



# White Paper

## Wireless and Your Business

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# 1. Introduction

Wireless technology has taken eBusiness to a higher level. Companies have often invested millions of dollars in their eBusiness initiatives which have resulted in building an excellent Web presence. The problem is that the Internet does not end with the Web – and certainly not with a traditional Web browser.

The real problem is that Web sites that require people to use a traditional Web browser require people to have access to a personal computer with Internet access. The vast majority of the people on this planet do not have this access. And the access that is available is certainly not available when people are mobile, such as in airports, at client sites, in factories, on vacation, etc.

Wireless technology allows businesses to work with their customers in ways that have not even been conceived. Not only will wireless technology be able to reach customers that have not been customers before, but it will cement the relationship with current and future customers by allowing them unparalleled levels of customer service.

Much as companies just a few years ago were trying to decide whether or not to invest in having a “Web presence”, the same decisions are being made in boardrooms around the world regarding having a wireless presence. It is also clear that the companies that invested early on in the Internet have progressed further than those that made the investment later on.

## 2. The Vision

To help understand some of the power of wireless technology, consider the following two scenarios:

**Scenario 1** You are traveling in a new city and are trying to get to an appointment. Using your wireless device, you enter your destination address (if your digital appointment book doesn't already have the address). The wireless device will then communicate with a variety of Internet sites to check for subway, train, and bus schedules. It can also check to see the whereabouts of the appropriate vehicle and whether or not you can make it to the closest stop in the time allotted. If no form of public transportation is available, your wireless device can summon a taxi for you. As your wireless device knows your physical location through its GPS (Global Positioning System) interface, guiding you to a specific location or directing a taxi to you is handled automatically. Assuming you decide to take a bus, while on the bus, your wireless device indicates where you are, your time until you have to get off the bus, and your estimated time of arrival. Once on foot again, your wireless device will direct you to your appointment by giving you directions both visually and textually.

**Scenario 2** You're on vacation. Your children want to go to a theme park without you today, but you want to ensure that they have everything they'll need for the day. You give them a wireless device and authorize the device to spend up to \$100. When the children get to the theme park, they use the wireless device to pay for their admission to the park. They also use the wireless device to pay for their lunch and souvenirs they want. The wireless device will tell them the wait times to the theme park rides and the most efficient way to ride all of the attractions as many times as possible. When the children want to be picked up,

they can call you using the wireless device and its built-in GPS technology will tell you precisely where they are. In the unfortunate situation where the wireless device is lost, the \$100 already authorized to the device is not lost, as the \$100 is kept in your bank account and only accessed via the wireless device (unlike pre-paid cards which carry the value in the card itself).

These two scenarios are just two of thousands of ways that wireless technology will affect our business and personal lives.

The fact is, we have yet to see the capabilities, benefits, applications, and impact that wireless technology will have on us.

### **3. The Reality**

As with all visions, they are simply peeks into the future. The reality is somewhat different. Consider the following:

- Neither of the scenarios above exist today;
- Most of the wireless devices are incapable of what they need to do in order to become successful, especially in the areas of screen size, bandwidth, and human interface;
- The standards have proliferated to a point where there is no clear “winner” and, hence, much confusion exists regarding where people should invest their resources; and
- There’s so much money to be made in wireless that the battles are going to be huge.

In a sidebar on the next page are some terms that relate to the wireless technology field. These terms only hint at the various competing standards and companies that are involved. Furthermore, many of the standards are competing or have companies that have decided to endorse, support, and build products around certain technologies. This can be both good and bad for consumers who will hopefully benefit from the increased competition, but may result in products that do not interoperate with the ease they would prefer.

Many organizations are involved in establishing wireless standards. The ITU (International Telecommunications Union, [www.itu.org](http://www.itu.org)) is a permanent mission of the United Nations, based in Geneva, Switzerland. It helps facilitate the establishment and adoptions of telecommunications (both wireless and non-wireless) throughout the world. Other not-for-profit and for-profit organizations throughout the world have been established to promote specific technologies and products.

## 4. The Technology

A document which discusses all of the current and proposed wireless technologies would be far longer than the intent of this White Paper. This document is intended to be an overview of the current state of wireless technologies, especially as seen from a company's perspective.

There are two major issues regarding wireless technology.

The first issue is that of the capabilities of the wireless devices themselves. Currently, handheld devices have limited functionality (they perform a single purpose) and are, therefore, constrained by their design. Furthermore, their user interface is minimal at best.

The second issue is that of the technology that communicates between the wireless devices and the servers providing the applications. Currently, bandwidth is the most significant issue – and the issue that most technologies are attempting to solve.

### Wireless Device Capabilities

Wireless devices are very limited in their capabilities. This is currently advertised as a benefit and often stated as a reason for the success of devices like cell phones and Palm devices. This limited functionality will be a liability in the future and devices with more functionality will be more successful than devices with limited functionality.

Some of the current limitations of wireless devices include:

- monochrome displays;
- lack of touch panels;
- size of displays; and
- lack of voice recognition.

All of these items will be addressed in the future, some sooner than others.

Color displays have started to appear, but tend to draw more power and result in shortened usability per charge. Two things will happen. First, display energy consumption will drop.

### Technology Glossary

**3G** – an ITU specification for the third generation of mobile communications technology. The primary benefit of 3G is increased bandwidth, from 128kbps in a moving car to 2Mbps for fixed applications.

**Bluetooth** – a short-range radio technology intended to simplify communications among wireless devices. Founding members of the Bluetooth Special Interest Group include IBM, Ericsson, Nokia, Intel, and Toshiba.

**CDMA** – Code Division Multiple Access, a competitor to GSM's TDMA. Commercialized by Qualcomm. CDMA and its successors, such as W-CDMA, provide some advantages over TDMA.

**CDPD** – Cellular Digital Packet Data, a data transmission technology for use on cellular phones. CDPD offers data transfer speeds of up to 19.2kbps as compared to a standard modem of 56kbps.

**GPRS** – General Packet Radio Service is a standard for wireless communications which supports data transmission speeds of up to 150kbps. Note that the maximum data transmission speed for GSM is 9.6kbps.

**GSM** – Global System for Mobile Communications is perhaps the world's most popular wireless communications standard, available in more than 100 countries around the world.

**PCS** – Personal Communications Service is a term used by the U.S. Federal Communications Commission to define a set of digital cellular technologies, including CDMA, GSM, and TDMA.

**SMS** – Short Message Service is a technology used to send short messages, primarily to and from wireless devices, such as cell phones, but also to IP Addresses and other devices. Messages are alphanumeric and cannot exceed 160 characters.

**TDMA** – time Division Multiple Access is the technology used primarily by GSM cellular systems.

**UMTS** – Universal Mobile Telecommunications System is a 3G technology. UMTS is designed to deliver information at up to 2Mbps, including audio and video.

**WAP** – Wireless Application Protocol allows users to access information (primarily on the Internet) using wireless devices. WAP is designed for small screens and one-hand use and navigation without a keyboard.

**W-CDMA** – Wideband CDMA is an extension to the CDMA technology intended to deliver full-motion audio and video on wireless devices. W-CDMA will support data transmission speeds of 385kbps and higher.

**XHTML** – Extensible Hypertext Markup Language is HTML's answer to XML. Whereas HTML defines the formatting of a document, XHTML attempts to combine the benefits of XML with the existence of mounds of HTML.

**XML** – Extensible Markup Language is used to tag the content and structure of documents rather than the formatting that HTML does so well. Information in XML can be easily and programmatically repurposed for a variety of uses, including Web, wireless, paper, CD-ROM, and sending to other applications.

Second, battery technology will improve. Both of these will address the issue of power consumption.

Touch panels allow people to interact without using a keyboard. This can be essential when people are making selections and keyboards are too bulky. While it is not practical to always have a large screen or keyboard, new technologies are emerging that will address these issues. Heads up displays will be available that will allow users to have a virtual display and even allow them to interact with that display without having the physical devices. In the short term, we will see Palm-type devices and sub-laptop computers providing interim solutions until more robust solutions become viable.

Note that the area of user interface with wireless devices will provide some very interesting and powerful capabilities, including full-motion two-way color video, audio communications, touch screens, GPS systems, and more.

## **Wireless Communications Technologies**

After North America implemented its analog cellular telephone technology, the rest of the world effectively standardized on GSM, the digital technology which is based upon TDMA technology. CDMA is a competing technology that will offer additional speed enhancements, although most technologies are in a race to provide higher levels of bandwidth to the wireless devices.

Unless a company is in the technology infrastructure business, the technology wars with standards are moot. Most business applications should be written irrespective of the underlying transport layer.

In order to utilize current and future wireless technologies, application designers need to ensure that their data is kept in a format that allows dynamic repurposing of the information in order to adapt to the variations of delivery devices. XML is a current leader, but SGML has been around for a very long time, and XHTML could also emerge.

Specifically, how one delivers text to a Web browser such as Internet Explorer, is very different than how the information is delivered to a cell phone or Palm device. Tools such as WAP allow content to be formatted specifically for cell phones and other wireless devices that adhere to the WAP protocols.

## **5. The Impact on Your Business**

If you are investigating or expanding your eBusiness investment, you will need to include wireless technology. The increased usage of wireless devices is already spawning demand for access to company information using these devices. Companies that provide wireless access to their systems will gain a competitive advantage. Early movers can increase the switching costs to customers by providing increased levels of service and support to their customers.

Don't let the limitations of current wireless technology prevent you from saying that wireless technology will not have a significant impact on your business. Wireless technology is in its infancy and will grow dramatically over the next few years in both capabilities and installed base.

The best use of wireless technology has yet to be determined. As wireless technology is still rapidly evolving, your opportunity is to look at your business and see how wireless

technology can be applied in a way that was not possible before. Leverage your current investment in eBusiness to make wireless technology a further extension of your company's strategy.

## **6. The Way to Benefit From Wireless Technology**

There is understandable confusion and hesitation surrounding wireless technologies. Wireless technology is at a comparable level to where the Internet was in the mid-1990s – very immature and the need and vision for is unclear to many people.

Yet the predictions of wireless usage far exceed that of desktop or portable computer users, which means that the number of users of wireless technology will skyrocket and be more accessible to the general population, not just the computer savvy users.

Here are three ways to position your company to benefit from wireless technology:

- Make wireless technology an integral part of your eBusiness strategy;
- Ensure that your content can be easily repurposed for use on ANY output medium (this means that information should be stored in databases and/or tagged formats such as SGML or XML – but not HTML); and
- Start working with your clients, vendors, and employees to determine how they could benefit from wireless technology – and implement their suggestions.

Whether or not you entered the Internet space early or late, don't let the wireless opportunities skip by you or your company.

## About the Author

Mr. Mathias is an internationally renowned eBusiness expert who works with both 'dot coms' and 'bricks and mortar' clients to realize the potential of the Internet. On a mission of outreach to the business community at large, Mr. Mathias discusses electronic relationship management, dynamic content and one-to-one marketing, wireless technology, XML and a host of other related topics. A highly rated speaker, he regularly addresses executive audiences at major conferences such as Internet World, Xplor, and AIIM, as well as meeting with business leaders to discuss the bottom-line impact and other benefits of the intelligent use of superior technology.

With 20-plus years in the computer industry, Mr. Mathias has provided services for mainframes to personal computers to people and companies in the United States, Europe, the United Kingdom and Canada. Clients (from Fortune 500 companies to small entrepreneurs) and business associates esteem Mr. Mathias' ability to amass, analyze, and disseminate valuable information.

Mr. Mathias founded what is now EurekaDIGITAL in 1991. Always ahead of his time, Mr. Mathias promoted mark-up languages well before they were 'cool'. He also began exploring hand-held friendly information delivery before it was trendy. The ability to recognize 'the next big thing' with the best potential ROI for clients is the cornerstone of Mathias' excellent reputation. Mr. Mathias' vision for adding value to information assets so that they can flow seamlessly from one application to another is a driving force for multi-platform capability. Understanding the nature of marketing and the power of the Internet has allowed Mr. Mathias to create flagship solutions that turn Web sites into valuable assets for Eureka clients.

The quality of work done by Eureka has been recognized repeatedly. Web sites such as REprofile.com and other projects have garnered both industry and national acclaim for Eureka's clients. Awards such as *BeyondComputing* magazine's 1998 Award of Excellence (made to Stewart Title Guaranty, a long-time Eureka client) attest to Eureka's high-quality contributions to corporate technology partnerships. And in March of 2000, Mr. Mathias was selected as one of *Computerworld's* Premier 100 IT Leaders. The Premier 100 IT Leaders is a distinguished awards program honoring the most innovative, outstanding information technology executives.

