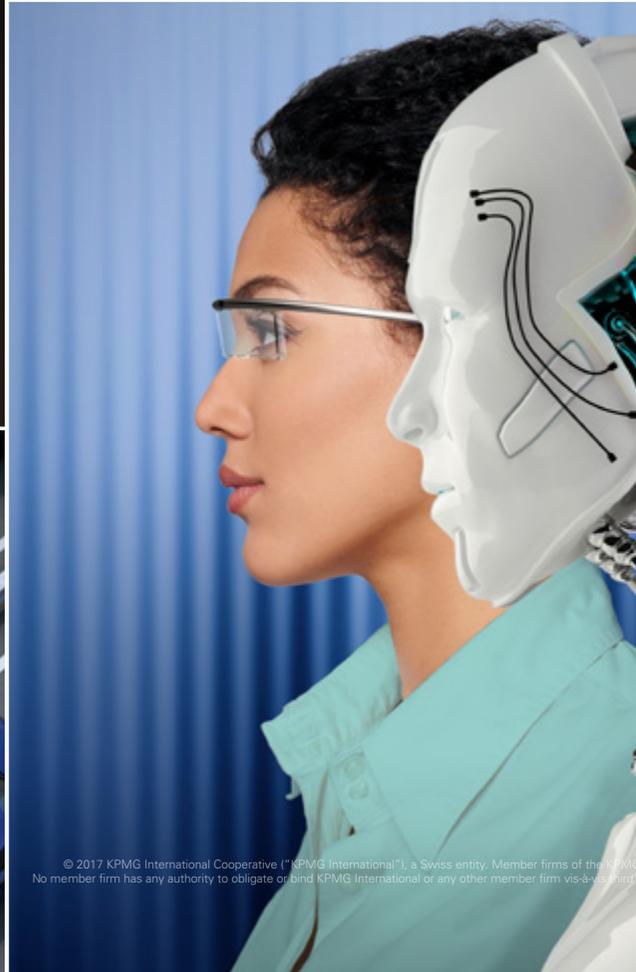




# The changing landscape of disruptive technologies

**Part 2: Innovation  
convergence unlocks  
new paradigms**

[kpmg.com/techinnovation](https://kpmg.com/techinnovation)



# Contents

- 1 Foreword**
- 2 Technologies unlocking massive market opportunity**
- 3 Emerging tech trends
- 12 Innovation and commercialization barriers
- 16 Industry disruption
- 18 Technology disruption and the 21st century enterprise**
- 20 Everything as a service
- 22 The changing nature and value of assets
- 24 Workforce of the future
- 26 Customer engagement
- 28 Global tech industry CEO insights**
- 30 Conclusion**

# Foreword

**KPMG recognizes the importance of innovation to the technology industry and the global economy as a whole. KPMG's publication series, *The Changing Landscape of Disruptive Technologies*, now in its fifth year, provides perspectives about technology innovation trends, top barriers to commercialize innovation and insights into technology innovation best practices.**

**The 2017 publication is being issued in two parts, featuring the following topics:**

**Part 1 | Global technology innovation hubs**

showcases the rise of new ecosystems of start-ups, incubators and venture capital alongside government incentives to create leading innovation hubs. In this section, we unfold the cities and countries that are making significant strides in innovation development and provide 15 country perspectives. With stakes so high to compete in a global technology industry ecosystem, we also look at global leadership views on innovation management.

**Part 2 | Innovation convergence unlocks new paradigms.**

In this part we examine the emerging technologies with the most potential to disrupt industries and transform business models. We showcase the barriers faced by tech industry leaders to commercialize new technologies on a global and regional scale and assess the monetization opportunities of these disruptors. The tech industry leaders are on a journey to redefine the 21st century enterprise: the workforce of the future, customer engagement, everything as a service and the changing nature, and value of assets.

We include insights from our annual survey of more than 800 global technology industry leaders including start-up entrepreneurs and FORTUNE 500 executives. We are also highlighting KPMG's global CEO survey "Disrupt and Grow." The survey showcases opinions from over 1,200 CEOs across 11 key industries.

We hope you find this publication insightful and we welcome your suggestions for the next edition.



**Tim Zanni**

Global and U.S. Technology Sector Leader  
Chair of Global and U.S. TMT Line of Business,  
KPMG in the U.S.

# Technologies unlocking massive market opportunity



# Emerging tech trends

**The technology industry continues to drive unprecedented global cross-industry disruption and the pace is expected to accelerate. Consider the following trends:**



**The Internet of Things** is massive in terms of data and continues to grow exponentially. **These connected devices are becoming intelligent things.**



**Robotics** is enabling enhanced dexterity, intelligence and sensors. Robots are **changing the limitations of what humans can do** including people with impaired mobility.



**The next wave of artificial intelligence (AI)** is designed to simulate **how a human brain learns, reasons, understands, and makes a decision** that results in an action.

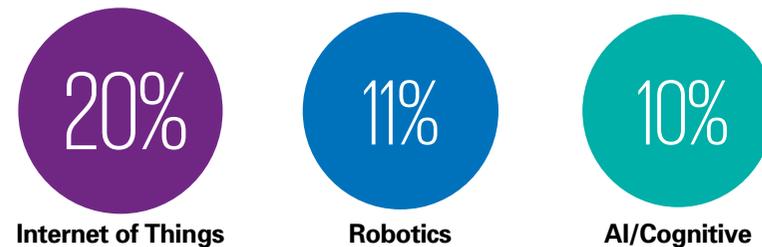


**Computational power** growth, in the next five years, is creating **unprecedented improvements in data processing power.**

These technologies are transforming business models, in every industry and unlocking massive market opportunities. Today's profit pools and competitive advantages will be short-lived if industry leaders don't quickly address disruptive technology opportunities. The tech industry is poised to continue to be a global engine of growth and profitability.

KPMG's global technology industry innovation survey captured the opinion of 841 global tech industry leaders including start-up entrepreneurs and FORTUNE 500 executives.

**What are the top technologies that will drive business transformation over the next three years?**



Partial list. Percentages do not sum to 100%. Source: KPMG Technology Innovation Survey, November 2016

**“The convergence of emerging technologies including the Internet of Things (IoT), robotics, and artificial intelligence (AI) is creating new market value and displacing existing products and services. These technologies are driving profound changes impacting industries and business models as well as life, society, and the environment.”**

— Tim Zanni, Global and U.S. Technology Sector Leader;  
Chair of Global and U.S. TMT Line of Business, KPMG in the U.S.

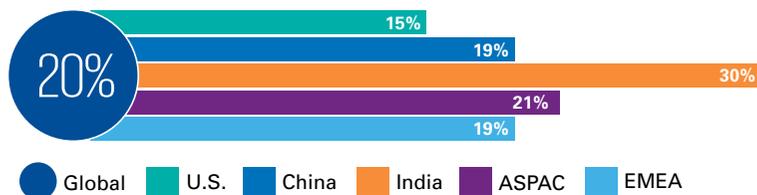
## IoT the #1 game changer

**This top status for IoT was reinforced as networks of low-cost sensors are converting physical goods into virtual goods. These sensors are becoming intelligent things with mini-computing capabilities that will enable more innovation and monetization opportunities.**

In KPMG's tech innovation survey, IoT had high marks in Asia, where India, Korea, China and Japan had percentage ratings of 30, 25, 19 and 18, respectively. In India, mobile and IoT connectivity are enabling a variety of new use cases specific to the country such as payments for the unbanked and digital health for people in remote locations. There are a broad range of new capabilities that will have a big impact, given the size of the population and growing number of millennials in India. IoT is unleashing great innovation opportunities to drive new business models in a number of industries including healthcare, banking and agriculture.

IoT also had high marks in Germany (23 percent), the United Kingdom (19 percent), and Israel (18 percent).

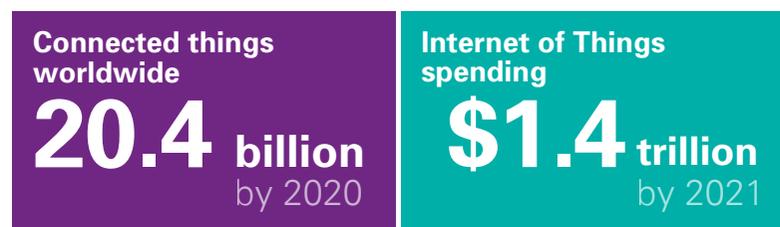
### IoT is the top technology expected to drive business transformation over the next three years



Partial list. Percentages do not sum to 100%. Source: KPMG Technology Innovation Survey, November 2016

"A new update to the International Data Corporation (IDC) Worldwide Semiannual Internet of Things Spending Guide forecasts worldwide spending on the Internet of Things (IoT) to grow 16.7% year over year in 2017, reaching just over \$800 billion. By 2021, global IoT spending is expected to total nearly \$1.4 trillion as organizations continue to invest in the hardware, software, services, and connectivity that enable the IoT." – IDC, June 2017

### IoT technologies are unlocking a massive market opportunity



Source: Gartner February 2017

IDC June 2017

**"Exciting IoT innovations are emerging at an accelerated rate. As we evolve as a networked society, IoT will transform the way we interact with technology. From an enterprise perspective this evolution will require a new framework to manage the opportunities and risk."**

— Peter Mercieca, Management Consulting Leader, Technology Sector, KPMG in the U.S.

## Business benefits from IoT adoption

Tech industry leaders who selected IoT as the top technology that will have the greatest impact in driving business transformation, identified the top benefit for businesses that adopt IoT.

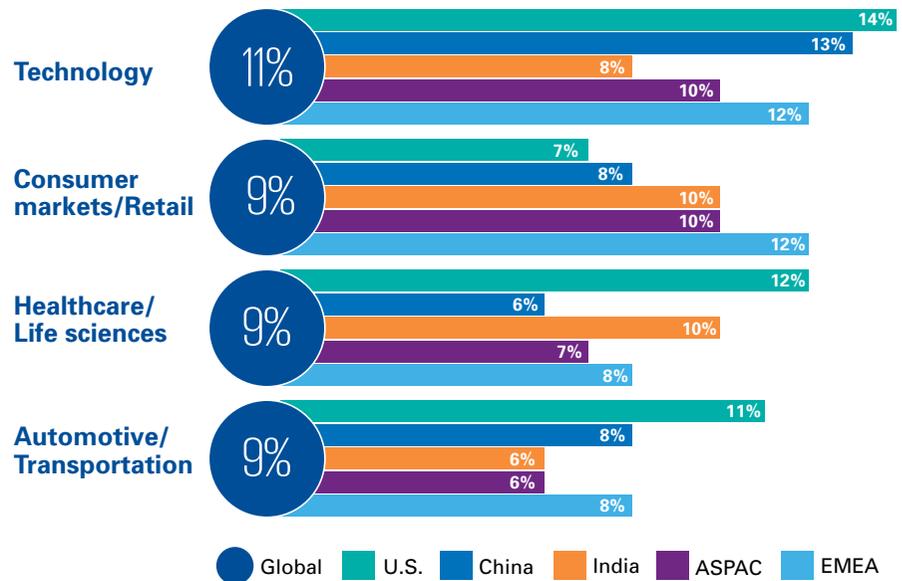


Partial list. Percentages do not sum to 100%. Source: KPMG Technology Innovation Survey, November 2016

Companies that can deliver clear use case benefits are leading the way on the impact IoT has on improving efficiencies and developing new products and service models. In the survey, tech industry leaders continue to be bullish on IoT monetization opportunities in the tech sector. Software is touching everything, from healthcare to agriculture. As IoT connected devices become intelligent things, value creation will continue to shift to the tech sector. In

consumer markets, IoT is enabling ubiquitous understanding of customer behavior; in healthcare many advances in digital health are driven by IoT use cases; and in transportation IoT connectivity is transforming the industry with new products and services such as “mobility as a service.”

## Which industry has the greatest monetization potential as a result of the adoption of IoT technologies in the next three years?



Partial list. Percentages do not sum to 100%. Source: KPMG Technology Innovation Survey, November 2016

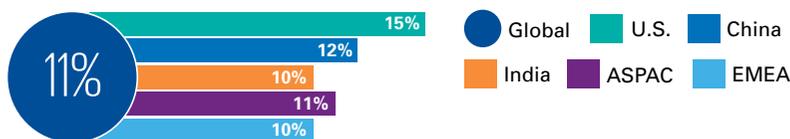
In an IoT world, where new features and functionality can be delivered to the customer over the network, industries will continue to be transformed.

## Robotics placed second; robots are changing the limitations of what humans can do

Open source robotics and new innovations such as AI-empowered robotics are factors in this ranking.

In KPMG's tech innovation survey this positive outlook for robotics in enterprise markets was led by the United States and Japan tied at 15 percent each; Germany and Israel at 13 percent each; and China at 12 percent. A contributor has been the aggressive move, in these countries, into innovation and factory automation.

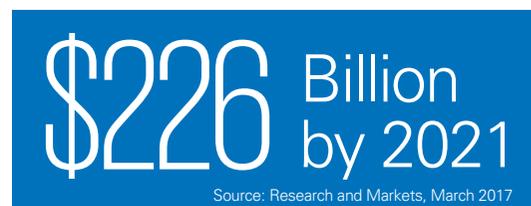
### Robotics was the next technology expected to drive business over the next three years



Partial list. Percentages do not sum to 100%. Source: KPMG Technology Innovation Survey, November 2016

In addition to a growing industrial robotics market in the United States, companies in the service industry want to automate tasks that can be done by robots so employees can spend more time on improving the customer experience. Robots are already making room service deliveries in hotels and high rises and beginning to deliver packages to homes.

### Robotics boom predictions



Until now, industrial robots have made up more than 50% of overall robotics market revenue, however 2016 marks one of the critical turning points of this shift in the robotics market,

as Tractica estimates that industrial robots will drop to 41% of total robotics revenue, with the remaining 59% coming from non-industrial robots. The non-industrial sector largely consists of consumer robots, enterprise robots, military robots, and UAVs." – Research and Markets, March 2017

**“Robotics has reached a tipping point where the demand from the non-industrial segments (including consumer robots and UAVs) now generate the majority of revenues. As scale grows further, and functionality continues to improve, a global mass-market for robotics products and services is emerging that will impact the lives of millions in the decade ahead.”**

— Per Edin, Strategy Practices Leader, Technology, Media & Telecommunications, KPMG in the U.S.

Savioke was launched in October 2013. The Relay robots are their first use case in making deliveries to hotel guest rooms. Savioke and many technology companies commercializing robots are using RaaS (Robot as a Service). SaaS has taken off because it basically puts the upgrades and maintenance burden in the right place. The same thing with RaaS. From the customer's point of view, they know exactly what the service is going to cost and they have information to do an ROI analysis. They are getting the value for a reliable service without adding work to the IT staff.

Savioke pioneered this model in 2015 and the company predicts RaaS will be one of the key ways that robotics is offered to the service industry and other sectors. The model of buying hardware and having to worry about maintenance over time may not be the right approach for many businesses.



## Business benefits from robotics adoption

Tech industry leaders who selected robotics as the top technology that will have the greatest impact in driving business transformation, identified the top benefits for businesses that adopt robotics.

**1. Improved business efficiencies/Higher productivity**

36%

**2. Faster innovation cycles**

14%

**3. Increased market share**

14%

**4. Cost reductions**

11%

**5. Increased profitability**

9%

Partial list. Percentages do not sum to 100%. Source: KPMG Technology Innovation Survey, November 2016

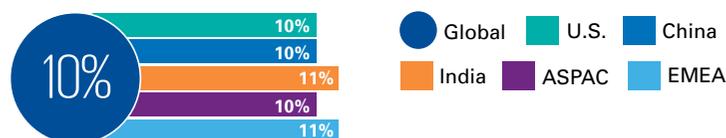
Industrial robots had been common in industrial manufacturing, such as auto plants, doing jobs like heavy lifting and welding. In the last five years robots became more collaborative, designed to work in the proximity to people, to help assemble products and increase efficiencies with the ability to sense if parts are assembled correctly. The convergence of IoT, robotics and AI is unlocking new business paradigms and faster innovation cycles.

## AI and the cognitive revolution ranked third

**Most industries will be transformed by the growth of cognitive systems that can predict, infer, think and learn by experience much like humans do.**

In the last ten years significant increase in data and computational power have spurred AI innovation. In looking at enterprise markets, tech industry leaders identified AI as a key disruptor. Top rankings were led by the Singapore (15 percent), South Africa (14 percent), Australia and Israel (13 percent each), Japan (12 percent), India and the United Kingdom (11 percent each), and the United States, Korea and China (10 percent each).

**AI was the third technology expected to drive business over the next three years**



Partial list. Percentages do not sum to 100%. Source: KPMG Technology Innovation Survey, November 2016

AI is embedded in platforms, chips, software, intelligent products and devices, and is becoming a leading change agent in business models. The progression of AI use cases in specific industries will drive profound changes in the next three years. As our idea of intelligence changes and is refined, the definition of AI will evolve.

**“We are at an inflection point in the way humans relate to technology. This will be as impactful to labor as mechanical enablement was to workers in the Industrial Revolution. We may see history record this exciting window of change as the Cognitive Revolution.”**

— Steve Hill, Global Head, Innovation & Investments, KPMG in the U.S.

**The cognitive era is here**



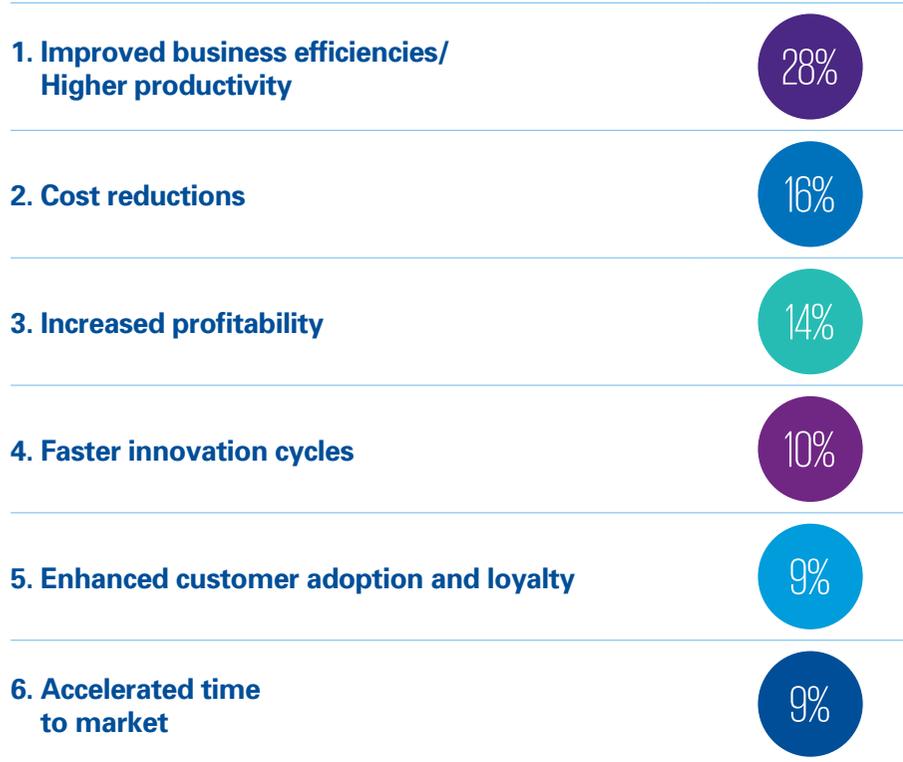
“International Data Corporation (IDC) forecasts worldwide revenues for cognitive and artificial intelligence (AI) systems will reach \$12.5 billion in 2017, an increase of 59.3% over 2016.

Global spending on cognitive and AI solutions will continue to see significant corporate investment over the next several years, achieving a compound annual growth rate (CAGR) of 54.4% through 2020 when revenues will be more than \$46 billion” – IDC, April 2017

As cognitive technologies become more sophisticated, new knowledge will be created at an explosive rate, supplementing decision-making by leveraging deep data domains. For decades, smart technologies including AI, robotic process automation and intelligent automation were limited to research and use by governments, academia, top tech companies and manufacturing floors. Then computing power caught up. Decreasing costs and the rise in technology capabilities have opened doors to smart technologies for all types of organizations to benefit—whether start-ups or established.

## Business benefits from AI/Cognitive adoption

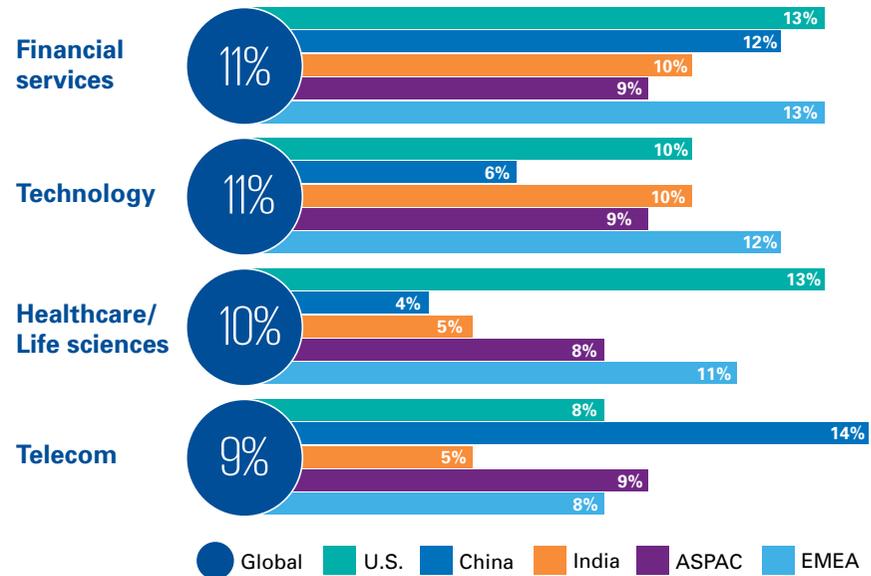
Tech industry leaders who selected AI/Cognitive as the top technology that will have the greatest impact in driving business transformation, identified the top benefits for businesses that adopt AI/Cognitive.



Partial list. Percentages do not sum to 100%. Source: KPMG Technology Innovation Survey, November 2016

The power of artificial intelligence adoption and monetization opportunities is global as indicated in KPMG's tech industry innovation survey. Building on fast-evolving AI technologies like natural language processing, machine learning, intelligent software and intelligent things, tech companies are enabling the redistribution of labor and new value creation. Welcome to the cognitive future.

## Which industry has the greatest monetization potential as a result of the adoption of AI/Cognitive technologies in the next three years?



Partial list. Percentages do not sum to 100%. Source: KPMG Technology Innovation Survey, November 2016

There is not an industry or business that cognitive technologies will not impact. From helping healthcare providers improve outcomes to boosting customer experiences at Telcos. In fact, KPMG is transforming a range of professional services in Audit, Tax, and Advisory, as well as its back-office with advanced cognitive technology. When humans and systems collaborate, the possibilities are almost limitless.

## Emerging tech trends (continued)

### Digital labor

Digital labor is a concept which enables a more collaborative and natural relationship between human and machine. Most of the current applications of digital labor involves the automation of repetitive knowledge work by leveraging a range of technologies, including artificial intelligence and process robotics to augment or automate tasks that were traditionally performed by human labor.

From software robots to sophisticated cognitive systems, advances in these automation technologies are changing the game, reducing costs in some areas while improving speed, accuracy, quality, and control. At their most advanced, these technologies can simulate human capabilities such as the ability to perceive an image, infer an intention or context, reason through a probabilistic outcome, and learn from experience. They can also interact naturally with their human colleagues.

When combined with human ingenuity, they have the ability to transform functions and entire organizations, freeing employees to focus on contributing to innovation, building key stakeholder relations and assimilating insights. To note:

- These technologies interact more naturally and productively in everyday business environments.
- Digital labor will leverage analytics and cognitive technology at scale to interpret vast amounts of data from multiple structured and unstructured sources including text, voice, imaging, and video to carry out repetitive tasks and free up humans to collaborate, innovate, and solve problems.
- These intelligent technologies can evaluate evidence and be trained in a manner to simulate human reasoning and make or support decisions much like humans would.

**“We’ll be seeing massive changes take place over the next decade, and from our point of view, it’s going to be positive change. The world is getting smarter, safer, and healthier, and the exponential growth and near universal access to technology is a major part of that.”**

— Cliff Justice, Digital Labor Leader, KPMG in the U.S.

### Business implications of digital labor



#### Cost Efficiency

Estimates suggest that a software robot is approximately 1/3 of the cost of an offshore FTE.

Digital labor savings are estimate to be between three and ten times the cost of implementing the automation



#### Productivity / Performance

Software robots work 24/7, and 365 days a year, do not take vacations and perform tasks at digital speeds



#### Consistency / Predictability

Expected reduction in mistakes, accidents, regulatory violations and fraud



#### Quality / Reliability

Software do what you tell them to do – when properly configured they do not make mistakes and thereby eliminate human error



#### Employee satisfaction & innovation

Eliminating mundane and repetitive tasks

frees up human talent to create and innovate



#### Scalability

Software robots scale instantaneously at digital speeds to respond to fluctuating work loads. There is also no overtime, ho hiring challenges and no training

Source: KPMG 2017

## Cyber and AI

Applying machine learning and artificial intelligence for cybersecurity is going to become more prevalent in dealing with the massive amounts of data that are being collected. We are moving very rapidly down the path of realizing that preventative technologies will only go so far and companies need to collect data across their systems, aggregate that information in a big data analytic system, and hunt for attackers inside that stream.

**“The next dimension is the opportunity to monetize security so it’s not a barrier. Applications will utilize my behavioral data and give me benefits. At KPMG we call these personal information agents which apply AI and machine learning to get information and services that are customized to an individual because it knows their preferences and tailors the security features accordingly. It changes the concept of security from being a barrier to technology adoption, if you use information about a person and give them higher confidence and integrity.”**

— Danny Le, Principal, Cyber practice, KPMG in the U.S.





# Innovation and commercialization barriers

---

**“Business leaders must be thoughtful about their innovation roadmap. This path should assess the major platform companies and the disruption they are leading across products, industries, and business models. Key considerations include defending against these platform companies, participating in their ecosystem or becoming a platform. Anticipating change can lead to important and courageous decisions to stretch a company’s brand and capabilities. Only responding to change or worse, ignoring change can yield to an obsolete business model.”**

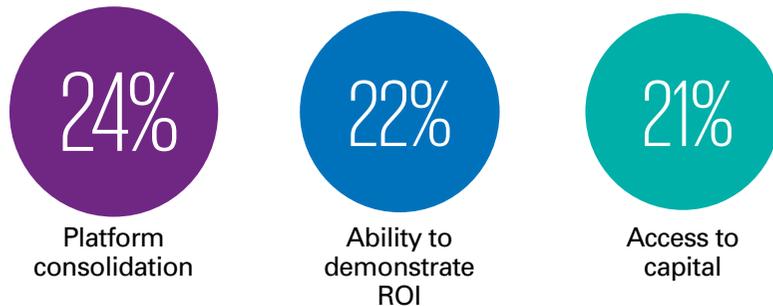
— Tim Zanni, Global and U.S. Technology Sector Leader;  
Chair of Global and U.S. TMT Line of Business, KPMG in the U.S.

## Barriers to innovation

### The changing landscape of disruptive technologies requires navigating a series of obstacles to achieve monetization success. What is holding back technology innovation?

In KPMG's tech industry innovation survey, platform consolidation and ROI leaped ahead from the prior year findings. This in spite of access to capital scoring about the same in absolute terms.

#### Top issues that limit or constrain innovation



Partial list. Percentages do not sum to 100%. Source: KPMG Technology Innovation Survey, November 2016

#### Platform consolidation

Platform companies are driving innovation by integrating hardware, software, data, and a services model that enables unique competitive differentiators. They are also acquiring key start-ups to scale their technology roadmap and talent.

Big tech companies and emerging start-ups driving innovation will most likely compete with a top global platform company; the competition is fierce. Platform companies are great examples of the multiplier benefits enabled by integrating emerging technologies and reducing the complexity to create new value propositions. These companies are building data models that are difficult to replicate and have the technology and business processes to make decisions in real time.

#### Ability to demonstrate ROI

In KPMG's tech innovation survey, the ability to demonstrate return on investment was an increasing challenge across the board – 22 percent named ROI measurements as a hurdle this year, compared to 14 percent in the prior year's findings. A possible rationale: as companies have obtained the necessary capital and invested it in new technologies or businesses, the onus to prove the effectiveness takes priority.

The ability to demonstrate ROI ranked high in Israel (31 percent), Singapore (30 percent), Australia (28 percent), Korea and Canada (27 percent each), and Japan and India (24 percent each). In many cases new key performance indicators and processes need to be developed to measure the ROI for these emerging technologies.

#### Access to capital

Access to capital again scored high as an important factor that limits innovation. The availability of capital to fund start-ups, budget for adequate research and development, and put money to work in unearthing new areas was cited on a global level as a top challenge.

Access to capital tied in China and Israel (24 percent) and also had high ratings in Germany (23 percent), and the United States (22 percent). Despite the progress in many cities and countries around the world in helping startups scale and grow, accessible capital remains elusive to many entrepreneurs and innovation ecosystems within the FORTUNE 500 companies. In the United States there is awareness for the need to increase the commitment to help early-stage companies, particularly those led by minority entrepreneurs. Access to capital for these groups is critical in creating an innovative and inclusive economy.

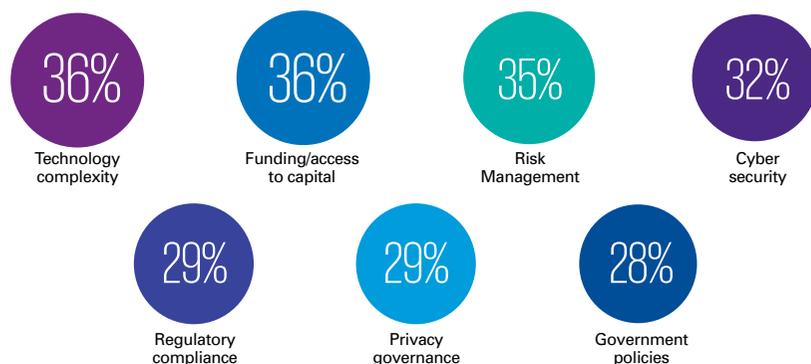
## Innovation and commercialization barriers (Continued)

### Barriers to commercialization

#### Managing these commercialization barriers is critical in achieving market leadership

Technology complexity, funding, and risk management were named by more than one-third of respondents, and all showed big increases from the previous year. In a distinct trend, regulatory compliance, privacy, and government policies were seen as more prominent barriers in this year's survey, almost doubling in importance. We expect this trend to continue.

#### Top barriers to commercializing technology innovations



Partial list. Percentages do not sum to 100%. Source: KPMG Technology Innovation Survey, November 2016

#### Technology complexity

The growing complexity of integrating legacy and emerging technologies surpassed cyber challenges for the first time in our annual tech innovation survey. Complexity was cited as a barrier by 36 percent of respondents, compared to 24 percent the previous year. Technology complexity also increased across regions.

As the number of emerging technologies increase and existing technologies evolve to offer more value, both consumers and enterprises face integration and complexity challenges. How tech companies address integration paradigms

to reduce complexity will be a competitive differentiator for the next wave of industry leaders.

In the Americas, where even successful innovative products are upgraded regularly (or cast aside quickly in search of the next, new thing), complexity was listed as a leading barrier by 41 percent of respondents, a big jump compared with 27 percent the previous year.

In ASPAC, the percentage of respondents citing complexity (33 percent) increased from the previous year, while the percentage in EMEA also grew from 23 percent to 36 percent.

This regional challenge demonstrates the widespread nature of technology complexity as emerging technologies are adopted around the world. Tech companies that facilitate the integration of emerging technologies are more likely to retain their customers. Enterprises and consumers want to be connected to an ecosystem that is delivering the most innovative products and services with ease-of-use. In order to thrive, platforms are investing heavily in their ecosystems by incorporating these emerging technologies, and the best are doing so in anticipation of what the customer wants.

#### Funding/access to capital

Not enough access to capital and funding is seen as a big challenge in commercializing the next, new thing. Despite these concerns, however, the good news for innovative companies is that over time, customers tend to weigh the potential benefits of new technologies more highly than the obstacles. In the early days of cloud and mobile technologies, for instance, security concerns were commonly cited by customers to explain their reluctance to explore, let alone adopt, these new platforms. But as technology providers clearly demonstrate the benefits and the security features, customers become more comfortable with the risk and, ultimately, adoption of the most compelling technologies.

## Risk management

The tech industry leads as a business model disruptor, given the magnitude of changes driven by the commercialization of emerging technologies. Innovative tech companies, big and small, have global ecosystems including supply chain partners and customers. Managing increasing compliance demands and mitigating risk is key to the successful commercialization of technology products and services.

**“As the reliance on technology companies for cloud and other services grows, customer expectations around security and compliance are also growing. Technology companies are increasingly being required to demonstrate that their services comply with a myriad of complex laws and regulations. Effectively demonstrating compliance can be a key competitive differentiator.”**

— Tom Lamoureux, Risk Consulting Leader Technology Sector, KPMG in the U.S.

Globally, risk management was cited by 35 percent of respondents. This concern was largely consistent among the Americas (39 percent), ASPAC (37 percent), and EMEA (28 percent). Compared to the prior year, the results indicate that respondents recognize risk management as an innovation challenge, and they are not as confident in their ability to mitigate risk. In China, risk management was the top concern by 41 percent.

Risk management issues are heightened by cyber risk hurdles. Around the world, governments are looking at regulatory frameworks as well as private sector collaboration to help reduce cybersecurity risk.

## Cybersecurity

Tech industry leaders recognize that security is a customer experience and revenue opportunity, not just a risk that needs to be managed. Security risks for both IoT and AI/Cognitive are viewed as a top obstacle to adopt these technologies. Security remains a persistent challenge for new and existing technologies alike, and the apparent risks seem to compound (or at least accelerate) as new innovations are introduced.

The leading tech companies are finding ways to turn cyber preparedness into a competitive advantage rather than a cost, building security into new products and services at the design stage and realizing that cybersecurity is not an IT issue: it is a C-suite agenda that requires cross-functional execution.

The C-suite and board members are viewing cybersecurity as a strategic issue. They realize cybersecurity is an enterprise-wide risk. If uncontrolled, it very quickly becomes a brand reputation issue and a regulatory and operations challenge.

**“Innovation in building cybersecurity into products, services and processes is a competitive differentiator. If you are able to authenticate your staff and your customers to very high levels of certainty, it means you’re able to provide new levels of personalized service and customer value.”**

— Greg Bell, Global and U.S. Leader of Cybersecurity, KPMG in the U.S.

# Industry disruption

**Many companies are becoming software companies, blurring the lines between product, services and industry categories. Some companies do not have the option of developing new competencies in-house so they are engaging in new ecosystems to contribute either capital, capability, or industry expertise to add value to their customers.**

The technology industry continues to be the global innovation engine as more consumers and businesses adopt emerging technologies faster. Technology companies have a dramatic impact in defining new cross-industry business models. In some industries, tech companies are displacing traditional brands and leading in market cap value.

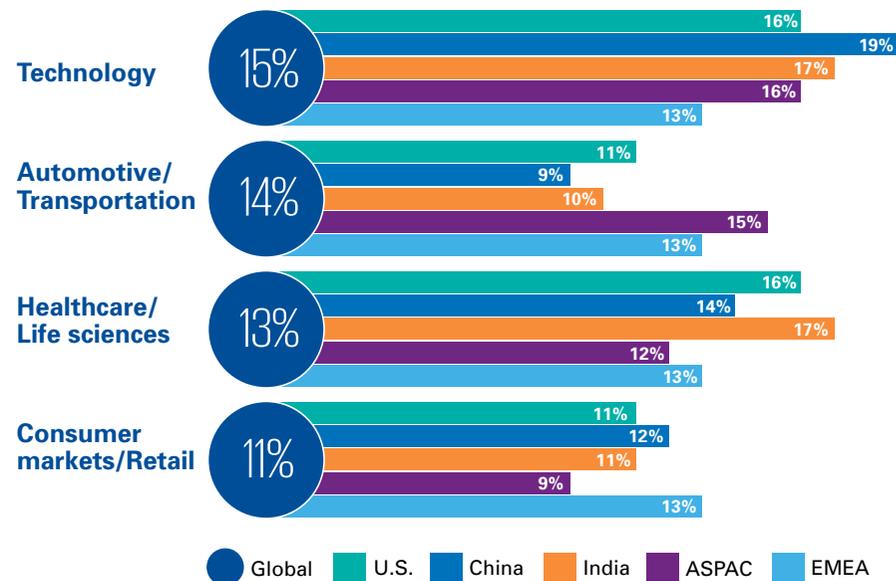
Technology industry executives are particularly attuned to disruptive waves of innovation in their own sector as products and services are redefined to develop the next generation breakthroughs that can enhance economic value.

**“The disruptive technologies trending as game-changers have already made a huge impact across the technology sector ecosystem and will continue to do so in the foreseeable future. The adoption of new technologies such as IoT and AI is complex. Tremendous opportunities exist for companies that can successfully integrate these disruptive technologies to create unique customer value propositions and new ways to compete. ”**

— Richard Hanley, Advisory Leader, Technology, Media and Telecommunications, KPMG in the U.S.

Tech industry innovation leadership is changing at a fast pace. Many of today’s industry leaders will be displaced by new players developing next-generation breakthroughs that can enhance economic value. The investment in emerging technologies, across sectors, identified in KPMG’s global tech innovation survey is consistent with KPMG’s recent global cross-industry CEO survey.

## Top industries to be transformed as a result of emerging technologies



Partial list. Percentages do not sum to 100%. Source: KPMG Technology Innovation Survey, November 2016

# Global cross-industry CEO insights

KPMG's 2017 Global CEO Outlook reveals insights from nearly 1,300 CEOs in 10 of the world's largest economies. With continued pressure to deliver on the bottom line, CEOs are keenly focused on managing their business' core strengths while transforming the way they create value.

## Disrupt and grow

More than ever before, leading a business is about challenging convention and driving positive change. CEOs around the world are championing new ways of creating value as well as strengthening their core business, and innovating to ensure their organization is not left behind.

## Top five strategic initiatives

1. Speed to market
2. Fostering innovation
3. Implementing disruptive technologies
4. Becoming more data driven
5. Digitization of the business

CEOs are building strategies around managing the value chain in an environment of constant disruption. They are beginning to realize how artificial intelligence, machine learning and cognitive capabilities could bring a surge in productivity as well as help create new products and new demand that would not be possible without these capabilities.

That will bring radical changes to the way people work in many functions, and workforce training is a top priority in this environment. Also, CEOs intend to significantly add headcount because of emerging technologies, in areas such as middle and senior management, R&D, and HR.

CEOs are still feeling the accelerating force of disruptive technologies and new competitors: 50 percent said that their organizations do not have the sensory capabilities and innovative processes to respond to rapid disruption. And 52 percent are concerned about integrating cognitive processes and artificial intelligence.

## Disruption as opportunity

CEOs are embracing disruption for many reasons, including technology-driven change sweeping through industries and economies on a global scale, as well as a shake-up in the geopolitical status quo.

- 65 percent consider technological disruption to be an opportunity, not a threat, for their organization.
- 74 percent said their company is striving to be the disruptor in their sector.

## Innovation

CEOs today are scaling up rather than scaling back on technology-led innovation. They know that their businesses can always innovate more effectively, especially when deploying emerging technology.

- 48 percent said that they were concerned about their business model being disrupted by a new entrant not currently perceived to be a competitor.
- 70 percent of CEOs are more open to new influences and collaborations than ever before.

**74%** of respondents said their company is striving to be the disruptor in their sector.

Source: KPMG Global CEO publication, June 2017. The data above is based on a survey of 1,261 CEOs from Australia, China, France, Germany, India, Italy, Japan, Spain, the UK and the U.S.



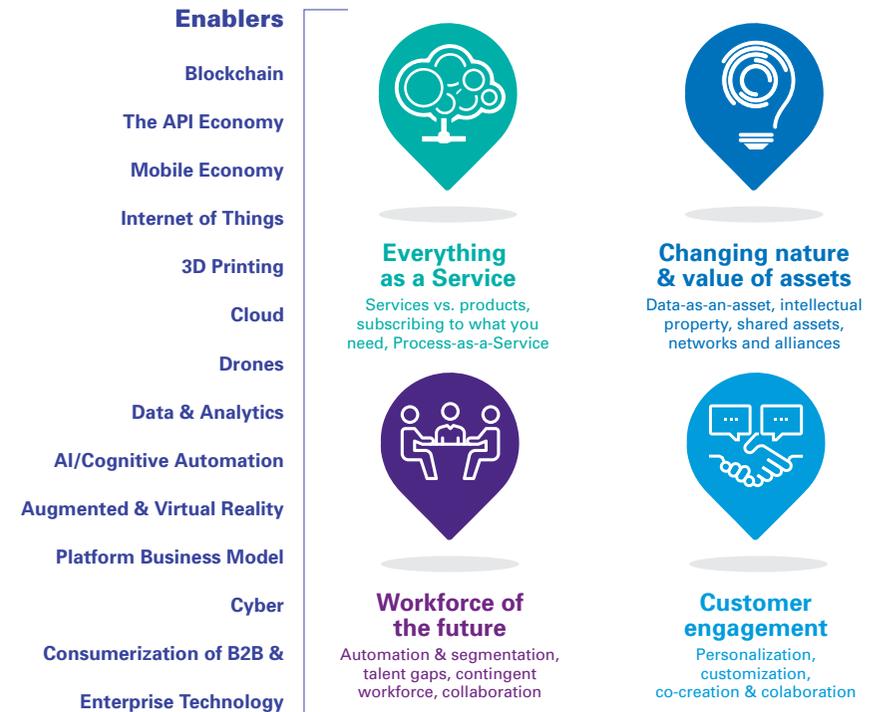
## The changing landscape of disruptive technologies and scope of digitization continues to accelerate and expand into the 21st century.

Many leaders are grappling with simultaneous disruptions spanning all aspects of business:

- **Product/service development** – agile, lean methods, customer-driven design
- **Manufacturing** – additive manufacturing, 3D printing, shifting import regulations/tariffs
- **Buyer behavior** – influencer networks, erosion of brand loyalty, experiences over status symbols, millennials
- **Sales channels and supply chains** – platform businesses are forging new, non-linear relationships
- **Distribution** – digital download, delivery-by-drone versus shopping in-store
- **Customer service** – bots and intelligent automation
- **Workforce** – “gig” employees, digital labor
- **Back office** – everything-as-a-service infrastructure for IT, marketing, tax, and other functions

This magnitude of change can be paralyzing, leaving many trying to redefine emerging challenges in familiar terms or double-down on proven, old behaviors. Others implement reactionary initiatives that are sub-scale and often seen as “competing with” instead of “replacing” the core business. But mounting market pressures tend to defeat all of these efforts. This new digital revolution era, like the major technology-fueled eras before it, demands a new organizational system – we need to redefine the 21st century enterprise.

## Pillars of the 21st century enterprise



Source: KPMG 2017

**“We are at the precipice of major technological and business model changes for the enterprise. Incremental innovations will no longer suffice. Companies need to transform themselves into 21st century enterprises, from the front to the back office.”**

— Steve Hill, Global Head, Innovation & Investments, KPMG in the U.S.

# Everything as a service

**The dynamics of scale are changing. Now, even small firms can access the benefits of scale without owning assets or capabilities. As a result, many firms are deepening focus on their core competencies and outsourcing back office functions in an effort to use resources effectively, remain nimble and scale faster. Rather than growing internal functions and infrastructure, these firms are making smart use of third-party services.**

A 20th century enterprise was rigid and bulky. As a company grew, it added organizational functions – perhaps a sales staff, followed by an accounting team, a marketing team, and eventually an IT team. As the business grew, the company created more infrastructure to support it. This infrastructure was optimized over decades, but when the business model faced a disruption, it could not adapt fast enough.

A 21st century enterprise is agile and lean. It scales up and down infinitely faster by subscribing to services instead of expanding internal functions and infrastructure. Contract sales teams and platform storefronts are now available at variable costs and can pivot instantly and autonomously based on demand. Finance and accounting staff are virtual and companies renegotiate with service providers annually, making specialized skills available on demand. Manufacturing is contracted and inventory is just-in-time and stored in transit by the shipping outfits. Marketing now consists of an ecosystem of agencies and freelancers, all accustomed to “gig” arrangements where they swarm a project. IT is in the cloud, allowing flexible capacity.

Amazon Web Services (AWS), and cloud storage as a whole, is a prime example of this shift. Data centers are expensive to build and maintain – the upfront investment, workforce necessary to run and service the network, and eventually upgrade the servers make data centers a big line item for companies. In recent years, data center infrastructure spend dramatically shifted toward the cloud, a trend that Amazon positioned itself to take advantage of to the tune of \$12.2 billion in revenue in 2016 (47% year-over-year growth in 4Q16).\* AWS, Microsoft, Google, Salesforce, Workday, and ServiceNow are at the forefront of a new wave of cloud-based capabilities that others can rent for a price. As this trend continues to grow, cloud-based service firms are becoming the default providers of back- and middle-office functions, dramatically shrinking the size of companies as they begin to shed non-core functions.

Although the tech industry is spearheading this transformation, companies across all industries can transform their products to services with technologies like IoT and AI. Technology now enables all industries to participate in and take advantage of services models. Discrete and process manufacturers are providing “product-as-a-service” platforms, and professional services firms are launching “cybersecurity-as-a-service.” IDC predicts

\*Source: Business Insider, Eugene Kim, February 2017



that by 2020, digital twins for industrial equipment will drive a 25% reallocation of end-user spend from “procure and maintain” to “service” models provided by manufacturers.

Adding a deeper dimension to the back-office services shift, industry participants (notably financial services firms) are beginning to pool resources, expertise and capabilities to create market utilities focused on specific functions, such as client services and onboarding, trading and execution, and cash and collateral management, often through joint ventures. A survey of 69 financial institutions found that top-tier banks are increasingly open to the adoption of utility-based shared service models to drive down costs and increase efficiency in back-office and compliance functions (“Bank cost-cutting driving uptake of financial industry utilities,” Finextra February 2016). Goldman Sachs, JP Morgan, and Morgan Stanley created a company to clean reams of reference data at a lower cost than each firm would spend individually.

Although the services economy has picked up steam in recent years, we are likely still in the early stages of its evolution. Large incumbent enterprises have operated for decades under the assumption that consolidating operations in-house drives down transaction costs, while an increasingly connected, digital world flips that theory on its head. Geoffrey Moore, author of *Crossing the Chasm*, emphasizes this new perspective in his paper, *Reinventing the Company in the Digital Age*: “The optimum configuration of resources will be one which maximizes its number of external touch points and minimizes its internal overhead.” Small and medium-sized firms, especially those established in just the last decade, have already harnessed this mentality, mostly out of necessity. Larger, legacy firms are beginning to grasp the benefits of working with third parties, but most are still operating as they have for decades.

## Thoughtful and thorough is the way to go

If you are a legacy firm, how can you adapt? Executives should evaluate their organization to better understand how each function will evolve. Will certain functions require large-scale technology overhauls to remain agile and competitive? Will others demand new skills or talent that do not exist in your organization? Firms need to be thoughtful and thorough in determining whether they should continue to invest in certain internal functions or tap into third party resources.

# The changing nature and value of assets



**“Software is eating the world” (Marc Andreessen) – and with that, it is also displacing the value of traditional, physical assets. Today, the highest-valued firms leverage non-traditional assets – intellectual property and data – to drive operational efficiency, identify new revenue streams and feed analytic and AI insight engines.**

In the 20th Century, enterprises focused on physical, tangible assets – property, plant, equipment, and employees. In the digital age, these traditional assets are quickly becoming expensive liabilities. Fixed physical locations can impede the ability to tap into new pockets of emerging talent. Plants accustomed to manufacturing for the masses produce “one-size-fits-none” products in an age when consumers now demand individuality and customization. Equipment is obsolete long before it is fully depreciated.

A 21st century enterprise unlocks value from non-traditional assets – data, alliances, networks, and agility. They recognize that the data they collect in the regular course of business transactions can be shared and monetized. Each seeks to build an unassailable ecosystem of buyers and suppliers which, if sufficiently diversified and scaled, could emerge as a platform whose value as a commerce enabler far outweighs the good or service it was initially designed to deliver.

These efforts all tie back to one of, if not the biggest, intangible assets – data. Data is the lifeblood of emerging technologies, including AI/Machine Learning, IoT, autonomous vehicles, drones, and

bots. These technologies are only as strong as the underlying data that feeds them – and the more data they ingest, the better they perform. Using these technologies, businesses can generate insights from massive amounts of data to improve business operations and transform customer experience. Across all industries, companies that effectively use data to drive decisions and efficiencies in the front and back office are gaining competitive advantage.

For example, GE is implementing a technology called Digital Twins, or digital representations of physical things or systems. Organizations will use these virtual environments, to proactively repair and plan for equipment service and manufacturing processes, as well as increase operational efficiency and perform enhanced product development. Gartner predicts hundreds of millions of things will have digital representations in three to five years (Gartner, “Gartner Identifies the Top 10 Strategic Technology Trends for 2017,” October 2016).

Many of these companies are also leveraging Application Programming Interfaces (APIs) in smart ways. APIs can be used to collect and deploy data both externally and internally, enable collaboration by

allowing the sharing of data and services between organizations and attract developer communities to create complementary products. A recent study of APIs by Platform Revolution author Marshall Van Alstyne indicates that deploying data through API adoption is directly related to increases in revenue, decreases in operating costs and increases in market cap (Benzell, Lagarda, Van Alstyne, "The Impact of APIs on Firm Performance," October, 2016).

With data now playing such a crucial role in the enterprise, it is vital for executives to put this valuable asset at the forefront of their corporate strategies. Furthermore, data does not discriminate by industry – you do not have to be a technology company to access and leverage data to your advantage. Executives can simply start by scanning a company's entire value chain to understand what departments, partners, suppliers, vendors, or customers have or generate data that can be leveraged or purchased to improve the front and back office.

**"The explosion of data creates enormous opportunities for organizations of all types in an economic environment driven by digital disruption. From new customer and portfolio acquisition strategies to the development of new business models, leading organizations need to rely on trusted data and analytics to transform and drive future growth."**

— Christian Rast, Global Head of  
Data & Analytics, KPMG International

## Seeing the future of autonomous vehicles

In March 2017, Intel announced its plans to acquire self-driving tech supplier Mobileye for \$15.3 billion (NY Times, "Intel Buys Mobileye in \$15.3B Bid to Lead Self-Driving Car Market," March 13, 2017). Mobileye, which makes cameras and laser-based sensors for autonomous vehicles, already sells its technology to 27 automakers, as well as to other automotive suppliers.

The move gives Intel the opportunity to further expand outside its legacy computer business and the ability to offer customers a more complete technology stack, from sensor technology to data crunching. Intel predicts that eventually, one autonomous vehicle with average use could provide 4,000 GB of data per day, creating a rich source of information on customers and their surroundings (Portland Business Journal, Malia Spencer, February 2017). Intel sees that owning and leveraging this data is a huge opportunity to open new revenue channels in the future, and it has moved swiftly to secure that opportunity.

# Workforce of the future



**Decisions on how digital labor will shape the 21st century enterprise requires digging into a company's deepest core values. A 21st century enterprise is lean, leverages digital labor and has access to global talent, on demand, through platforms and alternative employment models. The displacement of jobs due to the rise of new technologies is not new. How is digital labor different?**

Innovations in computing power and the rapid increase of structured and unstructured data in the last 10 years have led to the rise of AI innovation and market adoption. The combination of cognitive technologies and robotic process automation augments human reasoning and automates physical tasks, mimics human activity and interacts naturally with people. It is what we call digital labor.

Digital labor's entry into the workforce will be incremental, but it will be fast. As indicated in the recent KPMG CEO survey, it is increasingly becoming clearer to business leaders around the world, the breadth of the impact that cognitive technology and artificial intelligence will have on business and operating models. As more of the use cases become apparent to the marketplace, the reality and magnitude of the impact is starting to set in, and so is the speed. Last year CEOs were saying this was two or three years out. In the 2017 survey, they are saying this is not a linear progression; it is exponential.

Business software applications and computer intelligence are converging, creating a world where cognitive systems handle many business processes faster, at a lower cost and with fewer errors. Precursors of this sci-fi-like digital labor are already at work. Use cases include copying and pasting order information into spreadsheets, answering customer questions in call centers and helping technicians diagnose equipment maintenance issues and

virtual assistants. AI is also adding value by enabling enterprises to have new insights about their supply chain, employees, and customers in real time.

Many leading organizations are beginning to address the evolution of their workforce to redeploy human talent from mundane, time-consuming work to focus their human workers on what humans do best; innovate, build relationships, and do what the previous generations thought was only science fiction. There will be job dislocations but underlying this scenario is a series of potentially positive outcomes. Digital labor is not so much a threat to the human workforce as it is the next evolutionary step toward smarter, more productive and innovative employees. Private and public leaders need to proactively assess the impact of digital labor to define how to train and support the workers whose jobs are impacted.

In this new workforce paradigm, the way we work will be transformed, changing the nature of jobs. Management roles will be restructured as well as traditional functions like sales, finance, marketing, and procurement. AI will have an impact at the highest levels including the C-Suite and the boardroom. As the workforce of the future becomes a reality, business leaders need to develop an AI strategy that is in line with their corporate values, builds stakeholder trust, and protects the company's corporate reputation.

The nature of work has been reinvented for years, just like it evolved during the industrial revolution. The demand for existing jobs will be impacted but, most likely, new job markets will be redefined by the next wave of disruptive technologies and the 21st century enterprise.

Advances in deep neural networks, which are inspired by the way the brain works, will continue to redefine digital labor and the workforce of the future. The 21st century enterprise will have a different mix of workers including core employees and “on-demand” people plus bot workers. Public and private platforms will enable access to workers on-demand to fulfill temporary assignments. The workforce of the future will help companies become more agile, efficient, and innovative.

As the composition of the labor force shifts, technology progress will also lead to new goods and services. The balance between humans and machines, in a customer-centric world, will help determine tomorrow’s winners. Visionary leaders will align people and technology investments to allow the redeployment of their workforce to its highest and best use to do what is now unimaginable, to solve problems and make the world a better place.

**“Intelligent, data-rich platforms allow rapid, virtual scale, and unleashes innovation from talent anywhere in the world. The inherent automation frees humans to do what they do best, design, invent, lead, communicate, and interact. We are at the very beginning of a generational change in a new way of working and it is difficult to overstate the magnitude of the implications. We will see many new entrants operating across different technology platforms, crossing industries, and disrupting traditional business models in almost every type of business to create a new order of industry and a new paradigm of division of labor.”**

— Cliff Justice, Digital Labor Leader, KPMG in the U.S.

## Freedom to make a difference

Many companies will find that digital labor acts less as a displacer of employees, especially in its earliest iterations, and more as an assistant, allowing people to do their jobs faster, more thoroughly and more accurately—and to spend more time on work that makes a difference. At KPMG, we are investing heavily in cognitive technologies, including IBM Watson, to supercharge our audit capabilities. For example, a typical audit today covers a statistically valid sample of data, but we see that cognitive systems could analyze the full population of available data—financial and non-financial. The result: more accurate audits; more granular audit reports; deeper insights into controls, accounting practices and reporting processes; and a broader perspective on risk.

# Customer engagement

**The evolution in technology is ushering in a new era of customer identification, personalization, and engagement – driven by customer experience and insights. A 21st century enterprise delivers the best customer experience, leveraging data collected from customers to learn and personalize.**

Customer experience has long been a top priority for companies – 76 percent of businesses named improving customer experience as their top business priority (Forrester, 'Master DevOps For Faster Delivery Of Software Innovation', December 19, 2016). But what exactly does delivering an exceptional customer experience mean in the digital age?

A 20th century enterprise looked inward. If a business had strong product design, efficient production and a competitive price, a robust customer base would follow.

A 21st century enterprise looks outward. They recognize that the best customer experience is conceived of, designed and iterated by the customers themselves. They leverage data collected from every customer transaction, at each step in the value chain, and then review and interpret these inputs to further personalize and enhance the user experience. Platforms are able to deliver an unmatched user experience and for example, avoid price shopping and other competitive pressures that distract and divert customer attention.

In today's digital world, customer engagement is driven by experience and insights. Such engagement focuses on the overall experience the customer has with the offering including convenience, ease of interface, support, and accessibility to products

and services. Today, companies are leveraging robotics and automation to build smarter, more customer-centric interfaces to make their products and services stand out. Insights-driven customer engagement focuses more on retention and loyalty, driven by data collection and analysis. Companies are leveraging data collected from mobile, Web and wearable channels to better understand and predict customer preferences and provide relevant recommendations with the aim of increasing customer loyalty and retention. Platform companies are particularly good at this and have a huge advantage because of this customer data as well as transactional data. This data allows for a more personal experience and as noted, greater loyalty.

AI – including robotics and automation – represents a major disruptor and a key opportunity for enhancing the customer experience. Currently, companies leverage AI to streamline their processes and redefine their communication channels. Virtual agents and chat-bots are spreading across industries to improve the quality and accuracy of services provided to customers.

Though AI has played – and will continue to play – a big role in improving customer experience, 21st century enterprises must figure out how to transform positive customer experiences into long-term loyalty. This is where insights-driven customer engagement comes into play.



The increase in technological disruptors and the emergence of new communication channels, such as mobile phones, IoT, wearables and Web interfaces, have enabled companies to gather unprecedented volumes of data to understand customer preferences and brand perceptions. Most companies can gather data, but many struggle to translate unstructured data into meaningful insights. Insight service providers – including KPMG’s Data & Analytics group – enable companies to analyze and curate their data to uncover impactful insights.

Looking ahead, what does this mean for the future?

Despite advances in insights-driven capabilities, businesses are still searching for ways to promote brand affinity and lasting customer loyalty. According to KPMG’s 2017 Global CEO Outlook, 64 percent of CEOs say they are effective at sensing market insights and 45 percent admit that their customer insight is hindered by a lack of quality data.

Rather than AI and data analytics working in parallel on customer experience and retention, these two technological enablers will converge to generate increased loyalty. Cognitive analytics solutions – self-learning systems that get smarter with more data – will be used to interact with customers, gather and analyze data, and provide personalized recommendations to customers. In 2017 alone,

investments in AI have tripled and many vendors are already embedding components of cognitive computing into their solutions and service offerings. (Forrester, “Predictions 2017: Artificial Intelligence Will Drive the Insights Revolution,” November 2, 2016).

With the fast-paced change in technologies and increase in competition, companies need to maintain an agile approach to automation and continue leveraging AI and data analytics to retain their customers.

## Better relationships through big data

In February 2017, IBM and Salesforce announced a global strategic partnership between Watson and Einstein to deliver joint solutions leveraging AI to enable companies to make smarter, faster decisions. With this partnership, an entirely new level of intelligent customer engagement will be available across all functions including sales, service, marketing, and commerce and across all industries, including healthcare, retail, technology and financial services (Salesforce, “IBM and Salesforce Announce Landmark Global Strategic Partnership,” March 6, 2017).

This integration will combine data from Watson with Einstein’s cognitive analytics capabilities to deliver deeper insights, giving clients a better understanding of their customers and overall business performance.

# Global tech industry CEO insights

**KPMG's 2017 Global CEO Outlook includes insights from 92 tech industry CEOs in 10 of the world's largest economies. With continued pressure to deliver on the bottom line, CEOs are keenly focused on managing their business' core strengths while transforming the way they create value.**

Reflecting the impact of emerging technologies and disruption, tech industry CEOs, who were part of the overall 2017 KPMG CEO study, said greater speed-to-market, digitization, implementing disruptive technology, and fostering innovation are their top strategic priorities over the next three years. At the same time, to continue to be successful, technology CEOs must consider ramifications of the environment they have created.

Emerging technologies that bring some of the greatest promise also require significant considerations. For example, artificial intelligence and cognitive automation present tremendous opportunities for business efficiencies and new services to customers. Yet, it is imperative to develop a holistic strategy that encompasses business processes, culture, ethics, security, reputation and customer centricity. It is a rebooting of the entire enterprise to create value for the organization, customers and employees.

Depending on where their companies are in the disruption cycle, tech CEOs could be simultaneously navigating the transformation of their own organization and assisting customers in their tech-driven disruption and transformation. Tech CEOs must overcome the fact that one could distract from the other. Even if they are past their own disruption, the extent of their customers' discomfort can provide a significant challenge on its own.

## Top strategic priorities over the next three years

**Greater speed-to-market**

30%

**Digitization of business**

24%

**Implementing disruptive**

23%

**Fostering innovation**

23%

Source: KPMG Global CEO publication, June 2017

**Technology may be driving the disruption but technology leaders are recognizing success will require the right combination of human talent and technology.**

Between now and 2020, CEOs predict they will need to hire more people in several areas to support emerging cognitive technologies.

- Over 75 percent see increases in IT
- 64 percent in middle management
- 62 percent in customer service
- 60 percent in sales and production
- More than half anticipate increasing headcount in finance, research, HR, and marketing
- 43 percent expect to add to senior management

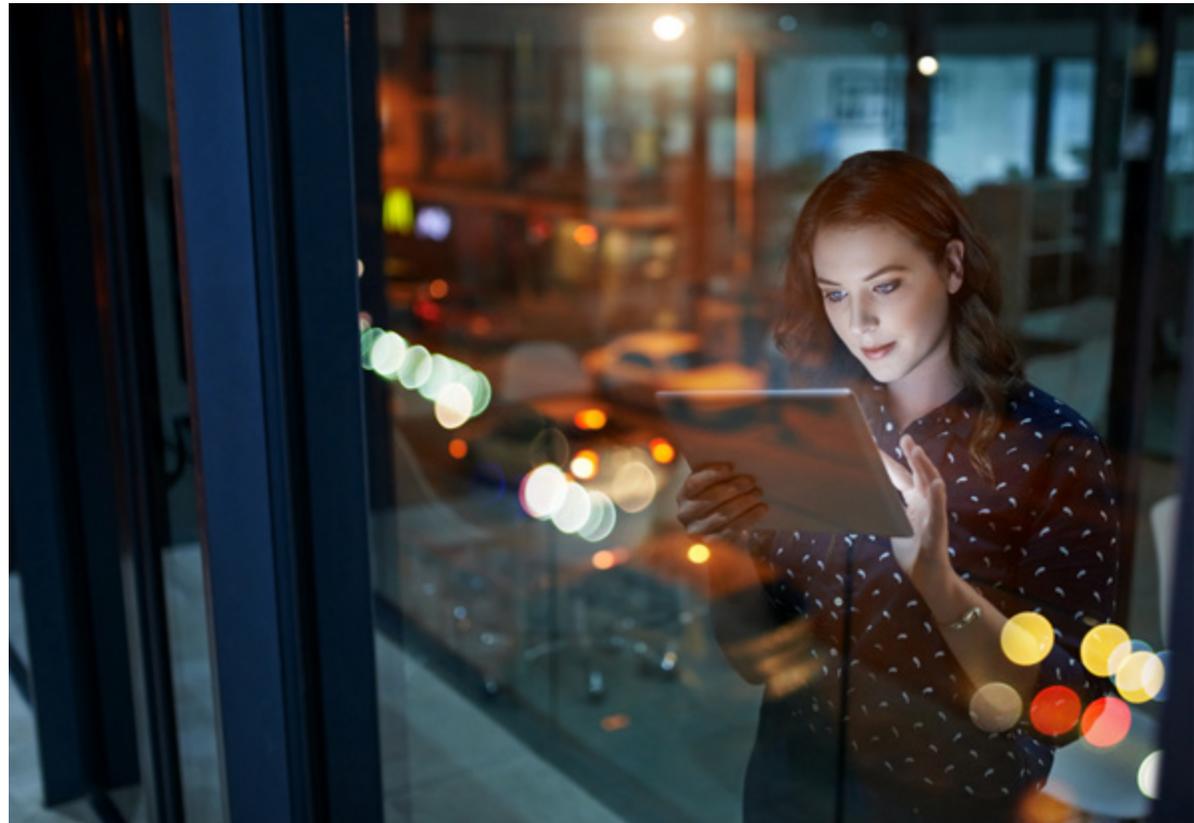
Hiring in the area of emerging technologies also provides the opportunity for tech CEOs to ensure their organizations attract and retain individuals who not only have the technical skills to develop or implement new technologies but also the human skills to help an organization transform in a way that is aligned with its culture and values, trust being the foundation for success that applies across all of a company's activities.

**Do an organization's employees and customers trust the company's cybersecurity?**

Smart companies are seizing the opportunity to build cybersecurity into their products and innovate around security to enhance trust. Having a customer's trust is the critical step on the way to delivering on customer expectations, which has become a focus area for CEOs in all industries.

**“Customers’ trust is nonnegotiable for technology companies to attract and retain customers. Technology industry market leaders are constantly balancing their investments, evaluating their governance protocols, and assessing collaboration opportunities inside and outside their companies to reduce risk.”**

— Vijay Jajoo, Principal, Cyber practice, KPMG in the U.S.



# Conclusion

**“Along with technological innovation, true success relies on business leadership. The ability to build a culture is based on clear ethical values and transparency. Companies that fail to maintain the trust of key stakeholders will have a problem delivering their value proposition.”**

— Tim Zanni, Global and US Technology Sector Leader; Chair of Global and US TMT Line of Business, KPMG in the U.S.

**Technology has enabled revolutions before, from the Industrial Revolution of the prior two centuries to the Information Age to today’s Fourth Industrial Revolution, a term coined for a convergence of cutting-edge technologies led by artificial intelligence, the Internet of Things, robotics, biotech, and many other explosive advances.**

**The technology industry is driving unprecedented global cross-industry disruption and the pace is accelerating.** Another wave of innovation is coming as new consumer and enterprise technologies are being adopted. This requires a strategic mind shift to focus not on just one evolving innovation but several at once to stay ahead of the competition. The interplay of technologies is a hallmark of today’s tech upheaval. It is about the combined power of robotics with AI working alongside humans to deal with problems and find solutions. It is about IoT combined with machine learning to manage personal health and improve customer experiences. It is about leveraging AI and data and analytics to anticipate change and make better decisions faster. Companies that can leverage the combined power of these new technological advances should be able to get a competitive edge. The way we work, learn, and make decisions will change dramatically.

**Technology complexity, funding, and risk management are challenging the commercialization of new technologies.** Regulatory compliance, cybersecurity, privacy, and government policies are also more challenging for tech industry leaders than in the past and we expect this trend to continue. There is a change in philosophy on how companies approach cyber.

The reality is that with the adoption of IoT and other technologies, and a mobile workforce, the perimeter is gone. Companies are starting with an assumption that the attackers are already inside. There is an evolution in how organizations can expand their own intelligence by sharing information about their own security threats with peers and competitors. Customer trust is nonnegotiable. Market leaders are constantly balancing their investments, evaluating their governance protocols, and assessing collaboration opportunities inside and outside their companies to reduce risk.

**Technology industry visionaries continue to challenge our assumptions and the pace of innovation will continue to drive disruption across all industries.** How do we recognize bright ideas? How do we recognize the remarkable sooner? When new ideas arrive in the world, they often come from unexpected places. As new technologies evolve, there are new economic, ethical, social, risk, and regulatory dilemmas. Yet, in this year’s KPMG global cross-industry CEO Outlook, more CEOs than ever before are embracing disruption, speed, and the power of technology to chart a new course to success, even if these decisions bring uncertainty. Many CEOs understand change is the best option – possibly the only option.

### **The changing landscape of disruptive technologies and scope of innovation will accelerate and expand in the 21st century.**

This new digital revolution era, like the major technology-fueled eras before it, demands a new organizational system. We need to redefine the 21st century enterprise. Nothing propels the world forward like embracing new ideas. The trick is to stay open to unexpected and challenging notions, keep seeking out opportunities beyond the obvious, and root out opportunities wherever they may be. In every industry, there is a “next,” a “new,” a “never before” waiting to happen.

### **The business implications of disruptive technologies for the tech sector**

**The disruptive technologies trending as game-changers are making a big impact across the technology sector ecosystem.** Whether it is in creating new ways to serve and derive value from customers, driving operational innovations to lower cost and improve agility, or transforming entire industries and business models, the pace of change is only going to accelerate.

Growth opportunities exist for companies that can successfully integrate these disruptive technologies to create unique customer value propositions and new ways to compete. For technology companies, whether they are creators of these disruptive technologies, solution providers who use these technologies, or suppliers to companies who create or integrate these technologies, innovation and business agility are key. Profit pools and competitive advantages that exist now are going to be short-lived if boards and C-suites do not address – with increasing speed and agility – disruptive trends that both threaten their existing business models and provide sources of opportunity. Taking action to harness the opportunity and minimize the threat will be essential to be a market leader.

### **Forward-thinking executives constantly reevaluate and optimize their business. Are you:**

- **Revisiting your company strategy** to understand how disruptive technologies are impacting your suppliers, partners and customers, their value propositions, and how you can monetize incremental value.
- **Rethinking your innovation and business models** to harness these disruptive technologies and the ecosystems around them for new value propositions and competitive advantage.
- **Reconsidering capital allocation** to optimize and balance your funding on current vs. new.
- **Revising your M&A strategy** to take advantage of disruptive technology opportunities, fill technology and capability gaps, and accelerate time-to-value.
- **Reinvigorating and transforming your operating model** to capture incremental profits to fund the change, and to improve organization agility to capture new opportunities.

# The strategy landscape

## Strategy shaped by disruptive technologies

Today's market is shaped by disruptive innovations. The challenges of defining and executing winning strategies increase materially. This is driven by the accelerating pace of change, broadening portfolio of options for how/where/when to compete, and a more complex ecosystem of competitors and partners.

Traditional strategy approaches remain fundamental. The speed and magnitude of market disruptions force winning players to run strategy processes better, connect to financial and operations planning, and determine the frequency to revisit and refine outcomes. Simultaneously, companies have increased and have better access to market information, internal data, and advanced digital tools to analyze and predict the impact of different strategic options. Options include gathering and cleansing data from multiple sources, predictive analytics, and/or machine/deep learning.

We see a unique opportunity to change how the world views strategy to: deliver increased value to our clients today while disrupting the strategy consulting market we operate in tomorrow.

## KPMG's Global Strategy Group (GSG)

We believe companies need advisors to help take them from "innovation to results," by balancing financial performance, risk and innovation. We support clients in defining their ambition and developing innovative strategies that embed agility, customer-centricity and operational excellence to thrive in dynamic markets.

We believe in "strategy through execution" and pride ourselves in our ability to work shoulder to shoulder with clients through implementation. We help deliver targeted results by: accelerating momentum, reducing execution risks and helping executives change, grow, adapt, shape and respond to disruptive forces.

We invest heavily in building deep analytical capabilities, proprietary benchmarks, and relevant perspectives to deliver new insights to our clients faster. We use today's latest market data analytics tools and cognitive approaches, while working closely with market shapers to develop next generation capabilities for tomorrow.

KPMG's global network of strategy professionals provide specialist support, ideas and insight, cross-sector and cross-border. We also leverage KPMG's broader cross-functional capabilities to: tailor strategy, elevate boardroom conversation, and maximize our value to clients. Our extensive industry experience includes: large-scale transformation, change management, mergers and acquisitions, corporate and finance restructuring, tax structuring and risk management, cyber, data & analytics, asset and regulatory, and more.

GSG's integrated "9 Levers of Value (9LoV)" strategic framework integrates our capabilities into one consistent discussion for the boardroom and ensures no stone is left un-turned to maximize the value delivered to our clients.

## For more information contact:

**Per Edin**

[pedin@kpmg.com](mailto:pedin@kpmg.com)



**From idea generation to strategy to execution, or at any stage in between, KPMG Ignition can help you spark innovation and fuel change. We discover emerging opportunities through our far-reaching innovation and intelligence capabilities; design bold scenarios using state-of-the-art interactive technology; and deliver the insights and solutions that only come from efficient cross-team collaboration. With multiple locations throughout the United States and KPMG international member firms, our dynamic network of innovation capabilities includes:**

### **The Innovation Lab at KPMG Ignition**

KPMG Innovation Labs use an outside-in lens to help clients identify signals of change to anticipate the future and take strategic action. With industry research, customer insights, technology innovation, and investment analysis capabilities, our professionals work closely with you in an immersive process to apply design thinking for business model innovation so you can drive from signals to action.

#### **For more information contact:**

**Colleen Drummond**

colleendrummond@kpmg.com

### **Insights Center at KPMG Ignition**

Using sophisticated data and analytics solutions and next-generation technologies, we have created a space where we help our clients visualize and interact with their data to gain new insights and enhance data-driven decision-making. Within this highly-collaborative, immersive experience, you can participate in sessions ranging from analytics showcases to facilitated workshops.

#### **For more information contact:**

**Brad Fisher**

bfisher@kpmg.com

**For overall information about KPMG Ignition contact:**

**John Farrell**

johnmichaelfarrell@kpmg.com

Visit us at:

[www.kpmg.com/innovation](http://www.kpmg.com/innovation)

### **Technology Solutions at KPMG Ignition**

Our dynamic team of developers, experience design engineers, data scientists, business transformation professionals, and information architects collaboratively build and deliver digitally-enabled technology solutions. We stay at the forefront of technology, using flexible design and development techniques to deliver business transformation, large-scale organizational change and complex program management. As a result, you can benefit from game-changing solutions that drive greater performance potential and address complex business issues.

#### **For more information contact:**

**Lou Trebino**

ltrebino@kpmg.com

# About KPMG

## **KPMG: An experienced team, a global network**

**KPMG's network of professionals combine industry knowledge with technical experience to provide insights that help technology industry leaders take advantage of emerging business opportunities and proactively manage business challenges. Our network of professionals have extensive experience working with global technology companies ranging from the FORTUNE 500 to pre-IPO start-ups. We aim to anticipate the short- and long-term opportunities of shifting business, technology, and financial strategies.**

**KPMG International's independent member firms have 189,000 professionals in 152 countries.**

## **KPMG Technology Innovation Center**

**KPMG recognizes the importance of innovation. In 2012 we launched a global Technology Innovation Center to identify and evaluate the impact of future disruptive technologies. The center connects leading technology thinkers including entrepreneurs, FORTUNE 500 technology executives, venture capitalists and KPMG member firm professionals.**

**Visit us at:**

[www.kpmg.com/techinnovation](http://www.kpmg.com/techinnovation)

## **Tech innovation survey demographics and methodology**

KPMG's technology industry innovation survey, now in its fifth year, included 841 global technology industry leaders, representing start-ups, mid-market enterprises, large tech companies, and venture capital firms.

The survey is designed to spot tech innovation trends leading to consumer and enterprise market disruptions, recognize opportunities and barriers in tech innovation adoption and monetization, identify top countries and hubs driving technology innovation, and provide insight into tech innovation management leading practices.

The survey spanned the Americas, EMEA and Asia-Pacific markets. Fifteen countries are represented. The web-based survey was conducted September-November 2016.

# Related insights



## **Global CEO Outlook 2017**

Most CEOs see disruption as an opportunity to transform their business model, develop new products and services, and reshape their business.



## **Risk or reward: What lurks within your IoT?**

IoT security within the enterprise will require reliable solutions that take into consideration the types of devices, the ecosystems, and the use cases in which devices operate.



## **Rise of the humans**

Discover the five steps organizations can take to better understand how digital labor will affect their workforce.



## **An ethical compass in the automation age**

This publication presents steps to take and questions to ask as companies consider implementing cognitive automation.



## **Global technology innovation hubs**

We unfold the cities and countries making significant strides in innovation and provide 15 unique country perspectives.



**Global and cross-industry collaborations and partnerships are key to staying ahead, as is learning how to embrace change in a nimble way to avoid the status quo for fear of failure or uncertainty.**

# Authors

## Tim Zanni

Global and U.S. Technology Sector Leader  
Chair of Global and U.S. TMT Line of Business, KPMG  
in the U.S.  
tjzanni@kpmg.com

## Kevin R. Bolen

Managing Director, Strategic Investments & Growth  
Initiatives, KPMG in the U.S.  
kbolen@kpmg.com

## Richard Hanley

Advisory Leader, Technology, Media and  
Telecommunications, KPMG in the U.S.  
rhanley@kpmg.com

## Patricia Rios

Director, Technology, Media and Telecommunications,  
KPMG in the U.S.  
patriciarios@kpmg.com

# Country contacts

For further information about how KPMG can help your business, please contact:

## AUSTRALIA

**Kristina Kipper**  
kkipper1@kpmg.com.au

## CANADA

**Anuj Madan**  
amadan@kpmg.ca

## CHINA

**Philip Ng**  
Philip.ng@kpmg.com

## FRANCE

**Marie Guillemot**  
mguillemot@kpmg.fr

## GERMANY

**Peter Heidkamp**  
pheidkamp@kpmg.com

## HONG KONG

**Irene Chu**  
Irene.chu@kpmg.com

## INDIA

**Akhilesh Tuteja**  
atuteja@kpmg.com

## IRELAND

**Anna Scally**  
anna.scally@kpmg.ie

## ISRAEL

**Arik Speier**  
aspeier@kpmg.com

## JAPAN

**Eiichi Fujita**  
eiichi.fujita@jp.kpmg.com

## KOREA

**Seung Yeoul Yang**  
seungyeoulyang@kr.kpmg.com

## RUSSIA

**Yerkozha Akylbek**  
yakylbek@kpmg.ru

## SINGAPORE

**Juvanus Tjandra**  
juvanustjandra@kpmg.com.sg

## SPAIN

**Ignacio Faus Perez**  
ignaciofaus@kpmg.es

## SOUTH AFRICA

**Frank Rizzo**  
frank.rizzo@kpmg.co.za

## TAIWAN

**Samuel Au**  
syau@kpmg.com.tw

## UNITED KINGDOM

**Tudor Aw**  
tudor.aw@kpmg.co.uk

## UNITED STATES

**Tim Zanni**  
tjzanni@kpmg.com

Some or all of the services described herein may not be permissible for KPMG audit clients and their affiliates.

© 2017 KPMG International Cooperative (“KPMG International”), a Swiss entity. Member firms of the KPMG network of independent firms are affiliated with KPMG International. KPMG International provides no client services. No member firm has any authority to obligate or bind KPMG International or any other member firm vis-à-vis third parties, nor does KPMG International have any such authority to obligate or bind any member firm. All rights reserved. NDPPS 650647

The information contained herein is of a general nature and is not intended to address the circumstances of any particular individual or entity. Although we endeavor to provide accurate and timely information, there can be no guarantee that such information is accurate as of the date it is received or that it will continue to be accurate in the future. No one should act upon such information without appropriate professional advice after a thorough examination of the particular situation.

The KPMG name, and logo are registered trademarks or trademarks of KPMG International.

**[kpmg.com/socialmedia](https://kpmg.com/socialmedia)**

