



## Is your workplace safety a differentiator? The power of environmental health and safety



### Abstract

In today's dynamic and demand-driven market, global enterprises are more competitive than ever. Technology can help keep pace with rapidly evolving operational, production and compliance environments. And if you are an asset-intensive industry, your workplace by its very nature involves significant risk. Stringent regulatory and compliance requirements heighten corporate responsibility and require additional investment, measurement and reporting. This can be complicated as assets are typically spread across a wide geographic area, overseen by a field-based workforce, and subject to physical and environmental stress in potentially hazardous environments.

However, the advent of advanced technologies - which include elements for environmental monitoring, biometric sensing and process monitoring, and machinery condition monitoring - makes it possible to take environmental health and safety to new heights. But amplifying people and processes with the right digital technologies and devices to help make smarter and faster decisions is no simple task.



Imagine you're one mile beneath the surface of the earth. Your firm is extracting rare and precious metals that are used in a number of industrial processes. The deeper you go, the more potential there is for danger – a cave-in or a cloud of noxious gas. Luckily you and your colleagues are outfitted with the latest biometric body straps that you can wear like a belt. The biometric strap is outfitted with sensors that monitor conditions such as heartbeat, blood pressure, and body temperature.

A mobile app displays these vital statistics for your reference and also communicates to a call center via Bluetooth, and Wi-Fi technology sends the information to a remote location using GPS and the cloud. This device is able to send real-time information up the value chain remotely so that executives in the home office can monitor and manage employees in the field. This seamless operation radically changes the way to manage your field engineers and enables quicker insights on their health condition and response to people across the entire network. And it keeps your people safe.

## Embracing technology to enhance occupational safety

There are risks associated with every workplace and the impact can vary between relatively slight to hugely devastating. In the most extreme cases, the impacts are personal, financial and reputational. The existing systems for health and safety at most industrial workplaces, whilst perhaps sound, have failed to keep up with the pace of change and trail behind industrial and technological developments. Safety, like the industries it serves, is much more complicated than it used to be.

Organizations can use technology to proactively identify workplace hazards and establish more comprehensive goals toward hazard reduction. The strategy should be to go beyond compliance to systematically reduce risk and improve worker, equipment and process safety.

For any business the workforce is a vital asset, especially for companies in the process industries—manufacturing,

chemicals, mining, energy and utilities—where a critical factor in meeting challenges is reliant on the health of the workforce. Developing ways to ensure your people are safe is not easy because the manufacturing industry is complex and disconnected, relying on a network of systems, processes, assets and talent to keep it moving forward.

Today the combination of wireless sensors and sensor networks with computing and artificial intelligence have built a cross-disciplinary concept of ambient intelligence in order to overcome the occupational health challenges faced by every industry. Body sensor network systems help people by providing healthcare services such as physiological monitoring. This manages the capture and transmission of comprehensive physiological data from the wearer via mobile and fixed data networks, enabling genuine remote monitoring of human performance and the condition of personnel deployed in the most challenging environments.



## The Infosys Internet of Things Platform

Infosys partners with companies in asset-intensive industries to create innovative and technology-enabled health and safety solutions. Think of the biometric strap coupled with a remote management platform. The device monitors engineers, sets alert thresholds, and analyzes trends. Companies can set policies and metrics for each one so that whenever the feed goes below a predetermined threshold, it sends an alert. It can tell the company if the field engineer is standing up or has fallen down. It charts the person's activity level over time and comes up with a standard health profile of that employee. The biometric strap can even independently call for emergency services, such as an ambulance.

This real-time monitoring of employee health is built using the Infosys Internet of Things Platform – a dynamic solution with multiple features, including a mobile app for field engineers, one for facility managers and a Web-based remote monitoring server application. These

can monitor in real-time physiological parameters such as heart rate, skin temperature, breathing, body posture and activity level and broadcast all of this data to a remote monitoring and management server.

### Key features of the Infosys Internet of Things Platform:

- End-to-end solution for real-time monitoring of vital health parameters
- Real-time and continuous measurement of vital physiological parameters
- Ability to configure thresholds for individual health monitoring
- Real-time and historical reporting and analysis
- Emergency services integration

### Business value:

- Centralized monitoring of employees in multiple places along with real-time location information – saving resource management time and

enabling faster issue resolution

- Enhanced health and safety intervention via real-time monitoring of vital health parameters
- Reduce fatalities by up to 90%
- Risk assessment development and visibility
- Greater safety compliance.

Smart companies use these advanced solutions to better care for their employees. It also means that their modeling includes more data. By taking more granular asset data into consideration, including additional data dimensions that enable them to create models that are more quantitatively based, companies are arming themselves with sharper insights. This means they can make better informed, and faster, decisions. This intelligence enables enterprises to better manage commercial risks such as potential order delays; associated revenue loss and penalties; health and safety of employees and facilities; and last-mile brand impact in market.



## The Infosys difference

Infosys collaborates with partners and customers in the field of environment, health and safety to help amplify existing approaches with the power of technology and software:

- We have adopted data models to help standardize data capture for integrity management systems that meet a host of regulatory maintenance requirements
- Rules engines help enterprises model the various regulations and conditions to be monitored and, if need be, trigger action
- Enterprises receive all this data on powerful and easy-to-use visualization tools
- Personalized dashboards for each role help users focus on relevant data for better decision-making
- Mobile solutions capture data in the

field and also enforce compliance to procedures by mandating users to follow the process steps.

### Recent customer highlights include:

1. Implementation of a biometric field engineer safety monitoring solution for one of the largest manufacturers of escalators and elevators worldwide. Infosys developed and deployed three applications:
  - Mobile App for Field Engineers: An Android-based mobile application that gathers physiological data from a smart fabric strap equipped with biometric sensors. Data includes heart and breathing rate, ECG data, temperature, posture and activity level. Sends physiological data to the remote monitoring server via a wireless connection, enabling commands such as 'Time to Leave' and panic button activation.

- Remote Monitoring Server: A Web-based service that enables real-time monitoring of field engineers' physiological condition and health. Customizable alert thresholds allow safe working environments and policies to be set and monitored. Alerts are triggered when the parameters are abnormal or when the 'panic button' is initiated by a field engineer via SMS, e-mail, or the Web. Sends "Time to Leave" instructions to field engineers after the expiry of safe working hours in lift shafts, and other hazardous work areas. Integrates directly with other enterprise systems and/or emergency services.
- Mobile App for Facility Managers: Control center that receives alerts when physiological parameters of field engineers is abnormal. On-demand monitoring of physiological conditions and

health status. Ability to assign other staff in the network to deal with emergencies and enables tracking of action taken.

The Infosys solution was designed for people deployed in harsh and remote environments, providing real-time monitoring and reporting for multiple individuals and teams simultaneously. It ensures faster response times in emergency situations as well as a reduced number of accidents as the vital parameters of field engineers are continuously monitored and action is taken before they reach critical levels.

2. Development of a centralized dashboard for a leading mining company that needed to implement continuous remote monitoring of its field-based personnel. The key safety driver was to quickly mobilize help for miners working in life-threatening conditions (cave-in

zones), for moving personnel from unsafe zones (such as those filled with noxious gases), and/or rushing help in case of fire in the mines and equipment injuries. The company also wanted real-time tracking—of its miners and workers at high risk—to be available on mobile tablets in the form of data-rich map visualizations so that in case of an emergency alerts could be sent to the supervisors immediately via SOS calls. Infosys created a dashboard that identified the severity of the breach and the personnel affected, was able to notify affected people to evacuate and move to the nearest safe zone, and enabled continuous monitoring to ensure all affected people were evacuated. The system delivered immediate benefits including faster evacuations of miners in case of an accident, continuous tracking of

high risk workers (i.e. near to smelters, chemical tanks or furnaces), faster mobilization of specialist resources (medical, support engineers, firefighters) and a reduction in the cost of miners insurance health cover through the improved health and safety matrix.

The unique bridge that Infosys has built between the digital and physical worlds is our biggest strength. As a technology enabler for Industry 4.0 we believe safety and security are both critical components of smart manufacturing systems. We implement technology components including condition monitoring tools to ensure that production facilities and the products themselves do not pose a danger either to people or to the environment. Our solutions have a track record of proven experience, helping to create value and transform maturity levels for Industry 4.0-enabled asset efficiency.



## About the Authors

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