With research and analysis by

IDC

Industry 4.0:
Embracing the Future of Industrial Automation to Build a Resilient Business



March 2025

etisalat

Infinite digital potential. Realised.

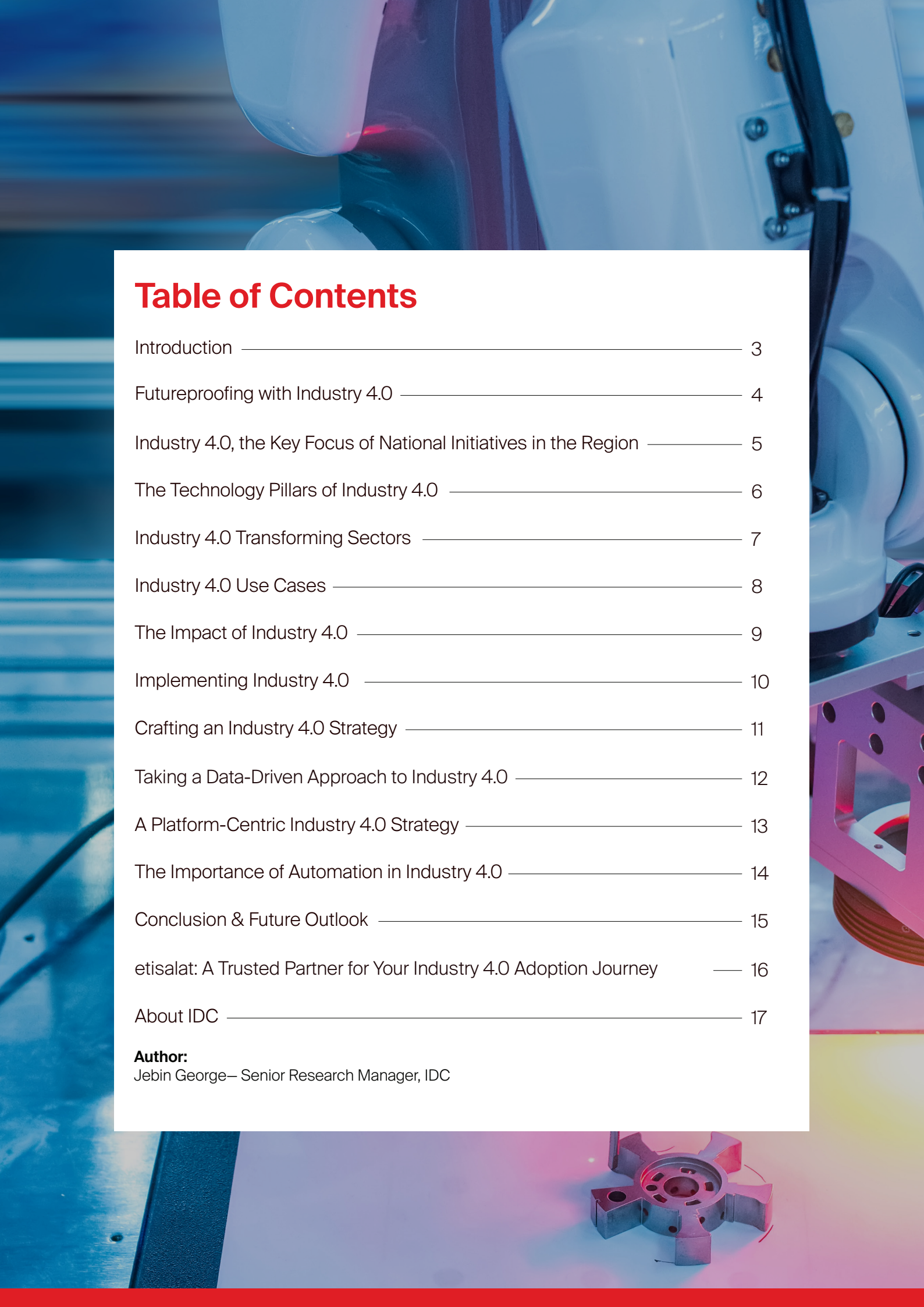


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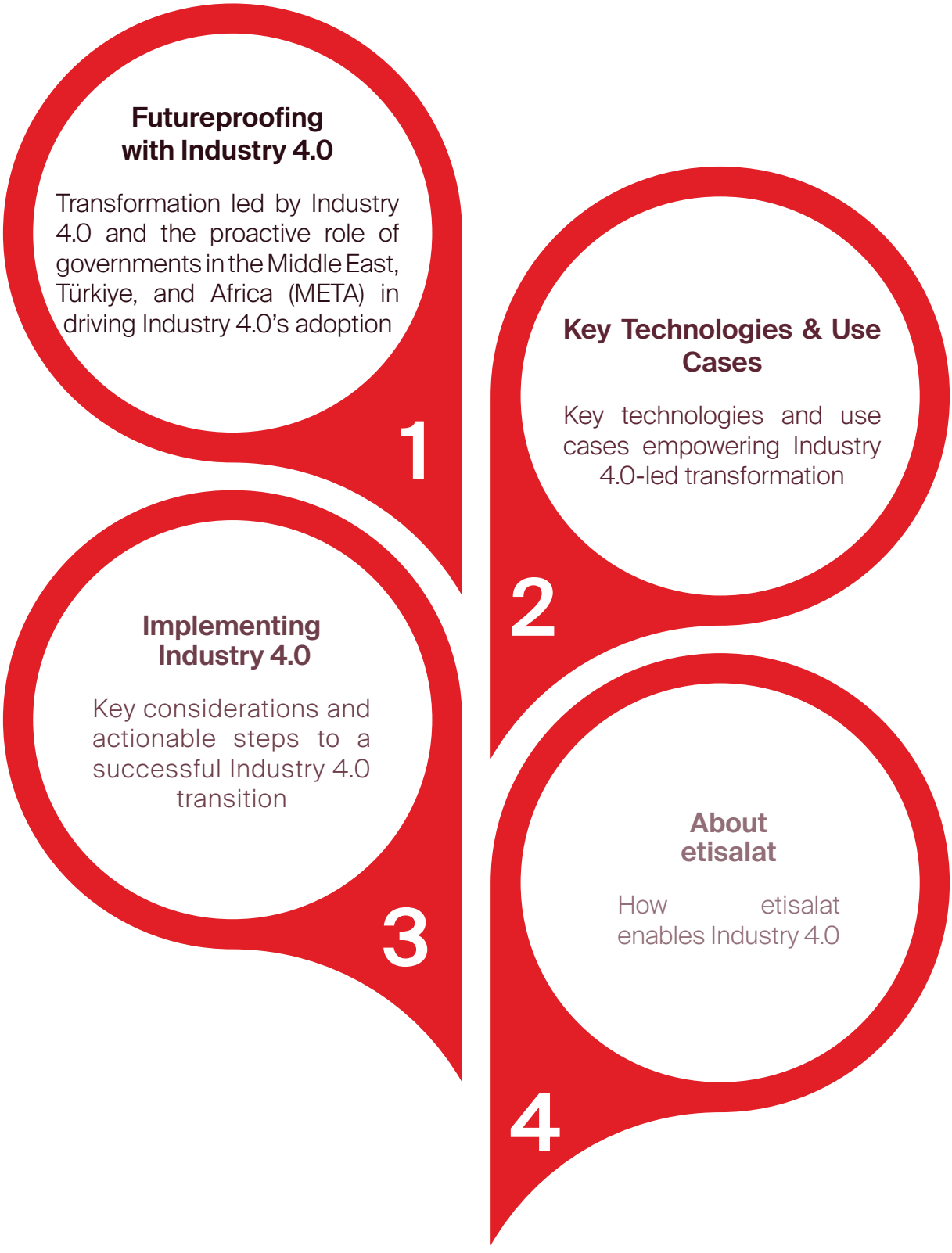
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Jebin George– Senior Research Manager, IDC

Introduction

This e-book provides a comprehensive understanding of Industry 4.0, exploring adoption drivers, challenges, key components, implementation strategies, and prospects.

The content is structured as follows:



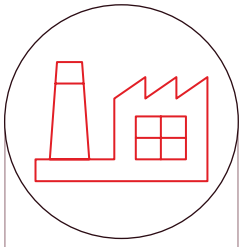
Futureproofing with Industry 4.0

Understanding Industry 4.0 and Its Relevance

The Evolution of Industry

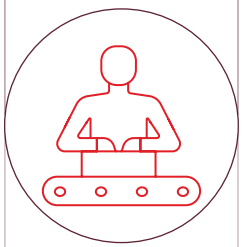
The industrial sector has undergone significant changes over the past few centuries. Currently, it is experiencing the Fourth Industrial Revolution (4IR), known as Industry 4.0. This new paradigm is characterised by the integration of information technology (IT) and operational technology (OT), resulting in a cyber-physical ecosystem in which machines, devices, and humans are interconnected over the Internet of Things (IoT) and exchange information in real time. This interconnectedness enables data-driven decision-making, automation, and optimisation throughout the value chain, leading to increased efficiency, productivity, and innovation.

1



First Industrial Revolution
Mechanisation using steam or waterpower

2



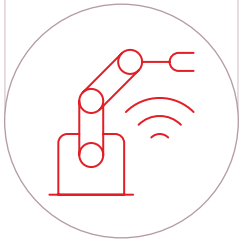
Second Industrial Revolution
Mass production using electricity and assembly lines

3



Third Industrial Revolution
Automation through electronics and computers

4



Fourth Industrial Revolution
Industry 4.0, digitalisation through IoT and cyber-physical systems

Industry 4.0, the Key Focus of National Initiatives in the Region

Key Initiatives and Strategies for Building a Digital Future

Industry 4.0 is the core of the economic diversification plans of many countries in the Middle East, Türkiye, and Africa (META). Many of the region's governments have developed national industrial development plans, with Industry 4.0 initiatives in the UAE and Saudi Arabia being prime examples.



UNITED ARAB EMIRATES
MINISTRY OF INDUSTRY
& ADVANCED TECHNOLOGY

اصنع في الإمارات
MAKE IT
IN THE EMIRATES

- **The Operation 300 Billion Strategy**
  To increase the manufacturing sector's contribution to GDP to AED 300 billion by 2031 from 133 billion in 2021
- **The Make it in the Emirates Initiative**
  To encourage companies to develop and manufacture products in the UAE
- **The Industry Technology Transformation Index (ITTI)**
  To assess the IR 4.0 maturity level of companies and provide guidance on digital transformation
- **The Transform 4.0 Initiative**
  To support digitalisation and create 100 Industry 4.0 'lighthouses' by 2030



رؤية VISION 2030
المملكة العربية السعودية
KINGDOM OF SAUDI ARABIA

National Industrial
Development and
Logistics Program

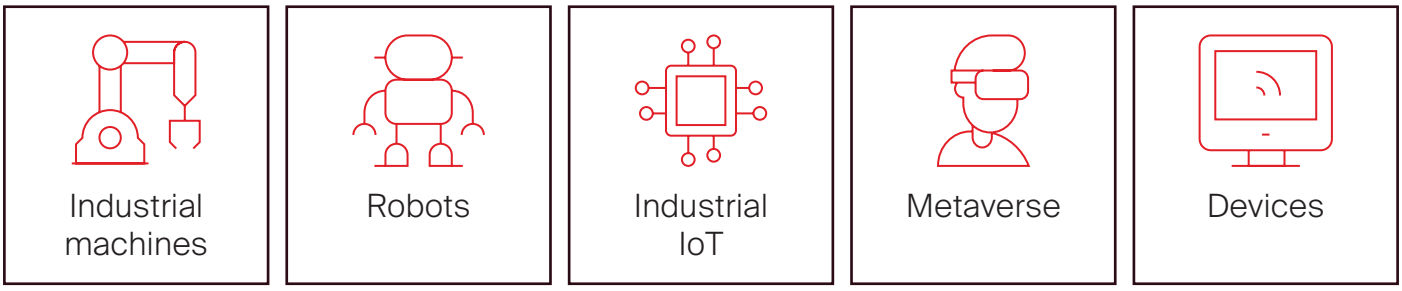
- **The National Industrial Development and Logistics Program (NIDLP)**
  To transform Saudi Arabia into a leading industrial power and a global logistics hub and increase economic diversification
- **The Made in Saudi Arabia Program**
  To help local businesses increase their visibility and promote their products to a wider domestic and global audience
- **The Industry 4.0 Centre of Excellence Initiative**
  To establish five industry 4.0 centres of excellence by 2025 to share best practices and accelerate digitalisation
- **The Future Factories Program**
  To transform 4,000 factories by adopting advanced production techniques, automation, and Industry 4.0

The Technology Pillars of Industry 4.0

Key Technologies That Need to Operate in Unison to Accelerate Industrial Transformation

Industry 4.0 is a realm of interconnected possibilities, where technology converges to redefine industrial efficiency. Several technological innovations across infrastructure, platforms, and hardware paradigms come together to enable the fourth industrial revolution. For instance, consider quality control on an assembly line. A sensor attached to production equipment collects data on various quality parameters. This data is processed at the edge to minimise latency, allowing for real-time insights and alerts. As a result, immediate action can be taken when product quality falls outside of acceptable control limits.

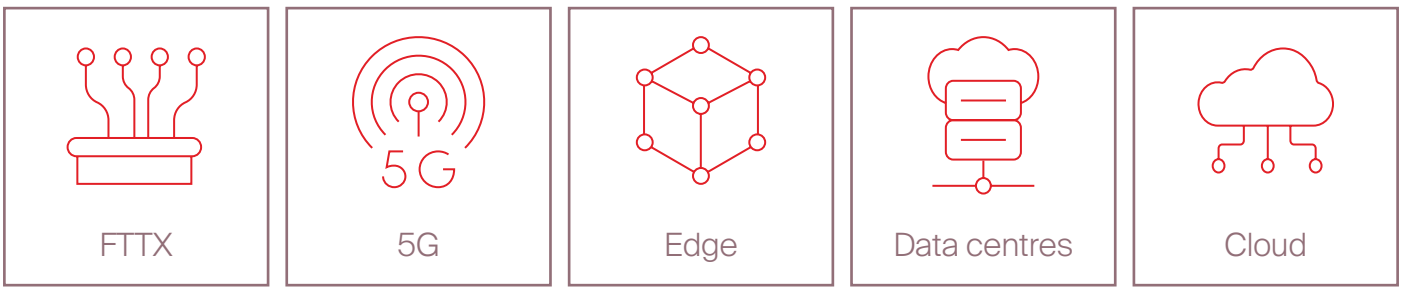
Hardware



Platform



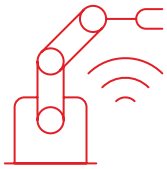
Infrastructure



Industry 4.0 Transforming Sectors

Strategic Focus Areas Within Key Business Functions

Organisations in sectors such as manufacturing, oil & gas, utilities, mining, transportation, logistics, and healthcare are at the forefront of implementing Industry 4.0. In organisations' pursuit of the digital mission, some critical digital priorities emerge within each business function. The four areas listed below form the primary segments of Industry 4.0 transformation.



Smart Manufacturing

Objective:
to maximise the efficiency and yield from existing assets to develop the next generation of production capabilities

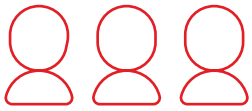
Action areas:
smart plant, smart asset management, quality management, and robotic automation



Digital Supply Chain

Objective:
to enable the seamless flow of information throughout the supply chain while driving value within business processes

Action areas:
smart warehousing, inventory optimisation, and transportation optimisation



Omni-Experience Customer Engagement

Objective:
to empower business lines and enhance customer experience with deeper customer insights

Action areas:
digital service models, intelligent customisation, and digital channels



Digital Innovation

Objective:
to leverage digital capabilities to drive faster and wider innovation across products and processes

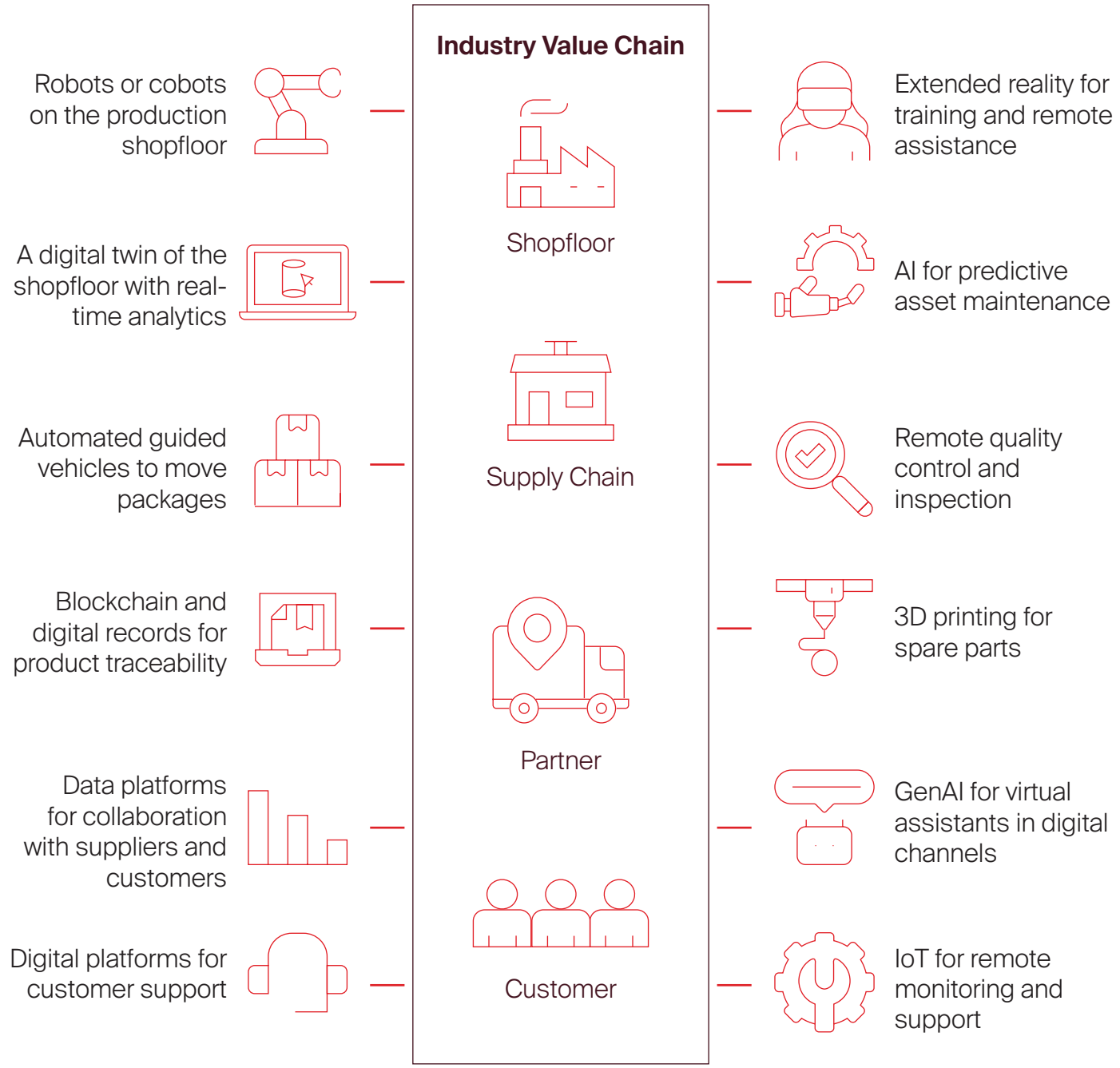
Action areas:
digital simulation, remote collaboration using AR/VR, and shared industry platforms

Industry 4.0 Use Cases

Key Areas in Which Technological Advances Are Driving Significant Transformation

The technology pillars of Industry 4.0 work together to enable use cases that support the digital priorities of each business function. Identifying and prioritising use cases are crucial steps for any organisation planning to digitally transform. Each use case can be handled as a specific project in support of a business function objective and should be discretely funded.

Key Industry 4.0 Use Cases – Illustrative Examples



The Impact of Industry 4.0

Key Benefits Achieved from Use-Case Implementations

Industry 4.0 has proven to drive significant gains in business value in such areas as productivity, quality, time to market, and sustainability. To foster the adoption of Industry 4.0 and highlight best practices, the World Economic Forum (WEF) identified various 'lighthouse factories' around the globe as beacons of innovation. The impacts of Industry 4.0 use case implementations on some key KPIs in these factories are outlined below.

Area	KPI Improvement	Impact Range Observed
Productivity	Factory output increase	10% – 200%
	Productivity increase	5% – 160%
	Overall equipment effectiveness increase	3% – 50%
	Quality cost reduction	5% – 90%
	Product cost reduction	5% – 40%
Agility	Time to market reduction	30% – 90%
	Inventory reduction	10% – 90%
	Lead-time reduction	10% – 90%
	Changeover shortening	30% – 70%
Others	Lot-size reduction	60% – 90%
	Energy efficiency increase	2% – 50%

Source: World Economic Forum Whitepaper: Fourth Industrial Revolution Beacons of Technology and Innovation in Manufacturing

Implementing Industry 4.0
Key Challenges

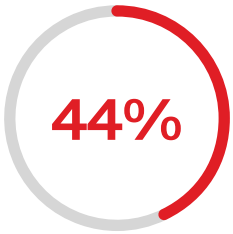
Adopting Industry 4.0 necessitates a comprehensive transformation, with automation and data at its core. However, enterprises often encounter challenges stemming from legacy systems, proprietary technologies, and data silos. Overcoming these obstacles is key to unlocking the full potential of Industry 4.0 and achieving data-driven, agile, and scalable operations.

Key Challenges for Technology-Enabled Innovation Among META Organisations



Skills Gap

- Lack of digital skills among employees (e.g., application and device usage, data literacy, IoT, and GenAI)
- Lack of skills within the IT team (e.g., cloud, AI, and cybersecurity)



Lack of Strategy

- Lack a companywide strategy or plan for transformation
- Siloed efforts, which undermine scalability and return on investment



Data Issues

- Lack of access to reliable granular data
- Lack of consolidated and integrated data sets



Legacy Systems

- Disparate systems plagued by a lack of interoperability
- Ageing and outdated applications and infrastructure, which lack new features

Source: IDC's Industry Acceleration Survey, 2024, META; only the industrial sector (manufacturing, resources, oil & gas, utilities, and transport & logistics); only organisations with 10+ employees (n = 139)

Crafting an Industry 4.0 Strategy

Best Practices for Creating an Implementation Plan and Roadmap

Many organisations approach Industry 4.0 in siloed efforts, resulting in pockets of innovation that cannot scale. An organisation's Industry 4.0 journey should start with a comprehensive enterprise-wide transformation strategy. The strategy should be aligned with business goals and driven by top management, with the active involvement of functional heads. Organisations should take a platform-centric data-driven approach to transformation.

Key Steps in Crafting a Successful Industry 4.0 Strategy

1 **Conduct a readiness assessment.**

Evaluate current capabilities and requirements against business objectives and market trends. Identify the gaps and prioritise them based on business impact.

2 **Define strategic objectives.**

Based on the readiness assessment, create the strategic objectives of the transformation project. These should be detailed at a business-function level.

3 **Create projects and initiatives.**

Create specific projects under business functions and initiatives that cut across functions. Determine the technologies and solutions relevant for each project. Allocate resources.

4 **Create a roadmap.**

Prioritise projects and initiatives based on impact and feasibility. Outline specific actions, timelines, and milestones. Define KPIs to measure progress.

5 **Start small and scale up.**

Start with pilot projects and expand to full-scale implementations. Continuously update the strategy based on learnings.

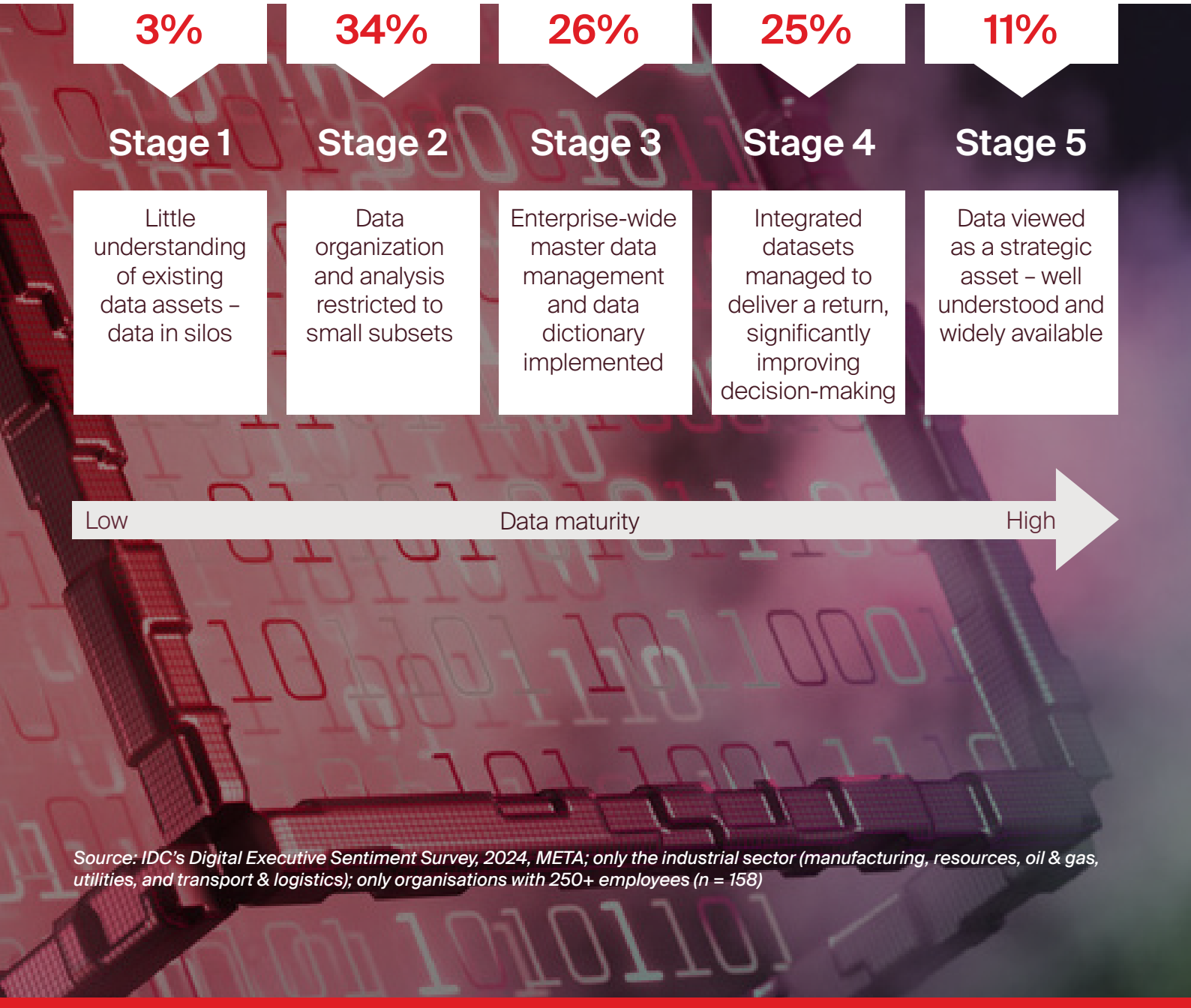
Taking a Data-Driven Approach to Industry 4.0

Best Practices for the Successful Implementation of an Industry 4.0 Strategy

The success of Industry 4.0 transformation heavily depends on data. An organisation typically deals with multiple datasets, such as data from (or related to) assets (machines, sensors, and devices), products, ecosystem partners, the workforce, customers, and finance systems. In a data-centric organisation, this data flows seamlessly within the organisation, creating value across business functions and processes and significantly improving decision-making.

The current reality for most organisations, however, is different. A staggering 63% of the organisations in the region lack dataset integration (see the below chart). To progress and improve data maturity, organisations must ensure the availability of granular data in real time, data quality, and data integration; leverage AI to generate insights; ensure regulatory compliance; and enhance employee data literacy and skills.

Data Maturity in Large Industrial Organisations in META, 2024



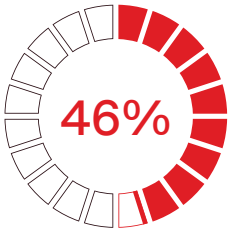
Source: IDC's Digital Executive Sentiment Survey, 2024, META; only the industrial sector (manufacturing, resources, oil & gas, utilities, and transport & logistics); only organisations with 250+ employees (n = 158)

A Platform-Centric Industry 4.0 Strategy

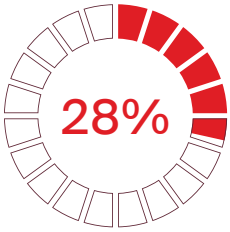
Best Practices for the Successful Implementation of an Industry 4.0 Strategy

Platforms play a crucial role in industry transformation by enabling the seamless integration of technologies such as IoT, AI, and cloud computing. They facilitate real-time data sharing, enhance operational efficiency, and enable automation. Platforms also help standardise processes, improve product quality, and reduce costs. By leveraging platforms, organisations can overcome the key challenges they face concerning data silos and legacy systems and machines, achieve greater agility, optimise resource utilisation, and gain a competitive edge in the market.

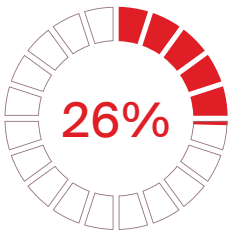
Platform-Centric, the Optimal Approach for Deploying Factory Solutions Among META Organisations



Leveraging an industrial platform – such as a manufacturing execution system (MES) – upon which multiple functionalities can be deployed



Having multiple best-of-breed solutions dedicated to solving specific business issues



Using a single solution to cover different processes and functionalities

Source: IDC's Manufacturing Industry Core Survey, 2024, META; only manufacturing (n = 100)

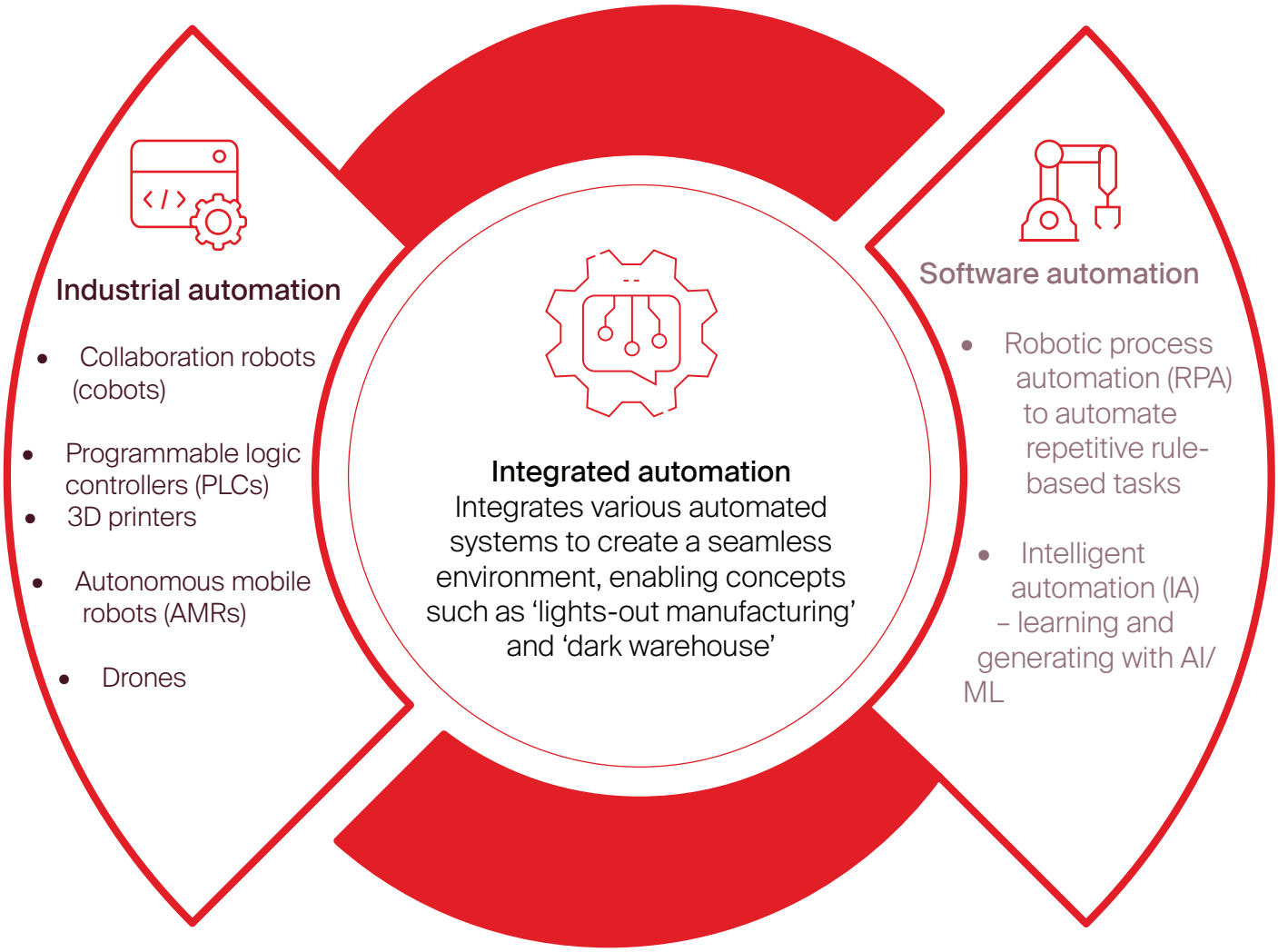


The Importance of Automation in Industry 4.0

Best Practices for the Successful Implementation of Industry 4.0 Strategy

Organisations that embark on a transformation journey should consider automation as a critical component. While separate automation initiatives bring fast and tangible results, end-to-end automation brings scalability and return on investment. The focus should be on integrating heterogeneous technology environments – particularly operational technology (OT) and information technology (IT) systems.

Key Components of Automation in Industry 4.0 Transformation



Conclusion & Future Outlook

IDC's Top 5 Global Predictions for Industry 4.0

The industrial, logistics, and energy sectors continue to deal with high levels of change, and both challenges and opportunities abound. The following are the top 5 predictions that frame IDC's perspective on how organisations can best take advantage of Industry 4.0 in the coming five years.

1

Automation

By 2026, 90% of G2000 organisations will have augmented operational roles with automation technology, elevating employee engagement and unlocking a 30% increase in worker efficiency.

2

AI Impact

By 2028, the integration of AI/ML into robotic and automation routines within industrial operations will have increased by 30%, driving higher efficiencies and a 10% reduction in downtime.

3

LoB Transformation

By 2027, 35% of G2000 companies will use supply chain orchestration tools, integrating key suppliers/customers that include digital twin capabilities, improving supply chain responsiveness by 15%.

4

Modernisation

In early 2025, organisations still on legacy systems will need to modernise their applications immediately to survive and adapt to the digital world.

5

Data at the Core

By mid-2026, 65% of G2000 will have moved to one data model for all operational/back-office information, becoming more agile in collective decision-making within their enterprise application landscapes.

Source: IDC 2024

"Industry 4.0 is a boardroom priority—not a factory-floor experiment. Executives must lead from the front to turn digital ambition into competitive advantage."

Gonçalo Fernandes
Vice President, Solution Marketing IoT, etisalat



etisalat: A Trusted Partner for Your Industry 4.0 Adoption Journey

etisalat offers a comprehensive suite of Industry 4.0 solutions designed to empower organisations' adoption of Industry 4.0 principles and technologies. Our collaborative approach and deep industry expertise enable us to deliver tailored solutions that address unique business needs.

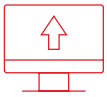
etisalat Differentiation



Managed services excellence
A dedicated team for 24 x 7 support, ensuring seamless operations and minimal downtime



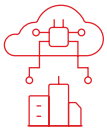
Cost-effective SaaS solutions
A SaaS-based service model to reduce upfront costs and accelerate time to market



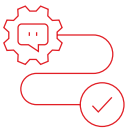
Ready-to-deploy solutions
A marketplace with 60+ industry-specific applications, enabling rapid deployment and immediate value



Robotics as a service
A range of autonomous solutions to automate tasks, increase efficiency, and reduce operational costs



Future-ready infrastructure
Advanced 5G and secure cloud, IoT, and AI platforms to power digital transformation



End-to-end support
Comprehensive services to guide the whole IR 4.0 journey, from strategic consulting to deployment and ongoing support

Having etisalat as a partner, organisations can position themselves well for the future, driving innovation, efficiency, and growth.

About etisalat UAE

etisalat UAE is the flagship telco arm of etisalat group. Building on five decades of network leadership, it delivers secure, high-performance connectivity and advanced digital solutions for individuals, homes, businesses and government entities across the UAE.

Its capabilities span fixed and mobile connectivity, AI-powered solutions, cloud, cybersecurity and sovereign digital infrastructure, providing businesses and government entities with secure, reliable and scalable technology solutions to meet their evolving needs.

etisalat UAE continues to invest in next-generation networks and digital infrastructure, strengthening the UAE's digital economy and enabling a more connected and intelligent future.

etisalat

www.etisalat.ae

About IDC

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