

# The Changing Landscape of Disruptive Technologies

**Global Technology Innovation  
Insights — 2014/2015**

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**KPMG**  
cutting through complexity

# Global Technology Innovation Survey — Fall 2014



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# Foreword



**Cloud and mobile** continue to power tech innovation enabling a new wave of disruptive technologies including IoT, 3D-printing, data & analytics, AI and robotics. Solutions are still needed for growing security and privacy risks. **New tech hubs springing up** from Shanghai, Tokyo, New York and Seoul foster more breakthroughs. As **technology innovations spread wide and deep and become more complex**, technology and business executives need to be nimble and alert to **embrace change and capitalize on new business models** more than ever.

**A great shift to a new portfolio of disruptive technologies in a wide range of industries is underway: the Internet of Things (IoT), machine-to-machine (M2M), biotech, data & analytics and 3D printers, to name a few. The prospect of drones, digital currencies, robotics and artificial intelligence going mainstream adds a new dimension to this year's forward-looking view of disruptive technologies.**

In the last two years, KPMG's Tech Innovation publications have showcased the allure of cloud and mobile services as disruptive forces. Thanks to these fundamental technologies and their global adoption in consumer and enterprise markets, they remain today's engines of growth and profitability.

As the scope of technology disruption increases, many new monetization opportunities and business models are emerging. Data is increasingly rich and ripe for analysis. Churning out new products and services is happening faster than ever before, spreading farther and becoming less costly. It's an unprecedented time for entrepreneurs and innovators given that the lean and fast startup trend is enabling more tech innovations from all corners of the world.

Customers are only too eager to try out the latest new app or gadget that promises to make their lives more enjoyable and productive at home, on the road or at the office. The rewards for embracing new technologies run deep, from productivity gains to cost efficiencies to quicker innovation cycles. Several risks loom large, however, with security remaining the biggest concern as consumers and businesses still need to figure out how to share personalized data online safely and prevent the growing number of hacking attempts and cyber-attacks that continue to make headlines.

With the rise of so many emerging technologies, an oversaturated, overloaded market is evident as a leading indicator—and can only become a bigger hurdle for future technologists. Customer fatigue and technology complexity are highlighted as barriers for commercialization.

We expect global players to increasingly emerge from Asia and developing markets to challenge market leaders. Technology is playing a key role in capitalizing on new business opportunities in an ever-competitive business world. While the U.S. is perceived as the global tech leader, other countries vie for that position. Multiple versions of "Silicon Valleys" are springing up in tech hubs such as Tel Aviv, Shanghai, Tokyo, London, New York and Seoul as a tech economy builds with startups and innovations.

The 2014 Technology Innovation Survey, now in its third year, offers perspective from nearly 800 technology leaders globally about where the next new ideas will rise, which markets will prosper, and challenges that remain to commercialize new technologies. We hope you find this publication insightful, and we welcome feedback and suggestions for the next edition. ●



**Gary Matuszak**

Global Chair  
Technology, Media and  
Telecommunications,  
KPMG LLP (U.S.)



**Richard Hanley**

Advisory Leader,  
Technology, Media and  
Telecommunications,  
KPMG LLP (U.S.)

# Executive summary

“ No matter their shape and size, companies find themselves addressing a critical question: Are they able to transform their businesses quickly enough in an age of disruption? Technology plays a crucial role in quickening the pace of disruption as consumers are exposed to more information and more choices, which results in a demand for greater value. Our mission is to help companies understand the technological forces at play so that they can detect market disruption signals earlier and adapt their businesses transformation plans accordingly. ”

— Steve Hill, Vice Chair of Strategic Investments and Innovation, KPMG LLP (U.S.)

## KEY TAKEAWAYS

- ▶ **A significant number of emerging technologies are gaining momentum on a global scale**, at faster innovation cycles, with the potential to be the next market disruptors. Growing acceptance of technologies such as IoT, 3D printing, biotech and AI in both consumer and enterprise markets are pushing them into the mainstream.
- ▶ **Cloud and mobile technologies are increasingly maturing as disruptors**. These foundations will remain vitally important to further technology progress and will remain a source of enabling innovation.
- ▶ **Security and technology complexity continue to be major hurdles in adoption of new technologies**. New ways of making technology safer to use and easier to integrate are needed and are big market opportunities for visionary innovators who want to tackle this challenge.
- ▶ **In addition to regulation, a major obstacle to tech innovation is consumer fatigue**. This is the first year this finding has shown up in the survey. Too many devices, too much info, not enough time – it's an opportunity for simplification.
- ▶ **Digital currencies look likely to succeed**. The positive outlook on Bitcoin/Blockchain shows the market is ready to try something different despite some security concerns.
- ▶ **The Internet of Things is seen as having the greatest monetization opportunity in retail, home automation and environmental management**.
- ▶ **Multiple Silicon Valleys are cropping up around the world**. Shanghai, Beijing, Tokyo, Seoul, London, Mumbai and Tel Aviv all are emerging with their own tech hubs. The high number found in Asia shows the region continues to be on the rise.
- ▶ **The dilemma continues about the possibility of Silicon Valley losing its tech status leadership**. Survey results continue to position China as a great contender. Interestingly, Japan, China and India tout their own merits as tech leaders.
- ▶ **Staying private is the trend**. The ability to scale up small businesses lean and fast without giving up equity makes turning to acquisitions and IPOs less appealing. ●

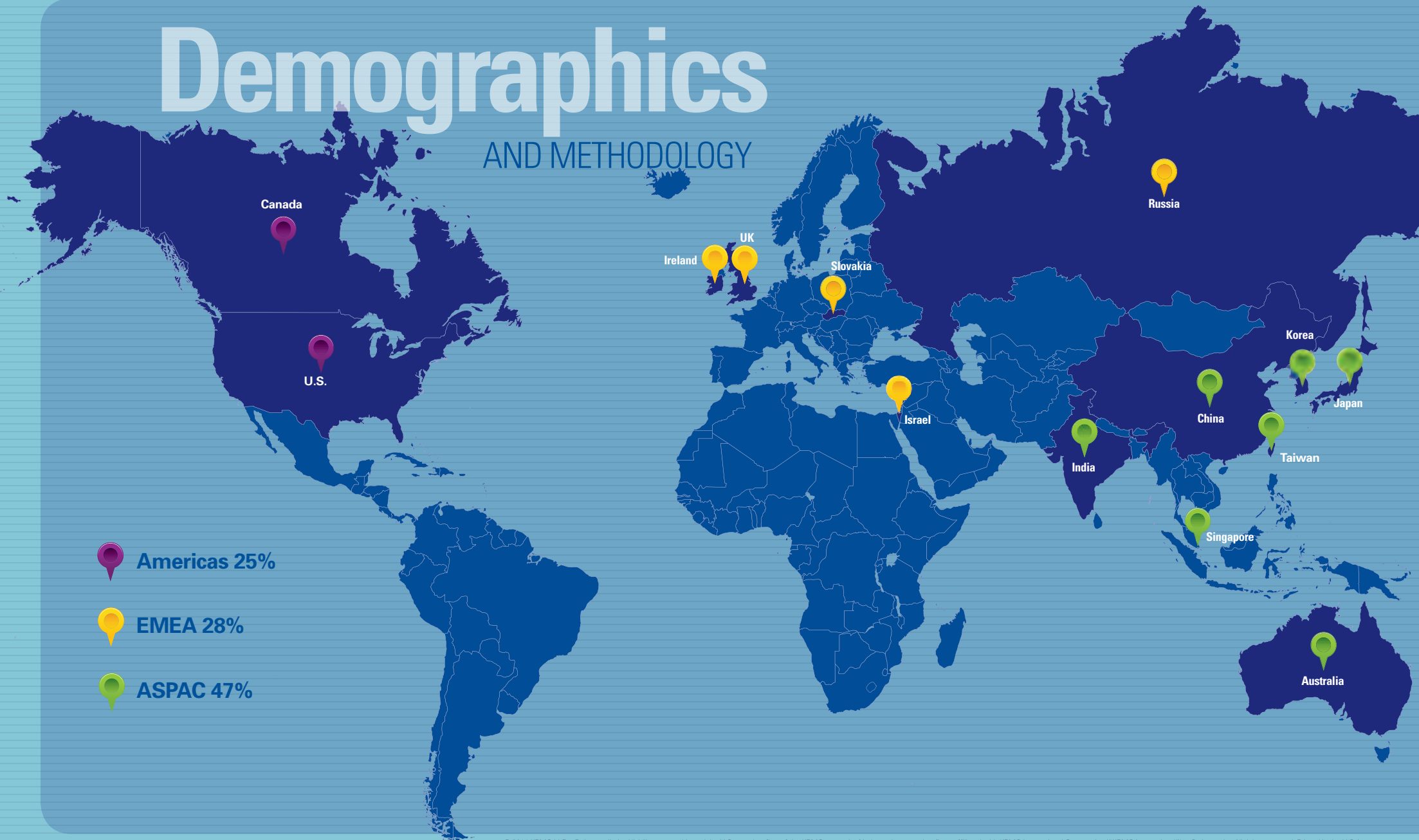
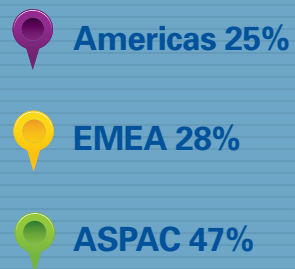
“ A portfolio of emerging technologies will disrupt consumer and enterprise markets. Key factors are enabling this momentum, ranging from macroeconomic opportunities to local incentives and a growing global tech innovation engine that is creating more rapid widespread disruption. The interplay of these emerging technologies is enabling new business models and fueling innovation. ”

– Gary Matuszak, Global Chair,  
KPMG Technology, Media & Telecommunications, KPMG LLP (U.S.)



# Demographics

## AND METHODOLOGY





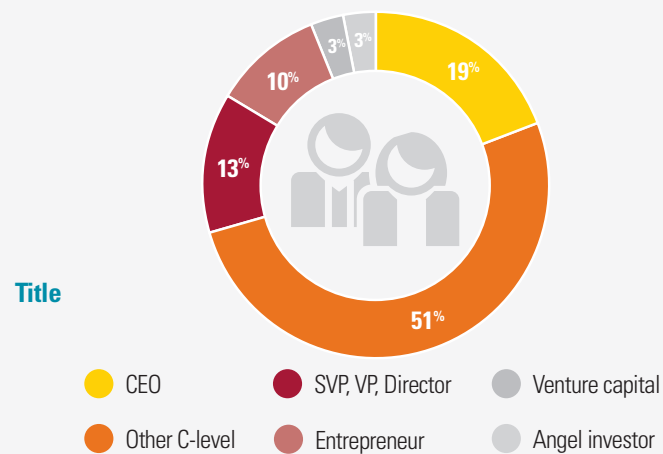
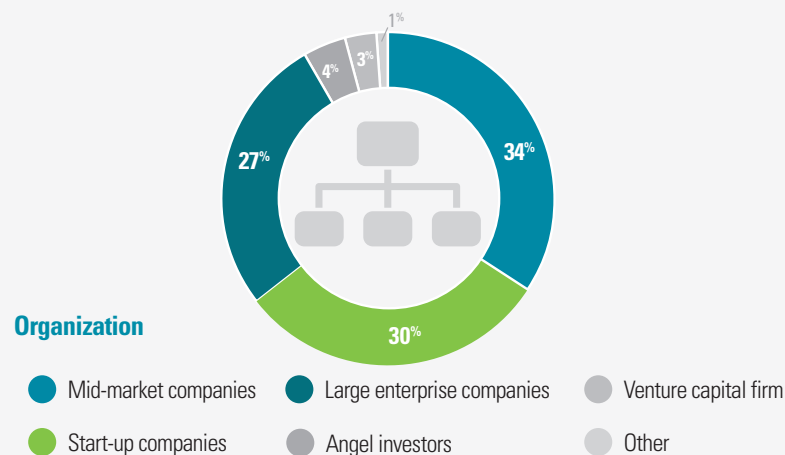
## METHODOLOGY

This year's global tech innovation survey canvassed 768 technology industry leaders ranging from start-up to large companies to angel investors and venture capitalists. The web-based survey was conducted from mid-July through early September.

The survey provided a look inside the board room, with the C-suite accounting for more than two-thirds of the responses. SVP/VP and director level executives comprised 13 percent. Startups were well represented, with entrepreneurs checking in at 10 percent and startup investors at 6 percent. The survey results were tallied up globally, with good representation from Asia, accounting for nearly half of the responses. The Americas contributed one-quarter of the answers and the EMEA region the remainder. In all, 14 countries active in tech industry innovation are representing leading hubs worldwide. ●

## DEMOGRAPHICS

**Q: Which of the following best describes your organization; your title?**



Note: not all percentages sum to 100% either due to rounding or because multiple responses were allowed.

Source: KPMG Technology Innovation Survey 2014

# Disruptive technology

TRENDS IN CONSUMER MARKETS

## 3D Printing

South African carpenter Richard van As, working with a MakerBot 3D printer, collaborated online with mechanical designer Ivan Owen in the U.S. to develop Robohand for his own use. But when the mother of a five-year old born without fingers on his hand asked for help, the developers made the files available online. All the parts are 3D printed, then assembled using cables and stainless steel bolts, making a customizable prosthetic that's affordable and reproducible almost anywhere in the world.

## CONSUMERS GO FOR THE TECH COCKTAIL

The emerging technology portfolio for consumers is becoming far more complex and diverse including 3D printing, biotech/healthcare IT, the Internet of Things and data & analytics as forces of change. Meanwhile, two major foundations for technology – cloud and mobile – will continue to be the basis for cutting-edge advances.

The shift in consumer markets can be seen most tellingly by comparatively lower scores this year for cloud and mobile. The 2014 results show a dramatic drop for mobile to 9 percent globally compared with 32 percent in last year's findings. The shift is particularly pronounced for China, where only 5 percent see mobile as a disruptor, compared with 22 percent last year. This finding should not be a surprise: the Chinese market already has gone through a disruptive phase with mobile, a must-have device in China with payment, commerce and messaging features that are arguably more advanced than in Western markets.

While not about to drift away, cloud services globally showed a similar downward trend. Only 14 percent named cloud this year as enabling the next indispensable technology for consumers in the coming three years, contrasted with 29 percent in the 2013 findings.

IoT is destined to spread in consumer markets as sensors are embedded in watches, refrigerators, lights, and shirts. Also on the upswing are digital currencies. Could these eventually become the default currency?

New innovations for transport with self-driving and parking cars, and systems to help drivers avoid traffic jams, will be increasingly in use. China and Japan, in particular, see autotech as promising, which is no surprise given the government policies and commitments in this market. ●

### Q: Select the top technology that will enable the next indispensable consumer technology.

Technologies	Global	U.S.	China	Japan	ASPAC	EMEA
<b>Cloud–SaaS/PaaS/IaaS</b>	<b>14%</b>	16%	<b>19%</b>	15%	<b>15%</b>	<b>12%</b>
<b>Mobile–platforms &amp; apps</b>	9%	<b>18%</b>	5%	3%	6%	9%
<b>3D Printing</b>	8%	6%	3%	9%	8%	10%
Biotech/digital health/healthcare IT	7%	9%	4%	6%	6%	10%
Internet of Things/M2M	7%	7%	10%	3%	9%	4%
Data & analytics	6%	4%	7%	3%	7%	6%
Artificial intelligence	6%	3%	4%	<b>18%</b>	8%	5%
Security	5%	7%	6%	12%	6%	2%
Digital currency platforms (e.g., bitcoin)	5%	5%	8%	0%	5%	5%
Nanotechnology	5%	4%	7%	6%	6%	4%
Wearables	5%	5%	3%	6%	4%	6%
Digital media	5%	2%	1%	3%	3%	8%
Autotech	3%	0%	12%	12%	6%	1%

Note: Only top technologies shown.

Source: KPMG Technology Innovation Survey 2014

## CLOUD BENEFITS AND CHALLENGES FOR CONSUMERS

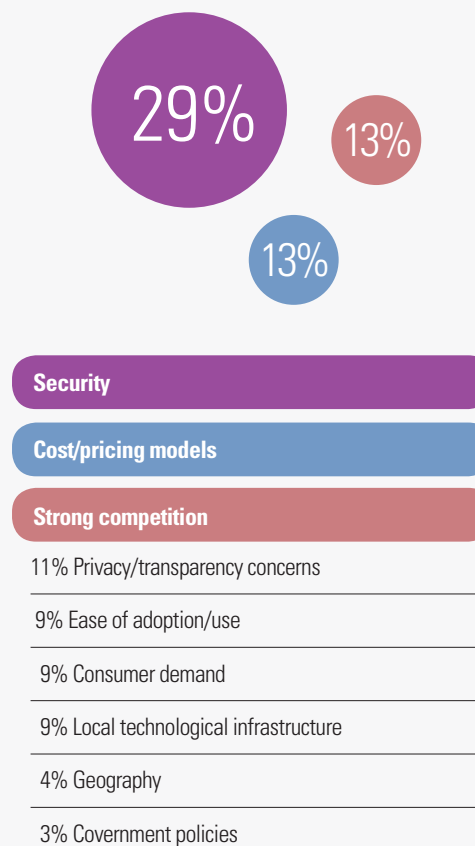
As cloud continues to enable innovation, consumer benefits include better-connected home technologies, easier and instant access to personalized information, and productivity improvements. The major drawback is security risk, named by 29 percent of those surveyed, far more than any other factor, compared to 23 percent last year.

Cost and pricing is still a challenge for consumers to sign on to cloud services, but is gradually becoming less of an issue – 13 percent named pricing today compared with 18 percent in 2013. Customers flocking to cloud services are becoming more comfortable with pricing models that start with freemium trials and move up to paid, upgraded services. ●

**Q: Choose the top benefits for consumers in adopting cloud technologies.**



**Q: What do you see as the biggest challenges for consumers to adopt this technology?**



Source: KPMG Technology Innovation Survey 2014

“Consumers have come to expect the seamless integration of the numerous devices that have become an essential part of their everyday lives, and cloud technology is the engine that has enabled this sea change. In the workplace, cloud has become a catalyst and enabler of the innovative workforce, ensuring the success of a customer-centric approach for the enterprise and ultimately resulting in better experiences for end users.”

—Rick Wright, Global Cloud Enablement Leader, KPMG LLP (U.S.)



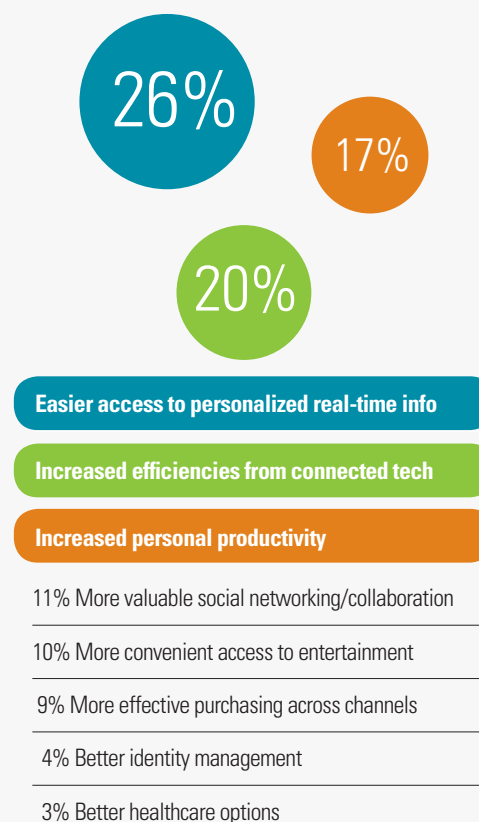
## MOBILE BENEFITS AND CHALLENGES FOR CONSUMERS

The competition is fierce to gain and keep market share across the mobile ecosystem including smartphone providers, app developers and carriers as mobile technologies continue to be adopted by billions.

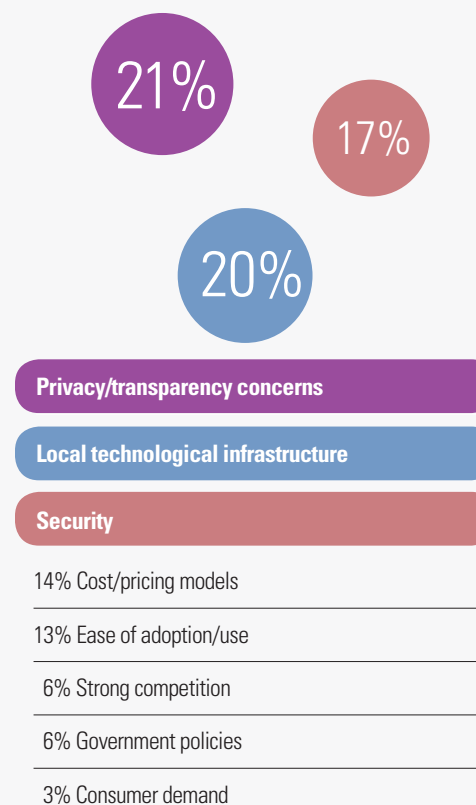
Mobile is constantly enabling new services. In Africa, China, Brazil and other countries mobile is providing access to medicine, education, banking and managing crops in ways that were not feasible in recent years. Consumers around the world continue to love mobile innovations for entertainment, purchasing, healthcare monitoring, hailing a taxi, and social networking.

The biggest factor holding back mobile's influence is a persistent challenge – security and privacy concerns. Another drawback is local technological infrastructure, as consumers demand higher speeds and more stable telecom connections. ●

**Q: Choose the top benefits for consumers in adopting mobile technologies.**



**Q: What do you see as the biggest challenges for consumers to adopt this technology?**



Source: KPMG Technology Innovation Survey 2014

“We will continue to see an increasingly mobile-first environment – more powerful handsets, better batteries and screens, and a migration from Internet products and services all shifting over to a mobile-first world from banking to grocery delivery.”

– Geoff Yang, Partner,  
Redpoint Ventures, Menlo Park, CA  
(Interview page 30)



“ The auto industry is undergoing an unprecedented period of technological innovation that has seen cars evolve into highly complex, customizable, mobile computers. Today’s car includes advanced micro-processors, software code, sensors, telematics, apps and more, which have fostered the convergence of the auto and tech industries. ”

— Gary Silberg, National Automotive Sector Leader, KPMG LLP (U.S.)

# Disruptive technology

TRENDS IN ENTERPRISE MARKETS

## CLOUD AND DATA & ANALYTICS DRIVE INNOVATION

Overall, the results reveal a wider spread of technologies that are driving disruption in the business world, and the uptake is global.

Cloud has enabled business efficiencies and cost reductions. As cloud continues to drive business transformation, the next wave of benefits will include incremental knowledge and datasets for verticals, customers, employees and suppliers that will provide new insight and predictability to make decisions.

Data & analytics (D&A) trended in second place at 10 percent globally, surpassing mobile as a change agent. The finding illustrates the significant impact D&A has in driving incremental business value. We expect adoption and investment in data & analytics to continue and grow quickly, as other technologies such as IoT, artificial intelligence and robotics catch up to exploit the new opportunities driven by data & analytics.

Japan placed artificial intelligence (AI) in first place, named by 21 percent as the biggest disruptor, with expectations for the 3D printing opportunity trailing only EMEA. Opportunities to disrupt existing models range from manufacturing to healthcare. Japan, with its leading-edge R&D base and ability to break through in automotive, robotics, electronics and hardware, has the opportunity to gain traction as a leading tech innovator. ●

**Q: Select the top technology that will have the greatest impact in driving business transformation for enterprises.**

Technologies	Global	U.S.	China	Japan	ASPAC	EMEA
<b>Cloud–SaaS/PaaS/IaaS</b>	<b>14%</b>	<b>22%</b>	<b>21%</b>	12%	<b>13%</b>	<b>13%</b>
<b>Data &amp; analytics</b>	10%	12%	13%	6%	9%	9%
<b>Mobile–platforms &amp; apps</b>	9%	16%	2%	0%	5%	11%
3D printing	7%	6%	4%	12%	8%	5%
Artificial intelligence	7%	2%	7%	<b>21%</b>	10%	6%
Internet of Things/M2M	6%	7%	9%	6%	9%	3%
Security	6%	7%	3%	9%	4%	7%
Nanotechnology	6%	6%	8%	3%	5%	7%
Digital currency platforms (e.g., bitcoin)	5%	2%	6%	3%	6%	4%
Biotech/digital health/healthcare IT	5%	4%	3%	6%	5%	6%
Digital media	5%	5%	1%	0%	3%	8%
Autotech	4%	2%	13%	9%	7%	0%
Wearables	2%	1%	3%	0%	4%	1%

Note: Only top technologies shown.

Source: KPMG Technology Innovation Survey 2014

“Global tech sector executives are increasingly seeing cloud as an engine of growth and profitability. The vast increase in the amount of data coming from mobile devices is driving the development of advanced Analytics applications. And, in turn, the growth in Analytics is driving mobile developers to provide new, enhanced solutions that provide new types of data. This cycle is continuing to power the growth of D&A and new business models across sectors.”

– Brad Fisher, U.S. Data & Analytics Leader, KPMG LLP (U.S.)

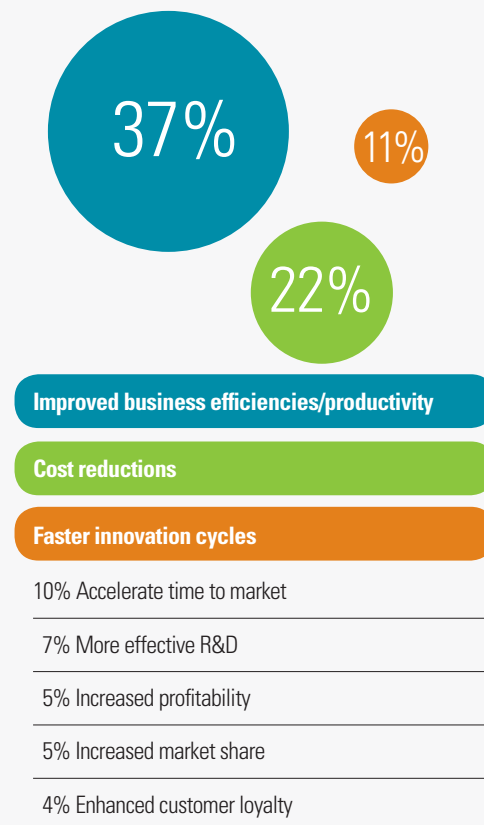
## CLOUD BENEFITS AND CHALLENGES FOR BUSINESSES

### LITTLE PROGRESS WITH SECURITY, COMPLEXITY ISSUES

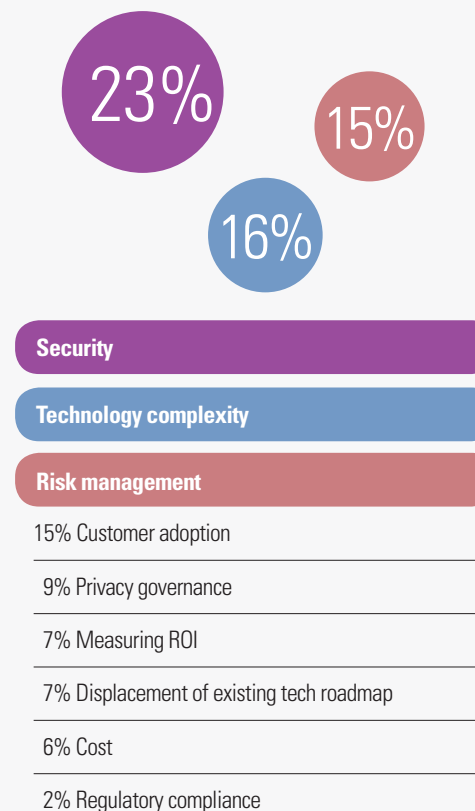
Not surprisingly, improved productivity, lower costs and faster innovation speeds were again touted this year as the top benefits for enterprises in uptake of cloud services.

On the flip side, security remains the leading challenge. Technology complexity continues to be a thorn as well, ranking second again this year, though with a slightly lesser percentage (16 percent) compared with last year's finding. Concerns over displacement of existing technology dropped to a mere 7 percent from 15 percent the year before. ●

#### Q: What is the top benefit for business to adopt this technology?



#### Q: What is the biggest challenge for businesses to adopt this technology?



“For enterprises and governments, tackling security and transparency issues will remain a priority even as next-gen cybersecurity solutions emerge to deal with this challenge. Tech companies, big and small, will continue to invest in the development and implementation of information security and IT risk management technologies to manage security issues proactively.”

— Richard Hanley, Advisory Leader, Technology, Media and Telecommunications, KPMG LLP (U.S.)

Source: KPMG Technology Innovation Survey 2014



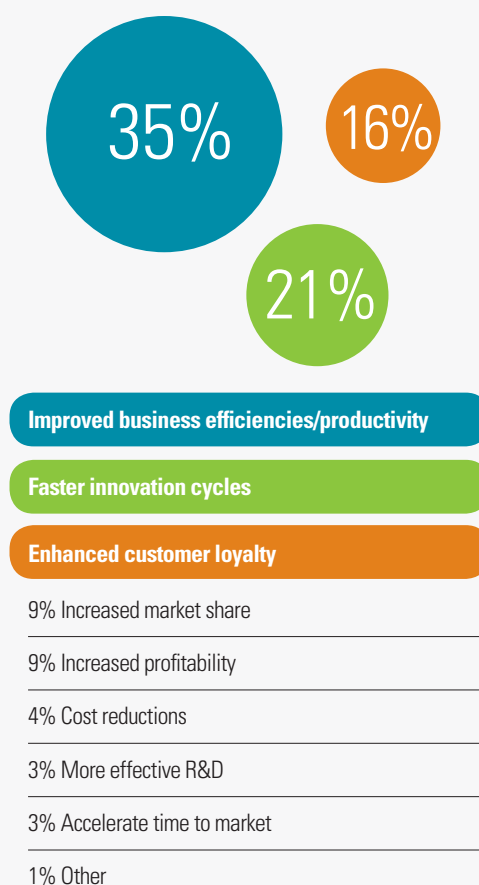
## DATA & ANALYTICS BENEFITS AND CHALLENGES FOR BUSINESSES

### D&A DRIVES EFFICIENCIES AND INNOVATION

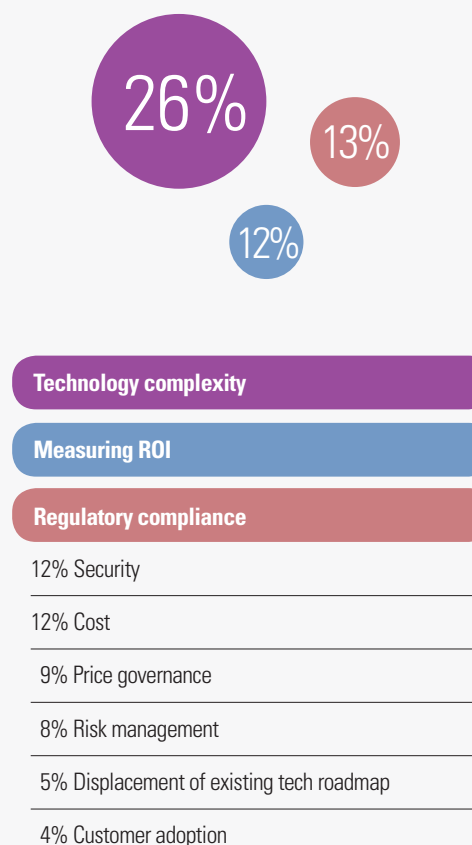
As businesses develop a comprehensive data & analytics strategy and investment, improved efficiencies and productivity were picked as the biggest benefit by more than one-third of respondents. Faster innovation cycles and enhanced customer loyalty are also key business benefits. The findings demonstrate D&A is here to stay for the long term as an enabler to generate value.

In contrast, barriers that were cited show the major challenges in adopting data & analytics in business markets, is technology complexity. Other issues such as measuring return on investment, regulatory compliance and cost did not place high on the challenge barometer. ●

#### Q: What is the top benefit for business to adopt this technology?



#### Q: What is the biggest challenge for businesses to adopt this technology?



Source: KPMG Technology Innovation Survey 2014

“Data and analytics cuts across everything that this increasingly disruptive technological world is presenting us. As technologies such as cloud and the Internet of Things become embedded into organizations, a well-designed and robust data and analytics strategy will be critical to the success of their integration. These new environments enable access to vast amounts of data. I believe the most successful companies will be those which have the right solutions to analyze and interpret their data, so that they are on the forefront of operational and management issues and, equally important, so that they have the means to continually innovate and increase customer value.”

— Mark Toon, CEO KPMG Capital KPMG LLP (U.S.)

# Barriers

## TO COMMERCIALIZING TECHNOLOGY INNOVATION

“ We see a perfect storm taking shape in China – on the one hand the rise of the Chinese consumer and on the other, China is leapfrogging other countries in a number of technologies such as mobile commerce and payments. These factors are driving the fast adoption of emerging technologies and in turn there is increased technology complexity. Facilitating how to get to the value of these new technologies will be a key market differentiator. ”

– Edge Zarrella, Partner, Clients and Innovation Consulting, KPMG China

## COMPLEXITY, SECURITY ISSUES LIMIT INNOVATION

Security continues to be the top-of-mind issue in the commercialization of tech innovation and the challenge is most pronounced in the United States. For enterprises and governments, tackling security issues will remain paramount even as next-gen cybersecurity solutions emerge to deal with this challenge. Tech companies, big and small, will continue to invest in the development and implementation of information security and IT risk management technologies to manage security issues proactively. It will be interesting to watch the advances in security driven by innovative thinking to develop new infrastructures designed for mobile, cloud and Internet of Things environments.

China and Japan ranked technology complexity as the highest hurdle. The increasing rate of new technologies in the marketplace is making the integration of multiple technologies, mixing old with new, at home and at work, a challenge. Far more strategic thought is needed to prevent potential tech jams in configuring and integrating various technologies to work together smoothly and reduce complexity.

Access to engineering talent was highlighted as a key challenge among those surveyed in China. Despite millions of engineering graduates and professionals in China,

supply simply cannot keep up with demand, creating an acute talent shortage in China's fast-growing tech-centric markets. ●

### Q: In your opinion, what are the top barriers to commercializing technology innovations?

Technologies	Global	U.S.	China	Japan	ASPAC	EMEA
<b>Security</b>	<b>27%</b>	<b>36%</b>	31%	32%	<b>29%</b>	17%
<b>Technology complexity</b>	22%	13%	<b>37%</b>	<b>35%</b>	26%	19%
<b>Customer adoption</b>	21%	29%	14%	15%	17%	<b>23%</b>
Risk management	18%	16%	27%	29%	21%	14%
Government policies	16%	17%	16%	21%	18%	13%
Privacy governance	15%	16%	18%	18%	16%	13%
Funding/access to capital	15%	15%	12%	3%	12%	20%
Measuring ROI	13%	12%	14%	29%	15%	11%
Regulatory compliance	12%	13%	12%	9%	12%	10%
Develop monetization model	12%	10%	12%	9%	11%	13%
Patent process	12%	9%	8%	12%	13%	15%
Customer acquisition	12%	12%	12%	6%	13%	11%
Access to engineering talent	11%	5%	22%	12%	13%	13%
Manage customer churn	8%	4%	8%	12%	8%	9%
Other	1%	2%	0%	0%	0%	0%

Source: KPMG Technology Innovation Survey 2014

“Competitive advantage will continue to be driven by emerging technologies which attract the attention of groups looking to disrupt or misappropriate the value of intellectual property and critical business information. We're seeing that these attacks are only becoming more sophisticated and frequent as the costs to prevent such disruptions continue to rise. Companies that align their business strategy, technology roadmap, and control environments will be able to minimize the disruption and cost by proactively implementing effective security and risk management approaches.”

— Greg Bell, America and U.S. Service Leader, Information Protection and Cyber Security, KPMG LLP (U.S.)

## TECHNOLOGY INNOVATION INHIBITORS

### REGULATION CAN SLOW TECH INNOVATION, WHICH IS A VALUABLE ENGINE OF ECONOMIC GROWTH

As technology companies continue to innovate, restrictive regulatory policies are universally a top concern as getting in the way of progress. In many industries, the entry of a disruptive technology and business model signals the end of business-as-usual for the current market leaders who may not have the time or expertise to respond to a thoroughly superior alternative; regulators often face the same challenge.

Consumer fatigue also ranks high as a block to the vast number of emerging technologies. Both consumer and business markets are overloaded with devices, apps and systems to the point that going off the grid could become “in vogue.” This is the first year that consumer overload has shown up as a challenge in the survey results. ●

**Q: As technology companies seek to innovate, which of the following will limit/constrain innovation?**

Technologies	Global	U.S.	China	Japan	ASPAC	EMEA
<b>Restrictive regulatory policies</b>	<b>34%</b>	<b>31%</b>	32%	38%	<b>36%</b>	<b>34%</b>
<b>Customer fatigue/pullback</b>	29%	28%	<b>35%</b>	<b>44%</b>	30%	25%
<b>Ability to demonstrate ROI</b>	27%	28%	34%	35%	27%	29%
Demise of “net neutrality”	22%	25%	22%	24%	22%	17%
Platform consideration	21%	16%	23%	21%	25%	18%
Vendor consideration	15%	8%	23%	18%	17%	17%
Other	1%	3%	0%	0%	0%	1%

Source: KPMG Technology Innovation Survey 2014

“Technology sector leaders recognize the impact of new regulations — now and in the future — across emerging and existing technologies. New regulatory requirements may drive up costs for tech companies and customers, constrain innovation and prevent emerging technologies from reaching more regulated markets. We are seeing more tech companies taking a proactive approach in working with government groups and standards-setting bodies to develop internationally recognized standards in a variety of areas.”

— Richard Hanley, Advisory Sector Leader, Technology, Media & Telecommunications, KPMG LLP (U.S.)



## TECHNOLOGY INNOVATION Trends



“

We see great potential in wearables technology – the combination of machines, people and data. We also are continually looking in our field of robotics for new ideas, new shapes in an abstract way that can provide solutions we may not have imagined yet. ”

– Dr. Shigeo Hirose, Professor Emeritus and  
Dr. Michele Guarnieri, Co-founders, HiBot, Tokyo, Japan  
(interview page 26)

## GREATEST INDUSTRY TRANSFORMATION AS A RESULT OF EMERGING TECHNOLOGIES

### RE - THINK HOW TECHNOLOGY CAN DISRUPT MOST INDUSTRIES

Global and faster innovation cycles make the tech sector the obvious one to continue to be the leader as the industry that will have the greatest transformation as a result of emerging technologies. As the scope of technology disruption increases, many new monetization opportunities and business models are emerging and transforming business models and fueling innovation in most industries.

“We see great potential in wearables technology – the combination of machines, people and data. We also are continually looking in our field of robotics for new ideas, new shapes in an abstract way that can provide solutions we may not have imagined yet.”

– Dr. Shigeo Hirose, Professor Emeritus and  
Dr. Michele Guarnieri, Co-founders, HiBot, Tokyo, Japan  
(Interview page 26)

But then again, not every market canvassed came to the same conclusion. Japan, for instance, ranked automotive and transportation as the sectors that will change the most – and Japanese car makers continue to strive to stay ahead of the curve. ●

### Q: In your opinion, what industry will have the greatest transformation in the next three years as a direct result of emerging technologies?

Technologies	Global	U.S.	China	Japan	ASPAC	EMEA
<b>Technology</b>	<b>21%</b>	<b>25%</b>	<b>22%</b>	3%	<b>18%</b>	<b>16%</b>
<b>Consumer markets</b>	12%	17%	10%	9%	14%	7%
<b>Healthcare</b>	11%	19%	5%	6%	8%	12%
Automotive/transportation	10%	8%	11%	<b>32%</b>	11%	10%
Manufacturing	10%	5%	21%	15%	13%	7%
Energy	9%	9%	6%	12%	8%	12%
Telecommunications	8%	7%	8%	12%	8%	10%
Aerospace & defense	7%	2%	2%	3%	5%	11%
Financial services	6%	2%	9%	6%	8%	5%
Education	6%	4%	6%	3%	6%	7%
Media	1%	2%	0%	0%	1%	1%
Government	1%	0%	0%	0%	1%	1%
Other	1%	1%	0%	0%	1%	0%

Source: KPMG Technology Innovation Survey 2014

## THE FUTURE OF DIGITAL CURRENCIES (I.E., BITCOIN/BLOCKCHAIN)

### ASIA'S E-MONEY INNOVATION LEADERSHIP

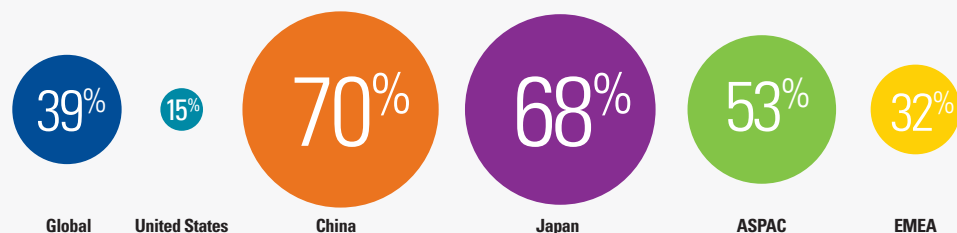
Many countries in Asia have led mobile innovation and adoption by redefining and creating new products and services. As a result, mobile commerce, payments and apps are disrupting industries.

Regulatory issues aside, a high percentage of those surveyed in Asia predict banking and payments will continue to be disrupted by the growing acceptance of digital currencies such as Bitcoin/Blockchain. China and Japan, leaders in mobile innovations, are particularly bullish in this forecast.

The U.S. turned in the weakest response on this survey point, with only 15 percent predicting big change in traditional banking systems from Bitcoin/Blockchain and the like. Regulations and legacy systems could be the cause.

For digital currencies to take hold, issues with security and international integration need to be resolved, a majority of respondents noted. ●

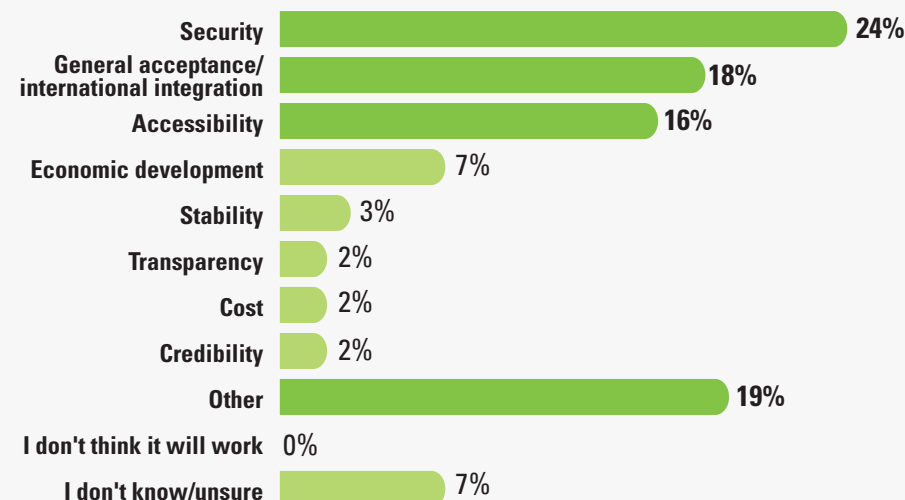
### Q: What is the likelihood that digital currencies (i.e., Bitcoin/Blockchain, etc.) will disrupt banking and payments in the next three years? \*



\*Percentage answering 4-5 on a 1-5 likelihood scale

Source: KPMG Technology Innovation Survey 2014

### Q: What is the critical factor for digital currencies to succeed?



Source: KPMG Technology Innovation Survey 2014

“Asia Pacific generally has been an early adopter of mobile payments and e-commerce and may be more comfortable using digital currency. China is one of the innovators in the payments sector especially in e-commerce. With the massive rise of the consumer in China, there are significant innovations taking place.”

— Edge Zarrella, Partner, Clients and Innovation Consulting, KPMG China

## MONETIZATION OPPORTUNITIES FOR THE INTERNET OF THINGS

### RETAIL COULD WIN BIG FROM IoT

Several vertical applications have the opportunity to monetize new business models as a result of the Internet of Things. Retail/intelligent shopping was identified as the top application with the potential to benefit financially.

Consumer products that talk to each other can redefine what we do across the smart home, to the connected car, to intelligent shopping (sensors activating an order at our preferred store when the milk is almost gone) to many other categories. How we shop can change dramatically.

Another sector identified at the top for money-making potential from IoT acceptance is home automation – automatic lighting switches, garage door openers, coffee makers, alarms, you name it – in every household. The U.S. is ahead of other markets in identifying the home automation opportunities.

Asian markets see the greatest potential for the IoT in environmental sustainability and waste management, with China (thanks to government support for this sector) and Japan ranking this vertical market exceptionally high.

Social interaction cropped up, too, as prospering from IoT as sensors pick up on people's cues. Being able to predict individual's common interests based on their past activities and the information pulled from the world around them has the potential to augment opportunities to find and interact with others digitally and in real life.

New business models can be developed based on the incremental intelligence gained by “connected things” embedded all over the place. Innovations in the development of a standard IoT platform are a huge opportunity as well as security and analytics. ●

### Q: Which vertical application has the greatest monetization potential as a result of the adoption of the Internet of Things (IoT)?

Technologies	Global	U.S.	China	Japan	ASPAC	EMEA
<b>Retail/Intelligent shopping</b>	<b>20%</b>	16%	18%	18%	<b>21%</b>	<b>20%</b>
<b>Home automation</b>	14%	<b>22%</b>	10%	3%	14%	11%
<b>Social interaction</b>	12%	13%	7%	0%	10%	13%
Surveillance/security	12%	12%	6%	15%	12%	13%
Telepresence/monitor and control distant objects	11%	12%	9%	15%	9%	12%
Sustainable environment/waste management	10%	3%	<b>20%</b>	<b>24%</b>	13%	11%
Wellness, continuous care/emergency response	10%	13%	8%	12%	9%	8%
Transportation safety/efficiency	7%	5%	12%	12%	7%	8%
Food safety	4%	3%	10%	3%	5%	5%
Other	0%	2%	0%	0%	0%	0%

Source: KPMG Technology Innovation Survey 2014

“New business models can be developed based on the incremental intelligence gained by ‘connected things’ embedded all over the place. Innovations in the development of a standard IoT platform are a huge opportunity as well as security and analytics. The lines are breaking for what is a consumer technology and what is an enterprise technology. For instance, there is no way that the Internet of Things works without Big Data. And if you look at Facebook and Google, there are no companies bigger than them in Big Data.”

— Jon Medved, Founder and CEO, OurCrowd, Jerusalem, Israel (Interview page 29)



## ADOPTING IoT, M2M: BENEFITS FOR BUSINESSES AND CONSUMERS

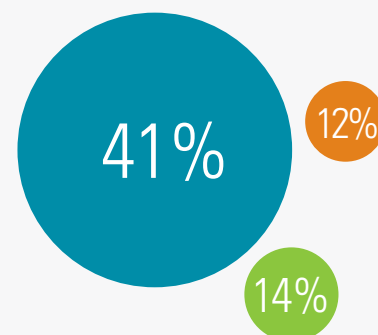
A particularly high percentage (41 percent) named improved business efficiencies and higher productivity as the number-one benefit of using IoT and M2M technologies. No other factor came close to that strong showing.

Increased efficiencies from connected devices at home are seen as the top consumer benefit in adopting Internet of Things and M2M technologies.

Other benefits lagged such as access to personalized real time information, personal productivity and improved purchasing across channels.

Wearables can become a “personal assistant” for IoT platforms enabling consumers to gain incremental value in the way they manage their personal assets. For example, each person may own and easily manage their credit score and patient data. ●

**Q: What is the top benefit for business to adopt this technology?**



**Improved business efficiencies/productivity**

**Faster innovation cycles**

**Increased profitability**

8% Enhanced customer adoption and loyalty

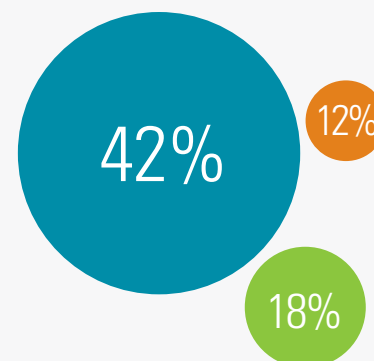
8% Cost reductions

6% Increased market share

6% Accelerate time to market

4% More effective R&D

**Q: What is the top benefit for consumers to adopt this technology?**



**Increased efficiencies from connected tech**

**Easier access to personalized real-time info**

**Increased personal productivity**

8% More effective purchasing across channels

8% Better healthcare options

8% More convenient access to entertainment

4% More valuable social/collaboration experience

“The IoT is going to be a lot more about people than things. As sensors collect huge amounts of data, and models process that data, and wearables allow us to consume it, the magic comes when we understand the human journey. That will drive how we consume the right data, in the right place and at the right time and on the right device.”

— David Wolf, Managing Director, Digital, KPMG LLP (U.S.)

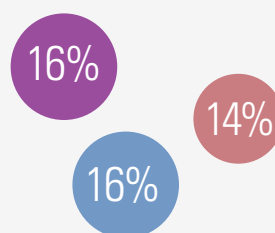
Source: KPMG Technology Innovation Survey 2014

## ADOPTING IoT, M2M: CHALLENGES FOR BUSINESSES AND CONSUMERS

As for challenges, a mix of factors were on the radar for enterprise markets. Companies investing in these new technologies to build value and product differentiation need to figure out a way to integrate the technology platforms of products that talk to each other across the smart home, wearables, connected car, and other devices, while avoiding incremental complexity.

Security and local technological infrastructure nearly tied as the most challenging factor in uptake of these tech services for consumers. ●

### Q: What is the biggest challenge for businesses to adopt this technology?



#### Technology complexity

#### Displacement of existing tech roadmap

#### Customer adoption

14% Security

12% Risk management

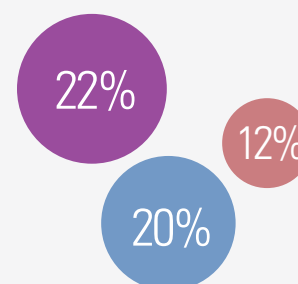
10% Measuring ROI

8% Privacy governance

6% Cost

2% Regulatory compliance

### Q: What is the top challenge for consumers to adopt this technology?



#### Security

#### Local technological infrastructure

#### Cost/pricing models

12% Consumer demand

12% Privacy/transparency concerns

8% Ease of adoption/use

6% Strong competition

4% Government policies

4% Geography

Source: KPMG Technology Innovation Survey 2014



TECHNOLOGY INNOVATION

# Interviews

Insights from technology  
industry visionaries

## Dr. Shigeo Hirose, Professor Emeritus, and Dr. Michele Guarnieri / Co-founders, HiBot, Tokyo, Japan

### What do you see as the future for robotics technology?

If you look at how robotics are used in automobiles, for instance, you can say that robots are already mainstream. In the other markets, robots are being used to make the work environment safer, more efficient and in some use cases robots are performing tasks humans can't do. In niche markets such as the power industry, robots are used to do dangerous jobs like infrastructure maintenance on high-voltage lines.

### What are the next breakthroughs needed to make robotics technology go beyond seeming like science fiction?

On the hardware side, we are looking to cutting-edge research and developments that will make robots more maneuverable—doing tasks that are complex or not doable for humans. Longer-lasting batteries and lighter-weight materials that can be resistant to extreme environments, for example.

Another area we are excited about is the use of motion sensors that can be built into robots in multiple spots to send signals such as an automatic stopping function. One more research area is tactile sensors that are strong and flexible and respond to touch, like skin.

Artificial intelligence is extremely important in robotics and here, there have been very rapid developments in computing speeds and memory capacity so that robots can be used for more precise tasks requiring a level of human-like judgment. Gestures and voice are other promising developments.

### What markets globally have an edge in developing robotics technology? How does Japan factor in?

Japan is a leader in humanoid robotics, designed in some instances for dangerous tasks. A niche sector where Japan is excelling is robotics inspections of power plants, which has gained more attention after the Fukushima nuclear accident in 2011.

The Japanese government is creating incentives for AI technologies and robotics

### How does HiBot manage product development from the lab to the market?

HiBot is a multi-cultural company that combines Japanese precision and dedication with Western creativity and design. We start by customizing robotics solutions for customer needs, working closely with end users to get a better idea of what is going on in the field. The most important part is the first step – developing an original concept and direction. From there we go to design and development to a prototype for evaluation in real working conditions.

Internally, we are a small team of 15-20 people so everyone gets involved – anyone can have a good idea. We have brainstorming sessions where we bring together mechanical, electronics and software teams. We discuss ideas, and then the teams give feedback on the practical applications.

We have a strong connection with the prestigious Tokyo Institute of Technology, where Professor Hirose, who is a pioneer in the field of robotics, teaches. Through his encouragement, we are inspired to be open-minded and creative.

### What's your goal for HiBot as a technology innovator?

We are striving to apply robotics technologies to real-world problems to improve people's lives and make dangerous work safer. We call this "humanitarian robotics."

We also see the market potential for robotics to create new services and integrate the value of data & analytics.

### On the business side, what are your objectives?

We are in discussions with corporate venture investors and venture capital firms in Japan and overseas to expand our resources to reach more customers. We want investors who have a long-term view of the potential – we are in a hardware field that requires a lot of investment. We see our company becoming more international and we are looking to triple the size of our team, with an emphasis on engineers and researchers who can bring in new ideas and solutions.

In August 2014, the World Economic Forum announced the selection of HiBot Corporation among the 24 companies at the forefront of their industries. "The Technology Pioneers, have demonstrated the ability to harness creativity to design and create transformative solutions." ●



## Sonny Vu / Co-founder & CEO, Misfit Wearables, San Francisco, CA

### How do you manage innovation processes at such a young startup in a hot sector such as wearable devices?

We don't really have a structure for managing innovation. We don't invite consultants in to work with us. We're a small team and we all dream of creating amazing products. Ideas are not in short supply. Sometimes we have product jams for a day to share and develop the ideas together. We are taking the lean model, dreaming up products the next few years out. We don't ask the customer what products to make. That's our job.

### That sounds like Steve Jobs, and I know you have John Sculley as a co-founder. What's his influence at Misfit Wearables?

What an incredible mentor he has been – his 50 years of experience, his sage wisdom, his sharing of successes and failures. It's definitely comforting to have someone who has been there in just about every possible situation who can empathize and offer moral support. What he says about startup life is true – the biggest benefit of working in a startup is that you get to do things that you are unqualified to do. You are taking on a lot of responsibility with amazingly smart people in a small team, which gives the advantage of agility.

### What's next for the wearable device market?

Wearables for monitoring activities such as fitness and sleep is the first stop – base one. What we envision is getting to base two and base three to climb the mountain. We don't really know what the next killer app will be, and honestly, if I knew it, I would be plowing all our money into it. But one area we see as exciting is wearable payment devices, where you have a bracelet with built-in sensors to swipe for payments like we do with a credit card.

### Your company has developed through an international footprint. Explain how that's worked.

We have 90 people — 20 are in San Francisco, 55 are in Vietnam and 15 are in China. We manufacture through a smaller contract manufacturer in Korea. The hardware device is designed in San Francisco. All of the R&D – the software – is in Vietnam and China, where we are able to get amazing talent. With this combination of talent, we were able to develop the only wearable activity device that is waterproof, fashionable and requires no battery charge – it's connected to a mobile phone. Our main product Shine – a wearable fitness tracker worn as a bracelet – is now sold in 35 countries.

### Have you faced counterfeiting in China, and if so, how have you dealt with it?

Yes, we have knock-offs of our products and some are pretty good. We're flattered to attract knock-offs. The worst would be to be ignored.

### Misfit Wearables is ramping up very quickly after raising finance initially from Indiegogo crowdfunding and then by venture capitalists including Vinod Khosla and Peter Thiel. What are the biggest hurdles going forward?

Managing fast growth is a challenge though – we sold 300,000 units in our first two quarters after the launch in 2013. The rate of our growth is limited by leadership, having leaders who can manage people both technically and culturally.

### This is your third startup. What's your advice for other entrepreneurs?

Make sure that your work doesn't feel like work. Do things with a sense of purpose and surround yourself with people you like and good food.

### What's your ultimate goal for Misfit Wearables?

We want to make a great ambient computing company with products for the home, body and car so that technology blends into the background and serves us, rather than us staring at tiny dots on a screen. ●

## Sameer Patel / SVP & GM, Enterprise Social Software, SAP, Palo Alto, CA

### Do you think we are in a tech bubble economy now or on the verge of a tech revolution?

The stock market does what it does. But I think we are at the beginning of the most disruptive period in technology we've seen in 50 years. We have just completed digitizing most of our assets and the process of real transformation now begins. The hotel industry is being transformed with AirBnB, taxis by Uber, and mutual funds by Alibaba's new financial investment business.

This transformation is in contrast to the dotcom days where we were facing new distribution and sourcing models with ebusiness. The disruption we are seeing today is redefining what the product is and can be. This is a completely different paradigm and it will continue to create new products and services over the next 20 years that we have no inkling of at this time. We are reimagining how we operate as businesses and ecosystems, and that will fundamentally change the current stack of business applications.

### In what tech sectors do you see the most change coming?

Everybody already knows about cloud, mobile and big data. What the future holds is not reporting a bunch of data points, but superior data that helps us to accelerate our productivity and compete more effectively.

Right now, I think that the Internet of Things is over-hyped. The real potential for IoT is how it can be combined with data & analytics to not just look for problems to solve, but to develop new business models. The Internet of Things will lead to an explosion of Big Data as sensors are being built into everything.

Take supply chains as an example. There's value in bringing data from sensors embedded deep into a supply chain to analyze and organize and respond quickly to shifts, without the latency we have now in the market.

The true value of the cloud hasn't hit yet, either. The cloud that came over a decade ago was focused on better cost management as we moved our technology investment from capital to operating cost. We're now entering the next generation of cloud that's built on leveraging knowledge gained by analyzing the work patterns of millions of end users and refining software to incorporate those best practices, and at speeds that go from quarterly to as fast as daily software updates. That's transformative as the software can keep up with the pace of business change.

### How is the information revolution changing traditional ways of conducting business?

With better analytics and second-generation cloud technologies underway, strategies will be shifted much more around speed, agility, cost benefits, knowledge and shared information. Newer versions of social computing are already evolving to support new efficient processes and enhance business applications with collaboration.

### Do you see cybersecurity continuing to be a big issue?

We've gone through a lot of the issues already as we moved from the physical to the digital world. Security is more emotional now but as organizations start to realize that if their customer records – arguably their most coveted asset – is in public cloud applications, why can't their HR or Finance or Supply Chain data live there as well? The issue of cybersecurity varies from country to country but is gradually dissipating.

### How is the role of the CEO changing with advanced technologies filtering into all layers of the corporation?

A CEO today has to be digitally savvy, embracing the changes to be able to innovate faster and in a customer-focused way. The CEO job is all about having the right people, the right data, processes and content in real time get the job done.

It's about understanding the accelerators of technology that corporations need to have in place to stay ahead and invest in the right building blocks. There are four main areas – building technology experience, staying agile to keep pace with new products and services, differentiating products to deliver better benefits and customize around your secret sauce, and putting in place the right tech and business roadmap. ●

## Jon Medved / Founder & CEO, OurCrowd, Jerusalem, Israel

### Are we in a tech bubble or on the verge of a tech revolution?

We're at the very beginning of a tech revolution. We've come quite far from the time when the Internet was launched to the public in the 1990s, and look how much it has changed our lives. But now the pace of change has accelerated remarkably fast. Think how long it took to get to 100 million cars, TVs, or users on the Internet. Now you can get to 100 million people on an app in a month, when it used to take a generation. These quick-paced technological gains will unleash a series of additional changes as we move into the Internet of Things and Big Data.

If there is a setback, it is a momentary setback. It's the same as in any growth curve, with jagged ups and downs. If you think about the ability to create new things quickly and how those changes can go to the rest of the world, I am extremely bullish about the future of tech.

### Do you think any market will replace Silicon Valley as the world's leading tech hub?

Not in the foreseeable future. Silicon Valley is number one, and Israel is an undisputed number two – we are Avis to their Hertz. Silicon Valley is such a beacon for talent around the world and that's not changing. However, there are innovation hubs that are coming up such as London, Berlin and Hong Kong. There is work being done in Africa and Latin America toward teaching the people to dream bigger and to have higher aspirations. And in Australia, it's interesting to look at what's happening. There is tremendous technology there, but no capital for funding innovative startups.

### What do you see as the future for tech innovation in Israel?

Here in Israel, investing is up and to the right, it's on an annual 20-25 percent increase in the country. With OurCrowd, we've built a crowdfunding platform in Israel with money invested in it largely from outside Israel. Today, capital knows no boundaries. Innovation knows no boundaries. OurCrowd has now invested over \$70 million in 51 companies, and 25 of those companies got investment of more than \$1 million each.

### What's the future for crowd financing?

We are seeing an explosion of innovation in the funding process. We are taking a process that has been limited to geography and demographics, that has not been transparent, and we are blowing the doors right off the whole process. It doesn't matter where you are, Australia, New Zealand or China, we are creating crowdfunding for real investors in real companies. And, once SEC regulations are approved, we will see crowdfunding by the masses.

It's interesting to note that angel investors are still funding companies on a hyper-local basis. That makes as much sense today as an old rotary phone. A number of wealthy people want to be angel investors but only a small percentage are sophisticated enough, have access to deal flow, and are willing to sit in on investor meetings once a month.

What we are seeing is that crowdfunding is appearing as leg 3 or 4 in startup financing – there's angel money, venture capital, corporate venture and crowdfunding. Time will tell if crowdfunding will eclipse the others. ●

## Geoff Yang / Partner, Redpoint Ventures, Menlo Park, CA

### In what sectors do you see the most technology innovation occurring in the consumer market?

We will continue to see an increasingly mobile first environment – more powerful handsets, better batteries and screens, and a migration from Internet 1.0 and 2.0 products and services all shifting over to a mobile first world for banking to grocery delivery.

We will see major change and impact coming from the Internet of Things and its ability to connect everything in your life and control it remotely. We are still early on with the first generation of data-driven wearable sensors.

A third area to watch is robotics – combining consumer robotics with machine learning, software and user experience.

### What tech innovation areas do you foresee disrupting business markets?

Over the next 15 years, we will see a hybrid private/public cloud developing that is very flexible, very configurable. The future will be about dial up or dial down software apps in small bite-sized chunks, minute by minute, hour by hour. We will see a lot of what was only available to the larger companies being pushed down to the SMEs at a fraction of cost without a huge IT department, that can be accessed on your desktop, table and mobile phone.

Big Data is the other big trend. You can now derive insights without knowing what the question is by looking at millions and millions of data.

### Do you see innovation continuing at the same pace, and why/why not?

We've had a big resurgence in IPOs and whenever that happens, it's really healthy for business. When you have a highly valuable public company, you have currency to make acquisitions of smaller companies.

Innovation is easier at small companies because there are fewer processes, less turf to protect. Startups live and die on whether the status quo works, there is no safety net, they are lean and mean. The venture capital business has been successful over decades because it brings in a new approach, kills off the old and ushers it in a new way.

### What companies do you see leading the innovation parade?

I continue to look to Facebook, Google and from China, Alibaba and Tencent. In the SaaS space, Workday is really interesting for selling software and services. Netflix is changing the way that people think about entertainment.

### What's your view of crowdfunding?

Crowdfunding can help signal latent customer demand in the market and can be very synergistic with venture capital. Crowdfunding is not money you can rely on in the same way you get with venture capital where you get the firm's network, the partners' experience and ties to companies they've been involved with – you stand on their shoulders. Crowdfunding's bigger impact will be on angel syndicates.

### Will Silicon Valley remain the center of the tech universe?

Right now Silicon Valley is still the center of the tech universe. If you look at all the major trends – social, mobile, tablets, cloud – all the tech and platform companies are located here such as Google, Facebook, Yahoo, Apple, Twitter, Pinterest, Instagram, Cisco and VMware. There is just an incredibly rich broth of cross-fertilization and insights here that creates an ecosystem that is hard to replicate.

### What about China as an up-and-coming innovation nation?

It used to be that U.S. models were copied in China, but now we're seeing the reverse: a lot of models that are unique to China and are being imitated by other innovators. China is the only place outside Silicon Valley that has the benefit of scale and the strong aspiration to be a significant player worldwide. Most of the action is concentrated in Beijing, Hangzhou and Shanghai. ●



TECHNOLOGY INNOVATION

# Hubs and country perspectives

“Emerging markets are shifting the paradigm for global technology in a number of ways, leapfrogging traditional market development through the use of technology. We are seeing financial services go direct to online banking rather than traditional bricks and mortar retail, and medical straight to remote care.”

— Mark Barnes, Global Lead Partner, High Growth Markets, KPMG LLP (U.S.)

## MARKETS WITH TECH BREAKTHROUGHS

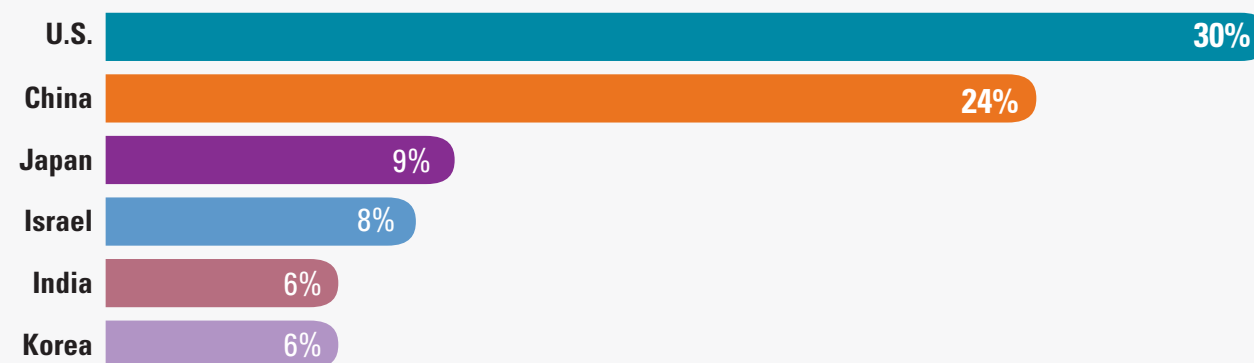
### THE RISE OF SILICON VALLEYS WORLDWIDE

Asked which markets promise to fuel technology change, the rise of Asian markets was clearly in the forefront, with China, Japan, Korea and India highlighted. While the U.S. is the leader, the gap between the U.S. and emerging markets is narrowing in year-over-year comparisons. Less than one-third of those polled globally this year, contrasted with 37 percent last year, agree the U.S. will lead disruptive tech breakthroughs with global impact. China maintains its second-place showing at nearly one-quarter.

Interestingly, Japan, which ranks high for new patents from such corporate leaders as Panasonic, Sharp and Toyota, climbs up this year. Japan is unleashing inventive geniuses and hardware R&D investments to come up with innovations and regain its tech leadership.

Overall, the results demonstrate that several “Silicon Valleys” around the world are bubbling up – and certainly Israel wins kudos for maximizing tech startups. ●

### Q: Which country shows the most promise for disruptive technology breakthroughs that will have a global impact?



Countries with percentages below 6% not shown.

Source: KPMG Technology Innovation Survey 2014

“Since the launch of this survey three years ago, we have seen the momentum of more countries joining the technology innovation ecosystem. China, in particular, continues to invest to be on par with Silicon Valley. The U.S., however, continues to be respected as the world’s technology innovation center and Silicon Valley is still the tech innovation epicenter.”

– Gary Matuszak, Global Chair, KPMG Technology, Media & Telecommunications, KPMG LLC (U.S.)

## SILICON VALLEY COULD LOSE ITS POWER

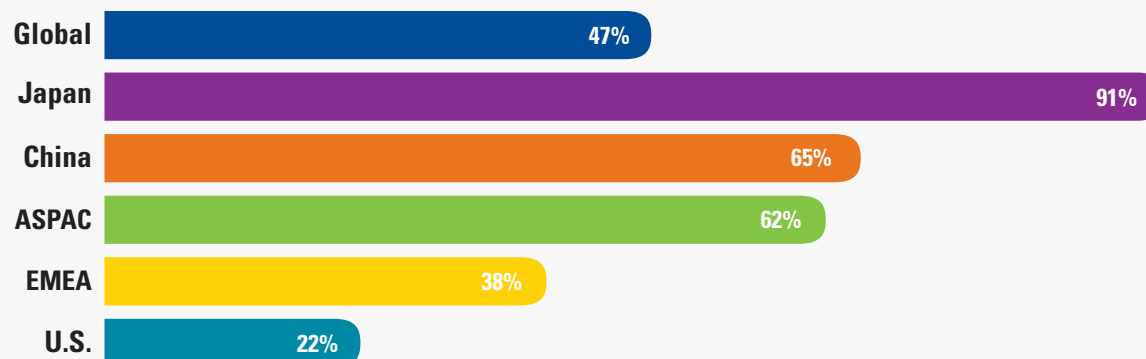
### SILICON VALLEY CONTINUES TO INSPIRE AND SHAPE TECH LEADERSHIP

More tech industry leaders surveyed predict Silicon Valley could lose power – in fact, 47 percent believe it's likely, compared with 33 percent in last year's findings.

China continues to race ahead, with 65 percent of the tech leaders in China saying Silicon Valley will shift to a new locale. Japan is even stronger on this point, at 91 percent! The U.S. remains confident of its tech leadership, with only 22 percent predicting Silicon Valley would lose its leadership.

Asked which country is most likely to take over, China came out on top – named by nearly one-third – just a tad under the 37 percent from last year. India scored second, though it slipped a bit from last year. Japan, with 9 percent, checked in with a respectable showing. ●

**Q: What is the likelihood that the technology innovation center of the world will move from Silicon Valley to another country in the next four years?**



\*Percentage answering 4-5 on a 1-5 likelihood scale

Source: KPMG Technology Innovation Survey 2014

## THE RISE OF A GLOBAL TECH ECOSYSTEM

### TOP CITIES AS LEADING TECH HUBS

The sheer dispersion of cities worldwide as emerging tech innovation hubs that are angling for Silicon Valley's leadership status is highlighted by the findings. On a global scale, Shanghai weighed in at first place, Tokyo ranked second, and Beijing third, while New York was rated fourth.

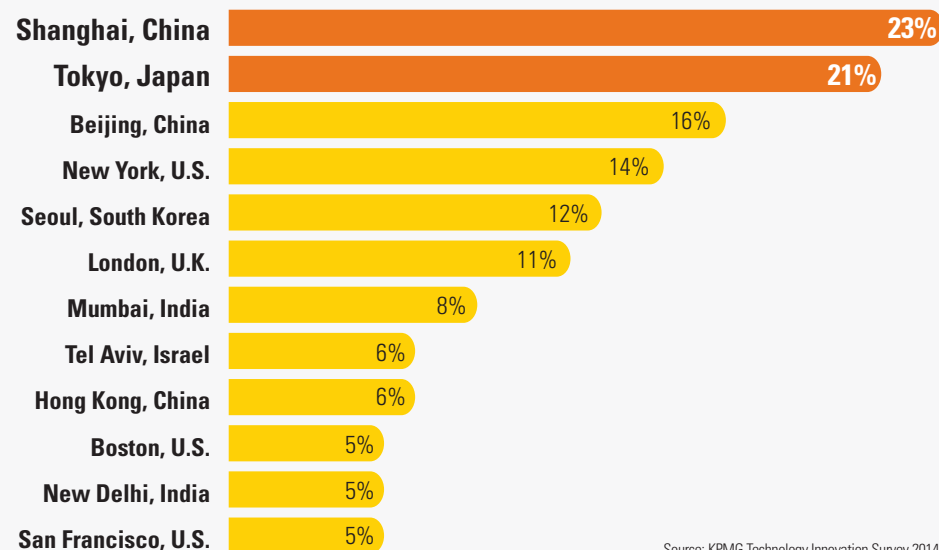
The identification of various cities in the U.S. illustrates how ideas and sources of capital are traveling beyond a close radius from the Silicon Valley/San Francisco Bay Area. New York City, which ranks second in venture capital financing for startups after Silicon Valley, pulled in at fourth place in the survey with a 14 percent mark. San Francisco placed 12th. Besides these two anchor east and west strongholds, five other U.S. cities drew favorable responses: Austin ranked 13th, Seattle 16th, Los Angeles 18th, Chicago 20th and Houston 22nd. Canada claimed two spots – Toronto and Vancouver.

China scored with four cities out of the total. Shanghai pulled ahead of Beijing in this tally. Beijing typically gets honors as China's leading tech hub and a center for software, e-commerce, mobile and venture capital. Shanghai has been more notable for digital media, entertainment and finance, but the opening of the free trade zone in Shanghai and what is perceived as a more comfortable lifestyle may be bumping up Shanghai in the ratings. Hong Kong and Shenzhen also were named. Shenzhen is a hardware capital and Hong Kong is acknowledged as a trading and finance hub, but is angling to prompt the growth of a tech economy.

Elsewhere in Asia, India claimed four cities in the rankings – Mumbai, Delhi, Bangalore and Hyderabad, in that order.

In Europe and the Middle East, London and (no surprise) Tel Aviv drew high marks while Berlin, seen as an up-and-comer on the European tech and startup scene, drew a more limited response. ●

### Q: Which three cities will be seen as leading technology innovation hubs over the next four years?



Source: KPMG Technology Innovation Survey 2014



# Country perspectives



## CANADA draws the right DNA

Canadian technology talent is among the best in the world, local innovation is growing, government policies have long favored generous R&D tax incentives, and the quality of life and ease of doing business in Canada is recognized widely. Canada's long history of immigration draws new talent, ideas and approaches into a globally oriented entrepreneurial DNA.

More than US\$6 billion in new equity capital was invested in Canada's technology, clean tech and life sciences companies in 2013, while the value of the innovation sector on the Toronto Stock Exchange rose by more than half. Venture capital investments in Canada increased by more than 30 percent, led by the US\$171 million financing of Vancouver-based HootSuite Media (the country's largest VC deal to date) and a US\$100 investment in Ontario's Shopify. Fast-growth companies in the Internet, SaaS, retail and healthcare sectors and a strong IPO pipeline reinforce the upward trend.

Meanwhile, Cisco is investing US\$4 billion over the next decade to create a new global R&D center in Ontario. Google has grown its R&D talent pool in Waterloo, Ontario, by more than 150 percent in the past four years.

Federal programs such as the Venture Capital Action Plan and the 2014 Economic Action Plan will direct new funds to start-ups and university research labs. Yet entrepreneurs in Canada note a lack of support for companies expanding operations and moving to the next phase of development.

In new tech innovation areas such as data & analytics, the ecosystem is growing rapidly and remains highly competitive with other leading markets, while organizations such as Thalmic Labs are making headlines in wearable technology. These complement Canada's existing strengths in software and software-related services, mobile and cloud networking.

Canada continues to lag, however, in driving innovation through 'corporate Canada.' Yet with a shift to a global, innovative and risk-taking culture, companies will increasingly look to drive more innovation within their core business to compete on a global scale. ●

**“Boasting a strong and constantly-refreshing talent pool, world-class infrastructure, growing capital and investment inflows, favorable R&D tax incentives and a globally oriented view, Canada has already become an important market for entrepreneurs and investors. Looking ahead, we believe Canada will continue to cement its place as a key destination for innovation-focused talent and ideas.”**

— **Brendan Maher, National Industry Leader** / Technology, Media and Telecommunications, KPMG in Canada

## COUNTRY PERSPECTIVES (cont.)



## CHINA's tech-savvy consumers propel advances

**C**loud adoption, IoT and autotech are catching on in China, where the government is emphasizing technology as a key strategic emerging industry in the State Council's 12th Five-Year Development Plan.

Autotech in particular is taking off as the government focuses on ways to combat pollution and congestion. In contrast, mobile platforms and apps – already pervasive in China – are now seen as less disruptive compared to other leading edge technologies.

In line with the country's transition from an investment-heavy growth model to a consumption-driven model, a major goal of both government and businesses is to continue developing China into a global e-commerce player. Due to fast-growth patterns, China has leapfrogged the United States to become the largest global e-commerce market and continues to hold on to this spot.

As Chinese consumers look for high-quality, more innovative products, this in turn will drive new technology developments. China's tech-savvy consumer population is already helping to stimulate significant technology advances in mobile commerce, acceptance of online payments and e-currencies, all of which are growing fast as the expanding consumer market adapts quickly to new technologies.

As one example of an advance, the China Banking Regulatory Commission recently gave permission to Internet giant Tencent Holdings to establish a private bank in Shenzhen's Qianhai special economic zone. We are likely to see additional developments in this space.

Underlying trends driving innovation in China include the country's highly diverse online market, where every province and city are different. In an additional shift, Chinese manufacturers are moving from "made in China" to "innovate in China for China." Given the huge volumes, many companies are likely to focus on the Chinese market and design products that are tailored for China.

For example, WeChat, outside of China, is a messaging application similar to WhatsApp; however the version available in China – Weixin – has additional features including a news reader and platform for blogs. Its integration with LinkedIn has enabled users to display their LinkedIn profiles on WeChat. It has also added payment functionality so users can make purchases directly from the application. In addition, home-grown platforms are underpinning the rise of online transactions, as well as the increasingly important roles of social media and mobile devices. This has driven retailers to develop a more sophisticated online presence.

Lastly, we see increasing numbers of entrepreneurs, angel investors and venture capitalists establishing a presence in China and seeking out new innovative ideas and projects. Their actions are helping to create an ecosystem similar to Silicon Valley, with Chinese characteristics. ●

**“Chinese manufacturers are additionally undergoing a shift in industrial production, from “made in China” to “innovate in China for China.” Given the huge volumes, many companies are likely to focus on the Chinese market and design products that are tailored for China.”**

— Egidio Zarrella / Partner, Clients and Innovation Consulting, KPMG China



## INDIA powers up tech with new leadership

India's new government this year has announced several initiatives and incentives to promote growth of the technology sector in the nation's economy. Indian tech companies have access to world-class technology infrastructure but what's been needed from the government are policy incentives and an improved education system. The new initiatives include:

**Digital India:** a pan-India program to improve access to services through IT-enabled platforms. This will leverage cloud computing to provide a digital locker to all Indian citizens. All government to citizen services will be delivered digitally using such lockers in the next three to four years.

**Technology Innovation Fund:** a US\$2 billion fund to act as a catalyst to attract private capital by providing equity, soft loans and other risk capital for startup companies has been established. In addition, a nationwide incubator and accelerator program has been set up to foster new ideas.

**Smart Cities:** development of 100 smart cities, which will not just push the frontier of urbanization in India but will also create a new innovation paradigm for technology companies.

Meanwhile, India continues to maintain a leadership position in IT and business process outsourcing, with a wide spectrum of services that help to fill a skill gap for global businesses. India's outsourcing sector revenues for 2014 are projected at US\$118 billion, with exports at US\$86 billion. To continue growing at more than 20 percent, innovating new products and services is crucial.

Large Indian outsourcing companies are being led toward innovation due to declining margins in their traditional application development business. They are also investing in platform-based solutions that can be modified easily according to varying client needs.

For mid-sized IT companies, innovation is an imperative for survival. Squeezed at the top by the larger players, mid-sized players must identify niches in the global technology market where they can make a difference.

New drivers in the coming years for tech advancements are occurring in social networking, cloud, analytics, and mobility and their convergence. The disruptive power of cloud computing and mobility will open avenues of growth instead of shackling existing business models.

Moreover, the spread of mobile communications in India (more than 900 million mobile subscribers) and a rising middle class is leading to a burst of innovative e-commerce and mobile companies. For example, two innovative local startups, Flipkart and Zomato, have emerged as market leaders, trouncing more fancied global rivals in the domestic market.

Yet several barriers to innovation exist in India – the lack of a Silicon Valley-like ecosystem being foremost. In addition, investors and innovators are wary of India's IP protection laws, and the path to commercializing innovation is blocked by numerous legal and bureaucratic barriers. ●

**“Necessity is no longer ‘the mother’ of invention. With the limitless possibilities of today's technology, possibility is fast becoming ‘the mother’ of invention.”**

— Akhilesh Tuteja, National Head / Technology sector, KPMG in India

## COUNTRY PERSPECTIVES (cont.)



## IRELAND Europe's innovation engine

**W**ith one of the highest concentrations of ICT activity and employment in the OECD, Ireland's global reputation as a place to start up, invest and live continues to grow. Ireland understands the needs of startups, a point reinforced by the World Bank's naming of Ireland as "the easiest location in Europe in which to start a business."

Ireland has more venture funding per capita available than any country in Europe. More than €800M is available through angel, seed and venture capital firms, and over 90 percent of all venture capital is invested in Irish technology companies, compared to 31 percent in Europe overall.

This highly attractive tech environment is underpinned by a business-friendly tax regime, including a low corporate tax rate of 12.5 percent, extensive double taxation agreements, and an attractive R&D tax credit regime.

Ireland's young workforce is capable, highly adaptable, innovative and very committed to achievement. Research from the OECD shows Ireland with the youngest population in Europe and one of the best education systems in the world. The IMD World Competitiveness Yearbook 2013 named Ireland as No. 1 for workforce flexibility and adaptability, investment incentives and attitudes about globalization.

Ireland's dynamic, tech-centric population attracts a disproportionately high number of young entrepreneurs, enthused by an ecosystem that combines a tech-friendly environment with a high quality of life.

Irish early-stage entrepreneurs have a strong focus on international markets. Exporting companies spent €20 billion in the Irish economy in 2013 and achieved record levels of job creation, according to Enterprise Ireland's 2013 Annual Report.

Ireland also has demonstrated an ongoing resilience in attracting inward investment despite intense competition, and has seen enormous business growth across the technology sector. Nine of the top ten global ICT companies have operations in Ireland. ●

**“Ireland has a unique appeal for both innovative startups and established technology players unparalleled in Europe. We celebrate and promote entrepreneurship and have a government and business community relentlessly focused on tech, talent, track record and tax. Dynamic individuals and businesses continue to choose Ireland and underpin our reputation as a location of choice for technology and innovation.”**

— Anna Scally / Partner, KPMG in Ireland





## ISRAEL An entrepreneurial powerhouse

**R**anked first in the world for innovative capacity by the IMD Global Competitiveness Yearbook 2014 and third for innovation globally out of 148 economies by the WEF Global Competitiveness Yearbook 2014–2015, Israel's modest size is clearly no barrier to its remarkable accomplishments.

Israel's high-tech hub continues to be an attractive location for investments in technology companies, with a surge of capital for the first six months of 2014 in the Israeli tech sector.

The geopolitical changes in the region have been responsible for a spur in the Israeli technology sector and Israel's broader economy through spin-off technologies originally developed by and for the Israeli military. Israel has become a global hotbed of technology development with the commercial application of once top-secret technologies. Such applications vary from information security and cyber solutions such as Checkpoint Software to medical device companies such as the developer of the swallowable "pill-cam" and Given Imaging, which was recently acquired by Covidien.

The supportive environment enabling the growth of the local technology sector is comprised of a talent pool of highly educated workers, the cultivation of an entrepreneurial spirit, government incentives through a robust national R&D funding program, and tax incentives to foreign investors in the local technology sector.

Top scores on global indexes of economic competitiveness, a striking concentration of innovative people, a culture that promotes experimentation and daring, and governmental eagerness to create supportive conditions for investors, combine to make Israel a leading site of investment far beyond what its small size and short history might suggest. ●

**“The Israeli technology market continues to mature, from an industry that was mostly funded by venture capital firms to a growing trend of private equity investments being made in revenue growth companies. Such companies are raising substantial higher amounts of capital on average than in the past, positioning themselves for continued market expansion.”**

— Ofer Sela / Technology partner, KPMG in Israel



## JAPAN Setting new standards in robotics

Innovation in the Japanese industrial market represents the foremost important government policy of Prime Minister Shinzo Abe's cabinet. As the result of the "Abenomics" economic and monetary policy of the prime minister, overall macro economy has improved over the course of the past two years. In order to stimulate further growth, the prime minister is looking to launch the "third arrow" of Abenomics, which focuses on the revival of the Japanese industrial market. He believes that robotics will play a key role in this new industrial revolution where the Japanese government is looking to invest a significant amount of governmental funds, and it represents one of the core components of the "third arrow," which also includes the development of medical devices to improve the public health and welfare and reduction of medical costs, IPS cell development, and new power system development with the decommissioning of nuclear reactors. The prime minister insists that the robotics will transform the manufacturing, medical, nursing, agriculture and transportation sectors. He also targets that the robotics sector in the manufacturing industries will grow by twofold and nonmanufacturing sector by 20 fold by 2020.

In order to support development of the robotics, committees will be established within the Japanese government to fully support the realization of the industrial revolution. In particular, robotics will be developed with a focus particularly on the domestic and overseas manufacturing sectors. Integration of the artificial intelligence sensors, software and Big Data will be the key to its successful development. ●

**“Japan has focused on robotics development since the 1980s and it has an edge over the competition. However, given the speed of technology, such advantage may be erased overnight and Japanese private and public sector will need to work in concert in order to ensure that Japan continue to remain as the industry leader.”**

— Hiroto Kaneko / Head of Technology, Media and Telecommunications, KPMG Japan

## COUNTRY PERSPECTIVES (cont.)



## KOREA fortifies its tech economy

In today's stagnant economy, faced with slow global economic growth and competition with emerging countries, Korea is at a point where it must develop a new economic paradigm and model of national development.

In response, the Korean government has established its own creative economy strategy that prioritizes and leverages Korea's strengths in science, technology and ICT.

The Korean government will call for and support the private sector's development of promising future technologies such as 5G telecommunications, realistic media, and content platform network devices. It will also support introduction of wired Internet that is ten times faster [Giga Internet] than the current one (100Mbps).

Korea has remained a good performer in a number of quantitative ICT infrastructure indicators and proved highly competitive in exporting high-tech products, according to several global competitiveness indexes.

Such science and technology innovations will be one of the new growth engines for invigorating the economy and opening up a new era for Korea. ●

**“I believe science, technology and ICT innovations will act as a vitamin that will invigorate the economy and integrate into existing culture, health, agriculture and maritime markets in Korea. Korea's new economy paradigm creates new growth engines and jobs through the convergence of ICT with other industry, based on creativity in science and technology.”**

— **Sung Rae Park** / National Industry Leader, Technology, Media & Telecommunications, KPMG in Korea



## RUSSIA steps toward an innovative path

The turbulence and increased economic uncertainty has not significantly affected performance in the Russian technology industry, which is seeing stronger market leaders and more startups despite flat growth and investment. The main industry drivers are export software development services, cloud and e-commerce solutions.

There is a strong demand for cutting-edge technology breakthroughs in Russia. The local economy is lacking business-oriented innovators in its pool of talented scientists and researchers, however, along with insufficient access to infrastructure facilitating commercialization of technology. Moreover, inspired innovation and an entrepreneurial way of thinking – fundamentals for the industry – have yet to become a trend.

Steps taken by the Russian government to set up powerful incentives to boost innovations are lacking, too. Local companies face difficulties accessing long-term financing, an inability to leverage industry alliances and mentoring, as well as an undeveloped innovation network, a downturn of ambitions and motivation of entrepreneurs. Apart from this, a vast majority of market players plan to remain private in the foreseeable future, although last year was marked by several big M&A exits in the industry.

Toughened competition has forced market players to seek further growth in consumer technologies such as 3D printing and virtual reality, although they could bring about security issues and extra costs. Customers often find it challenging to implement these advanced technologies, underlining the importance of raising awareness of benefits innovations would bring.

Nevertheless, local entrepreneurs have a reasonably high level of confidence in Russia's ability to demonstrate a substantial breakthrough in innovative technologies and potentially become one of the world's leading centers of innovation. The Russian government supports their optimism and strives to diversify the economy by switching to an innovation-based development model. Such joint efforts will contribute to changing the Russian economy's development pattern and set up a solid base for further establishing an innovative path of growth. ●

**“The top enterprise solutions that will drive the business in the near future are cloud technologies, artificial intelligence, and digital media as they improve business efficiency and facilitate cost reduction. These new solutions may turn out to be quite complex to implement, however, and may be costly at the initial stage.”**

— **Alisa Melkonian** / Partner, Head of Innovation & Technology, KPMG in Russia and the CIS



## SINGAPORE unlocks its innovation engine

**S**ingapore has laid a strong foundation for technology innovation to flourish, and is preparing to leverage emerging technologies in a next phase of innovative development of the Infocomm and Media (ICM) sector. The aim is to establish Singapore as a smart nation that taps the potential of the Internet of Things, advanced robotics and data & analytics. Building blocks to unlock this creativity surge in bandwidth-intensive services are ultra high-speed broadband networks and internet exchanges.

Under a new 10-year government plan to be released in 2015, Singapore intends to emerge as a country known globally not just for innovative and successful application of ICT technologies, but also for creating and building new technologies.

Singapore's multi-pronged approach to stimulate research, development and commercialization of technology innovation includes grants, tax subsidies and other stimuli to grow the infocomm sector and raise the connectivity and competitiveness of key economic sectors. The effort extends to an intelligent nation plan that has attracted global ICM companies to set up innovation centers, pushed for ICM education in schools, built professional abilities and deepened skills, and developed a strong infrastructure network.

Additionally, the Infocomm Development Authority of Singapore (IDA) has been fostering partnerships and alliances within the Singapore ecosystem — institutes of higher learning, buyer enterprises, ICM companies, research institutes and trade associations — to collaborate in development of innovative and transformative solutions. Other IDA initiatives are ISPRINT grants to small and medium-sized companies to adopt technologies to transform and increase productivity and the recent launch of IDA Labs and Accreditation@IDA to create a culture of creating, building, testing, and exporting innovative products and solutions. ●

**“Singapore has progressed steadily and leveraged emerging technologies since its independence in 1965. The next ICT Master Plan will again demonstrate Singapore's steady hand in experimenting and using new and emerging technologies to grow the economy and improve quality of life. One key concern that has emerged is the protection of personal data. To that end, Singapore has started enforcing the Singapore Personal Data Protection Act. Efforts to generate greater awareness of data security, especially in the face of growing cyber threats, must continue if Singapore is to successfully position itself as an infocomm hub.”**

— **Juwanus Tjandra** / Partner, Management Consulting, KPMG in Singapore

## COUNTRY PERSPECTIVES (cont.)



## SLOVAKIA smiles on innovation

Interest in innovation in Slovakia is building from established foreign enterprises and local start-ups with aims to strengthen progress through cooperation with Slovak universities and research institutes of the Slovak Academy of Sciences.

The enthusiasm can be seen from companies increasing efforts to find new customer solutions, growing demand for innovative training and development of creative thinking, and more time and space reserved at some companies for innovative pursuits. The number of new technology startups in Slovakia is increasing too.

The Slovak government has recently introduced a “positive economic package” that includes several innovation measures:

- Substantial tax concessions for practical education companies
- Financial support for innovative technological startups
- Tax concessions to support research and development

Slovakia still has a lot to do to develop innovation. For incumbent companies, a major challenge is to find ways to structure innovation – manage it strategically, create favorable conditions for innovation, and find a suitable combination of motivational factors. For startups, assistance is needed to enter foreign markets, search VC investors, develop products and attract customers.

Slovakia’s big advantage is its passion for innovation as enthusiasts build networks of contacts and create innovation forums and platforms to share experiences. The next development phase will be to collaborate and communicate more. ●

**“The Slovak innovation ecosystem is making progress rapidly with positive energy from private companies and Slovakia as whole. Slovakia has a chance to be an exceptional and innovative country and become an innovation-driven economy. From top management to employees to startups, there’s interest and enthusiasm in innovation, mentoring and sharing practical experience. KPMG in Slovakia is contributing significantly with strategic initiatives such as innovative training for established firms, development of The Startup Studio, launch of the Slovak Startup survey, and opening of a KPMG office in Košice (Eastern Slovakia).”**

— **Vladimír Švac** / Head of Innovation Advisory Services, KPMG in Slovakia



## SOUTH AFRICA powers up tech from the tip

South Africa is the technology powerhouse of the African continent. At the tip of Africa, significant global and local company investments, growth of innovative services such as mobile money, a large market for healthcare and education solutions, and a regional supply chain hub reinforce its standing. A stable political and economic system additionally allows for a conducive business environment and sustained demand for IT by a vibrant small and medium-sized business sector.

Looking forward, the technology market is set to grow at 6.5 percent annually to reach US\$18.18 billion in 2017. Although the weakening local currency poses a significant risk to imported products, such as computer hardware, the slowdown in demand is likely to be offset by an uptick in foreign business process outsourcing (BPO) services – the most developed market in Africa – as international firms take advantage of lower costs.

South Africa provides a breeding ground for tech startups. Yet while a few tech hubs and some subsidies for incubators already exist, the nation could strengthen its position by providing a more conducive environment.

Challenges that IT companies face are budgetary pressures that require a combination of government and private sector effort such as laying of fiber. It is encouraging to note that President Zuma has alluded to government plans for ‘South Africa Connect,’ the country’s broadband policy and strategy.

Other challenges include the local economy’s vulnerability to global economic shocks that may directly impact local subsidiaries of international IT organizations. Additionally, there is an IT skills shortage of professionals and students in math and science entering IT-related disciplines.

Turning to technology innovations, data & analytics is seen as a key disruptor, and data collected from electronic documents, transactions, sensors, web and social media, global positioning systems and e-commerce websites is being used to help South African organizations make better decisions. ●

**“Africa is a great example of disruptive technology changing the playing field for economies across the continent. The mobile financial services revolution is one example of using technology platforms to address a burning need for Africans. The success of so-called ‘mobile money’ across the continent has been driven by the proliferation of mobile networks and phones. We look forward to innovative technology solutions to education and healthcare challenges across Africa.”**

— Frank Rizzo / IT Advisory Director, KPMG in South Africa



## COUNTRY PERSPECTIVES (cont.)



## TAIWAN embracing the opportunities

**T**he Taiwan government's science and technology policy concentrates on four major emerging intelligent industries: cloud computing, electric vehicles, green architecture, and industrialization of invention patents. Over the next five years, Taiwan's vision is to become a global innovation leader in green energy technology and intelligent living.

Taiwan's leading electronic and information technology companies are gearing up to capture opportunities offered by the coming boom in the Internet of Things as well. Our semiconductor companies are rushing ahead to develop advanced chips tailored for the IoT.

Local and regional data center markets will be particularly susceptible to change. Many leading Taiwanese manufacturing companies have gradually invested a lot in the China market, drawing strategies for integration of their global logistics, automation, cloud and IoT services. Furthermore, Taiwan's biggest branded PC vendors are seeking to reform their hardware, software and service products to profit from the industry's shift and transformation.

Major local telecommunication operators will provide enhanced network infrastructure to support the transformation, along with the launch of 4G-LTE services. Additionally, with the rapid development of cloud computing and mobile technology, the concept of smart city and home will be impacted.

Talent cultivation and quality improvements are also highly emphasized. Many universities have launched incubation centers to encourage a young generation to work with startup entrepreneurs and to shift R&D resources to develop their own intellectual property.

Multimedia, entertainment and safety systems in automotive electronics are under development as well by Taiwanese companies. These systems connect with sensors, cameras, displays, handheld devices and cloud computing to provide applications and information to drivers and passengers. ●

**“Taiwan has a very good foundation for tech innovation, including top-tier scientists in many famous universities, research institutes and tech companies. Taiwan has transitioned from a hardware orientation to integration of hardware and software – crucial to success in tech innovation. Our question is how to develop our strength based on our power in hardware to meet the market trends.”**

— **Samuel Au** / Partner, Head of Technology, Media and Telecommunications, KPMG in Taiwan



## UK Continues to power ahead on tech scene

**T**he UK's vibrant technology scene continues to see remarkable progress across the board. Examples include: attracting more headquarter operations than any other country in Europe; London having a higher density of start-ups than any other city in the world; Fintech deals experiencing a five-year compound annual growth rate of 74 percent, twice the rate experienced globally including Silicon Valley; and more online crowdfunding campaigns run out of London than any other city in the world.

A critical driver of this growth has been the prioritization of the technology sector by the government and regulators who are promoting policies that encourage technology innovation and investment. There are strong tax incentives for research and development, a lower corporation tax rate of 10 percent on income generated from UK patents, as well as tax-efficient structures for investors in new enterprises. Combining these fiscal incentives with world-class education institutions and a strong creative culture have helped the UK's tech sector progress strongly to a position where it is now one of the most attractive locations for technology investment. Importantly, this success is broad-based, from FinTech to video gaming, from aerospace engines to vacuum cleaners, and from Formula 1 to the technology behind the Oscar-winning film *Gravity*. ●

**“There is no doubt that the technology sector is critical to most global economies, both as an industry in its own right and as an enabler of other sectors. It is therefore encouraging to see the focus that is being given to technology investment in the UK by the government. This will help the competitiveness of the UK as tech destination and build on the strong foundations we have around talent, legal framework, creative culture and infrastructure.”**

— **Tudor Aw** / Technology Sector Head, KPMG in the UK



## United States – The world's technology innovation center

**T**he U.S. tech economy continues to maintain its leading edge for innovation worldwide. Look at most any sector, from mobile apps and cloud to the exciting opportunities on the frontier in the IoT, biotech and data & analytics.

Silicon Valley is still the nucleus of disruptive breakthroughs that will rock business and consumer markets. In a sign of national strength, tech hubs are also becoming far more diverse both geographically and in tech subsectors throughout the 50 states.

New York City has emerged as a prominent tech hub, led by creative advances in digital media and adtech. Other tech hubs can be found in Seattle, as well as Austin and Boston. San Diego has become known as a biotech hub. And dare we say even Detroit and New Orleans are looking to get on the tech map, in a great example of necessity being the mother of invention. Nevada could emerge as well too with Tesla Motors planning to put a manufacturing base there. The sharing economy, with Uber and AirBNB as prime examples, is everywhere – although it's safe to say that drones and Google Glass aren't exactly mass (yet).

What continues to feed the U.S. innovation spirit is its highly entrepreneurial, risk-taking culture that is refreshed by new ideas and newcomers from abroad – although immigration reform is needed to retain more tech workers. Improvements needed in healthcare, education and cybersecurity set the stage for a steady source of new ideas from corporate America and startups to improve business and the quality of life in the United States and abroad.

New financing programs are helping to boost lots more startups than ever before in groundbreaking ways. Crowd financing has emerged as an alternative to venture capital and angel investment for some companies to get off the ground. Corporate venture investing from the likes of Google, Qualcomm and Intel have enriched the pools of capital for startups — and more

venture groups from overseas corporations such as Samsung, Baidu and Tencent are investing in U.S. tech startups. Venture capital in the U.S. remains the world's largest, with \$33 billion invested in 2013, about two-thirds of the global total, although VC is a powerful force too, in China, Israel, and India.

Other signs of the U.S. tech powerhouse status are its leading role in patents. The U.S. ranks first in the world for patent applications, with a 28 percent share of the world's total, with Qualcomm and Intel scoring among the top 10 companies for patent applications globally. The market value of U.S. tech titans is another power indicator. Apple, Google, Facebook, Amazon and eBay rank tops for market valuation – although Chinese e-commerce conglomerate Alibaba could surpass all.

The U.S. tech economy is increasingly influenced and impacted by innovations from abroad – particularly China. Mobile messaging and payment apps from Tencent's WeChat, smartphone maker Xiaomi, gaming and entertainment platforms YY and mobile commerce and banking from Alibaba are just a few examples. The U.S. needs to continue to embrace, and nurture the tech ecosystem and culture that has enabled tech innovation. ●

**“Emerging tech hubs around the world are gradually figuring out how to reinvent the U.S. model for disruptive innovations. That creative spark and risk-taking culture that the U.S. is respected for worldwide may never fade. But now as more overseas markets learn from the U.S. and begin to invent their own ideas and approaches, it's up to the U.S. policy makers, educators, entrepreneurs, technologists and corporate executives to maintain that competitive edge.”**

— **Gary Matuszak** / Global and U.S. Chair, Technology, Media and Telecommunications, KPMG LLP (U.S.)

# Innovation management

Going public, which used to be the gold standard of success for an entrepreneur, is not as appealing. Many founders prefer to keep their companies private for longer periods of time and others prefer to remain private.

## COMPANY'S PREFERRED GROWTH PATH

### STAYING PRIVATE MORE VIABLE THAN EVER

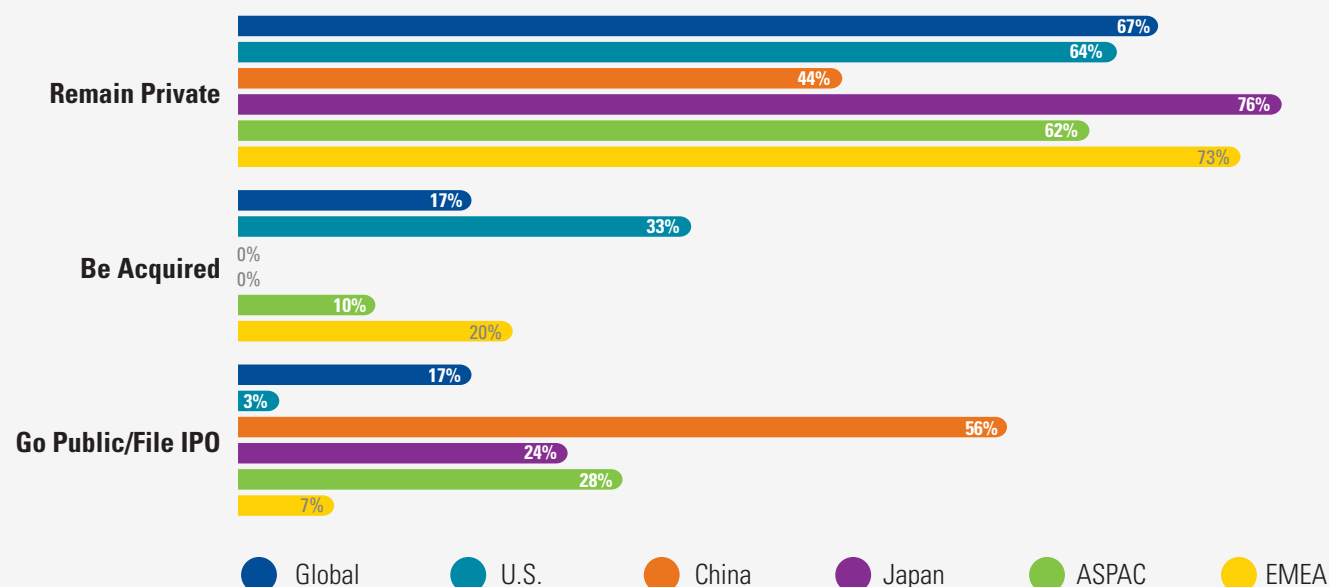
Companies are exercising more discipline to IPO. Building substantial businesses requires discipline to attract the right management team, build a strong balance sheet and a more global footprint. More and more startup founders (67 percent this year compared to slightly more than half last year) are preferring to stay as privately owned businesses as they scale operations. The ease of bootstrapping a lean startup makes this more viable than before. Mobile and cloud technologies cut costs and save time, and finance sources from debt to crowd finance to angel investment are increasingly abundant.

Despite the sky-high valuations that highly innovative startups are getting from the likes of Google, Amazon and Facebook, an acquisition isn't seen as attractive as staying private, and thus keeping the equity with the founders. Only 17 percent globally named acquisitions, with China skewing slightly higher on this point.

The cost of going public and the pressures on CEOs to meet quarterly performance goals are enough to diminish its appeal. Again, only 17 percent singled it out, although China proved to be nonconformist

with a startling 56 percent saying that going public is preferred. What Chinese entrepreneur doesn't want to ring the bell on Wall Street? ●

### Q: What is your company's preferred growth path?



Source: KPMG Technology Innovation Survey 2014

## KEY TECHNOLOGY INNOVATION ENABLERS

### TALENT TRUMPS IN TECH RACE

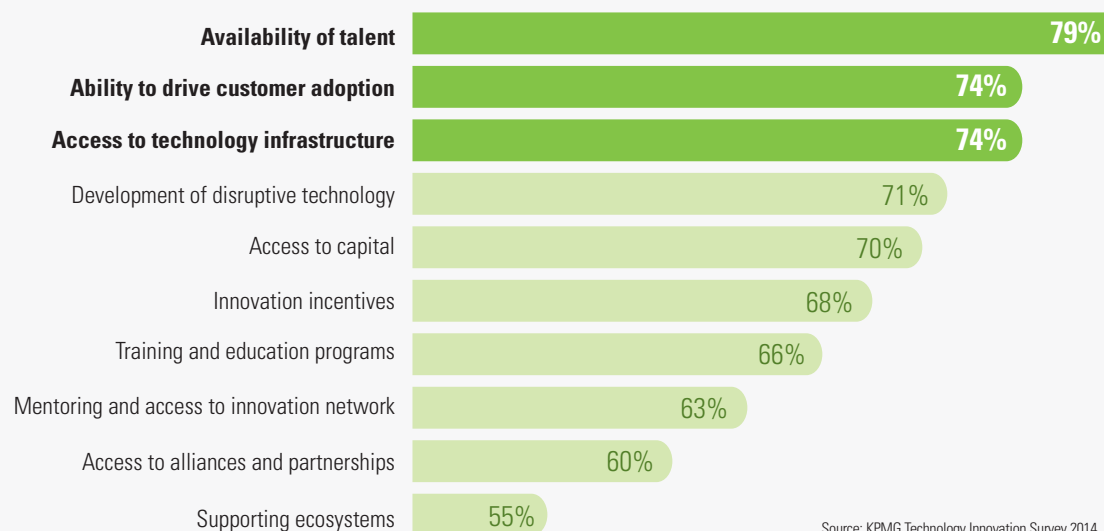
Availability of talent was cited more often than any other factor in enabling tech innovation. This finding was nearly universal. In the United States, immigration reform remains very much in the headlines to bring in more tech talent to fill highly skilled jobs.

China rated development of disruptive technologies with global impact as the most important priority, followed by customer adoption and access to technology infrastructure. These factors resonate as Chinese tech makers go from copiers to innovators and from local to global markets. China ranked nearly all the factors significantly higher than did other geographies. Japan and other Asia-Pacific nations tended to rate them higher as well – perhaps a recognition of the Asian region's ambitions to get ahead technologically. ●

“Tech companies big and small are playing the global resource game by picking the best talent from each market to gain competitive advantage. Talent, customer adoption and access to tech infrastructure have led the last three years as the top tech innovation enablers.”

– Patricia Rios, Global Director,  
KPMG Technology Innovation Center  
KPMG LLP (U.S.)

### Q: How would you rate the importance of the following factors in enabling technology innovation?



Source: KPMG Technology Innovation Survey 2014



## METRIC TO MEASURE INNOVATION VALUE

### THE ALMIGHTY INDICATOR – REVENUE GROWTH!

In an increasingly competitive marketplace, revenue growth continues to be the leading measure of innovation value, cited by more than one-third of those surveyed, a slight slippage from last year. Trailing closely is market value at 30 percent, an increase from the 20 percent seen in last year's findings. Brand reputation emerged higher on the barometer this year, with a 27 percent selection compared with 15 percent in the 2013 survey. It's an indicator that customer value really does matter big time. ●

### Q: What is the top metric used in your organization\* to measure the value of innovation?

Metric	Global	U.S.	China	Americas	ASPAC	EMEA
Revenue growth	36%	37%	28%	42%	32%	38%
Market value	30%	21%	33%	24%	38%	23%
Number of new customers	29%	15%	39%	18%	38%	25%
ROI	29%	29%	42%	26%	32%	26%
Market share	27%	31%	26%	33%	31%	13%
Brand/Reputation barometer	27%	19%	46%	20%	33%	24%
Number of patents	17%	9%	24%	9%	21%	19%
Other	<1%	2%	0%	1%	0%	0%

\*Asked among large enterprise/mid-market companies only

Source: KPMG Technology Innovation Survey 2014

## CREATING AN INNOVATIVE CULTURE

### MONEY COUNTS

It may be a no-brainer to agree that financial incentives such as a bonus or a salary increase are the most effective ways to create a culture that embraces innovation. More than one-third picked this metric, outscoring career progression, time off to come up with new ideas, internal recognition and finally, external recognition. Career progression advanced year-over-year, with more companies refining career and promotion paths to reward and retain motivated talent in a very competitive sector.

Internal acknowledgement scored a little higher this year than last. With more and more people working remotely, perhaps this sort of soft reward can be used more often as a motivational tool and teamwork builder. ●

### Q: Which is the most effective method for an organization to motivate its employees to be innovative?

Method	Global	U.S.	China	Americas	ASPAC	EMEA
Financial incentives (bonus, salary increase)	38%	50%	41%	45%	39%	31%
Career progression (promotion)	21%	17%	28%	18%	24%	18%
Time allocation (paid time allocated to innovation)	17%	12%	13%	15%	16%	20%
Internal recognition (acknowledgement)	12%	15%	6%	21%	9%	17%
External recognition (market place notoriety)	12%	5%	12%	8%	12%	14%
Other	<1%	1%	0%	1%	0%	<1%

Source: KPMG Technology Innovation Survey 2014

“One of the big trends is that instead of solving problems for the wealthy, we solve the problems for the 5 billion in the world who are not wealthy. The developing world is now leaping ahead because of technology to improve mobile health, and farming.”

— Jon Medved, Founder & CEO,  
OurCrowd, Jerusalem, Israel  
(Interview page 29)

# Conclusion

The democratization of technology, data, services and knowledge enabled by cloud, mobile, and social are creating exponential opportunities for new technologies to be developed and industries to be disrupted.

**T**he global survey findings indicate 3D printing, IoT, and biotech/healthcare are in the portfolio of emerging technologies rising on cloud and mobile's long tail of disruption. The findings also highlighted the steady rise of data & analytics (D&A), auto tech and artificial intelligence.

**With the ramp-up of new and complex technologies**, it's paramount that business leaders proactively embrace the new opportunities enabled by tech innovation. In many industries, the fast entry of disruptive technologies and new business models signals the end of business-as-usual for market leaders, who may not have the expertise to respond to a superior alternative. Companies big and small need to foster a culture of innovation, enabling experimentation, accepting failing fast, and encouraging teams to iterate quickly. Continually inventing the future is the way to stay ahead, but it's not easy when so many diverse areas of tech are taking hold, risks abound, and talent is in short supply in some markets.

**Security and privacy risks have the potential to worsen as data & analytics**, always-on connections and IoT technologies spread. There is a great market opportunity for visionary innovators who can develop next-generation security models. Yet for enterprises and governments, tackling security and transparency issues will remain paramount even as next-gen cybersecurity solutions emerge to deal with this challenge.

**Meanwhile, other barriers such as technology complexity and customer fatigue** have emerged as key issues. Figuring out how to integrate new and older technologies so that they work together seamlessly, in our business and consumer lives, is a great problem for innovative tech leaders to tackle.

**Silicon Valley no longer has a lock on tech innovation.** Today, multiple hubs exist and emerging technologies are created in many countries including Japan, Israel, China and India. Technologies such as mobile commerce and digital currencies have taken hold more rapidly in Asia than in the West, leapfrogging over legacy systems. Micro-innovations from China for gaming, instant messaging and smartphones are now being copied in the West – the reverse of a decade ago.

**Leaders, across industries, need to keep up** with and outpace existing and new competitors to a much higher degree than in the past. Capturing some of the entrepreneurial magic that has made Silicon Valley the inspiration for the world and applying that creativity to technology advances is an important path to develop new solutions. Innovation will remain as a critical differentiator in most industries as organizations are continually competing in the development of the next generation of products and services that will add economic value and serve those who are most in need. ●

“ In Silicon Valley we've seen a more proactive approach from multiple industries to collaborate much closer with the tech sector in the development of the next wave of industry innovation. Today, leaders from across industry need to keep up and outpace multiple market forces to a much higher degree than in the past. Ultimately, it's critical to develop a roadmap to drive incremental value, monetize new business models and identify the global and local partnerships to succeed.”

– Gary Matuszak, Global Chair, KPMG  
Technology, Media & Telecommunications  
KPMG LLP (U.S.)

## Authors

### **Gary Matuszak / Global Chair, Technology, Media and Telecommunications, KPMG, LLP (U.S.)**

Gary Matuszak is the global chair – KPMG’s TMT industries and Chair of KPMG’s Technology Innovation Center. Mr. Matuszak works with global technology companies ranging from the Fortune 500 to pre-IPO startups, and represents KPMG in a number of organizations impacting the industry. Mr. Matuszak has devoted virtually his entire career to serving the technology industry and has influenced the industry thinking on several key issues. He is a frequent speaker on technology industry trends, including cloud and mobile business strategies, global technology industry perspectives, and C-suite technology business outlooks. His speaking engagements include the Stanford Directors College annual conference and CNBC’s Squawk On The Street. Before joining KPMG in 2002, he was the Silicon Valley office managing partner for Arthur Andersen where he led the U.S. Software practice.

### **Richard Hanley / Advisory Industry Leader, Technology, Media and Telecommunications, KPMG LLP (U.S.)**

Based in Silicon Valley, Richard works with U.S. and global clients in the areas of management and risk consulting, as well as transactions and restructuring. Mr. Hanley’s previous responsibilities at KPMG include Advisory practice leader for the Bay Area and Pacific Northwest and the national technology sector leader for Transaction Services. Richard provides advice on domestic and cross-border mergers, acquisitions, and disposals to leading technology companies as well as private-equity and sovereign-wealth funds. He advises clients on due diligence, including evaluation of commercial, financial, and accounting aspects of potential acquisition targets and assistance with purchase agreements. He also assists with postmerger integration. Mr. Hanley has an economics degree in accounting and business finance from Manchester University and is a member of the Institute of Chartered Accountants in England and Wales.

### **Patricia Rios / Global Director, Technology Innovation Center, KPMG LLP (U.S.)**

Patricia Rios manages the Technology Innovation Center, which is a global entity created to identify and evaluate the impact of disruptive technologies that may result in business transformation. Ms. Rios joined KPMG in 2008 as the technology industry marketing director and assumed her current responsibilities in 2011. Before joining KPMG, Patricia held global marketing leadership roles in the information technology industry, including more than seven years at Oracle and Sun Microsystems. She also has extensive sales and business development experience in private banking at JPMorgan Chase. Ms. Rios has served as an advisor to startup companies involved in outsourcing, smartcards and other emerging technologies. She holds an MBA degree in finance and a bachelor’s degree in marketing from the Illinois Institute of Technology.

## Interviewees

We thank the following tech sector leaders for their valuable insights:

**Dr. Michele Guarnieri** / Co-founder, HiBot

**Dr. Shigeo Hirose** / Professor Emeritus, Co-founder, HiBot

**Jon Medved** / Founder & CEO, OurCrowd

**Sameer Patel** / SVP & GM, Enterprise Social Software, SAP

**Sonny Vu** / Co-founder & CEO, Misfit Wearables

**Geoff Yang** / Partner, Redpoint Ventures

## Contributors

We appreciate the insights and support of the following individuals in the development of this publication:

**Hasan Dajani** / Associate Director, Primary Research, KPMG LLP (U.S.)

**Kevin Davidson** / Marketing Director, Technology, KPMG LLP (U.S.)

**Charles Garbowski** / Director, Primary Research, KPMG LLP (U.S.)

**Paul Pullara** / Associate Director, Design, KPMG LLP (U.S.)



## About KPMG

### KPMG: AN EXPERIENCED TEAM, A GLOBAL NETWORK

KPMG's technology professionals combine industry knowledge with technical experience to provide insights that help technology leaders take advantage of existing and emerging technology opportunities and proactively manage business challenges.

Our network of professionals has extensive experience working with global technology companies ranging from Fortune 500 companies to pre-IPO startups. We aim to go beyond today's challenges to anticipate the potential long- and short-term consequences of shifting business, technology and financial strategies.

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Rebecca A. Fannin is a contributor to *Forbes* writing about emerging tech markets and innovation trends. She is the author of two widely read and influential books, *Silicon Dragon* and *Startup Asia*. Ms. Fannin runs news, events and research group Silicon Dragon Ventures, and is a public speaker and media commentator. She has contributed to several KPMG publications.

### 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 global technology thinkers including entrepreneurs, Fortune 500 technology executives, venture capitalists and KPMG member firm professionals.

The KPMG Technology Innovation Center is headquartered in the United States. The global network includes Australia, Brazil, Canada, China (and Hong Kong), Germany, Finland, France, India, Ireland, Israel, Italy, Japan, Korea, Netherlands, Russia, Singapore, Slovakia, South Africa, Spain, Taiwan, the United Kingdom and other countries.

**The center provides access to a number of programs including the following:**

- **Tap into unique insights identifying technologies that will drive business transformation and reshape the future of the tech sector and other industries**
- **Access a global network of tech sector visionaries**
- **Join digital and in person programs with tech visionaries**
- **Drive ideas for global research about emerging technologies**
- **Opportunity to be a featured speaker in KPMG's global Technology Innovation Center and country summits.**

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# KPMG Technology Innovation Center Contacts

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

## Global

### **Gary Matuszak**

Global and U.S. Chair,  
Technology, Media & Telecommunications  
KPMG LLP (U.S.)  
gmatuszak@kpmg.com

### **Patricia Rios**

Global Director, Technology Innovation Center,  
KPMG LLP (U.S.)  
patriciarios@kpmg.com

## Countries

### **Australia**

#### **Peter Mercieca**

Technology, Media and Telecommunications,  
National Partner in Charge,  
KPMG in Australia  
pmercieca@kpmg.com.au

### **Canada**

#### **Brendan Maher**

National Industry Leader,  
Technology, Media and Telecommunications,  
KPMG in Canada  
bmaher@kpmg.ca

### **China**

#### **Edge Zarrella**

Partner, Clients and Innovation Consulting,  
KPMG in China  
Egidio.zarrella@kpmg.com

### **India**

#### **Akhilesh Tuteja**

National Head – Technology sector,  
KPMG in India  
atuteja@kpmg.com

### **Ireland**

#### **Anna Scally**

Partner,  
KPMG in Ireland  
Anna.scally@kpmg.ie

### **Israel**

#### **Ofer Sela**

Technology Partner, KPMG in Israel  
osela@kpmg.com

### **Japan**

#### **Hiroto Kaneko**

Head of Technology,  
Media and Telecommunications,  
KPMG in Japan

#### **Eiichi Fujita**

Technology Lead Partner,  
KPMG in Japan  
eiichi.fujita@jp.kpmg.com

### **Korea**

#### **Sung Rae Park**

National Industry Leader,  
Technology, Media & Telecommunications,  
KPMG in Korea  
seungyongchoi@kr.kpmg.com

### **Russia**

#### **Alisa Melkonian**

Partner, Head of Innovation & Technology,  
KPMG in Russia and the CIS  
amelkonian@kpmg.ru

### **Singapore**

#### **Juvanus Tjandra**

Partner, Management Consulting,  
KPMG in Singapore  
juvanustjandra@kpmg.com.sg

### **Slovakia**

#### **Vladimír Švac**

Head of Innovation Advisory Services,  
KPMG in Slovakia  
vsvac@kpmg.sk

### **S. Africa**

#### **Frank Rizzo**

Technology Sector Leader,  
KPMG in South Africa  
frank.rizzo@kpmg.co.za

### **Taiwan**

#### **Samuel Au**

Partner, Head of Technology,  
Media and Telecommunications,  
KPMG in Taiwan  
syau@kpmg.com.tw

### **United Kingdom**

#### **Tudor Aw**

Technology Sector Head,  
KPMG in Europe ELLP  
tudor.aw@kpmg.co.uk

### **United States**

#### **Richard Hanley**

Advisory Sector Leader,  
Technology, Media & Telecommunications,  
KPMG LLP (U.S.)  
rhanley@kpmg.com

### **Gary Matuszak**

Global and U.S. Chair,  
Technology, Media & Telecommunications  
KPMG LLP (U.S.)  
gmatuszak@kpmg.com

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