



The top 10 technologies for business transformation

Insight on the latest disruptive technologies for company executives and VC investors

Internet of Things reigns again, but surprise technologies appear

We are in a period in which technologies are at once emerging, resurging and converging. Companies across virtually every sector are positioning themselves to outpace their competition by embracing—and implementing—innovative technology-based business models to create differentiated value.

Against this backdrop, respondents to KPMG’s 2019 Technology Industry Innovation Survey again ranked Internet of Things (IoT) as the top driver of business transformation over the next three years.

This result comes as no surprise given how broad and far reaching the category is. From wearable health monitors to connected homes and cities, everything feels “smart” these days and is interwoven with a myriad of devices and applications. IDC forecasts global IoT spending will reach \$745 billion this year, and \$1.2 trillion in 2022.

Leaders in the semiconductor industry, whose chips, processors, and memory are the backbone of virtually all modern technology, are on board with the promise of IoT as well. For the first time in 14 years, respondents to [KPMG’s Global Semiconductor Industry Survey](#) ranked IoT as the most important application driving their revenue over the next fiscal year, surpassing wireless communications.

This importance makes security even more imperative. Failure to secure IoT devices and their connected ecosystem could prevent a company from delivering services, protecting sensitive data, or even keeping customers safe. Few companies know how to get started even though they recognize the need for a comprehensive [IoT governance program](#). And even then, IoT governance does not follow an exact formula. The program should be malleable to the needs of an organization, and involve multiple functions including engineering, information technology, and operations.

A revealing aspect of the 2019 Technology Industry Innovation Survey is that while the universe of top ten technologies was essentially the same as last year, the order changed dramatically. Robotic process automation (RPA) and blockchain both jumped up significantly in this year’s ranking.

In the following sections, we’ll take a closer look at these two big gainers, as well as the key benefits and challenges our survey respondents perceive in adopting transformational technologies.

The top 10 ranking

Responses to the 2019 Technology Industry Innovation Survey yielded the following top ten list of technologies that are perceived by technology industry leaders as having the greatest potential to drive future business transformation and long-term value.

Technology	2019 Rank	2018 Rank
Internet of Things (IoT)	1	1
Robotic process automation (RPA, e.g. software bots)	2	9
Artificial intelligence, cognitive computing, machine learning	3	2
Blockchain	4 (tie)	7
Robotics and automation (including autonomous vehicles)	4 (tie)	3
Augmented reality	6	8
Virtual reality	7	4
Social networking, collaboration technologies	8	5
Biotech, digital health, genetics	9	6
On Demand marketplace platforms	10	10

Largest jump in ranking: <<<<

Source: KPMG Technology Industry Innovation Survey 2019

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Leaders struggle using new technologies to grow revenue and market share

Almost regardless of the specific technology, industry leaders most frequently cited the bottom line impacts of “improved business efficiencies” or “increased profitability” as the top benefits of adopting transformational technologies. Surprisingly, “increased market share” was only named once and “new revenue streams” was not ranked in the top three for any technology. This implies that business leaders are more focused on taking costs out of their business and are uncertain about how new technologies can transform their business models to

grow revenue and market share. This point is reinforced by the fact that “unproven business case” was the top cited challenge with adopting new technologies.

As for other perceived challenges with adopting these technologies, respondents also said they were given pause by “technology complexity.” Another popular concern was “security” which is ubiquitous in today’s business world as data or privacy breaches can cause untold reputational and financial harm.

2019 Rank of Technologies	Internet of Things (IoT)	Robotic process automation (RPA, e.g. software bots)	Artificial intelligence, cognitive computing, machine learning	(tie)		Augmented reality	Virtual reality	Social networking, collaboration technologies	Biotech, digital health, genetics	On Demand marketplace platforms
				Blockchain	Robotics and automation (including autonomous vehicles)					
Top benefits for companies to adopt this technology										
Improved business efficiencies	1	2	2	1	1	1	2	2	1	1
Increased profitability	1	1	1		3	2	1	1	1	2
Cost reductions	2		3	3	2					
New business insights from incremental data				3			3	2		
Product and/or service differentiation				2		3				1
Business process automation									2	2
Increased market share		3								
Biggest challenges for companies to adopt this technology										
Unproven business case	1	2	1	1	3	3	1	2	1	
Technology complexity	2	1	2	2	2		3	3	2	
Security	3				1	2	2	1		1
Regulatory compliance			3			1				1
Legacy technologies		3							3	
Lack of capital to fund new investment				3						
Limited experience to turn data into valuable insights										2

Repeats indicate a tie. Partial list shown.

Source: KPMG Technology Industry Innovation Survey 2019

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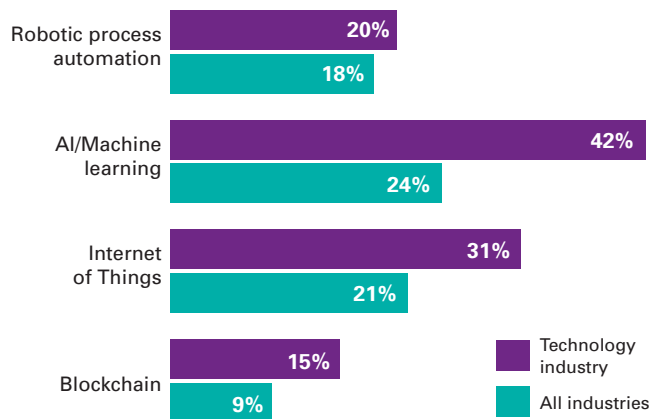
Robotic process automation

The big mover in this year's survey is RPA, which shot up the top 10 list from #9 a year ago to #2. RPA comprises the software bots that facilitate the automation of manual and structured activities. It is viewed as an entry point in the spectrum of intelligent automation (IA), which is a broad portfolio of enhanced and cognitive automation applications that also includes machine learning and true artificial intelligence (AI).

In offices around the globe, automated software bots are already performing numerous basic tasks and even making decisions that were previously in the domain of humans. RPA complements and augments human skills and boasts the power to exponentially increase the speed, scale, quality, precision and efficiency at which enterprises operate. Case studies showing the positive impacts that RPA has had for technology companies can be found [here](#).

By 2023, the global RPA market is expected to be worth \$8.69 billion¹, and technology company CIOs report they are outpacing other industries with their investment in RPA and other transformational technologies such as artificial intelligence, IoT, and blockchain.

Percentage of CIOs reporting moderate/significant investment in transformational technologies



Source: Harvey Nash/KPMG CIO Survey 2018
Partial list shown.

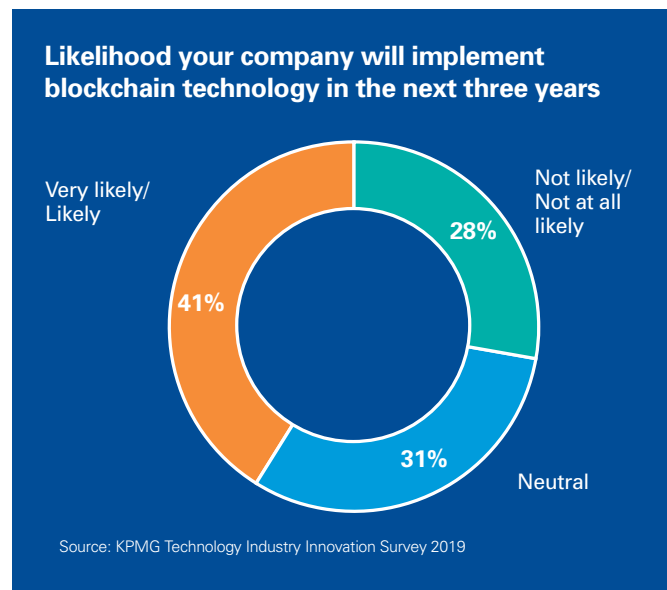
Interestingly, AI ranked #3 on the 2019 list of transformational technologies, down one spot from last year. This suggests many respondents feel the need to take a step back and assume a more proof-of-concept position as they seek to integrate IA with existing business and operating models. This approach also enables companies to assess their risk mitigation and control processes, as well as workforce impacts, before green-lighting an enterprise-wide implementation.

¹ Research and Markets, *Robotic Process Automation Market by Process – Global Market Size, Share, Development, Growth, and Demand Forecast, 2013-2023*, June 2018

Blockchain

Over the decade since the 2008 publication of the seminal paper “Bitcoin: A Peer-to-Peer Electronic Cash System” by the mysterious Satoshi Nakamoto, blockchain has progressed from being overhyped and disparaged to now firmly in the implementation phase. In fact, worldwide spending on blockchain solutions is forecast to reach \$11.7 billion in 2022.²

KPMG survey respondents' opinion of blockchain correspondingly increased, jumping from #7 to #4 on the top 10 transformative technology list. And as outlined in [KPMG's Blockchain for Technology, Media, and Telecommunications Companies report](#), 41 percent of technology company leaders expect to implement blockchain technology at their company over the next three years. Similarly, nearly half (48 percent) believe blockchain will change the way their company does business over the next three years.



The survey data also revealed that the top three industries expected to have the greatest blockchain adoption over the next three years are:

1. **Financial services**
2. **Industrial manufacturing**
3. **Telecommunications**

Blockchain's ability to connect systems and processes across multiple entities makes it an innovation catalyst, efficiency accelerator, and purveyor of trust and transparency. Use cases are many and varied. A company's appetite for blockchain can depend on many factors, including current technology and processes, the company's regulatory environment, and their assessment of organizational impacts.

² International Data Corporation (IDC), *Worldwide Semiannual Blockchain Spending Guide* (July 2018)

The millennial perspective

Millennials are the first generation to be considered “digital natives,” meaning they essentially grew up with much of today’s technology. Millennials already comprise the largest segment of the U.S. workforce³ and may constitute up to 75 percent of the global workforce by 2025. Thirteen percent of millennials report they are already making B2B buying decisions and an additional 28 percent state they are influencing buying decisions.⁴

We also asked millennials the same questions as the broader group about the technologies they believe will drive the greatest business transformation over the next three years. While their rankings similarly show AI, IoT, and RPA near the top, other selections like 5G, digital payments, and mega platforms illustrate millennials’ proclivity to the wireless and digital world they’ve always known.

1	Artificial intelligence, cognitive computing, machine learning
2	Internet of Things (IoT)
3	5G
4	Increased computational power (quantum computing, etc.)
5	Robotic process automation (RPA, e.g. software bots)
6	Social networking, collaboration technologies
7	Digital payment platforms
8	Robotics and automation (including autonomous vehicles)
9	Mega platforms (such as Amazon, Alibaba, Facebook, etc.)
10	Voice, speech and chat interactions

Source: KPMG Technology Industry Millennials Survey 2019

3 Richard Fry, “Millennials are the Largest Generation in the U.S. Labor Force,” Pew Research Center Fact Tank (April 11, 2018)

4 Aaron Dunn and Matt Heinz, “The Millennials are here!”, SnapApp and Heinz Marketing (2017)

Next steps for corporate leadership

KPMG professionals see several specific actions companies and their boards can pursue as they work to gain a competitive advantage via transformational technologies:

Assess how transformative technologies and new competitors may impact different aspects of your business model including value proposition, key stakeholders, workforce, current processes, and legacy technologies.

Prioritize the capital allocation for adoption of new technologies that will be instrumental in creating sustainable long-term value.

Engage in strategic M&A and partnerships to accelerate implementation of transformative technologies.

Ensure your business model is adaptable to harness new technologies and build an operational ecosystem around them.

Foster a corporate culture that embraces innovation, agility, and experimentation.

Explore adoption of transformative technologies that millennials are comfortable with. As the largest contingent of the future global workforce, they are positioned to create competitive advantages by leveraging these technologies.

About the research

The 2019 KPMG Technology Industry Innovation Survey included responses from over 740 technology industry leaders across 12 countries. The online survey was conducted between December 2018 and January 2019.

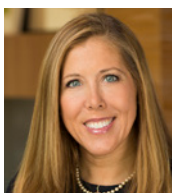
The 2019 KPMG Technology Industry Millennials Survey included responses from 600 millennials working in the technology industry across seven countries. The online survey was conducted between February 2019 and March 2019.

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