

The Fourth Industrial Revolution is a technology revolution, and nearly every country, business and household across the globe is an integral part of it.



INSIGHTS INTO THE FOURTH INDUSTRIAL REVOLUTION

Overview

From handling financial transactions to customer data to placing orders and tracking inventory to marketing and communications with a web footprint – very few businesses exist today without the benefit of technology.

In the past, industrial revolutions made a worldwide economic, political and social impact on the human race. Consider:

- 1st Industrial Revolution – From 1760 to 1830; involved the rise of steam engines and railways
- 2nd Industrial Revolution – From 1925 to 1944; introduced electricity, crude oil and gas
- 3rd Industrial Revolution – Starting in 1969, launched electronics, telecommunications and computers, which enabled new avenues for space expedition and biotechnology.

The Fourth Industrial Revolution (4IR) is no different; it is simply the most recent chapter in the story of human progress. And yet, its transformative power is expected to generate up to \$3.7 trillion in economic and societal value within the next four years.¹

“The Fourth Industrial Revolution is moving faster than expected and impacting lives around the world.”²

Global Lighthouse Network

Over the past several years, the World Economic Forum has identified more than 60 companies globally as Fourth Industrial Revolution leaders. They have been designated as advanced manufacturing “lighthouses” for demonstrating operational and financial success by innovating new systems and transforming the way people work and use technology. These companies are considered the blueprint for how to modernize and scale a business operating system.³

Perhaps more than any other industrial revolution, the recent technological transformation is more global. In response, the goal of the World Economic Forum is to establish a global platform for technology governance. Composed of governments, industries, startups, civil society, academia and international organizations, these stakeholders have come together to create a policy framework that will shape and oversee the relationship between technology and society. This includes the development of policies and a regulatory framework for emerging technologies such as artificial intelligence, autonomous mobility and precision medicine.



Tech projects fall into the following categories:

- Autonomous and Urban Mobility
- Healthcare Data Policy
- Internet of Things, Robotics
- Smart Cities and Agile Governance
- Data Free Flow with Trust (DFFT)
- Data for Common Purpose Initiative (DCPI)
- Ethical AI Facial Recognition
- Future of Protein
- Circular Economy Projects

Teams within the Forum are working across the network to support cross-border data flows, flexible data-governance models, health data sharing agreements and sustainable rural mobility systems.⁴

A key reason why it is critical to harness these technologies and share them across the globe is because our economies are so interconnected among nations worldwide. To various extents, we all rely on other countries for raw materials, labor, manufacturing and shipping capabilities as well as innovation, research and development.

Environmental Sustainability

One of the objectives of the Fourth Industrial Revolution is to use technology to produce more sustainable solutions with less impact on the environment. Combining the digital with the physical world will allow us to drive productivity well beyond current levels, shorten cycle times, reduce energy consumption and, in general, do more with less.

In fact, many lighthouse manufacturers have created new revenue streams while building a carbon-neutral manufacturing ecosystem. They have combined initiatives to reduce waste, resource consumption and emissions while driving profitable growth. To wit, 53% have developed measurable environmental sustainability benefits, including a near total reduction in CO2 emissions, double-digit increases in efficiency and a substantial reduction in the use of raw materials.⁵

U.S. Lighthouses

Perhaps of greatest concern to Americans is that U.S. manufacturing companies lag Fourth Industrial Revolution innovations in other countries. As many as 70% of manufacturers are currently incapable of scaling their operations, which puts the U.S. at a higher risk of permanently falling behind.⁶ Among the 69 lighthouses currently recognized worldwide, only seven are in the U.S.⁷

Ericsson (Lewisville, Texas) – Ericsson, a Swedish networking and telecommunications company, built a U.S.-based, 5G-enabled digital native factory in Texas. This factory utilizes a robust “Internet of Things” (IoT) architecture that has increased output per employee by 120% and reduced lead time by 75% and inventory by 50%.

Procter & Gamble (Lima, Ohio) – After P&G’s Lima plant invested in supply chain flexibility, advanced analytics and robotic automation, it



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was able to increase its speed to market for new products tenfold and became two times better than competitors at avoiding running out of inventory.

Johnson & Johnson Vision Care (Jacksonville, Florida) – Vision Care implemented reconfigurable manufacturing to digitally connect its value chain end to end from suppliers to consumers, leading to double-digit cost reduction and sales growth.

Zymergen (Emeryville, California) – This bio-engineering site is using robotics and artificial intelligence to replace manual processes, yielding twice its innovation rate.

DCP Midstream (Denver, Colorado) – This oil and gas producer developed internal digital solutions and tech-venture partnerships to integrate the remote control of operations (i.e., planning, logistics, commercial systems), resulting in real-time optimization of margins and more than \$50 million in value.

Schneider Electric (Lexington, Kentucky) – This 60-year-old facility implemented Fourth Industrial Revolution technologies to generate end-to-end transformation of operations from supplier to customer. These changes enhanced demand forecast accuracy by 20%, reduced energy costs by 26% and improved customer satisfaction by 20%.

Fast Radius with UPS (Chicago, Illinois) – This additive manufacturer uses industrial-grade 3D printing and a proprietary operating system to design and produce customized products and facilitate fast turnaround and global fulfilment with real-time analytics.

“Digitization is going to touch every aspect of our business ... it will just be so imbued into every process, every function, every connection that we make.”⁸

Society 5.0: Smart Cities

“Society 5.0” represents a new era in which technology is seamlessly integrated into our daily lives, with data as the new capital and digital networking acting as global connective tissue. We are now using tech innovation to address all of our primary challenges in society, which in recent years have been dominated by the pandemic, climate change and the progressive aging of the world’s population.⁹

Integrating the potential of digital technologies with human needs aligns with the futuristic vision of smart cities. Last year, Japan enacted the Super City Law, which is designed to improve collaboration between the public and private sectors to create digitally transformed cities. A select pilot group of Super Cities will deploy AI and big data for consumer-use applications of medical care, education, energy, crime prevention and transportation, including the use of autonomous vehicles.



The Super City Law authorizes the appointment of “smart city architects” to coordinate services and technology in their regions. This will help ensure that siloed agencies cooperate and systems are interoperable across different jurisdictions. These changes are being driven by a younger generation of municipal and public sector leaders determined to overcome institutional resilience and radically overhaul public services through new technologies. Instead of cities and the private sector working in isolation, the goal is to adopt sensible technology policies to integrate fragmented systems and negotiate with global vendors through a consolidated procurement process.

Moving forward, these digital initiatives are being used to drive Japan's economic recovery and create long-term sustainable growth while meeting the needs of citizens. Examples include implementing local 5G and regional broadband wireless access and accelerating online medical services.¹⁰

U.S. Smart Cities

In the U.S., we also have smart cities working to deploy connected technologies and IoT solutions to improve traffic flow and mobility, public safety, efficiencies in city lighting, and environmental and wastewater management as well as reduce energy use.

U.S. cities that have been identified as meeting the criteria for smart, sustainable urban development, technology innovation and social responsibility include:¹¹

- Dallas, Texas
- Chicago, Illinois
- Austin, Texas
- Seattle, Washington
- Charlotte, North Carolina
- San Francisco, California
- Washington D.C.
- Boston, Massachusetts
- Pittsburgh, Pennsylvania
- Boulder, Colorado
- San Jose, California
- New York, New York

Final Thoughts

Investing is a forward-looking endeavor. While many established companies have delivered sound investment returns and dividends for decades, they are often in a latter stage of their life cycle with less opportunity for substantial growth. However, that is not always the case. For example, companies like Procter & Gamble and Johnson & Johnson have proven that they can embrace new technologies and use them to improve product launches and operational margins as well as predict accurate inventory usage – even during a once-in-a-century pandemic. While new, innovative tech companies tend to grab headlines with IPOs and impressive short-term returns, it just goes to show that even “old dogs” can learn new tricks. The same goes for investors. Diversifying a portfolio among new firms developing emerging technologies as well as proven blue-chip companies can offer the potential for both growth and income. Consult with your financial professional about ways to incorporate participants of the Fourth Industrial Revolution to take advantage of the changes that might be coming our way.



¹ Francisco Betti and Enno de Boer. World Economic Forum. December 2019. "Insights from the Forefront of the Fourth Industrial Revolution." http://www3.weforum.org/docs/WEF_Global_Lighthouse_Network.pdf. Accessed June 21, 2021.

² World Economic Forum. April 5, 2021. "Japan Takes Leadership Role in Fourth Industrial Revolution Global Summit." <https://www.weforum.org/press/2021/04/japan-takes-leadership-role-in-fourth-industrial-revolution-global-summit-5626acf5c9/>. Accessed June 21, 2021.

³ Francisco Betti and Enno de Boer. World Economic Forum. Dec. 2019. "Insights from the Forefront of the Fourth Industrial Revolution." http://www3.weforum.org/docs/WEF_Global_Lighthouse_Network.pdf. Accessed June 21, 2021.

⁴ Chizura Suga. World Economic Forum. 2021. "Centre for the Fourth Industrial Revolution Japan." <https://www.weforum.org/centre-for-the-fourth-industrial-revolution-japan>. Accessed June 21, 2021.

⁵ Enno de Boer, Katy George and Yves Giraud. McKinsey & Company. April 7, 2021. "CEO dialogue: Perspectives on reimagining operations for growth." <https://www.mckinsey.com/business-functions/operations/our-insights/ceo-dialogue-perspectives-on-reimagining-operations-for-growth>. Accessed June 21, 2021.

⁶ Patrick Burson. Supply Chain Management Review. Feb. 6, 2020. "Global Lighthouse Network: Insights from the Forefront of the Fourth Industrial Revolution." https://www.scmr.com/article/global_lighthouse_network_insights_from_the_forefront_of_the_fourth_industr. Accessed June 21, 2021.

⁷ Enno de Boer and Katy George. World Economic Forum/McKinsey & Company. March 2021. "Global Lighthouse Network: Reimagining Operations for Growth." http://www3.weforum.org/docs/WEF_GLN_2021_Reimagining_Operations_for_Growth.pdf. Accessed June 21, 2021.

⁸ Enno de Boer, Katy George and Yves Giraud. McKinsey & Company. April 7, 2021. "CEO dialogue: Perspectives on reimagining operations for growth." <https://www.mckinsey.com/business-functions/operations/our-insights/ceo-dialogue-perspectives-on-reimagining-operations-for-growth>. Accessed June 21, 2021.

⁹ Chizura Suga. World Economic Forum. 2021. "Centre for the Fourth Industrial Revolution Japan." <https://www.weforum.org/centre-for-the-fourth-industrial-revolution-japan>. Accessed June 21, 2021.

¹⁰ Yuta Hirayama and Rushi Rama. World Economic Forum. April 6, 2021. "Japan's smart city initiatives will play key role in its digitization and economic revival." <https://www.weforum.org/agenda/2021/04/japan-smart-city-initiatives-digitisation-economic-revival-gtgs/>. Accessed June 21, 2021.

¹¹ Jayna Locke. Digi. Oct. 9, 2020. "Top 12 Smart Cities in the U.S. - Smart Cities Examples 2020." <https://www.digi.com/blog/post/smart-cities-in-the-us-examples>. Accessed June 21, 2021.

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