

Emerging Manufacturing Technologies Drive Employers to Reform Talent, Organizational Policies

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One crucial lesson from the COVID-19 pandemic is that cost-effective, digital manufacturing solutions are needed to keep factories and supply chains running smoothly while producing high-quality products. This is true for all in the industry, whether original equipment manufacturers, parts or assembly suppliers, contract manufacturers, or manufacturing services suppliers.

Most manufacturing leaders appear unlikely to return to pre-pandemic work arrangements. Rather, manufacturers are seeking ways to redesign work, the workforce, and the workplace to better manage disruption and uncertainty. Many manufacturers have accelerated adoption of automation and robotics to ensure consistent output levels with a reduced workforce. To keep pace with technological changes, manufacturers also may need to increase investments in intellectual property (IP) and exponential technologies, explore “industry 4.0” digital manufacturing opportunities, increase interconnectivity of the industrial ecosystem, and rapidly adopt sensor technology, smart products, and Internet of Things (IoT) strategies and analytics. Moreover, many manufacturers may conclude that their ability to respond to major disruptions depends on a more agile workforce.

Employers can ensure their production workforce is suited to achieve their desired productivity, efficiency, and flexibility gains that are promised by emerging manufacturing technologies with workforce upskilling and job realignment, among other strategies. Steps to consider include the following:

- *Reevaluate the role and capabilities of the workforce* Some operational job losses during the pandemic could become permanent. Moreover, as robots, cobots, and other forms of automation in the production environment grow, the need for a workforce that knows how to manage and interact with these technologies also increases. These roles require high levels of technical expertise and regular upskilling.
- *Develop programs for employee upskilling and building new skills* to match evolving work environments (such as automation, digital, and remote).
- *Assess and address existing employee handbook policies, and, if unionized, collective bargaining agreements.* Digital operating models and technologies require greater flexibility and problem-solving capabilities. Manufacturers are adding sensors and machine learning to production lines to predict, prevent, and even fix problems before they occur. In addition, they are evaluating vision systems with data analytics to improve in-line quality of products or parts. Each of these initiatives will likely impact how and where work is performed. For example, using a digital model, a

manufacturer can virtually recreate a product, its production, and even simulate its performance without having to “bend metal” to test the product.

- Is there a collective bargaining contract provision that may preclude the manufacturer from relocating, turning to an alternative production site or methodology, or upskilling or defining the workforce for manufacturing the product(s) currently being made by bargaining unit employees?
- *Address prevailing skills shortage.* Attract, recruit, and retain human capital with needed skills and knowledge for implementing industry 4.0 technologies. What is needed is greater agility and cross-functionality in the way manufacturers define roles, the skills needed for them, and training programs to reskill the existing workforce. Coincident with the shift in *where* and *how* work is done, manufacturers must ensure their workforce’s skills mesh with emerging technologies.
- *Cyber risks.* HR and IT coordinate development of employee education and awareness training to mitigate “internal threats” to data security and IP. Many workers already use computers, smartphones, and other equipment that allow employers to monitor their activity and location, even when off duty. However, as the manufacturing sector moves closer to an “industry 4.0” paradigm, cyber has become a broad business risk, encompassing nearly every aspect of a company’s operations, from R&D to the factory floor, and from the supplier to the customer. In the age of the IoT, and the frequency with which employees are permitted, if not encouraged, to Bring Your Own Device, manufacturing companies are increasingly exposed to new and potentially more disruptive cyber threats.
 - Has the organization developed, implemented, and documented industrial control system (ICS)-specific policies, standards, and procedures so that employees understand its stance and procedures on ICS security?
 - Are awareness programs tailored to address special considerations for high-risk employee groups handling sensitive intellectual property, ICS, or connected products?
- *Assess legal compliance regarding employee privacy, EEO, and wage-hour laws where personal devices allow monitoring or blurs historical definition of regular workday.*

The future is one in which robotics and other technologies capture huge amounts of personal information to feed artificial intelligence (AI) software that learns which metrics are associated with things such as workers’ moods and energy levels, or even diseases like depression. AI software programs used in the hiring process are marketed as reducing biased human decision-making. In fact, they can create more bias, because these systems depend on the input of assumptions and large collections of data, which can be biased themselves. The laws about discrimination based on computer algorithms are unclear, just as other technologies stretch employment laws and regulations well beyond their clear applications. The legal landscape is likely to evolve further in protecting individual rights of privacy in the workplace.

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