The Global Lighthouse Network is growing in size and diversity across all industry sectors

Consumer packaged goods

Alibaba
Apparel, CN

Danone
Consumer goods, PL

Henkel
Consumer goods, DE

Henkel
Consumer goods, ES

Henkel
Consumer goods, MX

Mondelez
Consumer goods, IN

Procter & Gamble
Consumer goods, CN

Procter & Gamble
Consumer goods, CN

Procter & Gamble
Consumer goods, CZ

Procter & Gamble
Consumer goods, FR

Procter & Gamble
Consumer goods, US

Tsingtao Brewery
Consumer goods, CN

Unilever
Consumer goods, CN

Unilever
Consumer goods, CN

Unilever
Consumer goods, IN

Unilever
Consumer goods, UAE

Process industries

Baoshan Iron & Steel
Steel products, CN

DCP Midstream
Oil and gas, US

MODEC
Oil and gas, BR

Petkim
Chemicals, TR

Petrosea
Mining, ID

POSCO
Steel products, KR

Renew Power
Renewable energy, IN

Saudi Aramco
Oil and gas, SA

Saudi Aramco
Oil and gas, SA

Saudi Aramco
Oil and gas, SA

STAR refinery
Oil & gas, TR

Tata Steel
Steel products, IN

Tata Steel
Steel products, IN

Tata Steel
Steel products, NL

Advanced industries

AGCO
Agricultural equipment, DE

Agilent Technologies
Industrial equipment, SN

Arçelik
Home appliances, TR

Arçelik
Home appliances, RO

AUO
Optoelectronics, TW, CN

BOE Optoelectronics Technology
Optoelectronics, CN

BMW Group
Automotive, DE

Bosch
Automotive, CN

Bosch
Automotive, CN

Bosch Automotive
Automotive, CN

CATL
Electronics, CN

CATL
Electronics, CN

CITIC Dicastal
Automotive, CN

Danfoss
Industrial equipment, CN

De'Longhi
Home appliances, IT

Ericsson
Electronics, US

Fast Radius with UPS
Additive manufacturing, US

Flex
Electronics, AT

Flex
Electronics, BR

Ford Otosan
Automotive, TR

FOTON Cummins
Automotive, CN

Foxconn
Electronics, CN

Foxconn
Electronics, CN

Foxconn
Electronics, CN

Foxconn Industrial Internet
Electronics, CN

Groupe Renault
Automotive, BR

Groupe Renault
Automotive, FR

Groupe Renault
Automotive, FR

Haier
Home appliances, CN

Haier
Home appliances, CN

Haier
Home appliances, CN

Haier
Home appliances, CN

Haier
Home appliances, CN

Hitachi
Industrial equipment, JP

HP Inc.
Electronics, SG

Infineon
Semiconductors, SG

Innolux
Optoelectronics, TW, CN

LG Electronics
Electronics, KR

LS ELECTRIC
Electrical components, KR

Micron
Semiconductors, SG

Micron
Semiconductors, TW, CN

Micron
Semiconductors, SN

Midea
Home appliances, CN

Midea
Home appliances, CN

Midea
Home appliances, CN

Midea
Home appliances, CN

Midea
Home appliances, CN

Nokia
Electronics, FI

Phoenix Contact
Industrial automation, DE

Protolabs
Additive manufacturing, US

Rold
Electrical components, IT

SAIC Maxus
Automotive, CN

Sandvik Coromant
Industrial tools, SE

Sany Heavy Industry
Industrial equipment, CN

Sany Heavy Industry
Industrial equipment, CN

Schneider Electric
Electrical components, CN

Schneider Electric
Electrical components, FR

Schneider Electric
Electrical components, ID

Schneider Electric
Electrical components, IN

Schneider Electric
Electrical components, US

Siemens
Industrial automation products, CN

Siemens
Industrial automation products, DE

Weichai
Industrial machinery, CN

Western Digital
Electronics, CN

Western Digital
Electronics, MY

Western Digital
Electronics, TH

Wistron
Electronics, CN

Pharmaceuticals and medical products

Bayer
Division Pharmaceuticals, IT

Cipla
Pharmaceuticals, IN

Dr. Reddy's Laboratories
Pharmaceuticals, IN

GE Healthcare
Medical devices, JP

GSK
Pharmaceuticals, UK

Janssen
Pharmaceuticals, IT

Johnson &Johnson Consumer Healthcare
Self-care products, SE

Johnson & Johnson Consumer Healthcare
Self-care products, TH

Johnson & Johnson DePuy Synthes
Medical devices, CN

Johnson & Johnson DePuy Synthes
Medical devices, IR

Johnson & Johnson DePuy Synthes
Medical devices, US

Johnson & Johnson Janssen
Pharmaceuticals, IR

Johnson & Johnson Vision Care
Medical devices, UK

Johnson & Johnson Vision Care
Medical devices, US

Novo Nordisk
Pharmaceuticals, DK

Sanofi
Pharmaceuticals, FR

Janssen
Pharmaceuticals, IT

Teva
Pharmaceuticals, NL

Zymergen
Biotechnology, US

The lighthouses show a variety of new use cases (1/3)

Site	Change story	Top 5 use cases	Impact	
Danone Opole, PL	To address an increasing product portfolio complexity, Danone Opole engaged its whole workforce across functions and levels into a digital transformation journey to deploy connected shopfloor, artificial intelligence and automation at scale. As a result, it improved costs by 19%, efficiency by 12% while improving quality and reducing GHG emissions by close to 50%. It became a transformation leader for the other 39 Danone plants in Europe and top employer in the local market	AI-guided machine performance optimization	↓ 40%	Energy consumption
		Digitally enabled batch release	↑ 50%	Labour productivity
		Digital dashboards to monitor OEE performance	↑ 12%	Process OEE
		Digital tools to enhance a connected workforce	↓ 28%	Change-over time
		Integration platform to connect machine-level data with enterprise-software	↑ 50%	Labour productivity
Agilent Technologies Singapore, SG	With the ambition to simplify high-tech manufacturing in low-volume, high-complexity instruments to meet rising customer demand, Agilent Singapore deployed IIoT-powered digital twin, AI & Robotic Automation solutions to achieve sustainable growth, overcoming bottlenecks from specialized manpower and transforming the workforce into scalable 4IR-ready generalists. This resulted in an increased output by 80%, improved productivity by 60%, improved cycle time by 30% and quality cost by 20%.	Digital twin for flexible production	↓ 25%	Overall manufacturing cost
		Cycle time optimization through big-data analytics on lines PLCs	↓ 33%	E2E cycle time
		Digitally enabled quality failure diagnosis	↓ 75%	Testing lead time
		IoT-enabled manufacturing quality management	↓ 19%	Cost of poor quality
		AI-powered optical inspection	↑ 31%	Labour productivity
CATL Yibin, CN	To catch up with significant business growth, and higher quality and sustainability expectation, CATL builds up a large greenfield in Yibin city. The plant further deployed in depth AI, IoT and flexible automation on top of CATL Ningde headquarters lighthouse digital initiatives, and has achieved 17% increased line speed, 14% reduced yield loss, and zero carbon emission.	AI-powered optical inspection	↓ 63%	No. of FTEs
		AI-powered process control	↑ 100%	Assembly efficiency
		IIoT real time sensor-based data aggregation for energy, emissions, waste, and water management	↓ 13%	Energy consumption
		Digital twin for flexible production	↑ 128%	Automation rate
		AI-enabled safety management	↓ 100%	Production safety incidents
Cipla Indore, IN	To preserve access to high quality affordable drugs globally while facing an increase in material and labor costs, Cipla deployed digital, automation and analytics solutions to 22 Indian sites in parallel. Indore's Oral Solid Dosage facility led this journey by implementing 30 4IR use cases thereby improving total cost by 26% and enhancing quality by 300%, while reducing greenhouse gas (GHG)emissions by 28%.	Analytics-driven procurement supported by spend intelligence and automated spend cube	↓ 26%	Overall manufacturing cost
		Advanced IIoT applied to process optimization	↑ 16%	Product yield optimization
		AI-guided machine performance optimization	↑ 37%	Process OEE
		Production planning optimized by advanced analytics	↓ 22%	Process change-overs
		IIoT and advanced analytics-based energy consumption optmization	↓ 34%	Energy consumption

The lighthouses show a variety of new use cases (2/3)

Site	Change story	Top 5 use cases	Impact	
Dr. Reddy's Laboratories Hyderabad, IN	Facing business challenges from severe price erosion and rapidly evolving quality expectations, the 25-year-old site embarked on large scale digitalization to sustain and grow in the generics pharma market. The site deployed 40+ 4IR use cases by operating in garage mode and leveraging IIoT & democratized platform for advanced analytics. As a result, it improved manufacturing cost by 43% while proactively enhancing quality and reducing energy by 41%.	Dynamic production scheduling with digital twin	↓ 21%	RM / overall manufacturing cost
		IoT-enabled manufacturing quality management	↓ 52%	Quality deviations
		Analytics platform for yield management and root-cause analysis	↑ 22%	Product yield optimization
		Field quality failures aggregation, prioritization and advanced analytics enabled problem-solving	↑ 90%	Labour productivity
		Real-time asset performance monitoring and visualization	↓ 20%	Energy consumption
Haier Qingdao, CN	Facing growing demand for customized design, fast delivery and high quality, Haier refrigerator factory leveraged big data, digital twin and advanced visual inspection technology to accelerate R&D, upgrade manufacturing process and logistics scheduling mode. The order response lead time has been shortened by 35%, production efficiency has been increased by 35% and quality performance has been improved by 36%.	Big-data/AI-enabled product design and testing	↑ 85%	Market research time
		AI-powered process control	↓ 37%	Energy consumption
		Collaborative robotics and automation	↑ 52%	Assembly efficiency
		Dynamic delivery optimization	↓ 52%	Loading time for finished goods
Midea Shunde, CN	In order to meet demand for high quality products delivered in shorter lead times, Midea Shunde factory has deployed AI, digital twin and other 4IR technologies in the end-to-end value chain, achieving 24% lower unit production cost, 41% shorter lead times, 30% shorter R&D lead time and 51% less defect rate.	Advanced analytics to optimize manufacturing and distribution footprint	↓ 45%	No. Of warehouses
		Connected devices to track and measure product performance	↓ 30%	Market research time
		Supplier material quality prediction using advanced analytics	↓ 63%	Incoming defect rate
		Field quality failures aggregation, prioritization and advanced analytics enabled problem-solving	↓ 36%	In-process defect
		Analytics for dynamic warehouse resource planning and scheduling	↓ 56%	Inventory cycle
Mondelez Sri City, IN	Driven by the aspiration to outgrow the market through superior volume delivery, cost leadership and building further resilience and diversity in a volatile environment, Mondelez's Sri City deployed end to end digitalization, predictive analytics, artificial intelligence and advanced automations to increase labour productivity by 89 %, reduce manufacturing costs by 38% and sustain 50% female workforce. Thus, making it a benchmark manufacturing site for Mondelez globally.	Real-time asset performance monitoring and visualization	↑ 21%	Productivity
		Advanced IIoT applied to process optimization	↑ 31%	Product yield optimization
		Predictive maintenance aggregating data based on historical and sensor data	↓ 69%	Mean time between breakdowns
		Collaborative robotics and automation	↑ 28%	Productivity
		Advanced analytics enabled sustainability optimization	↓ 11%	GHG emissions

The lighthouses show a variety of new use cases (3/3)

Site	Change story	Top 5 use cases	Impact	
Sany Heavy Industry Changsha, CN	To address the challenges from industry specific market cycle fluctuations and product complexity (263 SKUs), Sany Changsha leveraged flexible automation, AI and IIoT at scale to build a digital and flexible heavy equipment manufacturing system. As a result, the site expanded capacity by 123%, improved labor productivity by 98%, and reduced unit manufacturing cost by 29%.	AI-powered process control	↓ 60%	Process cycle time
		Advanced IIoT applied to process optimization	↓ 73%	Change-over time
		Digital twin for flexible production	↑ 44%	Production capacity
		Digital-enabled flexible manufacturing	↑ 80%	Output in assembly
		Robotics-enabled logistics execution	↑ 11%	On-time delivery rate
Western Digital Shanghai, CN	To address a 250% annual growth rate, short technology transition pace of 18 months and workforce challenges, Western Digital semiconductor backend factory in Shanghai implemented diverse 4IR use cases such as automated product design system, machine learning based virtual wafer test and intelligent planning system. The site reduced time to market by 40%, product cost by 62% and improved productivity by 221%.	Automated product design	↑ 62%	Market research time
		AI-powered optical inspection	↓ 35%	Energy consumption
		Automated inspection enabled by digital thread	↑ 221%	Productivity
		Analytics platform for yield management and root-cause analysis	↑ 0.3%	Product yield optimization
		Digital integrated business planning	↓ 94%	Inventory reduction
Flex Sorocaba, BR	To improve site competitiveness, sustainability and health, Flex implemented 4IR initiatives along the end-to-end value chain, such as IoT-enabled recycling of electronic waste and supply chain control tower. Digital transformation journey resulted into a 50% labor cost improvement, a 81% material loss reduction, while increasing customer satisfaction (+18%) and employees well-being.	Integration platform to connect machine-level data with enterprise-software	↑ 23%	Process OEE
		AI-enabled safety management	↓ 93%	Lost workday
		IIoT real time sensor-based data aggregation for energy, emissions, waste, and water management	↓ 198%	GHG Emissions
		IIoT real time sensor-based data aggregation for energy, emissions, waste, and water management	↓ 94%	Material Waste
		Digital tools to enhance a connected workforce	↑ 18%	Customer Satisfaction

Sustainability Lighthouses show 4IR-enabled sustainability impact

Site	Change story	Top 2 use cases	Impact	
Arçelik Ulmi, RO	Arçelik Ulmi greenfield factory, powered by 100% green electricity, deployed sustainability use cases such as digital-twin for energy management and closed loop water management system integrated to advanced water treatment plant. In an environment suffering from water stress, it resulted in a reduction of water consumption by 25% as well as a reduction of energy consumption by 17% and GHG emission by 22%, per unit manufactured.	IIoT real time sensor based data aggregation for energy, emissions, waste, and water management	↓ 35%	Energy consumption - Boiler
			↓ 35%	GHG emission – Scope1
		Advanced analytics enabled clean water reduction and contaminated water cleaning optimization	↑ 20%	Water withdrawal
			↑ 68%	Water recycling
Micron Singapore, SG	With the growing demand for memory and storage solutions, there is a need for Micron Singapore to expand and increase Gigabyte production while reducing environmental footprint. From 2018 to 2021, Micron Singapore increased output by ~270% and simultaneously reduced resources used per Gigabyte produced by ~45%. This is enabled by sustainable technology development with optimization of materials consumption through environmental footprint tracking.	Advanced analytics enabled sustainability optimization	↓ 16%	Waste reduction
			↓ 13%	GHG emission – Scope1 & 2
		Analytics-platform for yield management and root-cause analysis	↓ 26%	Waste
			↓ 24%	Water
Unilever Dapada, IN	In a bid to achieve corporate sustainability goals of 70% reduction in Scope 1 & 2 emissions by 2025 over baseline of 2015 and reducing water consumption while tackling rapidly increasing volumes, Unilever Dapada deployed 14 use cases such as ML powered energy optimization through integrated energy management system, digital twin to accelerate eco-friendly formulations. Dapada reduced its scope 1+2 emissions by 54%, its scope 3 emissions by 43% and its water consumption by 36%, and as a result is ahead of its goal to achieve the emission reduction targets.	Advanced analytics enabled sustainability optimization	↓ 34%	Energy consumption
			↓ 23%	GHG emission – Scope2
		Quality improvement by predictive analytics	↓ 22%	Water consumption
			↓ 25%	Material waste
Western Digital Shanghai, CN	In the context of growing demand, Western Digital doubled the site's petabyte (PB) output between 2017 and 2021 while reducing its environmental footprint per PB to achieve corporate ambitions. This result was enabled by multiple 4IR use cases such as machine learning to dynamically optimize the performance of the water recycling plant and should consumption prediction to detect abnormal energy consumption based on real-time operating data. These measures reduced water consumption by 62% and energy consumption by 51% per PB.	Advanced analytics enabled clean water reduction and contaminated water cleaning optimization	↑ 30%	Water recycle rate
			↓ 62%	Normalized Water consumption
		Machine learning enabled should energy prediction	↓ 51%	Normalized energy consumption
			↓ 57%	Normalized GHG – Scope2