LTIMindtree

Worker NxT

WHITEPAPER

Connected and protected:

how wearables, IoT and cloud can help to improve workplace safety

The modern manufacturing and construction workforce is changing. It's more diverse and dynamic than ever before—and the imperative to properly train and retain that workforce has never been higher. Worker turnover is at record levels—and industries with a greater injury potential lead that list.

While traditional analog methods are no longer sufficient to meet rising standards for workplace safety, technology such as IoT-enabled sensors, wearable devices and eXtended reality can help fill that void.

Keeping worker safety at the center

Workers in heavy industries such as manufacturing, mining, and construction are exposed to a litany of hazards during every shift: chemicals can be inhaled, persistent noise can lead to long-term hearing damage, and fall-related risks are a mainstay. Despite carefully written safety procedures, workers can quickly become complacent with personal protective equipment (PPE). And sometimes, workers might not even be aware of the risks or damage until health problems arise years down the line.

According to a 2020 report from the Bureau of Labor Statistics (the most recent period for which data is available), the construction sector in the US reported 74,520 nonfatal injuries in that calendar year. Over that same time period, manufacturing workers (across all sectors) accounted for 135,900 nonfatal injuries. The reality is that workplace injuries do happen, but IoT, wearables, and cloud technologies can improve workforce safety and retention.

Monitoring safety conditions can introduce additional logistic challenges; it's not feasible to ensure that every worker is in compliance at every moment, and self-reporting measures may fall short.

Refined tracking with IoT devices

IoT technologies connect seemingly mundane devices with one another and give end users the ability to track and control the world around them from their fingertips. We're accustomed to these solutions in smart home devices—where we can now unlock the front door or raise the temperature on the thermostat—all from the couch. But in the industry, the applications are endless. IoT devices allow enterprises to track every aspect of the manufacturing process, from precise temperature readouts to advanced supply chain tracking. These solutions have largely focused on throughput for the manufacturing and construction process, and not on ancillary objectives such as worker safety.

Worker NxT from LTIMindtree changes that paradigm. To date, **LTIMindtree has onboarded nearly 1.5 million workers at more than 300 locations.** Data on those workers is tracked in a multitude of ways to help improve safety.

For instance, worker harnesses have RFID tags to ensure that they're worn properly. AI can scan jobsite surveillance footage to ensure that everyone entering a job site is wearing a hard hat, eye protection, boots, etc., and issue an alert if the algorithm detects that a worker or visitor is not compliant. IoT sensors can also work in tandem to provide comprehensive data about workers' exposure to potential hazards. In manufacturing, for example, geofencing and worker location tracking can be used to record how long a person is in a specific factory zone—or to prevent specified workers from entering. This location data can be cross-referenced with air quality sensors to calculate how long—and in what quantity—a worker was exposed to a potentially harmful chemical. When a worker has reached a defined exposure limit, they can be alerted directly—and the alert can escalate to a managerial level if the worker does not promptly leave the exposure area.

To be clear: IoT devices don't bubble wrap workers or prevent every accident, but they do give workers and supervisors a deeper line of sight into what safety measures workers are (or are not) following at a job site or on the factory floor.

Wearables for worker safety

Worker safety isn't limited to just industry-specific applications either. Wearables for workers can also be an essential part of a connected strategy for increased safety. Studies indicate that tired workers are more likely to make mistakes, leading to added injuries on the job.

Traditionally, the countermeasure has been to track and limit the time spent on a shift, which doesn't give stakeholders true insights into workers' fatigue levels. Data from high-tech devices, such as specialized exoskeletons or respirators equipped with IoT sensors, can be paired with external data points (e.g., temperature or air quality) to yield deeper insights. Wearables and even run-of-the-mill devices like fitness trackers can provide an extra dimension of data, when connected to other variables. Gyroscopic sensors can offer fall detection capabilities. Metrics such as heart rate and step count can offer information about the level of fatigue a worker may be facing, and appropriate measures can be taken—including but not limited to mandatory breaks, shifting the assignment to a less incident-prone task or zone, ending a shift, or augmenting with additional staffing—before an incident occurs.

Augmented and virtual reality for worker training

Other common reasons for incidents are untrained workers, negligence and improper training. The manufacturing and construction workforce is changing—and the ways that workers are onboarded, trained, and supported need to evolve accordingly. The best learning often takes place during hands-on field work, but many industries are currently working in tight labor markets. Job sites are filled with inexperienced workers requiring ongoing training, and the supervisors equipped to give that may not always be available when it's needed. Augmented reality (AR) and virtual reality (VR) stand to change that.

AR and VR solutions can independently guide workers through an unfamiliar procedure in real-time—or connect the worker with a remote advisor to offer assistance. For instance, a headset can use AR to superimpose component names and inner workings while a worker is actively completing a repair. A supervisor can use digital tools to virtually 'draw' on the machinery as the worker looks at it, and smart technology will track those drawings to their specific points for reference—even if the worker leaves and returns. Large construction firms can use these capabilities to optimize the knowledge of their most skilled workers—allowing them to train or help less skilled workers remotely on an as-needed basis.

In other instances, VR can be employed to visualize a component in its final, installed state, and not just how it appears on the factory floor. This can be used to train workers on how to safely use a device or machine even before its installed on the factory floor—reducing downtime and speeding up the ROI period for the device.

VR-based safety training can help trainees visualize the outcome of an incident, including injuries and its repercussions. By experiencing the reality of these situations, workers develop a more emotional connection to possible dangers. This type of connection reliably increases retention rates for training content, and Worker NxT has already trained more than 500,000 workers on industrial safety using this method.

AR and VR solutions don't just improve worker efficiency; they also enhance worker safety. With specialized headsets, tablets, and other solutions, workers don't need to fumble through hundreds of pages worth of instruction manuals to find the answer they're looking for (which they won't). In a productive industry 4.0 world, the contextualized information they need is right in front of them. This prevents errors of all kinds, keeping both damage to expensive machinery and workplace injuries to a minimum.

Embrace the future of connected worker safety with LTIMindtree

Connected devices are the future of workplace safety, but IoT, wearables, AR, XR and more can be difficult to implement when they don't integrate seamlessly with other business systems. This concern is assuaged with the Worker NxT solution, which integrates seamlessly with the entire suite of LTIMindtree NxT products, including materials tracking, geospatial solutions, advanced dashboards, and numerous other offerings to propel your business to a safe and productive Industry 4.0 transformation.

Ready to bring the future of worker safety to your manufacturing and construction processes? **Let's talk.**

About LTIMindtree

LTIMindtree is a global technology consulting and digital solutions company that enables enterprises across industries to reimagine business models, accelerate innovation, and maximize growth by harnessing digital technologies. As a digital transformation partner to more than 700 clients, LTIMindtree brings extensive domain and technology expertise to help drive superior competitive differentiation, customer experiences, and business outcomes in a converging world. Powered by 82,000+ talented and entrepreneurial professionals across more than 30 countries, LTIMindtree — a Larsen & Toubro Group company — combines the industry-acclaimed strengths of erstwhile Larsen and Toubro Infotech and Mindtree in solving the most complex business challenges and delivering transformation at scale. For more information, please visit https://www.ltimindtree.com/.