



PDA's at WAR

By Tedd Vodde

From the current handheld applications in the service to futuristic systems on the drawing board, handheld computers will play an ever-increasing role in our nation's defense.



The objective lies ahead. From ancient warfare to today, the objective is the high ground. And to take it with the least casualties on your side. Crouched in a foxhole, a sergeant reaches into his camouflaged pocket to pull out a key weapon, his handheld computer, to survey satellite photos and communicate with headquarters to coordinate the attack. Although ruggedized to survive the wear and weather of combat, the unit is not much different from the ones carried by business Road Warriors all over the world whose eye is on a different high ground, the coveted corner office.

After the devastating attacks of 9/11, the military response in Afghanistan was swift and overwhelming. Handheld computers played a greater role in military operations than ever before. From support services to combat on the front lines, handheld computers are becoming a key element of military life.

The USS McFaul, based out of Norfolk, Va., is a guided-missile destroyer designed to handle any high-density, multi-threat environment. The Navy selected the McFaul as a prototype for its IT-21 "Information for the 21st Century" program. This program seeks to equip Navy frontline ships and key bases with advanced data networks, high-speed satellite communications links, and top-of-the-line PCs. As one of the newest vessels in the US Navy's Atlantic Fleet Surface Force, the McFaul is outfitted with a full suite of IT-21 capabilities, as well as the world's most sophisticated information technology. The ship's technological advances were a key reason behind the Navy's choice to use it as the test bed for the latest in mobile and wireless technology.

Since success in battle relies on smooth logistics and instant communications, the crew need-

ed an easy and efficient way to share complex tasks, training assignments and schedules, and a better way for sailors throughout the ship to communicate onboard. After exploring a number of options, the Navy decided to implement a PDA program. At first, an initial 30 officers on board used the devices for their daily activities and uploaded and downloaded each day's data. The pilot program was a success and slated to expand to include the enlisted personnel on board as well. "With a limited number of desktop gateways to the ship's local network, we knew we'd need more interfaces to replicate and exchange data aboard the ship," said Mike Gray, deputy chief information officer of the Atlantic Fleet's Naval Surface Force. "The users would need more portals to the information stored on the network."

The Navy implemented a system that combined Aether's ScoutWare technology to help manage and transmit the data with 32 infrared wireless communications posts provided by Clarinet Systems of Milpitas, Calif., a developer of wireless technologies. The Navy then increased the number of Palm handhelds aboard the McFaul to 145 to accommodate almost half of the ship's crew. Not only was work facilitated by the new system, but also crew morale enjoyed a boost. Sailors enjoyed the personal benefit of being able to easily send and receive email back home by linking to and communicating through the central McFaul communications server. "This is what it's all about: putting technology into the hands of sailors to not only increase combat readiness, but to enhance their quality of service," said VADM Henry C. Giffin, III, Former Commander, Naval Surface Force, Atlantic Fleet U.S. Navy.

SHIP BUILDING

Palm handhelds have also streamlined the Navy's shipbuilding process. The Navy's Program Executive Office for Theater Surface Combatants (PEOTSC), with the help of third-party developer TMA, Inc. of McLean, Virginia, used Palm handhelds to track newly constructed Arleigh Burke (DDG 51 Class) guided missile destroyers, replacing a paper-based system and simplifying ship inspections and workflow management. Inspection includes assessments of numerous ship systems, compartments, work completed, corrections made, and readiness for taking new ships to sea. Inspectors use Palm handhelds loaded with electronic forms that include drop-down menus. The electronic forms allow inspectors to tap on an item to cite a deficiency or to note that an item meets inspection requirements. Inspection records are shared via Hotsync, which enables inspectors and shipyard supervisors to receive data updates on new inspections and work completion status. The data exchanges also sync with the central database, enabling the handhelds to transcend from a data-collection tool to a workflow-management planner.

"Introducing the handhelds has improved the quality, timeliness and efficiency of collecting the complex shipbuilding data," said Commander Scott Spooner, production manager, U.S. Navy. "By automating this process, we now save days of clerical data entry per ship, and have also improved the consistency and accuracy of data collected, which allows faster turnaround of data."

MEDICAL SERVICES

Another critical support function in any branch of the service is medical service. Physicians at Naval Medical Center Portsmouth use Palm handhelds to maintain patient files and access reference materials, pager numbers and notes from the care team. Now, doctors can easily beam or synchronize patients' complete medical histories and instructions to the overnight staff, giving them simple, mobile ac-

cess to everything they need to know about their patients, from allergies to recent medical procedures.

Naval Medical Center Portsmouth is the oldest continuously running hospital in the United States Navy, delivering state-of-the-art healthcare to sailors and their families since 1830. To continue its tradition of excellence, the medical center must provide physicians with the information they need to effectively care for patients.

Until recently, physicians at Naval Medical Center Portsmouth kept track of patients by recording medical information, patient histories and to-do lists on index cards. "When someone called for a phone consultation," says Dr. Brian N. Bowes, Staff Internist, "those chicken-scratched index cards often left us without a lot of information, and we had to go to the file room to fill in the gaps." In addition, preparing for the daily changeover to the overnight shift-when one doctor is responsible for as many as 40 patients-could be overwhelming. The physician on duty often had only a few hurried minutes to consult with the daytime care team and jot down notes.

Naval Medical Center Portsmouth needed to find a more effective way for physicians to communicate complex patient data and instructions and give both daytime and overnight physicians better access to information. "Adequate" worked for years," said Bowes, "but the idea was to make both the process and quality better."

The Center developed an application that runs on Palm handhelds and is synchronized with Windows NT servers. The application gives physicians an easy-to-reference format for maintaining patient files, saving time and reducing the chance of errors associated with handwritten notes. The Palm solution also gives physicians access to reference materials, medical algorithms, flow sheets, frequently used pager numbers and notes from the care team.

The handhelds streamline the process of preparing for the overnight shift. Now, doctors can easily beam or synchronize patients' complete med-



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ical histories and instructions to the overnight staff, giving them simple, mobile access to everything they need to know about their patients, from allergies to recent medical procedures.

Eventually, Naval Medical Center Portsmouth wants to develop a wireless network that will query a central database every night and synchronize the next day's patient list. "Ideally, doctors could come in to find a list of all the current medicines, lab values, allergies, tests and pending problems loaded on their Palm handheld," said Bowes.

The Palm solution gives Naval Medical Center Portsmouth physicians mobile access to comprehensive medical information. With this tool, physicians no longer rely on handwritten index cards for patient data, improving efficiency and reducing the possibility for error.

USES IN THE U.S. ARMY

The Navy isn't the only branch of the service embracing PDA technology. Whether you need to build a snow shelter, trap wild game, or recognize edible plants in the wild, the *Army Survival Manual* has long been hailed as a classic. Covering every climate and every situation, this book is the soldier's bible for living in the wild. This classic is now available for downloading on the Palm. For soldiers in the field and civilians who want to be prepared, it's a must and it's available at www.military.com.

Palms seem to be the early favorite in the military based on their simplicity of use and reliability. One company that sees this as a developing trend is Warrior Solutions, Inc of Boulder Colorado. "Your average sergeant has got to keep up with something like 300 individual elements of data on every soldier under him," said Charles Stibrany, vice president and co-founder of the company. Stibrany served 24 years in the U.S. Army before retiring with the rank of Lt. Colonel in 1999.

Warrior Solution's breakthrough product is Platoon Warrior Personnel and Leader's Guides. The Platoon Leader's guides help military leaders track platoon logistics and monitor information on each soldier in their troop, including blood types, important dates, physical-training test scores, education, equipment training, weapons testing scores, even uniform sizes. The software includes a navigation system, checklists and memory aids for routine field operations and training scenarios. The handheld system enables leaders to free themselves of bulky reference notebooks that were once crucial to daily activities. In addition, the handhelds save leaders valuable time that was once wasted on paperwork. Today, platoon leaders can simply enter information into their Palms and then Hot-Sync to send updated information to their PCs.

"The Palm system is fantastic," said Staff Sergeant Jim Lewis, Law Enforcement Command, Fort Knox. "It is a powerful, portable database, packaged in a simple format. I have almost completely eliminated paperwork because I no longer have to flip through reference books and notebooks to obtain important information I need on my platoon."



FOOD SERVICES

Caesar once said that an army marches on its stomach. Around the world, the US Army feeds its soldiers in 350 dining facilities or field locations. Keeping track of inventories, menu planning and pricing, recipe conversion and accounting for soldiers' meal entitlements are all essential parts of the daily operation. At Fort Hood, twelve dining halls each serve three meals a day to as many as 400 soldiers at a time.

The Army, in conjunction with Columbia, MD-based developer Impact Innovations Government Group has created a prototype Windows NT-based, client/server application to replace their legacy mini-computer system, which has become obsolete and cost-prohibitive. FS2000 is a food management system tailored to meet the requirements of the military. One of FS2000's many functions is to capture the subsistence entitlement of soldiers, i.e., to what extent their meal is subsidized. The traditional method is to

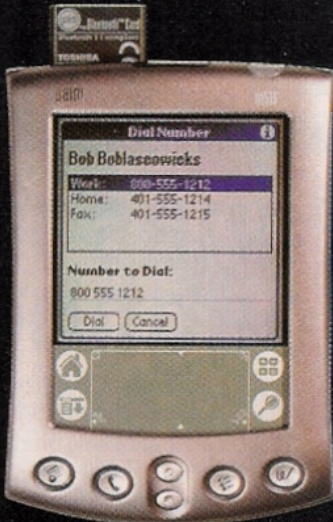


have soldiers write their social security number, rank, service, and entitlement on a clipboard upon entering a dining facility. If the soldier receives a cash subsistence entitlement, a cashier also collects for the price of the meal. This tedious method of ten kept hungry soldiers waiting in line. Moreover, cashiers counted cash receipts by hand and a data entry clerk spent approximately two hours entering this information into a SQL database. The dining facility manager would then use this data to produce a monthly report indicating how many meals were served and verifying if the soldiers entered the correct entitlement.

To eliminate the cumbersome clipboard process, Impact Innovations and the Army opted to evaluate Palm devices as an alternative to expensive point-of-sale systems. Now, cashiers using Palms with attached bar code scanners quickly swipe soldiers' ID cards bearing all the necessary information. The Palm also calculates how much money each diner owes for a meal, displays it, and stores the information with the other collected data. At the end of the day, the Palms are synchronized with a Windows NT server, which uploads the data into the SQL database. The server then generates a daily report showing any discrepancies in the amount of cash collected and if any soldiers used the wrong entitlement code.

"Using the new Palm-driven process, Fort Hood is eliminating hours of data entry and report generation," said Toby Ostrowski of the U.S. Army Center of Excellence, Subsistence (ACES). "The solution also allows managers to determine in real-time how many soldiers have been served and whether to prepare more food, thus making it possible to improve meal planning and reduce food waste."

The Army is considering an added feature that enables soldiers to use their ID cards using the Palm application to deduct the cost of their meals di-



rectly from their paychecks. This would eliminate the cash transaction process, increase traffic flow, and ultimately, increase customer satisfactions.

LOOKING INTO THE FUTURE

In the novel *Starship Troopers*, Robert Heinlein envisioned soldiers of the future in suits that were complete defense systems replete with devastating weapons as well as access to sensor data and complete communication with fellow troopers on the ground as well as command posts in starships overhead. Current research projects like the Invisible Computing Initiative by the Defense Advanced Research Projects Agency (DARPA) aim at making this a reality.

A part of this effort is Project Aura. True to its ephemeral name, Project Aura seeks to redefine the very nature of

computing itself. Researchers at Carnegie Mellon University have led this project to rethink human-computer interaction to remove distractions that get in the way of immediate problem-solving and information flow. A key concern for a future soldier relying on a high-tech information flow that is as critical, if not more so, than the flow of ammunition and supplies. Eventually researchers aim to create an "invisible halo" of continuous computing and information flow that continues no matter where the soldier is located.

The Project Aura system will design and evaluate a system that encompasses handheld computers, wearables, desktop and network computers within an information grid. Just as modern fighter pilots can observe displays projected in front of them so they don't have to take their attention from the battle to the cockpit gauges, the same type of display is seen for soldiers on the ground. "Nomadic Data Access" is also a part of the plan. This is the concept of "Internet Resync" for palmtop computers. Rather than tying a PDA to a specific machine as is done today, the project's goal is to resync from anywhere using a program called Coda. Demonstrations using an early version of the Compaq IPAQ were successful with varying modes of access such as Bluetooth, WaveLAN or infrared. Researchers plan to use this capability to demonstrate how a user's information "aura" can be extended with its "shadow" as the user moves.

Now that the soldier of the future is taken care of, what's happening at headquarters? Another one of DARPA's pet projects is called the "Command Center of the Future." Not too far removed from the image of the *Starship Troopers'* generals in the sky directing a battle from orbit, this project focuses on using handheld computers for staff to quickly analyze battle data without disrupting the big picture projected on the wall in front of the commanders. One of the many facets of this project spearheaded by Carnegie Mellon is called Pebbles, short for PDAs for Entry of Both Bytes and Locations from External Sources.

Pebbles looks at using handheld computers in a shared space. Imagine you're in the "Command Post of the Future" looking at a large satellite projection on screen. There may be maps, pictures and schedules of the current situation. Let's say you're interested in an operation involving several Army platoons that are clearing caves. You could focus your PDA with a special unobtrusive cursor on that part of the main display that you're interested in. Your PDA would then offer you a menu attuned to your particular needs, you select your item of interest and check out the situation so that you can make recommendations and report status to the commander. At the same time in the same room, a Navy officer could be using his PDA to beam at a carrier group at sea to get their status in order to make recommendations. All the while, the commanders are not being distracted from the "big picture."

From the current handheld applications in the service to futuristic systems on the drawing board, handheld computers will play an ever-increasing role in our nation's defense. In future wars, victory will literally be in the palm of our hand. ☞

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