



# ENTERPRISE DISRUPTION

DRIVING VALUE THROUGH  
CONNECTED INDUSTRIAL WORKERS

# There are millions of industrial workers in the world today.

These people are often highly skilled and highly mobile, performing the high-level, complex tasks that keep critical operations running in high-risk industrial environments like the energy sector, or in process industries like manufacturing and chemicals.

The growth of digital technology and the Internet of Things (IoT), together with the convergence of operational and information technology, heralds a new era for these workers. By enabling a connected industrial workforce that can use smart devices, and IoT-enabled assets, whole new levels of operational performance and safety can be achieved.

# In action today

**This is not just about tomorrow's technology. It's ready now, available today and capable of helping to drive improvements in real-world industrial environments.**

For example, KPN, a European telecom company, ran a pilot using wearable technology in a group of field workers: this found that quality improved (18 percent less rework) and average handling time was reduced (by 17 percent). Similarly, Airbus, a worldwide leader as well as Europe's largest aeronautics and space company, is using wearable technology to help operators reduce the complexity of assembling cabin seats and decrease the time required to complete the task. As a result, productivity was improved by 500 percent for this particular process and the error rate was reduced to zero.

Industry agrees that the connected workforce has a critical role to play: in our survey<sup>1</sup> of more than 500 manufacturing executives in North America, Europe and Asia, we found that 85 percent believe connected workers will be commonplace in their plants by 2020. And more than half see large productivity improvements coming from enabling these connected workers. In another survey,<sup>2</sup> executives report direct bottom-line benefits: about one-third say their use of connected workers has decreased operating costs (34 percent) and overhead costs (31 percent), while 30 percent say it has increased revenue.

---

## KPN

**KPN, a major Dutch telecommunications company, asked Accenture to explore how wearable devices might support its field force activities. Together we piloted a solution that provides hands-free visual instructions, checklists, pick lists, work orders and other instructional information to the company's employees as they perform field work. It helps KPN engineers better manage and execute their work orders, as well as enabling expert collaboration and data capture in the field. KPN has identified productivity improvements of 30 percent as a result. This program won the GSMA's Global Mobile Award for "Best Mobile Service for Enterprise" category in 2016.**

# The connected industrial worker – a day in the life

**To help businesses realize benefits like these for themselves, we've developed the "Connected Industrial Worker" – a multi-value solution leveraging field-tested mobile, sensor, asset-tracking, analytics and wearable technologies to help execute the work activities of an industrial or field worker more effectively.**

Here are some practical applications for this solution in a day in the life of an industrial field worker deployed to service and maintain plant equipment:

1. The connected worker begins the day by securely logging on through a smart device and receiving a work order either on a smartphone or through some type of wearable like a heads-up device. Their control center knows precisely who has logged on, when and in which location.
2. The worker's devices interact with smart sensors in the work environment to verify they are in the right permitted location and have the right components, tools and materials to complete the tasks.
3. The worker has easy access to smart operating procedures, and both generic and asset-specific instructions and checklists. Carrying hundreds of pages of unwieldy manuals prove a thing of the past.
4. At the point of repair, digital coaching capabilities can be provided through a smart device or wearable, enabling the worker to interact virtually with offsite expertise. It can be a huge step forward in safety and efficiency, especially for less experienced workers.
5. Once they've completed their tasks, the worker simply updates the work order, captures a picture of the asset and adds any comments required to close. With all of this managed seamlessly across "on-line" and "off-line" modes of operation, risk of lost work or data is reduced.
6. In hazardous and large industrial work environments, the worker would also wear location and hazmat sensors that can monitor, for example, levels of environmental toxin exposure, as well as the worker's location. This information is provided to the control center personnel who have a holistic and consistent view of the safety and well-being of all workers.

These examples show how the connected industrial worker offers huge potential for improving industrial and operational outcomes – from facilitating faster decision-making, safer work environments, less non-productive time and travel and fewer mechanical failures to less rework, better training experiences and improved security and identification of onsite workers.

---

## **AIRBUS**

**Accenture is working with Airbus, one of the largest aerospace manufacturers in the world, to make use of the latest wearables technology on the A330 final assembly line. This initiative is helping Airbus operators improve the accuracy and speed of cabin seat marking processes. Innovative heads-up display technology enables the company's aircraft seat locations to be marked down to the millimeter and checked for accuracy and quality. As a result, productivity has been improved by 500 percent for this particular process and the error rate reduced to zero. Airbus honored Accenture with its 2016 Best in Class Award for Innovation for this program.**



# Getting started on the connected worker journey

**Creating a connected industrial workforce means embarking on a journey. And it can be hard to know where to start.**

Deploying new technologies among a workforce that may find them unfamiliar or daunting can create challenges. In the Accenture research previously mentioned, just 22 percent say they've implemented the promise of connected workers in their industrial operations. And 85 percent view their own organizations as "digital followers" or even "laggards" in implementing the benefits of a digital workforce.

That's why we set out to identify **four key areas that we believe are essential in determining how to prioritize and implement your connected industrial worker journey. These are:**

## **1. UNDERSTAND THE OUTCOMES YOU'RE LOOKING TO INFLUENCE**

Any organization setting out on the connected worker journey should start with its business objectives. What is your organization trying to achieve? Are you looking for operating efficiencies and cost reductions?

Are you trying to improve worker health and safety? Or are you seeking new sources of revenue by providing new services to customers in the field?

Once these objectives are understood, an organization should identify the key performance indicators (KPIs) most important for delivering them. Take the example of an oilfield worker tasked with repairing a pump to extend the life of the asset. To measure the pump's performance, we would collect information including its location the nature of the failure and its maintenance and repair history. Using analytics on this data, we'd be able to deliver recommended preventative maintenance tasks to the worker.

This shows how, once relevant KPIs have been identified, Industrial IoT technologies can better inform and help prioritize field activities based on real-time performance of assets and data-collecting sensors.

## 2. UNDERSTAND YOUR USER ENVIRONMENT

Great ideas and great technologies need to work in the field. Impractical or unrealistic solutions will inevitably fail to deliver on their potential. It's why understanding the user environment is the critical second step in verifying the practical application of your connected worker solution. This understanding will form the basis of the way you design, deliver and visualize the data provided to your workers. For example, the Accenture Connected Mine solution is a good example of combining environmental and asset data in the cloud to help mining companies more effectively manage in-pit operations and worker safety, for example, monitoring blink rates and movements to identify worker fatigue. Organizations should start by analyzing their workers' activities and building a solution that helps address their specific challenges. This means scrutinizing the conditions under which your connected workers will operate, asking questions like "Can they use their hands or might they need a heads-up display?", "What are the light and moisture levels – are they working in dark and wet environments?" or "Are they working in dangerous conditions where worker safety is at risk?"

## 3. IDENTIFY YOUR DATA REQUIREMENTS

Once the performance outcomes and user environment are fully understood, the next proposed step is to understand your data requirements. This means identifying what data already exists in the organization and what new data might be required. Which existing systems can be tapped into and used to feed data to workers' devices? What data is already being supplied by assets in the existing environment? What formats are these different data sources in – will new interfaces be required to translate them into a common standard for practical use? Where there are gaps in the data, what would you need to do to capture, format and distribute what's required? Restrictions on sharing certain types of data and appropriate security measures also need to be assessed.



#### **4. BRING IT ALL TOGETHER IN A SOLUTION THAT ADDRESSES TARGETED OUTCOMES**

Building a connected worker solution begins, and ends, with the workers themselves. Don't overlook how the workforce feels about the introduction of new technologies that may be unfamiliar and could disrupt established working patterns. Instead, engage them in the design of the solution from the outset. Demonstrate your solution's potential to provide real-world, day-to-day value for each worker by, for example, highlighting safety improvements. The major resources company (see sidebar) is an example of how connected devices improve worker safety and productivity.

As with any technological shift, a spirit of experimentation is needed. So be prepared to embrace agility and start small with pilot schemes, testing your assumptions as you go. Set targets, measure outcomes, and if any have been missed, ask yourself why. Analyze and learn from pilot results, then iterate and refine your solution before scaling it up. Plan and execute to a production-level solution, considering the implications of scale on resources, systems integration, time and cost.

---

### **MAJOR RESOURCES COMPANY**

**Accenture teamed with a major resources company in the use of RFID location triangulation technology. To support improved turnaround execution, our solution provides the company with real-time visibility of the location of over 1,800 contractors and pieces of equipment during major industrial shutdowns. This kind of technology not only facilitates real-time decision-making, but also provides the basis for detailed trending and improvement analysis. The capabilities of the solution have supported improvements in safety, in productivity and in proper cost auditing for vendor work management.**

# Reaching the destination – a connected workforce

**Industrial and process organizations face unprecedented pressure to improve operations, improve maintenance and provide a safe work environment. These are all core areas where the Industrial IoT can make a real difference. Some organizations are already realizing these benefits today. For others that have yet to set out on their journeys, your future connected workforce awaits.**



