

Operations Practice

# The Fourth Industrial Revolution and manufacturing's great reset

Manufacturers that are ahead in scaling advanced production technologies are successfully navigating four durable shifts that are critical to managing unprecedented disruption.

*by Francisco Betti, Enno de Boer, and Yves Giraud*



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**Since its inception in 2018**, the Global Lighthouse Network (GLN) of advanced manufacturers has demonstrated how leading companies can work toward realizing the full potential of the innovations and advances at the core of the Fourth Industrial Revolution (4IR). Beginning with a select collection of leading-edge organizations, we have seen how lighthouse factories can help entire organizations navigate their modernization journeys, inspiring and catalyzing change among partner organizations along the way.

That's why GLN now comprises 54 sites, with ten sites added in Q3 2020 (Exhibit 1). This growth reflects the accelerating adoption of core 4IR technologies, and their infusion into daily manufacturing and supply-chain operations, as organizations act on a new urgency to remain competitive—even as others have fallen behind, still stuck in pilot purgatory.

GLN includes companies that have achieved remarkable 4IR advancements within the four walls of factory sites or have effectively implemented end-to-end (E2E) digitization across the value chain. Indeed, in both cases, 4IR technology has powered the reimagination of manufacturing and supply chains across industries and sectors.

Moreover, an essential aspect of lighthouses' success lies in a dedicated focus on workforce development and capability building through a variety of means. Indeed, these organizations have prioritized their people by transforming the nature of work through intentional upskilling and/or reskilling efforts, empowering workers to realize their potential through new ways of working.

Recent world events, most notably the COVID-19 pandemic, have led to significant disruptions on a scale unprecedented in recent times, affecting nearly every aspect of global industry and calling for a "great reset" across all sectors of the global economy: a decisive set of actions oriented toward delivering

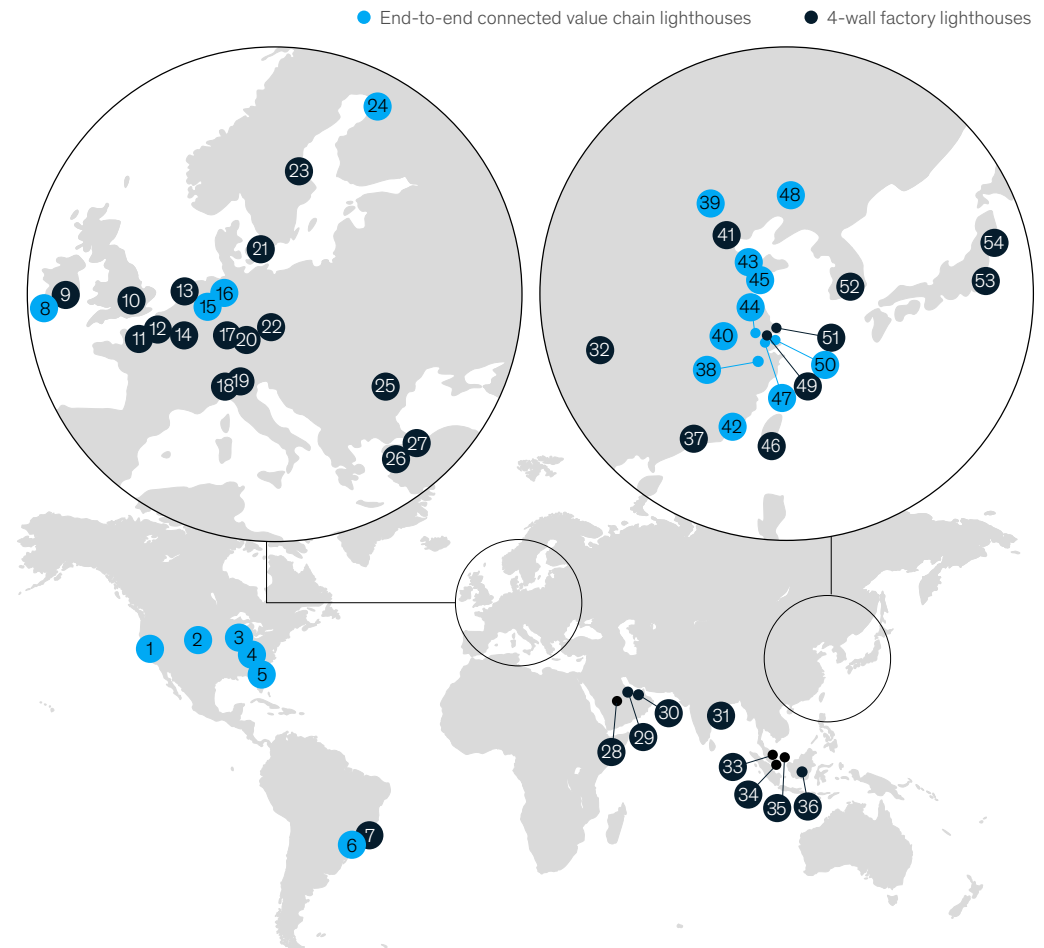
value not only to companies themselves but also to society as a whole. While supply-chain shocks have uncovered operational vulnerabilities, they also have presented transformative opportunities for manufacturing and supply-chain leaders. The advances in technology and new ways of working implemented by these trailblazing organizations have enabled them to adapt quickly during disruption, while remaining viable and operational.

Even before the massive disruptions imposed by the pandemic, the gap between 4IR frontrunners and the majority was growing rapidly. Now, four durable shifts in manufacturing and supply chains have emerged as particularly critical:

- Improved **agility and customer centricity** across E2E manufacturing and supply chains facilitates faster recognition of customer preferences. This, in turn, enables quicker adjustments to manufacturing flows at next-generation, small-scale modular plants to allow higher levels of customization.
- **Supply-chain resilience** provides a competitive advantage, requiring connected, reconfigurable n-tier supply ecosystems and regionalization.
- **Speed and productivity** are attained through increased levels of automation and workforce augmentation coupled with upskilling and reskilling efforts.
- **Eco-efficiency** is increasingly considered a must-have to remain in business and ensure compliance with an increasingly complex regulatory landscape.

The level of agility and resiliency that these shifts require sits at the core of true 4IR innovation, with valuable assets that serve as critical levers during unexpected adversity. The benchmarks and achievements heralded in previous findings about these leading companies remain impressive in their

# The Global Lighthouse Network includes 54 sites as of June 17, 2020.



- |  |   |  |   |
|--|---|--|---|
| ● 1 Zymergen<br>Biotechnology                          | ● 15 Henkel<br>Consumer goods                 | ● 29 Saudi Aramco<br>Gas treatment               | ● 43 Weichai<br>Industrial machinery                    |
| ● 2 DCP Midstream<br>Oil and gas                       | ● 16 Phoenix Contact<br>Industrial automation | ● 30 Unilever<br>Consumer goods                  | ● 44 SAIC Maxus<br>Automotive                           |
| ● 3 Fast Radius with UPS<br>Additive manufacturing     | ● 17 AGCO<br>Agricultural equipment           | ● 31 Tata Steel<br>Steel products                | ● 45 Haier<br>Home appliances                           |
| ● 4 Schneider Electric<br>Electrical components        | ● 18 Rold<br>Electrical components            | ● 32 Siemens Industrial<br>automation products   | ● 46 Micron<br>Semiconductors                           |
| ● 5 Johnson & Johnson Vision<br>Care Medical devices   | ● 19 Bayer<br>Division pharmaceuticals        | ● 33 Infineon<br>Semiconductors                  | ● 47 Johnson & Johnson DePuy<br>Synthes Medical devices |
| ● 6 Groupe Renault<br>Automotive                       | ● 20 BMW Group<br>Automotive                  | ● 34 Schneider Electric<br>Electrical components | ● 48 Haier<br>Appliances                                |
| ● 7 MODEC<br>Oil and gas                               | ● 21 Novo Nordisk<br>Pharmaceuticals          | ● 35 Micron<br>Semiconductors                    | ● 49 Bosch<br>Automotive                                |
| ● 8 Johnson & Johnson<br>Janssen Pharmaceuticals       | ● 22 Procter & Gamble<br>Consumer goods       | ● 36 Petrosea<br>Mining                          | ● 50 Procter & Gamble<br>Consumer goods                 |
| ● 9 Johnson & Johnson DePuy<br>Synthes Medical devices | ● 23 Sandvik Coromant<br>Industrial tools     | ● 37 Foxconn Industrial<br>Internet Electronics  | ● 51 Baoshan Iron & Steel<br>Steel products             |
| ● 10 GSK<br>Pharmaceuticals                            | ● 24 Nokia<br>Electronics                     | ● 38 Alibaba<br>Apparel                          | ● 52 POSCO<br>Steel products                            |
| ● 11 Schneider Electric<br>Electrical components       | ● 25 Arçelik<br>Home appliances               | ● 39 FOTON Cummins<br>Automotive                 | ● 53 GE Healthcare<br>Medical devices                   |
| ● 12 Groupe Renault<br>Automotive                      | ● 26 Petkim<br>Chemicals                      | ● 40 Unilever<br>Consumer goods                  | ● 54 Hitachi<br>Industrial equipment                    |
| ● 13 Tata Steel<br>Steel products                      | ● 27 Ford Otosan<br>Automotive                | ● 41 Danfoss<br>Industrial equipment             |   |
| ● 14 Groupe Renault<br>Automotive                      | ● 28 Saudi Aramco<br>Oil and gas              | ● 42 Midea<br>Home appliances                    |   |

Source: World Economic Forum; McKinsey analysis

own right. Nevertheless, the turmoil of recent events affords us an even more sophisticated appreciation for the very qualities that have sustained them, and have further advanced the impact that lighthouses have achieved, whether within a single factory or end to end, across the organization (Exhibit 2).

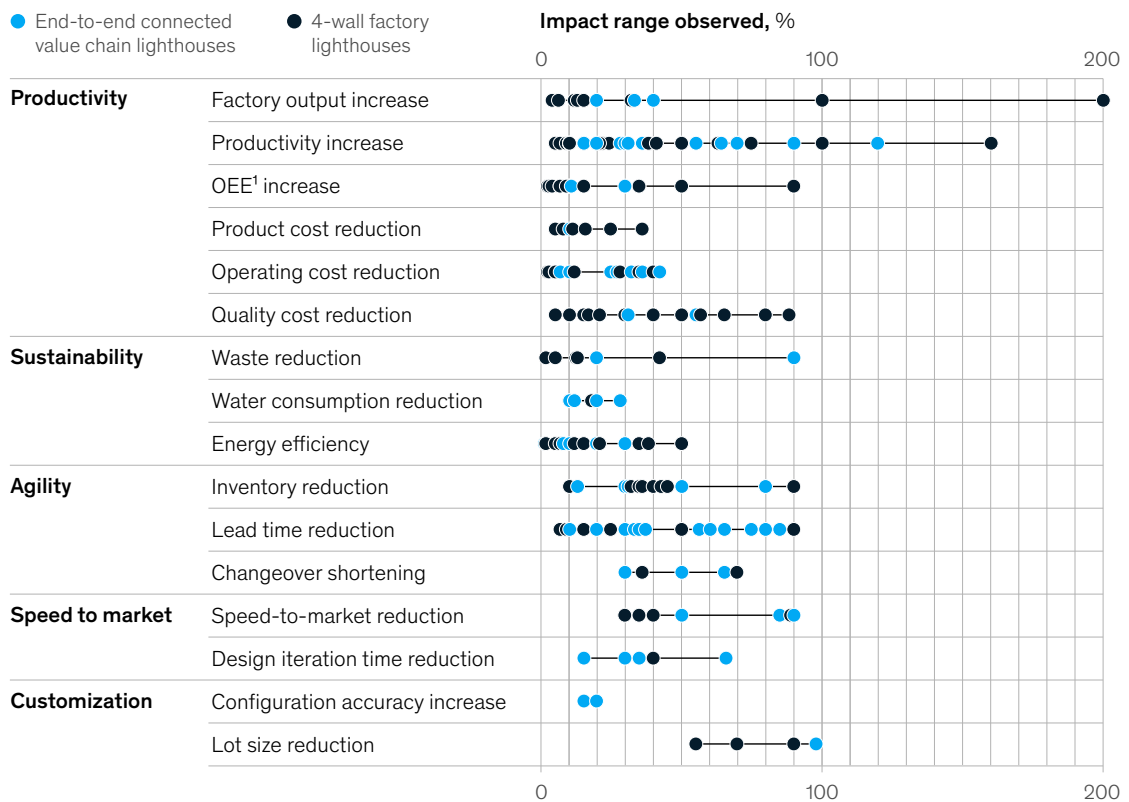
Thus, it is in this context of unprecedented challenge that lighthouses serve as models of transformation

and beacons of light that can guide us through the storm into a stronger, more resilient future. These organizations are leading the way by demonstrating how to reimagine and rebalance operations now and into the next normal. They are showing us how companies can provide value not only to their shareholders but also to a broader set of stakeholders including workers, consumers, and the environment—indeed, society at large.

Exhibit 2

## Lighthouses use digital technology to generate impact beyond productivity to build more agile, customer-focused organizations.

### Key performance indicator improvements



<sup>1</sup>Overall equipment effectiveness.  
Source: World Economic Forum; McKinsey analysis

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Perhaps most important, today's challenges make clear that lighthouses are not at the end of their transformation journeys—they are only just starting

to unlock the true potential of 4IR technologies. As the network of lighthouses grows, its light will shine brighter, helping even more organizations be better prepared to weather the inevitable future storms, whenever and wherever they occur.

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