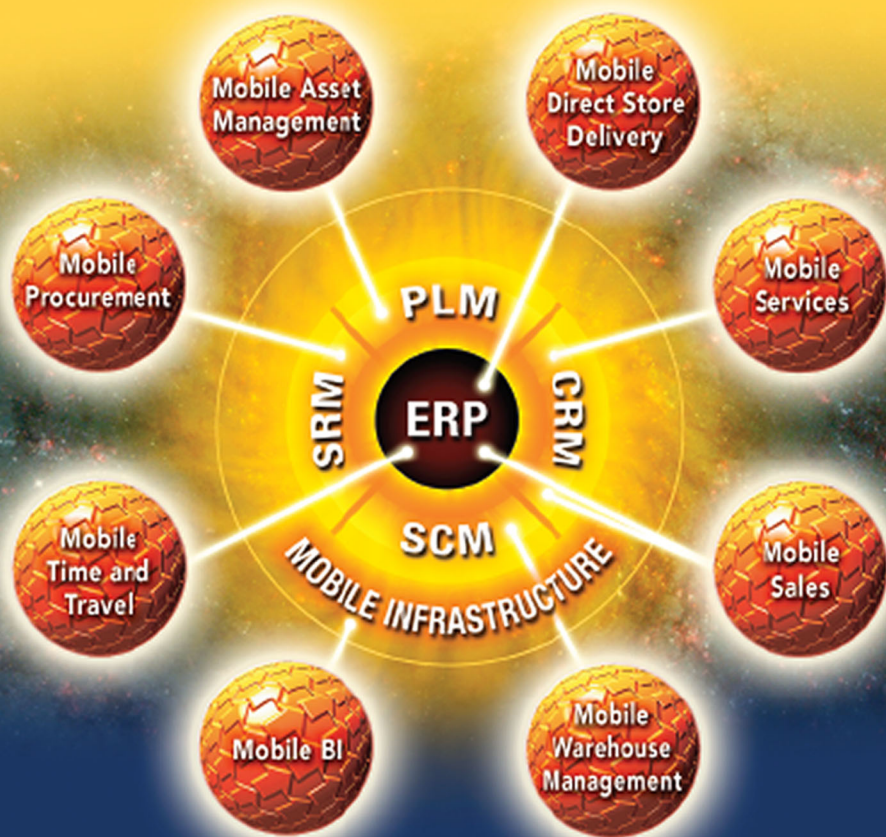


MOBILIZING SAP

Business Processes, ROI and Best Practices



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Paul Kurchina

Chapter Two

The Mobile Business Landscape

WiFi, 3G, Windows Mobile, disconnected infrastructure, Mobile Linux, field sales, field service, mobile asset management, RFID, and BlackBerry — how do these terms fit together? In this chapter, we organize the mobile business landscape. The framework provides a context for understanding the diverse applications. Gaining this understanding is a prerequisite for readers wishing to take their second key step of mobile business projects: analyzing the many opportunities available to them.

Introduction

In March 1990, Motorola marketed a combination wristwatch and pager with the tag line “It’s not science fiction anymore.”¹ It has taken another fifteen years before this “toy” could be integrated with back-end enterprise applications.

The future has arrived. Mobile solutions are shifting gears from “toys” to “tools.” This shift means that business requirements drive implementation, a phenomenon that we explored in Chapter 1 when we discussed the evolution from first-generation to second-generation mobile solutions.

Key characteristics of second-generation mobile solutions include the following:

- A focus on enabling business processes, not just tasks.
- More standardized packaged applications, not customized point solutions.
- An emphasis on mission-critical production systems, not prototypes.

- Proven ROI obtained through process improvement at the employee and enterprise levels.
- A desire to unlock the value of enterprise application investments in an exponential, nonlinear manner.

Now that you understand the mobile market dynamics, it's time to dig deeper and ask what's in it for your organization. Determining mobility's practical applications is difficult without an understanding of the changing business landscape. The first step toward a comprehensive understanding of the mobile environment is to look beneath its surface activity and apparent chaos for patterns. The next step is to categorize these patterns based on the appropriate analytic framework.

As you read this chapter, we encourage you to ask yourself the following questions when thinking about launching mobile solutions:

- What key issues — cost, quality, throughput, productivity, or velocity — affect my business the most?
- What are the performance gaps where improvements are needed?
- How do these business issues coincide with mobility? (In other words, will mobility increase the real-time nature of processes?)
- Which solutions will produce a return on my investment?
- What kinds of mobile solutions can be implemented today?
- How can I extend solutions and plan for evolution as the mobile market matures?

A disciplined approach is the only way companies can fully realize the benefits of mobility.

The Mobile Landscape

Your workforce likely sees mobility everywhere in their personal lives (sports events, ticket verification; restaurants, order taking; car rentals, rapid returns). You can safely assume that they've wondered why similar tasks can't be mobilized in corporations.

It does not take a genius to realize that mobile workplace applications will be instrumental in the quest to attain the next level of productivity gains. To move from vision to reality, however, a sound strategy is required. Such a strategy usually begins by articulating and structuring the opportunity landscape.

Figure 2.1 supports the notion that the mobile landscape can be organized systematically. The components of the mobile business framework presented in the figure are mutually exclusive and exhaustive enough to capture literally every activity taking place in the mobile landscape. A description of each of the major components follows Figure 2.1.

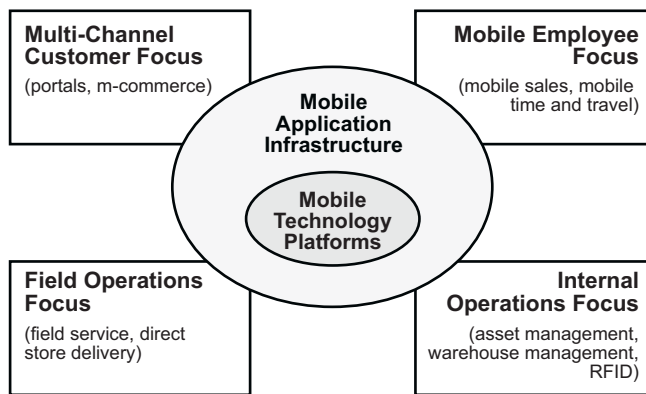


Figure 2.1: Mobile Business Framework

Mobile Technology Platforms. These platforms encompass software (Palm OS or Windows Mobile), hardware (PDAs, notebooks, or smart phones), and network infrastructure (3G or WiFi). Platforms provide the foundation upon which applications can be developed.

Mobile Application Infrastructure. Technology by itself is not enough. You need a layer of functionality that envelops the core technology platforms to enable, deliver, and manage mobile applications and services. Historically, the lack of a robust mobile infrastructure layer has made developing applications very frustrating; however, emerging products like SAP Mobile Infrastructure tackle the issue of multimode application development for multiple hardware devices and network connectivity.

Multi-Channel Customer Focus. The mobile Internet has to be put into the context of how technology fits into everyday customer tasks and lifestyles. Companies can use the mobile Internet to help customers complete transactions more easily. The mobile Internet can also become an important new channel for commerce, but it is not yet clear which tasks, activities, and transactions are a good fit for mobile commerce.

Field Operations Focus. Many enterprises share a common problem: They have made large investments in business applications that are inaccessible once their users leave their desks. Companies are adding wireless access to existing applications in order to leverage their technology investments and increase the productivity of their mobile workforce. Productivity improvements will occur when a company's employees, distributors, and business partners share and access information and perform transactions anytime, anywhere.

Internal Operations Focus. In many industries, the business pace has accelerated so much that a company's fortunes can rise and fall on its ability to monitor and manage the supply chain. Mobile Internet technology enhances supply chain and distribution operations by improving the flow of information, orders, products, and payments among the various players.

Employee Focus. Companies can use the extended Web to develop and deliver new products and services for employees. For example, a wireless portal could complement the enterprise portals to distribute content directly to employees on the go. Companies are using the mobile Internet to change their business process velocity and set new performance standards.

Using this framework, executives can systematically analyze their current operation to determine what new opportunities and risks mobile strategies provide. At a minimum, these executives will understand the business opportunities mobility makes available to them and the risks associated with both pursuing and not pursuing them.

Based on this assessment, executives can realistically determine what, if any, mobile investments they should make, so a longer look at each component is warranted.

Mobile Technology Platforms

Currently, the underlying hardware and software platforms of the mobile Internet are up for grabs, with several different options that IT groups have to wade through carefully.

To build mobile applications, a good grasp of the technology components is helpful:

- Network infrastructure — 2G, 2.5G, 3G, 4G, and WiFi
- Mobile devices — PDAs, smart phones, notebooks, and rugged devices
- Handheld operating systems — Microsoft's Windows Mobile, Palm OS, Symbian, and mobile Linux
- Third-party runtime engines — Java, J2ME, and QUALCOMM BREW
- Peripherals — printers, scanners, readers, and cameras

A brief discussion about each component should illustrate the complex decisions that IT departments frequently face.

The handheld or handset market, which has been dominated globally by a few firms such as Nokia, Motorola, Ericsson, Palm, Symbol, Intermec, Psion Teklogix, and Kyocera, is characterized by fierce competition. Key handset issues that differentiate the various players include battery life, small-screen usability, network connectivity (GSM, UMTS, and WiFi), and ruggedness.

The engineering and performance objectives of portable handheld hardware platforms differ markedly from those of desktop platforms. Established operating systems such as Windows, Unix, and Linux are designed for desktops with ever-increasing processing and storage capabilities; thus, they are unsuitable for portable appliances, which require a smaller, more lightweight, and more flexible operating system. New client-side software platforms must address the unique needs of portable devices and provide a variety of new features, such as connectivity with other devices.

Currently, the operating system segment for handhelds and smart phones is made up of five entities: PalmSource with Palm OS, Microsoft with Windows Mobile, Symbian, mobile Linux, and, to a more limited degree, Research In Motion.

To handle scenarios such as when a company has to deploy the same application on multiple operating systems and handheld devices, a new virtual machine (VM) layer is emerging. Both, QUALCOMM BREW (Binary Runtime Environment for Wireless) and Sun Microsystems are vying for dominance in this important category. Sun is creating a mobile version of the Java environment, a micro Java (J2ME), developed specifically for small devices with small screens.

Is your head spinning with all these choices? We have not even covered the different network connectivity options or peripheral devices! We leave that for the next chapter where we delve into these in more detail.

Mobile Application Infrastructure

A mobile application infrastructure is the foundation on which mobile applications and services can be developed. In the e-business world, this infrastructure is equivalent to the Web servers, Internet service providers, and application service providers that act as the base for building and deploying robust Web applications.

Three general categories of companies make their living through mobile application infrastructures:

- Mobile application platform companies: carrier-class platforms (such as Openwave for mobile operators) and enterprise-class platforms (such as SAP Mobile Infrastructure for corporations).
- Mobile Internet service providers (MISPs): general wireless carriers (Vodafone or Verizon), specialized data carriers, and WiFi hotspot providers.
- Mobile application enablers: data and transaction security, data synchronization, billing and payment service systems, and application integration providers.

Mobile Application Servers

Mobile application providers sell software platforms of prefabricated components that extend companies' business-critical applications to their mobile sales, service, and executive personnel.

Extending e-business functionality to an increasing selection of mobile devices calls for a single common application infrastructure or platform. For example, most applications are designed for viewing with a standard desktop PC. Small-screen wireless devices, such as mobile phones and PDAs, require optimizing the applications for quick viewing and data retrieval. Often, information must be completely reformatted for the best possible user experience.

Successful mobile application platforms provide users access to their business software with no loss in transaction capability and with a consistent user experience based on the type of device and connection speed. Mobile platform designs should be capable of the following:

- **Supporting multiple mobile devices.** The platform should be capable of delivering Web-based content and applications to multiple mobile devices employing diverse technological platforms. It should also be capable of adapting Web-based content and applications to fit the variety of mobile device specifications, capabilities, and formats with their different screen sizes, colors, and markup languages.
- **Optimizing content and applications based on varying connection speeds.** The application platform should optimize the amount and format of content for delivery based on the connection speed of the device requesting the information. It should also integrate effortlessly with the companies' existing Web infrastructures, reducing the need to recreate existing functionality and content solely for wireless delivery. Lastly, the platform should be compatible with existing security standards.
- **Cost-effectively supporting a growing number of applications and increasing capacity.** The application platform should be scalable to support additional applications and increased capacity as businesses expand the scope of wireless delivery to their mobile employees, customers, suppliers, and business affiliates.

- **Enabling companies to develop, maintain, and manage wireless capabilities easily.** The application platform should allow programmers to develop, maintain, and manage wireless delivery capabilities easily as they introduce additional applications and devices or change the format of existing content and applications.

The mobile application platform's primary assignment is to provide middleware for mobile computing. Wireless capabilities do require specialized middleware, and middleware vendors such as SAP are addressing these unique requirements. The features and functionality of middleware products generally includes the ability to support different networks and multiple devices and their form factors, as well as the data security, compression, and synchronization required.

Mobile Internet Service Providers

Mobile Internet service providers (MISPs) are the gateways to the Internet. Wireless carriers such as Vodafone, Cingular, Nextel, Sprint PCS, and Verizon are the MISPs for mobile phone Internet access.

The MISP business model is similar to the traditional Internet service provider (ISP) model. ISPs, such as AOL, MSN, and EarthLink, grant customers access to the Internet over the public switched telephone network (PSTN) for a monthly fee.

Several network independent MISPs — GoAmerica, OmniSky, Boingo Wireless, and Palm.net — specialized in offering wireless Internet access to handheld devices, which they provided over AT&T's and Verizon's networks. Other than WiFi service providers, almost all of these players have gone out of business or exited it as the market moves to 3G services.

Today, the dominant mobile Internet access method is coming from the large telecom players. The wireless access industry is maturing and consolidating around a few players.

Mobile Application Enablers

Mobile application enablers encompass data and transaction security services such as VeriSign, data synchronization services such as Intellisync, and micro-database providers such as Sybase.

A diverse array of businesses dedicated to mobile strategy consulting, implementation, and integration also fall into this category. Other ancillary services of mobile application enablers range from content conversion to project management. These firms run the gamut from full-service consultancies, to niche service providers, to large system integrators.

Mobile computing requires a significant systems integration effort since there is no single development standard for mobile devices. For example, a company's field force uses Symbol devices; its warehouse people prefer Psion Teklogix devices; the salespeople don't go anywhere without their BlackBerries; and the employees use a mix of everything, from Palms and BlackBerries, to Pocket PCs, wireless cell phones, and more. Enterprises must find a way to communicate and secure all of them.

See Chapter 4 for more detail on mobile application infrastructure.

Multi-Channel Customer Focus

Say you are an established company with customers. What can you do with the mobile channel? As customers become more mobile, companies have to figure out new ways of interacting with them. The success of customer-facing mobile initiatives depends on how well companies can extend existing business processes to multiple mobile channels in ways that create value for the customer.

Multi-channel applications are classified according to their purpose:

- Channel presence — information-only marketing channels that inform customers about products and services.
- Channel extension — transaction-capable interactions, a combination of marketing and sales, that can support existing customer outreach strategies.
- M-commerce applications — new services available only in mobile channels such as payment using mobile phones or location-specific coupon retrieval and redemption using handheld devices.
- Channel synchronization — fusion of a portfolio of channels (brick, Web, and mobile) into an integrated offering.

Channel Presence — Information Only

Many companies will use their mobile channel to increase their customers' understanding of their products and services primarily for marketing purposes. Other applications of channel presence include sending digital coupons, providing customer service, and receiving feedback.

These solutions use a transcoding process to make their Web site content quickly accessible from a mobile device. Transcoding converts a company's HTML Web pages into WML (Wireless Markup Language), a content format for the mobile world. Transcoders allow a company to have a quick brochureware channel presence by first reading the firm's Web site and then automating the content.

The quality of transcoding services can vary significantly. Transcoding allows marketing groups to leverage existing Web site material without the time and expense incurred when creating additional content.

Channel Extension — Mobile Channels for Existing Customers

Instead of using the mobile channel to generate sales, some retailers and financial institutions use it as part of a channel extension strategy to support their existing offline and online channels. Apple is an example of such a strategy. The firm offers Web site access for users of HP devices and cell phones. Other popular Web sites, such as Amazon.com, Google, and Yahoo!, are scrambling to deliver their content to Web-savvy consumers through Web-enabled cell phones, two-way pagers, and PDAs.

M-Commerce Applications

M-commerce is defined as the ability to purchase, track, and receive goods and services securely via mobile technology. As companies move from informational to transactional services, specialized m-commerce applications with unique mobile channel capabilities are cropping up.

These capabilities include:

- M-ticketing — for flights and other travel, as well as tickets to movies, concerts, and other performances.
- M-shopping — “personalized shopping” that can be combined with location-based applications.

- M-banking — allowing customers to check bank balances and transfer funds from anywhere and on any device.
- M-trading — buying and selling stocks, bonds, and currencies while on the go and from the most convenient wireless device.

For firms to succeed in each of these m-commerce areas, the top priority in application design must be creating an exceptional customer experience; one that is intuitive, informative, personalized, pleasant, secure, and reliable.

Channel Synchronization — Integrating Offline, Online, and Mobile

Eventually, companies will need to integrate their mobile, brick, and Web business channels. For instance, banks want their on-the-go customers to be able to complete their banking interactions from any channel. Mobile channels are not replacements of existing channels; they are complements for providing more customer convenience.

However, with every channel innovation comes the mistaken belief that existing channels will be displaced by the innovation. Over time, companies perceive the new channels as complements rather than replacements for the existing ones; thus, companies have to undertake the significant task of multi-channel integration.

Field Operations Focus

Fast-moving companies must respond immediately to real-time business changes. Mobile solutions enable these organizations to respond faster to supply chain disruptions by proactively adjusting plans or alerting key personnel about critical events as they occur.

Field operations applications include:

- Field force automation — field service dispatch,
- Direct store delivery, and
- Mobile sales.

Field Force Automation

Mobile two-way radio communications have been around for many years and have proven to be an effective way of delegating work to field

technicians and resolving problems. Field force automation, also known as field service dispatch, is one of the most popular mobile computing applications.

In traditional service dispatch, requests are received at a central location where a supervisor decides which representative will take the call. This approach has numerous flaws: It lacks responsiveness; it cannot handle schedule changes on the fly; and it creates delays when technicians order parts from the field electronically, but the transaction must be completed at the office.

Companies that are fed up with traditional service dispatch are embracing mobile data solutions to increase efficiency. AT&T MediaOne, the broadband company that later became part of Comcast Corporation, replaced its paper-based system for responding to service calls with a wireless system that included two-way messaging and a workforce management solution. Time-critical activities, service requests, and up-to-the-minute work assignments can be automatically dispatched to its 1,200 field personnel to ensure timely responses and efficient scheduling. The system led to a 25% productivity gain through improved logistics and fewer canceled appointments.

Direct Store Delivery

In the consumer products, beverage, retail, and grocery industries, direct store delivery (DSD) is a well-established business process. In this process, suppliers' personnel deliver products to each store location and store shelf, directly bypassing the stockroom. Mobile DSD solutions enable drivers to manage DSD, expedite presales orders, reconcile inventory orders, and track product delivery and stock levels.

Mobile DSD solutions increase productivity by streamlining the process and eliminating unnecessary paperwork. For instance, on delivery, each product is scanned, quantities tracked for store acceptance, and information uploaded. Upon order completion, drivers will print a customer receipt via wireless communication with a mobile printer. When finished with deliveries for the day, the mobile DSD solution helps drivers synchronize data with back-end systems for accounting and warehouse inventory functions.

Best-practice companies like Pepsi and Coca-Cola have found that mobile DSD solutions help them improve logistical performance and better monitor, analyze, and integrate data in near real time from sales to settlement.

Mobile Sales

Today's customers want instant information, competitive prices, and faster service when it comes to order status, promotions, and pricing requests. This is pushing salesforces to become even more responsive or risk losing business.

Whether they are on the road or in the office, sales personnel are demanding better communication with back-end systems for scheduling, order entry, sales leads, invoicing, inventory tracking, order fulfillment, and other support information.

Mobile solutions that address the complexities of integrating field sales with back-end systems (for example, user interface, security, and connectivity) are beginning to emerge as investment focus areas for many companies. Mobile sales solutions just might mean the difference between winning and losing business in today's fast-paced marketplace.

Internal Operations Focus

Typical internal operations applications include:

- Mobile asset management,
- Mobile ordering applications (procurement),
- Fulfillment and delivery management (supply chain execution), and
- Asset tracking and visibility (supply chain measurement).

Mobile Asset Management

Companies in industries like manufacturing, utilities, oil and gas, construction, and transportation have large quantities of fixed assets (tools, machinery, and facilities). Maintaining, servicing, and tracking their equipment and assets in a manner that maximizes value can be a daunting task.

Mobile asset management (MAM) solutions help the technicians in these industries perform their daily operations in the field. With the help of a handheld device, these mobile workers can view and update inspection and maintenance data at the point of work and automatically communicate the asset information back to the enterprise.

Take, for instance, the bulk and specialty chemicals industry. When a pump breaks, maintenance workers often travel through football-field-size plants by foot or bicycle to inspect the problem and then travel back to the control room and storage room to arrange for repairs that could take hours. Every minute of downtime for a pump is a potential loss of revenues. The best-practice firms are equipping engineers with handheld computers to report problems and arrange for repair equipment to be brought to the point of the problem.

Minimizing downtime in the course of plant maintenance and in break and fix scenarios is the objective in the utilities industry. Many utility companies such as TransAlta have implemented asset management solutions that enable technicians to collect and access asset information at the point of work, regardless of wireless network availability. The business objective is to improve the integrity of asset data and perform enhanced predictive and preventive maintenance.

Mobile Ordering Applications

Mobile ordering solutions basically extend e-procurement applications and enable customers to place orders on handheld devices. Wesco Distribution, a leading distributor of electrical products, uses mobility to transform its order-to-cash cycle. Wesco's customers are highly mobile and need to order supplies from remote locations. Wesco created a wireless application that lets customers order products from just about anywhere via a handheld device. A key business objective of the new application is to ease some of the pressure on Wesco's busy call center.²

The application helps customers save time, manage their businesses, and eliminate order errors. These solutions also include retail reorder applications that use handheld devices to scan item information and either store it locally or transmit it to a central server where it is matched against a replenishment plan. If a certain threshold is met, orders are automatically placed to the suppliers.

Several vendors, including Symbol and Intermec, have been offering a variety of mobile reorder systems for years. Their offerings include simple portable bar code readers and more sophisticated portable data terminals, or PDTs. These tools will read information from assorted devices and automatically transmit this information through wireless local area or wide area networks.

Fulfillment and Delivery Management

Delivery management is a critical function of any supply chain and was one of the first business functions to take advantage of mobile technology. Everyone is familiar with the FedEx or UPS delivery person writing on a tablet. The tablet is a wireless delivery automation platform that integrates the field activities with the company's back office. These drivers use the latest handheld devices to capture critical information and publish it immediately over the Internet. As delivery information is collected, customers can track their order throughout the fulfillment cycle.

This technology alone has helped improve productivity, shorten billing cycles, eliminate proof-of-delivery issues, and improve customer service — all by taking an error-prone, paper-based process that once spanned several days and reducing it to a few minutes.

McKesson, the world's largest healthcare distributor, uses mobile technology to improve its delivery process and electronically confirm every delivery. Approximately 800 of the company's 2,800 truckers use Symbol handheld devices running Palm OS to save the company and its customers time and money. Every package is bar code imprinted and scanned before and upon delivery. McKesson's customers can use the handheld scanners to place orders and obtain instant order confirmation and detailed status. The McKesson example highlights how mobile solutions are rapidly becoming a major presence in the delivery side of the supply chain.

Asset Tracking and Visibility

Imagine a supply chain where raw materials from China become component parts in Taiwan for a product made in Singapore that is then shipped to San Francisco where it is finally assembled and sent to a customer in New York. The manufacturing supply chain has been characterized by global materials movement for decades.

As the world economy transitions to global outsourcing, monitoring highly mobile, geographically dispersed assets takes on increasing importance. Not knowing where products and materials are at any given time along the supply chain is costly. The issues of supply process delays and waste have taken on new urgency with the advent of real-time commerce and increased customer intolerance for fulfillment errors.

Employee Focus: Enterprise Wireless Applications

Last but not least, we have the mobile applications that strive to boost employee productivity. This category includes applications for managing mobile employee access to business information and applications. Employee applications can be broken down into four major segments:

- Messaging solutions,
- Enterprise application extension models,
- Sales or enterprise information portals, and
- Legacy application extension models.

Messaging Solutions

Messaging has become a major application both in the mobile world and in the fixed internet. Messaging applications, such as those pioneered by PalmPilot and the BlackBerry pager, give workers wireless access to corporate e-mail, calendars, and address books while providing a high level of security.

A personal information management (PIM) and messaging application connects all leading mobile devices to existing enterprise messaging and information systems, such as Lotus Notes and Microsoft Exchange. These applications enable users to retrieve and respond to inbox messages, compose new ones, and access and modify contact, task, and scheduling information from anywhere, at any time, and with any device.

Enterprise Application Extension Models

Point solutions extend enterprise applications for easy access. Consider JetBlue Airways' curbside check-in application: The handheld system, which consists of a wireless local area network, portable data terminals,

and portable receipt/ticket printer, gives JetBlue's staff access to passenger and flight information via a real-time connection to its reservation system. The line-busting application allows JetBlue staff to check in passengers, print boarding passes, and check luggage virtually anywhere inside or outside the terminal.

The value of this solution for travelers is that it reduces the stress of flying during peak travel times like Christmas. For the company, the value lies in improving on-time operational efficiency by getting passengers, especially late ones, checked in and to the plane immediately.

Business Portals

Business portals give employees a single entry point into their business applications. For example, time and expense entry applications are used by professional service firms whose consultants record information in the field and send it in electronically. All manual, paper-based record entry processes are eliminated, saving time, reducing entry errors, and permitting faster billing and reimbursement. Business portals are designed to overcome such problems by aggregating information from a variety of sources. They compile information from the firm's e-mail systems, front-office applications, legacy applications, and Web-based content and deliver only the most relevant information to the user.

Legacy Extension Models

Most large firms have legacy applications and other focused applications that they have accumulated over the years. Providing access to these applications may become necessary in many industries. One way to do this is through middleware technology that unites disparate computer systems.

Middleware addresses the inefficiencies resulting from the ad hoc buildup of legacy systems over time and distance. Left unchecked, incompatible systems can create "islands of data," with a seriously limited ability to automate work processes and optimize business operations. As companies seek to capitalize on the potential of mobility, using middleware applications to integrate data, business processes, and legacy systems becomes critical.

The SAP Mobile Business Framework

The general landscape framework we have described fits well with the SAP mobile business framework (see Figure 2.2). SAP NetWeaver is the equivalent of our mobile application infrastructure layer.

The different applications that are in SAP mobile business map directly into the framework we presented in this chapter. SAP defines mobile business as the extension of enterprise applications beyond traditional corporate boundaries. To accomplish this extension, SAP is innovating along two fronts: infrastructure and applications.

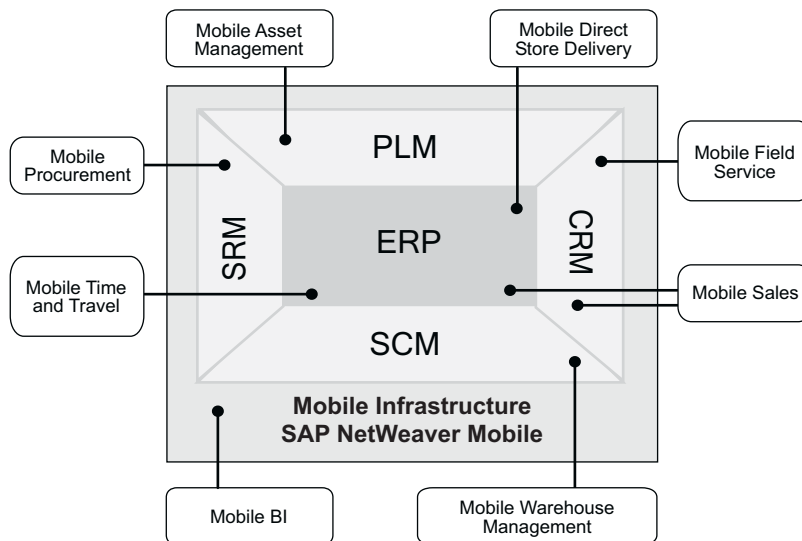


Figure 2.2: SAP's Solutions for Mobile Business

On the infrastructure side, SAP's solution for complete enterprise mobility is SAP Mobile Infrastructure, a technology foundation that is powered by SAP NetWeaver, the company's open integration and application platform that drives lower cost of ownership across heterogeneous IT landscapes. SAP Mobile Infrastructure's goal is twofold:

- Deliver the power of business-critical enterprise systems to all popular mobile devices in both connected and disconnected computing environments.

- Support cross-device — smart phones, PDAs, notebooks, and other mobile devices — scenarios that enable seamless information exchange.

On the application side, SAP's solution includes a set of mobile applications that satisfy customers' need for 24x7 access to corporate data and business processes. SAP's mobile solutions work closely with its enterprise resource planning (ERP), customer relationship management (CRM), supply chain management (SCM), and product lifecycle management (PLM) applications. Whether business is being conducted on the shop floor, at a customer site, or on the road in the middle of nowhere, these applications can minimize integration costs.

Summary

"If you don't know where you're going, you'll end up someplace else."

— Yogi Berra

Mobile business is in its infancy. Until now, no real frameworks for systematically thinking about opportunities or problems existed. Both the business models that support implementation and the competitive landscape are still in flux. By methodically approaching the problem, it becomes clear that the mobile landscape is a complex puzzle that accommodates the development of multiple business solutions.

As we developed the mobile framework, it became clear that mobile solutions extend the value of enterprise application and e-business investments. In one sense, the current transformation is simply the movement of e-business to a mobile environment.

The mobile business is not yet a reality; it is still a developing concept, as are the business applications that support it. In summary, mobile business solutions must take into account the following factors:

- Key enablers — advances in infrastructure, software, and hardware technologies,
- Source of innovation — new application concepts and designs, and

- Arbitrators of success — consumer preferences and marketplace dynamics.

Mobile solution innovations, while exciting in themselves, are significant because they enable the creation of rapid payback or ROI. The relationship between a business problem, the evolution of infrastructure, and the usefulness of an application, however, is not a simple one.

User preferences, corporate capabilities, and process dynamics make mobility even more complex. However, process dynamics will ultimately determine which mobile solutions are successful and which are relegated to the dustbin of history.

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