

The 21st Century Field Inspector: Improve Productivity, Accuracy, and Efficiency with a Mobile Field Inspection Software Solution

Field inspectors must regularly rely on paper-based, manual processes that reduce their own and their organizations' productivity, efficiency, and effectiveness. Mobile field inspection software solutions eliminate this problem by automating manual processes and facilitating two-way data sharing. This white paper explores the advantages of mobile field inspection solutions for inspectors, their supervisors, and their organizations.

The Problem

Day after day, government inspectors travel around the United States performing inspections that keep the public safe and ensure that building, health, environmental, and safety codes are met. Their daily work requires access to and the inputting of extensive information—schedules and maps, establishment information and histories, citation codes and descriptions, inspection forms and scores, and more.

While on the road, field inspectors frequently lack the tools they require to collect and report data effectively and efficiently. They rely on paper-based forms, hand-written notes, codebooks, and clipboards when in the field. Once back in the office, inspectors or office staff enter data from inspection forms into computers and file paper reports in file cabinets.

Such manual processes and superfluous work is more than just tedious for the inspectors and office staff. They also adversely affect the organization as a whole by reducing inspector and office productivity, degrading data integrity, and diminishing office efficiency and quality of service.

Reduced Productivity

Paper-based field inspection processes reduce productivity because work must be duplicated and because it takes time to complete and manage paperwork.

Time expended on repetition of work and manual administration lessens the number of inspections that inspectors can complete each day. It also occupies the valuable time of staff members who must input the data and file the forms from hundreds of inspections per week.

Degraded Data

Manual processing also degrades the accuracy of system data. When information is transcribed from paper to a database, especially when it has been handwritten, there are bound to be mistakes. Incorrect and inaccurate data diminishes an organization's effectiveness. Scores, license numbers, addresses, and violation codes can all potentially be inputted incorrectly, hindering investigation processing and/or triggering improper actions.



Data inaccuracies also result in increased expenses since additional staff must be called upon to unearth duplicates and missing, misdirected information. What is more, the IT staff and managers usually tasked with finding and correcting such problems are often the highest paid people in the office.

Diminished Efficiency

Finally, manual, paper-based inspections impede the efficiency of office processes. It can take organizations anywhere from one day to two weeks to input hand-written inspection results into computer systems.¹ This means that when that information becomes available, it is already old. Even after the data is keyed into the computer, it is frequently inputted into spreadsheets that are not linked with other system data or records.

These manual and paper processes limit the ability of supervisors to manage staff members and direct them to critical tasks. It hinders office workers' ability to handle phone calls about inspection results and wastes their time locating current information. It can also lead to a failure to provide the public and the establishments they inspect with vital information in a timely manner.

In an era of needing to do more with less, paper-based field inspection processes waste time and money and limit an organization's ability to function efficiently and effectively.

The Solution

Organizations with paper-based field service divisions can greatly benefit from a mobile field inspection tool. Mobile field inspection tools are software solutions that automate the paperwork process by facilitating two-way communication between business systems and mobile devices. The software enables inspectors to access, input, and electronically submit inspection information, scores, comments, and other data through mobile wireless devices.

Nearly two-thirds of organizations polled indicate that they are looking to purchase new solutions or to replace or upgrade current solutions and plan to do so in the next 6 to 18 months.

—Field Service 2011, July

Software solutions deliver mobile functionality in chiefly two ways: 1) through custom software applications designed for a mobile device, 2) through web-based system solutions. Custom software applications—"native" applications—are written specifically for and installed on the device being used (Blackberries, iPads, etc.) to enable bi-directional data exchange between the device and the central business system. Web-based solutions are database systems that all users—internal office staff and field staff—access via a web browser. Field inspectors access the software through browsers on their mobile devices.

A downside to native applications is that they must be rebuilt for each operating system and physical style of device (form factor) (Guide to Mobility, p. 8). In contrast, web-based solutions can be used by any device and operating system. In both cases, the software is frequently designed to provide inspection functionality even when an internet connection is not available. Inspection data gathered when there is no connection is electronically uploaded and transferred to the central database once connectivity is achieved.

¹ Time estimates based on telephone interviews with organizations experienced with manual field inspection processing and Guide to Mobility, pp. 10-18.

Mobile inspection software can be delivered through a software system provider or it can be developed in-house. In the past, organizations turned frequently to in-house solutions; yet recently, more and more are purchasing mobile software solutions from software providers. In the last two years, 40% of surveyed organizations purchased mobile software compared with 16% who developed in-house solutions (Analyst Insight, January 2011).

A range of mobile devices can be used with field inspection solutions. Currently, the most popular mobile devices are full-feature cell phones, followed by laptops and smartphones. But, a survey of organizations intending to purchase new devices and/or inspection solutions in the next 12 months reveals a desire to move away from standard cell phones toward smartphones, tablets, and laptops (Analyst Insight, January 2011).

Percentage of Field Service Devices Using the Following Operating Systems (Avg.)	
27%	Other Windows (XP)
19%	Blackberry OS
12%	Windows 7
11%	Windows Embedded Handheld
8%	Windows Phone 7
8%	Android
6%	Apple iOS
4%	Symbian
3%	Other Linux
2%	Other Apple

Analyst Insight, January 2011.

How it Works

While inspection scenarios vary vastly, the following will serve as an example of how an inspection might proceed when an inspector is equipped with a mobile field inspection solution.

Before the inspector heads out for the day, she uploads her schedule for the week by clicking the "Download Upcoming Inspections" icon on her device. Not only will she have access to facility addresses, but she can also link to a map plotted with all of the day's inspections. Most of her inspections are in areas without internet access; nonetheless, she will have complete automated inspection capabilities.

When the inspector arrives at each scheduled site, she can either select the establishment name or license number from a dropdown list of all scheduled inspections on the inspection form. Once she chooses the name or license number, other fields on the form (address, purpose for inspection, owner name, etc.) auto-populate with relevant data. If she wants, she can visit an unscheduled location as well and still use all of the tool's inspection capabilities.



As she conducts her inspection, she inputs scores for each inspection item into her device. If an item requirement is not met, she can select the violation incurred from a dropdown menu. She can also key in additional notes and mandatory corrections into a comment field. Once the inspection is complete, the inspector clicks “Calculate” to generate a final report containing total score, violations, details about the violation, and her comments. The final form also provides fields for electronic signatures from the inspector and the establishment’s representative. The inspector saves and prints the report and leaves it with the establishment.

Once back at the office, at home, or a location with an internet connection, the inspector clicks an icon on her screen to upload and transfer the day’s inspection data to her organization’s central system. All of this information (including a copy of the final report) populates automatically into the inspected establishment’s record to be viewed by staff, printed, securely saved, and/or used for reporting.

Market Drivers—Process Improvements

A variety of factors compel organizations to seek alternatives to their paper-based inspection processes. GL Solutions’ survey of government regulatory organizations that have field inspection divisions revealed the following as central reasons for their desire to implement a field inspection solution. Interviewees were asked to rate the importance of each motivating factor on a scale of 0 to 5, with 0 meaning “not at all important” and 5 “the greatest of importance”.

Average Score (0-5)	Motivation
4.7	Improve Staff Productivity/Capacity
4.6	Make Inspection Results/Information More Accessible (electronic storage)
4.5	Better IT System Utilization
4.4	Reduce Paper in Office (in file cabinets and on desks)
4.4	Eliminate Transcription Errors
4.4	Transform Processes & Reduce Cycle Time (a desire to identify better ways to perform work and reduce process steps)
4.2	Improve Management Capabilities (know where inspectors are, schedule inspections, review inspections, stats, etc.)
4.2	Improve Customer Responsiveness (public demand for self-service, transparency, availability of information)
3.9	Public Safety Issues
3.9	Reduce Paper Waste (environmental concerns)
3.8	Greater Use of Multimedia (e.g. take pictures of and upload issues at inspection sites)
3.8	Cost Reductions
1.6	Increase Revenue

In GL Solutions' survey, the number 1 motivation that drives organizations to implement a mobile field service solution is the desire to improve staff productivity and capacity. This result concurs with evidence gathered by the Aberdeen Group in a survey of 320 organizations. According to their findings, 67% of those polled indicated that the key motivation for their field service improvements was better workforce productivity and utilization (Analyst Insight, January 2011).

In fact, productivity is a common thread that links all of the highest-ranking motivators in our survey (those that ranked above 4). Each top motivation has at its core the desire to make better use of and get more out of the hard work executed daily by those involved in the inspection process.

Market Drivers—Developments in Technology

Developments in technology have made it more viable for organizations to acquire and fruitfully utilize mobile field inspection solutions. Among the most pertinent advancements are:

- Increased device options (tablets, smartphones, laptops, netbooks)
- Less expensive mobile devices
- More powerful mobile devices
- Advancements in both fixed and mobile wireless technology (Wi-Fi, 3G)
- Improvements in wireless security (WPA and WPA2 security protocols)

Additional emerging technologies will only increase the ability for organizations to use mobile field service solutions:

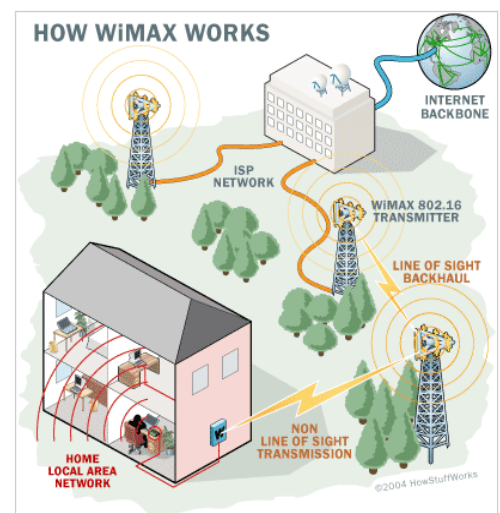
- **4G:** 4G (fourth-generation wireless) offers mobile users significantly faster data speeds than 3G (3G networks transmit data between 144 kbps and 2+ Mbps; 4G networks transmit between 100 Mbps and 1 Gbps). Though still considered a developing technology, two US companies, Verizon and Sprint, already provide 4G networks to their customers.
- **WiMAX:** WiMAX (Worldwide Interoperability for Microwave Access) is an emergent fixed broadband wireless technology. It operates at higher speeds and delivers more expansive connectivity than Wi-Fi. WiMAX is expected to provide internet access to remote, rural areas that currently lack coverage.

Organizations leveraging mobile solutions saw a 23% boost in productivity, partially tied to the reduced amount of paper forms and administrative tasks required from field workers.

—Mobility in Service, March 2010

WiMAX will enable greater mobility, higher speed data applications, range, and throughput than Wi-Fi.

—IJCST, 202



HowStuffWorks.com

Benefits

Mobile field inspection solutions correct the central issues associated with manual inspection processes. They improve inspector productivity, data integrity, and office efficiency.

Increase Productivity

Mobile field inspection solutions provide inspectors with access to all of the tools necessary to perform their jobs and enable them to complete their tasks automatically and electronically. Such processes permit inspectors to spend more time performing inspections and less time handling paperwork both in the office and in the field. Mobile inspection solutions eliminate the need for data from inspection reports to be keyed into the database and the burden of managing and filing paperwork. They enable less staff to accomplish more. As a result, they ease budgetary concerns and enable organizations to redirect staff to other business.

Maintain Data Integrity

Because information inputted onto the mobile device is synced electronically with the central business solution, there are fewer transcription errors and system data is more accurate. This translates into a savings of time and money—since fewer errors have to be identified and fixed—and a reduction of risk—since system information is correct and up-to-date.

Improve Efficiency & Service

Mobile field inspection solutions increase regulatory efficiency and improve customer service and public safety. Electronic inspection processes eliminate the filing time associated with paper and offer instant archive, reporting, and retrieval functions. They deliver improved management capabilities by providing supervisors with timely information to manage staff better. They improve customer service and public safety by facilitating immediate knowledge acquisition and dissemination.

In 2010, San Diego County undertook a mobility pilot program to combat the network connectivity issues of their old system. To date, the program has increased inspector productivity by 31% (2,500 additional inspections annually), eliminated the time spent travelling to the office for schedules and paperwork, and has allowed staff to spend time on more productive activities.

-Guide to Mobility, pp. 11-12

Since Salt Lake City Building Services implemented a mobility solution, they have saved staff time, reduced paperwork, and improved customer service. Staff once assigned to transcribing inspection reports can now give time and assistance to customers.

-Guide to Mobility, pp. 10-11

In 2011, Raleigh, North Carolina experienced multiple tornadoes in one day. Thanks to their mobility technology, the city was able to report total damages in 3 days instead of the 2 weeks it took after a tornado in 1988 and 6 months after a hurricane in 1996.

-Guide to Mobility, pp. 12-13

What to Look For

Organizations have diverse requirements of their mobile inspection solutions. However, in making the decision to adopt a mobile field inspection solution, there are several essential questions to ask that will help organizations navigate toward a system that will deliver optimal functionality for both office and field staff.

- * Will you be able to sync field data with your central database?
- * Does the solution support full functionality in an offline mode?
- * Will the solution allow for inspection scheduling?
- * Will the solution support unscheduled inspections?
- * Does the solution offer tools for speed and accuracy—dropdown lists, form auto-fill, auto-calculate, filtering capabilities, and so on?
- * Does the solution and the device you are considering have electronic signature capabilities?
- * Does the solution offer adequate data security?
- * Does the device you are considering have a large enough screen for viewing and working with inspection materials?
- * Will inspectors be able to print inspection results while onsite?
- * Can the solution be integrated with GPS to plan drive routes, etc.?
- * Will you be able to upload all desired/required media types—images, audio/video files, and so on?
- * Will you be able to modify the solution as your needs and requirements change?

Polling reveals that, on average, nearly 30% of field service tasks are conducted in areas with little or no wireless coverage.

—Field Service 2011, July

Best Practices

There are always risks when organizations decide to adopt new systems and processes. To mitigate risk and improve the likelihood of success when adopting a new mobile field service tool, organizations can benefit from the advice of those experienced with such system implementations and modifications.

Involve All Stakeholders. By collaborating with everyone who will be affected by the new tool for all purchasing and planning activities, organizations ensure that the solution they select will work optimally for the whole organization. Collaboration will also help build internal support and enthusiasm for adopting the new system.

Know What You Want. Take the time to understand what functionality you need, what your forms should look like, what your business process steps are, and so on. It is more difficult to modify and/or add details once the solution has been designed than to create them as desired/required in the first place.

55% of Best-in-Class organizations polled... involve all stakeholders in the needs analysis, selection, deployment, and management of mobile solutions

—Field Service 2011, July

Assess Scalability and Flexibility. Enlist the expertise of your IT staff and/or your potential solution provider to ensure that the solution you are considering will be able accommodate the new device types and operating environments that are sure to develop in the future. A flexible system will also enable you to modify workflow and outputs as your needs change over time.

Know Your Staff. For technology to be a success, your staff must both be willing and able to use it. Mobile field inspection tools can only help organizations become more productive and efficient when their employees use them. Organizations with staff resistant to or unfamiliar with using computers should consider investing in training to improve staff computer skills. Otherwise, they may be better off continuing to use paper and pencil processes.

Next Steps

Organizations all want to reduce paper backlogs, eliminate redundant work, redirect time wasted on administrative work, and increase productivity. The technology to make these changes to field inspections processes is both available and accessible. If you think that a mobile inspection solution might help your organization achieve its aims, call GL Solutions to talk with one of our specialists (sales@gl solutions.com, 541-312-3662).

References

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