

Mobile Technology to Improve Workplace Safety and Efficiency

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Introduction

The mobile application revolution is sweeping the nation and the world. There are over a million mobile applications (or apps) available for download to do everything from depositing checks, displaying documents, finding restaurants, shopping, social networking, and of course, playing video games.¹ All of these apps in some way make our lives easier, more convenient, or just more enjoyable.

The revolution doesn't show any signs of slowing. Sales of smart phones outpaced traditional PCs in 2011, and it is estimated that sales of tablet devices will outpace the notebook in 2013.^{2,3} Mobile devices are also making inroads into routine business use. According to research by Consumer Intelligence Research Partners (CIRP), users of the iPad3 report an increase in use of the device for business purposes over previous versions of the iPad (21% vs. 13%).⁴

Despite the vast number of mobile apps available and the increasing use in the business environment, the mobile revolution hasn't fully reached safety professionals. While there are quite a few mobile safety apps available to safety professionals, the offerings that are available today are limited in their impact on productivity and safety performance. Mobile apps do however offer a new and innovative opportunity to increase efficiency, increase employee participation in safety programs, and increase safety program performance.

¹ Shelly Freierman, *One Million Mobile Apps, and Counting at a Fast Pace*.

http://www.nytimes.com/2011/12/12/technology/one-million-apps-and-counting.html?_r=0 (Dec. 2011).

² Chris Taylor, *Smartphone sales overtake PCs for first time*, <http://mashable.com/2012/02/03/smartphone-sales-overtake-pcs/> (Feb. 2012).

³ Jay Yarrow, *The death of the PC: Tablet sales will beat notebook sales this year*, <http://www.businessinsider.com/the-death-of-the-pc-tablet-sales-will-beat-notebook-sales-this-year-2013-1> (Jan. 2013).

⁴ Erica Ogg, *Usage stats show the new iPad is more business-like*, <http://gigaom.com/2012/07/19/usage-stats-show-the-new-ipad-is-more-business-like/> (Jul. 2012).

This presentation will share just how mobile apps can help safety professionals improve their safety programs and conserve the ever important resource of time.

The Common Denominator: Workplace Inspections

How Mobile Applications Offer a Unique Opportunity for Safety Professionals to Improve Workplace Safety Inspections

Every workplace needs to perform some type of workplace inspection. Let's take a basic requirement – life safety equipment like smoke detectors and fire extinguishers. On some periodicity, one or more workers need to visually inspect, and in some cases test, these items to ensure they are properly functioning and are therefore likely to work when needed. In the specific case of fire extinguishers, someone needs to inspect each individual fire extinguisher 12 times a year. This begs the question, how does an organization know that all of the equipment and supplies needing inspection have been inspected as needed?

Many places of business are managing inspections by pen and paper. They rely on someone printing some type of list or spreadsheet and taking that into the field. Using the list or spreadsheet as a guide, they inspect each item, whether it is fire extinguishers, smoke detectors or some other items. They mark up whatever document they are using with notes about deficient conditions that need additional follow up. The inspector then likely needs to initiate a work order or corrective action process to address the deficient conditions.

Anyone who has performed workplace safety audits knows that auditing fire extinguisher inspections is low hanging fruit. It is easy to pull a tag to see if it has been inspected in the last month. In many cases during the course of an audit, one or more fire extinguishers are found that have not been inspected as required. This is attributable in part to the inefficiencies associated with pen and paper inspections. It relies on an individual to make field observations, document by hand what they see and go back to their computer to type up their field notes. If inspectors are using a list of fire extinguisher locations, the process relies on the inspector to note new fire extinguishers that have been installed, note new locations for ones that have been moved, and delete ones that have been removed from a particular location.

Documenting the reality observed in the field is a critical step in the process, and if this doesn't get done, the list inspectors are working from is inaccurate the next time they use it. Pen and paper processes also rely on individuals going back to their desk and initiating some work order or corrective action process. Initiating the corrective action mechanism is another critical step in the workplace inspection process, which if missed means deficient conditions may not be resolved. It is also a step in the process that impacts the time between identifying a deficient condition and resolving it. Once a deficient condition is observed, the organization is aware of the deficient condition, and the time between recognizing the condition and fixing it is time that an elevated risk exists. In the case of fire extinguishers, it is the elevated risk that an employee may not be able to successfully extinguish a small, incipient stage fire because the fire extinguisher was not ready for use. This puts lives and property at risk because the deficient fire extinguisher was not promptly addressed.

Mobile technology such as smart phones and tablets coupled with a mobile app can eliminate these problems. Mobile apps increase program effectiveness by eliminating the time

delay between recognizing a deficient condition and resolving it by immediately initiating a corrective action sequence. When a deficient condition is observed, electronic notification can be sent immediately. Depending on how the app is configured, it may be simply an email that is sent out to individuals responsible for correcting deficient conditions, or it may be entering the deficient condition into a tracking database that can be done with the simple press of a few buttons. Notification of the condition can be initiated before the worker leaves the field, decreasing the time between observation and resolution.

Mobile apps also eliminate unnecessary process steps in a way that positively affects efficiency. With a traditional pen and paper process, a worker may need to go into the field to make observations and then go back to their office to enter the observation into a database or tracking system. To view it simplistically, that is a two-step process. Step one is to make field observation that takes some finite amount of time. Step two is to go back to the office and type up the observation into the computer that also takes some finite amount of time. Initiating the corrective action process directly from the field eliminates that second process step essentially converting a previously value added step into an obsolete, non-value added step in the process. Eliminating it makes the process more efficient.

Increasing efficiency of the inspection process deserves a little more attention. Eliminating an unnecessary, non-value add step from the workplace inspection process doesn't save a huge amount of time. The true impact on productivity comes when all the small savings are summed, and when it comes to safety inspections, most workplaces are required to perform a lot of inspections each year. Many of these are driven by regulatory requirement. The Occupational Health and Safety Administration (OSHA) under the 1910 General Industry Standards has promulgated at least 66 different regulations that require some type of periodic inspection of the workplace. Some of the more common regulations that require an inspection include:

- Portable Wood Ladders (1910.25)
- Portable Metal Ladders (1910.26)
- Safety Requirements for Scaffolding (1910.28)
- Manlifts (1910.68)
- Flammable Liquids (1910.106)
- Process Safety Management of Highly Hazardous Chemicals (1910.119)
- Permit Required Confined Spaces (1910.146)
- Lockout/Tagout (1910.147)
- Portable Fire Extinguishers (1910.157)
- Automatic Sprinkler Systems (1910.159)
- Fire Detection Systems (1910.164)
- Powered Industrial Trucks (1910.178)
- Guarding of Portable Power Tools (1910.243)
- Welding, Cutting and Brazing: General Requirements (1910.252)
- Bloodborne Pathogens (1910.1030)

Many of OSHA's regulations that require inspections require more than one type of inspection. OSHA requires at least 145 different specific inspections under the General Industry Safety Orders. OSHA has additional inspection requirements under the Construction Safety Orders not to mention inspection requirements set by other agencies such as the Environmental

Protection Agency and the National Fire Protection Agency. Taken collectively, most organizations face a large number of required inspections.

The type and number of workplace inspections required at an organization will of course vary depending upon the hazards of the work environment. For larger organizations, this number can reach into the tens of thousands of inspections per year. This sounds like a lot, and it is a lot. It is understandable however when one adds all of the different types of inspections the organization may need to complete. Common examples may include inspections of fire extinguishers (12 per year per extinguisher), smoke detectors, fire suppression systems, ladders, cranes, forklifts, personal protective equipment, fume hoods, grinders, power tools, biosafety cabinets, exits signs, eyewashes, chemical storage locations, hazardous waste accumulation areas, etc. The numbers of inspections add up quickly. It adds up even more quickly if you factor in preventive maintenance inspections of ventilation equipment and building systems and general area safety inspections of work sites, labs, etc. The efficiency of using a mobile app to document required inspections becomes clear when you consider all of the inspections an organization may need to perform.

That second step in the inspection process where a person needs to type field observations into the computer is eliminated with the use of mobile technology. The actual time spent doing that second step is eliminated, and summed over hundreds, thousands or tens of thousands of inspections, the time savings associated with using mobiles apps to document the field inspections becomes significant. In other words, mobile inspection apps can make workers more productive and the workplace inspection process itself more efficient.

Increasing process efficiency by eliminating process steps and decreasing the time between recognizing and correcting a deficient condition are just two advantages of a mobile inspection process over the more traditional pen and paper approach. There are several other significant advantages of using mobile technology to facilitate workplace inspections including:

1. Centralized inspection requirements
2. “Big Picture” insight
3. Electronic documentation of inspections and findings
4. Automated reminders for pending or overdue inspections
5. Inspection scheduling
6. Real-time feedback on inspection progress during the actual inspections
7. In field access of inspection histories
8. Easy scalability for greater employee participation

Many of these additional advantages of mobile technology impact the efficiency of the inspection process, which translates directly to higher productivity and time savings for safety staff. Most managers with oversight of a safety program would have a hard time quickly and confidently answering “have workplace inspections occurred as required” in part because workplace inspections are not centralized. Different process owners or program managers are conducting inspections applicable to their specific processes or programs. The information is not always shared between processes and programs. By centralizing all inspection requirements under a single mobile application, it is easy for directors and other management staff to know how many inspections are required per year, what inspections are required and what is the status of those inspections. It also allows managers to see what you might call the “Big Picture.” Where is

an organization seeing the most issues? What types of issues is the organization seeing? With all inspection and the associated findings under one mobile umbrella, it is easier to see these trends.

From an auditing standpoint, documented inspections are vital. If there is no objective evidence of an inspection, then the inspection didn't happen as far as they are concerned. Capturing inspections using a mobile app creates an electronic, time-stamped record of the inspection which can be produced quickly and easily at any time. Pen and paper inspections have a few critical weaknesses from an auditing standpoint. First and foremost, inspections must be documented, and these documents must be producible. Staff performing inspections must be diligent in maintaining records of inspections. If not, inspection records might be lost or can't be produced when needed. Electronic capture of inspections in the field eliminates this vulnerability from the inspection process.

Maintaining a database of all inspections also makes it easier to stay on track with required inspections. Because the mobile platform is based on information stored in a database, the database can add efficiencies to the process as well. Automated reminders can be sent when inspections are coming due or when they have been missed and are now overdue. This minimizes the likelihood that inspections will be missed, and it highlights those that have been missed.

Mobile apps have specific benefits to the inspectors using them that traditional pen and paper methods don't offer. Mobile apps can provide real time feedback on the progress of the inspections to the inspectors as they go. For example, if 50 fire extinguishers need to be inspected on a building floor, as each one is inspected, a mobile app can inform the inspector how many more they have to go. This helps eliminate the likelihood that one or more extinguishers will be missed while the worker is out in the field, which eliminates rework where staff needs to go back into the field to complete those inspections that were originally missed. With a mobile app, inspectors can also easily pull up results of past inspections for the item being inspected or for the area where the inspection is occurring. This can help inspectors focus on prior problem areas.

Mobile applications also open the opportunity to involve more employees in the safety program. Mobile apps are easily scalable and can be just as easily downloaded by one person as by everyone in an organization. Mobile apps offer a tool that is available to everyone. Staff can be trained to perform inspections, and as long as they have a smart phone or a tablet, they can complete an inspection, which simply adds to the volume of inspections performed by the organization and the data available for trending.

Using Mobile Apps for All Field Work

Mobile Apps Have Great Potential to Improve Efficiency and Effectiveness Wherever Field Work is Performed

Mobile apps are perhaps best suited to facilitate workplace inspections. As discussed, there is great benefit to organizations that adopt mobile technology to manage their inspection programs. Mobile applications however are not limited to safety inspections. In fact, with the capabilities of mobile technology, organizations are mainly limited by the imagination. Other areas where mobile technology can increase efficiency and safety performance include:

- Inventory management

- Lockout tagout
- Confined space entry
- Hot work
- Emergency communication
- Evacuation headcounting
- On-the-job training
- Incident reporting

These potential opportunities take advantage of the features of mobile devices (cell phone, memory, camera, scanner, internet access, etc.) and the ingenuity of mobile apps (video, push-to-talk, language translation, social networking, photo manipulation, etc.). Imagine a lockout tagout procedure that needs to be performed. A worker opens their mobile app and pulls up the lockout tagout procedure for the particular piece of equipment. They can tell if it has been reviewed in the last year and is current. They can even check off LOTO steps as they go to ensure each step in the process is completed. Imagine an evacuation. As workers evacuate a building and congregate in an assembly area, they open their mobile evacuation app and check off that they are present and accounted for, decreasing the time needed to account for all employees. Imagine a worker working with a corrosive chemical for the first time, and as they stand in front of a fume hood, they watch a video on their iPad on how to work safely with corrosives. Imagine a worker who sees an unsafe condition on a walkway. They open their inspection app, snap a photo, circle the deficient condition and send it to the safety staff whom then has the precise location identified (via geo-tagging) along with the marked photo of the condition. Imagine how mobile apps will improve safety performance and efficiency.

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