JAN 19, 2017 @ 09:14 AM 1,049

Its Back To The Future In Next Generation Factories

Harold L. (Hal) Sirkin, CONTRIBUTOR
FULL BIO

Opinions expressed by Forbes Contributors are their own.

One of the next big things in manufacturing, distinguishing the factory of the future from today's, will be the widespread use of digital technologies to train and instruct employees and provide them with ongoing real-time guidance as they go about their tasks.

Some manufacturers, including several major auto makers, already have started to integrate such technologies into their operations, as Daniel Küpper, leader of BCG's Innovation Center for Operations in Germany, Peter Burggräf, chief engineer at Germany's RWTH Aachen University Machine Tools and Production Engineering Lab, and others discuss in a recent report.

Mercedes-Benz S-Class cars are lined up on the assembly line in the Daimler factory. (THOMAS KIENZLE/AFP/Getty Images)

Mercedes-Benz, for example, "has developed virtual assembly lines with digital models of the vehicles and assembly components. Employees use an avatar in the virtual environment to analyze the best way to perform an assembly task," they write. Faurecia, the auto parts manufacturer, Volkswagen, and other companies also are increasing their use of virtual technologies.

This is all very cool. But it's not entirely new.

Air flight pioneers, for example, were building flight simulation contraptions—such as the Sanders Teacher, Ruggles Orientator, and Link Trainer—more than a century ago.

Used (depending on which machine we're talking about) to improve aircraft aerodynamics and/or to train pilots, these early simulators—some of which are described on the web site of the National Center for Simulation (NCS)—were precursors to the "machine learning" and "augmented reality" tools, such as 3D glasses, that are likely to become standard in the next generation of factories.

In other words, manufacturing in this sense is going back to the future. Or as Rudyard Kipling put it in his

1905 short story, "With the Night Mail," it's funny how "the new things are the old things" in some modified new form. This is a case in point.

Interestingly, the National Center for Simulation, which describes itself as the "epicenter of the modeling, simulation and training industry," seems unaware of the extraordinary developments taking place in the world of manufacturing. NCS's web site, for example, mentions the applications of simulation, training and modeling to "military readiness, space exploration, health care, transportation, education, entertainment, and technology development." There's no mention of manufacturing.

When you think about it, most technological advances, in essence, provide a new and better way of doing something that's already being done.

In "Night Mail," for example, Kipling was writing about a future world in which trans-oceanic air travel would be an everyday affair. This was just two years after the Wright Brothers first flight and nearly a decade before the first commercial air carrier (in 1914) began carrying passengers across Florida's Tampa Bay.

Kipling's vision of the future was correct. But he got a critical detail wrong: the technology—Kipling envisioned airships traversing the oceans.

In fact, Zeppelin airships, such as the ill-fated *Hindenburg*, didn't start crossing the Atlantic until the 1930s. Instead, a newer, superior technology took the lead: the fixed-wing airplane, which had come into its own during World War I.

So it was not an airship that made the first nonstop trans-Atlantic flight, as Kipling had envisioned in 1905, but a WWI-era fixed-wing biplane, piloted by the British team of John Alcock and Arthur Whitten Brown, which in 1919 flew nonstop from St. John's, Newfoundland, to Galway, Ireland.

In all of history, relatively few scientific and technological "breakthroughs" have fundamentally changed life as we know it: the printing press, electricity, the telephone, the internal combustion engine, the airplane, refrigeration, penicillin, vaccines, the Internet, and the PC are good choices for a "top ten" list, though many other possibilities exist as well. But still, we're talking about dozens of such life-changing breakthroughs, not hundreds, over the course of many centuries.

The factory of the future is still very much a work in progress.

In preparing their report, Küpper and his coauthors surveyed more than 750 production managers worldwide. They found widespread enthusiasm for the kinds of technological changes that appear on the horizon—changes that will enhance flexibility, quality, speed, and safety.

But they also found that many companies, while willing to get their feet wet, "appear to be struggling" to move beyond that point.

Even among German manufacturers, which as a group appear to be further along in adopting these new technologies than companies in other countries (including the U.S.), there is considerable hesitation, with nearly 20% of survey respondents saying they're not ready to move forward.

Change, of course, can be frightening, for corporations as well as individuals. But the reality is: It's going to happen, with or without the hesitant. Or in Kipling's terms: The new reality is the old reality.