Industry 4.0 Elicits Careers of the Future

Tomorrow's "cool" careers may follow the rise of manufacturing.

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I am a lifelong resident of southeastern Wisconsin, a region chosen last year by the largest contract manufacturer in the world to build a 20-million-square-foot complex (yes, you read that right, 20,000,000 square feet) that is being billed as the most technologically advanced manufacturing facility on the planet. Predictions about the impact of this project abound, but my favorite one is that the Midwest will become the nation's "epicenter of Industry 4.0 technology," bringing with it a host of new career opportunities.

One of the lead industrial engineers working on this transformative project shared some examples with me earlier this year. Thirty years ago, my classmates used to brag about their plans to be doctors, lawyers and investment bankers. Those were the cool careers. Tomorrow's "cool" careers may look more like those below. Each includes an MKF—My Kid Factor—meaning, "I would want my kid to consider this job." The scale is 1-10.

App Developer: as mobile apps become ubiquitous in industrial processes (think monitoring quality and productivity directly from your smartphone), people possessing a familiarity with manufacturing, combined with the requisite software and programming skills will find a prosperous future in industry. (MKF 8)

Automation Engineer: these people design, develop and test advanced manufacturing technology. Curiously, this occupation is the "fourth happiest job in America," according to *USA Today*, in part, I believe, because automation engineers get to work with really amazing technology, and also maybe because their bosses have no idea how they do what they do, so they get left alone at work. (MKF 9)

Electrical Engineer: responsible for the electrical aspects of systems, from the device level (a smart sensor on a machine) to the enterprise level and everything in between, electrical engineers will be in high demand in an Industry 4.0 economy. (MKF 6)

Industrial Engineer: the purpose of this role is to optimize industrial processes, reducing bottlenecks, eliminating waste, increasing yield and thereby maximizing efficiency. As technology on the manufacturing floor has become more complex and software-driven, so too have the aptitudes necessary to be successful in this career. (MKF 5)

Interface Developer: people who choose this career develop the software and hardware that connect people to machines and software. Think the human machine interfaces common in many industrial facilities. (MKF 8)

Mechanical Engineer: Imhotep is said to have built the Pyramid of Djoser in about 2630 B.C., dawning the role of the mechanical engineer. No longer designing pyramids for pharaohs, in an industrial setting the mechanical engineer's responsibilities might include the planning and design of mechanical systems and processes, conveyorized and automated material handling and product transfer systems. (MKF 6)

Production Engineer: the role of the production engineer is similar to that of the industrial engineer, but with increased emphasis on the execution of manufacturing processes. (MKF 5)

PLC Programmer: called by some the computer of manufacturing, the programmable logic controller receives information and turns it into output. For example, a material-handling system on an automated production or processing line is likely controlled by a PLC, taking an input signal from a sensor that indicates a part is ready to be moved and sending an output signal to a mechanical lift system to move the part. PLC programmers design these programs, enter them into the PLCs and troubleshoot industrial operations when necessary. (MKF 6)

Quality Engineer: responsible for overall product quality throughout the supply chain, quality engineers may also have a role in executing the processes designed by the test engineers. (MKF 5)

Systems Integrator: robotics, conveyors, material-handling systems, PLCs, industrial control systems and computer networks and the related software are becoming inextricably linked in manufacturing, requiring people with knowledge in all of these who are capable of making them work in concert. (MKF 9)

Test Engineer: these individuals design and operate the processes and systems used to ensure a product conforms to its specification. As quality control functions are performed automatically and in process, using technologies such as vision systems, 3D scanning, advanced coordinate measuring machines and tomography, the role of the test engineer is becoming an increasingly technical and engaging vocation. (MKF 8)

The same engineer who shared these careers with me was asked whether each would require a four-year degree, or if candidates with associate degrees also could be considered. No offense intended to those with bachelor's or master's degrees among us (myself included), but the engineer's response was "a lot of times the two-year people are smarter than the four-year people."

Know a young person considering a career pathway? Encourage him or her to consider the careers above and be open to the possibility that a four-year degree and the debt that may accompany it is just one of many means to an end. If your career choice has already been made, prepare for a future of lifelong learning, the only way to ensure your aptitudes remain relevant and your skills valued in what promises to be a wild ride.