

The future of manufacturing: Your people

New technologies are an enabler, not merely a goal in themselves.

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If you read much of what is being written about manufacturing today, you would believe that advanced technology is the key to a new level of production performance. Players in multiple industries are reporting their success with novel approaches, from big-data analytics used to optimize cycle times in highly automated production lines, to front-line operators equipped with augmented-reality glasses to help them locate parts or fix faults on complex machines.

These prominent examples can obscure a darker and much larger truth, however. In many cases, even large-scale implementation of technological solutions doesn't deliver hoped-for improvement in productivity, cost, quality or reliability. In our experience, the problem usually isn't a lack of investment in technology, but a lack of accompanying investment in companies' most important asset: their people.

From the steam engine to the neural network, no technology can achieve anything by itself. Value emerges as a combination of the tool and the people who operate it. Yet we've seen too many cases where that simple truth has been forgotten in the wave enthusiasm for a new approach. Advanced solutions often fail not because they produce erroneous results, but because the workforce doesn't understand, or trust, those results.

And the human factor isn't going to go away. Today's best estimates suggest that around 60 percent of current manufacturing jobs could already be automated, but that process is expected to take decades. Even companies working in sectors that are relatively straightforward to automate will rely heavily on their human workforce until at least the middle of the century. And after that, they will still need people to manage, adapt and optimize their automated assets.

Bringing productivity back into focus

We believe that the senior leaders of many manufacturing organizations need to start asking different questions as they think about the investments and changes they will make in the coming years. Rather than, "How can we apply this technology?" the fundamental questions should always be "How can we achieve the productivity improvements our organization requires?"

It is likely that advanced technologies will be part of the answer to that question, but ensuring that people have the skills, mind-set, and behaviors to use those technologies effectively will be equally important.

Performance is a moving target

An organization's improvement goals are set by the market. The required levels of quality or delivery performance may be determined explicitly by its customers, or implicitly by the levels achieved by its major competitors, and those numbers are evolving all the time. Unless it has the freedom to increase its prices, a company must continually raise its labor productivity by at least the rate of inflation, or its margins will eventually disappear. Other factors, including rising raw material prices, currency fluctuation and shareholder demand, may also create pressure to increase productivity even further.

Optimizing returns

Once an organization understands the rate of improvement it needs to achieve, it must decide which approach, or combination of approaches, it should use to obtain those improvements. These decisions should be determined by return on investment (ROI) calculations.

Evaluating different improvement options in terms of ROI is a powerful way to ensure a company exploits all the simpler, lower-cost options at its disposal

before embarking on complex and costly technology projects. In manufacturing, that means ensuring the operation is running on lean-management principles—hence, investing first in your people.

Calculating the comparative ROI for lean-management approaches and technology-driven solutions can be an eye-opening exercise. Take shop-floor performance management, for example. The basic “capital equipment” required to implement lean performance management is a white board and some pens for each manufacturing cell. If shift leaders are trained to run effective performance dialogues with their teams, lean performance management will typically deliver a 5 to 8 percent performance improvement. That’s a return on investment that few high-technology solutions can claim to match.

The message for manufacturing leaders should be clear: ensure you pulled all the “analog” lean-management levers before embarking on digital approaches. The implementation costs of digital solutions can only be justified if the payoff is significant. Indeed, in our Industry 4.0 Global Expert survey, 61 percent of respondents cited lack of ROI as a major obstacle when implementing Industry 4.0 solutions at scale.¹

A place for technology

That doesn’t mean that there is no role for advanced digital solutions in manufacturing. Some lean-management levers can be enhanced through the use of advanced technologies, such as electronic performance dashboards that track overall equipment effectiveness (OEE) automatically, or computer-aided root-cause problem-solving tools. Even these approaches need people with appropriate training to use them, however, and that requires investment in your people. Other levers cannot be pulled without advanced technologies, such as robots and automated guided vehicles, or the use of artificial intelligence to improve yield.

The right balance between traditional and advanced technology-enabled levers will vary by country and industry. For example, in high-cost countries, it may make sense to maximize labor productivity by front-loading automation. But contract terms or similar constraints may mean that a quick transformation is not possible, reducing automation’s attractiveness.

Once a company has thought through the relative costs and benefits of different improvement levers, it will be in a position to choose the combination of approaches that will allow it to achieve its performance aspirations. In all likelihood, this will be five to ten levers, not 30 to 50. And the success of each of those approaches will depend on the ability of the organization’s people to work with them.

Building the workforce of tomorrow

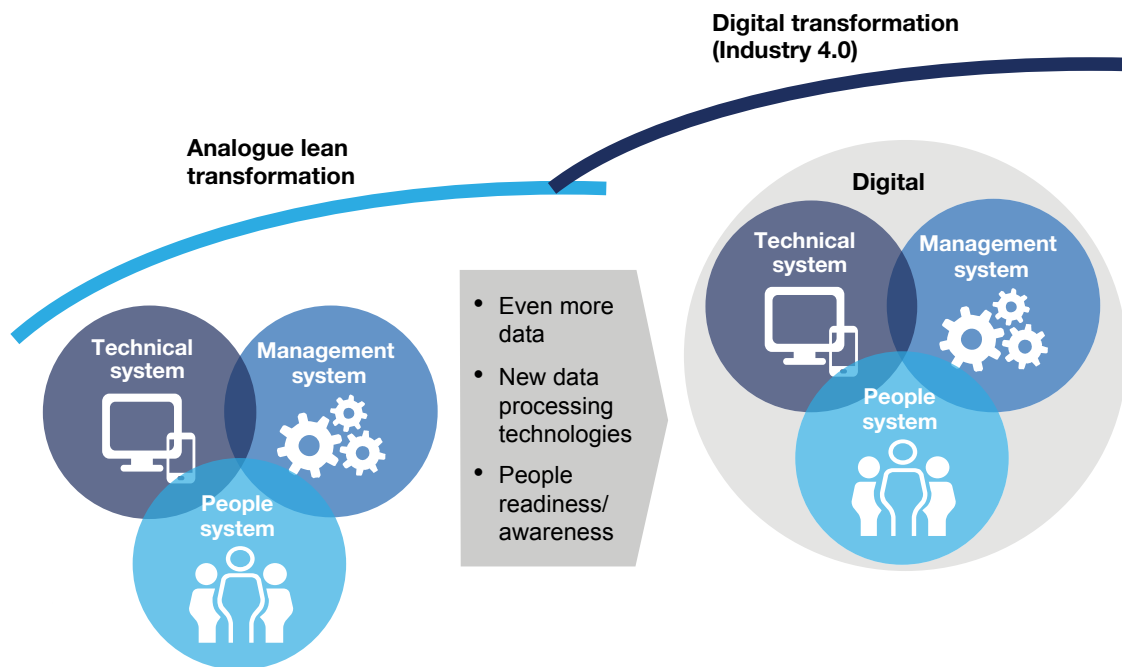
As we move into the digitized future, a new type of capability building will be essential, requiring further investment in your people. Manufacturing personnel will need to be able to use all the tools in the traditional lean-management toolbox, such as waste identification and root-cause problem solving. And they will also need to become comfortable with complex and sophisticated new tools, such as robotic systems or advanced analytics (exhibit).

Experts with specific skill sets will be required to install and maintain each of the new technologies, and since the availability of people with appropriate skills will be limited, companies will have to develop new capabilities internally to avoid shortages.

There will also be a requirement for the broader set of workers in the plant to work with these technologies, and to bring to them the benefit of their deep domain expertise. Furthermore, rising productivity will mean a smaller workforce, so each remaining employee will have a greater influence on overall performance. That will increase the imperative to develop skills, capabilities and mindsets.

Exhibit

A digital transformation requires even more capability building for employees.



Managers will have to educate operators about the changes advanced technologies will bring, and inspire them to embrace the new way of working. The challenge for the broader workforce is that they have spent most of their working lives in much simpler settings. Managers will have to convince the workforce to accommodate black-box technologies, trusting their outputs and recommendations even if they do not fully understand how these systems operate.



People will remain at the core of productivity increases in most industries for the foreseeable future. We believe that advanced technology-

enabled transformation (“Lean 2.0”) will have very similar characteristics to the lean transformations of the past, and face similar barriers to implementation. As in the past, these transformations will depend heavily on cultural factors, including management support for change and the willingness of employees to embrace it.

Every company should begin the next stage in its journey by clearly defining the rate of performance increase its business requires. This should be followed by a thorough assessment of all the levers available to achieve this—some of them will require investment in advanced technology, and some will not.

But every organization's ability to achieve its performance improvement aspirations will depend on how it builds the capabilities and mindset of its people. ■

¹ McKinsey Industry 4.0 Global Expert Survey, 2018.

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