



Mobilizing the Enterprise 2004

An Air2Web White Paper

Copyright © 2004, Air2Web, Inc.
1230 Peachtree St. NE
Suite 12
Atlanta, GA 30309
404.942.5300p
404.815.7708 f
info@air2web.com
www.air2web.com

Table of Contents

TABLE OF CONTENTS	2
PUBLISHER INFORMATION	3
INTRODUCTION	4
EXAMPLES OF MOBILE ENTERPRISE SOLUTIONS:	5
WIRELESS DRIVERS AND ROI	7
WIRELESS COMPUTING SNAPSHOT	8
BENEFITS OF OUTSOURCING	12
SELECTION CRITERIA FOR MOBILE MIDDLEWARE	13
CONCLUSION	15
ABOUT AIR2WEB	16
END NOTES	17

Publisher Information

Air2Web, Inc.
1230 Peachtree St. NE 12th Floor
Atlanta, GA 30309

© Copyright 2004 Air2Web, Inc.
All rights reserved.

All copyrights, patents, designs and other intellectual property rights in or relating to any information provided or made available in connection with this document remain the sole property of Air2Web. No part of this publication may be reproduced, transmitted, stored in a retrieval system, or translated into any language or computer language, in any form or by any means, including electronic, mechanical, magnetic, optical, chemical, manual, or otherwise, without prior written permission of Air2Web.

This publication is provided as is without warranty of any kind, express or implied, including, but not limited to, the implied warranties of merchantability, fitness for a particular purpose, or non-infringement.



Introduction

Enterprises are seeking the means to extend corporate data to an increasingly mobile workforce. IDC, a leading computing industry watchdog, estimates that by the end of 2006 roughly 66% of the U.S. work force will be mobile workers. Mobile workers are defined as employees spending at least 20% of their time away from the office.

And according to the Gartner Analyst Group, mobile applications are becoming strategic parts of a company's IT portfolio, rather than tools for tactical productivity gains). IS organizations spent up to 5 percent of their budget on mobile applications in 2003; this percentage will double by 2007 (0.7 probability).ⁱ

Wireless productivity applications leverage and extend corporate data and enterprise applications for workers on the move. Leading companies enable anywhere access to employees who are out of the office (and in the office), ensure real time communication of action items that require immediate attention, and provide a more efficient means to bring products and services to market. In addition, many corporations are embarking on wireless initiatives designed to further embrace customers – from business travelers to students.

Examples of Mobile Enterprise Solutions:

- Mobile Office - Email and Instant Messaging are rivaling one another as the primary online communication tool. In fact, analysts are predicting instant messaging functionality will be integrated into most business-to-business-to-consumer applications. Regardless, both applications are critical to employees' productivity. Having the ability to access these applications wirelessly is becoming more and more a necessity as employees become more remote and the number of daily tasks employees are expected to perform is rising, while the time per task is decreasing

Wireless access to office solutions such as Microsoft Exchange, Lotus Domino, and GroupWise includes real-time access to email, calendars, contact information and attachments. While wireless Instant Messaging solutions should offer enterprises simultaneous access to public and private IM services, essentially extending employees' PC-based IM services to mobile devices.

- Enterprise Applications – Many companies justify wireless initiatives by enabling revenue-generating Field Sales and Field Service personnel. Wireless extensions of back-end data leverage investments in enterprise applications such as

Customer relationship management (CRM) systems help to manage interactions with customers by improving sales, marketing, and customer support processes. Each part of an organization that has direct or indirect interaction with customers can benefit from real time access to customer information.

Wireless extensions of back-end data leverage investments in Enterprise Resource Planning (ERP) software. All types of mobile workers can be armed with information from primary business applications including accounting and controlling; production and materials management; quality management and plant maintenance; sales and distribution; human resources; and project management.

Wireless extensions of back-end data also leverage investments in Supply Chain Management (SCM) software and allow mobile workers to be even more responsive to business needs and make quicker, more informed decisions. Benefits include dramatically reducing lead times, accelerating order fulfillment, decreasing production downtime, reducing inventory, decreasing transportation costs, and increasing forecast accuracy.

- News, Alerts & Notifications – The ability to push messages to wireless data users is generating business benefits – both internally to employees, and externally to customers. From couponing applications to consumers, to staff-wide messages from the executive team, wireless messaging applications are increasing in popularity.
- Web content – Corporations can mobilize intranet and Internet content to employees and customers alike. Intranet mobilization enables remote employees to be more productive and feel less detached. Wirelessly extending Internet content helps corporations further embrace customers and consumers strengthening brand loyalty and establishing competitive advantage.
- Mobile Commerce – Naturally, wireless solutions that generate revenue are among the most compelling applications. The concept of using wireless as an additional revenue stream spurred the explosion in wireless technology and is helping sustain the momentum for many enterprise wireless initiatives.

Wireless Drivers and ROI

The decision to go wireless is one every company will have to face at some point. Most businesses already understand the value of wireless connectivity to their employees and are confident the technology is maturing. Primary reasons cited for deploying a wireless solution in the enterprise are to:

- ▣ Service mobile workers
- ▣ Provide access to mobile email and IM
- ▣ Provide access to Intranet applications
- ▣ Deploy specific corporate applications
- ▣ Improve scheduling
- ▣ Enable mCommerce

Return on Investment

In general, ROI for wireless investments is realized in terms of:

- ▣ Improved employee performance - Boosting productivity by leveraging enterprise applications, corporate data, and email for mobile workers.
- ▣ Increased competitive advantage - Increasing market share by heightening product awareness and enabling customer loyalty.
- ▣ Reduced costs - Reducing costs by providing a less expensive means to interact with both employees and customers.
- ▣ Revenue generation – Increasing revenue by selling the right product to the right customer at the right time for the right price.
- ▣ Customer acquisition and retention – Acquiring customers by reaching a wider audience unconstrained by time and place. Retaining customers by providing service on their terms.

For a more detailed discussion on wireless ROI, please download a copy of "The Business Case for Going Wireless: ROI Expectations and Results", available at http://www.air2web.com/solutions_papers.jsp

Wireless Computing Snapshot

The wireless industry is marked by rapid innovation and, perhaps more significantly, rapid obsolescence. In order to maximize return on investment for wireless initiatives, corporations should consider the following variables:

Lack of Device Standardization

The issue of standardization on specific wireless devices often arises as companies embrace wireless technology. However, a solution that only accesses a small number of devices limits its overall value to businesses:

- **Employee-purchased devices** - Businesses may not be able to justify purchasing mobile devices for all employees, yet all employees can benefit from remote, wireless access to corporate data and email, even if only on occasion. In fact, many businesses allow employees to purchase wireless devices and reimburse them for the device itself and/or for business-related airtime. Device choice, even in work environments, will continue to be highly personal – regardless if the company purchases a \$500 device for a mobile executive or a staff member uses their personal device to access corporate data.
- **Need-driven device selection** - There are currently over 1,000 models of mobile devices on the market. Mobile users have many different requirements and personal preferences. Some spend hours in a car where a voice-based device and voice access to corporate data is ideal. Others work in an environment where a keyboard-based device and advanced graphics capability is most powerful.
- **Device Diversity** - Wireless devices, driven by low-cost technology, are proliferating. Suppliers pay little attention to product upgrades and backward compatibility. Time to market is paramount. Although mobile devices are expected to converge to a set of features and performance standards, convergence to a single form factor is highly unlikely.

Wireless solutions should support ever-evolving array of advanced device types including SMS devices, browser-based (WAP) devices, wireless PDAs (Palm and PocketPC), RIM pagers, i-mode, and J-Phone.

Due to rapid device evolution, enterprises that commit to a mobile solution that only support a hand-full of devices may find it to be inadequate in less than a year. Trying to take advantage of new devices as they come on to the market is more expensive than choosing a mobile platform that already supports an array of device types.

Incomplete Network Coverage

Unlike the situation in Europe, North American wireless users still face multiple carriers and multiple networks. In fact, as of print date no wireless carrier in North America can claim complete coverage. With today's mobile workers logging more and more time out of the office, in various locations in and out of the country, selection of a single wireless provider is cost prohibitive and impractical.

Below is a list of the most prevalent wireless protocols:

CDMA (Code Division Multiple Access) – 2G	CDMA networks incorporate spread-spectrum technology to gracefully allocate data over available cells.
CDPD (Cellular Digital Packet Data) – 2G	CDPD is a protocol built exclusively for sending wireless data over cellular networks. CDPD is built on TCP/IP standards.
GSM (Global System for Mobile Communications) – 2G	GSM networks, virtually ubiquitous in Europe, are becoming popular in North America.
GPRS (General Packet Radio Service) – 2.5 G	GPRS technology offers significant speed improvements over existing 2G technology.
1xRTT (single carrier (1x) radio transmission technology)	1xRTT is a 3G wireless technology based on the CDMA platform. 1xRTT has the capability of providing ISDN-like speeds of up to 144 Kbps.
????? – 3G	3G networks promise speeds rivaling wired connections. Both in Europe and North America, carriers have aggressively bid for 3G spectrum but no standard has yet emerged.

EDGE(Enhanced Data GSM Environment)

EDGE is a faster version of GSM wireless service. EDGE enables data to be delivered at rates up to 384 Kbps on a broadband. The standard is based on the GSM standard and uses TDMA multiplexing technology.

Increased Security Risks

Wireless security is inherently different than LAN-based security. Enterprises must be aware of how traditional security challenges change in relevance in a wireless world. Key considerations include:

- **Privacy** - This is the most important component of secure transactions and is required when transmitting sensitive information (such as credit card numbers, financial details or patient records) so the information cannot be seen or used by other parties. Established privacy protocols and procedures are critical for wireless applications as wireless transmissions are ground zero for hackers.
- **Authentication** - Electronic authentication typically involves using a token or certificate that can be verified by a recognized Certification Authority (CA). Digital signature technology (popularized by VeriSign) is one way of authenticating users. Gartner Group adds, "Although encryption is essential, most vendors and enterprises focus too much on it as if it was a total solution. Most enterprises leave their systems vulnerable to attacks that can be executed regardless of their use of encryption. In the mobile/wireless world, encryption is a piece of access control and privacy that must be combined with strong, portable authentication...."
- **Two Factor Authentication** - This process is used to verify both the device and the identity of the end-user during a secure transaction (i.e., two-factor authentication confirms that both the device and the user are authorized agents). Two factor authentication is critical in protecting network integrity from the inevitability of stolen or lost devices.

"Although encryption is essential, most vendors and enterprises focus too much on it as if it was a total solution. Most enterprises leave their systems vulnerable to attacks that can be executed regardless of their use of encryption. In the mobile/wireless world, encryption is a piece of access control and privacy that must be combined with strong, portable authentication...."

- Gartner Group

- Data Integrity - This concept involves the detection of any change to the content of a message. For example, when an end-user instructs a bank to transfer \$1000 from one account to another, integrity guarantees that transaction specifics in the user's message cannot be altered without alerting the bank or the user. If the message is altered in any way during transmission, an integrity-driven security system detects this alteration.
- Non-repudiation - This process establishes a system so that users cannot deny they took part in a transaction. Non-repudiation is similar to authorization, in that it requires successful authentication of the user, but it also establishes a credible and legally enforceable record of all transactions.
- Encryption – Encryption involves scrambling data bits using mathematical algorithms to protect data.

For more on wireless security, download Air2Web's white paper entitled "Secure Wireless Computing: Best Practices for Managing Security in Wide-Area Wireless Networks", available at http://www.air2web.com/solutions_papers.jsp

Dynamic Usage Models

Mobile employees, even working in the same department, find themselves in a variety of situations that require different device characteristics and wireless application design. Mobile workers may be in a meeting where speaking in a phone would be disruptive or they may be driving in a car where working on a PDA is not feasible. Varying needs, coupled with highly personal device preferences, and lower price points for mobile devices perpetuate a trend of multiple devices for a mobile workforce.

Voice technology (speech recognition, text-to-speech, and streaming audio) resolves many of the user interface issues related to mobile devices with limited display and keyboard capabilities.

With speech recognition, field force workers can get information they need in geographic areas with poor or no cell phone coverage, and they can still connect with their enterprise systems. Speech recognition also enables users to get information in a hands-free mode that is less cumbersome and more desirable for many field force uses.

Compelling wireless applications support advanced audio and data because many mobile applications are better suited to multiple media formats (e.g., text, graphics and audio for WAP telephones OR audio and text messaging for SMS devices). Mobile users can move naturally from data-to-voice-to-data within a single application.

Benefits of Outsourcing

While many companies are piloting internally-built wireless applications, the majority of enterprises elect to outsource, either in part or entirely, the implementation of mobile middleware. Total or partial outsourcing yields the following benefits:

- **Preservation of IT Resources** – Depending on the number of users and the complexity of data interchange, wireless application development, management and support requires a significant amount of IT resources.

- **Leverage Vendor Expertise** – Wireless computing can be complex, depending on scope, and usually not an enterprise core competency. Corporations can take advantage of wireless vendor expertise to further spare IT resources.

- **Minimize Time-To-Deployment** – Working in conjunction with a middleware provider can significantly reduce development, Q/A and implementation times to ensure successful, timely wireless application deployment.

- **Cost Savings** – In most cases, outsourcing generates significant cost savings over internal buildout. Most vendors offer both hosted and installable solutions allowing companies to scale economically.

Selection Criteria for Mobile Middleware

Once your organization has determined to engage outside help for its mobile initiatives, the following selection criteria should be used to help evaluate vendors:

Does the middleware support multiple devices?

For the reasons previously stated, the ability to support a broad spectrum of devices is paramount. Be certain the vendor you select supports current device operating systems and is committed to incorporating additional devices as they become more prevalent. At a minimum vendor support should include:

- Palm
- Pocket PC
- RIM
- J2ME
- BREW
- J Phone
- IMode
- WAP
- SMS
- Symbian

Beyond just multiple device support, your vendor should be able to maximize device functionality so that the user experience is optimized – regardless of device type.

Does the middleware support multiple networks?

Though the buildout of high-speed next generation wireless networks promises to eliminate many of the holes in network coverage, there will always be competing carriers and some degree of network latency. Vendors with relationships with most of the major carriers should be given preference.

Does the middleware support voice and data applications?

For some applications, data is enough. For others, voice integration is crucial. Take care to select a vendor capable of supporting applications that offer both voice-centric, data-centric and integrated voice/data applications.

Does the vendor offer a hosted and installable version?

Many corporations choose to deploy initial wireless applications, whether pilots or small-scale applications, on a hosted basis. Hosted applications are usually located at vendor sites built with stringent security protocols and enterprise-class redundancy. When enterprises are ready to bring the application behind the corporate firewall, a vendor with proven expertise in both models can assure an elegant migration.

Comparison: Hosted vs. Installable Software:

- Hosted Deployment: wireless service is co-located at secure data center
 - Achieve a quicker time-to-market
 - Enjoy a reduced initial investment

 - Support a smaller number of users
 - Support a moderate usage pattern
 - Deployment where usage is difficult to predict

- Enterprise Deployment: wireless software is installed behind corporate firewall
 - Ensure additional control
 - Achieve a lower cost of ownership over long term
 - Support a large number of users
 - Support a heavy usage pattern
 - Deployment where usage is easier to predict

Does the platform support multiple applications?

Be careful to avoid point solutions as the integration of multiple platforms and applications can drain IT resources and cause user frustration. The solution you select should support certain applications out-of-the-box, and be capable of extending corporate applications through an extensible, open-source platform.

Compelling wireless applications are created by developers experienced in optimizing the end user experience while overcoming limited bandwidth, screen sizes, device memory, etc. Several criteria for developing compelling wireless applications are:

- New wireless applications (not a force-fit of Internet apps)
- Dedicated data feeds (not just a scrape of a web site)
- Timely information (critical to decisions, personalized to user)
- Interactive to any device (not just browser-based devices)
- Optimization of devices (use of audio when appropriate)
- Closing actions (provision, transact, and one-button response)

Does the vendor support multiple languages?

Preference should be given to vendors who support multiple languages so as not to burden IT resources with learning new languages to support wireless initiatives. Your platform should come equipped with out-of-the-box support for the following languages:

- WML
- HTML
- MML
- cHTML
- mHTML
- xHTML

Conclusion

Wirelessly extending corporate data, back-end information systems, email and instant messaging to mobile employees broadens the accessibility of mission critical data. Wireless access modifies the way workers interact with colleagues, customers, and suppliers. While strong drivers for wireless access to corporate data exist, confusion remains in the marketplace. Results-driven wireless applications can be deployed today, with usability extending indefinitely, through the deployment of solutions that support the exploding number of devices, networks and applications.

About Air2Web

Air2Web's Mobile Internet Platform provides the most powerful, flexible, and comprehensive technology for wirelessly enabling critical back-end solutions and corporate data across any carrier, network or device.

Air2Web efficiently extends productivity applications to mobile employees, such as:

- ☑ Enterprise Application Integration (EAI)
- ☑ Enterprise Resource Planning (ERP)
- ☑ Sales Force Automation (SFA)
- ☑ Customer Relationship Management (CRM)
- ☑ Supply Chain Management (SCM)
- ☑ Email
- ☑ Instant Messaging

Air2Web also extends corporate data to such mobile customers as:

- ☑ Financial services
- ☑ Customer service
- ☑ Product information
- ☑ Loyalty account information
- ☑ Mobile commerce
- ☑ News and alerts

Air2Web allows its business customers to accomplish the following:

- ☑ Access data directly rather using open XML, J2EE standards
- ☑ Optimize delivery of data to all device types through Cascaded Rendering Technology(tm)
- ☑ Blend advanced voice and data in a format best suited for the mobile user
- ☑ Extend interactive applications across all device types
- ☑ Embed conditional navigation logic to require minimal user input
- ☑ Implement m-commerce applications
- ☑ Secure data using public key infrastructure (PKI) reciprocal digital certificate transfer

Air2Web has deployed its technology with such blue chip customers as ABN AMRO, CBS SportsLine, Digital Insight, eBay, InterContinental Hotels Group, The Weather Channel, and UPS.

End Notes

i Plans for a Widening Range of Mobile Application Platforms, Gartner Group, January , 2004

ii Client Issues for Security Infrastructure, Gartner Group, September 2003