Who will lead the “Fourth Industrial Revolution?”

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By Sean T. Monahan

Digital supply chains, smart factories, Industry 4.0: However you describe the change upon us, the key point is just that—a change is upon us. An exponential change, at that. Klaus Schwab, founder and executive chairman of the World Economic Forum, refers to the change as the “Fourth Industrial Revolution.” To understand its implications, it is helpful to review the three prior revolutions. The First Industrial Revolution, which began around 1760, refers to a transition from manual to mechanized work, particularly through water and steam power. The Second Industrial Revolution, beginning in the later third of the 19th century, saw the advent of mass production, the growth of the steel and oil industries and electrification. Almost 100 years later, the 1950s saw the beginnings of the Third Industrial Revolution with the transition from analog to digital technologies.

In the 2010s we find ourselves in the midst of a Fourth Industrial Revolution. In it we see not only advances in science and biotechnology but also the cyber-physical systems of smart factories and the end-to-end value chains that encompass everything from raw-material extraction to conversion to distribution to use and reintegration. And whereas prior revolutions tended to be inter-generational, allowing successive generations to absorb and adapt to the changes, the pace of the Fourth Industrial Revolution will be intra-generational, with compelling new opportunities for sustainable prosperity.

But, there are challenges. Technology breakthroughs in areas such as mobile connectivity, artificial intelligence, the Internet of Things, robotics, 3D printing, biotechnology, genetic engineering, nanotechnology and advanced materials, to name a few, are radically transforming global production systems, from the individual worker on the factory floor to the globally distributed networks of suppliers and manufacturers that characterize today's typical supply chain.

Then consider the stakes for companies and governments. Companies that leverage these emerging technologies will transform their operations and business models, creating new sources of value for customers and stakeholders. Those that fail to do so risk their firms’ futures. Similarly, governments that successfully craft policies and regulatory frameworks to cultivate innovative technologies can spur economic development that benefits all of their citizens. Conversely, government miscalculations can threaten a national economy with decades of lagging performance.

What companies can do

Two defining factors for success are: a willingness to disrupt legacy ways of working and speed. More specifically:

• Provide a top-down mandate. While embraced by some, the disruptive change of the Fourth Industrial Revolution faces scepticism and resistance in legacy organizations. To enlist support and break up silos that are barriers to end-to-end transformation, the C-suite needs to communicate its vision and demonstrate its commitment to all stakeholders

• Ensure the initiative is holistic. Many organizations focus on a single aspect of their transformation. Retailers and many CPGs concentrate

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• Create pathways to production careers. The production industry suffers from a global talent gap. Preparing for a future career in advanced production requires both formal education and plenty of hands-on training. A diverse skill set is essential, as the new production paradigm requires workers to show creativity, adaptability and inventiveness as they produce highly complex, evolving products. Governments and companies need innovative partnerships that address apprenticeships, internships and higher education, along with workforce re-skilling and up-skilling programs.

• Embed a whole-of-government approach. The multiple facets of the Fourth Industrial Revolution and the multidisciplinary challenges and opportunities it raises, mandate that government agencies work together across portfolio boundaries to achieve shared goals and an integrated government response. Some governments are creating committees with the task of developing and overseeing strategy implementation and coordination for the Fourth Industrial Revolution.

The mounting pressures could tempt governments to pursue simplistic solutions intended to make them look strong and decisive in the near term. But no single government can control what is unfolding in the world. The wisest course for policy makers is to become stewards of their national production ecosystems and to collaborate with their global counterparts.

While companies and governments have their respective roles, future success requires both to collaborate. A change is upon us, and change can be daunting. But, by managing it well we can make the most of its opportunities and even lay the foundation for that inevitable sequel, the Fifth Industrial Revolution.

What governments can do

• Think broadly. Recently, industrial policy has become fashionable again, with governments using increasingly sophisticated and assertive policies to promote structural change. However, narrowly prescribed Industry 4.0 strategies that pick winners and save losers may not yield the greatest chances of success, given the uncertainties surrounding technological development and where the likeliest prospects of monetizing particular innovations and sectors lie.

• Foster research, innovation and technological readiness. Many technologies have yet to be fully developed—indeed, many have yet to be conceived—and the current prevailing picture will not last long. That makes it critical for governments to engage not just innovators and business managers but all areas of civil society in mapping multiple, flexible paths to future development.

• Democratize production knowledge. Many producers, entrepreneurs and SMEs have a limited grasp of production principles, technologies and tools. This knowledge is spread across a disparate range of sources, including tradespeople, books, suppliers, engineers and firms, which creates a major barrier to scaling up production. Governments can help coordinate and centralize access to this information.

• Gain scale and speed via one accelerator. Many organizations proudly point to numerous “entrepreneurial sparks” that experiment with emerging technologies. Unfortunately, in most cases these sparks fail to ignite because they are redundant, overly narrow, focused on interesting but non-value-added areas and unable to build the insight and momentum required to be truly transformative. Leaders establish an accelerator to coordinate, develop, test and scale new ideas.

• Enable a start-up culture. Allow bottom-up entrepreneurship, attract new talent and re-frame failure as learning, not as a cause for blame. Agile working methods can accelerate growth and shorten time to market at scale.

• Apply active change management. Foster a creative, positive culture that emphasizes transformation as opportunity rather than as threat. Change agents can energize teams and build organizational buy-in and harness their power.

on consumer engagement; heavy manufacturers look to transformation within the factory walls (Industry 4.0); product-centric organizations hone in on, you guessed it, the product. Leaders who embrace holistic transformation embrace initiatives across all aspects of their businesses.

• Establish a network of partners. The pace of change is fast and some of the best technology solutions are relatively narrow in application. Establishing a network, or ecosystem, of partners (suppliers, customers, peers) can help access, and at times co-create, the broad and developing array of capabilities that catalyze a holistic transformation.