

# Facing the future: Britain's new industrial revolution

*By Tera Allas, Eoin Daly, Wim Gysegom, and Roberto Migliorini*



**In a time of global turbulence**, manufacturers in the United Kingdom have an opportunity to reimagine and revitalize their sector. Those that embrace Fourth Industrial Revolution (4IR) technologies—such as digitization, artificial intelligence, robotics, and additive manufacturing—stand to boost performance, shape new business models, and drive sustainable growth.<sup>1</sup>

Some British firms have been forerunners of this shift—moving rapidly to embrace digitization and automation, and setting the benchmark for the “next normal” in manufacturing. One is Britishvolt, the United Kingdom’s leading advanced battery manufacturer, which is rapidly implementing high-speed manufacturing processes, adopting new materials technology, reusing processing materials, and generating its own energy from a 200MW solar farm.<sup>2</sup>

Another example, in the healthcare sector, is GSK: it has applied 4IR technologies across its operations in Ware, using advanced analytics, image recognition, and automation to achieve a double-digit increase in capacity. Its Ware plant has been recognized by the World Economic Forum as a “[Lighthouse](#)” manufacturer.

In addition to adopting advanced technologies at scale, such businesses are also investing heavily in workforce development. Upskilling or retraining the workforce for a digital environment is an essential facet of the required transformation; as [McKinsey research](#) shows, such investment typically yields positive economic returns and delivers a productivity uplift of as much 12 percent.

Pioneering UK firms also recognize that environmental responsibility and eco-efficiency are intertwined with higher productivity and growth. Their focus on productivity typically yields more efficient use of resources and positive environmental impact.

Our analysis suggests that there are real opportunities for British industry to sharpen its competitive edge. To seize these opportunities, a larger number of firms can follow the frontrunners’ lead in embracing the 4IR while tackling several entrenched obstacles to performance improvement and sustainable growth.<sup>3</sup>

**Some British firms are moving rapidly to embrace digitization and automation, and are setting the benchmark for the “next normal” in manufacturing.**

<sup>1</sup> K. Schwab, “The Fourth Industrial Revolution: what it means, how to respond,” World Economic Forum, January 14, 2016, [weforum.org](https://www.weforum.org/).

<sup>2</sup> Research and Development, Britishvolt, [britishvolt.com](https://britishvolt.com).

<sup>3</sup> Ruth Strachan, “Who killed British manufacturing?”, Investment Monitor, November 24, 2020 (updated May 13, 2021), [investmentmonitor.ai](https://investmentmonitor.ai).

## Productivity and other challenges

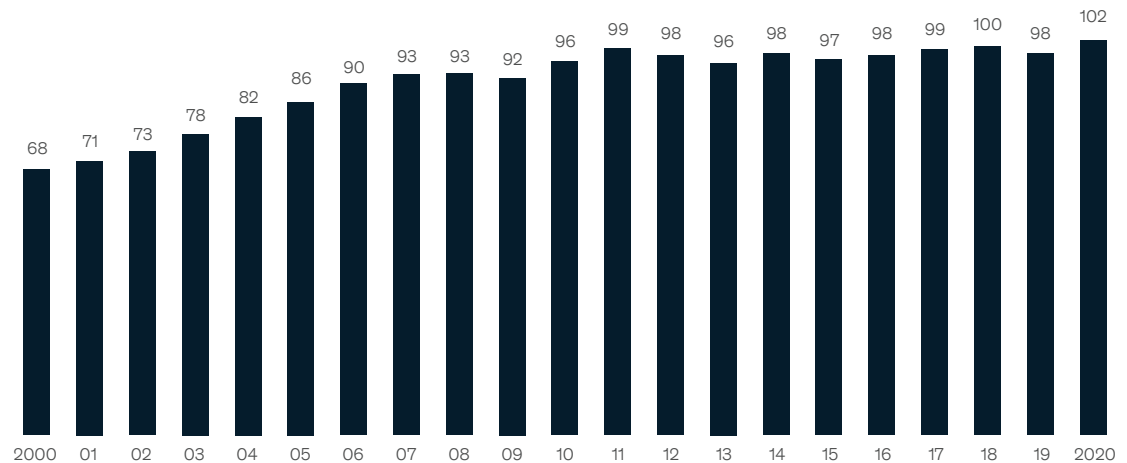
Several challenges hold back the UK manufacturing sector. One salient issue is that the United Kingdom's overall productivity persistently ranks below that of many other advanced economies, and this is true of manufacturing too. Many and varied goods fall under manufacturing, from food to semiconductors, and their circumstances and prospects differ. However, there is a significant general trend: for the sector as a whole, productivity has stagnated over the past decade (Exhibit 1).

Typically, one would expect advances in manufacturing technologies and management techniques to support a year-on-year productivity improvement of 2–3 percent. Indeed, many other countries have raised their industrial productivity significantly over the past decade, even as that of the United Kingdom has remained flat. One result is that the productivity-adjusted labor costs of the UK manufacturing sector are now higher than those of any other major manufacturing nation.<sup>4</sup>

Exhibit 1

### Productivity in manufacturing has stagnated in the UK since 2010

**Output<sup>1</sup> per hour worked in UK manufacturing, 2000-2020**  
Index, 2018 = 100



<sup>1</sup>The output measure used is the chained volume measure of gross value added (GVA) at basic prices  
Source: Table 1: Labour productivity key measures, ONS

<sup>4</sup> "Building a more competitive US manufacturing sector," McKinsey Global Institute, April 15, 2021.

Technologies such as the Internet of Things (IoT), artificial intelligence, and automation are already boosting productivity—but, if firms are to unlock the maximum benefits, these technologies need to be adopted at scale and throughout all parts of the operation and supply chain.<sup>5</sup> Research by the McKinsey Global Institute (MGI) suggests that there is great potential for such moves [to accelerate productivity](#).

As one example, the Coca-Cola Company has launched a holistic digital and analytics transformation at its flagship production site in Ireland. This has already delivered a double-digit productivity increase, enabling growth by creating the right capacity, capability, and agility to support a broader portfolio of beverages. Such successes remain the exception, however. The majority of manufacturers remain in “pilot purgatory,” slow to deploy 4IR technologies at scale.

Another major issue is that manufacturers risk [falling behind in reskilling their workforces](#)—a broader challenge across the economy. Without concerted action, two-thirds of the UK workforce could lack basic digital skills by 2030, while more than 10 million people could be underskilled in leadership, communication, and decision making.

Often, however, the required skills already exist in the organization—untapped potential that needs only to be activated. Consider the example of a European processing company that embarked on 4IR-driven transformation: it trained and deployed 150 of its existing staff in analytics-related roles, tapping in-house talent so comprehensively that it needed to hire in only four new technical specialists. In another case, a consumer-goods company successfully reskilled its own employees during a digital and analytics transformation. For example, workers in continuous-improvement and engineering roles become developers of user-centric digital applications.

With so much talent in their companies already, leaders can invest in strengthening their employees’ skills and supporting them to adopt new technologies. One key step is to map the reskilling pathways that can be followed to transition employees from classic manufacturing roles to the new roles in a digitally driven plant or company. Such an exercise will reveal which new roles can be filled relatively easily from within the organization, and which will require intensive retraining—or hiring in new talent (Exhibit 2).

There are, however, further factors impeding British manufacturers’ uptake of 4IR. One important requirement, sometimes neglected, is to develop a clear vision and roadmap for the 4IR journey, defining the performance opportunity and articulating the business case. Such a roadmap shows how technology could help address customers’ needs and problems better, more rapidly, or at lower cost.

This is a fundamental first step; without it, attempts at 4IR journeys can leave a business with a successful pilot but no scalable impact. In addition, we frequently observe firms implementing technologies in a piecemeal way rather than a systematic one, thus missing out on their [full potential value](#).

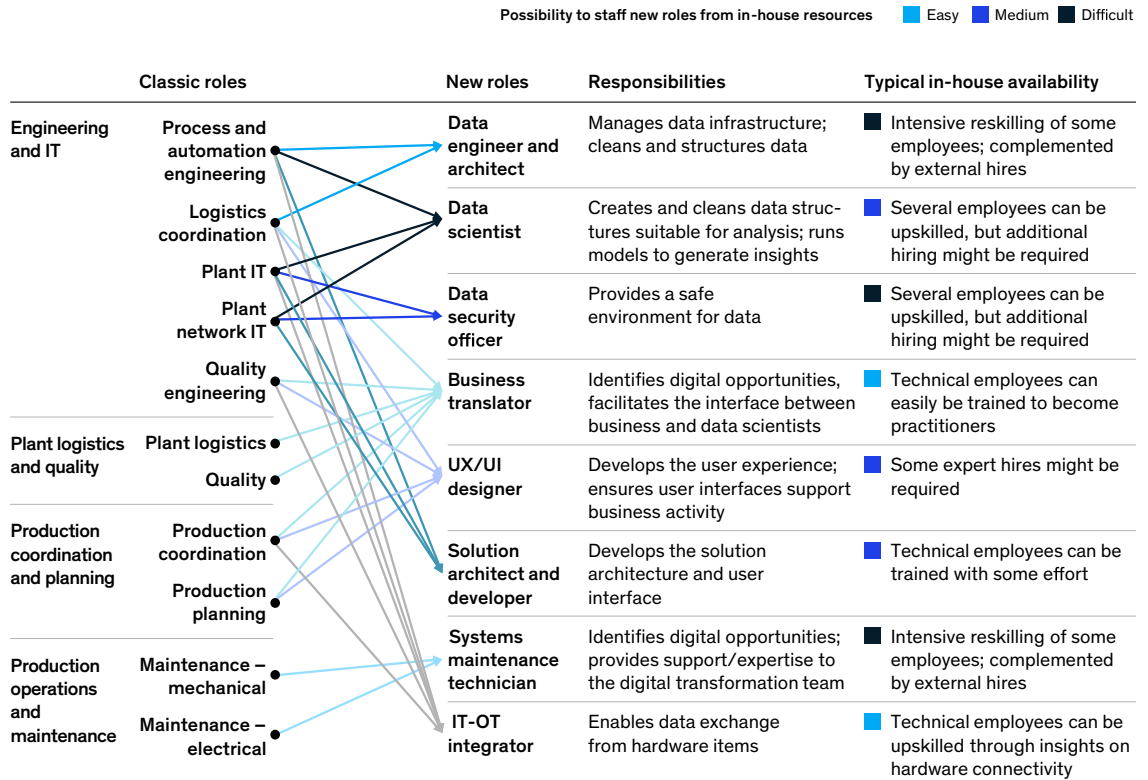
A final powerful challenge for the sector is that many UK manufacturers are just beginning a multi-decade journey to net-zero emissions.<sup>6</sup> With the government recently announcing its intention to cut greenhouse gas emissions by 78 percent by 2035, sustainability is becoming a crucial consideration. While such steep reductions are not straightforward, manufacturing firms can take many immediate steps that can be cost-neutral to reduce emissions, such as switching commercial fleets to electric vehicles or purchasing renewable electricity.

<sup>5</sup> *The next economic growth engine: Scaling Fourth Industrial Revolution technologies in production*, World Economic Forum white paper, January 17, 2018, [www3.weforum.org](http://www3.weforum.org).

<sup>6</sup> Dataset: Business insights and impact on the UK economy, Office for National Statistics (ONS), May 2021, [ons.gov.uk](https://ons.gov.uk).

Exhibit 2

## New roles can be partially filled with existing employees after coordinated reskilling



Source: McKinsey analysis

**A more productive and competitive manufacturing sector will create demand for many more technical, analytical, and managerial roles—and incentives for employers to invest in reskilling and upskilling.**



## New complications, new opportunities

The [course of the COVID-19 pandemic](#) has further complicated these challenges. Along with its other obvious disruptions, COVID-19 has been a significant driver of supply shortages—semiconductor shortages at a global level, for example.

Such uncertainties have been increased, even if only temporarily, by the United Kingdom's new trading rules with the European Union, its largest trading partner. Although many firms have managed the transition relatively seamlessly, a substantial number of UK manufacturers now face short-term trade frictions involving factors such as rules of origin, customs declarations, and VAT procedures.

However, new trading rules with the European Union also present significant opportunities for manufacturers in many sub-sectors. British makers of motor vehicles, chemicals, pharmaceuticals, and machinery, among other goods, have a chance to grow by increasing their production for the domestic market, replacing imports from the European Union, and expanding their exports to non-EU markets (Exhibit 3).

As our analysis suggests, it is critical to understand the specific challenges and opportunities facing each sub-sector and enterprise. UK food manufacturers, for example, have proved resilient during the COVID-19 pandemic, while automotive manufacturing has been heavily disrupted. The fact that some manufacturing sub-sectors are more affected by COVID-19 and new trading arrangements than others means that these areas have an even more pressing need to unlock the benefits of technology, agility, skills, and sustainability—and to chart bold strategies for future growth.

One need look no further than the recent blockage of the Suez Canal to realize that new crises could arise at any moment. Climate change, for example, could have disruptive effects on [supply routes](#). Overall, manufacturing companies need to be highly responsive and flexible if they are to meet such challenges in the future.

## How UK manufacturers can face—and shape—the future

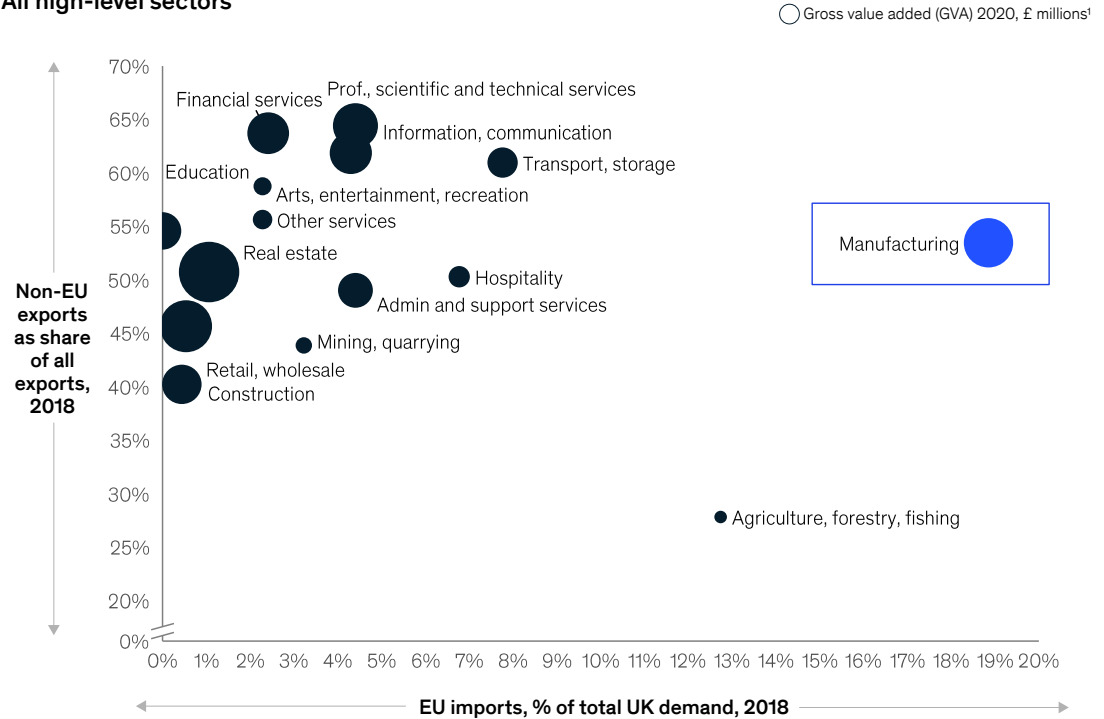
What strategies can British manufacturers adopt to help them harness the tremendous power of 4IR technologies? Our research, and our work with manufacturers across the United Kingdom and globally, suggests six key disciplines that firms can embrace:

- **Develop an ambitious and holistic vision.** Establish an ambitious goal for 4IR transformation. For instance, from the outset of one transformation, the CEO of a large processing company defined his aim as creating one of the leading analytics-enabled manufacturing plants in the world. Such inspiring aims can enable a company to overcome challenges, such as the “pilot purgatory” of early stages. In addition, a 4IR transformation calls for a holistic view of opportunities for radical improvement. For example, there is little value in striving solely for a fully digitized and analytically supported supply chain if a manufacturing plant is operating in the paradigm of a previous era, creating waste and inefficiency.
- **Work backwards from business-value creation.** Always work from a business case backwards, rather than with a technology-forward mindset. Implement technological or analytics solutions only where they create value—such as financial benefit, personal value for your employees, or convenience for your customer—and not where they are unneeded or wasteful.
- **Make speed and impact your mantras.** Aim for early Lighthouse successes, and focus relentlessly on impact—starting with areas that are set up for success, rather than tough nuts to crack. For the most impactful solutions, develop quick, use-case-oriented rollouts to introduce new ways of working across the whole network. Be alert to specific initiatives that will help to achieve the broader goal.
- **Change the organization to support the transformation.** This may involve making some

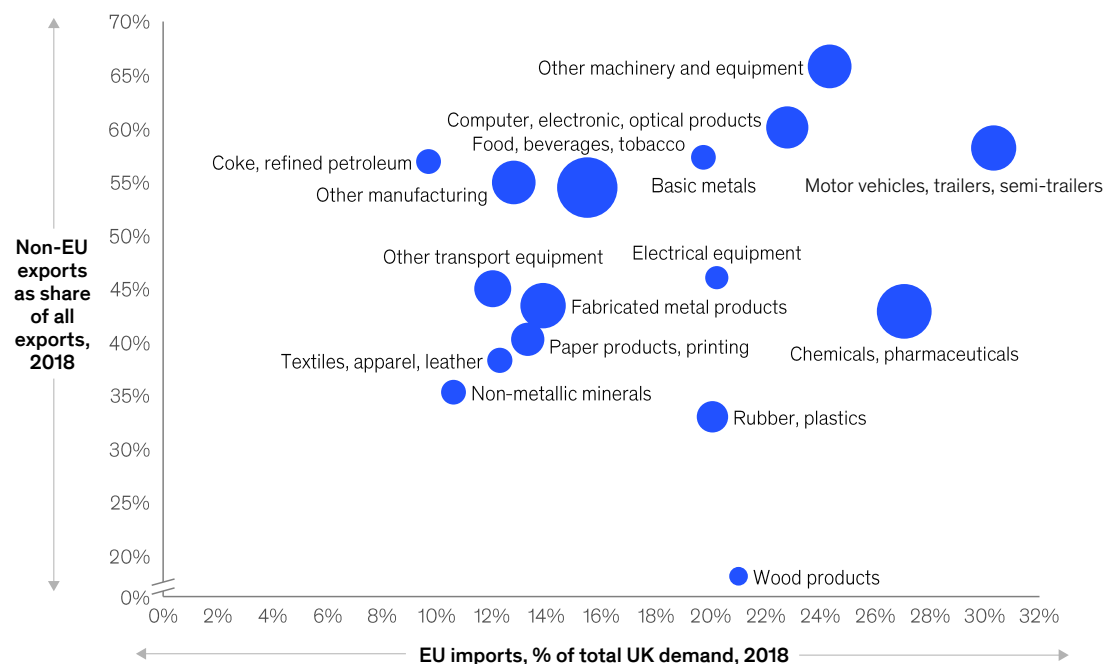
Exhibit 3

## UK businesses may be able to grow by taking share from EU imports, or exporting beyond EU, with some sectors already well-positioned

### All high-level sectors



### Manufacturing sub-sectors



<sup>1</sup>Manufacturing sub-sectors' GVA estimated based on 2018 percentage shares  
Source: ONS; McKinsey analysis

fundamental shifts in mindset and operations. For example, a company may decide to shift from business-unit-driven operations to an overall Chief Operating Officer, and to drive the digital and analytics transformation uniformly across the board, or it may set up new departments and Centers of Excellence to support the transformation.

- **Invest in capability building, starting with the leaders.** To drive change, make sure that leaders have a crystal-clear picture of the future they are advocating for the organization; passion and conviction cannot co-exist with confusion. It is crucial that leaders deeply understand what a digital and analytics transformation entails, what benefits it can bring, and how to drive it across the company. They also need to nurture the agile digital culture required for manufacturing organizations to operate sustainably in the new digitized environment.
- **Decide on key infrastructure early and implement it rapidly.** Develop an IoT architecture roadmap to enable scale-up and consistency, and ensure that IT is seen as central to the transformation, not just an enabler. In the implementation, apply a dual-speed, concurrent IoT approach that supports the quick deployment of priority-use cases while building the right foundations.

In addition, it is an increasingly urgent imperative for manufacturers to **drive sustainability** across their operations and value chains. Ideally, a 4IR culture can create synergies, making sustainability part of the overall agenda when transforming an organization. Firms can harness the latest manufacturing technologies to build a carbon-neutral ecosystem, while also driving company growth. They can deliver productivity and performance improvements that reduce waste, resource consumption, and emissions—while adopting digitally enabled process and machine optimization, predictive maintenance, and

production planning to improve eco-efficiency. And they can “think big” in exploring new operating models—such as the use of [resource cleansheets](#) to map a product’s cost and greenhouse gas footprint along its value stream and life cycle.

## The prize: new value, jobs, and development

There are powerful reasons to revitalize UK manufacturing and accelerate its development. One is size: the manufacturing sector is a significant contributor to employment and UK GDP. In 2019, the manufacturing sector was worth nearly £400 billion, and accounted for 9 percent of the country’s GDP—a prize to be protected and nurtured.<sup>7</sup>

A related reason is that the sector can create large numbers of high-quality, highly skilled jobs. While the 4IR will reduce the need for humans to undertake repetitive, manual tasks, a more productive and competitive manufacturing sector will create demand for many more technical, analytical, and managerial roles—and incentives for employers to invest in reskilling and upskilling existing workforces to take on those roles.<sup>8</sup> With sites across the country, manufacturers can create high-quality jobs in all regions of the United Kingdom.

In addition, manufacturing bolsters expertise: a strong manufacturing sector and the United Kingdom’s scientific and technological sector stand in mutual support. Again, Britishvolt sets an example, collaborating closely with the United Kingdom’s research and development ecosystem—including academia, the Faraday Battery Challenge, and the chemicals sector.<sup>9</sup>

...

Recent disruptions to the status quo present tremendous opportunities for UK manufacturers to grow and gain market share. The United Kingdom

<sup>7</sup> “Manufacturing, value added (% of GDP) – United Kingdom,” World Bank Open Data, [data.worldbank.org/](https://data.worldbank.org/); “UK manufacturers’ sales by product: 2019,” ONS, July 1, 2020, [ons.gov.uk](https://ons.gov.uk/).

<sup>8</sup> “Jobs lost, jobs gained: What the future of work will mean for jobs, skills, and wages,” McKinsey Global Institute, November 28, 2017.

<sup>9</sup> Research and Development, Britishvolt.



could be at the dawn of a new industrial revolution, with a chance for bold companies to respond to a dynamic market with technological innovation,

agility, reskilling, and a commitment to long-term sustainability.

### **About the authors:**

**Tera Allas CBE** is Director of Research and Economics in McKinsey's UK, Ireland, and Israel Office, where **Eoin Daly** is a Senior Partner and **Wim Gysegom** and **Roberto Migliorini** are Partners. All are based in London.