Economist Intelligence Unit

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Fertile ground:
Cultivating a talent for innovation

A report from the Economist Intelligence Unit
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Preface

Fertile ground: Cultivating a talent for innovation is an Economist Intelligence Unit white paper, supported by the Government of Ontario, Canada. The Economist Intelligence Unit conducted the survey and analysis and wrote the report. The findings and views expressed in the report do not necessarily reflect the views of the sponsor.

The report was based on a survey of 200 senior executives worldwide, research, and in-depth interviews with 15 senior executives and experts in innovation. The author was Paul Tyrrell and the editor was Katherine Dorr Abreu. The Economist Intelligence Unit thanks all those who contributed their time and insight to this project.

February 2009

Executive summary

For most companies, the ability to innovate is now the single most important predictor of future growth. Eighty-three per cent of respondents to a survey conducted in the autumn of 2008 by the Economist Intelligence Unit say innovation is vital to their long-term success. This is particularly important in view of the growth of the knowledge-based economy and the globalisation of markets—the ability to serve any customer anywhere.

Yet the globalisation of markets has not been matched by a uniform distribution of innovation capacity; some regions are simply more fertile than others. This report explores what qualities make a location ripe for innovation and how companies should build considerations of "place" into their innovation strategies. Key findings include:

- **The most innovative locations are those with the healthiest supplies of talent.** Ninety-two per cent of respondents consider access to talented staff to be critical for innovation. The most important external factor at national level that affects companies' ability to innovate, they say, is the quality of education. Education plays a role in the tendency for like-minded organisations to "cluster"[1], or locate near each other. Organisations are willing to pay a significant premium for access to talent, and proximity to a cluster is considered by survey respondents to be the most important city-regional factor contributing to their ability to innovate.

- **Organisations are increasingly sourcing their innovations globally and externally.** As large organisations have become progressively more disaggregated and globalised, they have realised that they need a global footprint for innovation. Despite the global economic downturn, 46% of survey respondents say they expect to invest in many new sites in several countries in the next five years.

In addition, the practice of "open innovation"[2], whereby intellectual property flows in and out of organisations to where it can be most effectively handled at each stage of its development, is becoming more popular. Fifty-four per cent of survey respondents say that in the period to 2013 most of their innovative capacity will be provided by open innovation and by Internet-enabled techniques.

Traditional research and development (R&D) teams remain important sources of ideas, but customers are deemed even more important. External partners also rank highly. The marketing department has become a vital broker of ideas between scientists, engineers and the marketplace.

1 Porter, Michael E, *The Competitive Advantage of Nations*, The Free Press, 1990

[2] Chesbrough, Henry, *Open innovation: The new imperative for creating and profiting from technology*, Boston, Harvard Business School Press, 2003.

Companies are investing heavily in systems and processes designed to identify good ideas wherever they arise and to disseminate them to the relevant decision-makers internally.

- **While virtual collaboration is growing, face-to-face contact is also becoming more important.** In spite of major advances in networked information technology (IT), innovation still requires face-to-face contact in order to be successful, especially in its earliest stages. Survey respondents say brainstorming is the most popular innovation technique, while interviewees emphasise the value of face-to-face contact to build trust between potential collaborators, maintain the momentum of innovation efforts and invest each project with the passion necessary to bring it to fruition. Nevertheless, the Internet is already vital in one area of innovation, namely that of "co-creation"—the practice of involving customers in the development of new products and services through feedback and suggestions. Sixty per cent of survey respondents say they are already co-creating with customers online.

- **Policymakers can help to stimulate innovation at city-regional level, but must be prepared for the long haul.** Legal, regulatory and even financial measures have been widely used to create a more fertile environment for innovation, but some regions have been more successful than others in reaching this goal. The US ranks among survey respondents as the number-one destination for investments to boost innovation capacity, while India, China and the UK form a second tier, followed by Canada, Australia and Brazil.

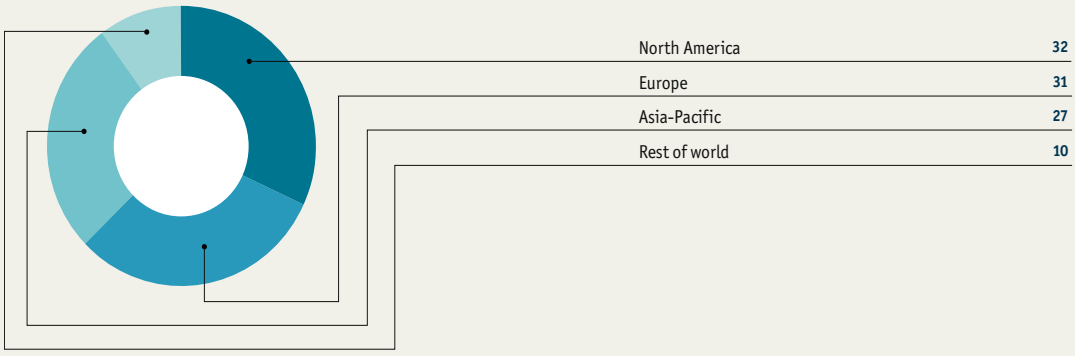
Who took the survey?

Two hundred senior executives from around the world took the online survey. Thirty-two per cent of respondents work for companies headquartered in North America, while 32% work for firms based in Europe, 27% are with companies in the Asia-Pacific region and 10% are from the rest of the world. Fifty per cent of respondents were C-level executives. They have a broad range of roles, with 41% being responsible for strategy and business development, 39% for general management and 26% for marketing and sales.

Fifty-four per cent of respondents' organisations have annual revenue of more than US$500m. They represent a broad range of industries.

For further information, see the appendix at the end of this report.

Where were survey respondents' companies headquartered?
(% respondents)



In part, this is a cultural issue: respondents rank business culture (such as a tolerance of risk) as the second most important factor contributing to their ability to innovate. However, the local climate for venture capital is also deemed very important—indeed, the world's most innovative clusters have all formed around a kernel of venture capitalists and entrepreneurs. While direct financial intervention can help to stimulate cluster growth if it is generous and carefully targeted, Richard Florida, the author of *Who's Your City* and director of the Martin Prosperity Institute at the University of Toronto in Ontario, Canada, argues that what counts most are the "Three Ts" of technology, talent and tolerance. Building these qualities can take decades.

Introduction

What makes one place more innovative than another? Since the beginning of the industrial revolution, it has been clear that a blend of minds and money produces the best cocktail of productivity, patents and economic growth. However, some cities—or city-regions, as economic geographers call areas of industry clustering—are disproportionately more creative than others. Such concentrations of innovation correlate primarily with concentrations of talent.

The trend seems counter-intuitive, considering that organisations are increasingly practising open innovation, are disaggregating their R&D facilities worldwide and are using networked communications technologies to manage the innovation process. Yet the importance of face-to-face contact is also growing. The techniques and strategies of innovation may be changing rapidly, but commercialising a great idea still requires companies to gather the right people in the right place.

A quick look at the terminology

The following terms are used throughout this report:

Clusters: "Clusters are geographic concentrations of interconnected companies, specialised suppliers, service providers and associated institutions in a particular field," according to Michael Porter, who popularised the concept in his book *The Competitive Advantage of Nations*, published in 1990. Clusters tend to increase the productivity of their constituent companies, drive innovation in their industry and stimulate the creation of new business.

Co-creation: A process in which a product or service is developed through a collaborative effort, often with external partners. Examples include: customers providing suggestions for new products or the improvement of existing ones; business partners contributing to the development of new products or processes; and the open-source software movement, in which users contribute refinements or make changes to programmes.

Innovation capacity: The processes, policies and environmental factors that make it possible for a company or region to generate, identify and act on value-generating ideas, whether from internal or external sources.

Open innovation: A strategy that allows ideas to flow outside their originating organisation to wherever they can be most effectively handled at each stage of the research and development process. This allows companies to increase their productivity by using ideas and innovations generated externally, and to push internal inventions that they are not developing out to other organisations that will bring them to fruition.

Key points

- Talent, innovation and creativity are not distributed evenly; they concentrate in specific locations.
- Siting a business based on costs is a strategic mistake: companies should go where talent is.
- The clustering of similar organisations encourages risk-taking—and more therefore innovation.

Talent: the highest priority

"Innovation ultimately comes down to talent and focus. You need like-minded people who are not just passionate about having ideas but about developing them too"

Mary Ward, global innovation director for idea creation in the decorative-paints business of AkzoNobel.

Innovations may begin in the mind of a single individual, but if they are to generate valuable products or services they need to be developed by a community of thinkers. This is why the most popular innovation technique used by organisations worldwide is brainstorming, as our survey found. There is still no better way to determine quickly whether an idea is worth exploring further than to bring a group of talented people together in the same room.

"Innovation ultimately comes down to talent and focus," says Mary Ward, global innovation director for idea creation in the decorative-paints business of AkzoNobel, a global paints and coatings company. "An idea doesn't just land on your lap one day fully fledged; your people have to incubate it. So you need like-minded people who are not just passionate about having ideas but about developing them too."

The quality of people within and around an organisation is critical to its ability to innovate, according to the survey. More than 90% of respondents consider access to talented staff to be critical (67%) or very important (25%). The quality of the education system is ranked by 47% of survey respondents as the most important external factor at a national level that affects their ability to innovate. In addition, 44% say that "educational initiatives to meet specific skill shortages" are the most important measures that could be taken at a national level to help foster innovation. "Our

The top five contributors to innovation are:

By country	By city/province/state	By company
Quality of education system	Cluster of companies/institutions in the same industry	Ad hoc brainstorming
Business culture (eg, tolerance of risk)	Telecommunications infrastructure	Facilitating the dissemination of good ideas throughout the organisation
Telecommunications infrastructure	Proximity to universities and other sources of fundamental research	Freedom for staff to explore their own interests
Financial incentives	Financial incentives	Flexible working practices (eg, focusing on deliverables rather than fixed working hours)
Protection of intellectual property rights	Amenities: social, cultural, recreational	Events/processes designed to stimulate interdisciplinary thinking

innovation capacity depends totally on having a supply of young 'eager beavers' that have just come out of university and other higher forms of professional education," says Rob Kirschbaum, vice-president of materials at DSM, a Netherlands-based international life-sciences and performance-materials group.

Finding the right people

As innovation becomes more important to the majority of organisations (83% of survey respondents say it is "critical" or "somewhat critical" to their long-term success), companies will have to ensure that their facilities are situated in places that have a healthy supply of talent.

This is one reason why the UK division of Philips, a Dutch manufacturer of consumer electronics, healthcare technology and lighting products, has moved from Redhill, Surrey to Cambridge. The move is to a location less than 100 miles away, but Terry Doyle, senior vice-president of Philips Research, expects it to make the job of attracting talented people considerably easier. "As part of open innovation, we build 'innovation ecosystems' through relationships with institutes, academia and industrial partners, as well as via regional projects and [a] presence at clinical sites," he adds. Philips is becoming more interested in healthcare and lifestyle products and services, so it makes sense to be a part of a cluster, such as that in Cambridge, that has a strong reputation for innovation in areas such as biotechnology, medicine and IT. "Cambridge has an inspiring population of 30,000 technologists and a tremendous collective experience in business development," Dr Doyle points out. The new location will give the company access to a talent pool with the skills needed to get Philips' new technologies to market faster.

This is confirmed by Richard Florida, director of the Martin Prosperity Institute at the University of Toronto, in Ontario, Canada, which studies how certain locations attract talent, and achieve higher levels of innovation as a result. "Today's key economic factors—talent, innovation and creativity—are not distributed evenly across the global economy. They concentrate in specific locations," he says. Location is "as relevant to a person's wellbeing as are his or her job, finances and interpersonal relationships".

These findings are mirrored in the survey, where respondents rank local amenities (cited by 20%) higher than tax breaks (14%) as local factors that contribute to their organisation's ability to innovate. Significantly, the cost of local land and office space is ranked lowest in importance by survey respondents, suggesting that any savings they might achieve as a result of basing themselves in more remote locations are outweighed by the need to have access to the right talent pool.

Employees of high-technology firms in California's Silicon Valley, for example, are paid 75% more than the national average for the same work, Professor Florida points out, yet organisations have been flocking to the region since the late 1970s. Clearly, they regard the value of the location to them as greater than the premium they must pay for access to it. It is a view shared by Patrick Sheehan, the director of a UK-based venture-capital fund for clean technology, ETF, and former managing director of venture capital at the UK's largest venture-capital group, 3i. "I've seen a number of young companies move to certain [remote or less popular] areas because they can get grants or cheap buildings and, over the years, I've come to believe this is a major strategic mistake," he says. "The priority should

always be to go to the place that has the best talent pool for your business."

Talent seeks talent

"It's much easier for you to take a risk if you know it's going to be relatively easy to get another job. For a technologist, Silicon Valley is a safer place to be"

Patrick Sheehan, director of ETF, a UK-based venture-capital fund for clean technology

The most important quality of a cluster, Mr Sheehan suggests, is that it encourages risk-taking, which is closely tied to innovation. "It's much easier for you to take a risk if you know it's going to be relatively easy to get another job," he points out. People will be more inclined to try a new venture in an area that offers them greater opportunities for employment, should things go wrong. "For a technologist, Silicon Valley is a safer place to be."

Regional conditions can either help or hinder innovation, adds Professor Florida. Location is a key mechanism for innovation, according to a Canadian sociologist, Jane Jacobs, and this adds a fundamental layer to Joseph Schumpeter's[3] view that entrepreneurship is the fundamental mechanism of economic growth. A favourable location "brings together people with open-minded thinking and new ideas and energy, and surrounds them with all the things they need to put in place," Professor Florida says. "Put simply, Steve Jobs [CEO of Apple Computer] and Silicon Valley required one another. Innovation—real innovation—the transformation of a hunch into…a business or venture, can only occur in vibrant, dense, talent-attracting, talent-activating places."

Elon Musk, chief executive of a California-based electric-car manufacturer, Tesla Motors, considers location vital to his organisation. "Silicon Valley is baked into this company's DNA," he says. "It has the world's best electrical, electronic and software engineers—key disciplines necessary to create a breakthrough electric drivetrain." Another key factor, he adds, is that people in California "are much more inclined to take a risk and join a start-up".

Tesla does benefit from certain financial incentives, awarded by the state of California to companies that develop environmentally friendly technology. However, the real benefit of being located in Silicon Valley, says Mr Musk, is that "people here are very environmentally conscious and have a desire to do good". They share Tesla's core values, and want to contribute to a cause that is important to the world.

[3]Joseph Schumpeter, the Czech political scientist and economist who coined the term "creative destruction", whereby the economy changes incessantly from within as new products and processes replace old ones.

Key points

- Companies disperse innovation capabilities worldwide to gain a foothold in new markets, recruit top talent and cut costs.
- Open innovation is catalysing the formation of industry clusters.
- The ability to communicate effectively internally and with partners distinguishes leading innovators.
- Marketers play an increasingly important role in spotting and disseminating ideas.

External and global: the changing face of innovation

Gone are the days when companies in the developed world would only offshore their production lines. Increasingly, they are coming to regard emerging markets as vital sources of innovation too. "The world is currently in the second of three transformative stages," says Richard Scase, a visiting professor at the University of Beijing, China, and the author of *Global Remix: The fight for competitive advantage*. "The first was the wholesale transfer of manufacturing operations into India and China, and of data services into India. The second is the shift in consumer spending towards Asia, as its middle classes expand to have more aggregate spending power than those in the West. And, from around 2015 onwards, we're going to see the core of the 'knowledge economy' shifting eastwards."

Large organisations are coming to realise that they need a global footprint for innovation. Among our survey respondents, for example, 46% say they expect to invest in multiple sites in multiple countries over the next five years to boost their innovation capacity. Another 40% say they will be investing in multiple sites in their home market, suggesting that they wish to consolidate their core businesses while casting a net worldwide for new ideas. Several interviewees say that the notion of a "home country" is becoming less important as far as innovation is concerned.

DSM exemplifies the trend towards multiple innovation locations. The company has just launched a new R&D operation in Shanghai, China. One reason for this, Mr Kirschbaum says, is that "you need innovators in countries that are likely to become major markets, and we expect to have US$1.5bn [in revenue] in China by 2010". Such an operation also extends the talent pool from which DSM will draw its next generation of scientists and engineers. "R&D is a good entrance point for technically skilled people," Mr Kirschbaum points out. The company foresees that by 2010 the number of people it employs in China might even surpass the number employed in Limberg, the region of the Netherlands where the majority of its personnel are currently based.

The need for innovation generates openness

Corporate innovation strategies are also becoming more open in order to maximise innovation capacity. For most of the 20th century, high-tech companies tended to hoard their ideas, deriving competitive advantage from how well they could monopolise brainpower and intellectual property. Now, however, the leaders are actively courting external ideas. As James Joia, associate director of

external business development at US-based consumer goods giant Procter & Gamble (P&G), says, "there are always going to be more good ideas outside the company than inside". This is the basis of P&G's Connect + Develop programme, under which the company has pledged to source 50% of all its new innovations from external sources.

P&G is arguably the world's leading proponent of "open innovation". Under this model, R&D departments are spending less of their time originating their own ideas and more time finding and filtering the best ones from elsewhere.

This shift is reflected in the survey data, where R&D teams rank high as sources of commercially successful ideas but external sources are valued almost as highly. Thirty-eight per cent of respondents consider development teams to be a key source of innovation, and 35% point to research teams. External business partners also rank highly, being chosen by 32% of respondents. Another external source—customers—rank even higher, being chosen by 45% of respondents. (Top of the list is the

Toyota: globally innovative

Toyota Motor, a Japanese vehicle manufacturer, has long understood the importance of location to innovation. Since the 1950s its policy has been to manufacture vehicles where they will be sold. In this way, the company feels it can be more responsive to the tastes and priorities of local drivers.

In Europe, for example, the latest generation of its best-selling family car, the Avensis, was designed in France and is being built in the UK. The innovation process for this car began in Japan in 2005, explains Kazuhiko Miyadera, senior vice-president for innovation at Toyota Motor Europe. Thirty-five engineers from the company's European division, representing more than 12 nationalities, were called to the Toyota's headquarters in Nagoya, Japan. "Some of our top suppliers joined us, to share ideas about advanced technologies," says Mr Miyadera. The aim was to create a "package" that would suit European tastes and driving conditions.

Bringing all of these people together resulted in a car adapted to European tastes. For example, knowing that Europeans prefer symbols to words to identify the controls, the team modified the dashboard. The steering wheel was also redesigned to give it a more luxurious feel. "We knew that small changes—attention to detail—would significantly impact how Europeans respond to the car," says Mr Miyadera.

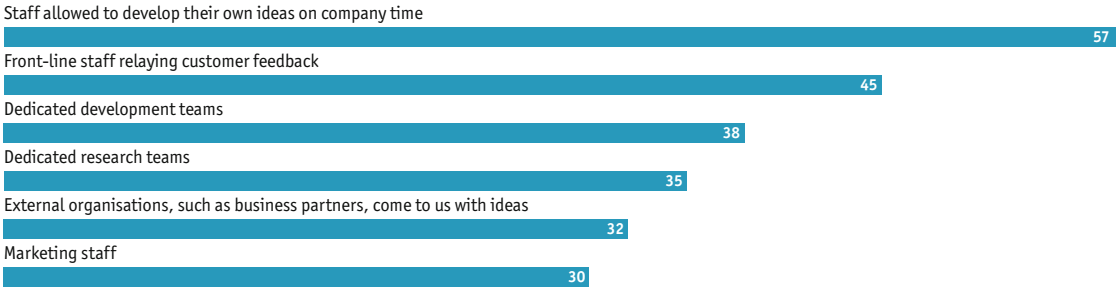
Eighteen months later, in 2007, the basic production drawings were finished and the team returned to Europe. They were joined by chief engineer, Takashi Yamamoto—"the first time a chief engineer for a Toyota vehicle has been located in Europe", says Mr Miyadera.

Still, the regional division's design studio ED2, based in Nice, France, had to compete with similar Toyota design studios all over the world to define the car's aesthetics. Nevertheless, the development of the car was based on exhaustive local research, including more than 15,000 km of test drives in Europe by Mr Yamamoto and his team of engineers. This enabled them to assess the car's response under different driving conditions.

Like such companies as DSM and AkzoNobel, Toyota steers its innovation strategy by making broad predictions about the future of its industry, and of society in general, and then turning these into overarching organisational goals. It recently published a document, "Global Vision 2010: Innovation into the Future", that predicts what life will be like between 2020 and 2030. Among other things, the document foresees a "recycling-based society" in which reducing consumption and reusing resources will be a priority. From this, Toyota derives its aim of becoming "a leader and driving force in global regeneration by implementing the most advanced environmental technologies". The ultimate goal is to produce a car that "cleans the air as it drives".

Such aims result from consultations between the company's headquarters in Nagoya and a network of large R&D facilities: four in the US and one each in the UK, Belgium, Thailand and Australia. These R&D hubs in turn communicate with local production lines in 24 countries, as well as with a vast network of suppliers. Information flows both ways. The famous Toyota production system, under which individuals are encouraged to continually find better ways of doing things and are empowered to stop the production line if they spot a problem, ensures that the company is always developing new process innovations—reportedly up to 2,500 ideas a day worldwide. In this way, Toyota ensures that it marries ever-improving global efficiencies with localised creativity.

Where do the most commercially successful ideas tend to originate?
(% respondents)



freedom for staff to develop their own ideas on company time, which is discussed in more detail below.)

Tapping into customers is a very high priority for AkzoNobel's Ms Ward. "We have a number of ways of gathering information with a view to innovation," she says. "For example, we work with consumer and end-user segmentations that identify common needs and approaches [to decoration tasks]; we also spend a lot of money and resources on market research and analysis of emerging trends. So we're not just looking at people's needs today, but at what they're likely to need in the future."

External partner companies are becoming important sources of innovation, too. In theory, the location of a business should no longer be central to its performance, given the opening up of global markets, advances in transportation and logistics and the proliferation of networking technologies such as the Internet. However, research by Professor Michael Porter of Harvard University in the US has shown that constituents of a cluster achieve higher levels of productivity and innovation and that clusters lead to the more frequent creation of new businesses in the area.

Indeed, survey respondents say that clustering does more for their ability to innovate than any other external factor. Forty-one per cent of respondents rank it number one in this respect, while 36% consider telecommunications infrastructure the most important factor. Twenty-six per cent give priority to proximity to universities and other sources of fundamental research. The fact that these three factors—all related to networking—are judged most important, while land and office costs are judged least important (being chosen by 6% of respondents), vividly demonstrates how valuable innovative companies believe location to be.

Even the proximity of competitors is becoming more beneficial. Situating a business close to others in the same industry has always been a good idea, since prospective customers have to travel less far in order to compare products and prices. However, open innovation is giving this clustering effect new impetus, according to some interviewees.

"We know that we have to be open to innovation from both main players and new kids on the block," says Stuart Pemble, head of operations at the broadcast and professional research labs of Sony, a Japanese-based electronics manufacturer. "Over the past decade especially, we've developed a much more open stance to working with third parties. For example, Sony now actively supports the major professional video-editing software applications on the market." The company also now sells hi-fi systems with built-in docking stations for Apple's digital music-file player, the iPod.

Making openness happen

Location is especially important in the earliest stages of the innovation cycle, according to Professor Florida. Once the product and its production process are established, it is easier to move them to other locations. The typical innovation process in a multinational company now begins at the local level with contact between a company employee and a customer or supplier, and then makes its way to the core of the firm, where it is subjected to various assessments of suitability, and is finally—if given the green light—disseminated back out to the local level on a global scale.

The trick to open innovation, says Andrew Gaule, is to master the "waggle dance", a term that refers to the dance performed by bees to communicate a new source of pollen to their queen. According to Mr Gaule, director of the H-I Network, a UK-based network for innovation chiefs at large organisations, and the author of *Open Innovation in Action: How to be strategic in the search for new sources of value*, a similar organisational communication system should be deployed to make sure that the person chiefly responsible for innovation gets to hear about potential new sources of value. Survey respondents also recognise the value of the flow of information. Fifty-two per cent consider "facilitating the dissemination of good ideas throughout the organisation" important in terms of encouraging innovation internally.

AkzoNobel: a template for global collaboration

Innovation at AkzoNobel, a paints and coatings company, is co-ordinated by a global steering group for innovation, whose job is to define the group's innovation priorities. These are propelled by a strategy that looks at the key drivers, the opportunities and the ambitions for innovation across the group's businesses and translates them into specific targets and "platforms" for innovation. The strategy is owned by the chief marketing officer, Kerris Bright, and is developed in conjunction with the steering group.

"Innovation platforms are a key focus across our markets and countries," says Mary Ward, global innovation director for idea creation in AkzoNobel's decorative-paints business, "as they contain the innovation challenges that marketers, scientists and technologists worldwide will use to determine where to look for new ideas and whether or not their ideas are likely to be of interest and relevant to the group as a whole."

To support the innovation platforms, AkzoNobel also runs a programme of science and technology exploration and development via major R&D facilities in Europe, North America and China. The focus of the Research and Innovation Group is "breakthrough innovation for the global paints business," explains Graeme Armstrong, director of research, development and innovation. "We also have development groups, which help deliver those innovations to market and play a key role in optimising our current portfolio of products." Typically, the development groups are regionally based and are attached to local marketing operations. Finally, Dr Armstrong says, "we have various partnerships with third parties, ranging from commercial partnerships with product development agencies through to university programmes co-funded by governments."

For Ms Ward, there are stages in an innovation project where remote collaboration can work—and indeed can be advantageous. For example, when an innovation challenge is broken down into a specific task or tasks, it can be seeded to various different teams worldwide, in what Ms Ward calls the immersion stage. "This can often take weeks," she says, "as people go away and get their heads around the problem, absorbing all the information they can from their market and other sources." A wider geographical spread of thinkers is preferable at this point, she says, and virtual collaboration makes good use of the knowledge and skills in many different locations.

However, the point at which an idea becomes a concept that you can show to consumers or end-users at AkzoNobel is "where the magic happens", Ms Ward says. "Making it real with mock-ups is important, and there is a human factor in creativity—a moment at which the enthusiasm of the other people in the room starts to take an idea forward—that can't be replicated virtually."

According to 30% of survey respondents, marketing teams are now the source of firms' most commercially successful ideas. Ms Ward says marketers and in-house market-research teams play a key role, as they are critical to identifying customer needs and disseminating customer intelligence throughout the organisation. "Our marketers are trained in generating customer (consumer and end-user) insights, which is often the start-point for great innovation," she says. "Increasingly, we are also bringing our scientists ever closer to the market (for example, by arranging for them to meet consumers and end-users face to face) so that they can really get under their skin." Spotting ideas that are truly significant and relevant to these customers is a key skill, she says. "A good marketing person will keep this customer focus up-front as the idea develops."

Innovation from within

A final, critical consideration for employers is how their immediate location—the workplace—affects their people's ability to come up with great ideas. Fifty-seven per cent of survey respondents say that most commercially successful innovations in their organisations result from staff developing ideas in company time, while 47% say their companies encourage innovation by giving staff the freedom to explore their own ideas. As Steve Wozniak, a co-founder of Apple, recently told the London Business Forum, "when you work on a personal project, you're so passionate, you learn so much, you're a better employee. A lot of companies pay for you do to college courses, but building your own projects is actually worth a lot more than [conventional] education—and it's actually a lot cheaper."

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Mary Ward, global innovation director for idea creation in the decorative-paints business of AkzoNobel

Ad hoc brainstorming is the most common method used today to encourage innovation, being cited by 59% of survey respondents. It will remain critical: 53% of respondents believe that face-to-face collaboration among staff will be more important to their innovation efforts over the next five years, whereas only 9% believe it will be less so.

However, several interviewees point out that staff need to be encouraged to share their ideas, not only through training in innovation and communication techniques but also by reassuring them that they are in an open and receptive environment. "When I was in China recently, we ran a very intensive innovation workshop that involved sending our scientists into people's homes with a questionnaire," says Ms Ward. This gave them direct access to end-users, which provided them with an insight into customers' needs and wants. "When they later sat down with marketers and other colleagues, they had much more market awareness. It's by building a culture like this, one that opens people up, that you get big ideas rather than just a tweak or a 'new and improved' product."

Key points

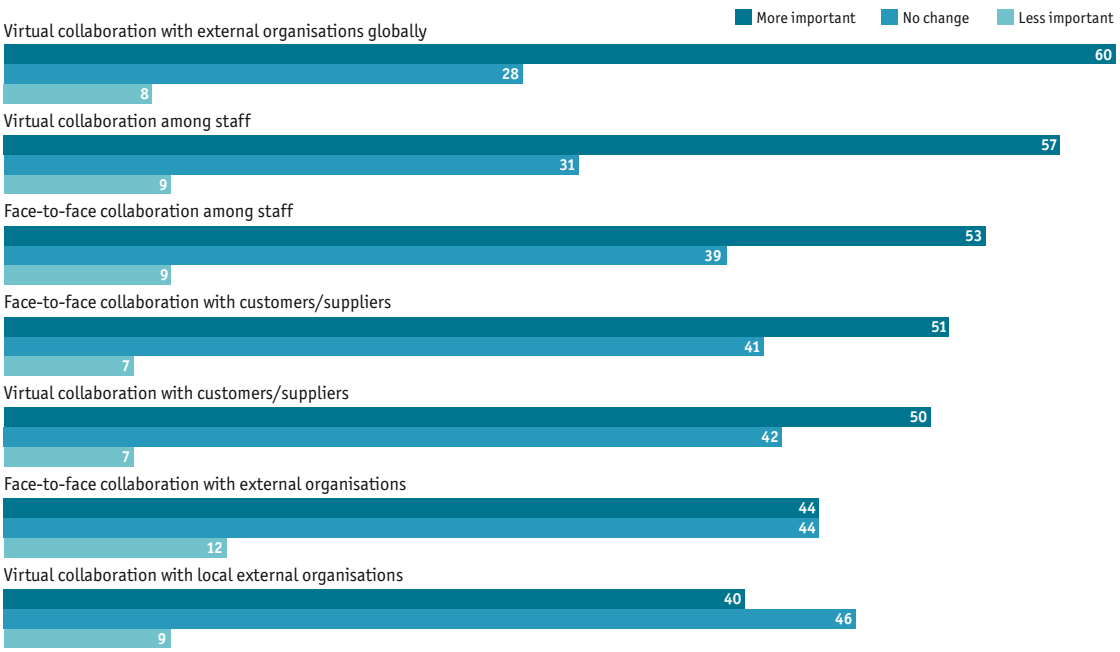
- Innovation will depend more heavily on collaboration, both virtual and face to face, over the next five years.
- Leading innovators combine intranet-based idea-sharing with formal networking schemes.
- Organisations are communicating with customers online, with a view to "co-creating" products and services.

In person versus online

Communications technologies have advanced so far in recent years that one would expect face-to-face meetings to be in decline. But survey respondents and interviewees all agree that, if anything, such meetings are becoming more important, especially where innovation is concerned. "It's analogous to the fact [that] we have used much more paper ever since the invention of the computer," says Professor Scase. "The global disaggregation of large organisations has actually led to a greater need for business travel, since competitive advantage now relies so much upon the co-ordination of global research and development and the localisation of ideas that will scale globally."

Survey results indicate that over the next five years innovation will depend more heavily on face-to-face collaboration between staff (cited by 53% of respondents), with customers and suppliers (51%) and with external organisations (44%). However, virtual collaboration will become much

Collaboration, both virtual and face-to-face, will become increasingly important in the next five years
(% respondents)



more important across the board as well. Fifty-seven per cent of respondents say it will become more important for their staff to collaborate virtually, and 50% say they will do more virtual collaboration with customers and suppliers.

The area in which the largest proportion of respondents (60%) expects to see collaboration becoming more important is that of virtual collaboration with external organisations globally—here, virtual methods of working together are clearly essential. These findings support the views that open innovation is becoming more popular, that organisations are sourcing innovations from further afield, and that face-to-face contact remains essential for at least part of the typical innovation process.

Relationship-building is essential to innovation

Interviewees for this report shed some light on which methods of collaboration might be most appropriate at the various different stages of an idea's development. P&G's Mr Joia, for example, says: "Telepresence studios are great, allowing real-time lifelike collaboration across regions, [but] there will still be occasions—especially at the beginning of a business relationship, where trust and familiarity are being built—that the added investment in time and travel for personal contact is needed."

Similarly, at Philips, Dr Doyle says that although the company has powerful online databases where researchers around the world can share information, getting an innovation off the ground is often about who you know. This is why Philips invests a lot in bringing its technical people together. "There's a very structured approach to this," he says. "For example, we have an annual global research fair, which gives staff freedom to demonstrate their own innovations and research projects (in line with Philips' strategy and key sectors) to the whole company, including the board, and to certain external people." The company also holds so-called Eureka Fairs, at which researchers show their colleagues and managers what they have been working on over the previous year. Both types of event "encourage staff to see what ideas are being investigated, and to get them looking for synergies", says Dr Doyle.

Nevertheless, he adds, virtual collaboration is necessarily a "standard way of working" at Philips, which has facilities all over the world and which needs to work increasingly closely with "worldwide innovation partners".

Face-to-face meetings are also essential for keeping momentum going in a project, suggests John Steedman, venturing principal at BP Alternative Energy, a division of BP, a UK-based energy giant. "Any innovation process related to alternative energy technology is going to face challenges, so we regard close support of these ventures as vital. As a strategic investor looking for disruptive clean-tech innovation wherever it is happening around the world, we need to provide this support for start-ups in the US, Europe and Asia. But it's worth it, because it gives us the opportunity to add value and drive for success."

The need for balanced face-to-face and virtual collaboration is illustrated clearly at Intel, a global semiconductor manufacturer. Around one-third of Intel's 100,000 staff is dedicated to R&D, and most of these are based in the US. However, overseas units are an increasingly vital source of innovation for the company. The need to localise products and services is less important in this industry than in many others, but Intel feels that developing an "R&D footprint" in emerging markets is essential in order to

forge good contacts in academia, business and government, and to diversify its talent base to ensure that it has a healthy supply of young, innovative minds for the long term.

"We have nine centres around the world that represent the physical infrastructure of our 'innovation ecosystem'," says Intel's global director of IT innovation, Martin Curley. "These are places that provide an enabling environment for innovation in terms of training, assignments and prototyping. They're all co-funded by business partners—internal partners such as local sales or marketing groups, and external partners such as suppliers, with whom we practise open innovation."

Mr Curley explains that although "a certain amount of face-to-face" collaboration goes into every innovation process, the importance of virtual collaboration is increasing. "There's a time advantage to this way of working," he says. Teams in different locations can work on the same project, and teams working on different projects can share developments.

Bringing the customer into the innovation loop

There is one area of innovation where the majority of survey respondents and interviewees feel that virtual collaboration is becoming essential. Sixty per cent of those surveyed say that they already communicate with customers online with a view to co-creating the next generation of products and services, while a further 24% say they plan to do so within five years.

P&G is using several online social networks for this purpose. Its VocalPoint network, for example, has a membership of about 600,000 mothers worldwide, who each receive free product samples and previews in return for gathering marketing intelligence from a local group of their peers (typically around 25 other mothers) and making recommendations that can be used in development.

What is the value of this to the mothers? "They get product samples and a feeling of 'I'm on the inside'," says Paul Greenberg, a US-based customer-relations consultant and the author of *CRM at the Speed of Light*. "And P&G gets to reach around 20m mothers with its products." In other words, the company is using the globalising power of the Internet to co-ordinate a colossal campaign of localised, grass-roots R&D. At the same time, it is giving valued customers the feeling that a gigantic corporation is taking a personal interest in their concerns.

Key points

- Higher concentrations of related organisations stimulate innovation for all.
- The venture-capital environment impacts innovation; a "portfolio" approach is becoming more common.
- Policy interventions to stimulate innovation should improve a city-region's technology, talent, tolerance.

What your location can do for you

What makes a city or region innovative? A perennial question, it has become more pressing as the value of the intellectual assets of most companies has surpassed that of their physical ones. Numerous cities and regions have tried to make their economies more innovative, usually by attempting to consolidate local expertise and infrastructure as it relates to a particular industry.

However, a recent study of regional innovation in the UK, carried out by the National Endowment for Science, Technology and the Arts (a think-tank set up in 1998 to produce recommendations on how to make the UK more innovative at regional and national level), concluded that "few firms could name any policy that had made a positive and measurable difference to their innovation activities"[4]. The researchers, led by the organisation's research director for regional and international innovation, Sami Mahroum, found that the policies most likely to boost innovation levels were not targeted interventions such as tax incentives designed specifically to attract companies, but rather more general ones that create an attractive environment.

Moreover, it is vital to "be aware that the world is spiky," says Professor Florida. "Innovation is where the playing field is least level," he says. Using successful patent applications as a metric, he and his team determined that there are "at most two dozen places worldwide that generate significant innovation". This clustering effect is visible in the results of the survey, where proximity to companies and/or institutions in the same industry is seen as the most important external factor contributing to innovation. Forty-one per cent of respondents say that being part of a cluster is the most important factor in their ability to innovate, while 26% say that the most important thing is proximity to universities and other sources of fundamental research.

The higher the concentration of companies and institutions related to the same industry, the more levels of innovation rise for everyone involved. The concentration of people in itself stimulates creativity. In 2006-07 a team of researchers led by Geoffrey West at the Santa Fe Institute, a US-based private research and education centre, analysed urban growth through an evolutionary lens. Their hypothesis was that, as cities grew, their "metabolic rate"—in terms of innovation and other factors—would slow, just as the ability to convert food into energy slows in a growing biological organism. What they found instead was a high correlation between population growth and levels of patent activity, wages and GDP. In other words, the greater the concentration of people geographically, the higher the level of innovation that results.[5]

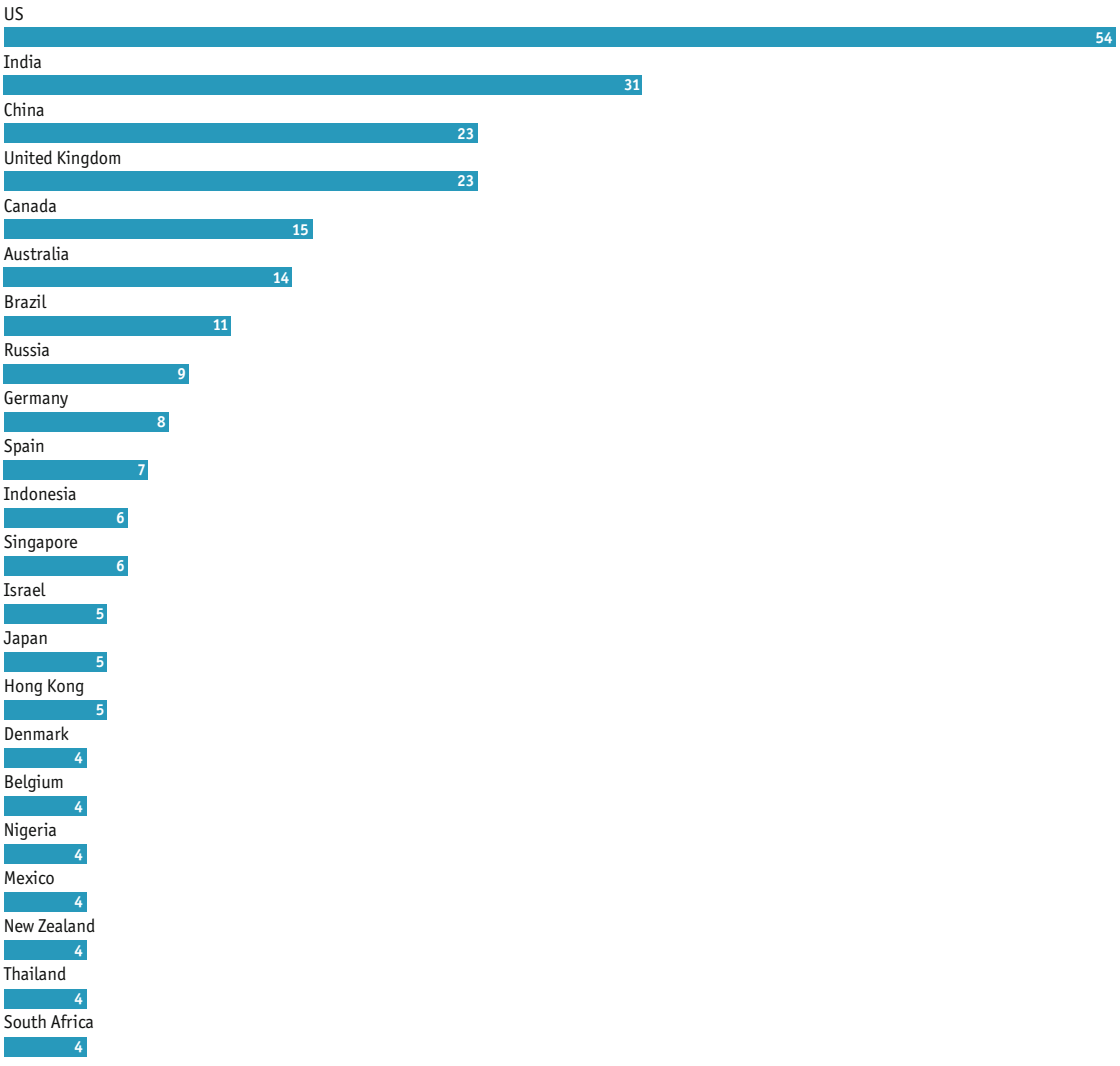
[4] *Path dependence and innovation in British city-regions*, National Endowment for Science, Technology and the Arts, July 2008.

[5] Luís M A Bettencourt et al, "Growth, innovation, scaling and the pace of life in cities," *Proceedings of the National Academy of Sciences*, 104, 17, April 24th 2007, pp. 7,301-6.

Some cities, such as San Francisco in the US, Bangalore in India and Cambridge in the UK, are recognised as innovation hot spots today. However, survey respondents indicate that the past performance of a city-region may not necessarily make it a hot spot of the future. Asked where they are making the greatest investment to boost their capacity to innovate, they rank the US as their number-one destination (chosen by 66 respondents). But the rise of Asia is clear, with 38 respondents choosing India and 34 selecting China (the same number as chose the UK). The next tier of countries include Canada (19 votes), Brazil (17) and Australia (also 17).

What makes the US so outstanding as a hotbed of innovation? It is not simply the size of the market. "There's definitely a difference in culture between the US and the UK," says Amanda Turner, strategy director at QinetiQ, a UK defence-technology company. "We're definitely more risk-averse. And we

Top locations for investments aimed at boosting innovation
Weighted average,where Choice 1=3; Choice 2=2; Choice 3=1.
(% respondents)



don't tend to invest in people who have failed in the past." The survey strongly supports this view: respondents rank business culture (such as tolerance of risk) as the second most important factor contributing to their ability to innovate in the countries where they personally are based.

Dr Turner recently completed an international study of innovation in service companies on behalf of QinetiQ and a major business lobby group, the Confederation of British Industry. As part of her research for the study, she learned that at least one company had recently failed to get venture-capital funding in the US precisely because its executives had never failed in business before. US venture capitalists want to see "scar tissue"—evidence of learning from past failures— in their entrepreneurs.

Venture capital

Clearly, no single policy intervention can change a national business culture. However, there are things that policymakers can do at a regional level to stimulate innovation, beginning with the venture-capital climate. For example, in Cambridge, UK, the local council has a programme designed specifically to help potential entrepreneurs—typically students or faculty members at the university—to prepare their ideas for consideration by venture capitalists.

Local authorities need to take positive steps to encourage venture-capital activity in their areas, suggests DSM's Mr Kirschbaum. "Venture capital is much more important than it was even ten years ago. Over the next five years we will invest more than three times the amount compared with what we spent on it over the past ten years." He explains that DSM is increasingly taking a portfolio approach to innovation, using internal and external venture funds to invest in a range of start-ups that may provide game-changing technologies in its principal areas of business. This is a key part of its open-innovation strategy, he points out—the recognition that a company's R&D department does not have a monopoly on good ideas.

A good venture-capital environment is not necessarily one in which venture capitalists are locally based. As finance has become globalised and the private-equity industry has grown exponentially, venture capitalists have become less averse to looking further afield for investment opportunities. "There used to be a '30-minute rule' that said you shouldn't invest in any company that was based more than 30 minutes from your office," says ETF's Mr Sheehan. Over time this has changed, and people are now willing to travel a bit more. However, he adds, "it is clearly easier to stay local". In other words, if you are going to provide seed funding to a high-risk start-up and you want to manage it actively, it makes sense to be based nearby.

Indeed, it is the "business angels", the private individuals who wish to invest small amounts in companies and to get heavily involved in their management, who often provide the kernel for successful clusters. "In Cambridge, it was the entrepreneurs who were the real catalysts," says William Webb, a visiting professor of communications at the University of Surrey in the UK and the author of *Wireless Communications: The Future*. "Hermann Hauser, for example, arrived in Cambridge in 1973 to take a PhD in physics. Since then, he's founded more than ten high-tech companies in the local area including, in 1990, Advanced RISC Machines (ARM), which is now the world's leading supplier of microprocessors for mobile phones." Besides forming companies, Dr Hauser has also provided funding

for many others, both as an angel investor and then through Amadeus Capital, one of the largest independent venture-capital firms in the UK. Today, around 25% of all high-tech start-ups in the UK originate in the Cambridge cluster, which has been nicknamed Silicon Fen, and around 7% of all the venture capital in Europe is directed there.

Can policy stimulate innovation?

Policymakers want to help create fertile ground for innovation. But can they?

At regional level, suggests Richard Florida of the University of Toronto, Canada, it boils down to promoting three things: technology, talent and tolerance. Survey results suggest that measures at the local and national levels can also help.

- **Investment in technology and infrastructure.** Investment in shared resources can be vital to sustainable innovation in a cluster. So, for example, in the fashion and textile cluster around Istanbul, the EU is partially funding the setting up of a fashion institute and equipment that can be shared by all cluster members. The Yokosuka Research Park in Japan, which now hosts 70 public and private bodies and 6,000 researchers, was equipped with numerous shared facilities by the local government to stimulate the creation of a cluster in the field of wireless communications.

- **Creating a talent pipeline.** This obviously means investing in education, and indeed the survey showed that the most helpful thing that local policymakers can do to help innovation is to implement "educational initiatives to meet specific skills shortages". But it also means that city-regional authorities must be careful not to neglect the kinds of cultural and aesthetic investments that will attract talent.

- **Tolerance means diversity.** Fifty-one per cent of survey respondents say they regard access to internationally diverse labour as "critical" or "somewhat critical" to their ability to innovate. This is borne out by successive surveys by the Corporation of London (the UK capital's local authority), which found that the city's pre-eminence in the world of international finance was in part due to the innovation created by its highly diverse workforce, clustered in the city's "Square Mile".[6]

- **Financial incentives and tax breaks at the local level.** Survey respondents rank these respectively the third and fourth most helpful policies that can be enacted by their local policymakers. They also rank financial incentives as the fourth most important factor contributing to their current innovation levels. Rob Kirschbaum, vice-president of materials innovation at DSM, at a Dutch-based international life-sciences and performance-materials group, points to the generous subsidies provided by the Dutch government and the support from regional authorities and universities in Eindhoven with the intention of stimulating a polymer-materials cluster, centred on the Dutch Polymer Institute at Eindhoven University. Incentives multiply every euro that a company puts into the consortium by a factor of four, he says, so the firm gets "to steer projects worth €4m (around US$5.5m) while only paying €1m". What the local area gets in return is extra employment, as the cluster collaboration and pre-commercial research and development will create many start-ups. "In turn," he adds, "we, of course, may be interested in buying and commercialising their intellectual property."

- **Perhaps the clearest advice for policymakers concerns what not to do.** Sami Mahroum, research director for regional and international innovation at a UK think-tank, the National Endowment for Science, Technology and the Arts, says that one of the key threats to innovation and general economic dynamism is institutional inertia—that is, governmental, organisational or cultural systems that lag behind economic change. His research shows, for example, that many innovative companies regard local land-use planning as "too slow, bureaucratic and unimaginative in developing transport and communications infrastructure". This too is reflected in the survey results, in which 43% of respondents cited "less restrictive rules and regulations" as an important policy measure at national level.

Success requires playing a long game. "In all our most innovative sample cities, the development of their current successes took around 30-40 years," says Dr Mahroum. As a result, he recommends that public policies for innovation be "broadly enabling" and adaptable over the long term. Innovation spikes can be built, says Professor Florida: "The rise of Silicon Valley out of the early efforts around Stanford [University] is but one example. But it takes time. And it takes sustained investment in great universities and in people—and of course in location. It was easier back then; now it is harder. But it can be done."

[6] *Financial Services Clustering and its significance for London*, Corporation of London, 2003.

Conclusion

Business is becoming more dependent on ideas. Rising levels of education worldwide and networked IT mean that ideas are both more numerous and more easily accessible. So it is becoming harder for businesses to create temporary monopolies, and more critical to invest in innovation capacity.

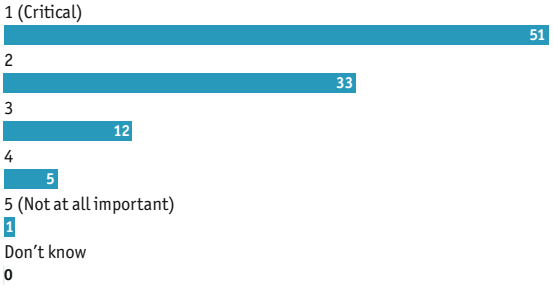
For those seeking to build a global innovation network, the local talent pool should be the number-one consideration when siting a new facility. A low-cost location is a false economy unless a company has a core of suitably inspiring leaders and a vision that will attract talented people away from city-regions where standards of living are higher and networking opportunities greater. Furthermore, the tendency of organisations in the same industry to cluster together is increasing. This means that the opportunity cost of not being a part of an industry's "go-to" destinations is rising.

As the practice of open innovation continues to become more popular, organisations must be prepared to draw more heavily on external sources of innovation. R&D teams will therefore need to act increasingly as filters of ideas. The leading companies will be those that gather ideas from a wide variety of sources: from external partner organisations in their supply chains or further afield; from individual "technology scouts" tasked with finding relevant innovations; and especially from customers, who will play an increasingly important role in the creation of new products and services.

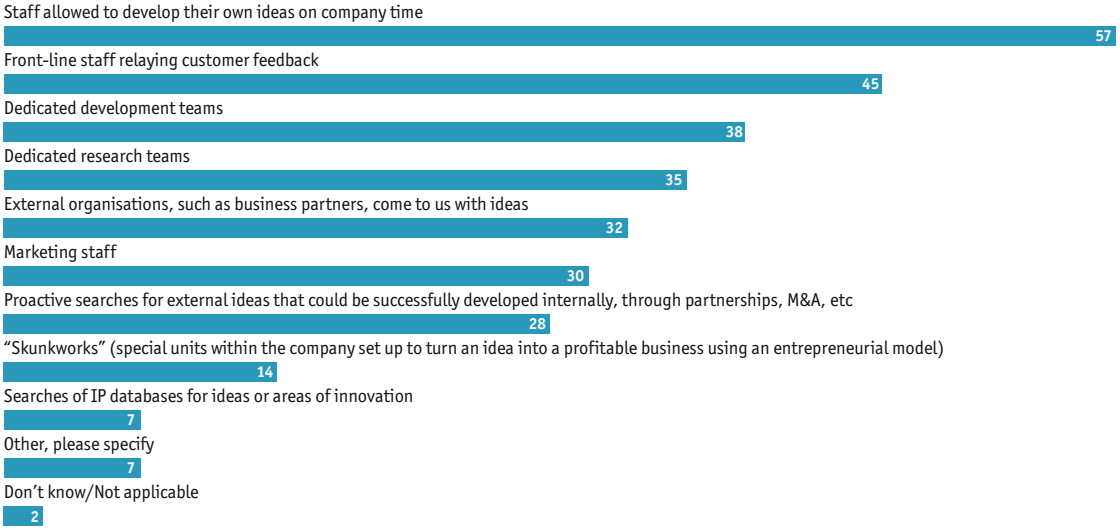
In turn, marketers should be trained to identify the value-creating overlaps between an organisation's technological advances and the needs of its markets. Where marketers are located is now just as important as where R&D facilities are located. The innovation capabilities of large organisations are necessarily going to become more globalised and widely dispersed, and the systems and processes they use to identify, capture and disseminate ideas must therefore be strengthened. This primarily means making better use of IT and virtual-collaboration tools. However, face-to-face contact between the people charged with developing ideas will remain vital for the foreseeable future, especially at the early stages of the innovation process.

Appendix: Survey results

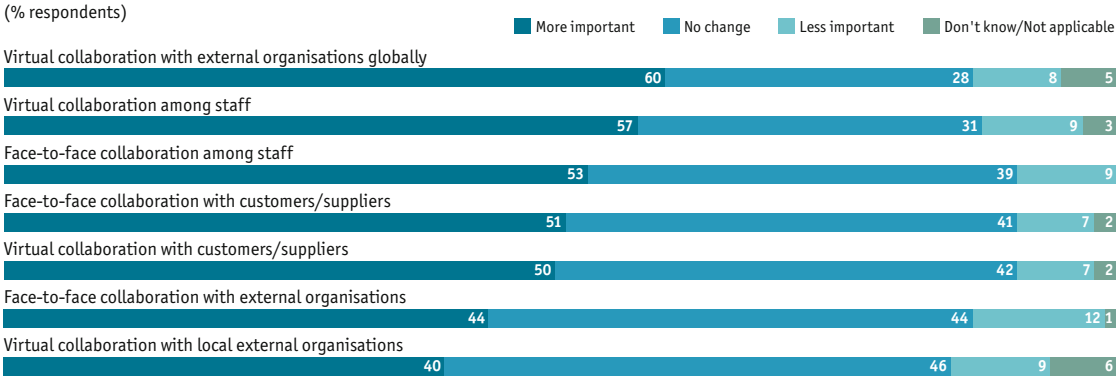
How important is innovation to your organisation's long-term success? Rate on a scale of 1 to 5, where 1=Critical and 5=Not at all important.
(% respondents)



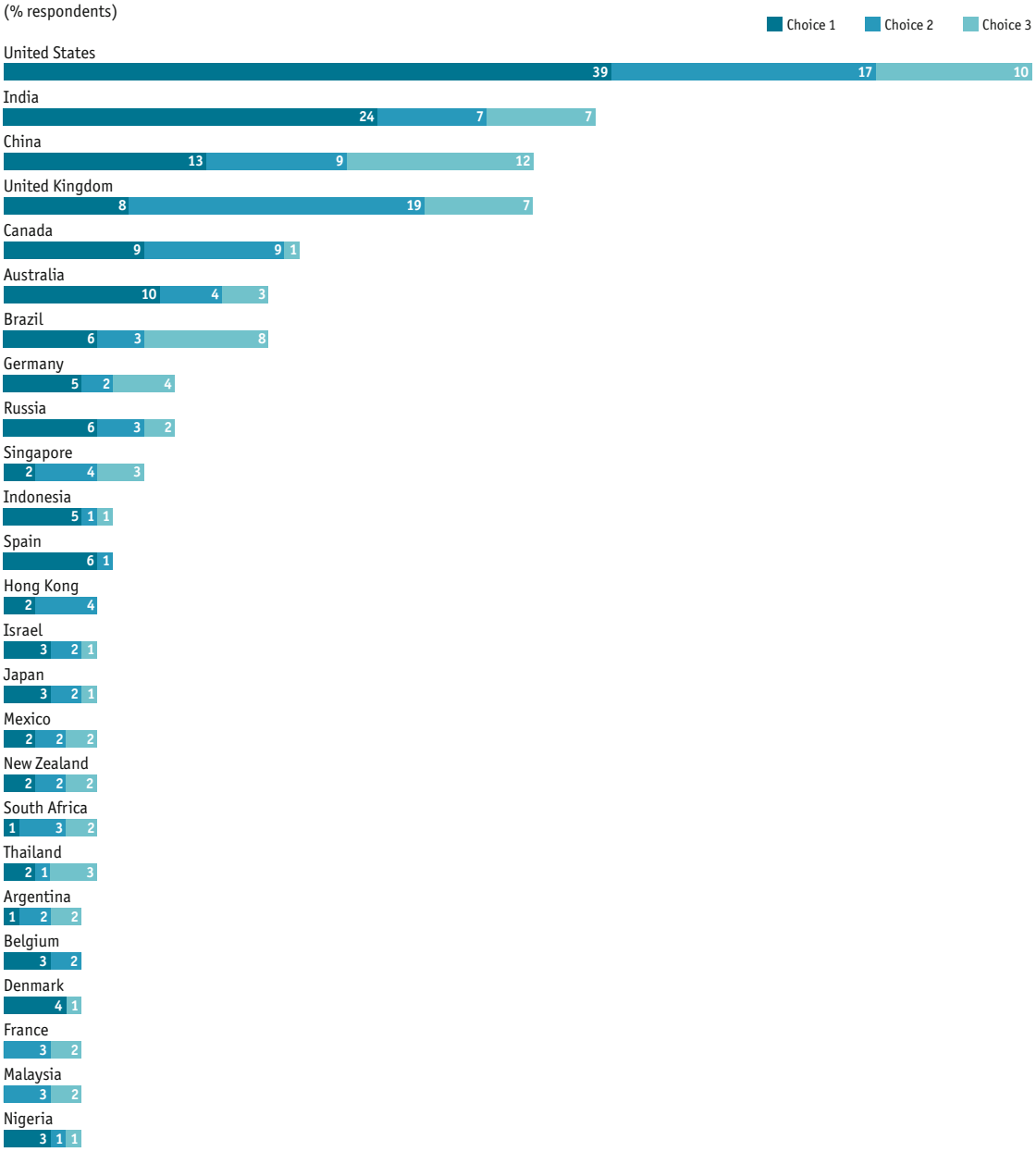
Where do the most commercially successful ideas tend to originate in your organisation? Select all that apply.
(% respondents)



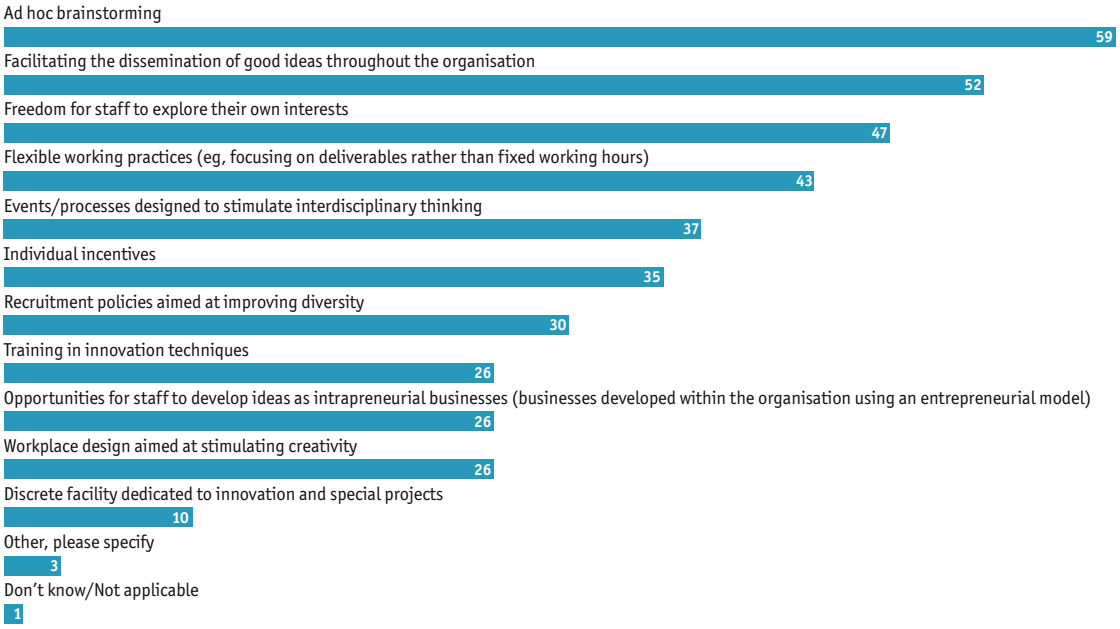
Do you expect the following types of collaboration to be more or less important in generating innovation in your organisation over the next five years?
(% respondents)



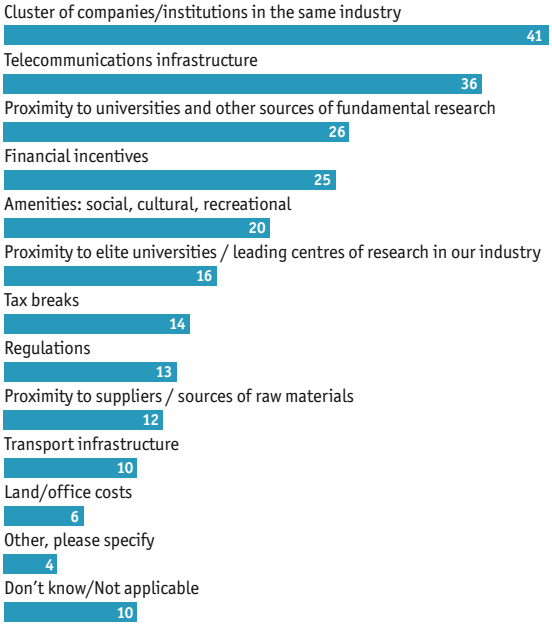
In which countries is your organisation making the greatest investment in order to boost its capacity to innovate?
Select the top three investment locations, if applicable.
(% respondents)



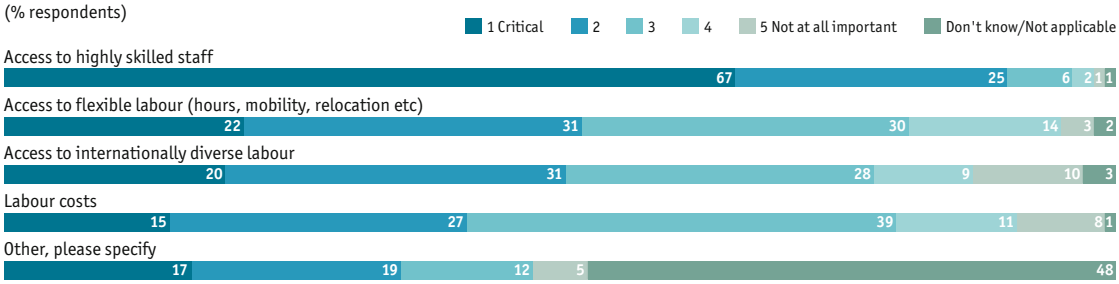
How does your organisation encourage innovation internally? Select all that apply.
(% respondents)



In the city/state/province where you are personally based, which external factors contribute most to your organisation's ability to innovate? Select up to three.
(% respondents)

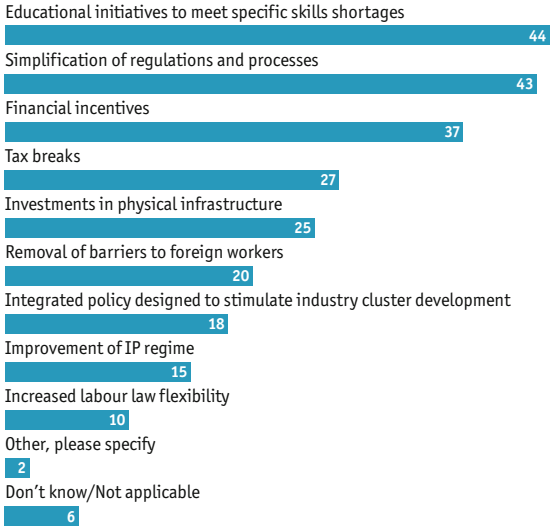


In the city/state/province where you are personally based, how would you rate the importance of the following factors to your organisation's ability to innovate? Rate on a scale of 1 to 5, where 1=Critical and 5=Not at all important.
(% respondents)

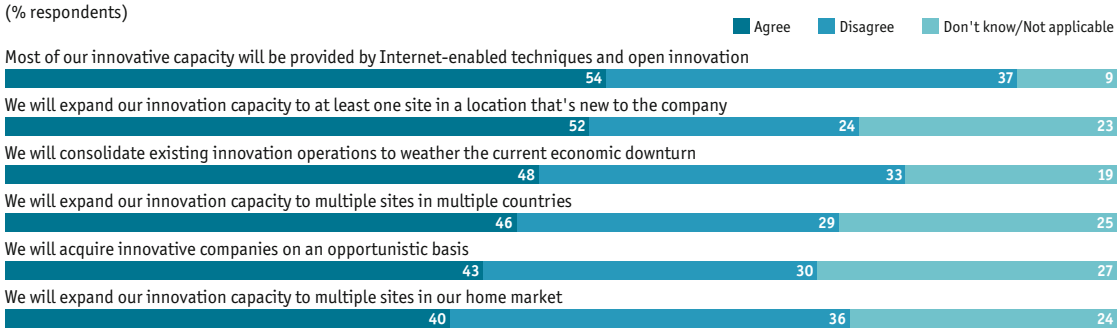


In the country where you are personally based, which external factors contribute most to your organisation's ability to innovate? Select up to three.
(% respondents)

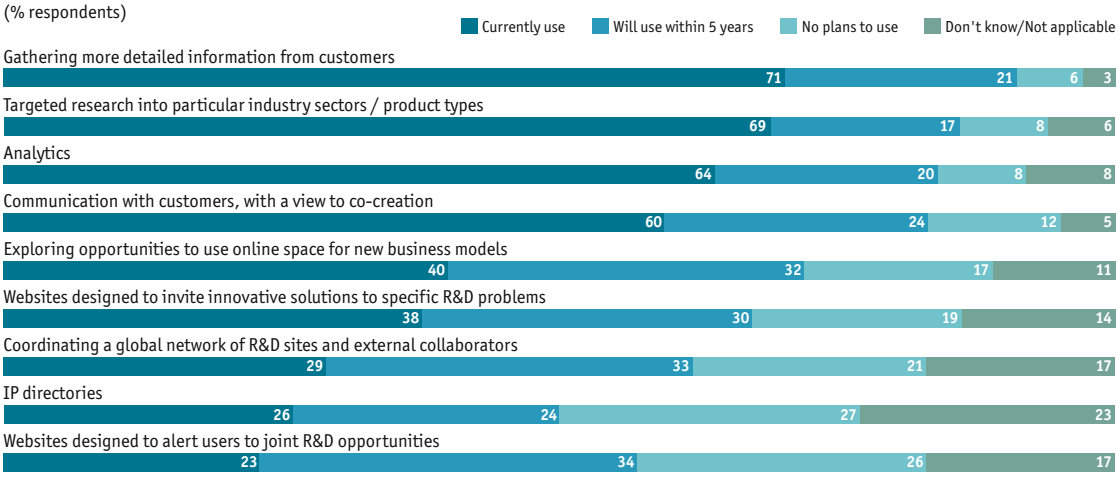
In the country where you are personally based, what is the most helpful policy that could be implemented by the government, a local authority or a development agency to stimulate innovation at your organisation?
Select up to three.
(% respondents)



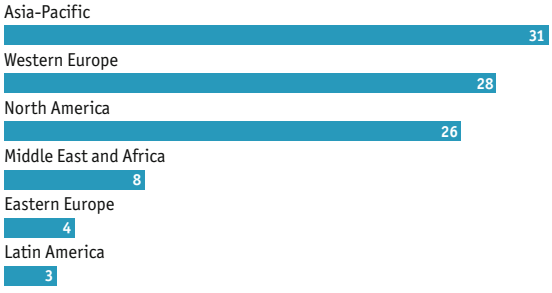
Do you agree or disagree with the following statements about your organisation's innovative capacity over the next five years?
(% respondents)



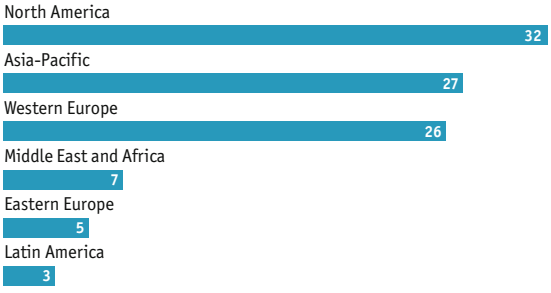
How does your organisation use the Internet for innovation?
(% respondents)



In which region are you personally based?
(% respondents)

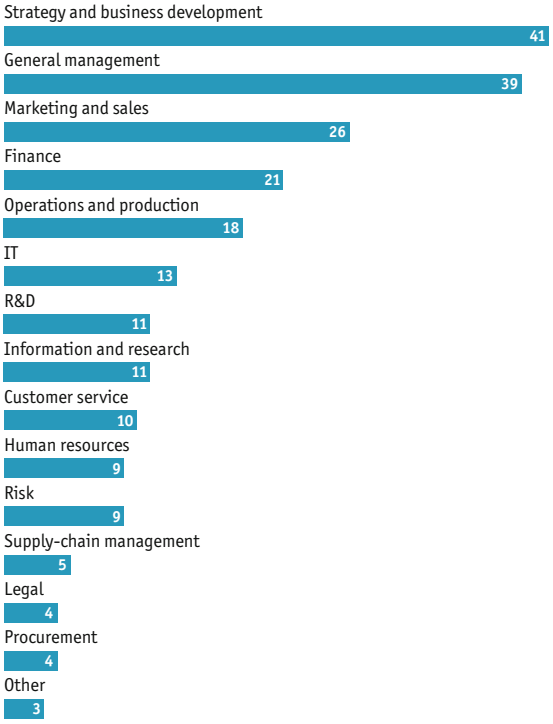


In which region is your company headquartered
(% respondents)

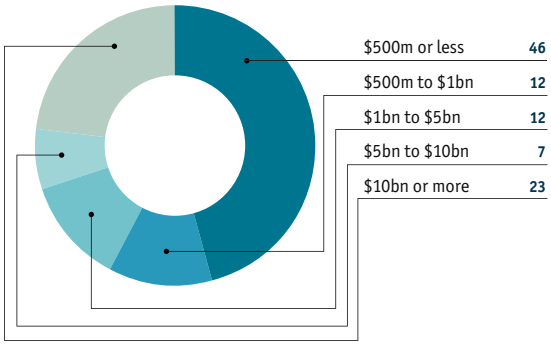


What is your primary industry?
(% respondents)

What are your main functional roles?
Please choose no more than three functions.
(% respondents)



What are your organisation's global annual revenues in US dollars?



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