

## Enterprise mobility: connecting to a world of opportunity



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Enterprise mobility presents opportunities to the business world and challenges to CIOs. Opportunities can be found in new capabilities and applications that will reshape business models, empower workers, improve collaboration, help to better manage customer relationships and drive consumer loyalty. CIO challenges include the provisioning, security and ongoing management of these devices.

## Enterprise mobility trends

Today's mobility trends are driven by new technologies, the broad adoption of mobile communications by Generation Y (persons age 15 to 30), and a growing appreciation for the market at the base of the socioeconomic pyramid and changing business requirements. In the technological arena, mobile devices are becoming more sophisticated, providing users (both corporate and consumer) with voice, Internet, e-mail, chat, gaming, television, bill payment and barcode-reading capabilities, among others.

Because of this—and because of dropping prices—smart phones are becoming a true alternative to the personal computer. As important as the smart phones themselves are the network capabilities behind them, in particular the wide availability of low-cost, high-bandwidth wireless access to TCP/IP.

## Enterprise mobility benefits

Benefits of enterprise mobility span the business-to-employee (B2E), business-to-business (B2B) and business-to-consumer (B2C) spectrums. Enterprise mobility can improve an organization's productivity, optimize logistics operations, enhance customer relationships and

streamline supply chain management. New mobile applications provide sales staff with updated information about their customers and new ways for field forces to work more effectively. By enabling employees to work from anywhere, businesses can also lower individuals' carbon footprints.

In some areas of the B2C arena, businesses can sell their goods directly through the cell phone. In other areas, presence information gives businesses a stronger link to their consumers. Information on where the cell phone user is located and what he or she is doing gives businesses a significant edge in determining how to present their products and services to that consumer.

## The mobility challenge

Mobility offers new possibilities to enterprises, but the path to mobility is full of significant challenges. The first is to develop an enterprise mobility strategy. The second challenge lies in determining how to manage, implement and secure new technologies across a broad spectrum of devices and carriers. Finally, companies must decide which mobile devices are most appropriate for which

employees or groups of employees. The challenge is to provide employees with the mobile devices they need to do their jobs, without overspending on communications products.

### **What's ahead**

The growth of mobile enablement will be fueled by openness and new applications. Motivated by huge growth opportunities in the mobile platform, Internet service providers and IT service providers are driving the openness of mobile technologies. These providers want to see open applications, open devices, open services and open networks.

### **How IBM can help**

IBM is leading the enterprise mobility market with next-generation technology and functionality, providing differentiated, unified communications offerings and collaboration leadership in developing mobility solutions. IBM enterprise mobility solutions drive client value by making end users more productive through the use of anywhere, anyplace, any-device access to critical applications and data. Every IBM Research laboratory is participating in mobile Web

research, developing new platforms and services for the mobile Web. And IBM has launched the World Development Initiative to help develop commercially viable mobile technology solutions to improve the lives of the world's poor.

### **For more information**

To learn how IBM is working with organizations around the world to help them develop and implement enterprise mobility programs, contact your IBM representative or IBM Business Partner.

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### ***The mobile revolution***

Right now, somewhere on the planet, a shopper grabs his cell phone to check the balance on his credit card. An executive uses her PDA to respond to a request for proposal. Mobile TV introduces a teenager to new commercial advertisements, and a police officer out on patrol submits an electronic incident report.

We know that no man is an island. John Donne made that point nearly 400 years ago. But neither the poet nor our grandparents could have envisioned the mobile technologies that now strengthen the world's connections—person to person, government to citizen, enterprise to employee and business to consumer or partner.

Many now look to the day when a seamless integration among handheld devices, networks and data provides corporations, governments and consumers with the ability to transact business from any location at any time. IBM predicts that the smart phone will soon be the ubiquitous handheld communications device for business users, running applications that propel enterprise mobility. The rise of the smart phone presents both opportunities and challenges to CIOs. Opportunities include new capabilities and applications that will reshape business models, empower workers, improve collaboration, help to better manage customer relationships and drive consumer loyalty. Challenges include the provisioning and ongoing management of these devices. Mobile device security is another significant concern.

It's all part of the mobile revolution. The business world is now moving activities from the electronic arena (e-commerce and e-purchasing) to the mobile arena (m-commerce and m-purchasing). New mobile applications are being developed to accommodate the corporate requirement to manage far-flung workforces and drive commerce. In addition, corporations want to lower communications costs, improve communications efficiency, increase employee productivity and drive future value. Mobility is being used to accomplish all of these objectives by driving operational excellence through cost-efficient management of people, processes and technology. Enterprise mobility can also help businesses rapidly modify processes and infrastructure to capture opportunities.

### ***Serving the base of the pyramid***

Mobile technologies represent a promising new platform for people at the base of the pyramid who want access to government and to consumer goods and services. In India, where illiteracy rates are high, one project provides a mobile platform for government and service providers to share information with villagers using voice-based information-browsing technologies. In Kenya, a project has been developed to enable mobile phone-to-mobile phone cash-transfer service. Prior to this project, the lack of conventional bank branches in rural areas left people with few options for transferring money.

### ***Enterprise mobility trends***

New technologies, the inclinations of Generation Y and a growing appreciation for the market segment at the base of the socioeconomic pyramid are merging with business needs to fuel today's mobility trends. In the technological arena, mobile devices are becoming more sophisticated, providing users (both corporate and consumer) with voice, Internet, e-mail, chat, gaming, television, bill payment and barcode-reading capabilities, among others.

Because of this—and because of dropping prices—smart phones are becoming a true alternative to the personal computer. As important as the smart phones themselves are, so are the network capabilities behind them. Low-cost, high-bandwidth wireless access to TCP/IP networks—both the Internet and corporate intranets—is becoming widely available.

Perhaps no one is as aware of these advancements as Generation Y, loosely defined as persons born between 1979 and 1994. Members of Generation Y are unique, both as consumers and employees. This generation communicates primarily through wireless handheld devices and turns to these devices for entertainment. They expect their employers to embrace mobile technology.<sup>1</sup>

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A technological world away from Generation Y sits the base of pyramid. Consisting of people who earn less than \$4 per day, the base of the pyramid is the planet's largest socioeconomic group. In base-of-the-pyramid regions, including large areas of Africa, India and Asia, wireless mobile devices provide opportunities for commerce, healthcare and overall societal engagement to areas that have never been wired. Here, wireless technologies are being established as the base communications infrastructure. In no place is the potential for increased commerce as significant as it is here: according to the World Resources Institute, the base of the pyramid represents a US\$5 *trillion* m-commerce market.<sup>2</sup>

The wireless trends spurred by these technological and societal issues fall into three broad categories: business-to-employee (B2E), business-to-business (B2B) and business-to-customer (B2C). The mobile employee population is growing quickly, especially in the areas of professional services, healthcare, utilities and logistics. The smart phone is becoming a mobile business terminal for these and other professionals, boosting their productivity and allowing them to remain closer to the customer while enjoying the same capabilities they would have if they were sitting at their PCs.

Mobile enablement helps enterprises to manage both these on-the-move workers and overall business operations. A recent study by Datamonitor indicates that the demand for mobile enterprise solutions will grow steadily through 2012, with the largest increase seen in Western Europe and Asia Pacific.<sup>3</sup> Sales force automation and customer relationship management software tools are beginning to offer mobile editions. These applications enable field workers and salespeople to manage customer information and interaction from virtually anywhere. The emphasis in these applications includes order entry and managing customer inquiries as well as managing bids and authorizations.

### ***Mobile initiatives improve patient care***

An Italian nonprofit hospital wanted state-of-the-art healthcare mobility services to improve communication and collaboration among hospital practitioners and other personnel. The goal was to provide quicker access to critical information and ultimately improve patient care.

IBM designed and implemented a new, fully IP-based network infrastructure that includes a wireless hospital network, IP telephony and smart phones. As a result, the hospital has become virtually paperless. Information exchange is synchronized between staff and back-end systems. Hospital professionals also receive rapid access to data and applications via wireless infrastructure for a variety of devices, including tablet PCs and medical equipment.

Similar mobile technologies have been developed to tackle jobs such as human resource management, asset management, mobile purchasing, fleet management, job dispatch, inventory management and remote inventory monitoring. Supply chain mobile applications focus on enablement of m-purchasing, particularly in industries that process large volumes of real-time transactions. Increased machine-to-machine interactions optimize logistical operations and enable preventive maintenance of costly equipment. Finally, mobile cloud computing provides businesses with capacity on demand and a resilient infrastructure.

Companies that sell directly to consumers also see significant opportunities in mobile enablement. The consumer mobile services market began with Internet service providers offering search, news, map, e-mail, instant messaging and other applications. Emerging applications in retail and in mobile ticketing and mobile bill pay are helping to drive this growth. Today, banks and retail operations find mobile technologies particularly good for business. Banks and credit card companies offer mobile services ranging from “check your balance” to money transfers to bill payment. In Japan, Korea and some Nordic countries, customers can load money onto their phones at accredited outlets and then store, withdraw or transfer funds, or use the virtual money to pay for products at stores and restaurants.

Retailers use mobile technologies—especially smart sensing devices and RFID—to better connect with their shoppers and drive customer loyalty. Pilot programs now in the works strive to transform consumers’ shopping experience with mobile services such as digital coupons and promotions delivered directly to customers’ cell phones. Mobile product-location services are also proving popular.

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### ***The mobile shopper***

A British supermarket chain partnered with IBM to roll out mobile service to its shoppers. At home, customers use hand-held devices to scan goods as they are used up, automatically adding them to a cyber shopping list. In the store, coupons tailored to current inventory and buyer preferences are delivered to customers' cell phones. Coupons can be redeemed at checkout, accommodating consumers' desire for immediate gratification. This program is helping increase customer loyalty by saving customers' time and, by reducing print coupons, supports the company's green initiatives.

Mobile bottomless-shelf solutions provide fulfillment alternatives for items that may be out of stock. With this solution, a consumer in a store who is faced with an out-of-stock item can enter the item's stock keeping unit (SKU) number into her cell phone to place a special order.

### ***Enterprise mobility benefits***

Benefits of enterprise mobility span the B2E, B2B and B2C spectrums. New mobile applications will enable enterprises to change the way they do business with their employees, partners and consumers.

Enterprise mobility can improve an organization's productivity, optimize logistics operations, manage customer relations and streamline supply chain management. New mobile applications and capabilities spawn increased information availability. This in turn provides the insight needed for better decision making. It provides enterprises with the opportunity to more quickly seize opportunities and respond to threats.

New mobile applications provide sales staff with updated information about their customers and new ways for field forces to work more effectively. By enabling employees to work from anywhere, businesses can also lower individuals' carbon footprints and improve worker productivity. These applications have made mobility a fact of life for many workers. In the United States alone, 89 of the largest 100 companies offer some form of telecommuting and 58 percent of all companies say they offer some type of virtual workplace to their employees.<sup>4</sup>

In some areas of the B2C arena, businesses can sell their goods directly through the cell phone. In other areas, presence information gives businesses a stronger link to their consumers. Information on where the cell phone user is located and what he is doing gives businesses a significant edge in determining how to present their products and services to that consumer. Finally, enterprise mobility initiatives can improve customer satisfaction and customer retention levels.

## ***The mobility challenge***

Mobility offers new possibilities to businesses, but the path to mobility is full of significant challenges. The first challenge is to develop an enterprise mobility strategy. Companies must understand how mobile technologies impact their business models. They must determine where to place initial emphasis (in B2E, B2B or B2C activities). Businesses should then identify a set of strategic initiatives to implement. In doing this, they must understand that m-business is not simply an extension of e-business. Consequently, m-business strategies cannot merely be extensions of e-business strategies.

### ***IBM helps telco expand***

The largest private sector telecommunications company in India was growing at a rate of 100 percent a year and needed to manage that growth. The company wanted a partner that could provide flexible and adaptive technology for both itself and its customers. IBM provided an IT infrastructure that supports the company's mobile telephone operations and is enabling astounding growth, from 6 million subscribers in 2004 to more than 80 million subscribers today, with scalability to support a projected 250 million subscribers by 2014.

To deliver mobility to end users, businesses will have to craft solutions that cover three domains. The first domain consists of areas over which the enterprise has control—LAN and campus networks, along with data centers where applications and middleware reside. The second domain is controlled by the carriers. The third domain is the device itself, which may have network, technological or software limitations.

The act of managing, implementing and securing new technologies presents the businesses world with significant challenges. These challenges include identity verification, software distribution, device inventory and reporting procedures, theft and loss protection, data synchronization and device configuration. Companies need to leverage and extend IT service management activities to automate mobile device and system management functions across the heterogeneous environments created by various types of wireless networks, carriers and mobile phones.

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Deploying enterprise mobility applications across this broad spectrum of devices and carriers requires its own management infrastructure. Companies are now seeing rapid growth in the number and types of devices and applications that must be provisioned and managed. While companies can invest in mobile device management tools from a variety of vendors, system managers typically find these tools awkward and complex to implement, even for a single group of users. Scaling out management tools to many users with many different device types and usage profiles can become incredibly labor intensive and costly.

Security issues associated with mobile enablement are another significant concern for the CIO. Mobile phones increasingly exhibit the security vulnerabilities of full-sized computers. Most of the PC and Web-related security issues now in existence will impact the mobile platform as well. The move toward application openness—in which any application can be used on any device on any network—exacerbates this problem as more and more mobile malware is being deployed. To conquer these issues, improvements are needed in the areas of software integrity and workload isolation. CIOs and system managers also need to consider different levels of security: that of the device itself, the network and corporate data. Biometrics security—voice prints, fingerprints and eye scans—constitute one security solution.

Finally, companies must decide which mobile devices are most appropriate for which employees or groups of employees. The challenge is to provide employees with the mobile devices they need to do their jobs, without overspending on communications products.

### ***What's ahead***

The growth of mobile enablement will be fueled by openness and new applications. In the mobile environment to this point, telephone carriers, service providers and phone manufacturers have been the gatekeepers for new applications. In most cases, applications are not deployed to cell phones without the joint permission of the network owner, service provider and cell phone manufacturer. This has limited innovation and the number of mobile applications deployed in the marketplace.

But, motivated by huge growth opportunities in the mobile platform, Internet service providers and IT service providers are driving the openness of mobile technologies. These providers want to see open applications, open devices, open services and open networks.

Innovative new mobile applications will be brought to market. Mobile advertising will reach an increasing number of users. Advertising efforts will also help enterprises to collect user presence data and aid business in plugging into customers' online social networks.

Openness and new applications will affect enterprises, the consumer market and the base of the pyramid. Among corporate workforces, mobility technologies will evolve to a platform capable of delivering virtually all the data, applications and services previously available only through a computer. Businesses will leverage mobile applications to better interact with their employees, business partners and consumers.

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Mobile cloud computing enablement will help businesses quickly respond to market changes. This mobile IT infrastructure will deliver flexible, agile services for computation, storage and networking. New applications will enable mobile solutions for security, threat mitigation, end-user services and service-oriented architecture. In addition, the mobile computing cloud will boost the ability of corporations to connect with populations at the base of the pyramid.

Mobility in the consumer arena will continue to grow, with retail, banking and healthcare organizations increasing their mobile offerings. New technologies will change the shopping experience—further connecting shoppers to their favorite stores—and expand mobile banking capabilities.

Mobile business transactions will increase, particularly in Europe and Asia Pacific. Mobile applications will enable customer access to enterprises via call centers and automated channels. Mobile ordering and billing will also come to fruition. Other applications will give consumers access to their medical records, to government offices and information and to business loyalty programs.

In the base of the pyramid, mobile enablement will be leveraged as a platform to serve people who don't have PC-based information access. Mobility will increasingly be used to deliver telemedicine. Handheld devices will serve as a platform for financial transactions such as transportation ticket purchases and money transfers. Companies will continue to see profit opportunities by offering these types of services to the base of the pyramid.

### ***Leading through example***

Companies seeking to implement mobile enablement strategies look to partner with businesses that have a proven track record in the mobile arena. IBM's experience in mobile technologies has been acquired through both internal efforts and through aiding its clients in the development and implementation of mobile enablement strategies.

To date, more than 48 percent of IBM's worldwide workforce leverages IBM's mobile technologies. Among them are the technical field engineers IBM is equipping with wireless connectivity. The company has begun rolling out PDAs to 6,500 field service engineers who travel to customer sites to repair or upgrade systems. These employees now have "always on" access to multiple applications. Field service engineers can exchange information instantaneously and conduct activities such as call management, parts ordering, status checks and peer-to-peer chat. This increases both employee productivity and customer satisfaction.

IBM has also enabled wireless access to its Lotus® Notes® collaboration platform, giving IBM users access to e-mail, calendaring and contact lists. Wireless access to Sametime® instant messaging and IBM's corporate directory allows IBM personnel to search 300,000 employees remotely. Push a button and the device automatically dials a contact's phone number.

Mobile business consists of moving data. IBM has been helping its customers move information for 75 years. The company's history of investment in mobility technology began with IBM's pervasive computing initiatives in the mid-1990s. IBM is now leading the enterprise mobility market with next-generation technology and functionality, providing differentiated unified communications offerings and collaboration leadership in developing mobility solutions.

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IBM is committed to creating a common architecture to support mobility service products and to drive end-to-end integrated mobility solutions. IBM enterprise mobility solutions drive client value by calling upon the company's deep experience to make end users more productive through the use of anywhere, anyplace, any-device access to critical applications and data. Every IBM Research laboratory is participating in mobile Web research, developing new platforms and services. These include context-aware services and device management products and services. Different offerings focus on specific industries and specific tasks.

Specific initiatives include:

**The IBM framework for zone-based services.** The IBM framework for zone-based services delivers business services—specifically, information and transaction services—to mobile users in public spaces. It is designed to foster an overall ecosystem that addresses the requirements of both the mobile user and the business owner. This is accomplished through an extensible architecture that supports the mobile user through device and context management components. The business owner is supported through classification and reasoning, business process management and interaction management.

**The World Development Initiative.** Recognizing that the base of the pyramid presents a large, attractive commercial market that aligns closely with IBM's capabilities and values, IBM has launched the World Development Initiative. This is an effort to develop innovative and commercially viable mobile technology solutions to improve the lives of the world's poor. IBM is providing IT and business products and services that align with its clients' goals for emerging markets in the realm of finance, education, healthcare, job growth and wealth creation.

**IBM Mobility Services for End Users.** IBM has established a repeatable approach to mobility enablement employing a three-tiered model. The first tier focuses on increasing productivity and performance by deploying mobility solutions to the highest impact areas. Improving cost control follows, through complete integration of mobility with business goals and with the overall technological operation of the business. Cost control can be further improved by unifying the management of all devices, from smart phones to task-oriented devices, through laptops and desktops. Finally, IBM clients can use mobility to drive future business growth by leveraging mobility performance analytics to improve business operations and enhance customer service.

### **For more information**

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- <sup>1</sup> Forrester Research. "The Generation Y Design Guide." 2007.
- <sup>2</sup> The World Resources Institute. "The Next 4 Billion: Market Size and Business Strategy at the Base of the Pyramid." 2007.
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