

Technology Today

BY MICHAEL E. LAYMAN

WIRELESS MOBILE FIRE INSPECTIONS

ALTHOUGH MANY FIREFIGHTERS are aware of the significant advances in technology and fire suppression hardware that make their job safer, most are not familiar with advances in wireless mobile data and software that increase efficiency and eliminate headaches associated with day-to-day fire department operations.

Since departments spend most of their time on EMS calls, fire prevention inspections, paperwork, and reporting—anything to improve efficiency in these areas—can help reduce personnel workload and increase job satisfaction. Wireless mobile data computers and new software can address that need.

FIRE INSPECTIONS

Virtually all departments use company inspections or individual fire inspectors to check occupancies for fire prevention guidelines compliance. The majority still relies on paper forms for the task, and many inspectors are frustrated with having to complete the paper forms, only to reenter the same information in the department's records management system or stand-alone database for record keeping.

This redundant data entry leads to possible transcription errors, report completion delays, and the aggravation associated with entering and managing data in two separate systems. New technology, including public wireless networks, rugged PCs with new operating systems, and enhanced software to improve the mobile experience, provides the tools to dramatically increase the speed, accuracy, and overall efficiency of this process.

■ **MICHAEL E. LAYMAN** is the director of product marketing for BIO-key International, responsible for fire and EMS products, and has more than 30 years of experience in marketing and sales of prehospital (EMS) and hospital medical devices, cardiac monitoring equipment, and information management systems.



Photo courtesy of Hewlett-Packard.

THE SOLUTION

BIO-key International's FireRMS Mobile™ system is designed to expedite mobile fire inspections. Data can be accessed and updated electronically in the field; inspectors do not have to return to the station to reenter data into the records management system. To accomplish this task, several new enabling technologies were required.

Hardware and operating system (OS). Rugged laptops have been around for years, but new pen-tablet systems can now provide better handwriting recognition. A point-and-tap stylus to select information from drop-down boxes increases efficiency and data collection accuracy. In addition, pen-tablets support signature capture for reports and offer drawing capabilities to permit inspectors to sketch diagrams or other pictures for preplans.

Devices ranging from light-duty tablets to mil-spec hardware are available from a variety of manufacturers (photo 1). All of these products are available with built-in wireless adapters, large hard drives, docking stations for vehicle mounts, and vehicle charging systems.

Although personal digital assistants (PDAs) and similar devices would seem to be viable solutions for field data collection because of their small size and relatively low cost, PDAs' small screen size and inability to store large

files were an impediment to first-generation solutions.

Network connections. Moving data seamlessly from a mobile client to a back-office database requires a reliable and secure network connection. The widespread availability of public wireless networks makes data collection in the field a reality. In addition, many municipalities are building their own

wireless networks using off-the-shelf 802.11x technology in either spread spectrum or "hot-spot" configurations. The new 3G public networks and the private/public 802.11 systems provide unprecedented bandwidth to handle even the largest file transactions.

No matter what the system, there will always be locations in which wireless coverage is marginal or nonexistent. Thus, to be effective, mobile applications must function and provide access to critical data in either a connected or disconnected mode.

Mobile enhanced applications. There are three primary considerations for a field data collection application to be effective, regardless of the type of data being collected.

- Minimal training requirements;
- Data fields should have drop-down lists, or be prepopulated with data when available to simplify data entry; and
- Automatic synchronization of the mobile client with the main database; user intervention should not be required.

BIO-key addressed these issues by installing the entire FireRMS™ records management application and database onto a mobile data computer. This accomplishes two things: (1) The user interface is the same as that in the stations, virtually eliminating the need to retrain inspectors, and (2) all of the occupancy information such as contacts, phone numbers, schedules, previous inspection

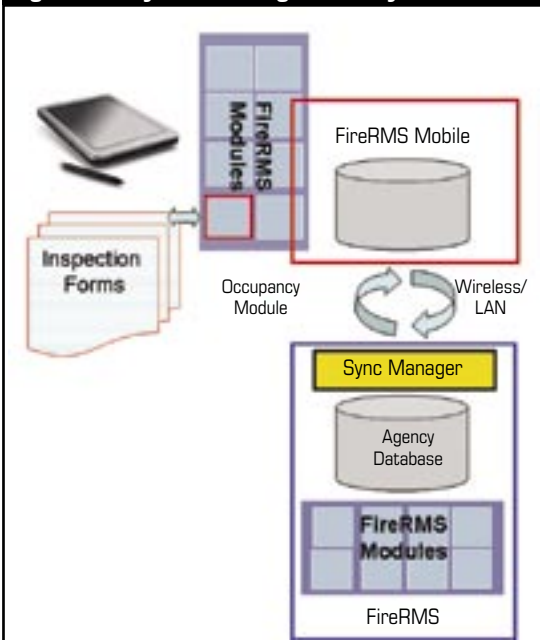
tions, and findings are available to look up and update on the mobile computer. This eliminates the need to reenter this information for each subsequent inspection, improving both efficiency and accuracy.

The Occupancy module within FireRMS was enhanced to improve the mobile experience for the fire inspector. An inspection checklist was added to quickly select any applicable findings, and a signature capture box records the occupant's signature after reviewing the report. A final report can be printed on-site or e-mailed to the occupant as required.

As the on-site inspection is completed and the necessary occupancy data are updated, the data collected must be synchronized with the master fire record's database. BIO-key used standard Microsoft® solutions to build its Sync Manager utility to accomplish this task.

At the core of the Sync Manager utility is standard Microsoft Merge Replication technology, which is used for distributing data between the FireRMS database and FireRMS Mobile. This allows updates to be made in the FireRMS database and the Mobile cli-

Figure 1. Synch Manager Utility



ent while connected and when disconnected, seamlessly managing the merging of data when reconnected (Figure 1).

The synchronization takes place over a wireless connection in real time without intervention from the user. If the mobile data com-

puter becomes disconnected, the synchronization will continue automatically once the connection is reestablished. In either case, data are cached in memory until the transaction is completed, eliminating the possibility of data loss. It is important to note that the system will operate without a wireless service. A physical connection to the department's network will accomplish the same task.

GOING PAPERLESS

Field data collection in one form or another has been around for years, but better hardware, operating systems, and wireless communications have improved the mobile experience.

A mobile application for fire inspections provides engine companies and inspectors with a powerful tool to perform occupancy inspections with full access to their database whether in a wireless or physically connected environment. The pen tablet-based mobile system eliminates redundant data entry and provides timely updates to critical information and immediate notification of code violations for improved efficiency and safety. ■

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