



Avoiding accidents
intelligently: How
digitization is redefining
safety at construction sites



In 1932, to promote the upcoming 70-storeyed Rockefeller Plaza, a photo shoot was arranged. Sitting on an iron beam that juts into the skyline out of the 69th floor, 11 workers casually light their cigarettes and look at their lunch. The snap became the famous *Lunch Atop A Skyscraper*.

Looking at the picture today makes the feet tingle because quite unexpectedly and poignantly, it also captured the hazards and risks to which an average construction worker was exposed. More than eight decades have passed since the picture was taken but the industry continues to pose more or less the same challenges and threats to its core workforce.

Yes, safety norms and best practices introduced over the course of several years have considerably minimized the risks and fatalities. However, for an industry that employs 7% of the world's working population, even a seemingly marginal risk adds up to a massive health hazard.

For instance, 20% of all workplace fatalities in the last decade have been attributed to the industry. A tragic number of people die – and have died – avoidable deaths. We will explain shortly why and how it is avoidable.

For starters, we need to make sense of this number. Why is it so hazardous and risky? There are two parts to the answer:

Construction sites are dynamic, constantly evolving, and physically demanding

A site buzzes with movement and activities from day one. Machines and people coordinate and collaborate extensively and constantly to get work done. Cranes, excavators, lifts, and a whole selection of equipment keeps adding to the site as the work progresses, and interaction becomes complex and difficult. Muscle, machine and insight needs to flow together in a single direction to avoid any accident or unexpected outcome – not an easy thing to achieve.

Operations are initiated, executed, monitored and documented manually – leading to operational uncertainty

The explosive growth of automation sent seismic waves in most of the major industries. The spike in productivity, for instance, in the automobile and manufacturing industries was astonishing. But the construction industry remains untouched. The heart of its processes are manual. It needs a

safety engineer to personally witness and monitor the events to prevent any mishaps. This leads to poor or no data capture and translation of data into real-time actionable insights. And without real-time insights, accidents are just around the corner.

These two reasons – construction sites are constantly evolving and operations are deeply manual – are two sides of the same coin, and explain why the fatality is high. But they also provide us a window of opportunity for disruption.

A new – Digital – way to operate

Electrification and mechanization of the construction processes once simplified work and eased the burden of labor on workers. And today, digitization is primed to make the work safer, more efficient and productive. The progression is from hard to easy, easy to smart, and smart to safe.



What? Bringing intelligence into mundane tasks

One of the four causes of fatality according to OHSAS (Occupational Health and Safety Assessment Series) is being struck by a moving object. For example, cranes colliding with adjacent cranes due to human error, collapsing due to overuse, etc. are some of the most common causes. Via digitization, with IoT, Cloud and Mobility, we can not only predict but also prevent the collision in real time. People and machines can interact intelligently and get insight before accidents.



How? Smart operations and real-time tracking.

The anti-collision system can be configured to capture the movement of the machine, speed, temperature of operations, and fuel consumption, among numerous other health parameters.

The program also triggers specific actions based on prior programming, when a particular safety criterion is met. To analyze performance, all that needs to be done is to extract equipment repair and maintenance data from the integrated work-order management. Automated analysis of equipment running hours measures the

productivity and efficiency of the equipment, which helps prevent overrunning the crane beyond its limits.



Who? Workers instead of operations.

Digitization puts the operator and workers, instead of operations, at the center. It vastly minimizes operational uncertainty, eases the burden on the safety engineer to identify potential risks and finally ensures that the equipment itself is working within healthy and safe limits.

The solution bridges the existing gap between machines, operators and safety engineers. It ensures that no data goes uncaptured, no movement is unsafe, and finally no collision happens without prior warning and anticipation. The solution, ultimately, ensures transparency and accountability. The engineer can find out which operator is doing well and operating within the safe range by taking a look at the operations record.

Some of the immediate benefits you can draw include:

- Zero accidents
- Increased equipment safety
- Increased efficiency
- Insights from data analysis
- One system for all
- Ease of use
- Lower operating costs
- Automated database querying

There are long-term benefits as well. A history of safe operations means a competitive edge for your company. It also directly translates to the well-being of your employees, no delays in work due to accidents, no cost and schedule escalations, and finally, systematic and timely delivery.

Conclusion

It is time that the construction industry recognized a fundamental reality: health and safety do not merely depend on precautions but also on proactive innovation. It depends on bringing together – like we alluded to earlier - muscle, machine and intelligence. Digitization may soon be no more an option but an obligation.

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