



*cutting through complexity*

TECHNOLOGY INNOVATION CENTER

# Mobilizing Innovation:

The changing landscape of  
disruptive technologies

**KPMG Technology  
Innovation Survey 2012**

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

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# Foreword

The brisk pace of technology innovations – including mobile devices and apps, social networking and cloud – indicate a need to constantly assess the business implications of disruptive technologies.

KPMG's Technology Innovation Survey reflects the viewpoint of 668 global technology leaders. The web survey was conducted from March to May 2012.

The development and adoption of new technologies is spreading out from the Silicon Valley epicenter to tech hubs around the world. Asia is leading the charge in mobile communications and commerce, skipping past the PC generation of the West. Technology parks have sprung up in Beijing, Bangalore and beyond as emerging markets vie to move up the innovation ladder from manufacturing or outsourcing centers. China is already the world's second-largest economy, and as micro-innovations unfold, could eventually stack up to Silicon Valley as a tech force.

Today and for the foreseeable future, tech innovation can drive a nation's economy forward and create jobs. Those leaders, companies and markets that can leverage technology's rapid advances will

be market share winners. What company doesn't want to have its own Steve Jobs-like leader, who can imagine futuristic designs and products and then commercialize them with big profits?

KPMG's 2012 Technology Innovation Survey proves it is a bold global tech era. We are moving to a new cycle of convergence and connectivity, led by cloud and the mobile internet. This trend will continue to change our lifestyles, buying habits and business practices in ways that could not have been foreseen just a couple of years ago.

We hope you find the survey results insightful, and we welcome feedback about the findings or suggestions for the next Technology Innovation Survey.

### **Gary Matuszak**

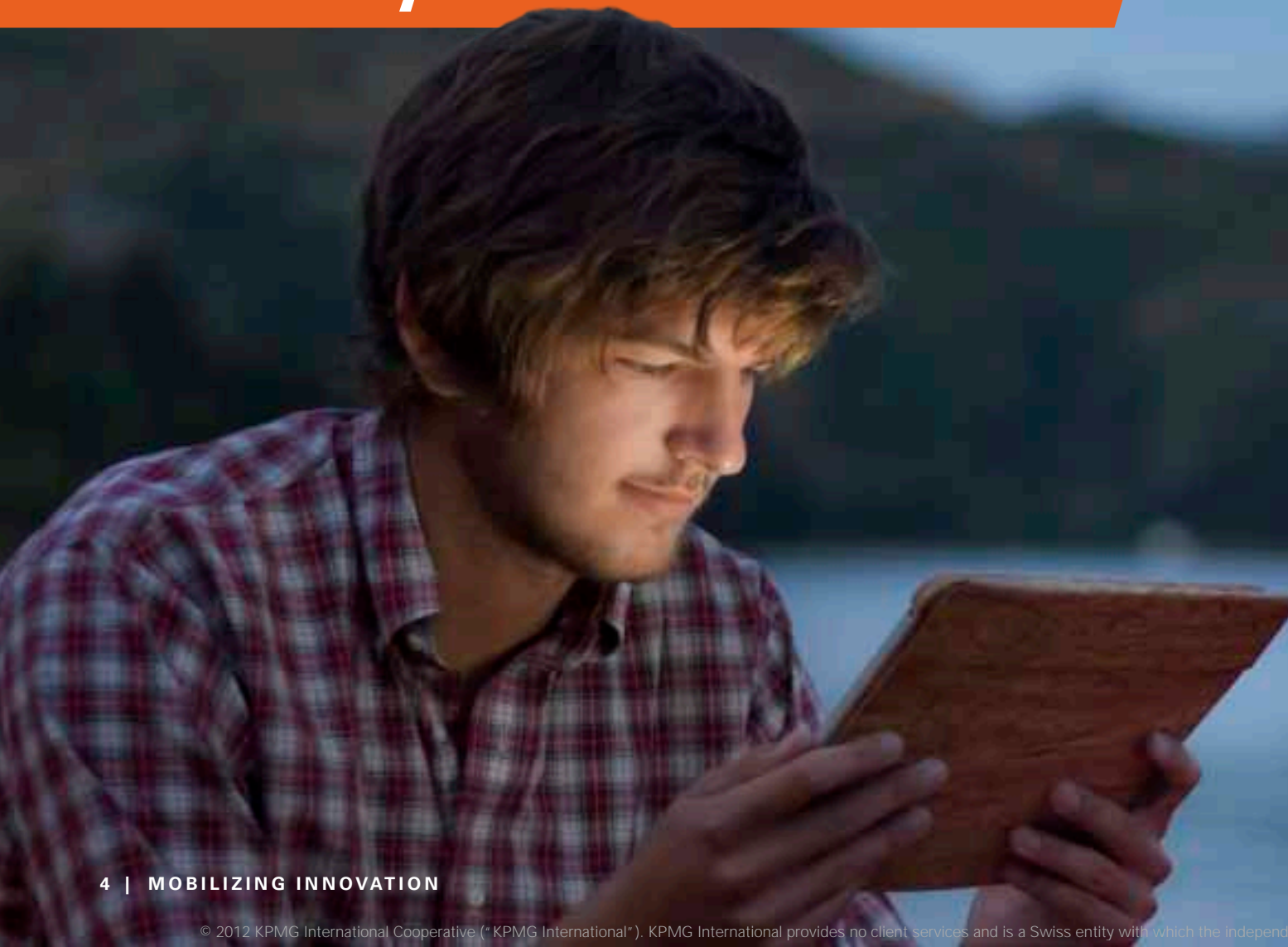
Global and US Chair, Technology,  
Media & Telecommunications

### **Tom Lamoureux**

Global and US Advisory Sector Leader,  
Technology

# Executive

## summary



# Innovations are transforming a variety of sectors in unforeseen ways in this switched-on era: smartphones, tablets, social networking, digital media, mobile commerce and the ubiquitous cloud. All are shaking up our lifestyles and workplaces.

Countries that were not part of the technology innovation map are emerging with talented entrepreneurs. Well-known technology innovation leaders such as Amazon, Apple, Facebook, Google and Microsoft are being joined by upstarts such as Tencent and Baidu from China. Visionary technologists like Masayoshi Son from Japan and Jack Ma from China are getting in the headlines outside their home country.

Three key takeaways of the survey's findings include:

- The undeniable power of cloud to unleash innovations and improve productivity.
- The still-developing transformations of an “always-on” mobile era.
- China emerging as a force that will compete with the US to foster tech innovation and gain market leadership.

## **The cloud floats above all in a storm of tech disruptions**

More than half of respondents point to the cloud (SaaS, IaaS and PaaS) as the next indispensable consumer technology and the greatest driver of business transformation. As the cloud emerges as a widespread technology and platform for new business models, disruptions in enterprise and consumer markets will continue to be a major trend to watch.

## **The upside of the mobile internet**

Three key results spotlight the onward march of mobile:

- Smartphones and tablets lead as top technology breakthroughs that will result in the biggest business transformation for the time being.
- Mobile device manufacturers such as Apple out-rank other types of businesses for tech innovation leadership within the respondent's home country.
- About one-third point to internet companies (such as Google and Amazon) as emerging champions in the fast-developing mobile commerce ecosystem.

These trends are led by the advanced mobile communications markets of Japan and Korea, big and growing mobile bases in China and India, and the uptake of next-generation mobile standards around the world.

## **Potential challenge to Silicon Valley's position as tech innovation leader**

More than 4 in 10 say it is likely that the world's technology innovation center would shift from Silicon Valley to another country in the next four years. Of those who believe Silicon Valley will not be the tech leader of the future, 44 percent point to China as the world's leading innovation hub by 2016.

The survey revealed a deviation in opinions along national lines about this China-US dynamic. Nearly three-quarters of those polled in China compared to about one-fourth of US respondents foresee that China has the greatest potential for disruptive breakthroughs with a global impact. Not surprisingly, US-based scorers rank the US in first place. It is no longer a shock to predict China's rise to prominence as a technology leader.

## **Apple leads as top tech innovators: the tipping point**

Apple and the late Steve Jobs lead the list of the world's most innovative companies and top visionaries by a wide margin. In second place is Google. Microsoft and Bill Gates also stand out for progressive innovation leadership, as do IBM, Mark Zuckerberg and Facebook, and Jeff Bezos and Amazon.

## **Time to quit class and join a startup?**

Less than half of respondents believe that their country's classrooms can help develop tomorrow's generation of innovative leaders – clearly leaving room for improvement over this heated issue.

## **Revealing differences about who leads the charge for innovation progress**

Nearly one-third say the responsibility to drive innovation rests with the CEO. Four in 10 feel research and development (R&D) is where innovation is most often spotted and nurtured.

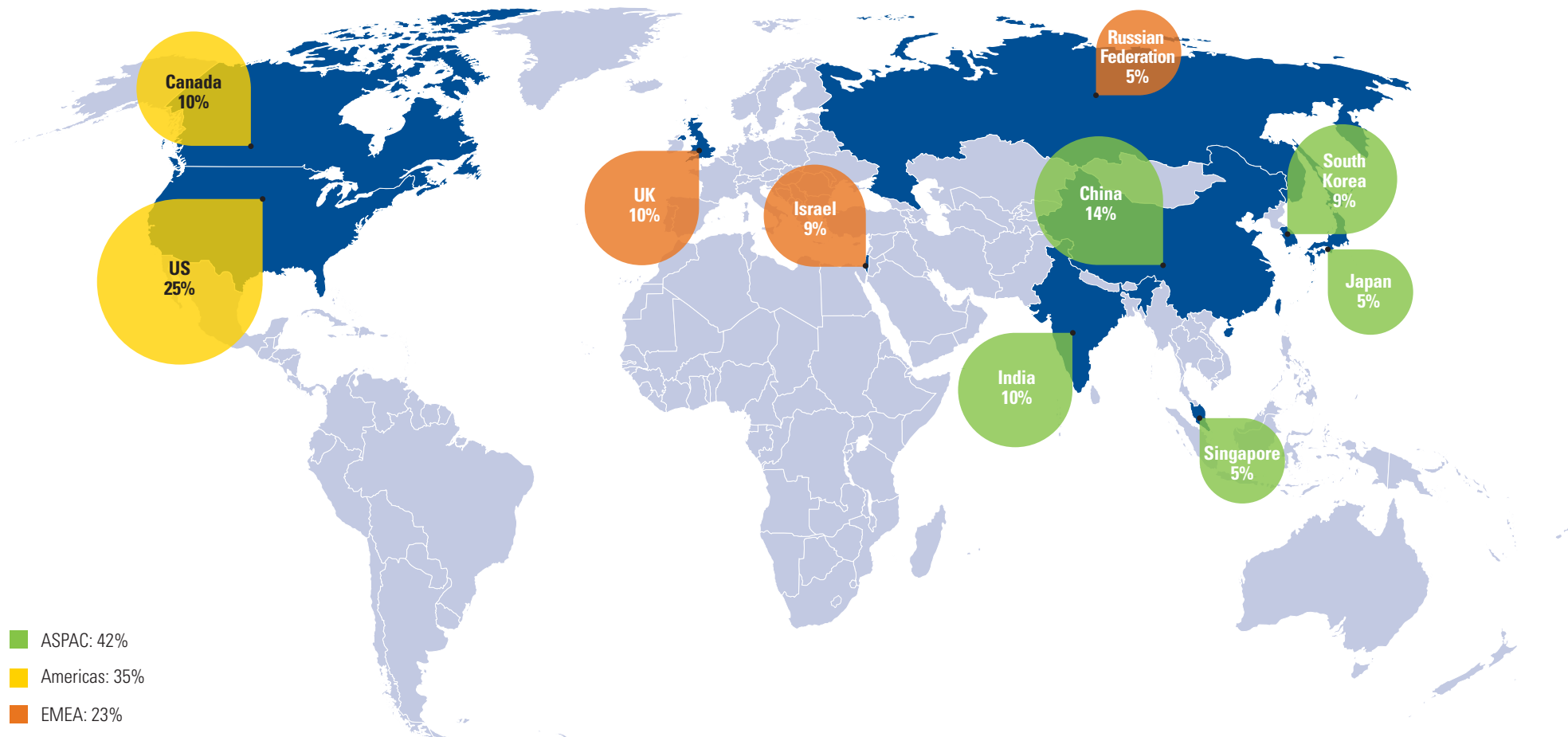
## **Championing innovation: the carrot and the yardstick**

How is innovation championed in the business world? Well, money works, with 4 in 10 answering that bonuses and salary increases are the most effective incentives. How do the survey's technologists measure the value of innovation? More than half respond that revenue growth is the best metric – understandably so. Surprisingly, the number of patents, a typical gauge for inventiveness, is ranked low.

# Demographics

## and methodology

Methodology: Participating countries/regions



■ ASPAC: 42%

■ Americas: 35%

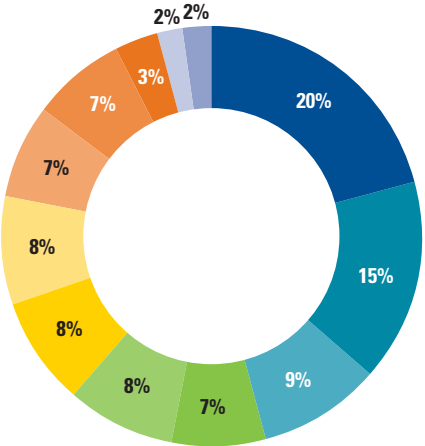
■ EMEA: 23%

Source: KPMG International 2012

KPMG's Technology Innovation Survey reflects the viewpoint of 668 global technology leaders. The web survey was conducted from March to May 2012.



Which of the following best describes your title?

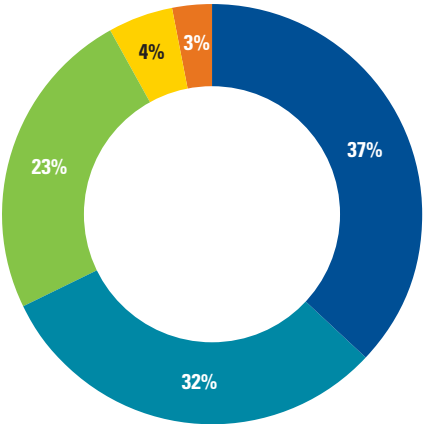


Global

- CEO
- Entrepreneur
- M&A VP, Director
- Corporate Strategy VP, Director
- Corporate Development VP, Director
- COO
- Chief Information Officer
- CFO
- CTO
- Venture Capital – Partner
- Angel Investor
- Chief Innovation Officer

Source: KPMG International 2012

Which of the following best describes your organization?



Global

- Mid-market enterprise
- Start-up technology company
- Large enterprise technology company
- Venture capital firm
- Angel investor

Source: KPMG International 2012

# Key findings

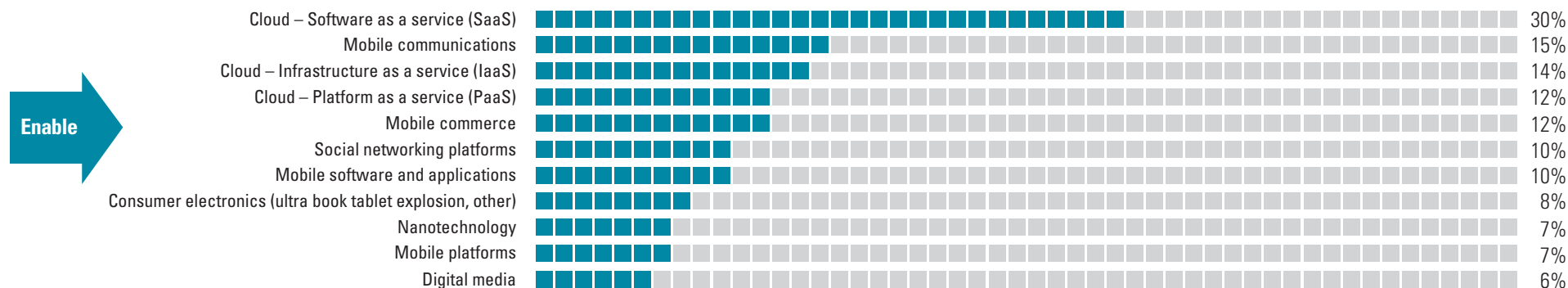


# FUTURE DISRUPTIVE TECHNOLOGIES

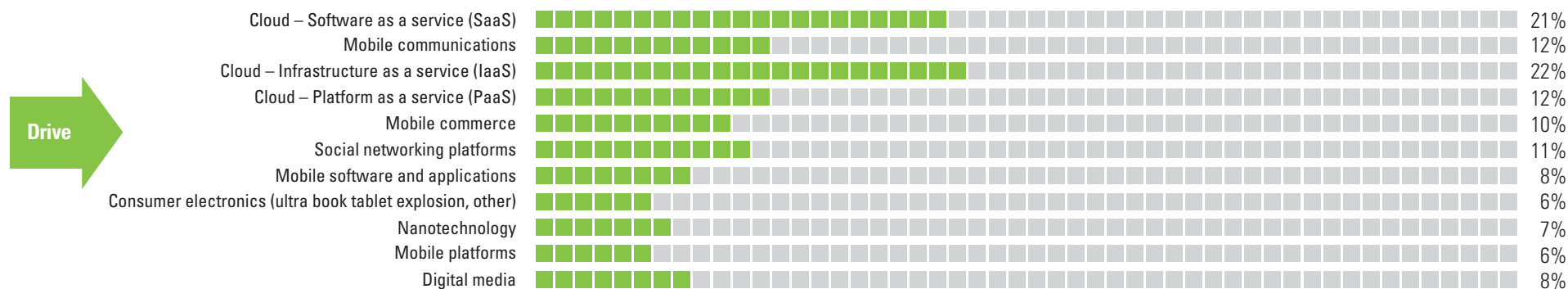
## Cloud and mobile innovations rocking consumers and business markets.

Mobile and the cloud lead as most disruptive technologies of the future; the two combined will magnify the transformation of business models and many industry ecosystems around the world.

### Select the top two technologies that will enable the next indispensable consumer technology in the next three years.



### Select the top two technologies that will drive the greatest business transformation for enterprises in the next three years.



Source: KPMG International 2012

### The cloud storms as a disruptive force

The cloud in its various forms (SaaS, IaaS and PaaS) trumps all market sectors by a wide margin in this two-part question as the most disruptive in consumer and enterprise markets. Slightly more than half (56 percent) predict that these cloud services will lead consumer technology change and shake up business the most (55 percent). Moreover, software as a service dwarfed the two other cloud categories (infrastructure and platforms), with 30 percent singling out SaaS on the consumer side and 21 percent for business.

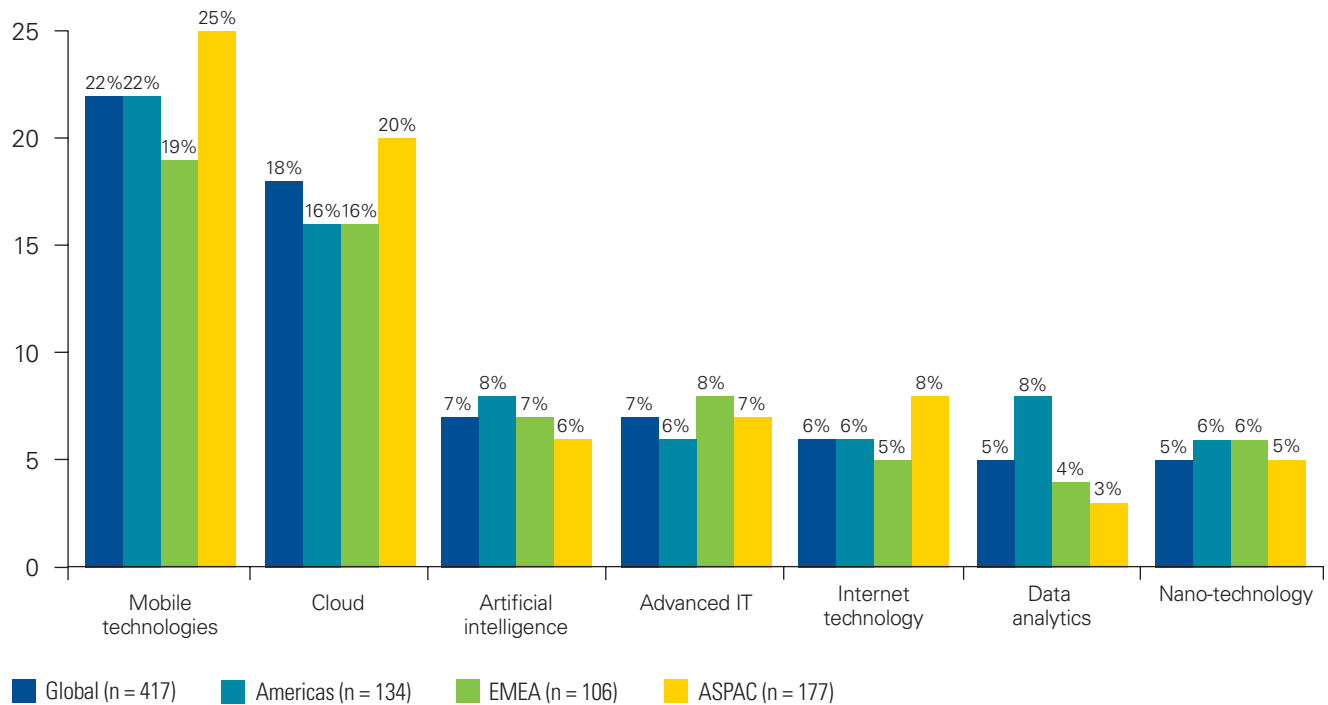
Throughout Asia, cloud is cited as a disruptive force by 72 percent and 63 percent on the consumer and business fronts respectively. Respondents from China give the cloud high marks, with 84 percent pointing to the cloud as the next must-have consumer technology and 74 percent saying it will have the greatest business impact.

### Cloud redefining markets in the US

In the US the cloud is seen as a potent disruptor according to 46 percent and 53 percent on the consumer and business fronts respectively. Cloud is transforming a variety of sectors including government and consumer markets.

US technology companies, both start-ups and established players, continue to roll out cloud services at a rapid pace. As a result, cloud service providers are managing a number of business transformations including the tension between pricing flexibility and dynamic revenue models, new business considerations related to tax structures and revenue recognition criteria, and the need to continue to educate customers about key metrics such as measuring time-to-market. From a US vendor perspective, the cloud sales cycles are shortening.

### What is the next technology breakthrough that will result in the greatest business transformation four years from now?



Source: KPMG International 2012

For the last three consecutive years, the KPMG US Technology industry outlook survey has indicated that technology executives expect cloud to be the biggest revenue growth driver in the coming years. In the survey released in May 2012, technology executives continue to cite cloud (51 percent), and mobile applications and devices (48 percent) as the biggest drivers of their company's revenue growth.

## Embracing the cloud in China

Today, there are five designated Cloud Computing Service Innovation Pilot Cities in China: Beijing, Shanghai, Shenzhen, Wuxi and Hangzhou. With significant government incentives, leading-edge projects in cloud, including R&D, are in abundance and produce a gamut of services to quench the appetite from business and consumer markets. The cloud is already ubiquitous in China; many consumers don't realize how often they access it for services like emails, mobile apps and social networking. The Asia Cloud Computing Association reported the Chinese government's plan to invest \$154 billion to boost the cloud industry over the next few years. The capital will no doubt encourage further involvement from local players and foreign direct investments (FDI).

## Mobile madness in the forefront

When it comes to breaking the mold, the broad category of mobile (communications, commerce, platforms and software and applications) comes close to the cloud's potential. Nearly half (44 percent) forecast mobile as the next indispensable consumer technology while more than one-third (36 percent) predict mobile will be the leading game-changer in the enterprise market. Of the four mobile sub-categories, mobile communications leads the pack.

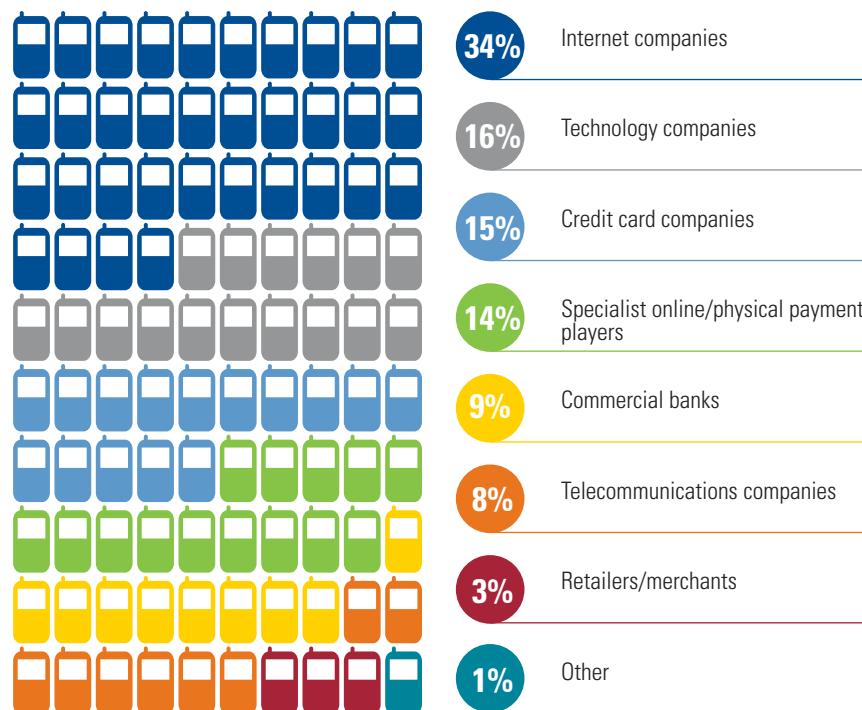
Select geographic markets favor mobile over the cloud as the top change agent. In Israel, for instance, 64 percent believe mobile will lead the next generation of consumer technologies while 58 percent feel the same way about the enterprise market. Additionally, in the Europe, Middle East and Africa region (EMEA), 54 percent foresee mobile as the most likely technology to shake up consumer markets in the next three years.

In one more measure of mobile's impact, smartphones and tablets lead as the next technology breakthrough that will provoke the greatest business transformation four years from now (according to 22 percent of respondents), followed by cloud and storage, at 18 percent.

In the swiftly advancing mobile commerce sector, where consumers are shifting to buying items on handheld devices rather than personal computers, Google, Facebook and Amazon net the most responses (34 percent) for leading this change. Respondents from China strongly agree, paradoxically; Facebook is blocked and Google has withdrawn from the local market.

**The mobile commerce ecosystem is changing at a fast pace. Which of the following industry players will lead the mobile payments market share over the next two to four years?**

## Global



Source: KPMG International 2012



**It is clear that technology leaders in countries where technology innovation is thriving believe that the cloud represents a technology tidal shift. The significant cloud investment that is under way is likely to spur technologies that drive breakthroughs in business transformation.**



**Tom Lamoureux**  
Global and US Advisory  
Sector Leader, Technology

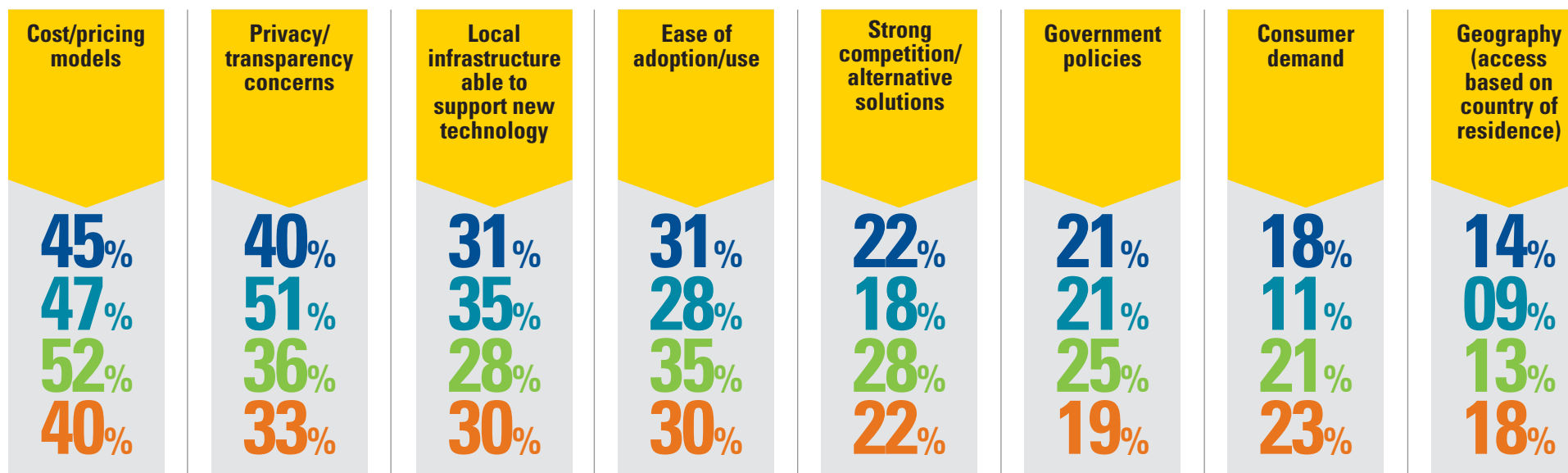
# Challenges

## and benefits in cloud and mobile adoption



## Pricing outweighs security issues for consumers to adopt cloud and mobile technologies.

What do you see as the biggest challenges for consumers to adopt the technologies in the next three years?



■ Global (n = 668) ■ Americas (n = 229) ■ EMEA (n = 156) ■ ASPAC (n = 283)

Source: KPMG International 2012

When asked what roadblocks limit the uptake of cloud and mobile consumer technologies, 45 percent name cost and pricing, more than any of the seven other factors. Coming a close second are privacy and transparency concerns, selected by 40 percent. With consumers sharing more and more data online and via their mobile devices, concerns over security and privacy

are a given – though it is unlikely these worries outweigh the advantages of being always connected and accessing a new array of services and products.

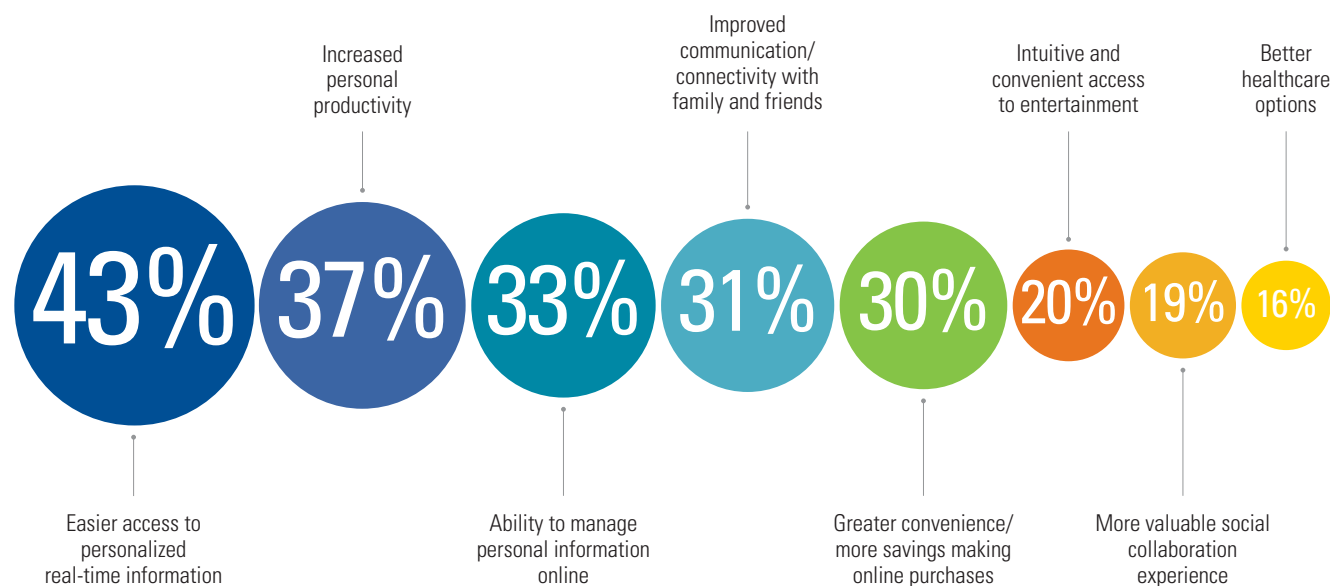
Ease of use is named by less than one-third (31 percent) as a limitation, highlighting industry progress in cracking this challenge.

# CONSUMER TECHNOLOGIES – BENEFITS

When it comes to the benefits of consumers adopting cloud and mobile technologies, a wide range of pluses are named such as convenience, better communications,

increased productivity, greater savings on purchases, and most of all, easier access to real-time personalized information.

**Select the top three benefits for consumers adopting these technologies.**



Source: KPMG International 2012

Enhanced ability to maintain control over that all-important digital persona also matters. Also highlighted are improved

entertainment and healthcare options, as mobile and cloud converge.

# ENTERPRISE MARKET

## Security/privacy are top of mind in cloud and mobile adoption.

What do you see as the biggest challenges for businesses to adopt the technologies in the next three years?



■ Global (n = 668) ■ Americas (n = 229) ■ EMEA (n = 156) ■ ASPAC (n = 283)

Source: KPMG International 2012

Opinions are mixed on the question of which barriers limit cloud and mobile adoption in the business world, although security and privacy issues are named most frequently (by 40 percent).

Respondents from large enterprises are more inclined to rank security as a priority issue.

A number of other factors receive about equal weight: cost is named by 35 percent while technology complexity is cited by 34 percent. There is little difference by region or country.

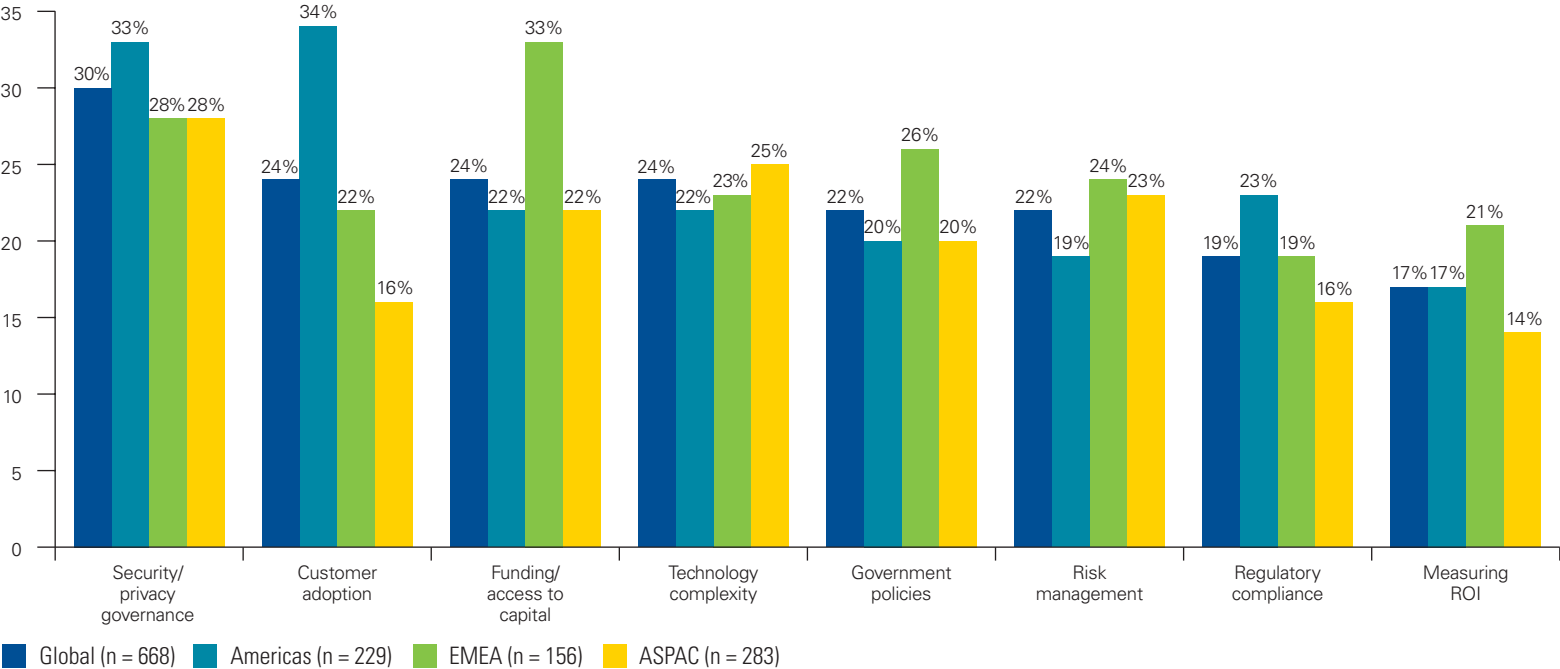
Lack of adequate corporate funding, technology complexity and regulatory compliance are also commonly identified as innovation barriers for enterprises. On the positive side, neither access to engineering talent nor monetization models are considered as significant obstacles.

**Privacy issues detour commercialization of breakthroughs**

Concerns over security and privacy surfaced again, with 3 out of 10 respondents claiming this issue as the biggest barrier to the commercialization of breakthroughs. Other issues such as access to capital, technology complexity and government policies are all seen as relatively less important.

Expect to see new developments in privacy and security solutions. As cloud and mobile business models continue to change, transparency from vendors is essential to maintaining customer trust and loyalty in the consumer and enterprise markets.

What are the top barriers to commercialize disruptive technology innovations?



Source: KPMG International 2012

“

**Security and privacy issues will continue to cause lots of headaches for consumers and businesses – but not enough to undermine the benefits of adopting new technologies. As cloud and mobile business models evolve, transparency from technology vendors is the key to keeping customer trust and loyalty in the consumer and enterprise markets.**

”

**Sanjaya Krishna**  
Digital Services Leader  
KPMG in the US

#### **Other technologies emerge**

Despite being the third most popular category, social networking was mentioned by just 10 percent of the survey participants as the next ground-breaking consumer technology, and only 11 percent cite business transformation. Respondents from Israel give particularly high scores to social networking as a disruptive force by 17 percent and 22 percent on the consumer and business fronts respectively.

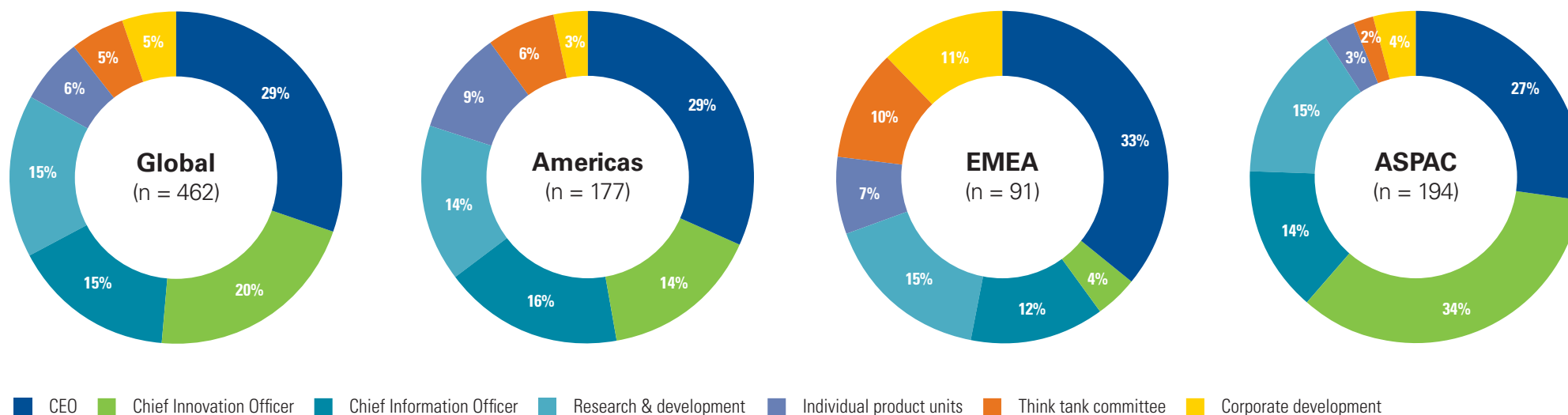
Far-out innovations such as 3-D technology and artificial intelligence also get on the map as big disruptive technologies. Interestingly, energy saving technologies are barely on the radar despite widespread policy and entrepreneurial priorities on cleantech. Big data/ analytics has low ratings as a disruptive force. We expect awareness to increase for big data as cloud, mobile, social business models evolve and converge.



# INNOVATION MANAGEMENT

About 3 in 10 say the CEO has the responsibility to drive innovation in their company

What function/role has the responsibility to drive innovation in your company?



Source: KPMG International 2012

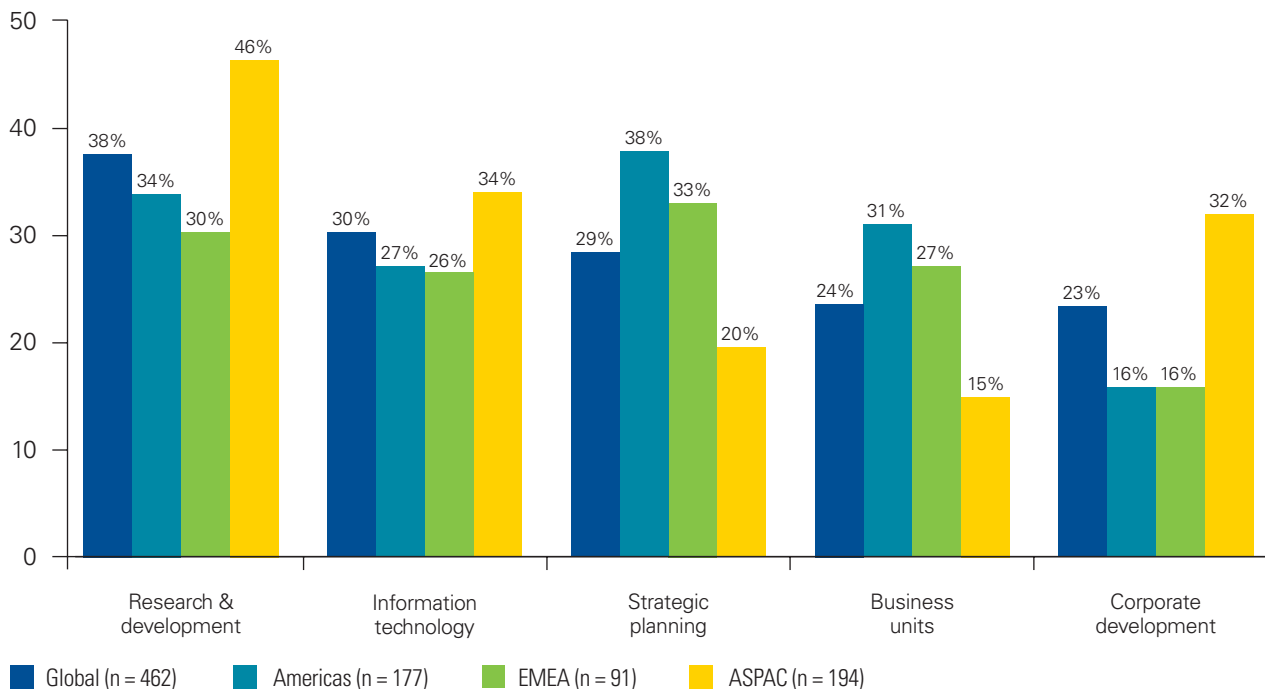
## The CEO is not the only one responsible for innovation leadership

Only 29 percent of respondents believe the CEO is responsible for spearheading their company's innovations. This is despite the contribution of the likes of Jobs, Gates and Ma in imagining and then churning out continually new and improved products and breakthroughs to give their companies a competitive edge. The survey findings

suggest that technology startups are more likely than other businesses to rely on their leaders for innovation inspiration. Chinese respondents indicate the Chief Innovation Officer has the responsibility to drive innovation leadership in their company, with more than half (51 percent) feeling that this role pioneers the pipeline of new products and services.



## Where is innovation spotted and nurtured in your company?



Source: KPMG International 2012

### Corporate innovation kick-started within R&D

More than one-third (38 percent) of those taking part in this year's survey said that innovation is most often spotted and nurtured within Research & Development. Respondents from Israel and China are more likely to hold this view, as are those from large and mid-market enterprises. Perhaps predictably, the business elements of R&D – Strategic Planning and Corporate Development – are also seen as important contributors.

Respondents at small, medium and large companies, consistently point to revenue growth as the leading metric

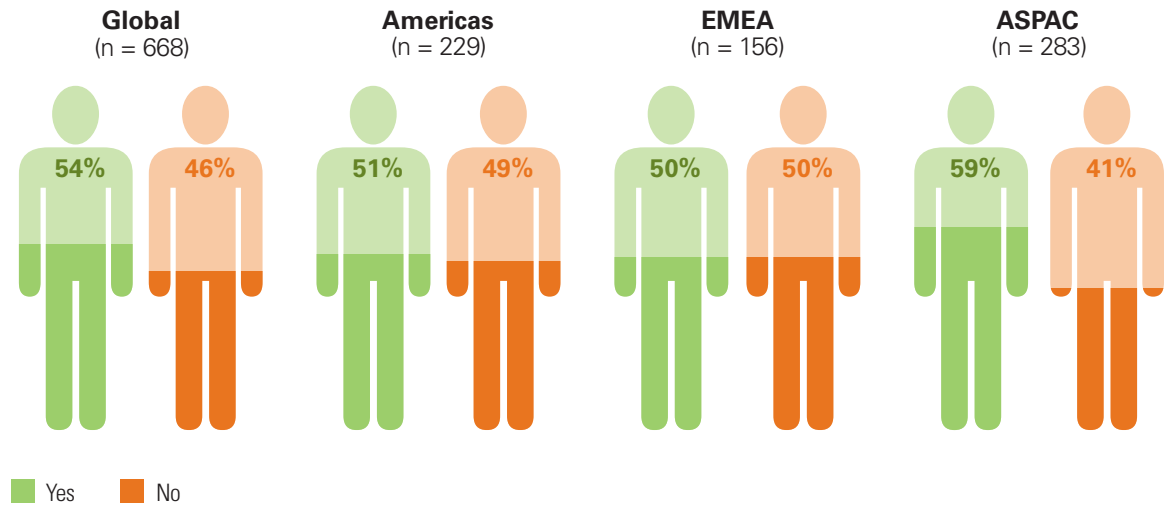
to measure innovation value, followed by return on investment and then market share.

Even an inspiring leader can not do it all, and in their quest to stimulate a creative environment, respondents from small, medium and large companies feel that financial incentives (bonus, salary increase) are the single best way to motivate employees to be more innovative, followed by good career progression opportunities and internal recognition.





### Is the educational system in your country an incubator for innovative thinkers?



Source: KPMG International 2012

### Time to quit class and join a startup?

Is the glass half empty or half full? It all depends on your perspective.

A slim majority of those surveyed (54 percent) believe the educational system in their country is an incubator for innovative thinkers. Looked at from another angle, almost half agree that there is room for improvement in their nation's classrooms in the search for the next Steve Jobs or Jack Ma.

There are also some intriguing geographic differences; 74 percent of those responding from China say that they are OK with their educational system as a font of original thinking, compared to 48 percent from the US.

These findings could be interpreted as a wake-up call for educational systems striving to prepare a new generation of technology innovation leaders.

# Technology

innovation perspectives



# Lisa Lambert

Vice President, Intel Capital, and Managing Director,  
Software and Services Sector, Intel  
Santa Clara, California

## **What are some of the key tech innovations that Intel Capital foresees?**

Mobility is a trend that is here to stay, and it's a huge area. The idea is how to improve on the Apple experience across devices and make it seamless and secure. That's more paramount than before. Some examples are mobile in the automobile, analytics tracking across mobile, pushing messages to a colleague, chatting across devices intermittently and live, or using your phone to make a purchase, as well as location-based services. It's about personal and customized content and a seamless set of platform capabilities so that you have great uses across all devices.

Another significant area is big data and analytics, an area of business intelligence that has been around for quite some time. Technology is now enabling it on a broad scale, and with distributed analytics and apps that can unlock data, you can get more insight from social and search. It's not just about harnessing the data, but scaling it across broad data points.

We think the cloud is huge and transformative. In cloud, the biggest thing going on for the enterprise is open source for the cloud. It offers an open source alternative to the cloud instead of proprietary services. It will reduce costs, lead to faster release cycles and enable the data center to grow.

## **Intel has made several investments across the 'compute continuum'. What's the significance?**

It's transformative and only started to be realized for the consumer in the past few years. It allows you to write a web app and run it on any platform and any operating system. It enables the vision of the continuum of computing; being able to move away from proprietary silos to cross-platform capabilities.

## **What do you see out there that is particularly edgy?**

One company that is in stealth mode makes a security solution that targets enterprises and it isolates web traffic for your company. The net effect

is to secure every browser interaction, and tag and protect it when the document is open.

## **Do you believe the enterprise market is slower to adopt new technology than the consumer market?**

Yes, and it's unlikely to change, not because enterprises are not innovative, but because they have so many restrictions for adopting technology that they lag behind consumer adaptations. Everyone was using social media before enterprises, for example. In corporations, there are guidelines on who uses Facebook and Twitter, and which employees can use iPhones and tablets.

# Jeanette Horan

Vice President and Chief Information Officer, IBM

Somers, New York

## **What are some key innovations you are seeing in technology?**

Everyone is looking to get more leverage from cloud technology, whether for computer systems or storage. It is about business agility. If you can minimize time to bring up a product, it allows you to be more efficient and productive.

The second area is big data. These days we are so completely overwhelmed with information from the internet that we need ways to sort through this info, such as navigation, tagging, search technologies and visualization to help people narrow in on something much more quickly. There is a need to marry how the human brain works with PC systems and technologies.

Another area of innovation I am seeing is development of security for smartphones or tablets, when the same device is used for personal and business use. No one wants to carry two devices with them. For example, there is an Israeli startup that is working in this space now that allows you to have different partitions on mobile devices, to operate two Android systems on the same device – personal and business.

## **Is innovation keeping up with the needs of enterprises?**

In some areas, technology is lagging behind business needs. One issue is how we put sufficient technology

in place to make security seamless from a user point of view. You need a number of players working together: security vendors, device manufacturers and service providers. There is emerging collaboration in some areas but not at the pace we need.

## **Where will the next tech breakthrough occur: startups, multinationals, labs?**

It is all of the above. It always has been. At IBM, we still have an active research organization that is a source of new innovation and patents. There are always gaps that venture capitalists and startups will fill. With a difficult economy, many companies have cut back on core R&D. A combination of business, university and VC-funded startups will be the answer.

## **How is innovation fostered at IBM?**

Innovation is one of the core values of our company. There is a focus on the development of intellectual property and intellectual capital. The ability to be innovative is part of the consideration for an employee's promotion. We also have a patent award system – a cash reward – for different tiers of new patents, from filing to acceptance to publication.

## **How important are acquisitions in the mix for IBM to generate growth in new areas?**

Over the last 10 years, we have acquired more than 100 companies. We select the best of breed to

acquire. We have tended to acquire a fairly established company that will take us into an adjacent market. We also look to small startups with niche products, usually a software product that will fill a gap in our portfolio.

## **What do you see as the main barriers for the adoption of new technologies among businesses?**

The biggest issue is always culture. It's about challenging the status quo and making a case for change so that it will be supported by senior management and be seen as leading to greater productivity.

Some say, 'survey your users to find out the needs.' But if you think back to 1992, people would never have said that they want a web browser. It took corporations a long while to adopt this web-based technology. The initial perception about instant messaging was that it was for chat, a time waster. But at IBM, if our instant messaging system goes down today, it's a big problem because we use it for key business communications in real time.

## **How do you see social media evolving?**

Social media is a fundamental new way of communicating that was not born in a corporate environment but found its way in via the consumer environment – Instagram and Twitter, for instance. Today, you can work with people that you never

meet and it is changing the whole dynamic of staying connected. It's about this concept that Thomas Friedman popularized with *The World is Flat*. Companies are now determining how to use social media at work.

**Which markets globally do you see forging ahead?**

If you look at the number of software startups in Israel, it is disproportionately large for the size of population. Scandinavia is forward thinking. They skipped a generation in telephony and went wireless, and that has been an enabler. And now Scandinavia has moved into mobile payments. The other country that is very interesting to watch is South Korea.

The innovation culture in China is more about manufacturing processes. It is all about 'how can we do it faster, cheaper.'

**Will Silicon Valley continue to have an edge in innovation?**

Silicon Valley plays an important part as matchmaker and gathering place. It has VCs and entrepreneurs who do serial startups. The environment and culture is high energy and it's about taking risks. I think it will continue to have this edge, though there is a risk that another place could take over – just like what happened to the Cambridge/Boston area if you go back to the 1980s.

One trend to watch is that as companies like Google reach a certain size, they need to spread out their workforces, and they are accessing highly educated workforces and creating new hotbeds of innovation; for example, by expanding into the New York and Boston areas.

**Who would you name as a top visionary today?**

Apple is really the world-class example, and Steve Jobs. The retailer Target pioneered the thinking about customer rewards; if you give me info, you will get coupons. It is a new way of building brand loyalty.

**What's the next tech breakthrough that will transform business five years from now?**

I would like to say, 'Beam me up Scottie!' We need to find a way to deal with time zones so that global teams – all on different time zones – don't have to stay up talking in the middle of the night.

# Aaron Levie

CEO and Co-Founder, Box

Los Altos, California

## **What do you see as the transformative power of cloud?**

Any new generation of technology brings greater efficiency and productivity for businesses of all sizes. When you enable collaboration through the cloud, you speed the process time for manufacturing, for instance – and for all kinds of other unfathomable stuff – to minutes instead of days or weeks. The level of disruption and creativity that cloud brings to the enterprise has a disproportional impact. It is not just a better way to share photos, for example.

## **What is the next generation of cloud?**

We are moving from the implementation phase – where everybody has adopted the cloud to store information and to communicate – to the next phase: how to collaborate with better business intelligence. Then there's a layer of customizable applications that can be built on top of that for specific industries and uses. As one example, in the airline industry, flight attendants can access customer information on iPads and pilots can have a paperless cockpit.

## **In what business markets will cloud have the greatest impact?**

The impact of cloud software is so far reaching that it's impossible to pick just one market. In health care,

cloud makes it possible to connect to any doctor in the world and get real-time expertise. In e-commerce, you can sell things much more easily. We're also seeing the democratization of education through classroom content online. Cloud helps to connect latent demand and supply together and leads to disruptive business models, such as new mobile apps for booking a car service or an assistant to run errands.

## **Would you say that the cloud compares in impact with the advent of the phone or electricity?**

Totally. It allows for instant and organic communication. It can enable productivity gains for the enterprise, where information flows are still constrained or locked down.

## **When you put cloud, mobile and open systems together, where are we going with design concepts?**

There's an interesting trend going on where products are now being designed in an incredibly simple way. It improves the efficiency of a product, reduces friction to adoption and lowers barriers in a disruptive way – especially in the enterprise world. This is what Apple did with all its products. Technology that is built with as little complexity as possible will radically change every

space. It leads to new business model design such as the online self-service concept.

## **Where do you see Silicon Valley on the plain of innovation hubs globally?**

From an innovation and creativity perspective, Silicon Valley is doing really well. We have lost jobs, but we're recouping in terms of creativity and innovation, and with the success of companies such as Google and Facebook. But our educational system means that the current level of competitiveness is not sustainable. There is not enough emphasis on the sciences to get to the next evolution of technology.

## **What's your view of China as a center for emerging innovations?**

China doesn't currently operate with the same model as the US; it has capitalism with a slant. It's free up to a point. Sites can be blocked, there are privacy issues. These are huge barriers to mass innovation.

## **Where do you get your inspiration?**

I read a lot. On a Saturday at 1am I'll be reading an interview with Larry Ellison, for instance. I also talk to the CIOs of businesses in fields like nano-manufacturing and 3D printing, where the way their businesses are changing will have profound implications.

**Where will the next tech breakthrough occur:  
a startup, lab, multinational?**

It will come from the startup world. Original design is not impossible in big companies but it depends on the motivation of the executives. A startup can be as big or small as needed, and there's no blocking the idea. For example, we created and built mobile applications for Box in eight weeks. That would be a two-year project for a multinational.

**How is innovation spotted and nurtured at your company?**

We have a 'hackathon' where we stay up for 24 hours and build the craziest things out of bursts of innovation. We review the ideas as a product or engineering team and what we want to add to our pipeline. There may be 10 ideas that are commercialized out of the pipeline. The 'hackathons' encourage non-linear innovation – stuff that comes out of nowhere as opposed to linear innovation. It's our responsibility to bet on the right non-linear innovation.

# Ashish Gupta

Senior Managing Director, Helion Venture Partners

Bangalore

## **Is there a market in the world that can rival the US for innovative technology?**

Most of the cutting-edge work is done in the US and some stuff in Israel. Look at the cell phone technology that has erupted from the US with the iPhone and Android. The sheer innovativeness facilitated by the ecosystem in the Valley is hard to beat.

## **Do emerging markets such as India have a chance of ever catching up to Silicon Valley?**

Ever is a long time, but not for the next five to 10 years. From an innovation perspective, India is not on the same level as the US by a long stretch as it is catching up on either applying existing technology or solving a different problem that is not cutting-edge technology. If we consider the Bay Area, then the best of India and the best of the US congregate in Silicon Valley. This quality outstrips anything available anywhere else in the world. There is a positive feedback loop of leading-edge talent, leading corporations and leading venture capitalists. There is a virtuous cycle and it will take something to break it. The pace of change is so large that the market that is ahead can continue to get further and further ahead. Something catastrophic or truly disruptive would have to happen for a place with such a cycle to lose its leadership.

## **In the future, do you see multiple Silicon Valleys emerging?**

In the era of the cloud, the Valley is like the mainframe. It took friction to make that concentration happen. In the 1970s and 1980s, when there was no net, it made sense for everyone to be in the same place. It's hard to replicate the ingredients in another place to create this concentrated ecosystem, because distributed work is now easier. While there are areas of local concentration like Bangalore, it will be hard to displace the Valley given all the components that are needed.

## **What 'blue sky' technologies do you see on the horizon?**

Analytics and big data are one area. It's about intelligent use of a large amount of data to make planning decisions. For example, a cell phone can give access to traffic data and provide predictive analyses of patterns. There is also an enormous amount of data about consumer habits and it is being combined in ways that have never been done before. But what you do with that collective data becomes a privacy issue.

## **What are the possibilities that the cloud unleashes?**

To use an analogy; when electric current is taken from a local generator to the grid, you suddenly require a meter in your house. Soon it becomes more important

to optimize distribution and pricing rather than maintenance. Or as in farming, once food production scales, each player begins to specialize: someone grows bananas, others grow spinach, other distribute, some warehouse. So in the cloud, there is a need to manage computers on an industrial scale by the suppliers who will bill users for use and not for machines; and take over the challenge of information technology maintenance.

If you take the power analogy further, small factories can generate their own electricity or run their own cloud. Hewlett-Packard (HP) will stop selling the tools to manage machines within enterprises and instead a different set of tools will make sense. The internet traffic that goes into these pipes will not stop at your server but at networking centers. Security will be affected as well. The impact will even be more pronounced in emerging markets, where access will become cheaper as cap-ex is replaced by op-ex when using the cloud.

## **How do you foresee trends in mobile communications impacting our lives?**

In addition to the business impact, the mobile or the iPad are significantly impacting kids on a social level, for instance in the way we communicate with each other. These devices are used so much now that no one is observing what is happening around them. It's like

we are wearing helmets. Getting someone's undivided attention is not in the realm of possibilities given this sort of addiction.

**Who do you see as a global technology visionary?**

I am not a big believer in individuals, but rather that we feed off one another and synthesize what we hear and what we learn from the ecosystem.

**Can you comment on hurdles for innovation progress?**

The time taken to get the first million customers has shrunk and the corresponding level of each idea is shorter. It's like waging war with increasingly powerful weapons and not with our bare hands. In this scenario, the ability to cannibalize is the key element to a company's ability to go forward. The time for new ideas to arrive is as short as someone's ability to think of it. In the past, it was about manufacturing it. Today, you need bottom line lunatic fringe thinking as opposed to straight-line thinking.

**What do you see as the key sources of innovation?**

Innovation has become more focused on solving consumer problems. It's a big change from 20 years ago. Because we can get to the consumer inexpensively, hundreds can innovate at the same time. Corporations can innovate more on the consumer side than was possible in the past. Entrepreneurs are now able to innovate and take their ideas out to the market. More innovation has

become possible in the information technology world. Longer-term fundamental research however has suffered. Previously, Bell Labs, IBM and universities were doing long-term research. But now PhDs are creating startups and running them.

**Is this shorter cycle a concern for truly breakthrough R&D?**

This trend could hurt us in the long run, as more fundamental research is indeed valued. We are moving from long-term and medium-term innovation to extraordinarily short-term innovation. We pigeon-hole ourselves into more short-term innovation because of the attention paid to company balance sheets.

# David Chao

Co-founder and General Partner, DCM

Menlo Park, California

## **What are some of the new technology adaptations you're seeing?**

The top three new technologies are cloud, mobile communications and big data; although big data is a buzz word that is too over-used. Salesforce is a company that is innovating with its software solutions through the cloud. With the advent of cloud and mobile communications, we're seeing the collection of more and more data that was never available before that can be used for e-commerce and marketing.

## **Which company do you see as the tech innovation leader in the US?**

Google, with its Android technology. Intel is on the cutting edge with its smaller nano fabs. Apple is a gainer with its iCloud services.

## **In what types of organizations do you see tech advances bubbling up most readily?**

Whenever a company becomes big, there is a voice in management that worries whether a new idea will cannibalize existing revenues. A startup can put tremendous focus on a new concept and it can succeed or fizzle.

## **Turning to corporate R&D; which markets are leading in their approach?**

In the US you have corporates doing R&D for R&D's sake, but the mentality is not there for the Chinese corporations. It's not like at Xerox labs or even at Apple, where you see experiments. You need a

manager who can recognize the value of a new idea and take it to market, like Akio Morito did with the Sony Walkman. You have to be able to do R&D for innovation's sake rather than for the return on investment.

## **In which sectors are Asian markets leaping ahead?**

Japan is at the cutting edge of mobile commerce. For instance, half of the revenues of Japanese e-commerce company Rakuten are from mobile services. China can catch up with Japan very quickly in this area. The US might be the laggard in mobile commerce because it is so much more dependent on the PC.

## **Is technology innovation happening in China yet?**

For hard-core innovative, next-generation standards such as telecoms, it could take China 10 years to catch up. But for internet services, one could argue that China is almost on a par with the US. In communications services, China is lagging behind the US by months not years. China is more advanced in using short-text messaging. In China, the younger generation use their phone number as their ID, not an email address.

Another area to look at is video. Initially, China's Tudou and Youku were YouTube-like, but they have surpassed YouTube in their ability to create their own content such as movies. But if you ask, "is China coming up with new materials for batteries, inventing

a new kind of flash memory," then the answer is, "no, not yet."

## **Can China crack the innovation code better than Japan and Korea?**

Japan has really had a lot of success in implementing enabling technologies. For instance, Japan was the king of transistor radios in the early years, and then of CDs and DVDs. The Sony Walkman was a great example. Korea has been great in implementing memories and flash. Samsung in particular has been really good – and might be the best in the world – at implementation of new technologies. Take a look at the Samsung Galaxy smartphone as an example.

## **Can China move up the ladder from a copycat mentality to true innovation?**

If you look at the sheer number of Chinese engineers, the creative minds, the high proportion of the US higher education system who are Chinese Americans, then you can say that China has a chance of moving up. But it is very difficult because you have to break through cultural barriers and make risk-taking penalty-free. China would still rather experiment with Japanese or US technology and then implement it. China would rather bet on something that is working in another country, rather than do something visionary like you might find in Silicon Valley, such as two guys from Stanford working on new battery technology. In China, the focus is on making the manufacturing of the battery more efficient.

# Brad Bao

General Manager, Tencent Holdings US

Palo Alto, California

## **Tencent innovated with its QQ instant messaging service. What do you see today that is cutting edge?**

The next emerging trend is the ability to unify communications and sharing online across different platforms, including PC, mobile, tablets, etc. and across different services like IM, SNS, micro-blogging and more. Now users can access what they want to use from everywhere. We're helping users to build their "online life," not just provide a product.

## **Anything else exciting on the horizon?**

Cloud is very interesting. It used to be that the telephone line was the connector of people, then came the internet and mobile phone and now the cloud for sharing and storing. It is still very, very early stage and limited in what it does, but it is all about bringing your online life truly online, with cloud services that store music, photos and all kinds of documents and user data that can be accessed from all your devices.

## **What's the impact of cloud?**

Once the user's information, data and applications are all truly on the cloud, users will rely on the hardware or even the OS much less than before. Users will be free from hardware, OS or even software, and the old hardcore +OS +S software model won't work anymore. They will enjoy a superior experience that the personal computer just won't be able to match.

## **How do you see commercialization of new ideas happening?**

Ideas travel very fast, and if you look at the creation of the intellectual property laws, ideas can't be patented. What you want is a sharing of ideas that can make human society better. It's always a balance to protect IP rights without limiting its use and spread.

There's no perfect solution. For instance, a pharmaceutical company invests \$1 billion to develop a new drug that can be produced at low cost. If it is open to everyone, then that may not be enough commercial incentive for innovation.

## **What's happening in gaming?**

With online games, gaming is now becoming a natural part of users' online life. However, there is a gap between the current games and the need for games to be more interactive. On mobile, the top-selling games are mostly single-player games. If you look at social games, most of them are not really "social." There is room for social games to be appropriately integrated with users' online life and there are some big opportunities there.

## **Do you foresee another Steve Jobs coming along?**

I truly believe there will be another Steve Jobs. There is already more than one Steve Jobs in the world, and the stuff these people are working on just may not be consumer-facing or recognized. It will be hard to compare anyone with such an innovative, passionate,

smart and paranoid character who was so publicly recognized.

## **What companies do you see leading the pack and staying ahead?**

HTC from Taiwan in smartphones. It is not as prized as the iPhone but the impact is fast in that the tech-savvy people use smartphones. Google is a leader in search. What's happening is that the strong are getting stronger. Further consolidation will keep on happening. The winners will be those companies that have enough cash and can stay on the cutting edge of technology and market change.

## **Will Apple be able to sustain its lead?**

I believe so. Will it dominate for another 100 years? No one has the answer to that.

## **Can big companies continue to be leaders in inventing new things?**

Yes and no. Big companies have better tools and resources, yet are conservative. Innovation equals risk. At Tencent, we have an innovation center to try out new things without straight profit and loss reporting. It's driven by customer needs; identifying the need and implementing it. If it's successful, we'll commercialize it. Staying intimate with users and consumers is the way to stay innovative and add value.

# Kai-Fu Lee

Founder and Chairman, Innovation Works

Beijing

## **What are some of the interesting startups you are seeing in China?**

Almost three years ago we invested in the Android ecosystem. About two years ago we made a bet on casual and social gaming, and a year ago we bet on specific social networking opportunities. Six months ago we started on online to offline e-commerce. We try to localize ideas and anticipate trends. Many Chinese companies follow American companies.

## **Do you see a trend from 'made in China' to 'invented in China'?**

Any Chinese company that merely copies and does nothing else will fail. The successful ones are those that copy, localize, iterate and micro-innovate. Some examples are Tencent's instant messaging service. It is no longer anything like MSN instant messenger having evolved way beyond this. Baidu search is quite a bit different from Google search. Sina Weibo is different and, some would say, much better than Twitter. Fundamentally, the whole American education system is more innovative, more risk taking, more out of the box and more rewarding even for failures. The Chinese culture tends to take what's good from somewhere else and most valuable Chinese companies will learn from the American direction but will execute and evolve at a fast and furious pace.

## **Is there a Chinese Silicon Valley developing?**

Most companies in China are still learning from American innovators. Most of the true innovation came

from the US but the Chinese will no longer copy them bit by bit. That is the trend.

## **Will there be a Chinese Apple or Google?**

I doubt it, but there might be a Chinese Facebook. Steve Jobs is someone who exemplifies the American culture that encourages you to follow your heart, take chances, celebrate failures and be different. China just hasn't had that culture for 1,000 years. I do think there are people with Steve Jobs' potential in a country with four to five times as many people as the US. But the likelihood of them gaining acceptance and being celebrated is very, very remote especially in light of the education system.

## **What are the gaps?**

Thousands of years ago, Chinese bureaucrats were selected from those that scored the highest on the exams. So that created a culture that celebrated high scores. Chinese language is about memorization of 4,000 characters. It will take years, decades, maybe even centuries to change.

## **Where will the next tech breakthrough come from in China?**

It has got to be in mobile.

## **Android?**

Probably, but it doesn't have to be. A large active user base creates the fertile ground for innovation and breakthroughs. Just like, 'why is the US the leader in the Internet?' Because DARPA funded the internet

ages ago and got the universities connected, and that led to the first browser, Mosaic, and the World Wide Web.

The next innovations for China are going to be on the mobile internet. That's where China has the largest population and when you connect people – especially in large cities – and you connect merchants, that new network creates lots of opportunities.

## **If you had to predict a breakthrough, what would it be?**

I think it will come from mobile being our own identity, with us every day every hour that will connect us to other people and information. It will change the way we meet new people, connect with new information and also with merchants and general business.

## **What's your outlook on the rise of the Chinese serial entrepreneur?**

I think it's going to be incredibly important, but not just yet. The reason is that China is really only at the first and second generation of internet companies. If you look at Silicon Valley, you see people move from Fairchild to Intel to Apple to SGI to Netscape and to LinkedIn and you see a lineage of people fanning out and beginning to have an impact. We are beginning to see the 'fan-out' stage now in China. I am very optimistic that some of those entrepreneurs still in their early thirties will come out and build the next breakthrough mobile company.

# Morten Lund

LundXY, Serial Entrepreneur, Chief Ideologist  
Copenhagen

## **Where should we look for the next disruptive technology innovations?**

Enterprise software. I know it sounds boring, but it's insane. What we are talking about is a global platform for enterprise software in the cloud.

## **How will it work?**

Enterprise apps will move to Facebook – it will be a huge paradigm shift in insurance and banking. Transactions for such services will move to peer to peer. Instead of a service rep that sends you a bill once a year, the relationship becomes transparent. There's no loan shark, for instance, it's peer to peer. Old industries will be challenged by these new structures. You will know where the insurance company's money comes from. Credit rankings will become very social. You can participate with your opinion about the business service, and users can help to innovate it.

## **Is this similar to what happened with traditional media and the move to social media?**

Exactly.

## **In what other centers in the world do you see disruptive change that can rival that of Silicon Valley?**

Innovation has been mainly consolidated in San Francisco because of the cash and the knowledge. Now it is becoming totally distributed. In the next 10 years Singapore will become one of the biggest

hubs for tech innovation. Smaller startups will end up there because of the British legal system and anti-corruption policies. Smarter teams will follow where the security is. And with Asia growing like crazy, Singapore is a hub, just like what happened with trading centers.

## **What about Russia?**

The Russian startup scene has a very strong home market. Russia has a tradition in math but is not especially good at 'product-ization.' Russia's search engine Yandex will become a real competitor to Google and start moving from country to country real soon.

## **Will Silicon Valley ever be displaced?**

Not a chance in the world. It is an Eden's garden for information technology, money and talent. Companies that are competing in each sector will only get bigger. PayPal, for instance, is one of the best performing companies in the world and will buy whatever it wants.

## **What's your view about privacy issues with search, email and social media?**

The discussion is dead. The risk is there, but corporations are already using Gmail when they can pay for a service from Microsoft. Everyone is already carrying around the biggest spy device voluntarily – it's called the cell phone.

## **Which companies do you see as highly innovative?**

Google has innovated a lot. Apple will steal the home entertainment and cable market. Alibaba is incredible with its trading platform for Chinese exports, and it will reinvent when the rest of the world sells to China.

## **Could you name an individual that you find as truly visionary?**

Christian Lanng at Tradeshift is my absolute number one visionary. The vision around Tradeshift has never been seen before. It will eat up old legacy software that no one under the age of 35 will ever use. It will take everything live, killing the batch job. Keep an eye on CloudScan from Tradeshift.

## **From what sources do you see innovation bubbling up: corporations, startups, R&D labs, universities?**

It's coming from social interaction. And it's coming from startups; say two guys with a lot of experience who are tired of what they are seeing and want to do it in the right way.

## **Where do you get your ideas?**

From my inbox. It is very inbound.

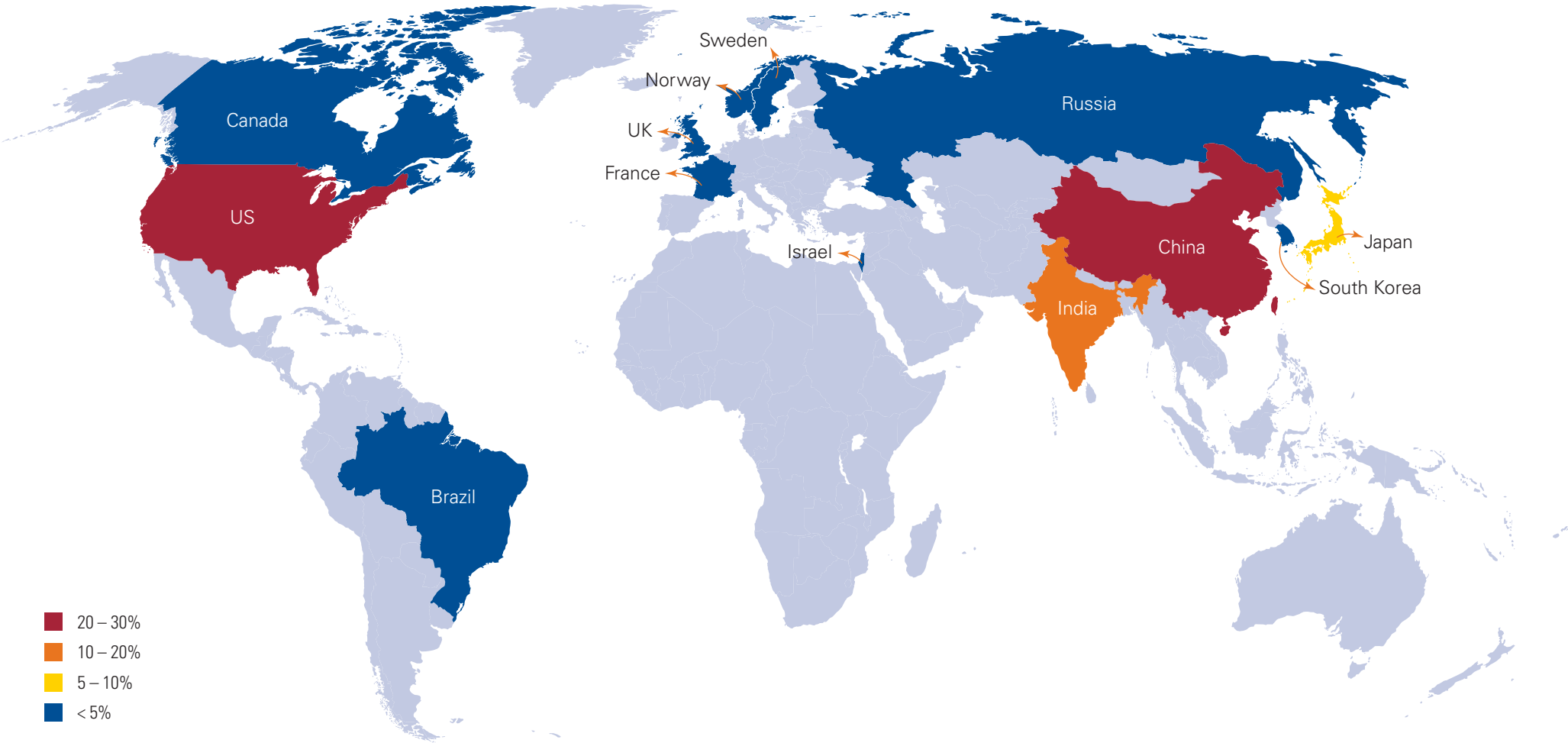
# Country

## perspectives



US and China were named as the most promising countries to drive technology breakthroughs.

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



Source: KPMG International 2012

**China projected to be on par with the US as a future technology innovation leader**

Twenty-nine percent of survey participants believe China shows the most promise for leading disruptive technology breakthroughs with global impact – with a similar majority voting for the US. Not surprising, US-based respondents favor the US while the vast majority of those from China believe their own country will dominate.

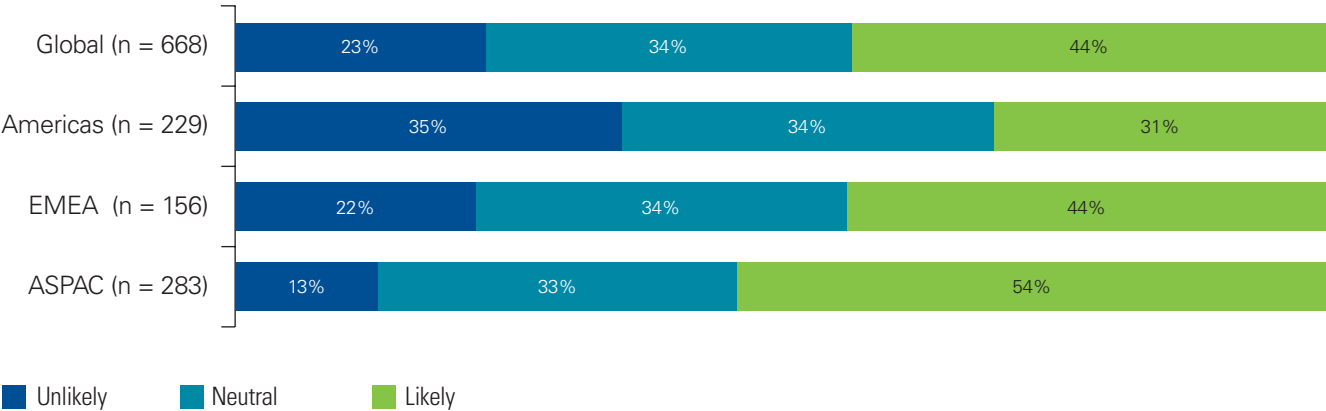
As both countries continue to advance their technology innovation agendas, collaboration between the US and China in key areas such as IP law and technology commercialization will be important. At this time many US tech companies have the global market leadership status and expertise, while Chinese tech companies have the advantage of understanding their local market, which has tremendous growth potential, given the huge tech demand inside China in the cloud, mobile and internet subsectors.

**Tipping point for Silicon Valley as the world’s future tech hub**

Notably, 44 percent predict that the world’s technology innovation center could move from Silicon Valley to another country in the next four years. Respondents from China and Israel share this sentiment.

Silicon Valley’s unique ecosystem is a solid foundation for companies big and small to continue to lead technology innovation. However, there is a tipping point for other technology hubs around the world to drive innovation, which should lead to more collaboration across countries in the development of new technologies.

**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?**

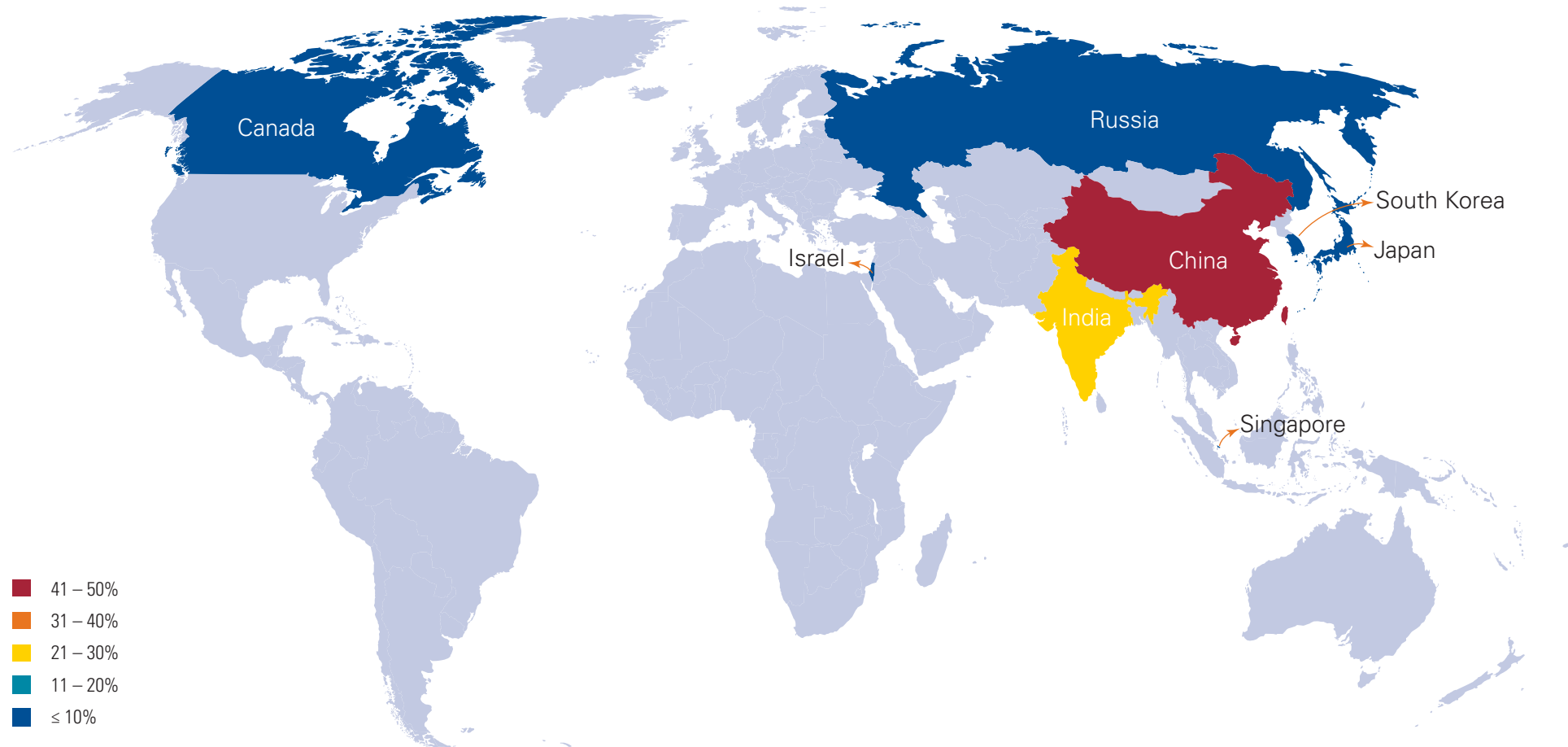


Note: May not equal 100% due to rounding.  
Source: KPMG International 2012

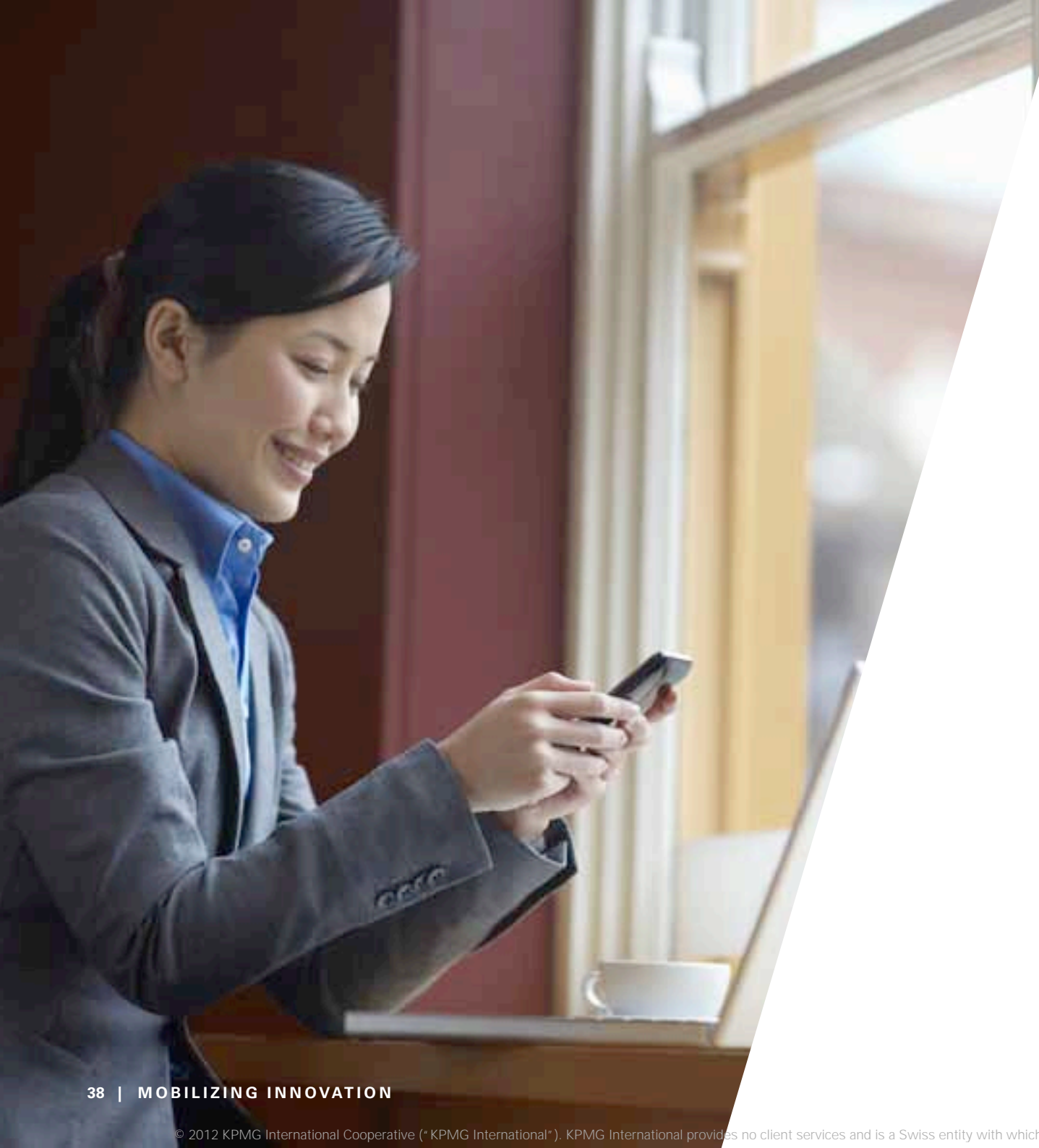
“ The survey findings demonstrate that China’s innovation investment has fostered a growing environment for the development of disruptive technologies. The Chinese government is encouraging significant investment in three key areas: shared services and outsourcing, payments and cloud. The 12th Five-Year Plan is also driving innovation in these critical areas, in order to create a nationwide virtual environment. ”

**Egidio Zarrella**  
Partner, KPMG in China

Those who think the technology innovation center of the world will move from Silicon Valley to another country in the next four years selected the following countries as the most likely to become the leading innovation center:



Source: KPMG International 2012



### **China emerges as the leading innovation center over the next four years**

Nearly half (44 percent) of those who think the world's technology hub will move from Silicon Valley to another country single out China as having the highest potential to become the leading innovation center of the world. Not surprisingly, 84 percent of respondents from China feel their own country is the most likely to be the leading global innovation hub – a view shared by only half of their peers in the US.

Those who think the world's technology hub will move from Silicon Valley to another country identify India as the second most likely new center for technology innovation, followed by Japan. These findings reinforce the view that technology innovation leadership is being fostered in emerging tech centers around the world.

“

**The pace of technology innovations is happening at unparalleled speed, and China's projected rise to prominence as a technology leader is another example of this. Silicon Valley remains the leading force as other areas of the world are becoming important technology innovation hubs as well. While China and other countries are creating their own ecosystems, it will take time for them to mature into the rich ecosystem that continues to drive innovation in Silicon Valley.**

”

**Gary Matuszak**

Global and US Chair, Technology,  
Media & Telecommunications

## Leading innovation visionaries

The legacy of founder Steve Jobs lives on, alongside CEO Tim Cook and Senior VP of Industrial Design, Jonathan Ive, who continue to spearhead Apple's top tech innovator status. Some 11 percent of those surveyed name Jobs specifically as *numero uno* while an additional 31 percent mention Apple as a company but not its leader.

### Emerging Innovation Visionaries

Individuals	Percentage (%)
Steve Jobs <sup>1</sup>	11 %
Bill Gates <sup>3</sup>	9 %
Tim Cook <sup>1</sup>	4 %
Mark Zuckerberg <sup>4</sup>	4 %
Larry Page <sup>2</sup>	3 %
Jeff Bezos <sup>5</sup>	1 %
Masayoshi Son	1 %
Michael Dell	1 %

#### Notes:

<sup>1</sup>An additional 31 % said 'Apple' and did not mention an individual

<sup>2</sup>17 % said 'Google'

<sup>3</sup>6 % said 'Microsoft'

<sup>4</sup>2 % said 'Facebook'

<sup>5</sup>1 % said 'Amazon'

“

Chinese respondents think Jack Ma is the third most important innovation visionary leader (behind Bill Gates and Steve Jobs).

”



# LEADING COMPANIES DRIVING DISRUPTIVE TECHNOLOGY INNOVATION

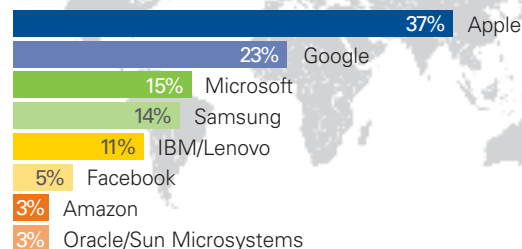
## Global ranking

### Apple tops the tech innovation rankings for the foreseeable future

Apple leads the rankings as the top innovative company, with respondents from the US, China, Canada, the UK, Israel, Russia and Singapore all crowning the Cupertino-based company as king of tech. Google places strongly as well, with India, the US, Israel, the UK and Japan survey participants giving the search leader high marks.

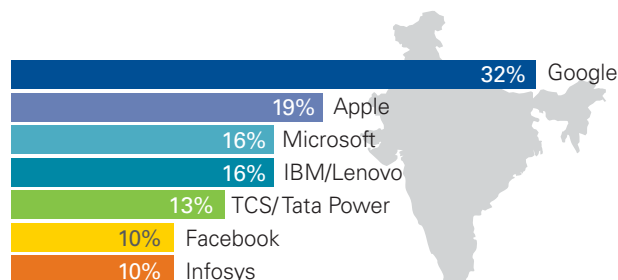
### Top companies driving disruptive innovation

## Global



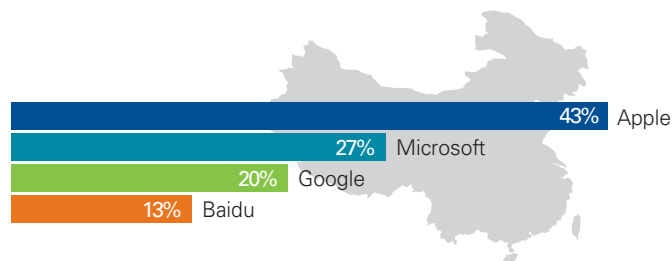
## India

Respondents in India position Google as the winner, with 32 percent of their votes. Other Indian companies including Tata and Infosys have honorable mentions.



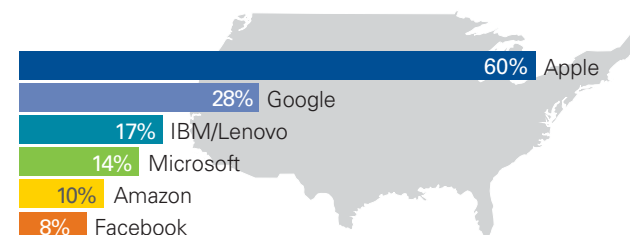
## China

According to respondents from China, Apple is the top technology innovation leader, although they also cite the importance of Microsoft, Google and search engine Baidu.



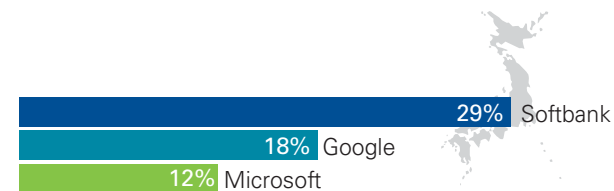
## US

According to the survey, Apple is well ahead of the pack when it comes to driving disruptive innovation, particularly amongst US respondents. Google, IBM, Microsoft and Amazon are also recognized by US respondents as these companies continue to innovate and expand their service offerings.



## Japan

Japanese respondents give the top technology innovation leadership mark to Softbank, the Japanese telecommunications and internet corporation.



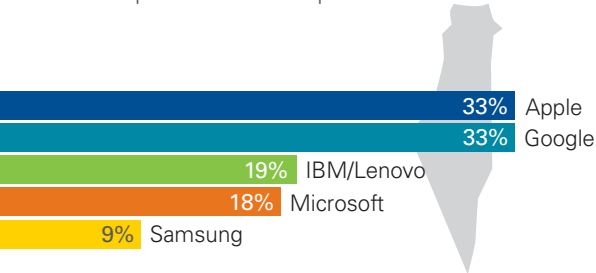
# South Korea

South Korea participants place Samsung in first position by a wide margin.



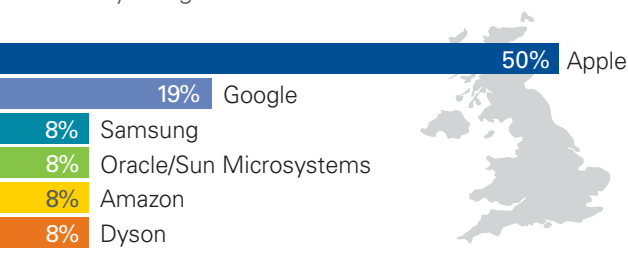
# Israel

According to respondents from Israel, Apple and Google tie for the top tech innovator position.



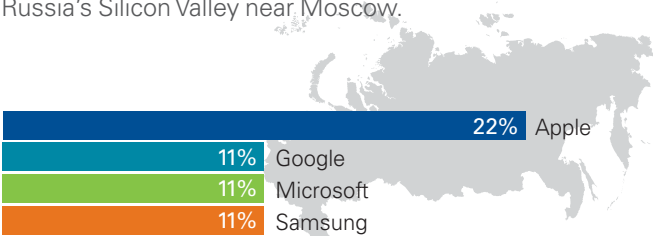
# UK

According to UK respondents, Apple is the winner, followed by Google.



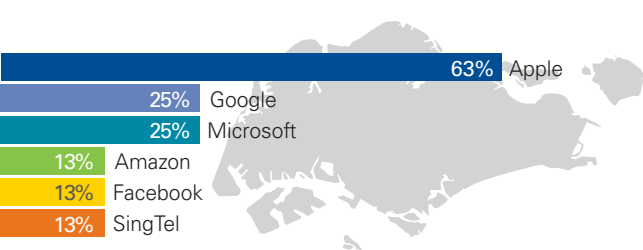
# Russia

Apple again towers over all other companies among Russian survey respondents. Interestingly, those polled in Russia named the Skolkovo Innovation Centre, Russia's Silicon Valley near Moscow.



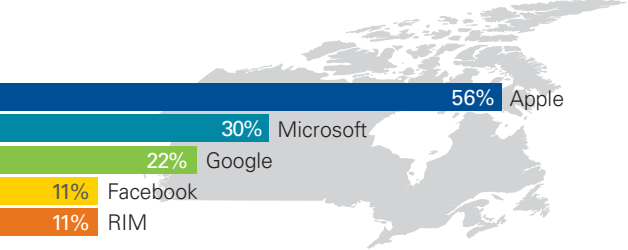
# Singapore

Apple is the winner among Singapore's respondents. SingTel, a Singapore company, also ranks as a leading innovator.



# Canada

Apple is at the top, followed by Microsoft and Google.



# COUNTRY INSIGHTS

## Canada continues to foster innovation

In Canada, sustained funding ensures that innovation is fostered in the right places and attracts the best talent. Tax policies and government support strive to not only stimulate innovation but also to explore the commercial potential of these discoveries.



**As a nation, we know innovation will not develop in isolation and that collaboration is key. Harnessing the energy and drive of all stakeholders – including government, universities, centers of excellence and most importantly our entrepreneurs – will help to create the ecosystem necessary to compete in the global innovation race.**



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

## China becoming a technology leader

China's 12th Five-Year Plan aims to accelerate the transformation of the economy toward services and scientific development. Seven strategic emerging industries are highlighted for support, including next-generation information technology, biotechnology and high-end equipment manufacturing. These seven industries are expected to attract RMB5 trillion (US\$787 billion) of central government investment by 2020.



**The Chinese government is offering incentives, including tax holidays for select industries such as software and integrated circuit companies and tax breaks for research-intensive businesses. The sub-industries that continue to draw attention in China and abroad include cloud, the internet of things, smart devices and other similar subsectors, primarily due to their investment potential as well as their longer-term consumer technology impacts.**



**Egidio Zarrella**  
Clients and Innovation Partner,  
KPMG in China

There are already five designated pilot cities in China for cloud. Demand for mobile payments continues to increase, with transactions projected to reach USD80 billion from 440 million users by 2015. The next frontier will be the "internet of things," merging cloud with radio frequency identification of wireless sensors and embedded intelligence to develop the next generation of networked 'smart' devices.

### China's next generation IT sub-industries

- next generation mobile communications
- next generation core internet equipment
- smart devices
- internet of things
- convergence of telecom, cable TV and internet networks
- cloud
- new displays
- integrated circuits
- high end software
- high end servers
- digitization of culture and creative industries.

## India's tech innovation continues to rise

Over the last decade, India has made substantial and rapid strides toward innovation-based development, and adapted and implemented a number of supporting measures, aided by the government's significant investment in technology. Communication technology such as 3G has made a mark in India and 4G will mirror this success. Cloud adoption is on the rise and several e-governance initiatives have been launched.



**Although the government is a primary pillar to drive innovation and cutting-edge technology, private sector involvement is equally important to achieve swift and effective implementation. Ultimately, technology will no longer play a support role in most businesses, but it will become a key enabler that drives business models.**



**Pradeep Udhas**  
Technology Industry Leader  
KPMG in India

## Israel's tech nation

Israel stands out as a tech hothouse and R&D power, and benefits from a military/industrial backbone to support its high-tech status. Israel excels in scientific and technological pursuits, anchored by Technion, the highly regarded Israel Institute of High Technology and the Weizmann Institute of Science. Israel is a research hub with more than 200 local R&D centers, and many global high-tech companies have R&D bases, among them Microsoft and IBM. Advanced software parks have sprung up in Tel Aviv and Jerusalem.

A vibrant venture capital market – one of the largest in the world – Israel has long had a keen eye for spotting the latest advances in computer science, software and semiconductors. A government program introduced in the 1990s called “Yozma” helped build a local venture capital sector that funded thousands of companies during the last two decades and helped Israel earn its high-tech stripes.

During the last few years, the majority of investments in Israeli technology companies have shifted from communication and semiconductor segments to new media, internet and mobile platform applications. Investment in VC-backed companies amounted to US\$2.1 billion in 2011, reaching a record high in the last

11 years. Government incentives (including low corporate tax rates ranging from 6 percent to 25 percent), grants and robust national and bi-national R&D funding programs are together fueling the vibrant Israeli technology market.

Israel ranks high as an incubator for startups and numerous Israeli high-tech companies have gone on to Wall Street listings. Over the past 10 years, global technology leaders have been on the acquisition trail in Israel and during 2011, VC-funded Israel companies drew US\$5.1 billion in acquisitions.



**The combination of a highly educated workforce, technology transfer from leading academic institutions, government incentives and cultivation of entrepreneurship spirit is expected to continue to fuel Israel's innovation.**



**Ofer Sela**  
Partner, Technology Group  
KPMG in Israel

## Japan's technology new growth strategy

Just before the great East Japan earthquake, the government undertook an industrial revitalization policy, designating 21 national strategic projects as part of its new growth strategy. Promoting investment in R&D is one of seven priorities in the science and technology growth strategy.

Japan plans to increase innovation through supporting business start-ups and ventures, developing pioneering technologies, and encouraging technological progress in manufacturing companies.

Tax laws are also being reformed to stimulate new investment, in the form of a 20 percent deduction on taxes for five years for certified companies, incentives for small business, and location subsidies for headquarters and R&D centers. A new government promotion bill is pending to help turn Japan into an Asian business center.



**Many Japanese tech companies have announced a great deficit for the year ending March 2012. However, Japan continues to maintain its position as one of the top locations for tech innovation, with a new focus on 'green' and 'smart' technologies. Efforts are under way to attract foreign companies and capital to Japan, to foster innovation and high-value-added technologies. Tax is one of the key incentives for promoting Japan as an R&D center.**



**Yoko Hatta**

Asia Pacific region Head of Technology and Global  
Transfer Pricing Services Partner  
KPMG in Japan

## Korea embraces 10 new IT technologies

Korea is a top semiconductor, display and mobile industry leader. It has achieved this position by promoting technology-intensive industry policies, strategic investment plans focused on comparative advantage and concentrated government strategies. These programs emphasize the role of IT and IT-converged technologies in improving industrial productivity, accelerating potential demand and creating new types of businesses.

The government has recently selected 10 critical new IT technologies to increase global competitiveness and keep up with the fast-paced IT industry, sharing its goals to achieve US\$43.3 billion in sales and US\$19.7 billion through exports, relating to these 10 new technologies, by 2020 with a commitment of US\$1 billion for five years. To achieve these goals, the government plans to focus and develop five strategic areas:

- mobile devices
- IT materials
- software computing
- network
- IT convergence with other businesses.



**Korea's IT industry is the core growth engine for its national economy. As technology and industry converges, the IT industry's role and scope is rapidly spreading throughout the economy and wider society. Even with the ongoing European financial crisis and continued global uncertainty, Korea's IT sector aims to become an innovator in cloud, mobile and network technology by keeping a step ahead in investment and R&D.**



**Seung Hwan (Sean) Choi**

National Industry Leader, Technology  
Media and Telecommunications  
KPMG in Korea

## Russia's Silicon Valley emerges

Over the past few years, Russia has made significant strides along the path of innovation-based development, having already adapted and implemented a number of measures to support its tech-oriented economy. The Russian president has declared that Russia's goal is to gradually change from an oil-oriented economy. Russia intends to increase the tech sector's input to GDP, increase the proportion of innovative products, enlarge R&D spending and promote commercialization of Russian innovative products.

Russia has introduced a unique framework for participants of the Russian flagship Skolkovo project (also called Russian Silicon Valley), granting tax holidays for up to 10 years, customs incentives and simplified rules for attracting foreign labor. In tandem with other state-supported measures to encourage innovation, the Skolkovo project should enable Russia to take a leading position among the world's innovation-based economies.



**Russia has introduced an extensive list of tax concessions for companies with a high intellectual capital, such as tax and customs concessions within technology-oriented special economic zones.**



**Alisa Melkonian**

Partner, Head of Innovations and Technology  
KPMG in Russia and the CIS

## Singapore's technology master plan

Singapore is currently on its sixth technology master plan, Intelligent Nation 2015, the latest in a series dating back to 1980. This plan seeks to infuse innovation, new business models and vibrancy into the local infocomm ecosystem through initiatives for start-ups and commercialization of technology.

Singapore has historically ranked high as a tech ecosystem, including being placed second in the World Economic Forum's Global Information Technology Report every year from 2009 to 2012. For over a decade, various investment initiatives and tax incentives have encouraged technological innovation and driven productivity.



**With China likely to surpass the US over the next 10 years to lead global technological innovation, Singapore is well-placed to become an important Asia-Pacific tech innovation hub. We already have the right level of government support and incentives; and if you add a significant multinational business presence and a technology-ready population (where local broadband wireless penetration recorded 150 percent in 2012), then you have all the ingredients for a successful tech innovation ecosystem.**



**HoWah Lee**  
Head of Advisory  
KPMG in Singapore

## UK Silicon Roundabout

There is renewed start-up energy around London today, and indeed, it even has a name: Silicon Roundabout. In the East End of London startups are forming and collaborating. The venture capital market is coming back and the entrepreneurial spirit is fueled by universities such as Cambridge and Oxford feeding talent and leading-edge research into this scene.

The UK has a notable history and visionaries in the technology field, such as Sir Timothy Berners-Lee, inventor of the World Wide Web, Sir Jonathan Ive, lead designer behind many of Apple's products, and Alan Turing, widely considered to be the father of computer science and artificial intelligence.



**It is encouraging that the start-up scene in the UK is becoming a hotbed; with the right backing from the government, as well as investment in enabling infrastructure such as LTE and high speed broadband, the UK will be well-placed to leverage its creative talent to compete to be one of the global centers of innovation.**



**Tudor Aw**  
Technology Sector Head  
KPMG in the UK

## US gears up the next technology generation

The US has shaped a series of technology industry innovation cycles, from the silicon chip to the dotcom boom to the social networking craze, and now the convergence of the cloud and non-stop mobile. The home of Apple, Google, IBM, Facebook, Microsoft and Amazon keeps on churning out new innovations.

Today, thanks to the lean start-up process, entrepreneurs are scaling companies to sizeable revenues with smaller teams and less cash than just a few years ago. The cycle of innovation is speeding up, and a new generation of talented entrepreneurs is ready to take over and invent the next disruptive technologies.

Silicon Valley continues to be the radius for tremendous innovation including start-ups and global tech enterprises. Having the largest venture capital market in the world does not hurt either, in addition to the optimistic pioneer spirit that has made Silicon Valley one of the top R&D centers in the world.

Other tech hubs are also emerging in the US. New York is getting a bigger footprint in digital media, with the local government developing a plan to proactively attract and nurture the tech start-up community. Other cities are emerging as start-up hubs ranging from Seattle to Cambridge and Portland to Austin, each with its own ecosystem.



**I do not believe that the center of technology innovation is going to change in the next four years. Silicon Valley is distinguished by an entire ecosystem that supports technology innovation. That ecosystem is unique and a solid foundation for Silicon Valley to continue to be the technology leader. However, other tech hubs will be driving innovation and there will be more collaboration and competition between countries in the development of new technologies.**



**Gary Matuszak**  
Global and US Chair,  
Technology, Media &  
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# Conclusive

forecast : Hyper-tech era



Countries that were never part of the technology innovation map are taking center stage. Tech innovative companies Apple, Google, Facebook, Microsoft, Amazon and Samsung are being joined by upstarts from emerging economies such as Tencent and Baidu from China and Yandex from Russia. Visionary technologists like Masayoshi Son from Japan and Jack Ma from China are getting in the headlines.

Innovation is unfolding in other parts of the world. China, in particular, is investing to be on par with Silicon Valley. The US is respected as the world's technology innovation center, but as technology innovation becomes more global other countries are gaining momentum to become technology innovation leaders.

KPMG's 2012 Technology Innovation Survey proves that we are in a brave new global tech era. The cycle of technology innovation is speeding up, and new technologies are transforming a variety of sectors in ways that could not have been imagined even a couple of years ago. As a result, technology companies face a constant stream of change in their business and operating models.

As the cloud and mobile continue to become the technology platforms for a number of industries, new business models and incremental disruptions in enterprise and consumer markets will continue to be a major trend to watch.

Despite the buzz, the survey shows that big data/analytics are not tipping the scales much as disruptive technology. However, awareness will increase for big data as cloud, mobile, social and data models evolve and converge. Big data/analytics are likely to enable new business models through contextual data and social graphs.

As tech companies mature in new innovation hubs around the world, start-ups will compete to become the next generation of global tech leaders. The next three years will no doubt bring many surprises as countries and companies compete to gain and maintain market leadership.

Ultimately it is all about innovation. Tomorrow's tech leaders will be those visionaries who can dream and develop a non-stop electric car or just the latest mobile app or chip; those optimists who dare to invest vast sums on R&D without an immediate financial return; and those strategists who can figure out a money-making model for the next wave of technology innovations.

# 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 start-ups. Our technology professionals go beyond today's challenges to anticipate the potential long- and short-term consequences of shifting business, technology and financial strategies.

This survey is the first project of the KPMG Technology Innovation Center, a global network created to identify and evaluate the impact of future disruptive technologies that may result in business transformation for the technology industry. For more information visit: [www.kpmg.com/techinnovation](http://www.kpmg.com/techinnovation)

### **Gary Matuszak, Global and US Chair, Technology, Media and Telecommunications (TMT), KPMG**

Gary Matuszak is the Global and US Chair of 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 US Software practice.

### **Tom Lamoureux, Global Advisory Sector Leader, Technology, KPMG**

Tom Lamoureux, Global and US Advisory Sector Leader for the technology industry, works with the world's top technology companies. A member of KPMG's Technology, Media and Telecommunications (TMT) practice steering committee, he leads the development of innovative services to help technology companies capitalize on business transformation opportunities and improve risk management and business performance. He is a frequent speaker on technology industry trends and has co-authored numerous publications addressing topics such as cloud, software asset management, software licensing, channel management, identity access management and internal controls.

### **Patricia Rios, Global Director, Technology Innovation Center, KPMG**

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 the US in 2008 as the technology industry Marketing Director and assumed her current responsibilities in 2011. Before joining KPMG, Ms. Rios 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 in Finance and a bachelor's degree in Marketing from the Illinois Institute of Technology.

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Rebecca A. Fannin is a writer covering global innovation trends and the author of two books, *Silicon Dragon* and *Startup Asia*, which have been translated into several languages. A media entrepreneur, Rebecca leads news, events and insights group *Silicon Dragon Ventures*. She is a weekly contributor to *Forbes*, and previously was an international editor at *Red Herring* and *Incisive Media* in Hong Kong. She has also written for *Harvard Business Review, Inc., Worth, Fast Company, CEO, The Deal* and *Huffington Post*. Ms. Fannin has appeared on *Fox Business News, SkyTV, Channel News Asia* and *CCTV*. Her speaking engagements include *Asia Society, NASSCOM, TiE* and *World Affairs Council* conferences as well as lectures at *Harvard, Yale, Columbia, Tsinghua, Fudan* and other universities. In 2010, Rebecca testified on Capitol Hill as an expert witness on China's internet.

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