

# The 2011 IBM Tech Trends Report

Tech Trends of today. Skills for tomorrow.





# Executive Summary

Technology is constantly changing how we live and work, pushing the boundaries of what we thought possible and increasing the rate and pace of innovation in every industry. For IT professionals — the catalysts of these changes — navigating career choices in such a dynamic environment can be difficult. If you could see into the future, what would you do to stay one step ahead? How would you ensure that you were building the right skills for future success?

The 2011 IBM Tech Trends Report offers a glimpse into the future of where technology is headed over the next two years. More than 4,000 IT professionals from 93 countries and 25 industries shared their opinions, and the report highlights trends from the five countries with the highest number of responses: the United States, Brazil, Russia, India and China.

The survey focuses on business analytics, mobile, cloud and social business, four critical and interconnected technologies that developers can use today to determine which skills they need to build a Smarter Planet. Over the next 24 months, these areas will only continue to grow, fueling development, architectural and analytic opportunities:

- **Business analytics** is the most adopted technology in the survey, showing the least adoption resistance as businesses struggle to automate processes and make sense of ever-increasing amounts of data.
- **Mobile computing** is here to stay, and offers room for IT professional growth as more and more organizations build mobile applications. Globally, Android emerged as the top platform for mobile application development; 70% of respondents are expected to develop for the Android platform over the next 24 months, while 49% plan to develop for iOS.
- **Cloud computing** offers new opportunities for technical professionals as businesses are moving beyond saving costs with infrastructure and beginning to build applications to innovate in the cloud.
- **Social business** adoption for business purposes varies by country, depending on the perception of security concerns and local acceptance of this technology.

Throughout the survey, the technical community paints a picture of where this evolution stands now, and how this transformation will continue to occur over the next 24 months. We believe this survey helps take the pulse of the ever evolving landscape of IT development and provides a look into the future that can help IT professionals build the skills they need to stay ahead of the curve.



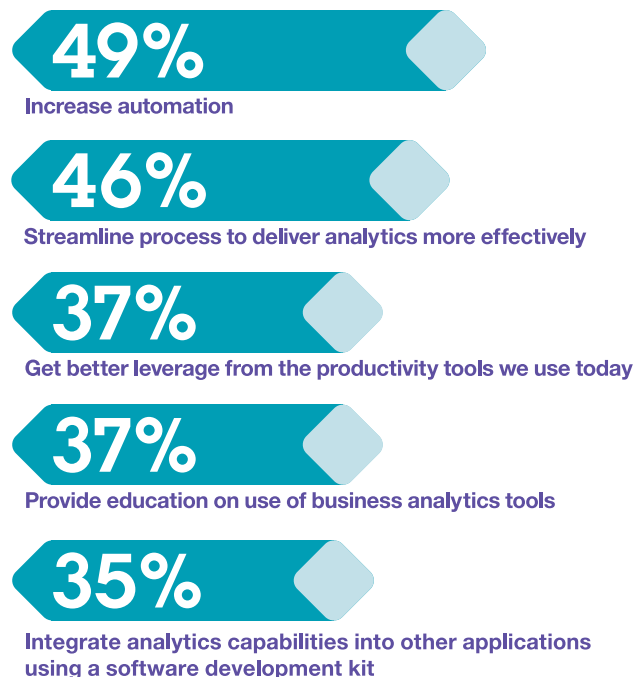
**A further breakdown of data shows interesting insights around localized plans and cultural implications:**

- There is generally a higher interest in automation in Brazil, Russia, India and China [BRIC] than in the U.S., perhaps suggesting that the U.S. has already saturated this area of analytics or is at least ahead of BRIC.
- Increasing automation is consistently the top business analytics area across key countries. Education in the use of business analytics is second, suggesting wider usage of business analytics tools by new users. To build key skills in business analytics and other areas, visit [ibm.com/developerworks/training/knowledgepath](http://ibm.com/developerworks/training/knowledgepath).
- Integrating business analytics into an existing deployed infrastructure ranks as the most common concern when considering new solutions, but training, performance and cost are close behind.

## Business Analytics

Business analytics was the most-adopted technology area in the survey, reflecting the struggle for organizations to automate processes and make sense of ever-increasing amounts of data by turning that data into actionable reports and insights. This technology has a bright future, with 42% of respondents naming it as an “in demand” area for software development and as having the highest adoption tendency (90%) when compared with other technology areas. IT professionals believe these technologies will have the highest impact in the education, healthcare, aerospace/defense, computer software and life sciences industries. Developers who want to grow their skills to meet these needs should take note that 87% of respondents cite open source platforms such as Apache Hadoop and Linux as playing a key role in the future of this application development.

### How organizations plan to use business analytics (n=1814)



Half of those who are not currently using analytics plan to do so within the next 24 months, to increase automation, streamline processes and do more with less in faster time. Even so, two-thirds of respondents report a less than 50% increase in the amount of business analytics work in their organizations over the past year, as organizations are concerned that they will face difficulty when integrating sophisticated analytics capabilities into existing technology and in educating people on how to make the most of the new insights.

# IBM Watson

This year, the possibilities of business analytics reached the public consciousness like never before with the unveiling of IBM Watson.

IBM Watson uses sophisticated analytics to understand the meaning and context of human language. With this capability – unprecedented in history – IBM Watson’s analytics technology can draw upon tremendous stores of data to instantly recommend responses to questions. In fact, the IBM Watson technology is able to sift through an equivalent of about one million books or roughly 200 million pages of data, analyze this information and provide responses in less than three seconds.

Survey respondents identified education as the industry with the biggest opportunity for IBM Watson’s abilities, with healthcare and aerospace/defense a close second and third, respectively. But how can the capabilities of IBM Watson impact the IT professional? When asked about IBM Watson’s ability to quickly analyze large volumes of data, 70% of respondents said data analytics would be most affected by this; another 69% said artificial intelligence would be most affected.

IBM has been committed to research and innovation for over 100 years. IBM Watson is a testament to this commitment. The next challenge is to apply IBM Watson’s underlying analytics and data management technologies to the business world. Stay tuned. The story of the IBM Watson system has just begun.



“By tapping into Watson’s technology, I believe teachers will be able to deliver a targeted approach to teaching their students. They will have the ability to cultivate skills and customize their teaching programs to address each student’s strengths and weaknesses.”

**Zhihua Wei, PhD**

Lecturer, Department of Computer Science and Technology, Tongji University. Shanghai, China



“Aside from education, I believe Watson’s technology will also have a huge impact in the medical field. In addition to reducing medical misdiagnosis and costs, it could also increase the level of personalized care. The benefits to global healthcare systems will be tremendous.”

**Edmund Perozzi, PhD**

Perozzi Academic Services, LLC. Virginia, United States



“Watson is not only changing how we view technology, it’s also changing our approach to problem solving and allowing us to be more creative. This presents a huge opportunity for the next generation of developers. By thinking outside the box, they can really challenge the realm of possibility and develop the next game-changing solution.”

**Jamir Monteiro, PhD**

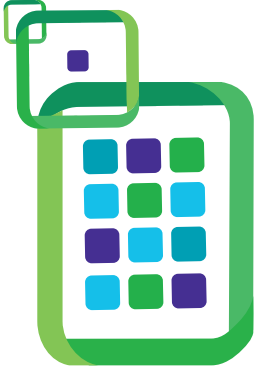
Associate Researcher, Technological Institute. São Paulo, Brazil



“As a university faculty member that is active in the IT industry, I see the huge potential for Watson technology in the classroom. It could give students and faculty members access to fast and accurate information to some of the complex questions we have today. It would also be a powerful tool to help educators in rural regions who may not have access to the same quality of training and materials as their urban counterparts.”

**Ben Uy**

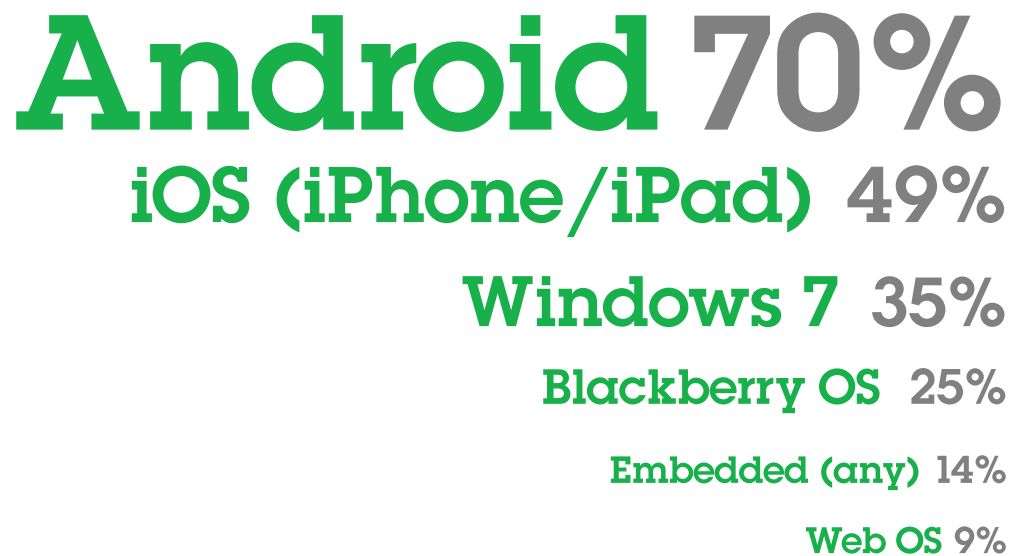
OIC-Chairperson, BS-Information Technology, De La Salle-College of Saint Benilde. Philippines



## Mobile Computing

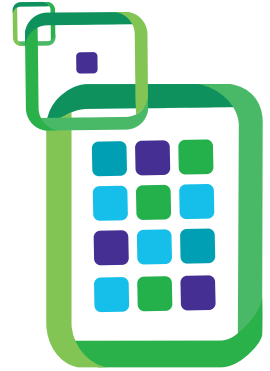
Mobile computing is firmly established in the marketplace and offers a means for IT professional growth as more and more organizations build applications. Developers looking to increase their mobile skills would be smart to look to Android. With its large and growing global install base, Android is ranked as being the top mobile platform over the next 24 months. This open source platform based on Java and XML offers a much shorter learning curve, and this contributes to its popularity with IT professionals. iOS remains strong in the U.S. and other developed countries.

Planned mobile development platforms (n=2920)

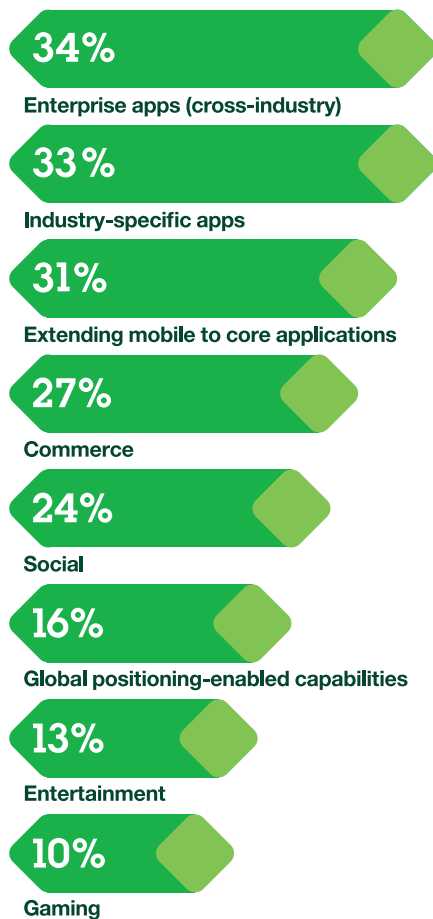


# Mobile Computing

As an effective channel in reaching many users and as a means of increasing the productivity and efficiency of an organization's workforce, mobile is viewed by respondents as the second most "in demand" area for software development. Mobile computing has a high level of penetration, with three in four survey respondents currently working in mobile computing, growing to 85% within the next two years. Respondents see enterprise and industry-specific applications as top areas for adoption within 24 months, with extending mobile capabilities to existing core applications close behind.



## Focus areas for mobile computing adoption (n=3885)



## Mobile adoption rates vary by country, but concerns are the same across the board:

- The U.S. and Russia are building mobile infrastructure, while India and China are building applications to take advantage of it. Respondents in the U.S. and Russia ranked "extending mobile capabilities" as the highest mobile adoption area, while developers ranked "industry specific applications" highest in India and China.
- Security/privacy and the cost of developing for multiple mobile platforms are cited as the top mobile adoption concerns (53% and 52% respectively).



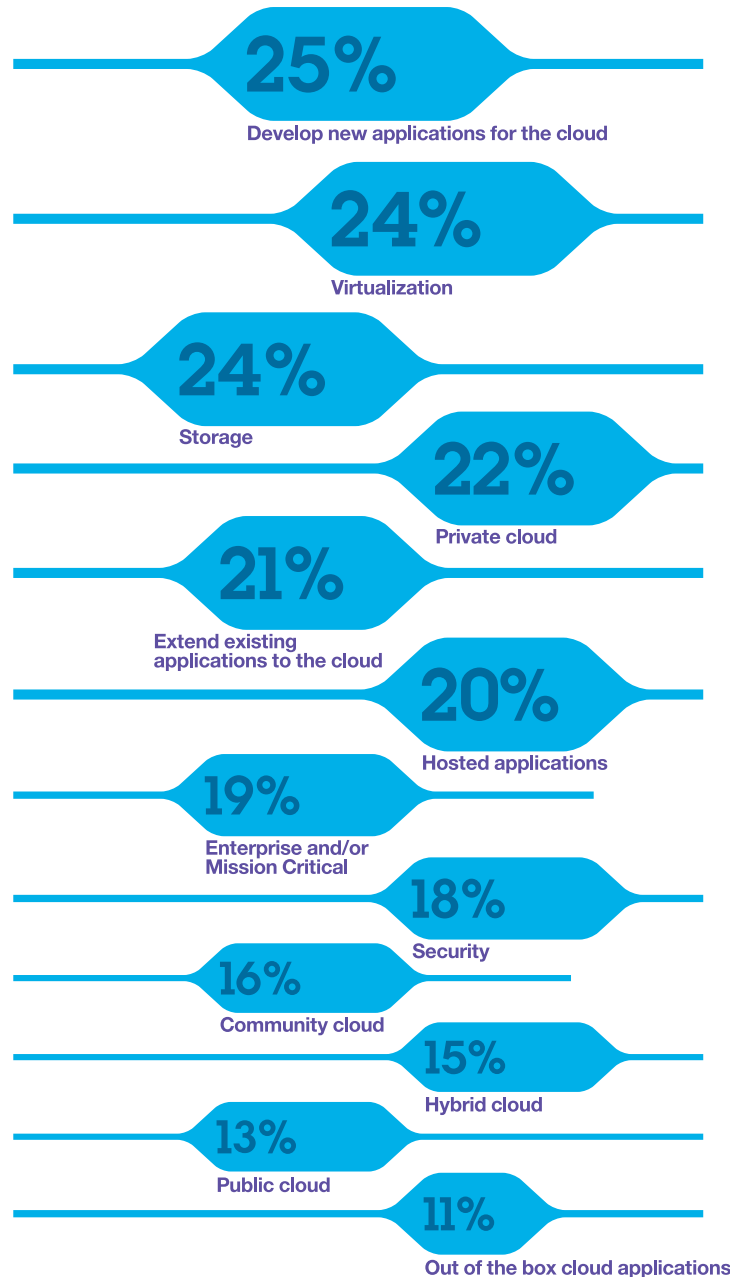
## Cloud Computing

Cloud computing has become more established in the technical landscape. Increasingly, organizations are taking advantage of the cloud, not only to build infrastructure but also to build and deliver new applications, services and business models, many of which are also tied to their mobile applications. At this stage in the technology lifecycle, IT professionals need to focus on learning how to integrate the cloud into application development.

How organizations plan to implement cloud computing (n=3142)

According to respondents, building cloud applications will outpace virtualization as the top cloud activity in the next 24 months. Still, companies still have concerns about building and utilizing infrastructure in the cloud:

- Flexibility, scalability and the reduction of operating expenses are the biggest motivators for this move up the stack.
- IT professionals cite security, compatibility with existing applications, privacy, and performance as the top concerns when adopting cloud.





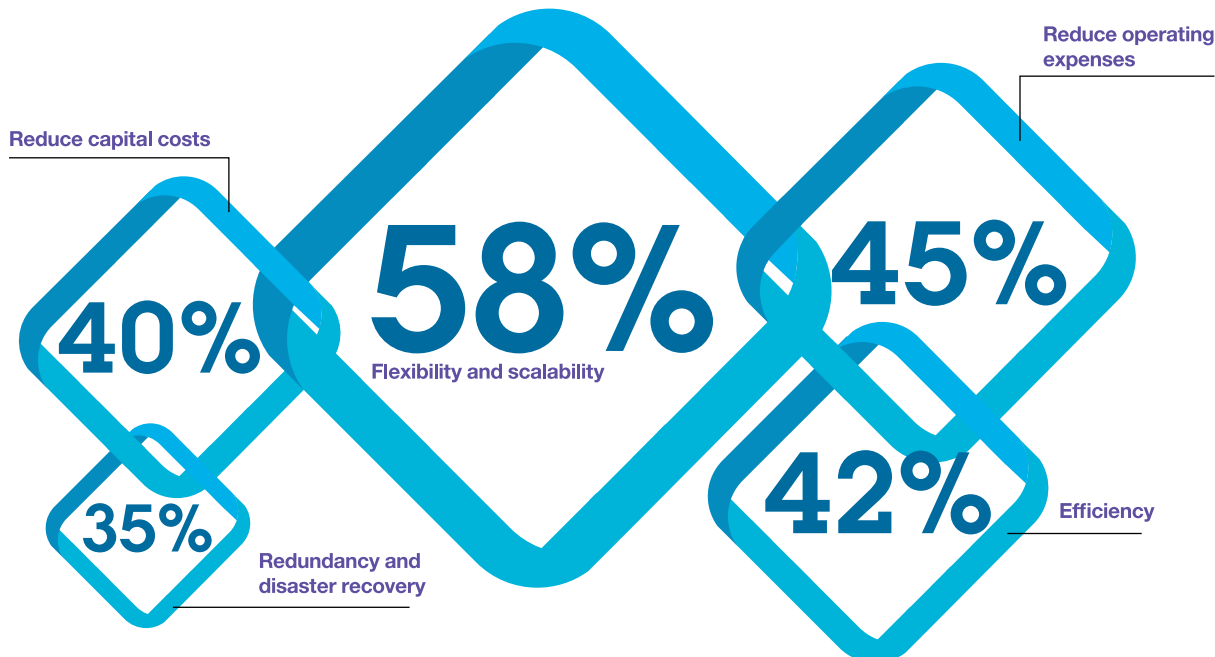
# Cloud Computing

While 40% of respondents indicated that their organization is not currently engaged in cloud computing, the vast majority (75%) of respondents believe that over the next two years their organizations will begin to build cloud infrastructure. IT professionals predict developing new applications will be the top cloud adoption activity in the next 24 months, overtaking the current top investment areas of virtualization and storage. This finding suggests that cloud is becoming more entrenched in the technical landscape as more and more organizations move from building cloud infrastructure to taking advantage of it with new services and business models. What's more, as mobile usage proliferates, so should the use of cloud. The survey uncovered a strong link between the adoption of mobile and cloud. Fifty-one percent of respondents cited the adoption of cloud technologies as part of their mobile strategy. Mobile usage increases the amount of transactions, while cloud enables the flexibility and cost-effectiveness to handle demand surges.

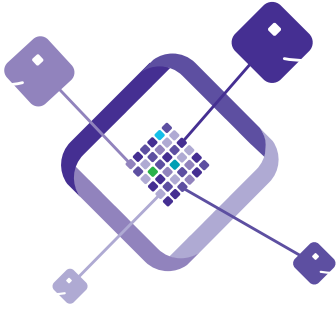


The top motivators for adopting cloud continue to revolve around the notion of doing more with less. Close to 60% of respondents cited flexibility and scalability as the top motivators for embracing cloud technology. IT professionals are also motivated to make a positive impact on their organization's bottom line, citing reduced operating expenses and capital as two other top motivators for embracing cloud.

## Top 5 motivators for adopting cloud technology (n=2254)



## Social Business



### Regional cultural differences dramatically impact social business adoption:

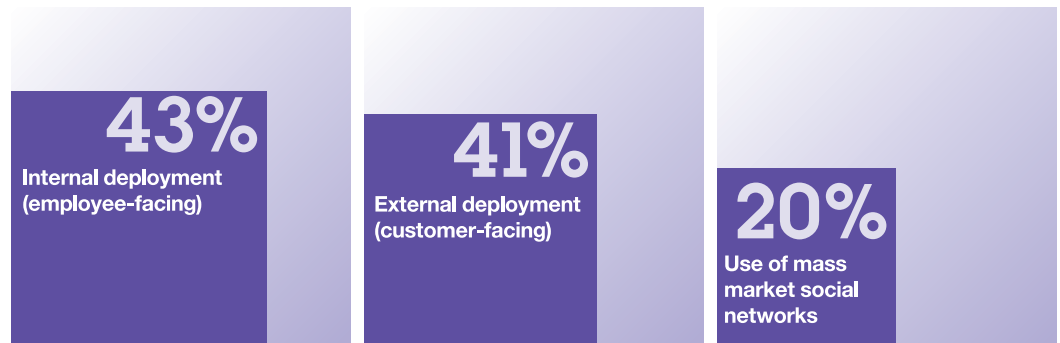
- Forty-eight percent of respondents cited “adoption by employee and/or customer” as a concern when adopting a social business solution.
- Different countries appear to have different comfort levels with this drive for critical mass. India is already embracing social business adoption very strongly (57%), followed by the U.S. (45%) and China (44%). Russia shows the strongest resistance (19%).

A social business embraces networks of people to create business value. An effective social business embodies a culture characterized by sharing, transparency, innovation and improved decision making. Such a culture enables deeper relationships with customers and business partners.

Social business is a clear force in the technical landscape. However, the focus on security as well as on local employee and customer acceptance drives variations in adoption in different countries. IT professionals looking for opportunities in social business should respond to this need by improving their skills in security, access control and confidential data management.

The majority of respondents reported that their organizations have embraced social business to some degree to benefit from increased efficiency and collaboration. Many companies are implementing intranet-based solutions to begin testing the waters, and respondents expect these implementations to grow. The survey showed employee collaboration, efficiency in locating people and resources, and idea generation and sharing as the top three motivators for internal deployment. The three top social business capabilities that companies are utilizing today are file sharing, blogs and forums.

### How organizations plan to become more social (n=2851)



Looking ahead, internal deployment still edges out external deployment as the top social-business focus area. Organizations with customer-facing external deployments are more likely to deploy their own social platforms (41%) than use third-party systems like Facebook (20%). This provides a much higher level of control and the ability to better understand their customers, while limiting exposure to other networks' ever-changing privacy policies.

## Looking Ahead

IT professionals have given us a clear message in the 2011 Global Tech Trends Survey: organizations are adopting and increasing investments in the areas of business analytics, mobile computing, cloud, and social business. This message is a clear indicator that these technologies have passed niche status, and are now part of organizations' core IT focus and discussions.

Macro factors such as cultural influences and regulations, and technical factors such as security, privacy and interoperability are driving differing adoption rates and trends across countries and industries. Successful IT professionals will be those who possess the necessary skills and can effectively address these technical factors in the context of their larger environment. To build your skills in these and other areas, visit [ibm.com/developerworks/techtrendsreport](http://ibm.com/developerworks/techtrendsreport).

The upward growth trends in business analytics, mobile computing, cloud and social business suggest the possibility of a strong link between these technology areas — that the adoption of one technology drives the demand for another. For example, as our respondents have told us, organizations' mobile adoption strategy will require the use of cloud technologies. Likewise, an effective social business platform may demand portability that can be delivered through the adoption of mobile computing. IT professionals who can build skills in multiple areas and work across these technologies will be poised to succeed over the next two years and beyond.

## About IBM developerWorks

IBM developerWorks is the industry-leading and award-winning technical resource and professional network for the developer community.

Four million developers, IT professionals, and students in 195 countries use developerWorks each month to learn about advances in IT and open standards, develop skills, solve problems, and work collaboratively with experts and peers.

Since 1999, developerWorks has been the IT industry's most comprehensive source of technical content, downloadable code, and community forums focusing on IBM software products, as well as on open-standards technologies such as Java, Linux, XML, Web development, and more.

For more information about IBM developerWorks, visit [ibm.com/developerworks](http://ibm.com/developerworks).

