



## Enterprise Mobile Apps

### How Role-Based Apps Will Drive Productivity and Transformation in Manufacturing Companies

#### Executive Summary

Just as it's difficult to recall how business was ever conducted without e-mail, the same conclusion is likely to be drawn about mobile apps in the next two or three years – how did business ever succeed without them? The iPhones, iPads, BlackBerrys, Androids and other mobile devices that are a fixture in the lives of hundreds of millions of people around the globe today are set to change the world of business through intelligent use of mobile apps.

Several mobility trends are converging to enable manufacturing companies to gain competitive advantage in today's new economy.

- **Organizations of all sizes are looking to the fast-growing economies of the BRIC and "Next 11" countries<sup>1</sup> to drive future growth.** In these countries, hundreds of millions of potential customers are mainly reachable via mobile phone.
- **Mobile device-touting millennials are driving change in how businesses operate and engage with customers.**
- **Businesses are increasingly looking to virtualized operating models** that enable real-time collaboration anytime, anywhere.
- **The mobile Web, social tools and embedded phone technologies** are influencing the development of new business process models.

These drivers do not revolve simply around shifting work from on-site platforms to mobile devices. Emerging enterprise mobility will mirror the consumer world. As with Apple's App Store,<sup>TM</sup> progressive manufacturing companies will build dozens of simple, intuitive and even single-function apps and compile them into an enterprise mobile apps repository from which employees will download applications that perfectly synchronize with their business roles. We have seen these "role-based" mobility apps boost productivity by 5% to 10%.

In addition, these organizations will transform their business processes by making use of the features already available in smartphones and tablets – camera, location identification, compass, gyroscope, near-field communication, to name a few. Finally, more forward-thinking manufacturers will radically overhaul their business and operating models using mobility, driving non-linear growth to their top and bottom lines. For most manufacturers, the required investment is lower than for many other strategic initiatives, as the communications infrastructure already exists, and the devices themselves contain the desired capabilities.

These types of strategic mobile initiatives require a deep understanding of business processes and activities within the organization, as well as the ability to select, prioritize and ultimately build

the optimal portfolio of enterprise mobile apps. This requires strong leadership and sponsorship at the C-suite level and an appreciation for how consumer-driven innovations in mobility will have huge ramifications in the business world, as well.

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The manufacturing industry, in particular, is well-suited for mobility, as it includes a complex value chain and processes with multiple interactions and distributed activities. Many manufacturers, however, are lagging behind companies in other industries in creating and executing their mobility strategies. As manufacturers seek the next level of productivity gains – and explore ways to attract

and retain a savvy and connected workforce to propel them to next-generation competitive advantage – the answer is smarter enablement through mobility.

### The New Business Mobility

Looking back at the second decade of the new millennium, mobility will be the predominant trend that towers above all others in terms of its transformational impact on our personal and professional lives. From mobile phones, to smartphones, to tablet computers, people have quickly become accustomed to – and even dependent on – easy access to information, applications, communication, collaboration, entertainment and more, all through the mobile Web.

The growth of mobile devices is unprecedented. When Apple introduced its iPad in 2010, it took just 80 days to sell three million units.<sup>2</sup> Meanwhile, the number of smartphone users worldwide is forecast to grow to one billion by 2015, from 174 million in 2009, according to In-Stat.<sup>3</sup> And once people obtain a mobile device, their usage of them soars. Apple counts 15 billion applications that have been downloaded from its App Store in the three years since 2008, which is half the time it took the iTunes store to achieve that number of downloads. IDC estimates there will be more than one billion mobile Web users worldwide by 2013, and by 2015, global mobile broadband subscriptions will reach the 3.8 billion mark. In five years' time, the International Telecommunication Union expects mobile Web access to overtake desktop Web.<sup>4</sup>

Millennials – who would not dream of leaving the house without their mobile devices – will increasingly be unwilling to accept the idea of being bound to a desktop computer in their work lives, either as employees or customers. In their minds, productivity, communication, collaboration and decision-making are all dependent on having a mobile device with which they can access their network of peers, whatever information they need and hundreds of targeted applications. Not only will younger generations of workers increasingly be unwilling to shut off these capabilities when they arrive at work or interact with business partners; they may not even know how to function at peak capacity without them.

It's no wonder that the boundaries are collapsing between mobile devices intended for personal vs. business use, as employees with an iPhone, iPad, Android, BlackBerry or other smartphone or tablet wonder why they can't just connect to their business systems so they can use the same device for both purposes. According to research firm Ovum, 75% of businesses allow smartphones for personal use, and 48% have employees who use personal smartphones for business.<sup>5</sup>

### The Mobility Opportunity for Manufacturing Organizations

Some industries are catching on to mobility more quickly than others. For instance, retailers have been among the fastest adopters of mobile strategies, as consumers are turning to the mobile Web for product selection information, purchase advice, deals and transactions. Financial services firms have also jumped on the mobility opportunity, as customers increasingly adopt mobile banking or check account balances on their mobile devices.

Fewer manufacturers have leveraged mobile solutions, but this is quickly changing as more advanced organizations realize the huge opportunity to be tapped. To date, most mobile implementations in the manufacturing world have centered around custom-made devices for specific applications, such as mobile scanners used for logistics and distribution or service applications used by field technicians/engineers. We believe adoption of custom mobile solutions will continue but at a slower rate, as smartphones and tablets become more prevalent. For the purposes of this paper, we will discuss mobility primarily from the standpoint of leveraging consumer mobile devices such as iPhones, Blackberrys, Androids and iPads.

In a 2009 study by Motorola, over 60% of manufacturers said they intended to leverage mobile and wireless solutions to streamline operations, and more than half cited a competitive advantage through the use of mobile and wireless technology to empower their shop floor and field workforce.<sup>6</sup> The biggest benefits of mobility were productivity and efficiency, with manufacturers citing a daily average time savings of 42 minutes per employee. We believe that businesses that enable their workforce to fulfill their business roles using mobile capabilities can realize such productivity gains.

While many manufacturers are increasingly interested in formulating a mobility strategy – if they haven't started already – confusion abounds as to what those strategies should focus on. The biggest strategic mistake that we see companies make is to view mobility as simply a shift in platform. For instance, they see the mobile device as a way for employees to access or run an entire business system – enterprise resource planning, customer relationship management, finance/accounting, human resources, etc. – from the road. In their minds, mobility simply means transferring these complex, multi-function business applications and systems to the mobile device. It's not unusual to see companies create mobile applications with more than 50 different screens, which is exactly the opposite of what will make people productive, assuming you can even get them to use something so cumbersome.

To realize why this type of mobile application is headed in the wrong direction, think about how mobile devices are used in the consumer world, where people regularly download applications for very targeted and even single-function activities. These range from checking an airline or train arrival, tracking your weight, avoiding a parking ticket through a meter timer and GPS location tracker, managing your budget with a balance check and alert tool, etc. The reason Apple's App Store has ignited the imaginations of so many (both consumers and developers) is because it's so easy to latch onto the idea of using specific, intuitive applications for obtaining information, conducting transactions or performing activities that in the past people simply could not do – or at least could not do in a simple way.

### Enterprise Mobile Apps

Translated into a business context, these targeted types of applications become “role-based applications,” as companies design them for specific

roles and functions in the organization. These role-based applications provide simple features and functionalities and are pre-populated with data and fields that make it easy for users to complete a specific task.

Here's how this could work within the manufacturing enterprise. In their daily jobs, service technicians might perform dozens of tasks, but they could probably identify just six or seven of these tasks that are crucial for performing on the road – confirming an order is complete, for example, or ordering a spare part for a repair job. They don't need an entire “field technician application” involving complex navigation schemes and requiring hours of training. They just need highly purposeful, single-function applications that are aligned with their role and intuitive to use, to ensure quick adoption.

Looking across the organization, role-based applications can be identified for virtually any function within the enterprise. For instance, outbound logistics could realize huge advancements in productivity through the use of a single-function dispatch scheduling app, route optimization app or track-and-trace app. The operations team could become more effective and efficient by using an app for scheduling visibility, plant utilization and throughput analytics or order tracking.

Now, imagine if all business functions throughout the organization could download these role-based applications from a repository that can be created, after careful analysis of the applications that would enable the highest worker productivity and adoption. Employees – as well as customers, suppliers and business partners – would use the mobile applications that make most sense to them, based on which ones apply to their situation and make them most productive. When these applications are properly chosen and designed for simplicity, even traditional, non-millennial employees would be inclined to download and use them to do their jobs more effectively. Figure 1 (next page) depicts an enterprise mobile apps approach for a typical manufacturing company, with dozens of applications available to various functions across the enterprise.

The key to creating enterprise mobile apps is following a structured process to analyze an organization's manufacturing-related processes and systems in order to prioritize and aggregate the features and functionality of the role-based

## Examples of a Manufacturing Company's Enterprise Mobile Apps

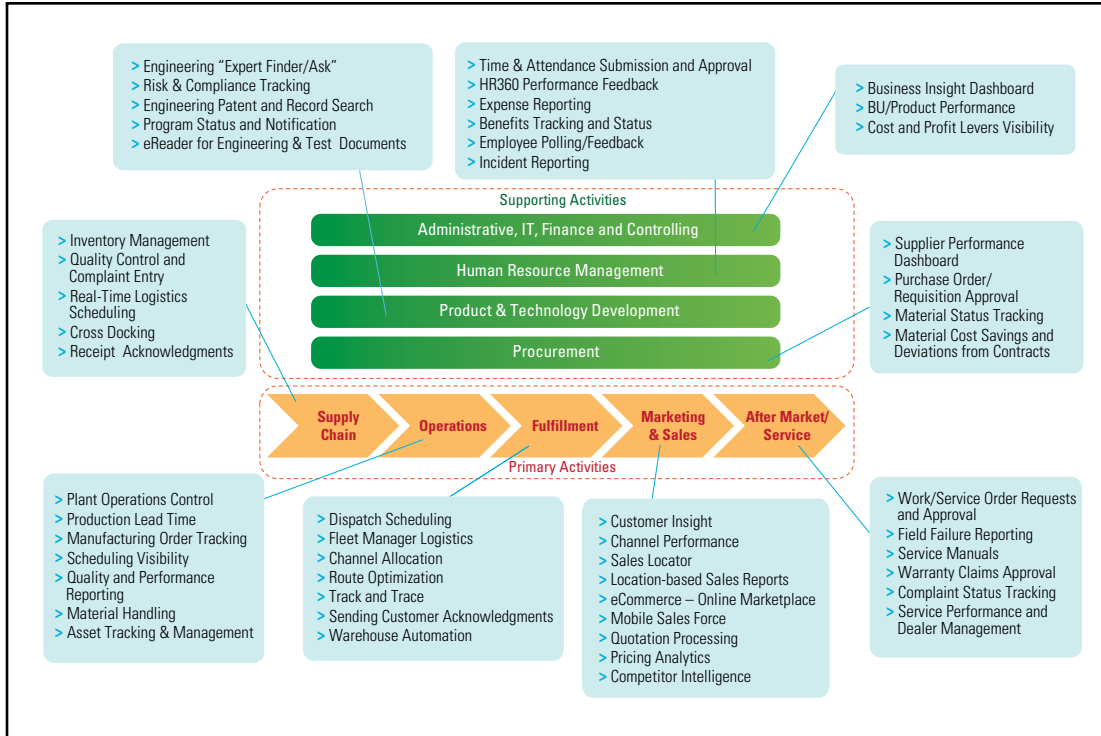


Figure 1

apps. This structured process allows businesses to rationalize what is important and create a roadmap for various apps that drive maximum benefit and adoption. More importantly, the process needs to consider the existing ERP/ legacy landscape and leverage this back-end infrastructure.

The well-designed enterprise mobile apps repository will combine a variety of technologies, including native applications (custom apps built for the device), the mobile enterprise application platform (MEAP), HTML 5 (rich, cross-platform) and mobile Web applications. Mobile versions of existing software packages will definitely be featured in the enterprise apps repository, as well, but this will not be the answer for all opportunities available for mobility in the organization. Companies will also have to build their own app distribution infrastructure – or leverage a partner's – that allows users to easily download the applications through wireless or wired means.

### Three Types of Mobility Plays for Businesses

When role-based applications are as much a part of the business culture as they are the consumer

mindset, they will drive three different outcomes: increased business effectiveness, a transformation in how business is conducted and changing business and operating models (see Figure 2). Let's take a closer look at all three of these.

#### 1. Business Effectiveness Mobility Play

When manufacturers first launch a mobility initiative, a likely goal will be to enable employees, or even customers, to increase their efficiency or productivity levels. This can be accomplished through apps that enable activities on a mobile device such as approvals, submissions, analytics and workflows.

For example, one manufacturing company developed a mobile app for senior managers to view the sales performance of their top 50 customers to proactively monitor their performance. Another example that we have ideated for a client is a days-sales-outstanding (DSO) app that would provide an overall DSO view of customers, as well as a view of all customers who exceed DSO limits. The app could also be used to alert sales people to all non-compliant customers within a 100-mile radius and provide a what-if analysis capability to calculate the maximum allowable

discounts the sales person could offer to these non-compliant customers. This would allow the business to not only be more productive but also drive better cash management.

In another case, a European supply chain logistics corporation rolled out a handheld device to fleet drivers for collection and delivery tracking, as well as fuel efficiency, daily mileage and GPS-based real-time location tracking on an iPhone-based app.

Hyundai's 2011 model of the Equus luxury sedan provides yet another mobility-enabled business effectiveness example. Hyundai has launched a replacement for the traditional paper-based owner's manual with a mobile app. The app enables customers to schedule maintenance through a "service valet" program and create reminders for routine maintenance. The app also explains the vehicle's functions through the use of video. Here, mobility is increasing the "stickiness" and engagement levels between the customer and the dealer/automaker throughout the ownership lifecycle.

**2. Business Transformation Mobility Play**

Stepping beyond business effectiveness, manufacturers will also look to mobility and role-based apps for the more strategic goal of affecting a step change in business performance by fundamentally re-engineering existing business processes. This is made

possible through the use of embedded phone features and technologies that are already available on mobile devices, such as the following:

- > Plug-and-play accessories.
- > Location identification/compass.
- > Cloud/Bluetooth.
- > Image/barcode recognition.
- > Camera.
- > Accelerometer/gyroscope.
- > Speech-to-text and text-to-speech.
- > Near-field communication.

Because these embedded technologies are already available on mobile devices, and the communications infrastructure exists, the investment required is marginal compared with other strategic initiatives, consisting mainly in developing and managing the application portfolio and implementation and enabling security. Forward-thinking manufacturers will quickly understand that they can utilize the available communication infrastructure, ERP

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**Three Types of Mobility Plays**

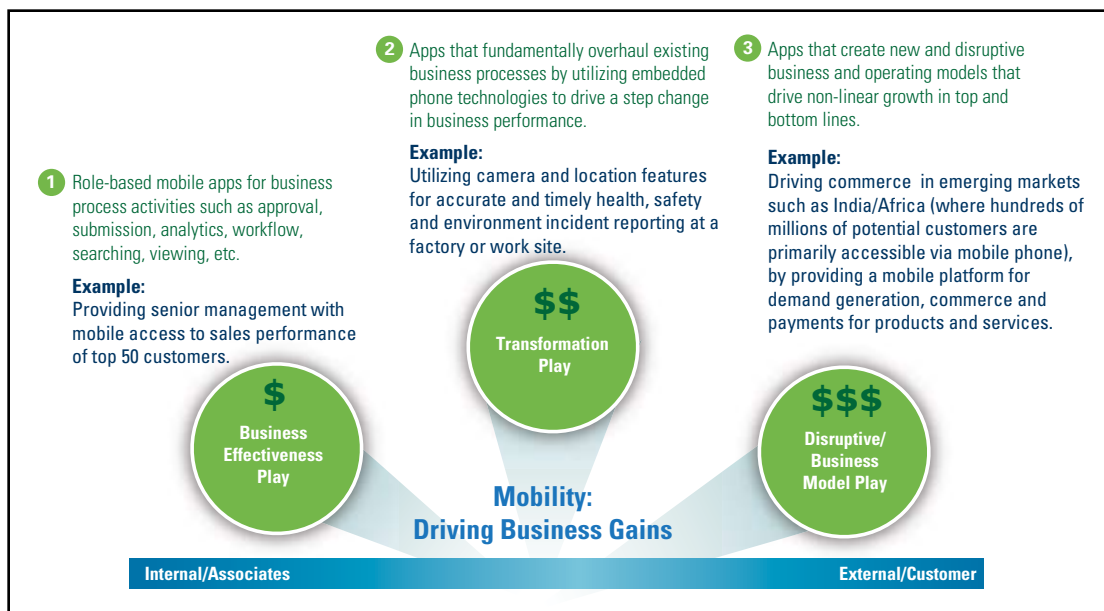


Figure 2

In areas such as India or Africa, for example, it is much more feasible to quickly reach potential customers through a mobile interface vs. the time-consuming and exorbitantly expensive route of setting up a traditional retail and sales network.

systems, smartphone devices and features to maximize business impact. One example of mobility-enabled business transformation is the use of a smartphone camera and location-based features to capture and report health-, safety- and environment-related incidents in a timely and accurate manner in a plant or workplace environment. This will not only allow for addressing issues rapidly (i.e., connecting with the emergency 911 phone number), but it will also minimize liability and fraud and fulfill insurance and compliance needs.

Mobility is already transforming the insurance business, where apps can collect data on customer driving habits and, based on that information, offer variable insurance rates and recommend new driving behaviors that will lower auto insurance costs. In healthcare, Mobisante, Inc. has developed an app with an external plug-and-play device that allows a phone to be used as an ultrasound scanner. The phone stores the video/images and is able to send them to the hospital for diagnosis. This has particular relevance in the developing world, where 70% of people cannot get access to ultrasound services. Because it is smartphone-based, the cost could eventually be as low as one dollar per ultrasound, according to Mobisante.

### 3. Disruptive Business Model Mobility Play

Most dramatically, mobility and role-based apps will also serve to create new and disruptive business and operating models that drive non-linear growth to a corporation's top and bottom lines. In fact, the mobility model will be a lynchpin for any company looking to emerging markets for growth. In areas such as India or Africa, for example, it is much more feasible to quickly reach potential customers through a mobile interface vs. the time-consuming and exorbitantly expensive route of setting up a traditional retail and sales network. With hundreds of millions of people (and mostly millennials) in these geographies already using a mobile phone, it is much less expensive to reach potential buyers through a mobile device.

An example is a multinational manufacturer with tens of thousands of SKUs that is considering the use of a mobility platform to quickly expand its business into India, the Far East, the Middle East and Africa. We have ideated a platform that would support three role-based mobile applications to drive business in these markets:

- **A field sales app:** This would provide the sales force with SKU information, stock levels, profitability levels and dealer-specific orders.
- **A retailer/distributor app:** This would provide retailers and distributors with sales promotion and new product information, as well as order status, inventory and invoice data.
- **A consumer app:** This would provide millions of customers with ordering, pricing, fulfillment status, coupons and mobile payments.

In this case, mobility and role-based apps would enable the company to obtain competitive advantage by deploying a business model that is based on a single mobile platform. The same platform, serving three different constituencies within the business ecosystem, could also be used across businesses, products and regions, providing non-linear economies of scale, with a low fixed cost due to the "light" sales force model. It would also enable optimal cash cycle time, with mobile bank payments driving improved cash management, as well as better brand management control, with direct-to-consumer capabilities.

Another disruptive model that we believe will unfold in the next few years is an automotive mobile apps repository that would provide drivers with new functionalities that they can download onto their smartphones and synch with the system onboard the vehicle. Such apps would go beyond today's proprietary performance-tracking and basic lock/unlock features, to perform tasks such as decreasing vehicle operating expenses (insurance, maintenance, service and fuel); remotely managing vehicle functions (battery-charging, remote lock/unlock, air-conditioning, radio); and enabling conveniences such as accessories purchase, service scheduling, route management, family/children vehicle safety controls, etc. These apps will integrate vehicle data, Web content, business systems and embedded phone technologies to

provide a range of innovative functionality and features. This is another example of non-linear growth, as the same platform can be used for different vehicle segments, across geographies and for the entire range of apps that can be developed.

We believe automakers that allow entrepreneurs to develop smart and intelligent apps will spawn a whole new set of innovation from which the driving public will greatly benefit. This model of “mass collaboration” has successfully stimulated innovation in other markets, such as in open source computing, where anyone is invited to contribute to the greater good of the system, and the most well-conceived and well-developed efforts naturally rise to the top. Automakers that enable or facilitate such open innovation will be the winners in the marketplace.

### Designing and Executing On Your Mobility Strategy

For many manufacturers, the types of mobile strategies outlined above pose two challenges right off the bat: Security concerns and determining who “owns” and should drive the mobility initiative.

Security concerns seem to go hand in hand with mobile computing, as businesses fear employees losing their devices and otherwise exposing corporate data through poorly secured endpoints. Today, however, there are numerous techniques for encrypting data, locating lost devices, “wiping” sensitive data from stolen or misplaced devices, disabling devices, authenticating users, etc. Companies are also able to design applications to store data on host systems, providing even more security for customers and sensitive data. In short, security concerns are not insurmountable; they just require knowledge of the many techniques for choosing the optimal set of solutions for a specific company.

As for driving the mobile initiative itself, the questions focus on who is best positioned to define the role of mobility for the company, as well as analyzing and determining the optimal applications for mobility. In many companies, mobility initiatives are headed by the IT organization, but the transformative mobility plays outlined above require a team that is co-led by business and IT, as well as sponsorship and ownership residing within the C-suite. Business management should take the lead in driving

“demand generation” to identify and prioritize the mobile apps and the art of possibilities; the IT organization should establish the “plumbing” – the mobile architecture, hardware/software, security and app distribution infrastructure, as well as put in place the “supply chain” to drive app development, maintenance and support.

Lack of enterprise-level support will inhibit economies of scale, limit opportunities to leverage enterprise-wide innovation and discourage standards and governance, which will ultimately raise the cost of the initiative, prohibitively.

To drive productivity and transformation using mobility, companies need to execute on three critical steps. Figure 3 (next page) details the activities involved in completing each of these three steps. The organization should:

- **Assess the value of enterprise mobile apps:** The team needs an understanding of the business activities, roles and end product opportunities; how to leverage mobility in these environments; and how to identify and create a portfolio of applications that lead to business effectiveness, transformation and disruptive business models. A typical repository will optimally have a combination of native, package-based and pre-built apps.
- **Determine the company’s “mobility technology strategy:”** The team needs to develop a mobile architecture that is composed of hardware, software platforms, security and an app distribution infrastructure, as well as communication protocols.
- **Establishing a “mobility center of excellence:”** The CoE is required to develop, deploy and support mobile apps, using a common set of standards, as well as manage the mobility architecture. It also needs to drive adoption of these apps across the enterprise, while keeping up with the rapidly changing environment.

### Call to Action

As manufacturers embark on mobile strategies – or fine-tune plans that have already been launched – it is important for them to understand the magnitude of how mobility will continue to impact the business world. In the end, mobility is not just a technology but the way people increasingly socialize, collaborate, communi-

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## Mobility Strategy Approach

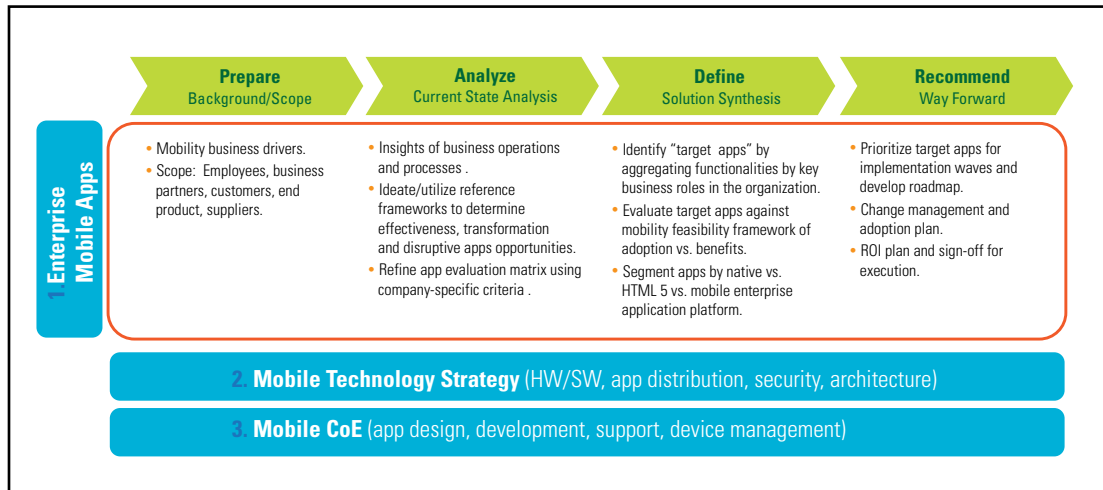


Figure 3

cate, transact business, obtain information and perform activities in both the personal and professional realms.

It is not enough to shift applications over to a mobile platform so employees can conduct business away from their desks; a mobile strategy requires a new way of looking at roles and creating applications that are single-function, intuitive and role-based. This initiative needs to be driven at an enterprise level to take

advantage of economies of scale and drive lower costs to deploy across the organization.

In today's dynamic business world, it takes bold moves to lift a company out of stagnant or linear growth. Just as mobility has ignited creativity and grabbed our imaginations in our personal lives, it will be a force for increasing business effectiveness, affecting transformation and even enabling disruptive and ultimately profitable business models in our work lives, as well.

### Footnotes

- <sup>1</sup> BRIC countries include Brazil, Russia, India and China. The "Next Eleven" (N-11) are an additional eleven countries – Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, Philippines, South Korea, Turkey, and Vietnam – that Goldman Sachs says have a high potential of becoming the world's largest economies in the 21st century, along with the BRIC countries.
- <sup>2</sup> "Apple Sells Three Million iPads in 80 Days," press release, Apple Computer, Inc., June 22, 2010, <http://www.apple.com/pr/library/2010/06/22ipad.html>
- <sup>3</sup> "More than Half of U.S. Handset Shipments Will be Smartphones by 2012, Worldwide Smartphone Shipments Move Toward One Billion by 2015," In-Stat, June 24, 2011, <http://www.instat.com/newmk.asp?ID=3012&SourceID=00000501000000000000>
- <sup>4</sup> "ITU Sees Five Billion Mobile Subscriptions Globally in 2010," International Telecommunication Union, Feb. 15, 2010, [http://www.itu.int/newsroom/press\\_releases/2010/06.html](http://www.itu.int/newsroom/press_releases/2010/06.html)
- <sup>5</sup> "Corporate Mobile Device Use and Security," Ovum/EEMA, November 2010, [http://store.ovum.com/Product/corporate\\_mobile\\_device\\_use\\_and\\_security?productid=0100043-0136](http://store.ovum.com/Product/corporate_mobile_device_use_and_security?productid=0100043-0136) "2009 Enterprise Mobility Barometer," Motorola EMS Business and Market Intelligence, June 2009, [http://www.barcoding.com/pDF/2009\\_Enterprise\\_Mobility\\_Manufacturing\\_Barometer.pdf](http://www.barcoding.com/pDF/2009_Enterprise_Mobility_Manufacturing_Barometer.pdf)
- <sup>6</sup> "2009 Enterprise Mobility Barometer," Motorola EMS Business and Market Intelligence, June 2009, [http://www.barcoding.com/pDF/2009\\_Enterprise\\_Mobility\\_Manufacturing\\_Barometer.pdf](http://www.barcoding.com/pDF/2009_Enterprise_Mobility_Manufacturing_Barometer.pdf)

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