# LEADING THE WAY

Some of the most successful innovations seem almost mundane. Velcro provides a convenient way to hold things together. A few twists and turns in a piece of wire and you have a paper clip.

On the surface, today's most innovative wireless applications also might appear decidedly ho-hum — confirming a reservation, checking stock prices, alerting passengers to flight delays. Yet, they are innovations nonetheless: They do what hasn't been done before in their respective industries, providing what customers want and setting a standard that rivals must scramble to meet. And they are successfully employing a rapidly evolving technology still at the earliest development stages.

BY ALAN RADDING

The promise of wireless — the ability to interact with people or systems at any time from anywhere — will eventually produce more mind-boggling innovations. But until the technology is mature, until the infrastructure is built out, until the standards, devices, interfaces and everything else required to achieve greater usability, reliability and consistency arrive, those stunning innovations will probably have to wait.

At this stage in the game, wireless technologies are addressing the most obvious needs. "That's why you're seeing wireless applications used widely in the transportation industry to track packages and for dispatch and notification," suggests Alan Reiter, an analyst at Wireless Internet and Mobile Computing in
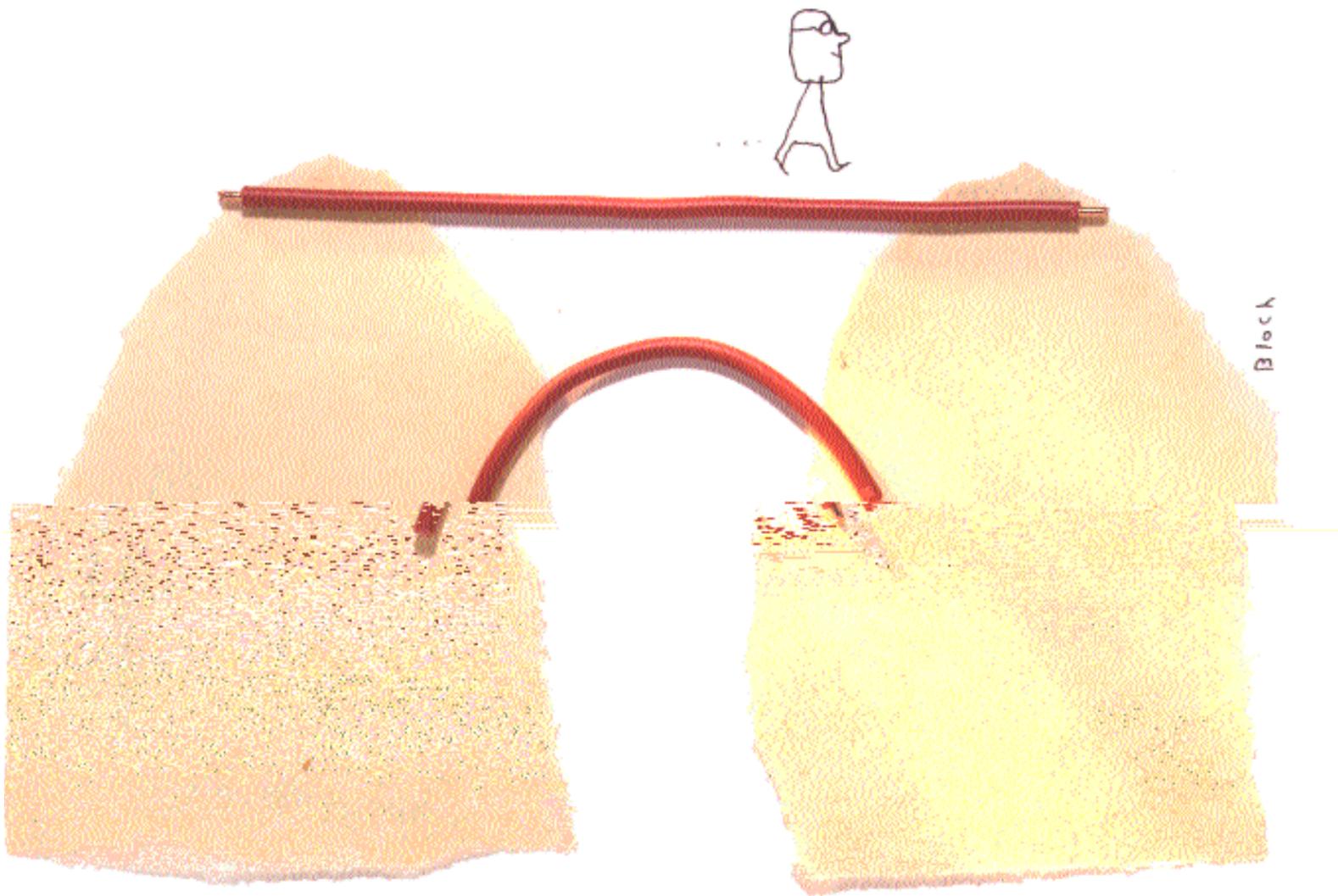
JDANE.   YET ADDING WIRELESS TO A SIMPLE BUSINESS PROCESS CAN REAP BIG BENEFITS

Chevy Chase, Md. These applications deliver an immediate benefit, typically generating a positive ROI in a year or less, he notes.

The largest companies to make *Computerworld ROI*'s list of wireless innovators certainly fall into this group. They are deploying wireless applications that are extensions of the kinds of things they already do in the wired world. Fidelity Investments, for example, is providing customers with wireless access to account information through Fidelity Anywhere. United Networks is alerting United Air Lines Inc. passengers to changes in the status of their flights. Thrifty Car Rental lets its wireless customers make and confirm reservations. Producers Lloyds Insurance Co.?? lets agents access the account information of its farmer customers to

file claims and authorize payments from the middle of a corn field.

On the industrial side, $27 billion United Parcel Service Inc. has launched UPScan, which uses wireless technology to standardize its handheld terminals and streamline data gathering. Pfizer Inc., the $30 billion pharmaceutical giant, has turned to wireless to improve manufacturing and warehousing. Both the U.S. Army and $169 billion Ford Motor Co. have deployed wireless devices to help locate and track things — equipment, vehicles, containers and material.

All of these applications may seem routine, even trivial, yet

ILLUSTRATIONS BY SERGE BLOCH

the impact they are having on their industries is substantial. In financial services, almost every major brokerage and investment firm is now playing catch up to Fidelity and has a wireless initiative under way. In the car rental business, Thrifty Car Rental Vice President Brian Carpenter says, "A number of our competitors have followed us," including Dollar Rent A Car, Thrifty's sister company.

And Ford recognized that its competitors would follow right behind if its wireless initiative worked as expected, so it took an equity position in its technology partner, Santa Clara, Calif.-based WhereNet Corp.

"We've got a head start, and we get a share of the revenue when others buy this technology," explains Mark Wrubel, project manager at Ford's advanced manufacturing technology development center. If that doesn't dissuade competitors from

How they measure ROI*
- customer loyalty
- customer satisfaction
- customer retention
- employee retention
- new assets
- brand loyalty
- production time
- leadership position
- job performance
- labor costs
- inventory turns

*(other than revenue)

following its lead, at least they will be subsidizing Ford's pioneering effort when they do, he adds.

All these projects latched on to emerging wireless technology to address problems the companies had wrestled with for a long time, whether it was customer service or shop floor efficiency. Although none of the innovators claim any major breakthroughs, each has deployed a wireless application that contributes to the organization's bottom line.

FIDELITY
Customers led Boston-based Fidelity Investments to launch its first wireless service, Instant Broker, in October 1998. At that time, a survey of Fidelity customers revealed that 40% believed they had missed out on investment opportunities because they were away from a wired chan-

ALL OF THESE PROJECTS LATCHED ON TO EMERGING WIRELESS TECHNOLOGY TO   SOLVE P

NO STRINGS ATTACHED

How the Top 25 are winning with wireless

ComputerworldROI's innovators are tapping still-emerging wireless technologies for everything from making, selling and shipping products both faster and cheaper to ensuring that the neediest patients are seen first at hospital emergency rooms. What's notable in many cases is the relatively low price tag of the projects, which frequently leverage a company's existing technology infrastructure to make an already good thing even better. The following short profiles zero in on how and why the Wireless 25's winning projects came about plus offer details on how the innovators tally return on their investments.

Automotive
FORD MOTOR CO.
Redford??, Mich.
www.ford.com
see page 24

Aerospace
UNITED AIR LINES
Chicago
www.united.com
see page 22

Chemicals/Energy
CELANESE CHEMICALS-AMERICAS
Dallas
www.celanesechemicals.com

Customer calls to the chemical maker used to trigger something like a relay race. Sales reps would respond by calling a home office customer service representative with network access. After retrieving the necessary product information, the home office would call back the sales rep, who would then call back the customer. The process took from about four hours to a full day.

Now, salespeople use handhelds linked to a Web-based SAP R/3 system to get real-time information and deliver it to customers on the spot. Celanese expects to see a rise in customer satisfaction due to the fast response times and one-on-one service, says William Schmitt , director of business enablement at Celanese, which is a division of Frankfurt, Germany-based Celanese AG. Celanese also expects to add other wireless capabilities and will launch a pilot system to Europe and Asia.

MESA ENERGY SYSTEMS INC.
Irvine, Calif.
www.emcorgroup.com
see page xx

TOP 25 ILLUSTRATIONS: TERRY ALLEN

nel and didn't have access to market information. Instant Broker let active traders monitor activities affecting their accounts through pagers. The next year, Fidelity added two-way capabilities, enabling traders to initiate actions and receive information.

Today, Fidelity has expanded Instant Broker into Fidelity Anywhere, which offers an array of services beyond retail brokerage. The wireless service, which boasts more than 92,000 registered users and is growing by more than 3,000 users a month, allows customers to manage their 401(k) accounts, charitable donations, insurance and more. Soon, it will include Fidelity's Boston Coach limousine service and even its Seaport Hotel, enabling users to book and confirm reservations wirelessly. Moving beyond pagers, Fidelity Anywhere supports devices from Palm and other vendors as well as General Motors Corp.'s onboard system, OnStar. "We want to be on as many devices as possible," says Joseph Ferra, Fidelity's chief wireless officer.

Figuring out the payback from Fidelity Anywhere isn't clear-cut. "Our overall objective is better customer service," which is difficult to place a value on, Ferra notes. There is no charge to access Fidelity Anywhere. Even non-Fidelity customers can access it for basic market information. Fidelity uses Fidelity Anywhere as a way to draw users into deeper relationships and increase customer loyalty through the use of more Fidelity services. Still, the company has tried to pinpoint specific gains. For example, based on a Fidelity study, Ferra estimates that about one-third of Fidelity Anywhere's registered users represent new Fidelity accounts. More important is the stickiness the wireless services achieve. "Once a customer subscribes, they stay. They really like the convenience and control," he says.

In any case, the ROI should come fast. Fidelity Anywhere "was

> **Fidelity's wireless brokerage service attracts 3,000 new users per month.**

GY TO SOLVE PROBLEMS THAT THE COMPANIES HAD WRESTLED WITH FOR A LONG TIME.

Education

BOSTON COLLEGE
Chestnut Hill, Mass.
www.bc.edu
Founded in 1863, Boston College epitomizes the classic New England university, complete with tree-lined walkways and spired buildings. It was those buildings, in fact, that helped Henry Perry, director of network services, persuade school administrators to fund an ambitious wireless LAN project. Ripping apart ceilings in structures almost a century old was not an option. "One of the selling points \[to administrators\] was not to have to hardwire those buildings," says Perry, who worked with network vendor Enterasys Networks?? Inc. to install 350 access points throughout the campus, including the library, common areas and outdoor quadrangles. The idea was to complement the existing network with wireless coverage in areas where it was difficult or not desirable to run wire, says Perry. Students, faculty and administrators can now use their laptops to connect to the school network and the Internet to register for classes, view curriculum, e-mail one another and collaborate on projects as they roam about the 116-acre main campus.

Perry and network engineer Brian David will install access points in the residence halls and finish up the administrative buildings by the end of this year.

Financial services

ETRADE GROUP INC.
Menlo Park, Calif.
www.etrade.com
ETrade, began offering an integrated brokerage and banking service to wireless customers in May 2000. Among other things, the system's personalization feature gives users the ability to customize stock quotes and other information they wish to receive without logging on to the Internet-based system each time. For the company, Mobile ETRADE's benefits have included the creation of incremental transactions and consolidation of assets and an increase in loyal and new customers. ETRADE executives say they expect to easily add programs to new wireless platforms as they emerge, allowing the company to stay a leader in the industry.

FIDELITY INVESTMENTS
Boston
www.fidelity.com
see page xx

HARRIS BANK
Chicago
www.harrisbank.com
Thanks largely to its relationship with parent company Bank of Montreal, Harris Bank was the first U.S. financial institution to offer wireless banking services through mobile phones and the Research In Motion Ltd. BlackBerry devices. Harris Wireless, a financial concierge service, lets customers transfer funds between accounts, pay bills, view transactions in real time and access stock watch lists, news and weather information. The costs associated with launch-

not a big investment. We were leveraging a lot of the existing infrastructure," says Ferra. And being first already is paying big dividends, especially when it comes to beating the competition in the crucial battle for wireless gateway menu positioning. "Position is critical. There are only nine keys that can be used as a menu option on a telephone," Ferra points out. Fidelity moved fast to establish relationships with the big wireless gateways operated by the major service providers for the purpose of securing a one-keystroke menu position.

UNITED AIR LINES

Chicago-based United Air Lines also adopted wireless early. In 1999, the $19.3 billion company became the first airline to offer real-time flight information on the Palm VII. In January of last year, it introduced Proactive Paging, which notifies passengers of changes in their flight status. Since its inception, use of Proactive Paging has more than tripled. In July of last year, United launched a Wireless Application Protocol-

based (WAP) phone application that gives up-to-date flight and frequent flier account information. In November it became the first airline to offer WAP booking domestically.

The wireless users "are frequent fliers. They want control, and they appreciate timely information," says Niru Shah, United Networks' director of application development. To receive alerts, the flier fills out a preference form at the airline's Web site. The company tracks the flight through its systems and notifies the passenger

ing the project were comparatively low because Harris was able to leverage the infrastructure of Bank of Montreal, which initiated wireless services in 1999. Later this year, Harris will provide customers with real-time stock trading services and direct access to their portfolios.

Government

CITY OF FAIRFAX, A o o.   a -   c -   oas-   c   r n A .5 Tf 07   oa   3 .37   .o G -   o 73IT   Y F Tf3.   c   r n a i T fa   ,

based on specified preferences. The passenger may be alerted to delays or changes in departure gates — whatever they specify. "The customers have really embraced this," she declares, noting a 2800% increase in usage last year.

Like Fidelity, United's primary objective is customer satisfaction. "It is a way to build customer loyalty and retention," Shah explains. But it also provides a distinct advantage. "In focus groups, customers make it clear that this helps persuade them to fly with us," she says. Other airlines have copied United's initiative, but Shah says United can stay ahead by rolling out new services.

Also like Fidelity, the cost of the wireless application wasn't a big factor. The application takes advantage of information captured by the airline's existing systems. "Cost was not the \[limiting\] factor. The value of the benefits outweighed the costs," says Shah. Still the company took a chance on wireless. "Any time you are dealing with emerging technology there are risks," she adds.

> "At the time it was instituted, none of our competitors had wireless technology available. Most have still not figured it out."
> — Gerald Buckley, director of Internet marketing, Thrifty Car Rental

THRIFTY CAR RENTAL

"Our goal is to make it simple to book a car. That means using any manner of access the customer wants," says Carpenter, vice president of marketing at Thrifty Car Rental, a unit of Tulsa, Okla.-based Dollar Thrifty Automotive Group. When consultants from Dallas-based Perot Systems Corp. already on site at Thrifty surprised Carpenter with a prototype of a system offering wireless Palm access to its reservation system through the company's Web site, he funded full development on the spot. "It fit with our strategy for easy accessibility," he recalls. The wireless application, developed by project leader Ron Salach for less than $100,000, would let customers reserve cars and confirm reservations anytime from anywhere.

Approximately 30% of Thrifty's customers reserve cars through its Web site. To date, about 1,500 people, or about 15% of visitors to the wireless section of Thrifty's Web site, have downloaded the Palm application

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critical information. When it detects that a neighborhood's water or sewage height reaches a dangerous level, for example, it can transmit an alert to wireless handsets, allowing safety crews to respond faster.

MIAMI-DADE BUILDING DEPARTMENT
Miami
www.TKTK

Thanks to recent wireless efforts of the Building Department of Miami-Dade County, Fla., building contractors can access county inspection results in as little as 10 minutes, instead of two days. The expedited results process translates into time and money savings for contractors, and, the Building Department hopes, more construction investments within the county.

A streamlined results process comes after the Building Department outfitted its field inspectors with wireless handsets. While still in the field, inspectors can now directly submit their findings to central servers for immediate publication on both the department's Web site and a voice response system. The process eliminates the need for permit clerks to enter inspection results from hard copy into computers, which saves time and frees clerks to perform other permit-related functions.

NASA GODDARD SPACE FLIGHT CENTER
Greenbelt, Md.
www.gsfc.nasa.gov

NASA Goddard Space Flight Center's Spacecraft Emergency Response System (SERS) employs advanced automation, expert systems and software agents to monitor the performance of satellites worth $50 million to $100 million. When the system identifies potential faults or emergencies, it sends detailed wireless alerts to the most appropriate personnel and facilitates remote interaction between their wireless devices, including two-way pagers, Internet phones and PDAs.

From its start in 1996, SERS's main aim has been to "reduce the cost of spacecraft mission operations without increasing the risk of losing the spacecraft or reducing the throughput of scientific data," says Julie Breed, branch head. Prior to the automated monitoring, satellite mission control was typically an expensive enterprise, requiring eight or nine engineers taking monitoring turns around the clock. Now, it requires only a single engineer from 9 a.m. to 5 p.m, Monday through Friday.

That saves thousands of person-hours each mission. The project, Breed says, "has already paid for itself many times over."

The first SERS mission, TRACE, now operating for more than three years, shows the system can reliably handle its load. To monitor the health and safety of TRACE, the system uses a combination of networks to examine more than 5,000 satellite parameters six or seven times each day.

Recent analysis of SERS logs shows that it has alerted on-call staff to 3,300 potential problems, only 12 of which were

that enables them to interact with the Thrifty Web site through their Palm. Carpenter assumes most downloads are by existing Thrifty customers. "We think most folks reserve a car by phone or on the Internet and then confirm it using the Palm," he says. The company doesn't track whether a user is accessing the site through a Palm or a wired connection.

But Carpenter doesn't worry about pinning down a hard ROI figure. "How do you measure the value of giving customers easy access to you?" he asks. When he saw rivals rolling out wireless access, he knew Thrifty made the right move, he says.

FORD MOTOR CO.

Wireless innovation at Dearborn, Mich.-based Ford started with the most mundane problem — returning containers that held parts used on the production lines. When empty, they

had to be collected. But this was just part of a bigger assembly line process. To complicate matters, the line is a brutal environment crammed with machinery, cables and systems.

The wired call system proved costly, inflexible and plagued with problems. The Ford team charged with solving these problems turned to radio frequency for a wireless solution. "We talked with the best research labs in the country and couldn't find anything at an affordable price," recalls Mark Wrubel, Ford project manager.

By luck, the team stumbled onto WhereNet, a small company that offered a small battery-powered wireless tag that could be easily placed on items. Once in place on an empty parts container or at a convenient spot along the assembly line, it would communicate with computers to send pick up or replenishment orders. The tag incorporates a button that an operator can push to trigger a mes-

> Ford installed a wireless call system for **half the cost** of a wired system **plus cut** installation time by **75%**.

NOT ALL INNOVATORS WORRY ABOUT PINNING DOWN A HARD ROI FIGURE: YOU C

serious enough to force a return to base.

Another half-dozen new satellite missions have committed to SERS upon launch. According to Breed, "A mission now has to justify why it would not use a system like SERS."

UNITED STATES ARMY, EUROPE
Exact location TK
Web url TK

The United States Army, Europe (Office of the Deputy Chief of Staff, Logistics) employs an advanced, wireless Automatic Identification Technologies (AIT) Network to track critical parts and supplies in transit to operations in and around Europe. AIT uses a combination of automated radio frequency and satellite tracking technologies to monitor supply shipments and troop movements between Germany and the Balkans. The system publishes the asset location information it gathers through a secure Internet feed to managers in charge of distributing and deploying assets to field operations, such as the Security Forces operations in Bosnia-Herzegovina. The

project supports a long-term U.S. Armed Forces commitment to enhance the efficiency of global supply chains through improved logistics operations.

"The AIT Network is presently recognized as the most extensive radio frequency identification and satellite tracking network system in the free world in terms of investment in commercial hardware and software, and the yearly support costs in Europe and the U.S.," says AIT Branch Chief Thomas F. Young.

Prior to AIT radio frequency and satellite-tracking programs, the military managed supply shipments within individual organizations. Now under a unified tracking system, service organizations have better information on inventory in the pipeline.

For example, a commander in Kosovo can "see" where in the supply pipeline inbound helicopter rotor blades are and doesn't have to do a panic reordering because he lost sight of the shipment.

Health Care
OAKWOOD HEALTHCARE, INC.
Dearborn, Mich.
www.oakwood.org

Oakwood Healthcare guarantees all incoming patients that they'll see a physician within a half hour. But now that hospital admitting clerks use handheld devices to register patients and wirelessly access their previous records, it often takes less than that.

Oakwood's $100,000 wireless project includes a wireless LAN that affords physicians, nurses and other staffers at its Annapolis Health Center easier, faster access to patient data. This translates into faster treatment, since clinicians can access information from a patient's bedside, rather than traveling to a nurse's station to read from handwritten charts.

"Were hitting around a 20-minute turnaround time," says Dan Paton, information services adviser. The project also supports wireless voice headsets, which improve clinicians' mobility.

sage. A very low-powered device, the tag contains a battery that will last up to eight years. After months of testing and refinement, Ford finally had a solution it could use. "We tried it side by side with the old wired system we had been using in one plant, and everybody liked the wireless system better," says Wrubel.

The primary wireless application is parts replenishment, but the tags also can be used to collect containers and even locate vehicles on the lot. "One plant is thinking about it for garbage pickup instead of continuously driving around looking for garbage to pick up," Wrubel says. Since the success of the pilot, 25 plants have adopted the wireless system for parts replenishment.

Compared to a wired call system, the wireless application is a bargain, costing $500,000 to $1 million less to install and maintain, Wrubel reports. Another benefit is that it can be installed

> If its wireless initiative were successful, **Ford knew the competition would follow right behind**, so the car company took an equity position in its wireless technology provider.

in one quarter of the time required to install a wired system, which means new vehicle model launches and assembly line rebalancing operations can be done in a fraction of the current time with virtually no additional capital expenditure for hardware and equipment. The wireless system also speeds inventory replenishment.

UNITED PARCEL SERVICE

Atlanta-based UPS also turned to technology right out of a research lab for the wireless portion of UPScan, a companywide, global initiative to streamline and standardize all in-building scanning hardware and software. For package tracking, UPScan will consolidate multiple scanning applications into one while maintaining interfaces with critical control and repository systems. The project is part of a reported $100 million upgrade of its wireless

YOU CAN'T MEASURE THE VALUE OF GIVING CUSTOMERS EASY ACCESS TO YOU.

Next year, the wireless project will be expanded to Oakwood's three other hospitals. There's also a plan to give patients and visitors wireless laptops to access the Internet. Patients and visitors will pay a fee to use the system, which will help quicken Oakwod's return on investment.

Hospitality/Travel

AVECRA OY
Helsinki, Finland
www.avecra.fi

Avecra Oy, the catering services provider to Finland's national railway, uses a year-old wireless system to transmit real-time sales and inventory data between moving railway dining cars and its central computer. Onboard mobile devices, such as hand-held PDAs used by waiters, are equipped with Espoo, Finland-based NetSeal Technologies' RoamMate software. This software continually searches for connection points to the Internet as trains make their way across their routes. When a connection point is found, real-time inventory and other data is securely transmitted to Ave-

cra's headquarters-based server. The wireless system has reduced time and labor costs and enables near real-time updates to accounting records and quick response to changing inventory needs. Based on data transmitted from the restaurant cars, Avecra can replenish quick-selling menu selections at intermediate stations.

"So far as we know, we are the first to implement this kind of system in this kind of environment," says Matti Saari, Avecra's financial manager. He says the company expects to see a positive financial return on its 800,000-markkaa ($180,610) investment in the wireless project within two to five years. For now, Saari says Avecra has gotten much better control over its sales and material costs.

SIX CONTINENTS HOTELS
Atlanta
www.sixcontinents.com

This unit of London-based Six Continents PLC (formerly

Bass PLC) began rolling out its wireless hotel locator and reservations service in North America in March. Six Continents requires users of its wireless reservation service to first enroll in its Priority Club via the Web. This lets Six Continents capture customer information, such as the type of wireless device or devices a guest uses and his hotel preferences.

Once a customer's profile is set up, Six Continents can customize the content for him, thus reducing the number of keystrokes required and providing a greater level of security. Six Continents, which owns, manages or franchises 3,200 hotels worldwide, plans to launch the service in Europe and Asia by year's end. "Because we are able to support the company's wireless applications with over 260-plus devices, we are able to be available to our customers whenever and wherever," says Eric Pearson, vice president of e-commerce at Six Continents.

infrastructure. UPS began working with wireless in the early 1990s to track packages in real time and has upgraded and expanded the effort throughout the decade.

As part of the latest initiative, UPS is also consolidating 18 hardware terminals each running different software. The consolidation of devices alone will deliver significant business benefits including simplified operations, lower costs, faster application development, lower support requirements, and improved data integrity, which leads to increased customer satisfaction, notes David Salzman, program manager.

UPS will use Bluetooth, a short range wireless networking protocol to communicate with cordless peripherals, such as ring scanners. It uses wireless LANs to communicate with corporate systems. The project calls for fixed-mount, wearable and portable devices, which are expected to serve most UPS applications, from package tracking to equipment monitoring to two-way communications, Salzman says. UPS will also install advanced wireless LANs at all of its 2,000 facilities worldwide.

"This violates our basic philosophy of being close followers" when it comes to new technology, Salzman notes. "There is a certain gee-whiz aspect to the project," he says, but UPS's prime interest is efficiency.

"For many companies, wireless is still a novelty, but it is technically possible to create wireless applications today with compelling features," says Jean-Christophe Cimetiere, CEO of the U.S. office of TechMetrix Research in Waltham, Mass. These firms show that wireless can indeed help achieve real business objectives. **ROI**

THRIFTY CAR RENTAL
Tulsa, Okla.
www.thrifty.com
see page xx

Insurance
PRODUCERS LLOYDS INSURANCE CO.
Amarillo, Texas
www.producerslloyds.com
This crop insurance provider is using handhelds and the Internet to let agents access real-time pricing data from just about anywhere. Producers has invested just under $100,000 in the project, which brings agents data at the "point of need," says Larry Latham, treasurer and project leader.

One big benefit: better and faster decision-making. "You never know what the weather is going to do, and making a decision too late because the coverage and cost information was not available could spell disaster," says Benson Latham, vice president of marketing.

Manufacturing
PRI AUTOMATION INC.
Billerica, Mass.
www.pria.com
In February 2000, PRI licensed Generation21 software to build its Web-based e-volution Training and Performance Support System. It provides employees with information on everything from routine system maintenance to mission-critical equipment error recovery.

Subsequently, PRI conducted a wireless test project that provided 30 employees with wireless Palm access to the system using Web-clipping technology. Although employees realized an

HOW WE SELECTED THE WIRELESS 25

The Wireless 25 awards project was designed to identify and honor those user organizations that are clear front-runners in successfully employing emerging and rapidly evolving wireless technologies to accomplish strategic business goals in new and innovative ways.

Our first step was to issue a call for nominations on our Web page (*www.computerworld.com/roi*). Between May 1 and May 25, we received 115 nominations online. *Computerworld* editors also nominated organizations that they felt fit the definition of wireless technology innovators. Nominees were then sent a comprehensive, 20-question survey that addressed all aspects of their wireless project, including the risks and challenges of deploying wireless; how the wireless project changed the way business is conducted; when the wireless project would yield a return on investment and how that return is measured; and how the project was funded.

Nominees completed and returned surveys, which were then reviewed by a panel of *Computerworld* and *Computerworld ROI* editors, who analyzed the qualitative and quantitative data. Surveys were scored and a final list of 25 innovators chosen based on the following:

1. The strategic nature of the wireless project.
2. The risks associated with the project.
3. The degree to which the wireless project has yielded a positive return on investment measured in both financial and nonfinancial terms.

Computerworld ROI's Wireless 25 Innovators are presented here in alphabetical order, by industry.
— *Julia King*

Thirty-five RF antennas support the wireless transfer of process, inventory and other information from a variety of wireless Palm and bar code scanning devices. These systems once required reams of paper and data-entry clerks to log nearly every step. Now, wireless applications monitor manufacturing progress in real time, optimize the use of equipment and manage inventory available to the manufacturing line. Information is also available on an intranet or via wireless to managers.

According to Thomas J. Cala, a senior manager and team leader of enterprise systems, reducing human data-entry requirements alone has saved Pfizer Brooklyn millions of dollars.

Technology
ITC
Sao Paulo, Brazil
www.itcsp.com.br
This systems integration firm designed and installed a wireless communications system to thwart Rio de Janeiro's infamous ticket scalpers at Maracan, the world's largest soccer stadium. The system, which employs Enterasys Networks' RoamAbout technology, now links the stadium's 10 electronic ticket offices. Eventually, it also will tie in remote ticket offices at neighborhood shopping centers and other locations. Fans are allowed to purchase five tickets each, with each purchase registered through the buyer's individual tax identification code. Since everyone is limited to five tickets, scalpers who used to buy hundreds of tickets and sell them at a much higher price have been severely curtailed. Since the system became operational in YEAR TK, stadium officials have seen a 40% increase in the number of fans with legitimate tickets.
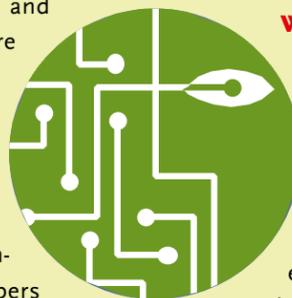
Transportation
UNITED PARCEL SERVICE
Atlanta
www.ups.com
see page xx

Wholesale
PACKAGEDICE/REDDY ICE INC.??
Houston??
See page xx

WESCO DISTRIBUTION INC.
Pittsburgh
www.wescodist.com
Practicality and ease of use were the key goals of this $4 billion electrical parts distributor's wireless project, which enables contractors at job sites to order from the company's 75,000-item catalog using a handheld wireless device.

Investment in the real-time field ordering system has been "modest," primarily because Wesco has piggybacked the system on its $2 million Web infrastructure.

"The project capitalizes on a lot of other investments," says Russ Lambert, director of e-commerce. The payback: greater mindshare and improved satisfaction among Wesco's construction company customers, which account for more than $1 billion in sales annually.