growth.

3

In seven years' time, an industry leader from today will have transformed into an ecosystem company spanning multiple markets. The enterprise will lie at the center of a disruptive ecosystem, holding **no physical headquarters and few permanent staff**. Their highest-valued asset will be a digital platform.

WORKFORCE MARKET PLACE

Invent Your Future

Driven by a surge of on-demand labor platforms and online work management solutions, legacy models and hierarchies are being dissolved and replaced with talent marketplaces.

This resulting on-demand enterprise will be key to the rapid innovation and organizational changes that companies need to transform themselves into truly digital businesses. Technology isn't just changing workplace tools. It's also radically reinventing the way businesses are designed, built, and run. Imagine a large enterprise, but with almost no organization chart. Picture a business that seamlessly mixes resources into ad-hoc teams, formed to accomplish specific goals, then dispersed and re-mixed to move on and accomplish the next.

WordPress parent company Automattic uses technology to run their company much differently than most, and more like the scenario above. Automattic's staff of 450 spans 45 different countries and has eliminated traditional organizational hierarchies: business is done based on project teams ranging from two to 12 workers, without traditional managers. Teams are encouraged to experiment with new ways of collaborating to complete jobs, and so far, the experiment has been a great success. Automattic is valued at more than \$1 billion, and has become the ubiquitous leader in content management on the Internet with 25% of websites using the Automattic platform.¹

New technology companies aren't the only ones reinventing the traditional approach to the workforce; incumbent enterprises are doing it, too. Procter & Gamble (P&G) is creating new ways of getting the job done by experimenting with larger external talent marketplaces. The 180-year-old company is embracing on-demand talent as a true innovation, adopting the idea of 'borrowing' workers alongside their traditionally hired workforce. P&G recently completed a pilot program using Upwork's freelance management system Upwork Enterprise, and the results speak for themselves: products from the pilot program were delivered faster and at lower cost than with conventional methods 60% of the time.²

The company is now looking to expand their efforts in this area, committing millions of dollars in funding over the next two fiscal years. Of the IT and Business executives we surveyed, 85% indicate they plan to increase their organization's use of independent freelance workers over the next year.

These moves are indicative of a larger trend: businesses are transforming their organizational models and the way they manage their people to take advantage of an increasingly digital and on-demand workforce. Labor platforms are enabling workers to become more liquid, supporting distributed teams that are quickly assembled to complete projects and then dispersed. With this flexibility, companies are moving toward models where they run their organization less like a hierarchy of static business processes, and more like an open talent marketplace. Businesses gain the power to quickly look internally or to the external labor market to meet demand for skills. These talent marketplaces are not only more efficient, but also enable companies to change rapidly and innovate in ways that weren't possible before.

Enterprises that have been intently focused on technology investments for their products and services are now under extreme competitive pressure to extend innovation to their workforce, and even their corporate structure. By taking steps to experiment with workforce technologies today, businesses will set a path to become built-for-change companies – removing by far the largest obstacle to leadership in the new digital economy. Labor platforms offer nothing short of a talent revolution. The result? A management model evolution – from legacy models to orchestrated talent marketplaces.

REPLACING A 100 YEAR OLD WORKFORCE MODEL

Born of the industrial era, bureaucratic management models drove the success of large corporations for decades, and their employment models have remained in the social fabric of modern economies.

Using defined boundaries and hierarchical structures, the models were based on fixed roles and rules. Designed for times of stable markets and long-term project planning, these approaches inherently maintain the status quo. These legacy models persist in companies of all sizes, across industries, creating struggles for businesses that need speed and agility to respond to new challenges and opportunities.

Given the now constant flux of business markets, legacy structures and management models are constraining innovation at many organizations. 73% of executives we surveyed report that corporate bureaucracies are stifling productivity and innovation. This directly impacts not only a company's ability to change with the market, but also its market-capitalization, valuation-driven power to invest in the digital economy.

Digital-born companies without legacy employment models are dominating, with fewer employees and markedly higher market capitalization per employee – more than two times that of incumbent companies.³ These companies are flourishing by leveraging technology solutions that attack the talent problem: efficiently matching the supply and demand for people and skills in a highly personalized way. Built using on-demand labor platforms like Freelancer and Gigster, which also provide online work management solutions, digital-born companies are capitalizing on the many pieces of a digital-age workforce that can be virtualized.

In a similar vein, large enterprises like MasterCard, Airbus, and World Bank have used Gigster's AI-driven platform for their high-end talent of software developers and product managers. Companies can spin up new agile design and development programs in just weeks if not days, compared to the traditional model that takes months of planning, budgeting, sourcing, and launching. Online work management solutions enable companies to leverage both internal and external workers – the blended workforce.

Without the legacy hierarchies that incumbent organizations have been relying on since the industrial era, digital leaders can easily use these technologies to more quickly fill talent needs, jump-start new projects, and respond to market changes. In doing so, the digital leaders are setting a path incumbents can follow to begin their own workforce innovations.

Gary Hamel, visiting professor at London Business School and co-founder of the Management Innovation eXchange, and Michele Zanini, fellow co-founder of the Management Innovation eXchange, estimate that outdated bureaucratic management practices are holding up 21 million members of the US workforce in jobs that create little or no economic value. Moving these individuals into productive work would bring \$3 trillion back to the US economy (17% of US GDP), along with a boost in innovation for their employers.⁴

"The potential gains are staggering," says Hamel. "We need to be honest about how much bureaucracy is costing the economy." In short, the workforce is long overdue for a remodel, and digital transformations are poised to make it happen.

"Complex knowledge work services like software development, design, legal and financial work are the next frontier for the gig economy."

Roger Dickey, CEO of Gigster

DIGITAL TRANSFOR MATION OF LABOR

Two distinct but converging technology advancements are driving the digital transformation of labor: the online management of work and the on-demand labor force.

Management of work is going online

More and more, even in jobs where the tasks themselves remain largely an analog effort, technology is bringing the management of work online. Platform solutions enable planning, management, and remote execution of work; remote and mobile workers are becoming a larger part of the workforce; and digital communication and collaboration models make that remote work more effective. Companies of all sizes are adopting new technologies, with many abandoning traditional tools like email and using next-generation digital tools like Slack and Google Hangouts.

Complementing these collaborative tools, freelance marketplace providers have built online work management features into their services, and created dedicated enterprise offerings. These features give companies powerful new capabilities in managing work online throughout the project lifecycle. Fueling a wave of innovation, \$7 billion has been invested into a broad range of human resources (HR) technology startups during the past five years, while the incumbent vendors – namely Oracle, SAP SuccessFactors, and Workday – are all vying for leadership positions in the overall human capital market.⁵ And HR

technology startups abound across numerous categories, such as online benefits (Zenefits), operations (OneSource Virtual), and payroll (Gusto). The most prominent and promising area is HR data analytics to predict business performance – powered with AI technology.

Collaborative platforms fuel on-demand enterprises

Online tools such as Slack, GitHub, Box, Microsoft Yammer, and Google Hangouts orchestrate communication for newly virtualized and distributed workplace environments. Supporting more than 60,000 teams, Slack has three million daily users, a rapid uptake from 100,000 in 2014.⁶ Moving beyond sticky notes on local, physical white boards, tools like Mural also provide an online and remote collaborative design environment – a digital and virtualized way to organize and share thoughts, and enable rapid, agile design and meeting innovation. Large enterprises like Accenture are using Mural for collaborative brainstorming and design thinking.

Labor is Going On-Demand

The digital management of work, while critical, is only half of the story: platform technologies are also delivering the capabilities that businesses need to connect their labor requirements with an on-demand supply of skilled workers. Digital technologies and intelligent algorithms eliminate the friction in terms of time, cost, location, quality, and transparency in matching workers and employers.

With a supply of freelance workers from more than 180 countries, the leading global freelance platform Upwork is just one of many examples of such platforms, where companies can complement at a vastly accelerated pace their long-term traditional workforce with the borrowed skills and experience of external workers. The supply of available, skilled freelance workers is already steady and growing, making on-demand labor not just possible, but also ideal to quickly augment a company's workforce.⁷

With three million jobs posted annually, Upwork reports more than \$1 billion in freelancer earnings per year through matchmaking transactions via five million customers and 12 million registered freelance users.⁸ The leading Chinese firm Zhubajie boasts similar annual numbers, reflecting the global nature of on-demand growth.⁹

The rise of freelance projects listed on these sites includes IT and non-IT categories, impacting the entire economy, and giving businesses the opportunity to blend their workforce across the enterprise. Numerous other platforms focus on specific vertical industries, types of work, or categories of freelancers. Catalant (formerly known as HourlyNerd) boasts a supply of more than 30,000 MBA-type consultant freelancers, and the company continues to expand their

focus on the needs of the large enterprise, including projects with GE Digital and Pfizer.¹⁰

These matchmaking platforms will be the railroad tracks of the digital era – eliminating traditional barriers, transparently connecting labor, and transforming the business world through new economic structures.

Linking professionals with freelance roles

Leveraging its data-rich platform and extensive base of 450 million business professionals, LinkedIn is expanding into freelance matchmaking with their LinkedIn ProFinder services. Expected to grow globally, LinkedIn is piloting the ProFinder professional services platform throughout the US.

According to the 2016 Upwork / Freelancers Union study,

55 million or 35% of the US workforce of 159 million are freelancers.

A growing part of the US economy, freelance earnings are estimated at \$1 trillion, or 6% of the \$18+ trillion US economy – with a sizable amount transacted online.¹¹

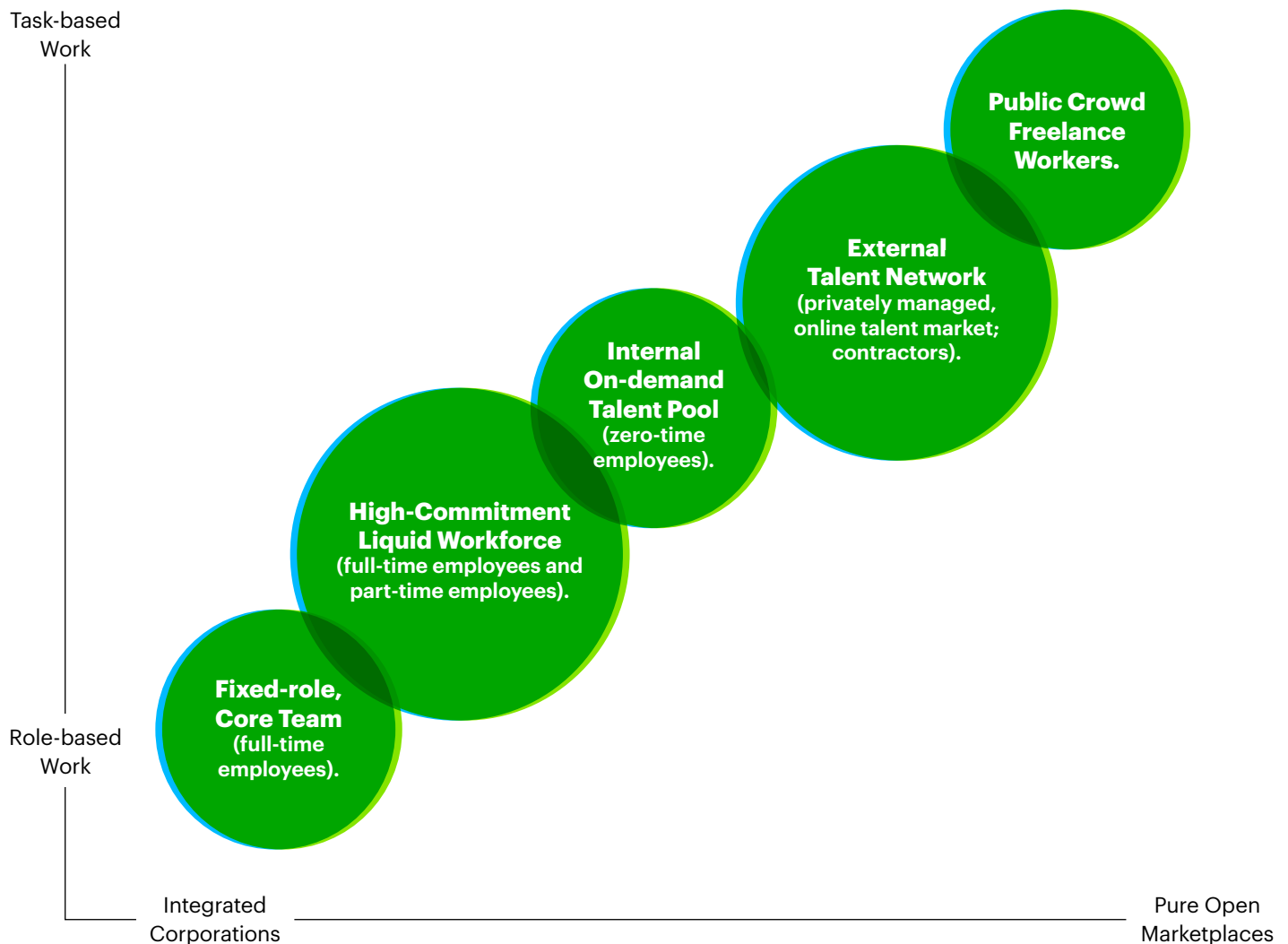
FROM LEGACY MODELS TO A **CORPORATE MARKETPLACE**

**Companies must take their first steps toward
the corporate marketplace model today.**

Innovative enterprises are already beginning the journey, using freelance labor platforms to supplement their workforce and capabilities with this large and growing pool of talent; 100 of the Fortune 500 are already using Upwork. These platforms give companies a way to test the waters of on-demand labor platforms without making immediate major changes to their own existing management models. And beyond labor-matchmaking, companies should also make use of freelance management systems like OnForce and Work Market to help manage project lifecycles and freelancers after they've been brought on.

Organizations will ultimately use the lessons learned from incorporating on-demand labor to drive larger transformations, establishing the corporate marketplace. Freelancers can continue to augment the workforce, but key parts of the internal workforce will also be transformed. Instead of a traditional structure where individuals are hired for a single position and engaged in fixed business functions, a marketplace-like approach will support people being dynamically teamed together on-demand from project to project, based on skills, knowledge, and staffing needs.





Accenture breaks ground with on-demand options

With a workforce of 394,000 professionals, Accenture is a people-powered business; to move forward in the digital age, the company has implemented a standard taxonomy for their skill base, and proactively analyzes capabilities with predictive modeling systems. Accenture has been experimenting with on-demand labor platforms for more than two years. In parallel, the company built the Accenture Crowd Platform, which has been piloted internally within the US, matching professionals with 30,000 hours of work.

Optimizing the matchmaking process, Accenture Crowd Platform is also streamlining the business for the company's distributed and virtualized global workforce. In addition, Accenture is exploring the future of 'zero-hour' worker relationships – on-demand workers who take on project-based work while earning credits toward training and benefits. And Accenture has implemented a paid-for-performance model company-wide, eliminating annual reviews in favor of continuous feedback, a key step in embracing next-generation talent strategies.

TREND 3

The digital era is breaking the industrial era models of how companies should do business.

But as they transform to act more like marketplaces, companies are also fundamentally rewriting the social contract – reshaping views on the relationships and responsibilities that organizations, governments, and society have with workers. Who provides worker training for non-traditional employees? Who pays for benefits if someone is a fluid worker, moving between different companies? If freelance workers are between assignments, are they unemployed?

Businesses are taking steps to determine the new role of workers in the digital era, as the binary employee or contractor classification blurs. But the future of work has already arrived – and companies must embrace the spectrum of worker-relationship types in the open talent marketplace, from independent contractors, to full-time employees, to every variation in between. Companies will need frameworks that provide the flexibility to scale the current and emerging worker relationships, while optimizing the related mix of compensation,

benefits, training, and community engagement. The nature of work and social contracts are in flux in economies around the globe; the steps companies take today can help lay the groundwork for a future of people fully engaged in a productive, socially balanced digital economy.

Creating your company's talent marketplace will unleash the power of people. With the management of work going online and on-demand labor matchmaking capabilities spinning up at a breakneck pace, companies that expand from innovating products and services to innovating people can blaze the path to the People First economy. Working toward a corporate marketplace model – where companies are designed for people – can drive unprecedented business speed and agility. Those who invest in people innovation today will unleash human potential and creativity, and by evolving their corporate structures, fill in a missing piece in the digital revolution.

**“We have to stop thinking
about people working
for companies and start
making companies
work for people.”**

Tim O'Reilly



100-DAY PLAN

1

Identify a top executive as the talent marketplace transformation sponsor. Task the sponsor to define a top-down, company-wide talent marketplace strategy, and to establish clear, measurable goals for improving agility and workforce opportunities.

2

With a dedicated budget and executive-level stakeholders, launch a cross-functional team to define governance and HR policy, identify the relevant and allowable technology tools, and manage legal issues for your corporate blended workforce strategy.

3

Start identifying pilot opportunities by interviewing business leaders within your organization to determine which two or three groups, projects, or products are most in need of gaining agility in their workforce and skills in order to compete in the digital economy.

4

Thinking beyond cost and efficiency, establish key performance indicators to track how the talent marketplace transformation is advancing broader business priorities for your organization. Communicate these data points with stakeholders on a regular basis.

5

Engage with freelance labor platform providers as your potential partners for pilots. Start understanding their know-how, offerings, and enterprise customer success stories.

365-DAY **PLAN**

1

Based on the interviews of business leaders for pilot opportunities, hone in on the one(s) where the work is already remote, externally sourced, highly variable, cost sensitive, or driven by specialist skills. Use this as a first pilot to engage external freelance labor markets and platforms. When the pilot concludes, perform a debrief and share findings among stakeholders as appropriate.

2

With governance, technology, HR policy, and legal issues clearly defined, launch an internal competition to be the first group to assemble a team entirely from an internal labor marketplace. Track the progress of this team, capture lessons learned throughout the process, and share them with internal stakeholders. Learn from your experience and launch a slightly larger second phase. Continue to iterate and expand.

3

With lessons learned from both pilots, define a formal governance structure to manage freelance worker policies and best practices. This governance structure should move your organization toward a marketplace management model and blended workforce.

4

Armed with a formal governance structure, policies, and best practices, work toward blending the internal and external strategies with a goal of erasing the boundaries between the internal organization and the external ecosystem of labor platforms.

TREND 3 **PREDICTIONS**

1

In the next five years, on-demand labor platforms will emerge as a **primary driver of economic growth** in developed and emerging economies worldwide.

2

Within five years, all industries will have new, dominant leaders with **business structures based on small cores and powerful ecosystems**. Incumbent corporations still carrying the burden of legacy bureaucratic models will experience rapid deterioration of market power.

3

In five years or less, the presumptive judgments around full-time employment and freelancers will flip completely. Compared to traditional full-time employment, **talent marketplaces will provide workers with improved earning opportunities**, more rewarding work, secure benefits, and respected credentials.

4

By 2022, the traditional purpose of industrial era corporations and management models will be replaced, having been displaced by **digitally connected marketplaces**.

DESIGN FOR HUMANS

Inspire New Behaviors

What if technology adapted to people?
The new frontier of digital experiences
is technology designed specifically
for individual human behavior.

Business leaders recognize that as technology shrinks the gap between effective human and machine cooperation, accounting for unique human behavior expands not only the quality of experience, but also the effectiveness of technology solutions. This shift is transforming traditional personalized relationships into something much more valuable: partnerships.

People often act in ways that defy simple expectation. Take computer security: customers and employees understand that cyber threats are serious. The \$3 trillion in damage that hackers, malware, and data breaches cause every year dominates headlines, and people are warned to be wary both at home and in the workplace.¹ Yet despite the risks, a recent study found that people mostly ignore warnings from their computer security software, dismissing the pop-up notifications up to 87% of the time while they are distracted with another task.²

Why do individuals ignore the warnings? Not because they think the technology doesn't work, or that it's unimportant – but because the warnings don't take into account that people are busy trying to read an email, create a data visualization or lead a collaborative virtual meeting. The researchers found that people were much more likely to respond to security warnings if they appeared in between tasks being performed. When technology works with people, they will use it. When it doesn't, they'll abandon or ignore it. Cybersecurity's struggles are just one stark example of an increasingly clear technology insight: functionality alone is not enough. To truly succeed, businesses need to account for human behavior.

Today, most technology operates at a machine level: it can do a great deal with data and facts, but it doesn't understand people. But what if technology could operate at a more human level? How would the relationship to technology change if it could not only interact with customers and employees in a more natural, human way, but understand personal and workplace behaviors and goals, and respond appropriately?

With today's nearly unlimited data stores, this is suddenly a real possibility. As technology is integrated into every action people take, every process they follow, and every object they use, 2.5 quintillion bytes of data are produced every day.³ This data not only provides businesses with vast amounts of information about how customers live and employees work, it's offering an unprecedented opportunity for companies to use more sophisticated analytics to understand how people behave. Companies suddenly have a potential level of insight they've never had before: an insight into how people think, what they want, and how they react. Designed with this in mind, technology can operate on a scale that's simultaneously more grand and more granular – it can operate at a human level.

EXPANDED PARAMETERS OF PERSONALIZATION

The beginnings of this revolution in the human relationship with technology are already apparent, and digital leaders that are focused on customer analytics are rapidly turning insights into profits.

From simple personalization techniques to fully customized experiences, the opportunities are dramatic. Stitch Fix, a startup subscription styling service, differentiates from other retailers by customizing every shipment of clothes to an individual customer's taste; 99.99% of the company's shipped orders are unique.

Going beyond recommendations that only look at basic attributes like size and color, Stitch Fix analyzes a shopper's social media interests, as well as advice from professional stylists more apt at interpreting specific customer requests. By collecting data on how shoppers react to each new style and article of clothing sent, Stitch Fix is able to continuously improve their recommendation engine and find new ways to delight returning customers. This dedication has paid off: the company generated \$250 million in revenue in 2015, with an expected increase to \$375 million for 2016, and nearly 40% of their customers are buying the majority of their clothes from Stitch Fix compared to 30% a year earlier.⁴

Ever-growing customer expectations have pushed businesses toward offering 'living services,' driven by digitized products and more comprehensive personalization.⁵ Consumers have a positive attitude toward

personalized offerings and services. In a recent survey, 58% of consumers reported they would be more likely to make a purchase when a retailer recommends options for them based on their past purchases or preferences.⁶

These changes, however, don't stop with personalization. Companies are using an understanding of behavior to deliver technologies that are more adaptive, responsive, and aligned to the goals and actions taken by customers and employees alike. With more data on the ways people interact with technology, coupled with computing power capable of processing these massive streams of information, businesses are now reshaping everything from the interfaces customers and employees rely on, to the larger engagement journeys they make possible.

Financial company Betterment helps investors reach long-term goals by understanding and reacting to their customers' behavior. Internet-based financial companies all provide tools that customers can use to make investments and trades quickly, but the onus is on the investor to figure out their best use. Betterment has tossed that approach out the window. Working to minimize the 'behavior gap,' or losses that result from human investors

taking short-sighted actions, Betterment's dashboard actually hides a portfolio's daily performance, knowing that the human tendency is to overreact to volatility.

Instead, their site is designed to encourage customers to take fewer actions, minimizing the risks of the behavior gap, and maximizing long-term profits. This approach has created an ongoing journey with Betterment's customers that, like a human financial manager, follows an investor's goals, monitors progress toward those goals, and guides decision-making needed to stay on track.

And this behavioral approach is working. A recent report from Morningstar found that over the past 10 years, behavior gaps cost individuals an average 1.32% of returns per year.⁷ But investors using Betterment have a behavior gap of just 0.31% per year.⁸ For Betterment, these investor savings translate into brand loyalty and advocacy for their financial services. Betterment's \$5 billion in assets under management position the firm as an industry leader among automated investors.⁹

On the surface, this transition from data to human behavior seems like a natural progression. But the implications to a business shifting to this philosophy of design are profound. In designing powerful journeys, companies are inherently redefining their relationship with both customers and employees. By offering technology that helps people reach their goals, businesses are graduating to a larger role in their lives: that of a partner. As a new customer-company partnership is created, the customer's goal becomes the company's goal. Similarly, as existing employee-company partnerships are strengthened, the goals of individual employees become design requirements for enterprise-level technology systems.

Doing this right means making fundamental changes to the way companies do business every day, from architecting their systems, to better understanding behavior, to rethinking their interactions with customers and employees, as well as seeing products and services take on new roles as pieces of a larger customer journey. Those who are up to the challenge have the potential to reimagine their relationship with people, from one that lasts the length of an interaction, to one that persists over a lifetime.

By offering technology that helps people reach their goals, businesses are graduating to a larger role in their lives: that of a partner.

ADAPTIVE APPROACH TO **UNDERSTANDING BEHAVIOR**

To help enable the level of AI-powered, back-end analysis that underpins behavior-centered technologies, enterprises must consider every application throughout their systems as a potential window through which they can understand customers, and a testbed to refine business offerings. This approach requires an adaptive framework where applications will not only observe, capture, and use customer-provided data, but also continually adjust. Enabling adjustments provides opportunities to optimize interactions, experiment with different approaches to understand behavior, learn and evolve models that predict how systems react, and capture the changing nature of customers themselves.

Modern, distributed computing frameworks like Apache Spark now allow businesses to run large-scale, adaptive analytics, often up to 100 times faster than conventional big data frameworks like Hadoop MapReduce.¹⁰ The Toyota Customer 360 Insights team uses Apache Spark to uncover salient customer feedback in streams of social media interactions.¹¹ The analytics that Toyota uses go beyond searching for simple classifiers like brake noise, instead experimenting with different semantic analyses that consider related symptoms that people may also be discussing. This method increases the scope of customer behavior that can be analyzed, and helps uncover new and improved ways to address customer needs.

Using this experimental approach toward refining categorizations helps Toyota offer customers the most relevant advice, as well as identify larger trends that may have safety implications for drivers. The benefit?

By adopting a framework to separate critical customer signals from noise, Toyota reduced the time spent analyzing customer feedback from more than six days to just four hours. As greater sensing functionality is added to Toyota's cars, the capacity to adapt and compare customer feedback with real-world observations will only enhance the company's ability to partner with drivers, giving individualized feedback to each driver and car.

In another adaptive approach, Virgin Atlantic focused on a critical workforce behavior for the airline industry, by conducting an experiment to track and attempt to lower the fuel consumption habits of their pilots. The company divided the pilots into experimental groups and delivered



different kinds of feedback on their fuel use to incentivize savings. At the end of the study, Virgin Atlantic had saved \$5.4 million in fuel costs and raised pilot job satisfaction rates by 6.5%.¹² Studying incentives that motivate positive behavior change opens new opportunities for companies to make immediate business gains while strengthening their long-term relationship with employees.

Finally, segmenting customers and running A/B analytics has become the digital standard to determine what kinds of technology experiences yield desired results, whether it's maximized sales or minimized abandoned shopping carts. But now, businesses can go beyond these traditional methods, and begin adapting based on human behavior as it occurs throughout a customer journey.

Web analytics tool FullStory helps companies understand the entirety of granular human behavior occurring across a website, in recorded visualizations of mouse movements and observed website interactions.¹³ This insight into behavior drives improvement efforts to make site features more accessible; it also provides valuable information for future customer support by pinpointing the exact causes of customer frustration. Combined with traditional segmentation experiments, tools like FullStory help businesses obtain an empathetic and human-level understanding of customer interactions as they occur over time. This additional layer of behavior can transform the way companies react to experimental findings, allowing them to focus on refining designs that optimize business outcomes by considering and addressing human outcomes.

TRANS PARENCY IS KEY

In addition to shifting toward an experimental approach, companies must commit to transparency as they begin to respond to human behavior. Accenture research from 2016 found that 75% of people are generally comfortable with companies collecting personal data if the company is transparent about how they're using it, and lets customers control how data is used.¹⁴ But the danger of misusing data cannot be overlooked. One study found that if a company was misusing personal data, 45% of customers would cease interacting with that business entirely.¹⁵ People must trust that when data on their behavior is used to build a path through a company's products and services, it will ultimately help them reach their own goals.

Studying incentives that motivate positive behavior change opens new opportunities for companies to make immediate business gains while strengthening their long-term relationship with employees.

REDEFINED RELATIONSHIPS

By responding to human behavior, companies will inherently find themselves redefining their relationship with both customers and employees. In other words, businesses are shifting from provider to partner.

By creating partnerships with the people using their products, services, or technologies, enterprises have a new opportunity to create long-term loyalty – with lasting value in both the marketplace and the workplace.

The more companies understand why customers are buying their products, or employees are using workplace tools in a certain way, the more these things can be molded to help people on a journey to achieve their personal goals. Businesses will walk alongside and support individuals throughout their journeys, delivering an experience that adapts and conforms over time.

Companies recognize the importance of these new relationships: 80% of the executives we surveyed agree that organizations need to understand not only where people are today, but also where they want to be – and shape technology to act as their guide to realize desired outcomes.

Becoming a partner demands fundamental shifts in the ways leaders think about their business. As companies move to develop new journeys for customers and employees, they'll slowly take on a fundamental role in people's lives. Businesses that do this well will also recognize that they're undergoing a journey to transform themselves, to allow for long-term growth.



80% of the executives we surveyed agree that organizations need to understand not only where people are today, but also where they want to be.

PEOPLE'S GOALS ARE YOURS

In becoming a partner, businesses succeed when their people succeed, which means that it's no longer the primary goal to drive people toward a product or service, or quickly increase employee productivity. The new goal is to help define a path that people can follow to reach their goals.

A company's new product is the partnership, along with accompanying guidance. In return for helping move customers forward, a business will have direct insight into the ways people seek out value through their products and services. On the consumer side, Google Calendar offers a goals feature, designed to help people find time for activities like practicing a new language or going to the gym. Individuals can tell Calendar what they want to do and how often, and the app analyzes their schedules to find suitable places for that activity, even learning better times to block off the more a person uses the feature. As people continue to use Google Calendar for their scheduling, both it and the larger ecosystem of Google products and services will generate data that the company can leverage elsewhere.

In the workforce, partnership is about addressing employees' goals. One such goal could be discovering business insights without having to use complicated technical solutions. Businesses can respond by aligning technology tools to make task completion more natural.

Tableau Software has developed a tool that lets people perform exploratory analysis on data visualizations, drilling down into areas of interest by asking questions in plain English.¹⁶ Tableau's focus is on integrating the tool, Eviza, with existing visualizations, so that people can have a conversation with a visual representation of data. From a graph showing the locations of earthquakes in the US, an employee could ask, "Where are the large earthquakes?", and Eviza will return a new version of the graph to provide the answer. This natural language processing eliminates a major source of employee frustration by delivering technology that helps them do their jobs better.

PARTNERSHIP IS A LONG-TERM COMMITMENT

Besides changing the focus of relationships, the cadence of those relationships must shift as well. It may give pause to companies used to monetizing every interaction, but long-term partnerships come with large opportunities. Customers who feel emotionally connected to businesses buy more products, use more services, provide vocal support, and pay more attention to company communications and advice. Research has found that emotionally connected customers deliver 52% more value over and above that from customers who are highly satisfied, but not emotionally connected.¹⁷ Yet a consumer study found that only 25% of traditional retail customers felt their individual needs were being catered toward.¹⁸ The gap between potential and captured value is tremendous, and companies have a chance to close it.

Just as customers have long-term goals that businesses can help meet, more journey-centered technology can also help employees reach larger career and life aspirations. L'Oréal has committed to providing their employees with ongoing opportunities for education. In order to extend learning opportunities, L'Oréal is using Coursera for Business to increase the breadth of training material and certification programs available to employees.¹⁹ The partnerships Coursera has developed with top universities around the world give L'Oréal employees access to high-quality training from recognizable institutions, which people can use to progress their careers.²⁰

Using technology that guides employees toward their goals, adapted to areas of strength and weakness to maximize useful learning, presents greater opportunities for increased job satisfaction. This translates into value through reduced turnover, since replacing an employee can cost a business more than 20% of that individual's salary.²¹

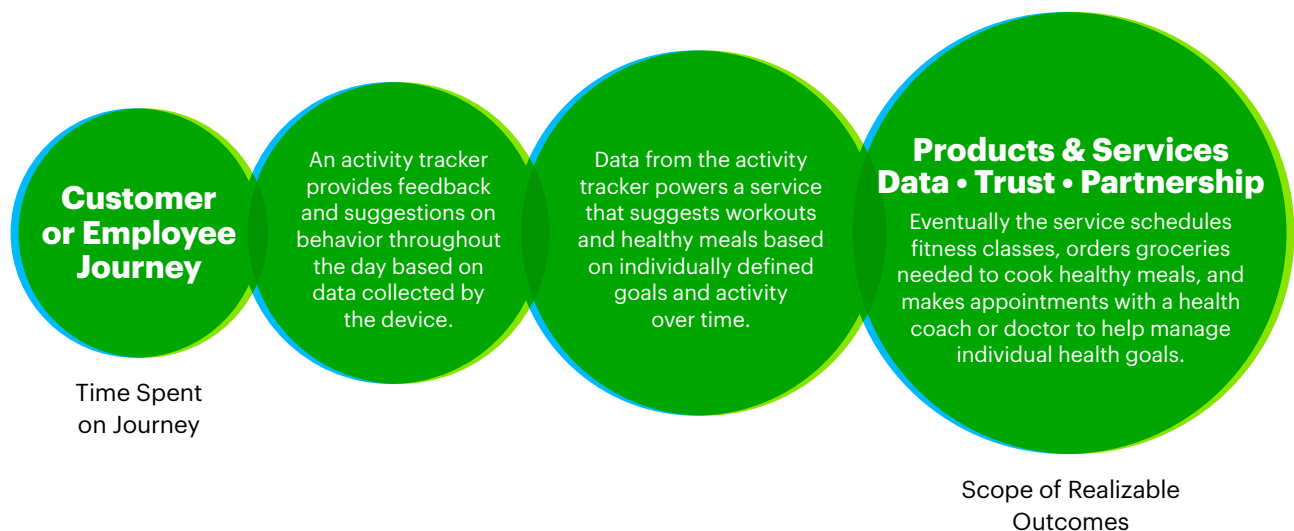
It's also worth noting that customer and employee journeys sometimes intersect. Take Hulu, a video on-demand provider that noticed returning customers' satisfaction ratings were lower than expectations. By studying both customer and employee feedback, the company discovered that customers were reacting poorly to aggressive sales tactics. In response, Hulu adjusted their sales bonus structure for employees to emphasize customer retention over sales. Based on a Hulu subscriber base of 12 million customers, an improvement of even 1% in retention via this behavior-focused approach could generate another \$11 million in annual revenue.²²

Customers who feel emotionally connected to businesses buy more products, use more services, provide vocal support, and pay more attention to company communications and advice.



WHAT'S POSSIBLE AS PARTNERSHIPS GROW

As customers trust a business more, they'll provide more data and use more products and services. With this trust, companies can turn more extensive data into an even stronger partnership and deliver on larger, more challenging goals.



TREND 4

By considering and responding to human behavior, businesses have an unprecedented opportunity to transform their relationships with people.

Building on the insights available from vast amounts of data, leaders will create rich, responsive journeys that guide customers and employees toward achieving their goals, and walk with them to get there. As they make these journeys together, companies will see their relationships with people flourish into that of a true partnership.

Taking customers on the best possible journeys is something no business will be able to do alone.

While these shifts toward responding to behavior are made possible by advances in technology, they won't amount to anything without an understanding of the social and behavioral sciences behind how people work. Companies will need to collaborate with experts from this space to move forward. And when it comes to delivering those rich journeys, businesses will have to look to the next generation of ecosystems – not only

to build their customer base, but also to partner with organizations that can enhance goal-oriented journeys over time. From health-focused food shops collaborating with fitness apps to improve customer nutrition, to enterprise training tools expanding on-the-job training, to university-backed courses, opportunities for collaboration are both abundant and necessary when customer journeys extend beyond a single company's reach.

With the power of partnerships, your company will find new opportunities to innovate, and new pathways into digital markets and industries. Just as your company will help customers and employees grow, these new relationships will help your business grow in return. This is the human-by-design approach that will deliver lasting value in the digital economy: technology that adapts to people, and puts their goals first.

100-DAY PLAN

1

Identify the technology channels that customers or employees move through while interacting with your products/services. Annotate the human behaviors that contribute to positive and negative outcomes during these interactions.

2

Enumerate the journeys your customers and employees take with your company, products, and/or services. Indicate the points on these journeys where engagement with your company begins and ends.

3

Catalog the data you already collect, could collect (but presently do not), and cannot currently collect that offers insight into customer behaviors and decision-making.

4

Using the customer behavior insights that you currently possess, plan a pilot to offer a behavior-personalized experience with an existing product or service.

5

To support conducting behavior-based A/B research with customers, draft a code of data ethics for such experiments. Leverage any existing ethical codes from your industry and Accenture's Universal Principles of Data Ethics.

6

Establish a strategic vision for making your technology products and services more goal-oriented.

365-DAY PLAN

1

From your technology channel research, identify at least three business cases for minimizing behaviors that inhibit positive outcomes in existing and upcoming products.

2

Using the journeys previously enumerated, work with strategy and product teams to uncover opportunities for improving the quality of outcomes that customers and employees receive with your company's guidance.

3

Still using the enumerated journeys, identify key organizations that engage with your customers or employees before and after your company's role on each journey. Using Accenture's *Ethics of Data Sharing* as a guide, establish data sharing agreements with these organizations to further enrich your business's understanding of behavior across a journey.

4

Finalize your code of ethics and begin performing behavioral studies to understand and improve the ways your technology elicits, or fails to elicit, specific human behaviors.

5

Challenge product teams to use behavioral insights to help individuals realize unique goals.

TREND 4

PREDICTIONS

1

Within five years, a set of Global 2000 companies will begin **hiring employees** based not only on self-reported experience, but also on behaviors exhibited during previous roles and how individuals handled themselves in certain situations.

2

In five years or less, governments will **collaborate with businesses to drive sustainability** shifts in societal behavior. Energy efficiency, CO² reductions, and landfill diversion will be the first targets.

3

By 2022, multinational organizations will introduce **employee-facing technologies** that are able to identify when a worker is frustrated and then alter the tone and style of feedback or guidance automatically delivered to the worker.

4

Within five years, a Global 2000 company will **lose significant market share** due to a behavior-manipulation scandal.

THE UN CHARTED

**Invent New Industries,
Set New Standards**

**Businesses are not just creating new
products and services; they're shaping
new digital industries.**

From technology standards, to ethical norms, to government mandates, in an ecosystem-driven digital economy, one thing is clear: a wide scope of rules still needs to be defined. To fulfill their digital ambitions, companies must take on a leadership role to help shape the new rules of the game. Those who take the lead will find a place at or near the center of their new ecosystem, while those who don't risk being left behind.

Whether they're blazing a path to automated driving or precision agriculture, the breakout businesses of today are defining the rules and standards for entirely new digital industries. Participating in the prevailing markets is not enough. In order to grow through their digital strategies and continue to be relevant, companies must work to shape the digital markets of tomorrow.

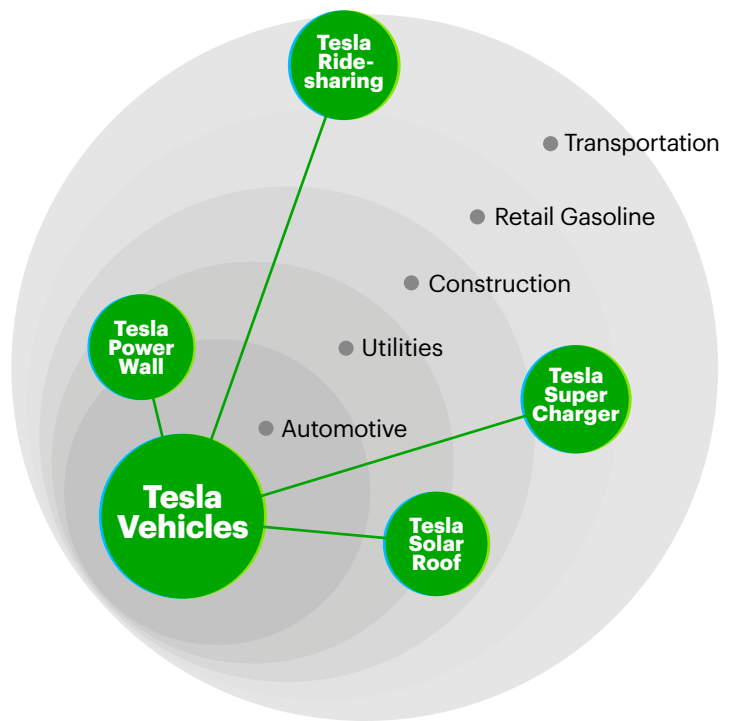
The early adopters have already started. Tesla's Silicon Valley approach to building electric vehicles has set them apart within the auto industry, but their plans portend a future as much more than a car company. Tesla's digital strategies cross multiple existing industries as they look to shape new ones.

The company is expanding their energy storage research into products for the home that upend traditional utility and building approaches, while their upcoming Tesla Network will create a fleet of personally owned Tesla vehicles to be used for self-driving ride-sharing – creating an entirely new model for both car ownership and shared transit.¹ Tesla's diverse digital strategy puts it in direct competition with legacy companies from myriad industries, while those legacy companies lack the maturity of a digital ecosystem to compete in more than one.

From every angle, it's apparent that emerging industries like this one are not just 'version 2.0' of industries that existed before. The change is much more dramatic: these new digital ecosystems are transcending disparate markets to create new digital industries.

These changes are happening at every level of business, in every sector. According to Gartner, "by 2020, your company will either lead a digital business industry you have created or be part of one created by someone else...if you are still in business."²

Amazon and Netflix started out, respectively, as e-commerce and DVD rental companies; they now both compete with television production studios and broadcasters through their streaming content, with Netflix getting their largest number of Emmy nominations ever in 2016 and winning a personal-best nine, and Amazon walking away with six.³ NVIDIA, which built their empire on computer video cards, developed graphics processing units (GPU) to address a host of problems fundamental to video, and have now adapted that technology for applications in supercomputing, the Internet of Things, and automotive. In fact, these are their biggest growth areas, not video.⁴



SETTING NEW STANDARDS

Taking the lead in this new environment creates new responsibilities. To thrive, companies must shift from market taker to market shaper.

Not only will successful organizations blaze a new trail in products and services, but they will also have to set the guideposts for it – from ethical standards, to industry best practices, and beyond.

Forward-looking companies are paving the way by defining the new rules of the game. Rather than sitting passively and waiting for guidance, Tesla is setting guideposts for both electric and driverless cars. Every car Tesla builds is 100% electric, and comes with the hardware necessary to make it autonomous; the company claims that enabling the feature simply requires regulations to be established and a company-issued software update.⁵ Tesla is both asking regulators to catch up to their advanced capabilities and actively working to shape the rules, collaborating with government regulators to create standards for the autonomous transportation industry. In June 2016, the US government announced a partnership with Tesla, other major auto manufacturers, and energy companies to create the *Guiding Principles to Promote Electric Vehicles and Charging Infrastructure*.⁶

By establishing best practices for their entire industry, businesses can help ensure that others must abide by those standards to compete in the new market. Strong standards also help to negate the need for external regulation. Alphabet, Amazon, Facebook, IBM, and Microsoft are working together to create a standard of ethics for advancements in the AI industry.⁷ Although these companies are competitors, they're working together on ground rules for the entire ecosystem of AI pioneers. Collectively setting the rules for this rapidly evolving industry helps to mitigate the risks of complex external oversight, prevent harm to consumers, accelerate innovation, and protect the reputations of every brand pushing the frontier of AI.

Winners will have to take on new corporate responsibilities to shape emerging digital industries. To be successful, businesses must work with regulators, standards bodies, and other ecosystem stakeholders to educate, collaborate, and define the rules of a new digital industry. They will also need to outline the new industry's ethics and best practices, and in some cases, heavily influence the social contract. Those who take the lead will find a place at or near the center of their new ecosystem, while followers will land on the periphery.

LEADING ON MULTIPLE FRONTS

Today, companies recognize that rules and guidelines for existing industries are outdated. 65% of IT and business executives we surveyed believe that government regulations in their industry have not been able to keep up with the pace of technology advancement.

To move forward with their digital strategies, businesses from all industries will need to take on additional roles to define the rules of the digital economy (see figure 1, page 72). From technology standards to industry best practices, government mandates, or ethical norms based on public opinion, in the ecosystem-driven economy, one thing is clear: the rules that are left to be defined span a very wide scope.

In some cases, there is simply no existing guidance that's relevant to the challenges of a new industry's products, services, or value chains. This is often the case with ethical guidelines, as new technologies present new types of considerations with ethical implications. In the case of virtual reality (VR), Google's Daydream VR team recognized how damaging foul play can be in online communities, and wanted to prevent abusive virtual behaviors from driving customers away from the technology.⁸ The company built features into their VR platform that not only recognize the sanctity of personal space, but also encourage positive interpersonal

interactions with bonus features such as animations and sound effects (e.g., fireworks and clapping sounds when players give each other high-fives). These features don't accompany aggressive actions, encouraging players to exhibit positive actions in order to earn rewards.

When businesses do have existing operating rules, they were likely written prior to the dawn of the digital era, and long before any of these new digital industries or technologies were created. As a result, they're consistently incomplete, often irrelevant, and can act as a limitation to progress when applied to new hybrid ecosystems.

The finance industry in Japan, where legacy regulations limit a bank's ownership in non-finance companies to 5–15%, is a case in point.⁹ Regulators in Japan consider

65% of IT and business executives believe that government regulations have not been able to keep up with the pace of technology advancement.

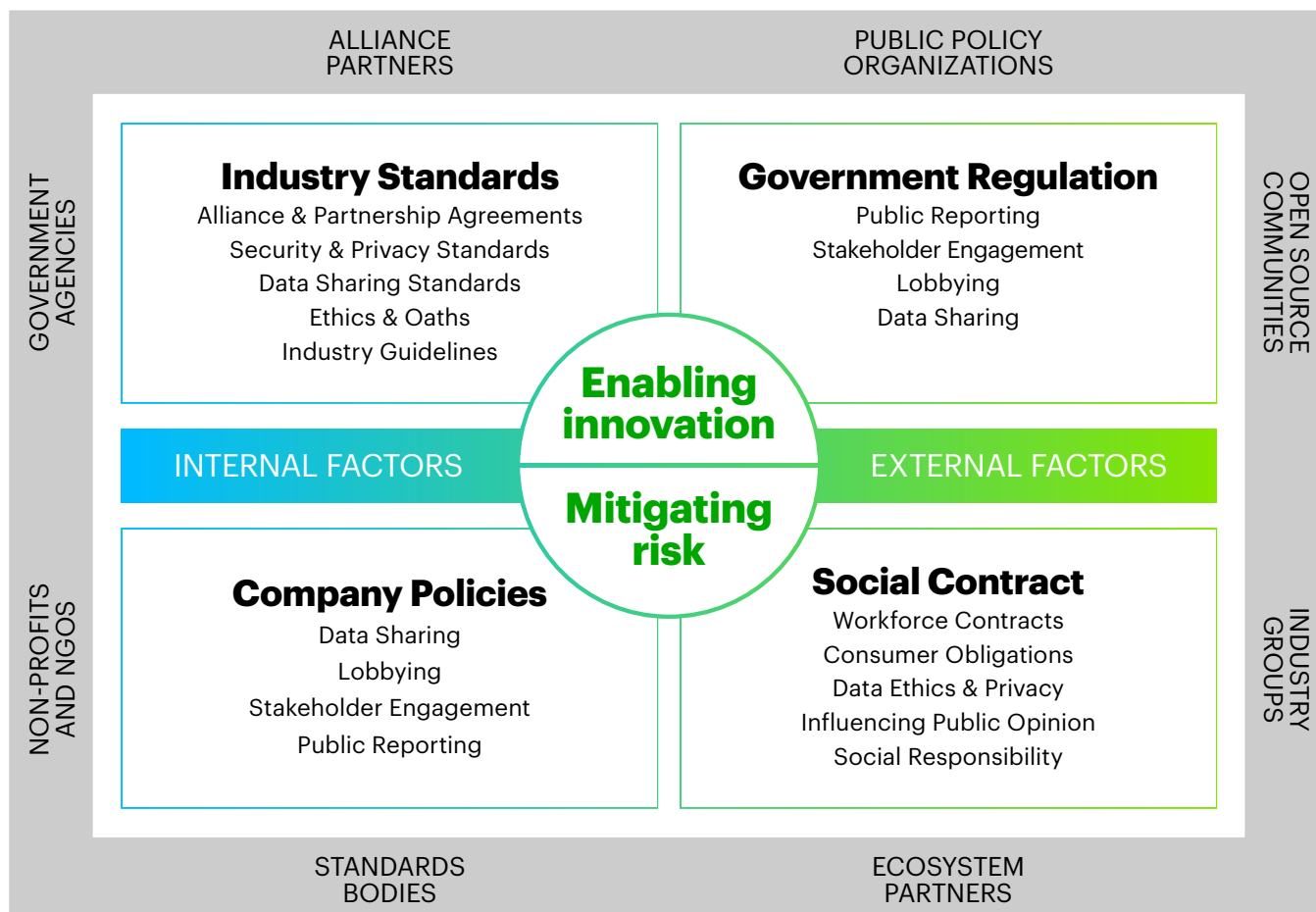
financial technology companies to be technology firms, not financial firms – so while megabank Mitsubishi UFJ might want to take a portfolio approach to investing in financial technology startups, regulations make that impossible to do strategically. In response, Mitsubishi UFJ is building an in-house financial technology R&D division to deliver the innovation they need.

In digital industries, competitors are joined by partners from completely different areas of business, meaning the rules for a new industry must be written to both consider and apply to every partner – no small feat given the varied capabilities and demands

of stakeholders in emerging industries. Mashups that would have been unheard of a decade ago are becoming more commonplace: who imagined that General Motors would invest in a car-sharing service, let alone acquire an AI company to work toward automated driving? Combinations like these will shape new digital industries, where new rules must be written to apply to organizations from multiple sectors of the economy.

Regardless of the circumstances that lead to the formation of a new industry, the partnerships within it will define the contours of what's to come. As with GM, companies will need to collaborate with ecosystem stakeholders who

Figure 1: New ecosystem for digital industry pioneers



Mashups that would have been unheard of a decade ago are becoming more commonplace.

do not share the same industrial heritage; they'll also need to work with industry organizations to set standards. For example, GSMA, the global industry group for cellular communications, has assembled 58 independent carriers and Google Android in an industry-wide effort to advance mobile messaging. This new approach will enable all phones across all networks to have compatible messaging experiences with group chat, high-resolution photo sharing, and more.¹⁰ Equally critical, leading companies will also need to work with consumer protection organizations, open source communities, and others to set guideposts for new digital industries.



REDEFINING RELATIONSHIPS

POLICY & PUBLIC

OPINION

Just as organizations will have to work with industry partners to set new rules, partnerships with governments and consumers will be critical to moving forward.

Governments have historically struggled to keep up with the pace of innovation. As a result, their policies often lag behind the industries they're required to regulate. Rather than waiting for government agencies to catch up, leaders of emerging industries will partner with these agencies, working together to ensure that any new regulations are inclusive of subject matter experts within the industry.

Where new digital industry efforts conflict with existing public policy from incumbent industries, companies must work with the relevant stakeholders to update or develop new rules. Airbnb has offered to self-regulate in San Francisco, Chicago, and New York.¹¹ By offering enforcement capacity to cities, the company looks to be more effective at shaping market dynamics (e.g., collecting and remitting taxes, requiring landlords to register with government agencies, preventing a single landlord from listing multiple properties) than what public policy alone could achieve. Partnerships like these will become increasingly common as companies push the boundaries of existing technologies, products, and services, creating new offerings that demand innovation in regulations as well as business models.

In some cases, public opinion itself will expedite the regulation. Early in Airbnb's lifespan, a host's home was ransacked by a guest. This was the first such incident and the company had no playbook for what to do next.¹² Today, Airbnb does have one, and they used this event

(and several others) to develop safety and compliance rules for hosts and guests. The company continues to update their rules as needs arise – for instance, after they uncovered systematic discrimination among hosts, Airbnb added anti-discrimination rules for hosts.¹³ Rather than wait to see where public opinion will land on a groundbreaking new industry, leaders will be proactive, working with stakeholders to determine where the lines should be drawn and how they'll be enforced. 78% of the executives we surveyed agree that their organization feels it has a duty to be proactive in writing the rules for emerging industries.

As businesses create these new relationships with governments and other stakeholders, they'll find it sets the stage to work on larger issues related to the new social contract being created as society evolves. Put another way: emerging industries can redefine what governments, enterprises, and individuals are responsible for in the digital era – and the potential disruption to the social contract is monumental. For example, the role of human labor and employment is now under constant redefinition. Uber has roughly 200,000 drivers globally, and a 2016 court decision in the UK held that these drivers must be considered employees; yet in other countries their relationship to the company remains as that of a contractor, but their role seems to sit somewhere between contractor and employee – leaving them in an undefined gray area.¹⁴ Clearly, the social contract is evolving; the question is how strong a role leading companies will take in influencing what it becomes.

USING A NEW ARSENAL OF TOOLS

The ripples created from a new digital industry can turn into disruption at all levels of society. This is why leaders must consider digital trust (security, privacy, and digital ethics) as core to any digital industry strategy.¹⁵ Doing so will drive adoption not only by consumers, but also other industry members and government regulators.

The scope and depth of defining rules and responsibilities change in new digital industries. Companies won't just be implementing governance strategies through offline activities like boards and committees; they'll be digitally replicating these approaches by embedding rules and standards within technologies themselves.

The most mature of these emerging technologies is the distributed database known as blockchain. Blockchains deliver built-in solutions to many historical challenges of governance: transparency, a guarantee that records have not been changed (immutable), and the ability to operate in a distributed fashion. Many banks are using private blockchains to speed intrabank transactions, cutting operations that previously took two to six days down to mere seconds.¹⁶ Maersk shipping lines has experimented with using a blockchain to replace cumbersome bills of lading, which often cost more to process than the price of a shipping container.¹⁷ IBM, Walmart, and Tsinghua University are using blockchain technology to "improve the way food is tracked, transported, and sold to customers across China."¹⁸

Another technology, known as differential privacy, integrates digital ethics and privacy standards. A statistical technique that adds predictable amounts of noise to data, differential privacy protects individual data subjects while preserving the accuracy of the insights derived from a large group of data subjects.¹⁹ It can help deliver the type of privacy controls required by strong governance, while also giving businesses a way to accept accountability for the privacy of their customers. Google's Better Cities initiative is using differential privacy with data gathered from Google Maps on mobile devices to gain insights on traffic conditions in Stockholm. The goal is to apply advanced analytic techniques to improve travel times without revealing any individual's trip.²⁰

As digital ecosystems expand, another technology innovation – smart contracts – offers an automated way to enforce contracts whether the counter-party is trusted or not. Smart contracts design-in the rules for an exchange of value and can be self-exercising or self-enforcing as a situation demands. One of the first public smart contract implementations allows people to buy gold – using Bitcoin or Ether cryptocurrencies – in any amount without the steep fees of traditional exchanges.²¹ Buyers receive a digital token that is redeemable for a unique bullion bar at a real-world, secure vault. The gold's provenance is traceable and immutable, indefinitely.²²

Participation in larger ecosystems also increases the likelihood that businesses will need to conform to stricter standards than their own, particularly when collaborating with healthcare or financial partners, with rigorous privacy and security demands. When companies need to perform analytics on highly sensitive data, for example, homomorphic encryption holds promise by implementing data sharing and data transformations that are performed exclusively with encrypted data, decrypting it only when a person needs to see a result.

Homomorphic encryption is not new, but being able to work with encrypted data without paying a heavy tax for computational time is new. In some instances, queries that would

have taken years to compute with the previous generation of homomorphic encryption can now be done in minutes or hours. This 'time tax' is still too costly in many instances, but will continue to see improvements as niche applications trickle out of research labs and into high-value business processes.

Technological solutions like these that address the historically cumbersome challenges of governance, accountability, and digital trust will continue to emerge. And businesses will use these same technologies to digitally transform business processes.

TECHNOLOGY	DESCRIPTION	GOVERNANCE	BENEFITS
Blockchain	The blockchain is a secure transaction ledger that is shared by all parties participating in an established, distributed network of computers.	<ul style="list-style-type: none"> Provides unprecedented levels of transparency No need for any single, central authority Self-reconciling ledger Single source for 'true data' 	<ul style="list-style-type: none"> Forensic traceability Participants in a transaction must sign with a private encryption key
Smart contracts ²³	The facilitation, verification, or enforcement of the performance or negotiation of a contract by computer protocols that makes a contractual clause unnecessary.	<ul style="list-style-type: none"> Rules for exchanges of value are designed-in (with self-reconciling features) Can be self-executing and/or self-enforcing 	<ul style="list-style-type: none"> Removes the need for a trusted third party to act as a governance/enforcement body
Differential privacy	A statistical technique that adds predictable amounts of noise to data, protecting the privacy of individual data subjects while preserving the accuracy of the insights derived from a large group of data subjects.	<ul style="list-style-type: none"> Can guarantee anonymity to data subjects, enabling privacy controls that might be required by strong governance 	<ul style="list-style-type: none"> Sought by firms looking to accept accountability for their data subjects' privacy
Homomorphic encryption	Ability to perform data exchanges and transformations exclusively with encrypted data, only decrypting it when a person needs to see a result.	<ul style="list-style-type: none"> Storing datasets in fully homomorphic repositories removes all chances for unplanned disclosures Only those entities with a private key can query the database, run analytics on the data, and see results 	<ul style="list-style-type: none"> Implementers of homomorphic encryption recognize the risks of improper data disclosure

TREND 5

With the relentless pace of change across industries, businesses must write the new rules of engagement themselves.

At the same time, these new digital industries are beginning to redefine relationships with partners, governments, and society itself. As the pace picks up, your company will need to employ new strategies, models, and technologies to remain competitive.

Defining the rules for new digital industries is the new corporate responsibility – and with great responsibility comes great opportunity. By acting now, your business can establish the rules for any new challengers in industries and ecosystems that are still emerging. And by demonstrating leadership in this space to customers, partners, and external agencies, your organization will enjoy expanded freedom and opportunities to innovate.



100-DAY PLAN

1

Understand your company's role among the ecosystems where you participate. Create a stakeholder map for each industry in which your company operates and catalog the ecosystems within these industries.

2

Make a list of ways your products and services influence society, and hold internal roundtable conversations focusing on this potential influence. Build a conscious strategy for influencing the social contract with a governance structure that ensures responsible and ethical influence.

3

Take inventory of data inputs to your organization. Focusing on areas where you receive personally identifiable information (PII), or where metadata could generate PII, enumerate the potential risks to highlight areas where new governance – for your company or industry – may be needed.

4

Highlight areas of innovation you're engaged in where improving or updating government regulation or industry/ecosystem rules would help to encourage innovation or economic growth.

5

Create a team to work with regulators at local, regional, and/or national levels. Efforts should focus on education, information sharing, and responsible growth of new industries. Commit to true collaboration with regulators, and to addressing their areas of concern. Reviewing *The Ethics of Data Sharing* will be helpful.

365-DAY PLAN

1

Look for the industries in the stakeholder map that are the newest areas of operation for your company. Research their regulatory history, and interview regulators and other industry participants to ascertain the current regulatory momentum. Share your findings with affected product managers and compliance officers.

2

Using the ecosystem catalog, identify the intersection of the industries you operate within, where you're growing, and which ones have the most opportunity for new ecosystems. Build a strategy for starting a new ecosystem to complement and accelerate your growth into new markets.

3

In recognition that your enterprise could be influencing the social contract, publish your governance model for public inspection, and begin implementing your strategy. Concentrate on recognizing the influence you already have and optimize for the behaviors you want to encourage.

4

From your data input inventory, work with the teams receiving those inputs, and collaborate with academic partners to pilot systems that make use of embedded-governance technologies: differential privacy, homomorphic encryption, and blockchain-based solutions.

5

Select a single initial area of innovation to engage with government regulators. Begin with individual conversations with multiple stakeholders; listen to their concerns and offer ways to share information and resources, encouraging future collaboration, as well as faster, more comprehensive development of regulations.

TREND 5 PREDICTIONS

1

Within three years, the new normal for businesses with mature digital strategies will be to operate across currently siloed industries as Tesla does today. For these companies, **industry boundaries will vanish**, and each new endeavor will amplify disruption.

2

By 2020, there will be entire **ecosystems requiring the use of smart contracts** in order to participate.

3

Within five years, new performance-based contracts – taking the form of ‘if/then/else’ between two or more parties – will exclusively be **smart contracts that self-govern and self-execute**.

4

In five years’ time, there will be numerous instances globally where **governments will cede rule-making authority** to industry groups or, minimally, enact regulations that were designed by an industry consortium.

These themes represent the newest expression of Accenture's People First view of the changing digital landscape.

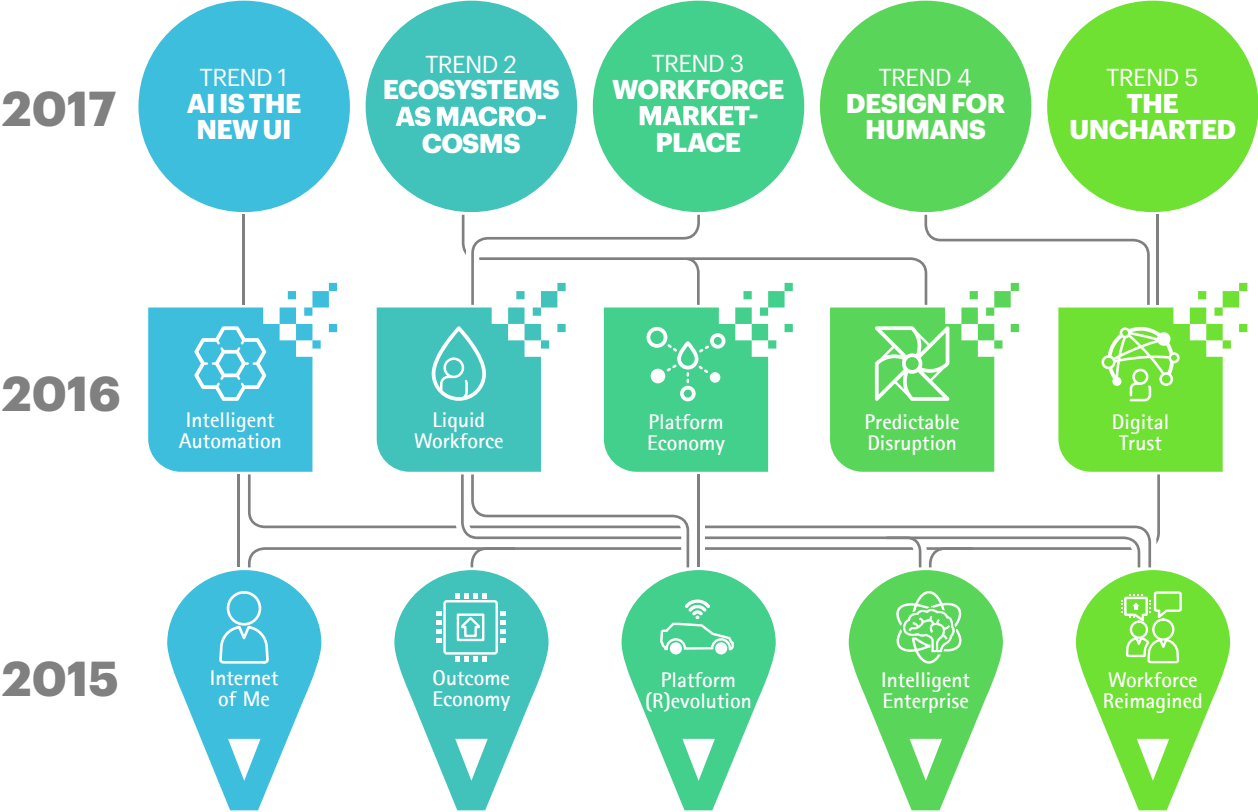
As part of Accenture's multi-year perspective on technology's impact on enterprise, they reflect the continuously evolving digital culture that creates challenges and opportunities for organizations worldwide.

Each individual theme from each year highlights the evolution of a key technology. Some of these are already playing important roles in the strategies of leading companies, while others are just beginning to make an impact, or are impacting organizations in unexpected ways. Viewed as a whole, our Technology Vision themes provide a guidepost for the way companies must consider their resources, responsibilities, and opportunities for success in the years to come.

With our world in a state of change at every level, being a leader isn't just about incorporating new technologies. It's about finding a place in the next evolution of society, by empowering people – your people, whether they are customers or employees – and becoming a partner, embedded throughout everyday life.

The world will continue to evolve, but leading enterprises that embrace this deeper dive into a People First mindset will find benefits at every scale. Across every industry, at every level of business, the one thing every company has in common is their people.

Technology Vision trend evolution



ABOUT THE TECHNOLOGY VISION

Every year, the Technology Vision team partners with Accenture Research to pinpoint the emerging IT developments that will have the greatest impact on companies, government agencies, and other organizations in the next three years.

The research process begins with gathering input from the Technology Vision External Advisory Board, a group comprising more than two dozen experienced individuals from the public and private sectors, academia, venture capital, and entrepreneurial companies. In addition, the Technology Vision team conducts interviews with technology luminaries and industry experts, as well as nearly 100 Accenture business leaders from across the organization.

The team also taps into the vast pool of knowledge and innovative ideas from professionals across Accenture, using Accenture's collaboration technologies and a crowdsourcing approach to uncover the most interesting emerging technology themes. The 'Trend Spotting' campaign encourages global participation from individuals at every level and throughout every segment of Accenture. Nearly 3,000 participants actively engaged in the campaign, contributing valuable ideas and voting on others' inputs, and the effort saw a 19% increase in the number of people submitting ideas compared to the previous year.

As a shortlist of themes emerges from the research process, the Technology Vision team reconvenes its advisory board. The board's workshop, involving a series of 'deep-dive' sessions with Accenture leadership and external subject-matter experts, validates and further refines the themes.

These processes weigh the themes for their relevance to real-world business challenges. Specifically, the Technology Vision team seeks ideas that transcend the well-known drivers of technological change, concentrating instead on the themes that will soon start to appear on the C-level agendas of most enterprises.

Themes are prioritized using the following criteria:

- Actionable today
- Highly relevant to an organization's transformation within three years
- Having significant impact beyond any one industry 'silo'
- Disruptive beyond a straightforward one-for-one replacement of an existing solution
- Transcending any one vendor or discrete product technology.

These tests produce a handful of robust hypotheses that are synthesized into the five overarching trends, presented in the final report.

TECHNOLOGY VISION 2017

SURVEY DEMOGRAPHICS

For the third year, we conducted a global survey of more than 5,400 business and IT executives across 31 countries to understand their perspectives on the impact of technology on their organizations, and to identify their priority technology investments over the next few years. The survey was fielded from November 2016 through January 2017.

31
COUNTRIES
SURVEYED

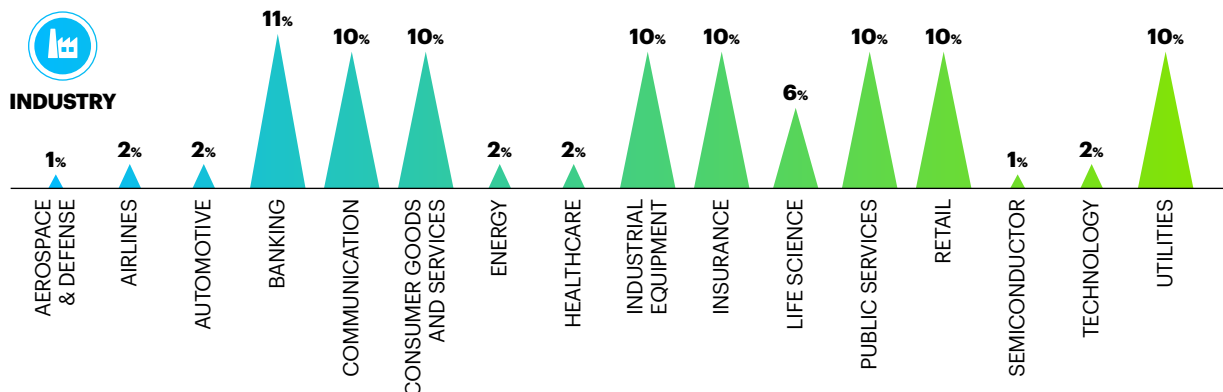
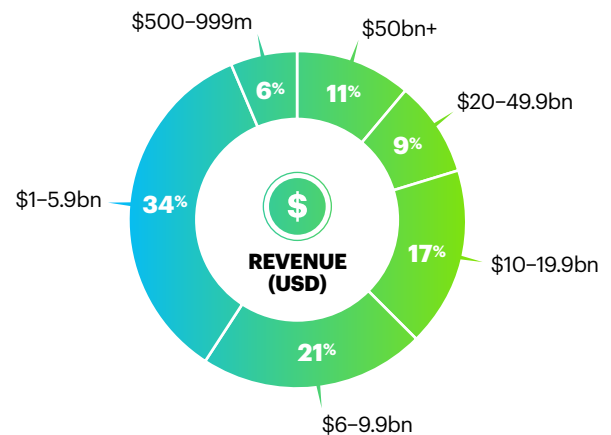
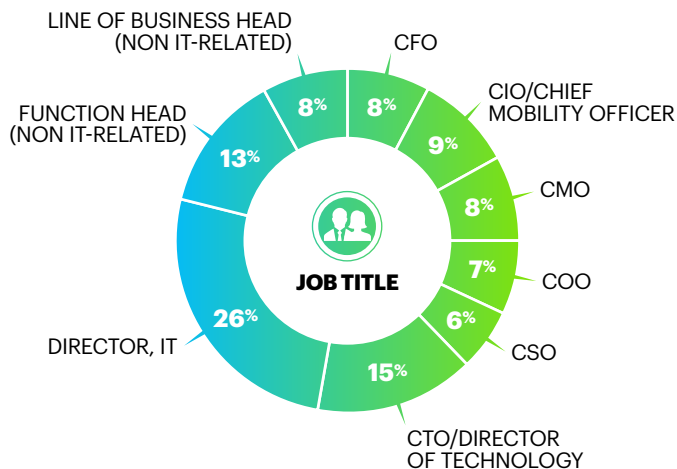
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MALAYSIA
NORWAY
PORTUGAL
QATAR
RUSSIA
SAUDI ARABIA

SINGAPORE
SOUTH AFRICA
SPAIN
SWEDEN
SWITZERLAND
THAILAND
TURKEY

UAE
UNITED KINGDOM
UNITED STATES



REFERENCES

INTRODUCTION

- 1 "Rhizabot Gives Salespeople Immediate Access to Deep Data," VentureBeat, August 9, 2016.
<http://venturebeat.com/2016/08/09/rhizabot-gives-salespeople-immediate-access-to-deep-data>
- 2 "Deep-Diving Robots Zap, Kill Invasive Lionfish," LiveScience, September 26, 2016.
<http://www.livescience.com/56251-lionfish-killing-robot-roomba-makers.html>
- 3 "2016 Internet Trends Report," KPCB, June 1, 2016.
<http://www.kpcb.com/blog/2016-internet-trends-report>
- 4 "CVS Health Launches Five New Digital Health Features, Including an Apple Watch App," MobiHealth News, November 18, 2015.
<http://www.mobihealthnews.com/48603/cvs-health-launches-five-new-digital-health-features-including-an-apple-watch-app>
- 5 "CVS and IBM's Watson Cloud Pursue Ways to Predict Patient Health," Forbes, July 30, 2015.
<http://www.forbes.com/sites/brucejapsen/2015/07/30/cvs-and-ibms-watson-partner-to-predict-patient-health-needs>
- 6 "Robot Technology Is Making Beer Brewing Better Now," Time, July 8, 2016.
<http://time.com/4399118/robot-beer-brewing>
- 7 Edelman. (21:07:05 UTC). 2016 Edelman TRUST BAROMETER – Global Results. Business.
<http://www.slideshare.net/EdelmanInsights/2016-edelman-trust-barometer-global-results>

TREND 1

- 1 "First Click: Amazon Echo Leaves the Door Open for Google Home," The Verge, October 4, 2016.
<http://www.theverge.com/2016/10/4/13160028/google-home-vs-amazon-echo-first-click>
- 2 "The Inside Story of How Amazon Created Echo, the Next Billion-Dollar Business No One Saw Coming," Business Insider, April 2, 2016.
<http://www.businessinsider.com/the-inside-story-of-how-amazon-created-echo-2016-4>
- 3 "The Future of Humanity's Food Supply Is in the Hands of AI," Wired, May 25, 2016.
<https://www.wired.com/2016/05/future-humanitys-food-supply-hands-ai>
- 4 "The Amazon Echo Echoes throughout Retail," Checkout Tracking, August 24, 2016.
<https://www.checkouttracking.com/wps/portal/ct/npd/blog/the-amazon-echo-echoes-throughout-retail>
- 5 "Rhizabot Gives Salespeople Immediate Access to Deep Data," Venture Beat, August 9, 2016.
<http://venturebeat.com/2016/08/09/rhizabot-gives-salespeople-immediate-access-to-deep-data>
- 6 "The Continuing Rise of Voice Search and How You Can Adapt to It," Search Engine Watch, May 31, 2016.
<https://searchenginewatch.com/2016/05/31/the-continuing-rise-of-voice-search-and-how-you-can-adapt-to-it>
- 7 "Voice Recognition Now Faster and More Accurate Than Typing, Says Stanford Study," Silicon Angle, August 25, 2016.
<http://siliconangle.com/blog/2016/08/24/voice-recognition-now-faster-and-more-accurate-than-typing-says-stanford-study>
- 8 "DeepDream – A Code Example for Visualizing Neural Networks, Google Research Blog, July 1, 2015.
<https://research.googleblog.com/2015/07/deepdream-code-example-for-visualizing.html>
- 9 "Human Curation and Convnets: Powering Item-to-Item Recommendations on Pinterest," D. Kislyuk, Y. Liu, D. Liu, E. Tzeng, Y. Jing, November 12, 2015.
<http://arxiv.org/abs/1511.04003>
- 10 Tractable – Insurance solution. (n.d.).
<http://www.tractable.io/insurance.html>
- 11 "Accenture and IPsoft Launch Accenture Amelia Practice to Help Organizations Accelerate Adoption of Artificial Intelligence," Accenture Newsroom, May 16, 2016. <https://newsroom.accenture.com/news/accenture-and-ipsoft-launch-accenture-amelia-practice-to-help-organizations-accelerate-adoption-of-artificial-intelligence.htm>
- 12 "Why it's Time for CIOs to Invest in Machine Learning," CIO, April 26, 2016.
<http://www.cio.com/article/3061713/leadership-management/why-its-time-for-cios-to-invest-in-machine-learning.html>
- 13 "Here's how A.I. Is About to Make Your Car Really Smart," ComputerWorld, June 14, 2016.
<http://www.computerworld.com/article/3083426/car-tech/heres-how-ai-is-about-to-make-your-car-really-smart.html>
- 14 "Forecast: Connected Car Production, Worldwide," Gartner, September 7, 2016.
<https://www.gartner.com/doc/3436517/forecast-connected-car-production-worldwide>
- 15 "Samsung and Volkswagen Use Driverless Vehicles in Russian Factories," Forbes, February 24, 2015.
<http://www.forbes.com/sites/jenniferhicks/2015/02/24/samsung-and-volkswagen-use-driverless-vehicles-in-russian-factories/#153d0b744b5f>
- 16 "Digital Disconnect in Customer Engagement," Accenture, March 23, 2016.
<https://www.accenture.com/us-en/insight-digital-disconnect-customer-engagement>
- 17 "Why Artificial Intelligence Is the Future of Growth," Accenture, 2016.
https://www.accenture.com/ro-en/_acnmedia/PDF-33/Accenture-Why-AI-is-the-Future-of-Growth.pdf
- 18 "Transforming Tomorrow. Delivering Today," IPsoft, (n.d.).
http://www.ipsoft.com/wp-content/themes/ipsoft_v2/attachments/services.pdf
- 19 "Supporting the Buyer Journey with Customer Service," Forrester Consulting report commissioned by SAP, July 2016.
<https://www.hybris.com/en/downloads/white-paper/forrester-research-buyer-journey/603>
- 20 "Getting Down to Business with AI: Double Economic Growth Rates, Boost Labor Productivity," Accenture, September 28, 2016.
<https://www.linkedin.com/pulse/getting-down-business-ai-double-economic-growth-rates-paul-daugherty>

TREND 2

- 1 "Lyft and GM Expand Express Drive Driver Rental Program," TechCrunch, July 11, 2016.
<https://techcrunch.com/2016/07/11/lyft-and-gm-expand-express-drive-driver-rental-program>
- 2 "Whole Foods Invests in Instacart at 2014 Valuation," Bloomberg, September 23, 2016.
<https://www.bloomberg.com/news/articles/2016-09-23/whole-foods-invests-in-instacart-at-2014-valuation>
- 3 "The Next Wave of Supermarket Competition," Progressive Grocer, March 20, 2015.
<http://www.progressivegrocer.com/node/77296>
- 4 "The Rise of the Platform Enterprise – A Global Survey," The Center for Global Enterprise, January 2016.
http://thecge.net/wp-content/uploads/2016/01/PDF-WEB-Platform-Survey_01_12.pdf
- 5 "Coming to Terms with Insurance Aggregators: Global Lessons for Carriers," Accenture, 2016.
<http://ins.accenture.com/rs/897-EWH-515/images/Coming-to-Terms-with-Insurance-Aggregators-POV.pdf>
- 6 "The Business of Aggregators: A Changing Market," CGAP, February 10, 2016.
<http://www.cgap.org/blog/business-aggregators-changing-market>
- 7 "APIs Blurring the Competitive Advantage Between Banking and Fintech," The Financial Brand, November 10, 2016.
<https://thefinancialbrand.com/62117/api-banking-fintech-innovation>
- 8 "2016 State of the Cloud Report," RightScale, February 9, 2016.
<http://www.rightscale.com/lp/2016-state-of-the-cloud-report?campaign=701700000015euW>; "The DNA of Strategic Vendor Partnerships – The CIO Executive Council's and IDC's 2016 Strategic Partner Index Study," IDC, Doc #US41491916, June 2016.
<http://www.idc.com/getdoc.jsp?containerId=US41491916>
- 9 "AT&T Deploys 74 OpenStack Clusters; Named Superuser," Mirantis, May 2, 2016.
<https://www.mirantis.com/blog/at-named-superuser>
- 10 Companies Supporting the OpenStack Foundation, OpenStack web site, (n.d.).
<https://www.openstack.org/foundation/companies>
- 11 "The DNA of Strategic Vendor Partnerships – The CIO Executive Council's and IDC's 2016 Strategic Partner Index Study," IDC, Doc #US41491916, June 2016.
<http://www.idc.com/getdoc.jsp?containerId=US41491916>

TREND 3

- 1 "This CEO Runs a Billion-Dollar Company with No Offices or Email," Inc., March 16, 2016.
<http://www.inc.com/glenn-leibowitz/meet-the-ceo-running-a-billion-dollar-company-with-no-offices-or-email.html>;
"Automattic – An IPO Candidate in 2016?", Investopedia, January 27, 2016.
<http://www.investopedia.com/articles/markets/012716/automattic-ipo-candidate-2016.asp>
- 2 "The Talent Potential: Leveraging the Freelance Marketplace to Harness a Global Talent Pool," Panel Discussion at the 2016 CWS Summit North America, September 19, 2016.
<http://www.cvent.com/events/2016-workforce-solutions-connect/custom-39-c06c1a44bbe34ddaa35cbfddbf0c199d.aspx>
- 3 Accenture analysis based on S&P Capital IQ Market Capitalization as of October 4, 2016;
"The Rise of the Platform Enterprise 2015 – A Global Survey," The Center for Global Enterprise, January 2016.
http://thecge.net/wp-content/uploads/2016/01/PDF-WEB-Platform-Survey_01_12.pdf
- 4 "The \$3 Trillion Prize for Busting Bureaucracy," The Management Lab, March 2016.
<http://www.garyhamel.com/sites/default/files/uploads/three-trillion-dollars.pdf>
- 5 "Up in the Air: HR Tech Deal Activity Reaches New High," CB Insights, November 7, 2016.
<https://www.cbinsights.com/blog/hr-tech-startup-funding-trends>
- 6 "Slack Passes 3 Million Daily Active Users, 930K Paid Seats," VentureBeat, May 25, 2016.
<http://venturebeat.com/2016/05/25/slack-passes-3-million-daily-active-users-930k-paid-seats>
- 7 "Freelancing in America 2016," Upwork, 2016.
<https://www.upwork.com/i/freelancing-in-america/2016>
- 8 About Us, Upwork web site, (n.d.).
<https://www.upwork.com/about>
- 9 "Zhubajie Charges on Toward Unicorn Status, and Flotation," South China Morning Post, July 1, 2016.
<http://www.scmp.com/business/article/1984094/zhubajie-charges-toward-unicorn-status-and-flotation>
- 10 "HourlyNerd Rebrands as Catalant," PR Newswire, July 26, 2016.
<http://www.prnewswire.com/news-releases/hourlynerd-rebrands-as-catalant-300303451.html>
- 11 "Freelancing in America 2016," Upwork 2016.
<https://www.upwork.com/i/freelancing-in-america/2016>;
Bureau of Economic Analysis, November 29, 2016.
<http://www.bea.gov/newsreleases/national/gdp/gdpnewsrelease.htm>;
"World Economic Outlook Database," International Monetary Fund, October 2016.
<http://www.imf.org/external/pubs/ft/weo/2016/02/weodata/weorept.aspx>

TREND 4

- 1 "Cybersecurity Economic Predictions: 2017 to 2021," Cybersecurity Ventures, October 19, 2016.
<http://cybersecurityventures.com/cybercrime-infographic>
- 2 "Research on the Timing of Security Warnings," Schneier on Security, August 22, 2016.
https://www.schneier.com/blog/archives/2016/08/research_on_the_2.html;
"More Harm Than Good? How Messages That Interrupt Can Make Us Vulnerable," Information Systems Research, August 16, 2016.
<http://doi.org/10.1287/isre.2016.0644>
- 3 "What Is Big Data?" IBM, (n.d.).
<https://www-01.ibm.com/software/data/bigdata/what-is-big-data.html>
- 4 "2016 Internet Trends Report," KPCB, June 1, 2016.
<http://www.kpcb.com/blog/2016-internet-trends-report>
- 5 "The Era of Living Services," Fjord, 2016.
<https://livingservices.fjordnet.com>
- 6 "Propelling Growth and Value Through Personalization," Accenture, October 13, 2016.
<https://www.accenture.com/us-en/service-propelling-growth-through-personalization>
- 7 "Mutual Fund Investors Continue to Suffer from Buying High, Selling Low: Morningstar," InvestmentNews, June 15, 2016.
<http://www.investmentnews.com/article/20160615/FREE/160619952/mutual-fund-investors-continue-to-suffer-from-buying-high-selling>
- 8 "Betterment's Quest for Behavior Gap Zero," Betterment, January 6, 2014.
<https://www.betterment.com/resources/investment-strategy/behavioral-finance-investing-strategy/betterments-quest-behavior-gap-zero>
- 9 "Robo-Adviser Betterment Hits the \$5 Billion Mark," Bloomberg, July 14, 2016.
<http://www.bloomberg.com/news/articles/2016-07-14/robo-adviser-betterment-hits-the-5-billion-mark>
- 10 Apache Spark – Lightning-Fast Cluster Computing, Apache.org, (n.d.).
<https://spark.apache.org>
- 11 "Data Driven-Toyota Customer 360 Insights on Apache Spark and MLlib," presentation at Spark Summit 2015, June 24, 2015.
<http://www.slideshare.net/SparkSummit/brian-kursar>
- 12 "Virgin Atlantic Tested 3 Ways to Change Employee Behavior," Harvard Business Review, August 1, 2016.
<https://hbr.org/2016/08/virgin-atlantic-tested-3-ways-to-change-employee-behavior>
- 13 FullStory web site, (n.d.).
<http://www.fullstory.com>
- 14 "Propelling Growth and Value Through Personalization," Accenture, October 13, 2016.
<https://www.accenture.com/us-en/service-propelling-growth-through-personalization>
- 15 "Whose Data Is It Anyway?" The Chartered Institute of Marketing, 2016.
<https://cimcomms.uberflip.com/i/729663-whose-data-is-it-anyway>
- 16 "Eviza: A Natural Language Interface for Visual Analysis," (pp. 365–377), Tableau Software, ACM Press. 2016.
<https://doi.org/10.1145/2984511.2984588>
- 17 "The New Science of Customer Emotions," Harvard Business Review, November 1, 2015.
<https://hbr.org/2015/11/the-new-science-of-customer-emotions>
- 18 "New Study Reveals That Traditional Retailers Are Failing to Meet Consumer Desires for 'Amazon-like' Personalization," Swirl, December 10, 2015.
<http://www.swirl.com/new-study-reveals-that-traditional-retailers-are-failing-to-meet-consumer-desires-for-amazon-like-personalization>
- 19 Coursera for Business. (n.d.).
<https://www.coursera.org/enterprise>
- 20 "Announcing Coursera for Business," Coursera web site, August 31, 2016.
<http://coursera.tumblr.com/post/149744002062/announcing-coursera-for-business>
- 21 "There Are Significant Business Costs to Replacing Employees," Center for American Progress, November 16, 2012.
<https://www.americanprogress.org/wp-content/uploads/2012/11/CostofTurnover.pdf>
- 22 "Linking Customer and Employee Feedback – The Unexpected Power of Connected Feedback Loops," Medallia Institute, 2016.
<http://go.medallia.com/rs/669-VLQ-276/images/Medallia-Linking-Customer-and-Employee-Feedback.pdf>

TREND 5

- 1 "Tesla May Have Announced the Breakthrough Needed to Make EVs Affordable for Everyone," Greentech Media, November 4, 2016.
<https://www.greentechmedia.com/articles/read/has-tesla-announced-the-breakthrough-needed-to-finally-make-evs-affordable>
- 2 "Disruption and the Digital Value of Business – the Rise of Digital Economics," Gartner Symposium/ITxpo, October 16, 2016.
<https://www.gartner.com/doc/3456117/disruption-digital-value-business>
- 3 "These Networks (and Netflix) Dominated the 2016 Emmy Nominations," Fortune, July 14, 2016.
<http://fortune.com/2016/07/14/emmy-nominations-2016-networks>
- 4 "Nvidia's New Xavier SoC Is an AI Supercomputer for Cars," TechCrunch, September 28, 2016.
<http://techcrunch.com/2016/09/28/nvidias-new-xavier-soc-is-an-ai-supercomputer-for-cars>
- 5 "Elon Musk Challenges Regulators to Catch Up to Tesla," Sci-Tech Today, October 22, 2016.
http://www.sci-tech-today.com/story.xhtml?story_id=1210090DZ5S2
- 6 "Obama Administration Announces Federal and Private Sector Actions to Accelerate Electric Vehicle Adoption in the United States," The White House, July 21, 2016.
<https://www.whitehouse.gov/the-press-office/2016/07/21/fact-sheet-obama-administration-announces-federal-and-private-sector>
- 7 "How Tech Giants Are Devising Real Ethics for Artificial Intelligence," New York Times, September 1, 2016.
<http://www.nytimes.com/2016/09/02/technology/artificial-intelligence-ethics.html>
- 8 "Google Used Virtual Poker Dogs to Find a Way to Stop VR Trolls," The Verge, August 9, 2016.
<http://www.theverge.com/2016/8/9/12412516/google-vr-daydream-troll-harassment>
- 9 "Old-time Regulations Hold Japan's Fintech Boom Back," IDG Connect, May 10, 2016.
<http://www.idgconnect.com/abstract/16264/old-regulations-hold-japan-fintech-boom>
- 10 "Google, Sprint Launch New Text Messaging Platform," Morning Consult, November 4, 2016.
<https://morningconsult.com/alert/google-sprint-launch-new-text-messaging-platform>
- 11 "Airbnb Tries More Self-Regulation In New York, Too," Consumerist, October 19, 2016.
<https://consumerist.com/2016/10/19/airbnb-tries-more-self-regulation-in-new-york-too>
- 12 "Airbnb: The Growth Story You Didn't Know," GrowthHackers, (n.d.).
<https://growthhackers.com/growth-studies/airbnb>
- 13 "Airbnb Now Requires that Hosts Accept Anti-Discrimination Rules," Engadget, November 1, 2016.
<https://www.engadget.com/2016/11/01/airbnb-now-requires-anti-discrimination-agreement>
- 14 "Uber-nomics: Here's What It Would Cost Uber to Pay its Drivers as Employees," Fortune, September 18, 2015.
<http://fortune.com/2015/09/17/ubernomics>;
"UK Uber Drivers Win Case to Get Paid Vacation, Minimum Wage," US News & World Report, October 28, 2016.
<http://www.usnews.com/news/business/articles/2016-10-28/uk-tribunal-to-rule-on-work-benefits-for-uber-drivers>
- 15 "Building Digital Trust: The Role of Data Ethics in the Digital Age," Accenture, June 13, 2016.
<https://www.accenture.com/us-en/insight-data-ethics>
- 16 "Banks Claim Blockchain Breakthrough in Money Transfer," Financial Times, June 22, 2016.
<https://www.ft.com/content/541414c0-3834-11e6-a780-b48ed7b6126f>
- 17 "Shipping Giant Maersk Tests Blockchain-powered Bill of Lading," International Business Times, October 12, 2016.
<http://www.ibtimes.co.uk/shipping-giant-maersk-tests-blockchain-powered-bills-lading-1585929>
- 18 "Walmart, IBM and Tsinghua University Explore the Use of Blockchain to Help Bring Safer Food to Dinner Tables Across China," IBM press release, October 19, 2016.
<http://www-03.ibm.com/press/us/en/pressrelease/50816.wss>
- 19 "Differential privacy," Wikipedia.
https://en.wikipedia.org/wiki/Differential_privacy
- 20 "Tackling Urban Mobility with Technology," Google Europe Blog, November 18, 2015.
<https://europe.googleblog.com/2015/11/tackling-urban-mobility-with-technology.html>
- 21 "A Current List of Use Cases for Ethereum," Around The Block, May 23, 2016.
https://medium.com/@AroundTheBlock_/a-current-list-of-use-cases-for-ethereum-b8caa5807553
- 22 Digix Global. (n.d.).
<https://www.dgx.io>
- 23 "Smart contract," Wikipedia.
https://en.wikipedia.org/w/index.php?title=Smart_contract&oldid=743497826

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