IBM Institute for Business Value

The "upwardly mobile" enterprise

Setting the strategic agenda

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Much as e-business represented a fundamental business shift in the early part of this century, mobile technology offers a unique opportunity for organizations today. Far more than simply an emerging consumer channel, mobile capabilities are disrupting traditional business models, providing businesses with new sources of data and insight, and driving top- and bottom-line results. Our survey of over 600 companies and interviews with 30 mobile leaders suggests that less than half of organizations have comprehensive strategies in place to encompass the spectrum of mobile efforts and address the broad challenges of implementation. Further, only a handful of mobile strategy leaders have put into place the needed building blocks to take full advantage of these new mobile opportunities. Significant opportunities exist for companies to improve their mobile strategy development efforts, leverage mobility to reinvent business and operating models, and deliver more effective mobile IT processes and solutions.

"This will get to the point where it is a fundamental way we do business. The value proposition will be that it is embedded in what we do. In 5 to 10 years, we will look back and wonder what all the fuss was about."

This quote could be from a futurist describing the Internet in the year 2000. But, in fact, it is how a senior automotive executive we interviewed recently characterized the future of the mobile enterprise. Organizations are currently in the midst of a new wave of mobile capabilities that can drastically reshape business models; drive increasing levels of employee productivity; and reinvent how customers learn about, interact with, and purchase goods and services.

Much as the Internet has created, and continues to offer, a seemingly unlimited set of possibilities for companies, mobility adds yet another set of emerging opportunities into the mix. It enables large segments of the global population to more rapidly access information and engage with others on a scale never seen before.

There is little doubt that consumer adoption of mobile products and services is continuing to grow exponentially. By the end of 2013, there will be approximately 1.4 billion smartphones subscribers, and more than 50 percent of mobile phone users in major markets worldwide are now smartphone users.[1] Over 79 percent of smartphone owners use their devices to purchase goods and services, with U.S. mobile retail revenues via smartphone expected to reach US$31 billion by 2017.[2]

Consumer adoption has become widespread and, from a corporate standpoint, mobility is vastly broadening its reach as well. Enterprise adoption of tablets, a category that barely existed three years ago, is estimated to grow by almost 50 percent per year.[3]

Further, recent data from an upcoming IBM Institute for Business Value study on the Digital Front Office indicates that individuals are using both mobile phones and tablets to accomplish a wide range of work activities that were previously restricted to desktops. Such work activities range from accessing e-mail (62 percent via phone, 38 percent via tablet) to collaboration and project management (25 percent via phone, 34 percent via e-mail) to videoconferences (30 percent by phone, 33 percent via tablet).[4] The ability to perform these and access other enterprise applications from non-traditional office settings holds the possibility to reinvent at a fundamental level how companies execute a range of activities – from sales and customer service to logistics and maintenance.

At the same time, mobility incorporates opportunities beyond the use of phones and tablets. Estimates indicate that the market for wearable devices alone will be worth more than US$1.5 billion in 2014 and that between 300 and 485 million devices will be sold by 2018.[5] Sensors built into wearable devices such as wristwatches and glasses and embedded in everything from cars to medical devices to thermostats will provide new sources of "big data" that can be harnessed to deliver more targeted products and services, as well as to create new sources of revenue.

Given the significant opportunities posed by mobile technologies, what are companies doing to develop and implement mobile strategies and prioritize mobile investments? How are they using mobile capabilities to provide faster, more effective support to customers and redefine their enabling processes and business models? What are they doing to develop an infrastructure that can address traditional challenges regarding integration and security, and also take advantage of new developments in the mobile marketplace?

These are some of the questions driving the survey we conducted in conjunction with Oxford Economics. Participants included over 600 individuals with knowledge of their organizations' mobile strategy. In addition, we interviewed representatives from more than 30 companies that have taken important forays into the mobile world.

We identified a subset of companies from the survey data – we call them "mobile strategy leaders" – that have already established a clear direction for their mobile efforts and see their mobile strategies as distinguishing them from their peers. These companies outperform their peers across a number of business metrics and provide additional guidance as to where more advanced companies are headed. For more details, see "Methodology" in the Appendix.

Mobile strategy leaders have also seen clear benefits in their mobile investments to date: 73 percent of leaders have seen measurable ROI from their mobile initiatives versus 34 percent of all other companies in our study. Further, 81 percent stated that mobile capabilities are fundamentally changing the way their organizations do business. An executive from a travel company succinctly highlighted this:

"We quickly realized that what people called 'mobile' today is more than just having small computers with them all the time. It's also a new way to distribute software and brings a completely new set of expectations and user experiences that users expect from software that they will use all the time."

From our study results, we see that mobility holds the promise of delivering a new set of capabilities that will not only dramatically increase the speed of commerce, but will also force companies to rethink the foundations of their competitive differentiation. It will require companies to take a closer look at what products and services they offer, how they engage with customers and how they deliver on their value propositions. In short, mobility is more than simply having computing power at the touch of a finger; it is spurring a fundamental shift in user experiences and expectations.

Developing a mobile strategy

There are clear reasons why companies should be focusing on the development of a mobile strategy. As we saw in the early days of the Internet and e-commerce, many companies start by undertaking lots of individual, often disconnected initiatives, resulting in numerous fragmented and uncoordinated efforts. This lack of integration with existing processes and infrastructure often causes confusion and poor utilization of limited resources. Limited mobile technology skills and resources remain scattered across the enterprise, making it difficult to tackle key initiatives and deliver tangible results to the business. This, in turn, makes it more difficult to integrate mobile efforts into a cohesive, enterprise-wide strategy. For mobility to be successful, it will require close partnerships among multiple stakeholders, all owning a valued stake in this rapidly evolving space.

Mobile strategy: A new source of corporate advantage

From our survey, we see less than half of organizations demonstrate characteristics of a well-defined mobile strategy (see Figure 1). This includes having a well-defined enterprise wide strategy that is aligned to business, a clear funding mechanism for mobile initiatives and established governance structure for mobile initiatives. At the same time, however, companies recognize the need for a mobile strategy to effectively compete in the future. While only 20 percent of organizations today believe they have a superior or leading mobile strategy compared with their industry peers, more than double that amount (44 percent) anticipate their mobility strategy to be ahead of their peers in the next three years.
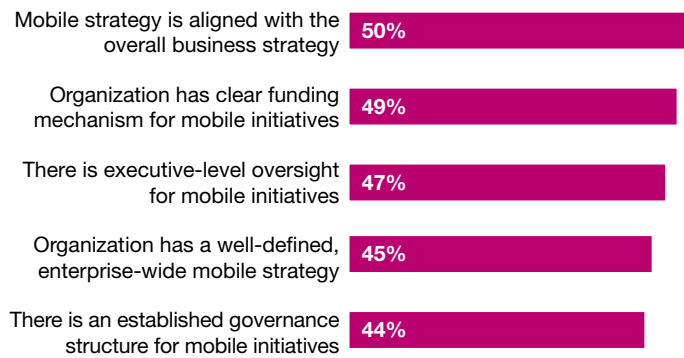
Source: IBM Institute for Business Value Mobile Enterprise Study: *To what extent do you agree or disagree with the following statements about your organization's mobile strategy and mobile practices? (percent indicating agree or strongly agree).*

Figure 1: **Only half of all companies have a well-defined mobile strategy.**

Mobility is clearly an area where companies are looking to increase their investments. Overall, 90 percent of those surveyed are looking to sustain or increase their investments in mobile technologies over the next 12 to 18 months, with mobile strategy leaders being twice as likely to increase their spending more than 15 percent. As the head of global digital deployment for a financial services company described, "If we don't invest in mobile, over time we will reduce our ability to acquire new customers and make acquisitions; our customer metrics will decline."

Governance: Making mobile decisions

In the early days of e-business, we often saw a lack of coordination among different parts of the organization as each looked to take advantage of the Internet. Marketing would work with an outside agency to design a Web page for the company that did not link effectively, if at all, to the company's customer service efforts. One business unit would launch a Web page that lacked consistency and standardization with others in the same organization, confusing customers and employees alike.

We see similar challenges in the mobile area. It is easy for individual business units to develop and release their own mobile apps. More challenging is developing a cohesive, coherent mobile strategy that identifies the coordination necessary to scale and take advantage of mobility at a corporate level. In our discussions, we clearly heard the importance of establishing a structured governance process to make decisions regarding strategic mobile investments. As one senior manager from an automotive company stated, "We made the mistake with the Web of allowing each business unit to operate independently. With mobile, we recognize the need to centralize development around one center."

Today, we see that the Chief Information Officer (CIO) is playing an important role in managing and implementing an organization's mobile initiatives. We asked our survey participants to name the individual (or individuals) who were primarily responsible for five sets of roughly sequential strategic activities: generating new ideas, setting/managing priorities, determining funding, acting as a lead sponsor and providing governance (see Figure 2). The CIO was identified as a primary figure in the decision-making process, ranking number one in four of the five categories (with the CFO leading funding efforts).

Overall, we also see clear involvement early in the process from Line of Business (LoB) leaders; however, their involvement appears to drop off significantly after the first two sets of activities. That is a potential challenge for organizations, as it appears that a "handoff" is occurring when the LoB executive charters a mobile initiative, yet leaves it in the hands of others during the rest of these early stages.

Another interesting finding arose when we examined the governance practices of mobile strategy leaders. For this group, the Chief Marketing Officer (CMO) plays a much more prominent role in early stage decision making. CMOs were ranked second in terms of driving the idea-generation process versus seventh for all others; CMOs were also ranked fourth in terms of setting/managing priorities versus sixth for all other companies. Given the importance of understanding customer needs and requirements, the use of creative design, and the importance of brand management in this quickly growing and changing space, we are not surprised that leaders are enlisting more prominent representation from the senior marketing executive in the mobile strategy process. As one senior advisor at an electronics company described, "In governance and decision making…make sure the voice of the customer is heard by the engineer."

Ranking	Generates new ideas	Sets/manages priorities	Determines funding	Acts as lead sponsor	Provides governance
1	CIO	CIO	CFO	CIO	CIO
2	LoB	LoB	CIO	CEO	CTO
3	PM	CTO	CEO	COO	COO
4	CEO	CEO	COO	CFO	CEO
5	COO	PM	CTO	CTO	CFO

Source: IBM Institute for Business Value Mobile Enterprise Study: *Please identify the lead participant(s) involved in managing and implementing your organization's mobile initiatives. Please rank up to three for each activity.*
Key: Chief Information Officer (CIO), Line of Business (LoB), Project Manager (PM), Chief Technology Officer (CTO), Chief Executive Officer (CEO), Chief Operating Officer (COO), Chief Financial Officer (CFO).
Note: Chief Marketing Officer (CMO) was also an option, but this role was not named in the top five responses.

Figure 2: **Today, the Chief Information Officer (CIO) plays a prominent role in the majority of mobile strategy activities.**
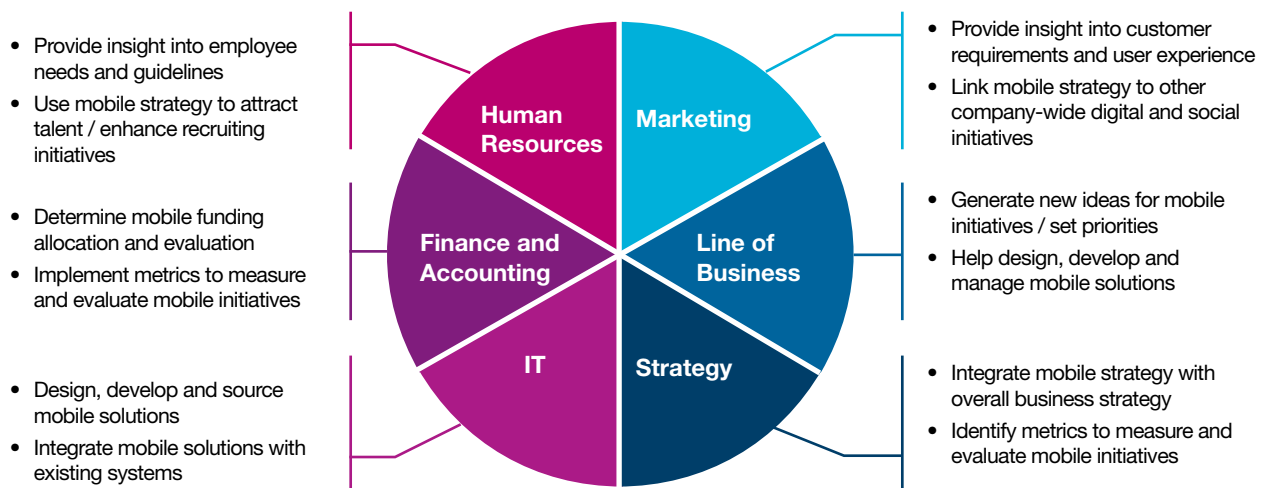
Overall, our interviews highlighted the need for greater cross-functional participation in mobile initiatives. As one banking executive noted:

"Our governance structure – which includes representatives from finance, risk, operations, customer service, product and application development, project management, technology, marketing and strategy – has been immensely effective in terms of increasing the precision and speed with which we deploy mobile solutions. The substantial membership of our governance team is reflective of how digital affects everything we do and the importance of collaboration."

A more comprehensive governance team can help on a number of levels (see Figure 3). First, it can help ensure that the various "voices" from LoB and enabling functions are heard so that the organization can invest its limited resources in areas where mobile will have the greatest impact. Further, it will help to coordinate the integration of mobile efforts with other components of the organization's digital strategy, such as social, cloud and analytics. Lastly, more structured governance can enable faster, more coordinated decisions on issues associated with skill development, partnerships and other areas that involve the use of resources outside the organizational boundaries.

Mobility as a driver of innovation

A significant percentage of mobile strategy leaders reported that mobility has fundamentally changed the way their organizations do business. Not surprisingly, over 60 percent of leaders indicated that mobility played a significant role in what
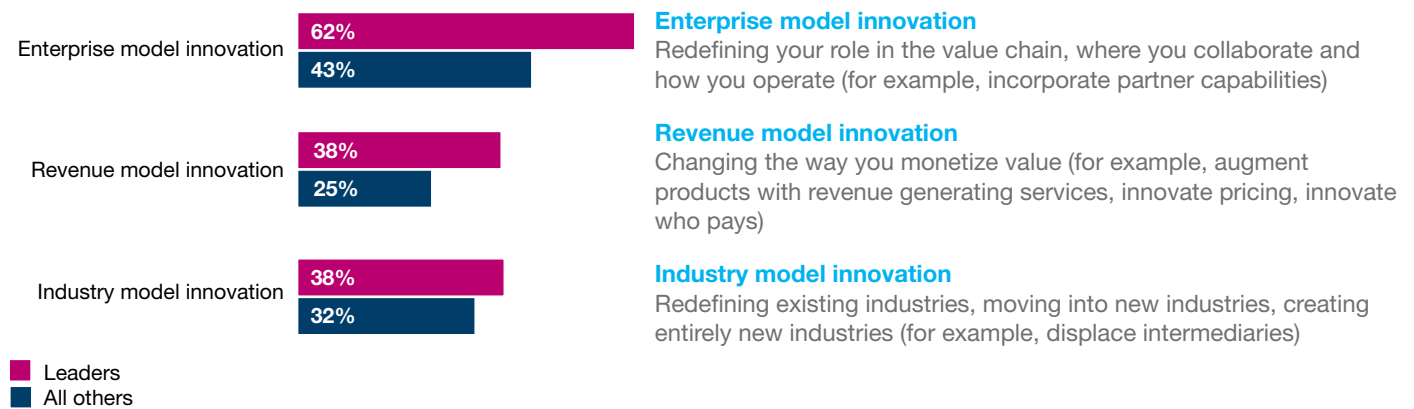
- Provide insight into employee needs and guidelines
- Use mobile strategy to attract talent / enhance recruiting initiatives

- Determine mobile funding allocation and evaluation
- Implement metrics to measure and evaluate mobile initiatives

- Design, develop and source mobile solutions
- Integrate mobile solutions with existing systems

Human Resources

Finance and Accounting

IT

Marketing

Line of Business

Strategy

- Provide insight into customer requirements and user experience
- Link mobile strategy to other company-wide digital and social initiatives

- Generate new ideas for mobile initiatives / set priorities
- Help design, develop and manage mobile solutions

- Integrate mobile strategy with overall business strategy
- Identify metrics to measure and evaluate mobile initiatives

Source: IBM Institute for Business Value Mobile Enterprise Study.

Figure 3: **An established governance structure, with representation from across the organization, is a key component of a mobile strategy.**

we call "enterprise model innovation" – the ability for the organization to redefine its role in the value chain and how it collaborates with partners, customers and other stakeholders (see Figure 4).

In addition to business model innovation, almost 40 percent of leaders saw mobile contributing to both revenue model and industry model innovation. Revenue model innovation – changing the way an organization monetizes value through the development of new products, services and pricing models – is an important source of value that mobile capabilities can provide.

Homeplus, the South Korean brand for Tesco Plc., provides a great example of how a company can leverage mobile for revenue model innovation. Homeplus developed virtual aisles on the walls of train platforms, providing customers the opportunity to shop while waiting for their trains. Consumers can use an app that scans the QR code of a product, and their purchased products are then delivered to their homes within several hours. Through this new approach to shopping, Homeplus was able to increase its online sales by 130 percent in three months and increased the number of registered app users by 76 percent.[6]

Enterprise model innovation	**62%** (Leaders) **43%** (All others)	**Enterprise model innovation** Redefining your role in the value chain, where you collaborate and how you operate (for example, incorporate partner capabilities)
Revenue model innovation	**38%** (Leaders) **25%** (All others)	**Revenue model innovation** Changing the way you monetize value (for example, augment products with revenue generating services, innovate pricing, innovate who pays)
Industry model innovation	**38%** (Leaders) **32%** (All others)	**Industry model innovation** Redefining existing industries, moving into new industries, creating entirely new industries (for example, displace intermediaries)

■ Leaders
■ All others

Source: IBM Institute for Business Value Mobile Enterprise Study: *What type(s) of business model innovation are being driven by the use of mobile capabilities?*

Figure 4: **While companies are using mobile to pursue multiple innovation paths, the majority are focused on enterprise model innovation.**

Mobility can help organizations innovate their industry models by enabling entry into completely new businesses or even defining entirely new industries. Daimler, traditionally an automotive manufacturer and financial services provider, has created a vehicle management solution called "car2go" that allows drivers to rent a vehicle without a contract, minimum charge or maximum duration. After registering with the company, a driver can go to a defined location, identify a car that is part of the program using a mobile app, and gain access to the car through a private access code that is transmitted through a sensor. Daimler expanded car2go in and outside of Germany to seven countries and 23 cities worldwide. There are more than 450,000 car2go registered users worldwide, and the smart vehicles have been rented more than 13 million times to date.[7]

Recommendations: Developing a mobile strategy

Given the power of mobile capabilities, the planned increase in corporate investment in the mobile arena and the opportunities for changing the competitive playing field, organizations need to have both external and internal mobile strategies that leverage common capabilities and platforms.

For companies that are just starting their mobile strategy efforts, the following actions can help get efforts off the ground:

- *Be comprehensive and bold:* Identify areas where mobile can fundamentally change business processes and models to generate new revenue streams, lower costs or redefine the organization's role in the value chain. Make sure that your enterprise mobile strategy includes initiatives that are external (for example, customer self-service apps or sales force automation) and internal (such as bring your own device or creation of an employee app store). Business cases should consider direct costs as well as benefits that accrue in areas not directly bearing the cost of the initiative.

- *Be targeted and iterative:* Pilot new capabilities with selected customers, employees and business partners to gain insights, reduce risk and make adjustments before rolling out at an enterprise level. Based on initial insights, rapidly adjust mobile offerings on an ongoing basis. Assess the current network structure's ability to support scaling of new initiatives when needed.

- *Be collaborative and inclusive:* Make sure that your governance team involves all relevant stakeholders from different LoBs and enabling functions. Given the potential for mobile to directly impact business model change, the CEO and LoB leaders need to take direct roles in guiding the direction of mobile efforts. Functions such as Marketing and HR can provide unique insights into the needs of customers and employees. Meanwhile, involvement from Finance and Strategy can help to develop business cases needed for investment and bring together scarce resources from around the company. In addition to involvement from the executive level, companies should also incorporate insights from "digital natives" to better understand how mobile will be used by the newest generation of customers and employees.

Companies that are more advanced in their mobile strategy development efforts should consider opportunities to:

- *Incorporate machine-to-machine and sensor-based capabilities into their overall mobile strategy:* Leading mobile strategies address opportunities to embed mobile capabilities into devices ranging from automobiles to thermostats, enabling them to provide information that had previously gone untapped. Retailers and other service providers can also leverage such capabilities to track shopping patterns and more effectively match staffing needs with customer demands. Explore how to take advantage of data and insights being generated from these devices – not only to generate process improvements, but also to consider new and emerging revenue streams and business models.

- *Invite trusted partners into their mobile strategy:* Recognize that in an environment where speed to market is critical, it's important to bring partners, customers and other third parties into the strategy development process early. Identify opportunities for mutual gain and innovation today and in the future, and work closely to address potential changes in the marketplace.

- *Plan for the future:* Given the rapid changes in both customer needs and technologies, identify the capabilities required to be competitive in the next two to three years. This can enable actions such as building in-house skills or buying them from the outside marketplace, as well as developing strategic partnerships that are necessary to deliver on mobile projects. Identify key investments that will be needed to sustain differentiation over the long term.

Regardless of the maturity of an organization's mobile strategy, companies should address the questions in Figure 5.

Improving the customer experience and driving employee productivity
The need for speed

Our findings point to an important opportunity for mobile services: the ability to respond faster and better to customers. Improving customer service/satisfaction was, in fact, the number-one benefit associated with using mobile to enhance the customer experience. Fifty-one percent of companies identified it as important, followed by increasing customer retention (36 percent) and attracting new customers (31 percent).

We also asked survey respondents to identify the most important benefits of using mobile to improve employee productivity. "Faster response time to customers" was the highest response, with 58 percent of the participants selecting that as a key benefit, followed by "Improved communications" with 48 percent and "Faster response time to internal inquiries" with 38 percent.

Summary	Critical questions to ask
Companies recognize the importance of building mobile capabilities, but lack a well-defined **mobile strategy**	To what extent does your company have a well-defined enterprise-wide mobile strategy? What is the opportunity cost for not having a mobile strategy? How does your mobile strategy compare to your competitors' strategy? What challenges do you face in getting the appropriate support/funding for mobile initiatives within your organization?
While the Chief Information Officer (CIO) is heavily involved in today's mobile activities, leaders tap the wisdom of the **Chief Marketing Officer** (CMO)	Who is involved in your mobile governance structure (e.g., IT, Marketing, Line of Business, HR, Finance and Accounting) and how effectively do the functions work together on mobile strategy and execution? How is the line of business involved in each stage of the mobile initiatives – from idea generation to implementation and ongoing support? What is the role of marketing in your mobile strategy?
Companies are using mobile to pursue different types of **business model innovation**	How does mobile drive business model innovation at your company? To what extent do your mobile efforts align with your organization's overall innovation vision and strategy? How do you anticipate mobile changing the way you operate your business and collaborate with third parties?

Source: IBM Institute for Business Value Mobile Enterprise Study.

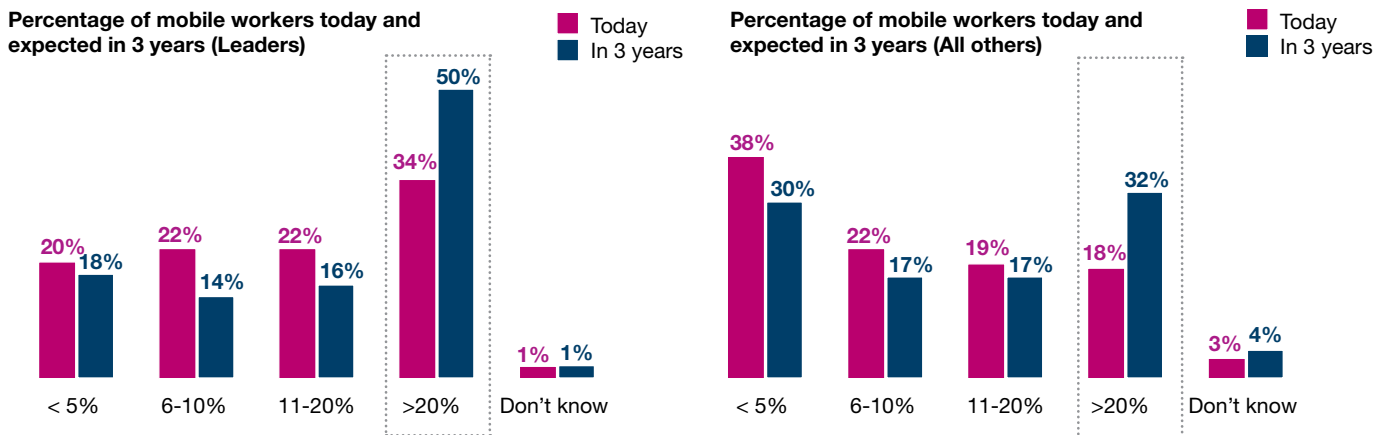*Figure 5:* Key questions to consider – Mobile strategy.

As the Manager for Innovation and Technology at a retail firm describes the use of a mobile application in the firm's order management process, "A salesperson can tend to a lot more customers in the same time period, and the customers are happier because the whole exercise is shortened. Instead of them making up a whole quote and then going to the front counter to find out they don't have stock…the customer can do it on the fly with the salesperson and make decisions in real time."

These responses reinforce one of the key strengths of an effective mobile environment: the timely delivery of information and insight to service customers regardless of location. Whether it involves allowing a customer to check on the status of a service issue via a self-service app, accessing social networks to find an answer to a difficult problem, allowing a salesperson to access an updated product inventory or providing a repair technician with access to diagrams and subject matter experts, mobility can reduce the time and effort it takes to resolve a customer challenge.

VCC, a construction services provider, uses mobile capability to improve its customer response time. To increase the productivity and responsiveness of project managers in the field, the company developed a customer relationship management solution that was available through multiple mobile devices. Project managers, working in the field to develop commercial properties, could access proposals, project contacts and other relevant project information. The amount of time it took to process customer service requests decreased by 30-50 percent and project managers could access more easily the information needed to make better decisions for their clients.[8]

Investing in a mobile workforce
One trend that was clear among our study participants was an increase in the number of employees working outside of traditional office settings. One-third of mobile leaders indicated that 20 percent or more of their workforces are currently remote/mobile (see Figure 6). Fifty percent of leaders expect to reach this threshold in the next three years. For all other firms in our sample, the trend was similar – the percentage of firms with a significant proportion of mobile workers was expected to grow from 18 to 32 percent.


Percentage of mobile workers today and expected in 3 years (Leaders) — Today / In 3 years

	< 5%	6-10%	11-20%	>20%	Don't know
Today	20%	22%	22%	34%	1%
In 3 years	18%	14%	16%	50%	1%

Percentage of mobile workers today and expected in 3 years (All others) — Today / In 3 years

	< 5%	6-10%	11-20%	>20%	Don't know
Today	38%	22%	19%	18%	3%
In 3 years	30%	17%	17%	32%	4%

Source: IBM Institute for Business Value Mobile Enterprise Study: *Approximately what percentage of your organization's employees are remote / mobile workers (i.e. work from home or other locations)? What percentage do you anticipate in 3 years?* All totals do not equal 100 percent due to rounding.

Figure 6: **One approach companies are taking to more rapidly service customers is to shift towards a more mobile workforce.**

Given these numbers, it is not surprising that the highest mobile infrastructure investment priority for mobile strategy leaders over the next 12 months was increasing the ability of employees to work outside the office. Seventy-eight percent of mobile leaders and 44 percent of all other companies selected this as a critical investment area.

Using mobility to enable a more productive workforce is an important goal for many companies in our study (see Figure 7). Today, half of them reported they have realized a greater than 10 percent gain in employee productivity as a result of their mobile efforts. However, in the next three years, 40 percent of companies are looking for productivity gains in the 10 to 20 percent range and 36 percent are looking for increases greater than 20 percent. This suggests that mobility services for employees are not simply going to be used to augment existing work processes, but rather will require companies to redefine work activities using mobility as a key capability.

To what extent has mobility improved employee productivity today, and what is expected in the next three years?

Greater than 20%
20%
36%

10-20%
30%
40%

Less than 10%
50%
24%
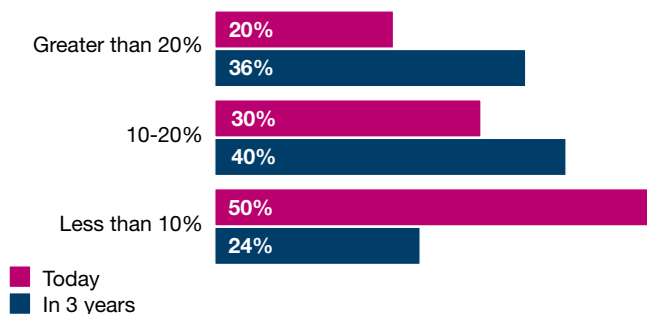
■ Today
■ In 3 years

Source: IBM Institute for Business Value Mobile Enterprise Study: *Please estimate the extent to which mobility has improved overall employee productivity today. What do you anticipate in 3 years?*

Figure 7: **Companies are looking towards mobile technologies to drive significant increases in employee productivity in the near future.**

In another example, the Advanced Manufacturing Research Center at The University of Sheffield, a U.K. based-research consortium, has developed a prototype for significantly improving the productivity of maintenance and repair operations in sectors such as aerospace, shipping, oil and gas. Using a combination of augmented reality and robotics, it is able to bring critical information and remote expertise directly to field engineers. Using wearable devices with cameras attached, technicians can receive real-time visual support from supervising experts based remotely. Early use of the system has yielded reductions in CAPEX from 3 to 7 percent, increased production between 8 and 15 percent and achieved 10 to 25 percent operating cost savings. Further, the information gathered during the repair process can be saved and repurposed, enabling critical knowledge to be passed along to the next generation of field engineers.[9]

We are also seeing companies use mobile technologies not only to deliver value in the field, but to better understand how employees within the traditional office environment can improve their productivity as well. Several organizations have used "sociometers" that incorporate the ability to measure different signals (for example, RFID, motion and sound) to understand how individuals interact in their work environment. Employees wearing these devices produce data, which, when aggregated, can highlight collaboration patterns, locations where individuals converse and share information, and identify when these interactions take place over the course of a day.

As Ben Waber, the CEO of Sociometric Solutions, said in his recent book, *People Analytics*, "Data on the physical world is also expanding at a breakneck pace thanks to the rapid development of wearable sensing technology… By combining precise data from both real and virtual worlds, we can understand behavior at a previously unimaginable scale."[10]

Bring your own devices (BYOD): Balancing complexity and opportunity

The subject of employees bringing their devices to work has been on the minds of LoB executives and IT departments alike. On one hand, companies are looking to accommodate employee preferences for different devices beyond traditional laptop and desktop computers. On the other hand, given the proliferation of different devices and the costs associated with managing those devices, BYOD has been a source for significant debate within organizations.

From our respondents, we see that mobile strategy leaders clearly see benefits and opportunities associated with BYOD for their organizations. These leaders were more than twice as likely to have adopted a BYOD approach for employees than other organizations were (66 percent compared to 32 percent). Leaders are also more likely to provide the needed support to make these programs successful.

For example, 79 percent of mobile strategy leaders reported that their organizations have well-documented policies in place for employees using mobile devices (versus 48 percent for all other firms), 78 percent said that IT provides the required support for BYOD participants (versus 39 percent) and 66 percent said they provide the necessary training (compared to 34 percent for all other firms). This suggests that mobile strategy leaders recognize that BYOD represents more than simply the ability to plug into a corporate network; rather, it requires a new approach to IT support and customer service.

One global banking company piloted and launched its BYOD efforts in 2011 in an effort to improve employee satisfaction, enhance its recruitment efforts and reduce the total cost of ownership of corporate devices. The company realized a 108 percent return on its investment within one month.

This return was generated primarily through increased sales revenue generated from quick, reliable access to business generating applications on BYOD devices; reduced costs from acquiring, provisioning, supporting and replacing corporate devices; and decreased help desk support costs. As one senior IT manager explained, "With the BYOD program underway, we are now more flexible in terms of where we work and how we work, and people are getting more productive time out of the workday. The BYOD program is innovative, which is good for internal marketing and is impressive to our peers."

Clearly, the BYOD trend is taking hold in numerous companies. However, companies need to consider more than just the devices they are willing to support and the policies that govern the ownership of those devices. The starting point of any BYOD strategy should be the various use cases within the organization: what activities mobility can best support, what apps will be required to enable them and ultimately, what device will best suit the needs of individuals performing those roles. After these are identified, then companies can more effectively determine the investment needed in their BYOD efforts.

Recommendations: Improving the customer experience and driving employee productivity

Companies that are just starting to provide their employees with mobile capabilities should:

- *Identify processes where mobility can provide faster, more engaging customer service:* This can range from providing field-based personnel with mobile tools that can provide rapid answers in customer locations to enabling employees to collaborate more easily with experts across the organization to solve a difficult problem. Mobility can also allow customers to engage directly with company experts and/or social networks – for example, sharing a potential room design with friends and family while a remote salesperson provides insights into potential colors and furniture selections.

- ***Use mobile capabilities to facilitate routine tasks and inquiries:*** In an era where more tasks are pushed to the individual level, enabling employees to handle administrative tasks through a mobile environment offers many benefits. Doing so with tasks such as customer data entry, expense reporting and approval, and time and attendance reporting can free up employees to spend more time engaging directly with customers. At the same time, it can allow workers to take advantage of non-productive windows during the day.

- ***Build in security and privacy safeguards for employees using mobile devices for work-related activities:*** Given the increasing BYOD trend and the fact that mobile devices can be used in a number of work/non-work situations, companies should take an active role in developing policies and guidelines to protect sensitive material. This includes customer information, business-specific applications and the employee's personal information. Protections should include employees, as well as external contractors or business partners who access corporate IT networks through mobile devices.

Companies that have already made progress in enabling their mobile employees should investigate ways to:

- ***Leverage location-based data to improve the customer experience and drive employee effectiveness:*** While companies have been tracking vehicles and other mobile assets for many years, companies can now identify interaction patterns of customers and employees to a much broader extent than ever before. For example, proximity data can provide valuable insight into where employees are working in a dispersed environment at any given point in time. It can enable them to be routed and scheduled on a more dynamic basis, which can help improve customer responsiveness, as well as increase opportunities to generate revenue.

- ***Customize the mobile experience for the employee:*** In a BYOD environment, employees will need to obtain the right applications, access and permissions relevant to their specific job needs. One way this is being accomplished is through the development of an internal "app store" that can be configured based on functions and job roles. Further, firms should consider incorporating the configuration of personal devices as part of the larger orientation/onboarding activities for new employees.

- ***Manage corporate-owned mobile devices like other corporate assets:*** For many companies, mobile devices are not managed to the same extent as other IT assets. However, as these devices become more central to delivery of key business activities, companies need to consider the need for specific processes that govern their procurement, distribution and maintenance. These processes need to address the unique considerations of mobile devices, including their shorter replacement cycles, the need to manage frequent application changes, and the need for help desk support that goes beyond traditional office-based assistance.

The questions in Figure 8 can help companies prioritize their requirements for improving both the customer experience and workforce productivity.

Summary	Critical questions to ask
Companies are looking to enable their employees to **provide better customer service** through mobile	How can faster response time to customers change the nature of competition within your industry?
	How can you leverage mobile to provide better self-service capabilities for your customers?
	Where do you see your competitors focusing their efforts with regard to mobile?
Companies are placing significant importance and investment in using mobility as a tool for **improving employee productivity**	Which employee populations could most benefit from enhanced mobile capabilities?
	Which existing internal processes could be modified to take advantage of mobile capabilities?
	What challenges occur when equipping employees with mobile devices?
Leaders in this space are seeing the benefits of **employees using their own devices** and providing the needed support	To what extent does your organization have a bring-your-own-device (BYOD) strategy? How effective are your existing policies and procedures for employee use of mobile devices?
	How has BYOD impacted supporting processes and service-level agreements (e.g., procurement, IT support)?
	How do you manage security within your BYOD environment?

Source: IBM Institute for Business Value Mobile Enterprise Study.

Figure 8: **Key questions to consider – Improving the customer experience and driving employee productivity.**

Enabling the mobile environment

From the design of new customer applications to the integration with existing legacy systems and the development of new uses for data and analytics, mobile solutions are forcing information technology executives to make new and perhaps difficult choices regarding their current and future skills, capabilities and infrastructures.

A new focus on design

Mobile solutions are pushing companies to rethink the user experience, from the presentation of data to the interaction patterns required to manage an application. Touch and sound become integral parts of the mobile experience; portability and bandwidth influence a user experience that can change in different settings and contexts. The requirement to provide users with continuity of transactions across multiple channels further complicates matters.

Given the complexity of mobile design, it is not surprising that companies struggle with this issue. Fifty-seven percent of survey respondents reported that they face quality and functionality challenges in developing/acquiring mobile applications, while 46 percent find it difficult to ensure a quality user experience. Further, 40 percent indicated that they face challenges with their existing development platforms/infrastructures.

Recognizing the need to build outstanding user experiences across multiple platforms, mobile strategy leaders are increasing their use of partners to manage their platforms and applications. Leaders are looking to decrease in-house platform development from 57 percent today to 47 percent in the next three years, while increasing the use of co-sourcing from 27 percent to 35 percent, and outsourcing from 16 percent to 19 percent.

Similarly, for application development, internal management will drop from 62 percent to 53 percent. Meanwhile, co-sourcing will rise from 22 percent to 27 percent and outsourcing will rise from 16 percent to 20 percent. While companies will continue to retain a significant percentage of their application development, it is clear they will be looking to augment such efforts with technologies and external parties over the longer term.

Integration, security and analytics: Capabilities for the mobile era

When asked about the most significant mobile challenges facing organizations today, the ability to integrate mobile applications with existing systems was an important topic. Fifty-four percent of all respondents see this as a critical issue.

Mobile strategy leaders cited integration as an area where they have been more successful compared to their peers (see Figure 9). Of mobile leaders, 70 percent or more indicated they have been successful in ensuring interoperability with other systems, leveraging APIs for external or cloud-provided data services, and providing service-oriented architecture and sharing information among systems/devices. However, approximately 40 percent or fewer of non-leaders reported being successful with these tasks.

One company that has been successful in integrating front- and back-end systems through a mobile platform is Air Canada. It developed an app that enables customers to check their flight status and obtain electronic boarding passes. The information provided through the app is delivered in real time, so that it is available to agents and customers at the same time. The app has had over 1.5 million downloads and was ranked number two overall in the Apple App store in Canada a week after its release. As a result of the successful app rollout, Air Canada was able to reduce its per-check-in costs by 80 percent.[11]

To what extent has your organization been successful with the following activities related to integrating mobile (percent indicating *successful* or *very successful*)
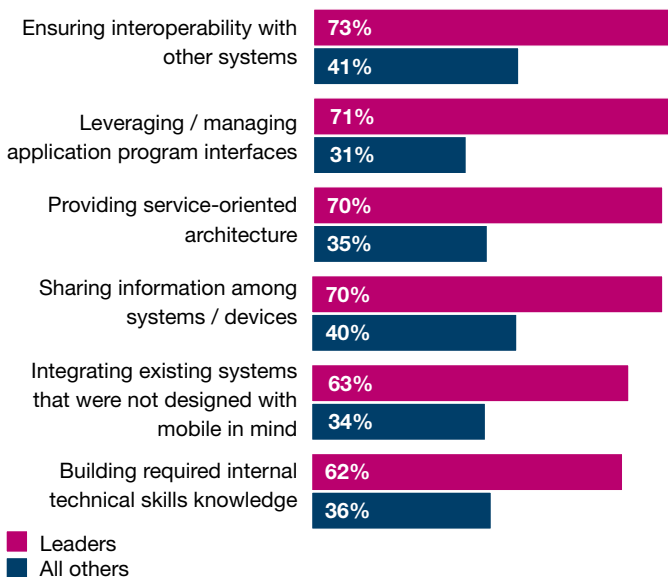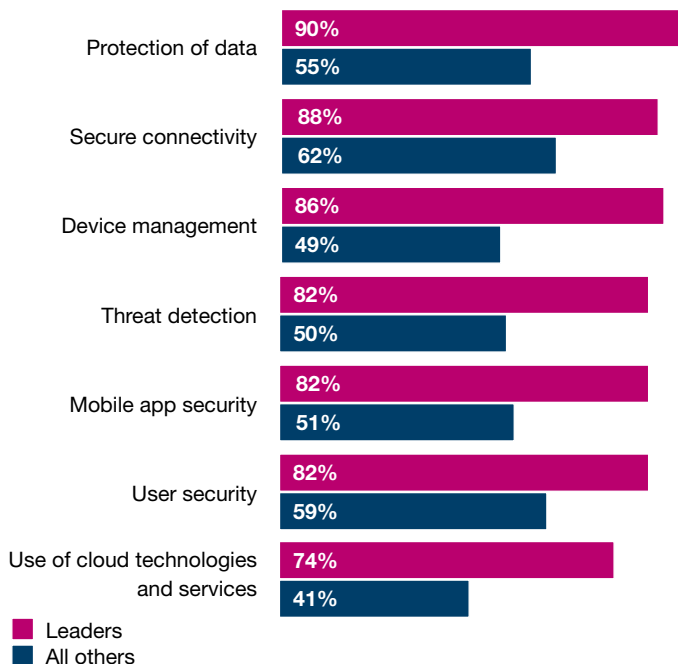

Source: IBM Institute for Business Value Mobile Enterprise Study: T*o what extent has your organization been successful with the following activities related to integrating mobile applications with other applications or back-end systems? (percent indicating agree or highly agree).*

Figure 9: **Mobile strategy leaders have seen greater success in addressing the integration challenge.**

Security was the second most-cited challenge facing organizations (named by 53 percent of all surveyed companies). As with integration, mobile strategy leaders have already focused time and attention on security. Over 80 percent of mobile strategy leaders reported that they were effective in addressing security issues such as data protection, securing connectivity, device management, threat detection, mobile app security and user security (see Figure 10). In contrast, less than 62 percent of all other companies stated they were effective in this area.

How effective is your organization at addressing the following mobile security issues? (percent indicating *effective* or *very effective*)

Protection of data	90%
	55%
Secure connectivity	88%
	62%
Device management	86%
	49%
Threat detection	82%
	50%
Mobile app security	82%
	51%
User security	82%
	59%
Use of cloud technologies and services	74%
	41%

■ Leaders
■ All others

Source: IBM Institute for Business Value Mobile Enterprise Study: *How effective is your organization at addressing the following mobile security issues?*

Figure 10: **Mobile strategy leaders also recognize the importance of making sure their mobile capabilities are secure.**

Given the expected growth in the number of mobile transactions over the next several years, organizations will have to stay vigilant regarding the privacy and security of users and their data. Further, as mobile services expand beyond the use of traditional devices toward embedded mobility platforms, security capabilities will need to adapt as well. As the Director of Strategy and Planning for an automotive manufacturer indicated, "As vehicles collect more and more data, we will be challenged with determining the owner of the data, and what is personal versus private."

Analytics is another area where organizations recognize the need for additional attention. From our discussions, this fell into two broad categories: (1) using analytics to understand how people were using their mobile devices, and (2) applying the underlying data gathered from mobile transactions/ interactions. Overall, 50 percent of companies indicated that understanding how customers were interacting with mobile applications/solutions was a significant challenge, while 48 percent said it was difficult to use analytics from mobile data.

Analytics is an area where mobile leaders particularly excel. Roughly 70 percent or more of mobile strategy leaders described themselves as effective in areas such as addressing structured and unstructured mobile data, handling large volumes of data, analyzing mobile data and taking action based on that data. But less than 37 percent of non-leaders were equipped to deal with these issues. Further, almost 70 percent of leaders placed high priority on making investments in data storage, data management and analytics, versus less than 45 percent of all other companies in the study.

Recommendations: Enabling the mobile environment
For companies starting to develop a mobile development environment that enables the business to differentiate itself in the marketplace, consider the following recommendations:

• ***Create with the omni-channel experience in mind:*** Mobile design, development and integration efforts need to take into account the larger picture of how and where customer interactions are taking place (mobile and otherwise); how customers will navigate through Web sites and apps; and how the company can evaluate the overall customer experience. Movement across devices needs to be seamless, with data and transactions being preserved as end users move between smartphones, tablets, televisions and wearable devices.

- *Evaluate your current application portfolio and development processes to identify opportunities to more effectively deliver mobile solutions:* Results of this evaluation can highlight issues ranging from inadequate development tools and processes to skill constraints. Benchmarking and evaluating the tools, development methods and skills required to successfully develop mobile applications can help organizations develop a clearer case for hiring additional resources, upgrading internal capabilities and platforms, or partnering with external organizations. Companies should also consider the feasibility of establishing a mobile center of excellence that can serve as both a talent repository and a body to establish common enterprise-wide standards.

- *Incorporate mobility into your existing security environment:* Given the multitude and diversity of potential mobile endpoints, the ease with which mobile devices can be lost or stolen, and the challenges associated with accessing sensitive material, companies need to apply the same rigor and advanced approaches to security as in traditional IT environments. For example, using predictive analytics can help review previous breach patterns and external threats to identify potential attack vulnerabilities. Analytics can also help monitor employee behavior to highlight patterns of misconduct and provide ongoing evaluation of the external environment for possible threats. Securing mobile transactions by customers is also a key requirement for financial services and other industries involved with high-volume, high-value transactions.

For companies that have more mature mobile development efforts in place, focusing on the following issues could further improve their overall efforts:

- *Tap into the value of APIs:* As APIs rapidly drive a new approach to application assembly, development and integration, it is critical for organizational leaders to develop a mobile API portfolio and management strategy. A robust mobile API strategy can drive several critical benefits. These include: efficiencies in development and integration; the ability to leverage external sources to add functionality; extension of mobile assets into third-party ecosystems; new business models for monetizing services or assets; and joint innovation through engagement of third-party developers. Building a plan for each of these strategies and building competency in API development, promotion and platform management are all key success factors.

- *Use analytics to provide end users and consumers with contextually relevant actions:* Mobile information can yield a vast quantity of contextual information regarding the timing and location of mobile interactions. Companies have the opportunity to combine this data with additional enterprise data from previous transactions to determine the next best offers and actions. This approach can help to increase ongoing engagement with mobile technologies.

- *Monitor emerging cloud services for opportunities to increase mobile engagement.* Mobile technologies are evolving at a rapid pace. Companies should evaluate cloud capabilities to increase engagement through notifications or location-based services. They need to consider whether cloud-delivered mobile lifecycle solutions meet requirements for security and fit with existing business constraints. Organizations can also examine the potential for cloud-based collaboration among mobile dev/ops teams.

The questions in Figure 11 can help an organization assess its mobile technology environment:

Summary	Critical questions to ask
Customers are demanding a **higher quality mobile user experience** that is responsive to their changing needs	How effective is your mobile design and development process in understanding customer needs and rapidly developing solutions that fill those needs?
	What functions do you manage in-house versus outsource to third parties?
	How easy is it for your organization to keep up with the most current data and technology industry standards for mobile?
Integration with existing systems and **security** are the primary mobile challenges facing companies today	To what extent are legacy systems a barrier for your organization in connecting mobile systems?
	How effective is your organization at addressing mobile security threats?
	How is your company approaching the use of mobile application programming interfaces (set of routines, protocols and tools for building software applications) as a way of connecting to a larger set of existing applications?
Leaders differentiate themselves by their ability to leverage **mobile analytics**	How do you think mobile analytics can help you in achieving your business goals?
	To what extent are you using analytics for the following: • Customer and employee mobile usage • Customer propensity for buying through mobile channels • Customer and/or employee location and presence
	Do you have the internal skills and capabilities to take advantage of mobile data?

Source: IBM Institute for Business Value Mobile Enterprise Study.

Figure 11: **Key questions to consider – Enabling the mobile environment.**

Conclusion

From our survey and discussions with executives closely connected to mobile efforts in their organizations, one point is clear. Mobility is not simply an initiative, a program, a discrete channel or a passing institutional fad. Rather, it is becoming a pervasive lens through which the organization must consider its fundamental tenets: how it interacts with its customers; how it develops and delivers products and services; and how it applies its physical, human and digital capital.

Our study highlights that companies are looking for their mobility efforts to improve customer experience, drive employee productivity and, most importantly, deliver on new and innovative value propositions in the marketplace. While there are always risks associated with the use of new technologies, we also see risks associated with not taking advantage of mobile capabilities as customer expectations grow, and new and emerging competitors achieve results in this space.

An organization's mobile strategy must address the basics: where within the organization mobile technologies can offer the greatest benefits, how organizations can enable their IT functions to develop mobile solutions more efficiently and effectively, and what segments of the workforce need to be "mobilized" to achieve the greatest return on investment.

But perhaps most important is to understand how mobile can be prioritized and integrated with other digital investments within the organization, and how mobile capabilities can be used to develop new and innovative business models that help differentiate the organization in the marketplace. Much as the Internet required a rethinking of the nature of commerce 15 years ago (and continues to do so today), organizations must consider how this new mobile inflection point will change their future direction.

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Appendix

Methodology

The IBM Institute for Business Value, in partnership with Oxford Economics, developed an online survey that was administered to 601 individuals with knowledge of their organizations' mobile enterprise strategy efforts. The respondents came from 29 countries and the sample was balanced between individuals based in mature versus growth countries (see Figure 12). There were a minimum of 50 respondents from eight industries: Banking, Insurance, Retail, Travel and Transportation, Telecom, Government, Healthcare and Automotive, with the remainder in other industries. We also conducted 30 interviews with companies across a variety of industries to better understand the issues associated with mobility and the development of a mobile strategy.

Additional analysis was conducted with a set of "mobile leaders" – companies that met two standards for mobile strategy development.

One standard was: they agreed or strongly agreed with at least three of these five statements:

- My organization has a well-defined enterprise mobile strategy
- The mobile strategy is aligned with the overall business strategy for the organization
- There is executive-level oversight for mobile initiatives
- My organization has a clear funding mechanism for mobile initiatives
- There is an established governance structure for mobile initiatives.

The second standard was: when asked to compare themselves with their industry peers today, these mobile leaders indicated that they had a superior or leading mobile strategy (4 or 5 on a 1-5 scale). Overall, 14 percent of companies fell into this category. Further, mobile leaders were more likely to indicate that they outperformed their industry peers in both revenue growth (47 percent versus 31 percent) and profitability (54 percent versus 35 percent).

Survey respondents by mature and growth countries

Mature		Growth
Australia	Japan	Brazil
Belgium	Netherlands	China
Canada	New Zealand	India
Denmark	Norway	Malaysia
Finland	Spain	Mexico
France	Sweden	Nigeria
Germany	U.K.	Russia
Iceland	U.S.	Saudi Arabia
Italy		Singapore
		South Africa
		Thailand
		UAE
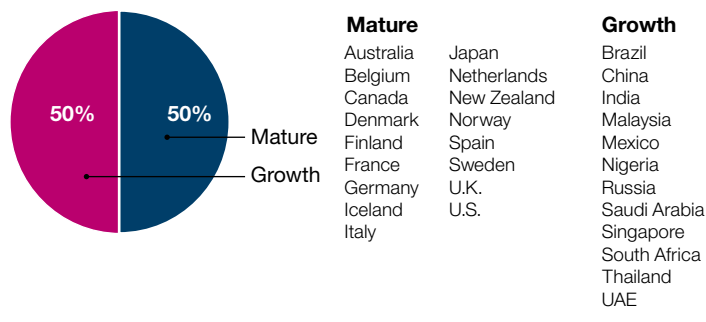
Survey respondent by annual revenue

US$500 million - US$1 billion
US$1 billion - US$5 billion
Over US$5 billion
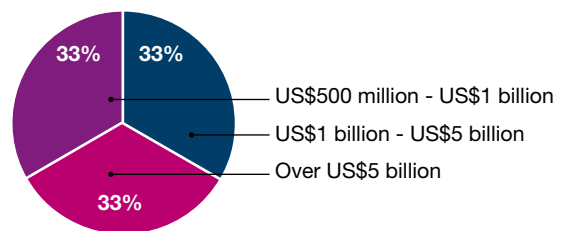
Source: IBM Institute for Business Value Mobile Enterprise Study: *In what country are you personally located? What was your organization's approximate global revenue in U.S. dollars? For public sector, what was your organization's approximate annual budget in U.S. dollars for the last fiscal year?*

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