Analog vs. Digital
Do they Compete or Complement?

- Global Forum: Analog and Digital in Asia Pacific
- Case Study: Tetrapol in the Czech Republic
Hype surrounds data applications for consumers, but the real substance lies in enterprise implementations.

By Jack Barse

Data has taken center stage in the wireless world. Carriers around the globe are spending billions of dollars to build networks that promise to bring cutting-edge, high bandwidth applications such as streaming video to your wireless handset. They believe there's a pot of gold at the end of this multimedia rainbow that will add to their bottom line for years to come. In fact, a recent study by Analysys predicts that mobile data use will account for one-third of all carrier revenue in Europe by 2008.

With all the hype, it's sometimes difficult to remember that mobile data wasn't invented the first time someone uttered, "3G." Mobile data, in fact, has been part of the wireless fabric for the better part of two decades.

Mobile Data in a Nutshell

So, what exactly is mobile data? In a nutshell, it's anything nonvoice-related on a wireless device. Early on, mobile data was viewed by many as a niche market, an enterprise play that enabled companies such as IBM and GE to stay connected with employees in the field. The terminals they used were large, clunky devices, often mounted on service vehicles.
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The vast majority of mobile data applications today are designed for business. And most of those applications reside on current-generation networks rather than 2.5/3G. Current-generation packet data networks still play a major role in mobile data and will continue to do so over the next several years.

Slow Uptake of Next-Gen
Despite the successes of mobile data, many businesses have been slow to adopt next-generation wireless technology for a number of reasons.

Let's start with coverage. For the most part, next-generation networks are not deployed widely enough to suit the needs of businesses. Enterprises, even more than consumers, require broad network coverage because mobile workforces need immediate access to critical information to conduct business effectively and efficiently when away from the office.

There is also a lack of business applications in the next-generation world. True, RIM has launched its
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BlackBerry wireless corporate e-mail service for GPRS networks within the past year, but the vast majority of BlackBerry subscribers still remain on current-generation packet data networks.

The reason behind customers' reluctance to switch to next-generation services is simple. Businesses primarily use wireless service to access text-based information such as e-mail, inventory status, customer data, and vehicle dispatch and location. In other words, businesses are sending and receiving short, bursty data for which current-generation networks are ideally suited.

In addition, current-generation networks provide businesses with a level of reliability that the next generation of mobile data cannot yet match. For example, Samsung subsidiary S1 selected a current-generation network over the 3G technology CDMA 1X EV-DO to power its widely deployed security application in South Korea. The reason? Superior reliability — not to mention functionality — in head-to-head testing.

Of course, next-generation wireless networks will play a role in the business space. For companies wanting to use wireless phones for large bandwidth services such as video teleconferencing, accessing PowerPoint presentations, sending blueprint drawings, and the like, 2.5/3G networks may prove to be well-suited. The decision of whether to deploy a current- or next-generation network will depend on whether businesses want to — or need to — do those types of things wirelessly.

Today's Applications

At the moment, however, we're not even close to seeing these types of "gee whiz" applications in the business mainstream. Some examples of applications available today:

Field force automation. Keeping a company's field employees in contact with the main or branch office was the first mobile data application, and it remains one of the staples in the enterprise world. FedEx, for example, has several mobile data implementations worldwide. In Australia, the company wirelessly sends pickup and delivery information to drivers throughout the country to further improve service to customers in the fast-paced world of overnight delivery. FedEx also wirelessly tracks the location of each delivery van via GPS technology, and makes barcoded package information accessible via the Web so that a customer can find where a package is every step of the way.

Public safety. This rapidly growing market in the mobile data world continues to be dominated by current-generation data technologies due to their consistently high levels of performance during crisis situations. For example, since deploying a mobile data solution, the Queensland Ambulance Service in Australia has improved its response times to life-threatening "Code 1" cases for the past three years. In addition, the Queensland service has exceeded the
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national benchmark set for Code 1 calls. Because of these encouraging results, the Ambulance Service of New South Wales, which serves the Sydney metropolitan area, began deploying a similar system earlier this year.

Vehicle monitoring. Vehicle monitoring allows companies to track the location of their valuable assets on a local or long-distance basis. Pacific Rim countries have taken this type of application a step further to benefit the traveling public. In Singapore, the Land Transport Authority tracks the speeds of thousands of taxis traveling the island's highways to determine where there are traffic tie-ups and then alerts motorists of these sites (see sidebar on page 34). The Public Transport Corp. of Victoria, Australia, uses its wirelessly enabled train location system to manage its extensive network of commuter trains. The system has resulted in improved train scheduling and enhanced customer service to rail commuters in the Melbourne metropolitan area.

Telemetry. Machine-to-machine communications is a rapidly growing mobile data segment. Samsung subsidiary S1 plans to install a wireless "black box" in hundreds of thousands of homes throughout South Korea to monitor security sensors and transmit alarm data to computers at an operations control center. The mobile data solution is immune to power outages and tampering by intruders.

The Implementation Process

Before implementing mobile data, businesses should first assess their needs in order to determine the type of mobile data technology to deploy. Businesses too often focus on a specific network technology out of the gate. That approach invariably narrows what they can accomplish wirelessly because every technology has its limitations.

By first having a clear idea of what needs to be accomplished wirelessly, a company can select the appropriate network technology on which to base solutions. It may turn out that a combination of technologies is most appropriate to accomplish its goals. For example, a company called Parkline uses both GSM and Mobitex to power a municipal parking availability/billing system that is now operating in three cities in the Netherlands.

When writing your specifications, make sure to base them on the capabilities of today's systems, rather than the hype of what's potentially to come. In other words, do your homework and investigate what other companies with situations similar to yours have successfully deployed. This can be as simple as going to the Web and perusing the sites of carriers for customer case studies or asking your prospective carrier's sales representative to provide you with examples of customer deployments and references that can be checked. Read with
a critical eye; all too often a carrier or advocacy group will tout a new technology as the best thing since sliced bread, when in reality the bread is not yet even baked.

In the enterprise world there is no such thing as one-stop shopping for mobile data. A considerable amount of integration is required to bring the various elements of a mobile data solution together so they work in harmony once deployed. The wireless network, the devices your workforce will use, the wireless application, and, in many cases, the in-house legacy enterprise application all must “speak” the same language fluently for the mobile data solution to work successfully. This can only be accomplished through integration.

Generally, the company that furnishes the mobile data solution — usually the wireless carrier or the wireless application provider — acts as the lead and brings all of the other elements together. Many in fact have professional service organizations dedicated to doing just that.

Even relatively “simple” applications such as BlackBerry require a good measure of integration between the end-user device, the software application, and the enterprise’s in-house e-mail system. Don’t be fooled — nothing is truly off-the-shelf.

Some companies are sitting on the sidelines and waiting for a future technology iteration to arrive before getting into the wireless data game. For most enterprises, however, the cost of waiting to deploy mobile data far outweighs the potential gains from newer technologies. In the United States, 2.5G networks are still in the early stages of deployment and in many parts of the world, 3G network deployments continue to be delayed — and in a few cases abandoned altogether. In other words, tomorrow may never arrive.

Technologies that are available today will meet the majority, if not all, of a company’s wireless data needs — even from a raw airlink data rate standpoint. Many carriers want you to believe that a higher airlink data rate equates to faster application throughput; the reality is that the airlink rate is but one small component of response time. Most of the latency that customers perceive in wireless applications is more a factor of network design than airlink rate. For example, transmitting two packets at 8 kbps takes one-eighth of a second. Current wireless packet networks generally deliver application responses in less than 10 seconds. In this context raw airlink rate isn’t much of an issue.

So why wait? Your company can begin reaping the benefits of mobile data today rather than waiting for the day when hype finally becomes reality.

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Singapore is a small, densely populated island republic in the South Pacific. With nearly 4.2 million people, it has all the traffic problems common in major cities throughout the world. Because open space is at a premium in Singapore, the government doesn't have the luxury of building additional roadways to accommodate the growing number of automobiles clogging the country's highways.

The Land Transport Authority (LTA) is the government agency responsible for managing Singapore's transportation infrastructure and public transportation system. For decades, the LTA has worked to provide highly efficient and cost-effective systems to solve the city's traffic problems.

The LTA recognized early on that simply building a comprehensive network of roads and expressways would not be enough to ensure a smooth flow of traffic. Over the years, it has influenced a number of policies aimed at regulating the volume of cars on Singapore's roads, including large surcharges on the purchase of new vehicles, high gasoline prices, and an expensive annual automobile tax. In another attempt to regulate automobile traffic, the LTA sold daily and monthly passes that allow the bearer to drive in Singapore's central business district.

One of the most successful traffic management programs is the wireless data-enabled intelligent transport system called TrafficScan. TrafficScan uses Mobitex and GPS technology to collect and disseminate information on traffic speeds throughout the island.
The system takes advantage of the natural circulation of some 8,000 taxicabs, whose private operators had already installed Mobitex terminals in them as part of a taxi dispatching/vehicle location mobile data solution. The LTA subsequently developed an application in collaboration with the Singapore-based Mobitex operator ST Mobile Data that piggybacks on the original mobile data implementation. Using the application, the LTA monitors the travel speeds of taxicabs on the island to pinpoint traffic jams and alert motorists of delays. The premise is simple: the slower that cabs are traveling in a given area, the heavier the traffic.

TrafficScan works in conjunction with the LTA’s Expressway Monitoring and Advisory System (EMAS), which uses a series of high-tech cameras to detect accidents and other conditions that may hinder traffic flow. EMAS also employs a system of variable message signs alongside roadways to inform motorists of traffic conditions ahead. Information is wirelessly transmitted to the signs via ST Mobile Data’s network. The LTA also transmits traffic information to motorists’ PDAs and other wireless devices and posts it on the Traffic Smart Web site.

LTA’s intelligent traffic system also comprises applications such as dynamic traffic signal control and automatic wireless payment of road tolls. The latter is accomplished via a series of overhead transponders on highways that scan “smart cards” mounted in automobiles. The toll information is transmitted wirelessly from the transponder to LTA’s central office.

The introduction of wireless technologies has enabled LTA to introduce a form of usage-based pricing that discourages motorists from traveling on congested roadways. Drivers who use traffic-filled highways are charged a higher toll rate than those who use alternate routes. The authority notifies users of the increased tolls as part of the traffic congestion alerts.

LTA’s TrafficScan system offers many benefits, including:

- Enabling drivers to better plan their routes or times of departure in order to avoid congested areas.
- Sophisticated monitoring of the city-state’s crowded roadways.
- More frequent use of public transportation due to better traffic information and improved services.
- A cost-effective alternative or complement to building ring roads and expressway lanes.
- Up-to-the-minute and highly accurate traffic information for automobile drivers.
- Improved traffic conditions, which resulted in a greater willingness of drivers to pay road tolls.
- Fewer accidents because drivers are now aware of traffic conditions before they reach problem areas, allowing them to avoid traffic jams that breed minor, fender-bender type mishaps.
- Increased accessibility on Singapore’s roadways.
- Improved air quality and reduced emissions by limiting the amount of time that cars are at a standstill or crawling at slow speeds with their engines running.

— J.B.