A close-up photograph of a hand holding a silver smartphone. The phone's screen is reflective, showing the hand and the background. A large blue rectangular overlay covers the upper portion of the image, containing white text. The background is a soft-focus indoor setting.

Transforming Health & Safety: Digital Disruption With Mobile Technology

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WHITEPAPER

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Abstract

Decades of awareness building, training, and record keeping on Occupational Health and Safety – spearheaded by private and public enterprises and prodded along by governments – have got us to where we are today. These efforts have moved us incrementally along a path over the past four decades from dozens of deaths per day to a quarter of this number today.

However, the new standard many companies are striving for of zero fatalities and zero serious injuries requires a breakthrough. Traditional health and safety investments relying on moral suasion and larger and larger budgets suffer from diminished returns after a certain point. To drastically change safety outcomes, we need to look beyond traditional Environment, Health and Safety (EHS) approaches. New social and mobile technology offer hope of us getting there.

Social and mobile technologies are exceptionally well suited to overcome the challenges facing Occupational Health and Safety professionals as they expose our thinking to new mental frameworks. Mobile technology as an “always on for everyone, always there for everyone” communications channel creates an opportunity to drive engagement throughout an entire organization. For safety professionals, it will allow them to shift from being the focal point of initiatives towards being social enablers of safety oriented cultures. Technological innovation combined with new organizational thinking can drive the paradigm shift needed to bring us closer to a “zero incidences” safety goal.

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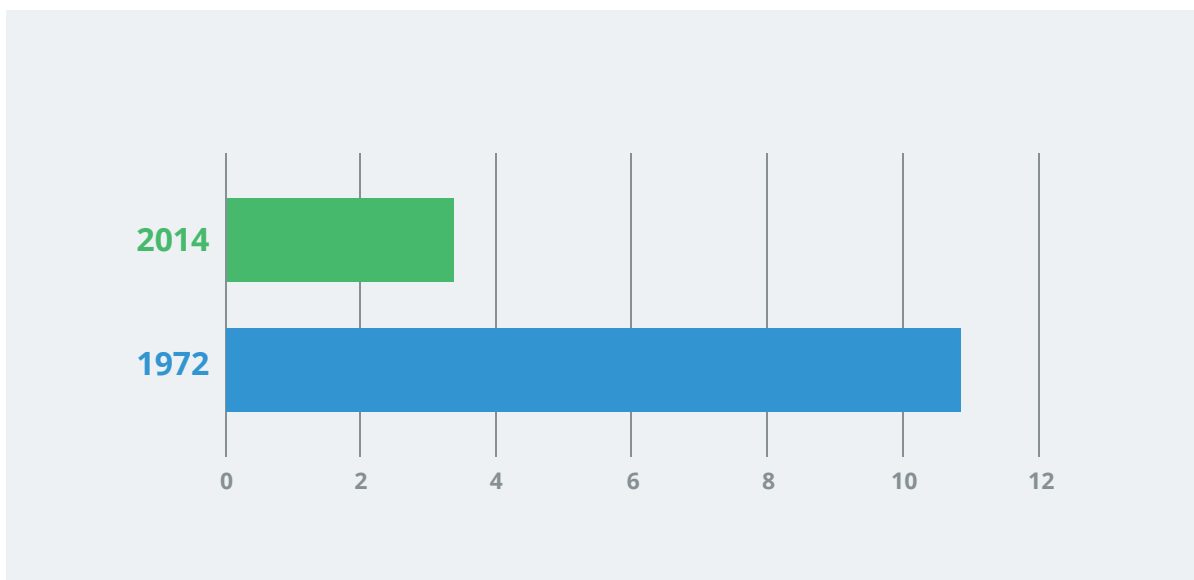
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Introduction

What got us to where we are today will not get us to where we want to be tomorrow.

Decades of awareness building, training, and record keeping on Occupational Health and Safety - spearheaded by private and public enterprises and prodded along by governments - have got us to where we are today. These efforts, to be fair, have moved us incrementally along a path over the past four decades from literally dozens of deaths per day (this figure in the US alone) to a quarter of this number today.

Total Worker Injuries and Illnesses Declining



US Department of Labor Statistics: Worker injuries and illnesses per 100 workers from 1972 to 2014.

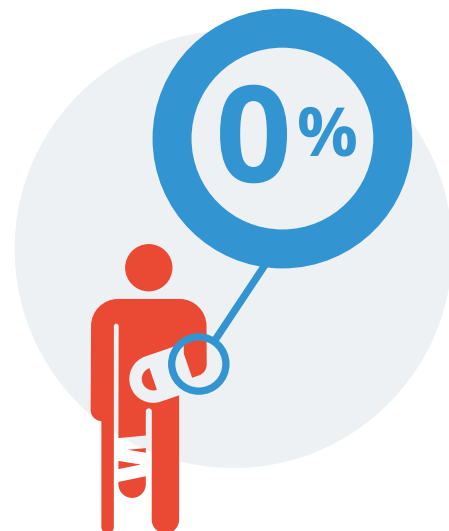
However, zero fatalities and zero serious injuries, a new standard many companies are striving towards, requires a breakthrough. If we doubled the number of safety meetings, checklists, and more clearly marked signs in our workplaces, would we cut our workplace fatalities and serious injuries in half again? Could we remove the workplace injury and fatality threat entirely? Likely not. At some point, these investments have diminishing returns. Improvement efforts cannot rely on the limited effectiveness of moral suasion and the belief that the answer lies in larger budgets for doing more of the same. Nor should they include the practice of placing the burden of safety improvement on one primary stakeholder group within an organization – safety professionals.

To drastically change safety outcomes, we need to look beyond traditional Environment, Health and Safety (EHS) approaches. New social and mobile technology offer hope to us in getting there. The opportunities created by these new technologies are exceptionally well suited for the challenge as they expose our thinking to new mental frameworks. For safety programs, we can re-evaluate who they are built for and what they focus on delivering. For safety professionals, we can re-think their roles entirely. New technology allows them to shift from being the focal point of initiatives towards being social enablers of safety oriented cultures.

Zero Goals

Technological innovation combined with new organizational thinking can drive the paradigm shift needed to bring us closer to a “zero incidences” safety goal. Mobile technology as an “always on for everyone, always there for everyone” communication channel creates an opportunity to drive engagement throughout an entire organization. Instead of just giving auditors and inspectors a task specific tool, Mobile EHS is about engaging an entire frontline workforce. It must be built with and for frontline workers and optimized to drive adoption.

Data Science aligned against these new torrents of available data streams can allow for benchmarking on leading indicators and prescriptive avoidance of serious incidences. Big Data infrastructure offers up the promise of safety “personalization” that reaches every corner of the shop room floor and every person in the field.



Mobile First Mindset

Technologists now build from a mobile-first mindset knowing that if they attempt to go from big screen to small, they get it wrong. Marketers have for over a decade criticized those who believe the internet was merely about shrinking television-style ads onto smaller screens. That new medium (along with the even newer medium of mobile) presented an opportunity for a new type of message. Given that today’s consumers entertain themselves through the day with 15-second clips on social devices, does it not stand to reason this ought to be considered an option for engaging workers in safety? Let’s avoid thinking that a 30-minute classroom session on health and safety simply live streamed onto a mobile device would be effective.

As EHS professionals already know, general safety meetings in traditional classroom settings are ineffective at changing behavior. Are the people you have gathered to train in a classroom suitable candidates for such learning? Is someone who skipped formal schooling, someone who has been out of a classroom setting for many years, or a person who struggles with English as a second language going to absorb the information you put on them in such a formal setting? Your training needs to focus on developing skills and behaviors, not necessarily delivering more information.

The Importance of Demographics

How about Millennials who speak to their tribe through 3 to 10 second Snapchats? Mobile technology has become their community gathering place, and this is where they learn, live and follow. To reach this cohort, you will need to influence or become part of their tribe. Advice, counsel, and direction will need in part to come from their peers, and it will have to be served up in bite-size pieces in moments that matter on a mobile device.

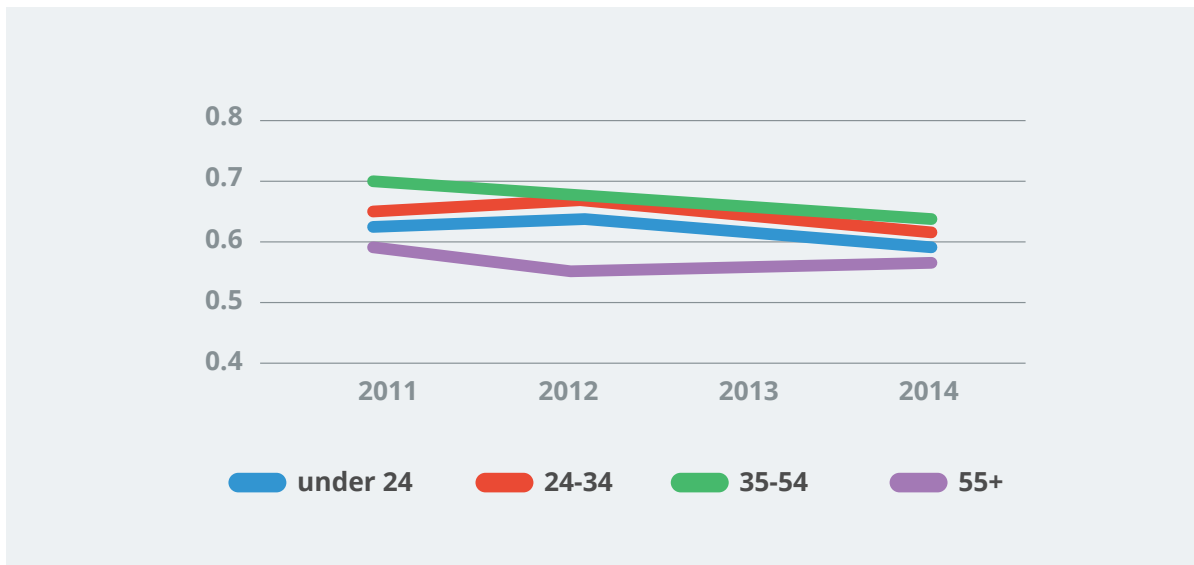
Wisdom comes with age, and without question, experience matters with safety. Why are young people who have the ability to think and move faster than their older cohorts restricted from such simple activities as renting a car until the age of 25? Decades ago actuaries discovered through probability analysis what neuroscientists have only more recently proven out. Not only do young people suffer overconfidence and an “it couldn’t happen to me” mindset, but the human mind does not fully develop its governance for impulse control until the mid-twenties age range.¹ Consider this fact when sending young people out to do tasks that entail some degree of physical risk. They are not permitted to rent a car, but they can drive heavy machinery, walk across a rooftop, climb under a machine, work with dangerous chemicals and near extreme heat sources. Now consider again the importance of reaching and engaging them with your safety message.

Age is an important matter to be considered with workplaces in general and safety in particular. There is, of course, a knowledge and skills gap between young, emerging workers and the aging workforce. This issue is particularly important to address in industries that are striving to attract younger workers, such as oil and gas, mining, and construction. While we agree that engaging young workers through social mobile make sense, some assumptions that it is an exclusive domain of youth need addressing. It is also an effective means to engage and interact with older workers. After all, Facebook is a land of short posts and videos from parents and grandparents.

The fact that labor forces continue to age overall and older adults are increasingly working longer does not diminish the importance of mobile technology strategies. In many respects, it necessitates it as this cohort is often the farthest removed from classroom type settings for learning. A recent Population Reference Bureau report noted that 23% of men and 15% of women aged 65 and older remained in the labor force in 2014 - levels that are projected to rise to 27% and 20% respectively by 2022.²

While workplace injuries and illnesses among younger workers is decreasing, alarmingly it is notching up in the over 55 cohort.

% Of Fatal and Non-Fatal Workplace Injuries and Illnesses By Age



US Department of Labor Statistics: Number of fatal and non-fatal workplace injuries and illnesses by age (USA) excluding misreported cases

Gamification

Gamify employees' workplace training. A badge in a mobile app is likely to mean more than a plaque on a wall. Applying game design to a non-game application like EHS makes it more enjoyable and engaging to use. Although we would like to believe moral imperatives and training on the social good of health and safety is the best approach forward, people at work and leisure respond exceptionally well to applications that have appeal and are motivating. When we "play" with our apps, the ranks or levels we achieve, the fun competitions we engage in with our counterparts which can be tracked by points or leaderboards, and the goals that are set with rules on how to achieve them create a great system that induces behavioral change. Where compliance regimes fall short, nudging workers through gamification produces results.

Recognition is a very powerful motivator for changing behavior and can turn safety into a top of mind activity.

Rally the troops and motivate them to join the cause through social technologies. As with any mobile application, adoption is a foundational necessity. Convenience, speed, and personalization are table stakes. Minimize the friction impeding your program adoption by transforming current safety tasks to near effortless micro-tasks, while building safe habits through nudges and gamified activities so that they are engaging. These mobile requirements should be considered essential and not an afterthought in design.

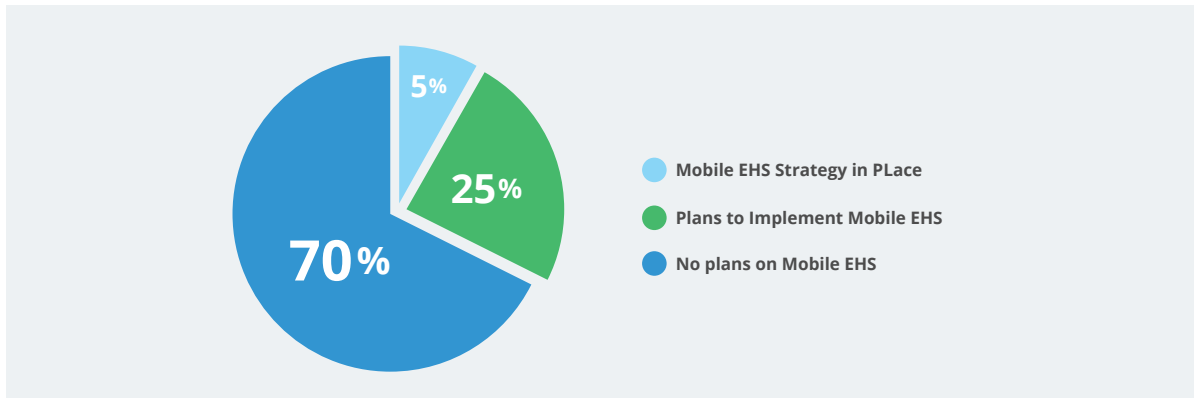
Delivering on the "Last Mile"

Occupational safety programs represent a classic "Last Mile" problem for companies. Large scale safety efforts get stymied not by a lack of strategic focus and effort but rather because the final beneficiaries can be tough to reach and engage. Everyone understands that safety is neither a project nor a one-time engagement. Efforts need to be ongoing and pervasive parts of the day-to-day corporate culture that reach everyone. Mobile technology that amplifies and extends the reach of information can help us overcome The Last Mile conundrum and help us reach the underserved but high-risk employees.

With mobile technology finally arriving on the workplace scene, it is now leveraged in many areas of enterprise management programs. According to research conducted by technology solutions provider CDW, businesses taking advantage of mobile applications report increases in efficiency and productivity, in addition to an increased ability to work remotely.³ Mobile technology is also allowing companies to engage with employees in more active ways. With all the untapped potential, it is not surprising that the mobile enterprise app market is expected to grow to \$61 billion by 2018.⁴

The mobile shift began with the acknowledgment that the very tools that are so prevalent in our day-to-day personal activities - from smartphones and tablets to wearable technology like sensors and smart watches - could also be utilized in enterprise management programs. Data from the manufacturing sector provides a valid sample of this trend for EHS application. While only a small percentage of manufacturers (5%) had implemented a mobile EHS strategy in 2015, according to LNS Research a quarter of the market (24.7%) had plans to implement such a strategy.⁵

Mobile EHS Strategy Survey



LNS Research: <http://blog.lnsresearch.com/blog/bid/204548/Is-Mobility-the-New-Norm-in-EHS-Management>

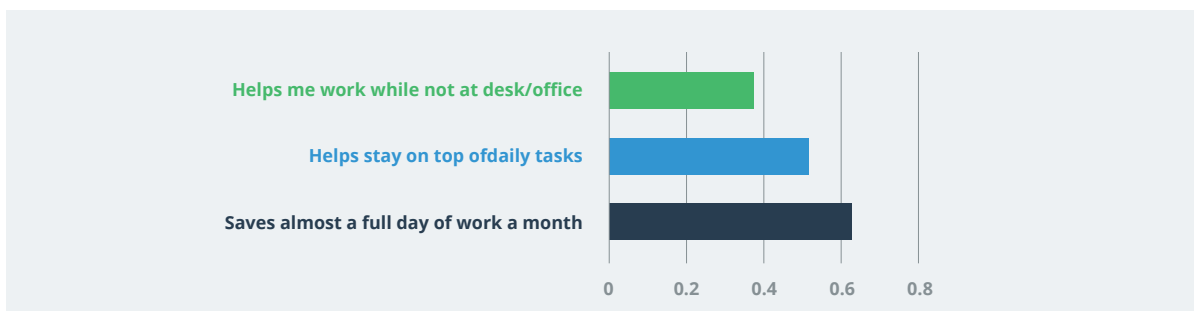
If there is one advantage to the slow rate of industry adoption, it is leapfrogging the process of evolution and jumping right to the forefront of mobile EHS thinking and approaches. For the socially conscious, this means reaching vulnerable and under-served masses. For the business minded, it exponentially grows the “total addressable market”. The intersection of these two is the land of entrepreneurship and innovation. It is where breakthroughs are occurring.

Reaching the Under-Served

Consider these realities and return to the challenge at hand. Mobile technologies are not just an interesting new way for EHS professionals to engage in what they currently do. Rather, they offer the opportunity to reach large masses of under-served populations that suffer disproportionately higher rates of fatality and serious injury.⁶ Safety is everyone’s concern but for breakthrough reductions, we need to find solutions for those disproportionately affected and for whom traditional safety education solutions have under-delivered. By the numbers, this includes minorities and contract workers.⁷ Mobile solutions offer the potential to reach these groups.

Mobile further assists with providing health and safety solutions in small, meaningful and memorable doses. Being able to sustain safety over time implies ongoing efforts. Often this means incremental tasks, actions, and activities each day that have a cumulative effect on company safety performance versus the impact of one-time large-scale events. Mobile technology provides an effective medium to deliver and to track these ongoing smaller actions that drive real change.

Using Mobile Technology In The Workplace



Secure Edge Networks: <http://www.securedgenetworks.com/blog/using-mobile-technology-in-the-workplace-supporting-happier-employees>

Why Take a Risk on Risk Management?

Organizations go through significant evolutions in many areas of their businesses. In managing risks around workplace safety, the technical challenges are similar in many respects to other parts of the enterprise: there is software to minimize the hurdles that impede getting information from a source into a system which in turn enables the right people to make informed, proactive and actionable decisions. Archaic EHS programs rely on employees to collect data manually, transpose the information into spreadsheets or disparate, disconnected software products - or, in worst cases, to paper binders - and perpetually repeat this process over and over. Such programs may suffice in meeting minimum regulatory standards, but they typically fall short due to human error and the sheer quantity of information involved. Absent adequate software, actionable intelligence is not available to inform proactive decision-making and preventive actions.

Mobile devices integrated with EHS tools to leverage real-time connectivity, native applications, and easy in-the-field data entry, are game changing. They place employees, not the Safety Manager, in the center of influence. With mobile, data is collected on the fly from all personnel. Conversely, these same field staff and their managers can receive data-driven insights and alerts as they go. Mobile unleashes new potential by exposing and reducing hazards and unsafe behaviors, facilitating broader employee (and contractor) adoption and by transforming real-time source data lifted from the field into instantly actionable intelligence.

In the case of incident management, for example, no reports are complete without some form of location-based data. GPS and mapping services embed into almost all current smartphones and tablets as native applications. Critical location data can be pushed to managers and employees instantly when on-device apps connect with EHS tools. Similarly, all smart mobile devices feature some form of a camera capable of capturing high-quality photos and videos, two elements that are already frequently used to enrich incident and audit reporting. These existing capabilities tied to EHS systems instantly provide essential visual support.

No mobile device is complete without a series of applications designed to fulfill the phone's cornerstone and original intended purpose: communication. Between the efficient use of phone logs and chat apps, as well as voice recording and dictation, note-taking tools, the burden on frontline staff of collecting and inputting data into an EHS system in the field is immensely reduced. Mobile improves accuracy and significantly reduces the time associated with completing tasks.

There are many more examples, but what is notable about combining native capabilities with existing EHS enterprise software is that it combines cutting edge technology with "battle tested" applications. By contrast, adopting new market entrant standalone entities injects considerable risk into risk management.

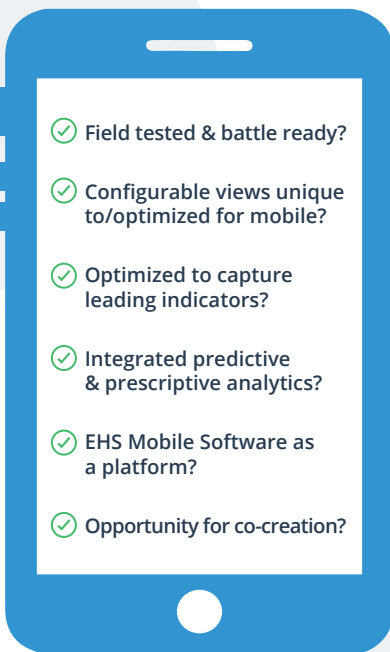


Rethinking Mobile Requirements

Unlike other mobile applications, choosing an EHS mobile app is not a simple “feature and functions” race. Because of the complexity and variety of operational requirements both within companies and within sectors, a simple feature list for an EHS app is not helpful in evaluating their potential effectiveness or fit.

Consider the following six essential requirements when adopting mobile EHS applications:

MOBILE FOR EHS



1. Is it field tested and battle ready?

Being developed in the field with frontline user input is crucial. That means the app has been optimized for ease, convenience, speed, and relevance in the environment and circumstances where end users put it to use. Beautiful scorecards might light up a Safety Manager's interest, but the real question to ask is: Does this tool work in the hands of my workers who are on the frontlines and at the highest risk? Approaching 100% adoption and engagement of EHS mobile is the only route to achieving 100% safety.

2. Are configurable views unique to/optimized for mobile?

User-friendly design is critical for field users. Remember that mobile is not just about shrinking a screen. Indeed, many mobile applications remain fixated on individual “page” views while neglecting the more important design elements. Consider the user experience in navigating within the app versus just the final destination page.

3. Is it optimized to capture leading indicators?

Capturing incidences as they occur in the field is an obvious and base requirement of any EHS mobile solution. To meet the promise that mobile disruption offers, EHS mobile solutions need to focus and optimize features that capture leading indicators, including hazards, unsafe behaviors (“etiquettes”), and minor incidences that do not get formally reported to regulators. Benchmarks on leading indicators must be part of the mobile solution if you want your enterprise to achieve a step change in safety results.

4. Does it offer integrated predictive and prescriptive analytics capabilities?

While some applications claim to provide data analysis, they are primarily descriptive reports of what incidents have happened and when. Descriptive information on past events, while informative, is very limited in enabling action. The abundant streaming data points provided by broad adoption of user-friendly mobile apps offers the opportunity for a “network effect” in workplace safety. Real-time data processed with machine learning algorithms can provide actionable in-the-moment prescriptive advice.

Data that engaged workforces capture is proving to be highly predictive of future serious incidences. Information collected on reports of pain, near misses, hazards, and safety observations all are proving to be strong leading indicators. Dashboards, reports, and alerts that highlight risk and provide the immediate opportunity for prevention need to be an integral part of any mobile solution. Ensure your mobile EHS application is an integral component of a safety ecosystem that prevents incidents rather than just reporting them.

5. Is it an EHS Mobile Software as a Platform or a simpler stand-alone entity?

Ideally, couple your existing EHS software such that changes in the core system are automatically reflected back into the mobile application. Need to capture new information? You should be able to add it into the existing software, seamlessly integrated, allowing you to get started in the field and finish up back at the office. Get an app that can be tweaked for each different user type in your company and that will adapt to your needs as they evolve.

6. Does your vendor offer the opportunity for co-creation?

This last requirement builds on the previous one and may be the most important of all. Ensure the ability for co-creation of requirements with your vendor. Additional features you discover are critical to the field must be easily captured, built into the core software, and reflected in the mobile app. User feedback and front-line input are essential to success.

Consider all the types of jobs, each with their attendant risks and the various experience levels of individuals who perform them. We could know who a person is, what training they need, and the particular time and place when they need a helpful reminder or nudge. Further, consider the Internet of Things (IoT) where we can track the objects and equipment people in our workplaces encounter day to day. Now combine the two. We can keep people safe in workplaces like never before by targeting their needs in ways that eliminate disengaging general advice and replace it with highly accurate information tailored to the job, the individual, and the moments when it matters to them.

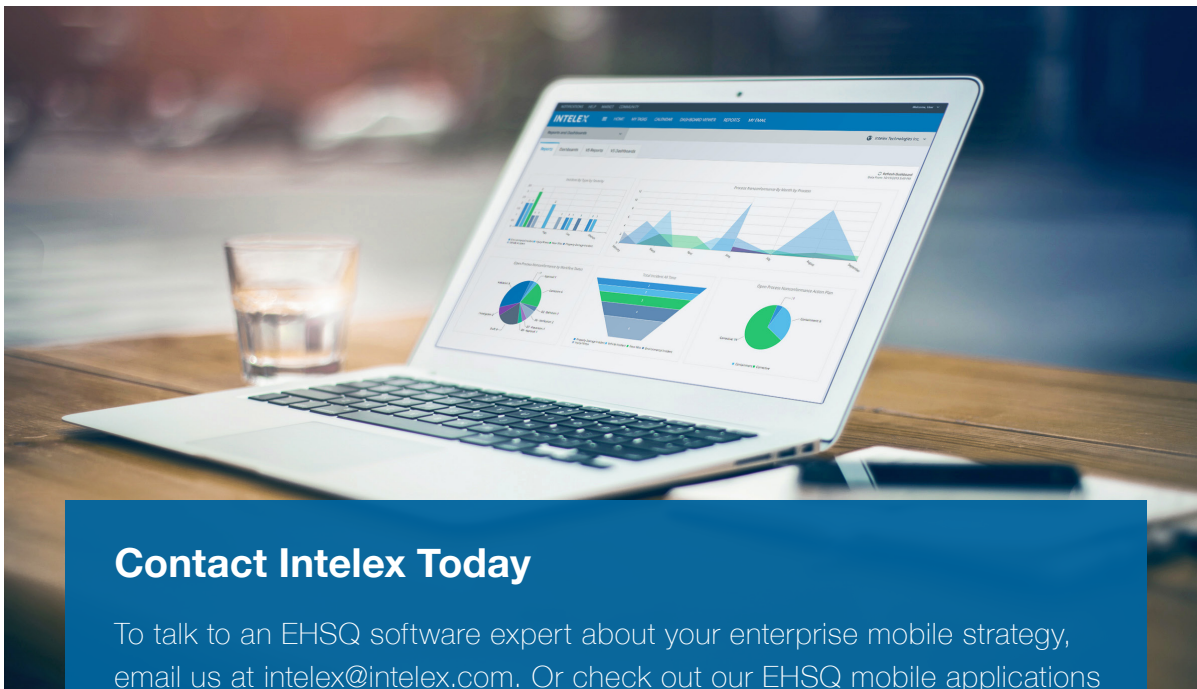
Consider that your Marketing department has likely already developed a strategy that avoids spamming its audience with “offers for everyone.” Using highly personalized messaging and offers in their place, they evolved from a one to many, to a one to one customer experience. Your Health & Safety department should follow suit. If you want breakthrough ideas in safety management, bring those lessons learned from digital marketing and its enabling technologies to the table to work alongside your Health & Safety professionals on a mobile strategy.

The Opportunity for Breakthrough Results is Here and Now

There may not be a magic bullet, but mobile technology may nonetheless be the secret sauce needed to achieve breakthrough results in eliminating serious occupational injury and death. If we adopt the right mental framework, new ideas abound. We shape our solution paths differently. Our provocation: what if our mobile phones become our own personal safety devices aside from their telecommunication use?

Before proceeding on a shop room floor or climbing behind the controls of heavy machinery, the Internet of Things (IoT) holds an immediate promise that your mobile device can know where you are and what you are about to do and provide in the moment guidance to avoid specific hazards. New rugged phones work on construction sites and underwater and can withstand shock and vibration. Being able to confirm through a mobile device that a piece of machinery is locked out or having a way to check in periodically with a simple touch or swipe on remote workers could make for large safety gains. As we develop mobile technologies, innovation will come from the field based on real user demands. Giving workers who are at greatest risk of injury - those out in the field and on the factory floor - real time access to what they need to support their safety will result in breakthrough gains in EHS.

We can save more lives. Let's rethink how we get the job of safety done. New mental frameworks are driving technology innovations that lead to transformational change. Business leaders see the opportunity here for building a strategic advantage. The key is to think beyond mere compliance requirements to engaging workers in new and meaningful ways on their safety, creating great outcomes for the entire organization. The right social-mobile technology affords the opportunity to reach those who are most at risk and to meaningfully engage in the moments that actually matter, preventing injuries and saving lives. The adoption of mobile technology in EHS, in turn, enables prescriptive analytics that can guide us to an environment with the ultimate goal of zero deaths and zero serious injuries.



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Endnotes

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