So, how did something such as “friend/foe ID” lead to breakthroughs that are reshaping industry?

To answer that, we go back to 1945, when museums around the world devoted space to the scientific breakthroughs that helped win World War II. Into one such museum in New York City wandered a small boy, a son of Italian immigrants. Young Mario Cardullo marveled at the achievements, taking note of the “friend/foe ID” system.

As an adult, while working as an engineer, Mario had an epiphany: by attaching a memory chip to the “friend/foe ID” system, you could create a network of sensors, feeding real-time data into a central repository for analysis, vastly increasing the available data and lowering the time and labor needed to track items in the system. With that, Radio Frequency Identification or RFID, a building block for the Internet of Things, was born.

I was the guy who invented the RFID but never made a penny.

Never one to be thrown by a setback, the insatiably curious and creative Mario Cardullo, — who also invented the first quick-cook pasta and helped the Apollo program put a man on the moon — has kept dreaming big at the age of 82. But this time he’s going small. As small as you can imagine, down to the fraction of the size of a human blood cell. That’s the size of the next generation OF RFID that Cardullo is developing.
This new nano RFID could open up whole new possibilities – forget just smart cars, we’re talking about smart paint, smart ink, smart bandages, smart meds, all deeply interconnecting the world.

Cardullo has said that nano RFID, or “NR” for short, could result in:

A world of global information systems, which will be available from all clothing, any surface. We, at NR, are postulating to build this mesh network that will track, monitor everything that is made or modified. They could even create a global computer linking every item as in Pierre Teilhard de Chardin’s Omega Point, a great philosopher of the twentieth century, where ‘no evolutionary future awaits anyone except in association with everyone else.’

With such massive potential, Cardullo is perhaps being a bit modest when he states:

This is a game-changer.

Before we reach Chardin’s Omega Point, innovative companies are utilizing RFID and a suite of smart connected tech to provide operational excellence while prioritizing the safety of their workers. Safety in the past might have meant better hard hats. But today Tracey Countryman, Accenture Resources’ Industry X.0 practice lead, is helping some of the world’s most complex oil and gas, chemicals, natural resources and utilities companies apply cutting edge tech to track workers.

Keep in mind, these plants are miles in size, so it’s not easy to have a pulse on where each individual is or if they’re alone, or if they have access to what they need to do in an emergency response in all cases.

So, what if you could use real-time data to track employees and contractors precisely across a plant? What if you could integrate the data on one digital platform that would alert not only to all of your workers’ locations, but also if they’ve been exposed to risks? A recent report for the American Academy of Chemical Engineers found that as much as 70% of major accidents occurring during non-routine operations. So, what if you could use that real-time data and smart technology to optimize safety?

Now that we know, in fact, that there is a reading, it automatically sends a signal and it automatically logs it as a reading or a potential incident within the agency’s database and then you could actually do a real thorough review. And it really automates, what historically has been a very manual business process. But it also means that if there’s anyone at risk, they have 30 seconds and they can find that individual within the plant.

The results at early adopters of worker tracking technology speak for themselves:

Where they deployed it, they haven’t had any deaths, which obviously is the ultimate goal – to be able to save people’s lives.

A safer workplace is one of the biggest potential benefits of applying smart and connected technology. Many industrial facilities are taking it a step further and applying Industry X.0 methodologies to tackle a major challenge: industrial plant turnarounds.

Turnarounds – or planned shutdowns for major maintenance activities – are routine, typically lasting between 18-60 days, and occurring every 2 or 3 years, depending on the type of plant. What’s not typical? The swell of workers who suddenly swarm the facility – employees and contractors who may number in the thousands – that can suddenly make a turnaround unpredictable, inefficient and costly. For instance, an energy refinery can easily lose anywhere from $80 to $300 million in a turnaround and Accenture’s research has found that 60% of turnarounds go over budget and past timelines.

However, David Abood points out that companies applying Industry X.0 methodologies
can solve these types of inefficiencies to deliver more productive, predictable, and safer turnarounds:

When you deploy the right technologies, you can achieve 20, 30-plus percent savings on the cost of turnarounds, you can manage the safety at multiples of magnitudes better than previously, and you know everything that's going on and can optimize all the contractors, all the work, all the tools, all the parts, to get the outcome you need for the turnaround.

The technologies that David refers to can entail a massive suite of tools, such as pervasive wireless, analytics and mobile applications. Indeed, it is not simply the tech at hand that is transformative, but also the ability of teams to weave different tech tools together to deliver improved outcomes.

So, what's a primary reason why more companies aren't embracing this new model? Security.

It's not only about protecting your enterprise systems, and making sure nobody breaks in to steal payroll, or steal intellectual property that we've been reading about in the paper lately. But it's, how do you make sure you're protected from someone shutting down a mine, or shutting down a power grid, or doing something nefarious to a nuclear power plant. Cyber security breaches in the resources industries could be life and death type situations versus just commercial implications.

So, it's even deeper than dollars and cents. Transforming the core of your business for a digital world could mean lives saved in the near term, but open up vulnerabilities that were impossible to imagine in a pre-Industry X.0 world.

This creates scenarios and questions that must be analyzed and answered. After all, most people agree that digital is transforming our personal lives. What's fascinating is that this same personal transformation is in part what's driving the digital reinvention of the industrial world. Here's more from David:

These people, humans, who are B2B and B2C customers every day of their lives are getting exposed to all these new technologies, and they're thinking, I expect some of these new technologies in my B2B existence. If I'm a purchasing manager at a large industrial, why shouldn't I expect to buy things from my company like I buy things for myself on Amazon? And why shouldn't I expect the supply chain to be as nimble, and dynamic, and efficient as the one that Amazon gets me something an hour after I ordered it. They absolutely have expectations around digital and the new, and they are starting to express those.

So, if hyper-personalization is driving changes in the industrial space, just how personal can it get? The answer is: as personal as humanly possible. In July 2017, a company in Wisconsin called 32M was met with enthusiasm when it offered to implant RFID chips for its employees, allowing them to get by locked doors and purchase items at the company’s cafeteria. In fact, with greater efficiency and security, employees have been freed up to pursue innovative new projects, driven in part by their enthusiasm for their implants.

Here's Patrick McMullan, 32M’s President and Chief Operating Officer:

We had discussions with all of our staff and said, 'This is something we're going to do. And by zero means if you don't want it, you don't have to do this. There's no pressure. But we're going to do it.' And about 70% of employees stepped up and said 'I want to be chipped and be a part of this' and participated in it, and it's turned our employees into a bunch of innovators where our employees have really been thinking outside of the box to come up with solutions to anything —whether it's a new product idea, a new service, a new way to service our customers, a new way to sell our products. It's just generated a new level of enthusiasm that I just can't stress how much fun it's been.
With such rapid shifts in technology, Accenture’s David Abood sees planning and approach as fundamental to success.

We have not seen the pace or magnitude of technological change that can be deployed out in the industrial environment anywhere near what it is today nor nowhere near what it promises to be in the coming years. Some of these technologies will absolutely change the way that a person works in a plant or change the way a company uses another company’s product, and there will be cultural and people changes that will have to be very well thought through and then implemented effectively.

So, what’s to come from all this? Josh Klein, a futurist and acclaimed inventor working with a variety of technologies like RFID, cryptocurrency, and AI, says there is reason for hope.

It's a time of enormous, huge potential, and if you look at human history ... When Gutenberg came out, his intention was to print lots of Bibles. It turns out there were some other applications. When the internet first came out, a lot of people thought it was only for email. Turns out there were lots of other applications. Blockchain, same thing. Internet of Things, same thing. All of these networks, it all comes back to that old Gibson quote, ‘The street has its own uses for things.’ People are going to find ways to use these technologies to solve problems we don’t even know exist, and when they do, they will change the world.

While solving problems we don’t even know exist might seem like a tall ask, it’s fundamental to Industry X.0. After all, those scientists looking to give their pilots an advantage during World War II couldn’t have imagined their work would one day lead to reinventing the industrial world.

This has been another episode of Innovation Decoded by Accenture. Join us again, as we continue to break down the latest technology trends and research to help you thrive in a changing world.