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SAPICS 2025


Digital Revolution
Embracing Technology for Innovation

The Emergence of Digitisation & Industry 4.0

The emergence and adoption of digitalisation

2020 – Artificial Intelligence, Robots, Industry 4.0 emerges

2018 – IBM & Maersk introduce TradeLens

2013 – Amazon files patent for anticipatory shipping

2004 – Walmart introduces RFID tags for top 100 suppliers

2000 – Global outsourcing surges – compounding SCs

1999 – First Alibaba e-commerce shipment

1994 – First Amazon e-commerce shipment

1990 – Emergence of ERP systems

1979 – FedEx launches real-time track-and-trace system

1975 – Walmart uses IBM for inventory and distribution

1974 – First Barcode scan in the United States

1973 – Toyota implements JIT successfully

1965 – First EDI (Electronic Data Interchange) Trans-Atlantic test manifest

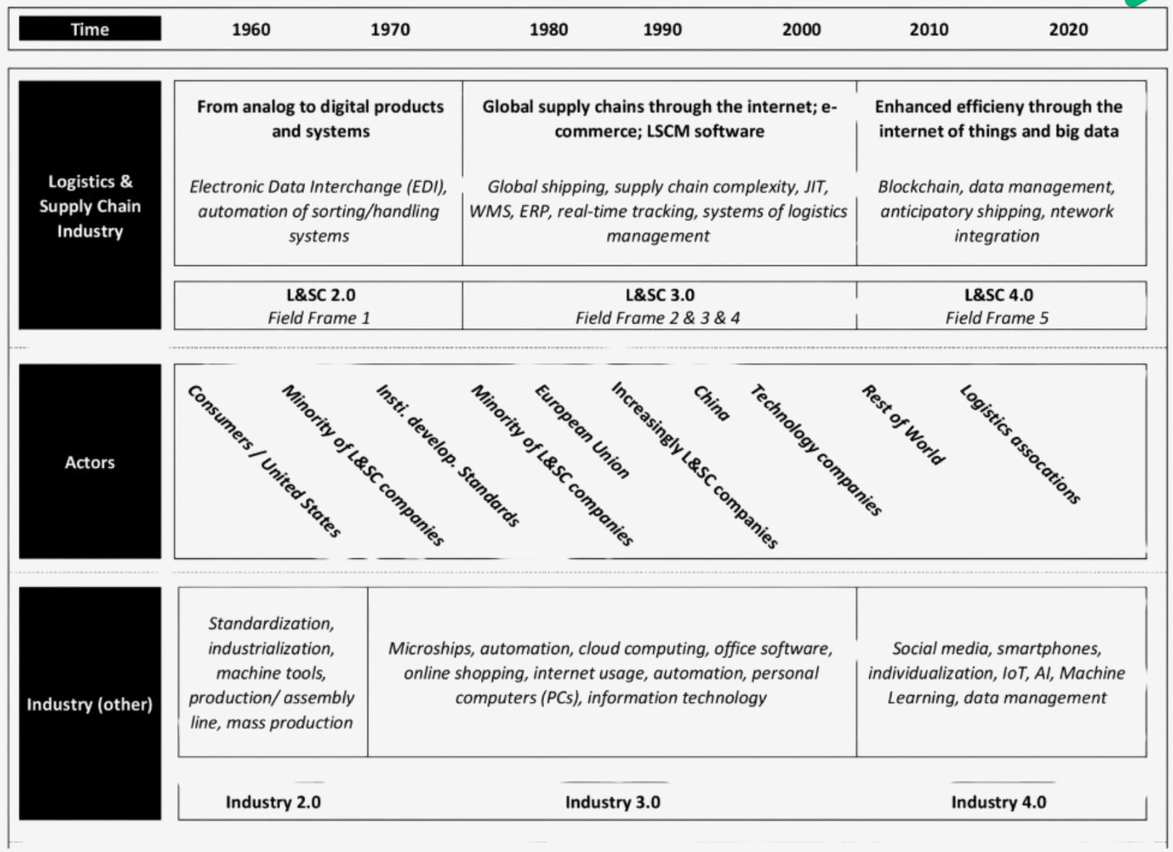
Figure 1.
Historical events of logistics and supply chain's digitalization

Digitalisation involves interconnectivity, automation, machine learning, and real-time data.

It integrates physical operations with intelligent technologies and big data, forming a cohesive ecosystem for businesses and governments.

This transformation is known as Industry 4.0.

The Emergence of Digitisation & Industry 4.0

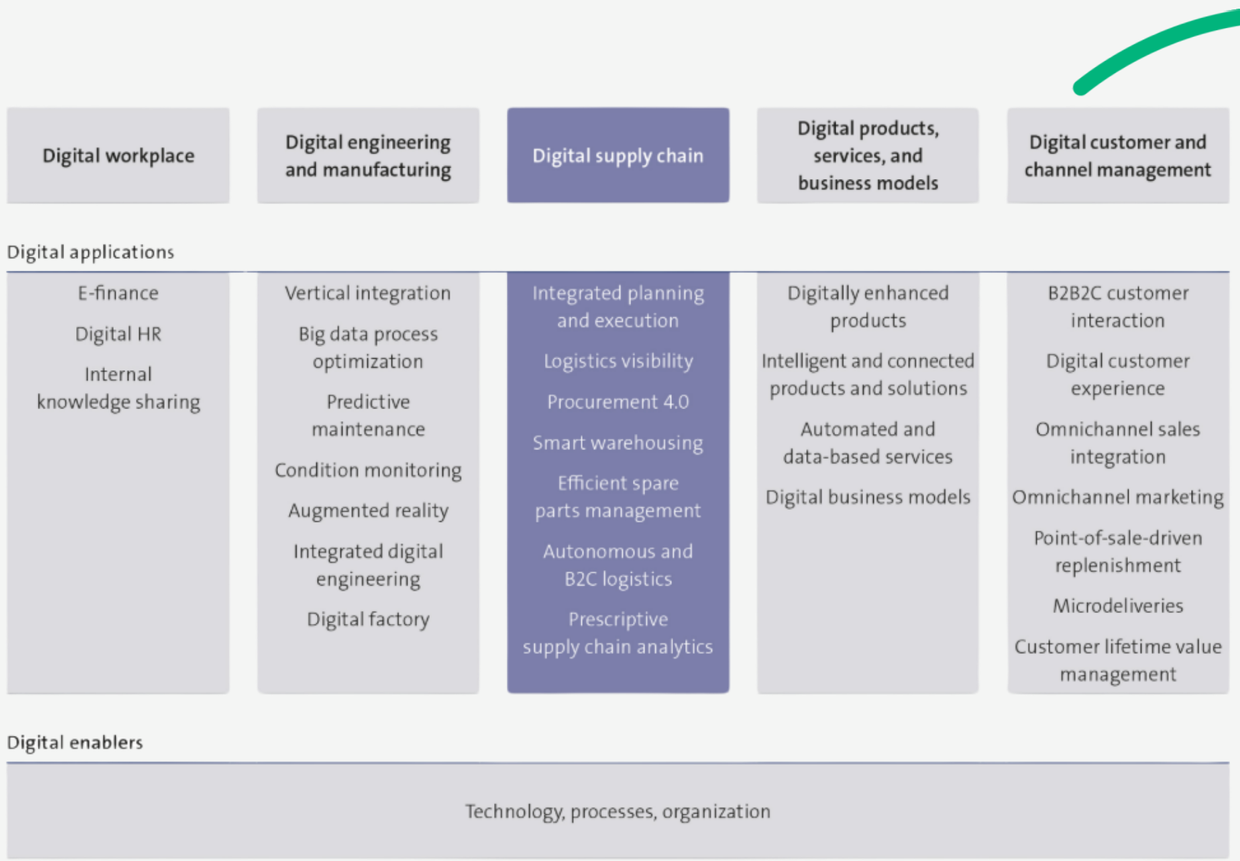


The Fourth Industrial Revolution brings together breakthrough technologies like advanced robotics, AI, IoT, virtual and augmented reality, wearables, and 3D printing.

These innovations are reshaping how industries operate and compete.

Business leaders must look beyond their own sectors and stay aware of shifts across suppliers, customers, and related markets to stay ahead.

The Supply Chain at the Centre of the Digital Enterprise

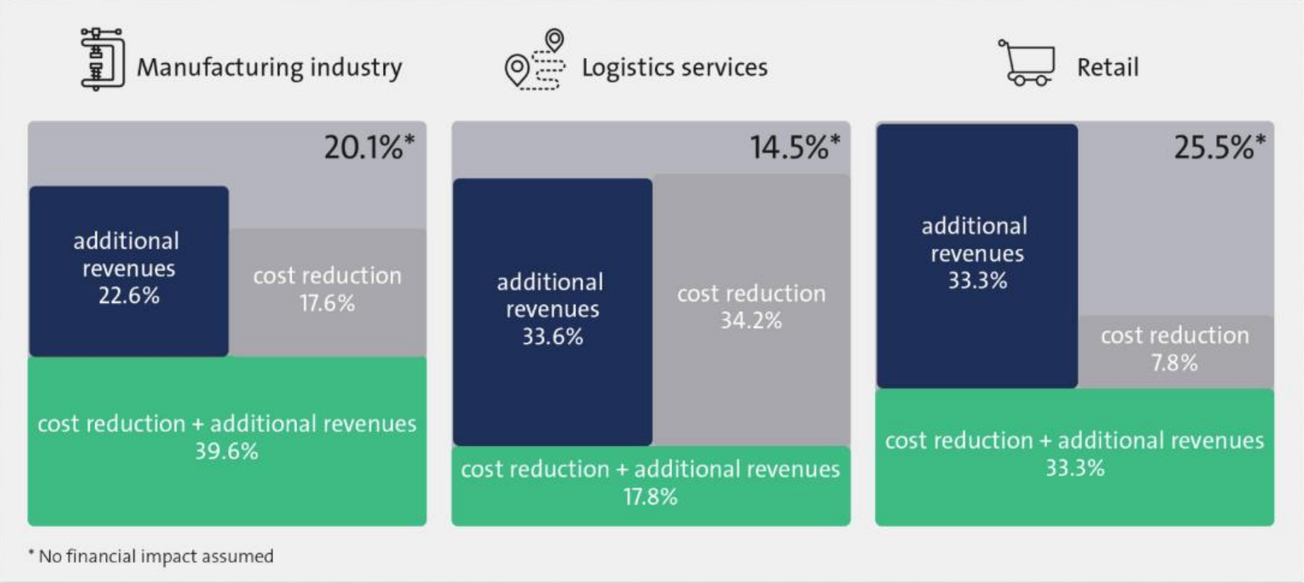


As technology becomes more affordable, labour cost differences across countries will matter less when deciding where to produce.

Digital supply chains will be central to distributing digital products and managing workflows.

This shift will reshape globalisation, increasing the importance of regional and local trade while reducing reliance on intercontinental flows.

Expected Impact of Digital Transformation

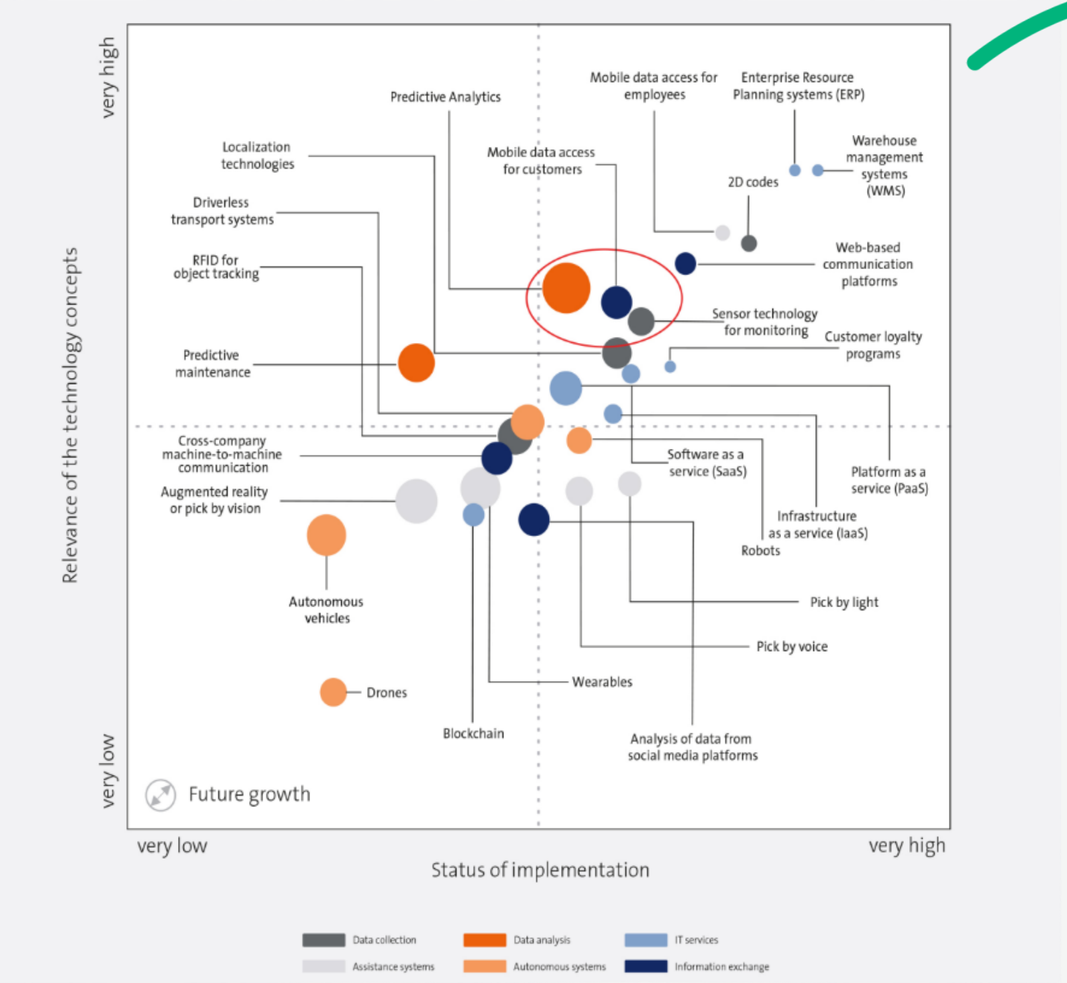


Source: German logistics association BVL International,

A wide range of these technologies is already affecting production systems and supply chains.

When combined and connected, they create new opportunities to deliver value across many levels including individuals, society, industries, businesses, and the factory floor.

The Relevance and Implementation Status of Technology Concepts



Four key technologies, which are currently at different stages in terms of level of readiness and adoption across industry sectors, are expected to significantly impact supply chains, both individually and in combination:

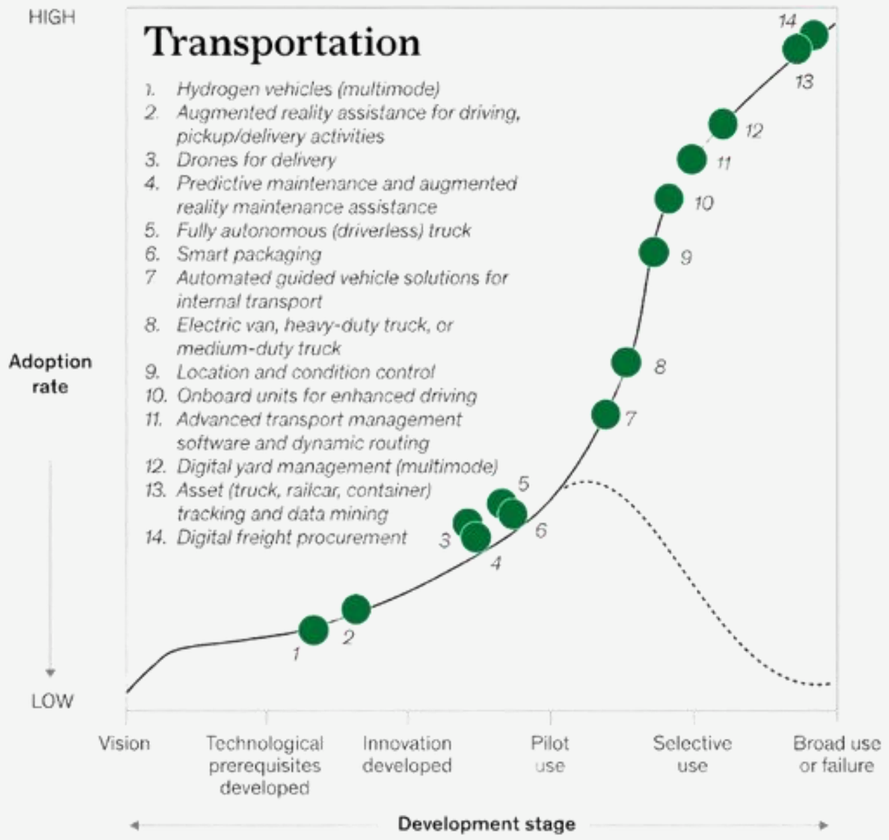
- Predictive Analytics
- Sensor Technology for Monitoring
- Platform-as-a-service (PaaS)
- Software-as-a-service (Saas)

Connected devices ensure the availability of real-time data, enable the geographic distribution of operations and manufacturing, and result in improvements in operational efficiency, processing time and operating and management costs.

Source: German logistics association BVL International

Technology Solutions by Development Stage and Adoption

Technology solutions,[1] by development stage and adoption rate, expert assessment (illustrative)



[1]List not exhaustive.

McKinsey & Company

Source: McKinsey & Company

As technology advances, shippers and providers can assess their transformation progress compared to the wider logistics sector to identify key capabilities and technologies.

With many use cases available, it can be hard to know where to invest and how to capture value, especially with newer, less adopted solutions like digital freight procurement in transportation.

Look out for concepts in pilot stage:

5 - Automated (driverless) truck
8 - Electronic. Trucks

Technology Impact Across Supply Chains

Value driver	Business problem addressed	Description	Impact	Origin industry	Applicable industry
End-to-end real-time supply chain visibility platform					
Speed to market Agility and responsiveness	Lack of end-to-end (E2E) visibility across supply chain performance, to enable decision making	Installed end-to-end real-time supply chain management software for centralized inventory management & supplier and site performance monitoring	•$80M savings in supply chain costs	Pharma	Consumer Automotive Aerospace Chemicals
Single platform for real-time supply chain decisions					
Resource productivity and efficiency Speed to market Agility and responsiveness	Lack of E2E visibility across supply chain performance to enable decision making	Automated purchasing, sourcing, inventory modeling and tracking onto a single connected platform, enabling simulations and fact based decision making	•20% improvement in productivity •5% reduction in SC coordination costs •5% improvement in on-time delivery	Aerospace	Consumer Automotive Pharma Chemicals
Aggregate demand across end-to-end supplier network					
Resource productivity and efficiency Agility and responsiveness	Delays in supply chain due to poor communication of demand needs across network of sites and suppliers	Deployed a material demand aggregation engine to maps all parts used across all the suppliers that deliver to all sites in the manufacturing network. The engine groups the common parts used at different points in the process, monitors part purchase points and creates visibility to all supplier tiers.	•3-25% reduction in raw materials purchasing costs Trim long tail supplier lists	Aerospace	Automotive Engineering Chemicals

Source: McKinsey & Company

End-to-end real-time supply chain visibility platform

Business problem

Lack of end-to-end (E2E) visibility across supply chain performance, to enable decision making

Solution

Installed end-to-end real-time supply chain management software for centralised inventory management & supplier and site performance monitoring

Preliminary Considerations for Fourth Industrial Revolution-Driven Supply Chains

Supply chain performance:
To transform supply chains, a new level of supply chain visibility needs to be achieved. Fourth Industrial Revolution technologies, such as the internet of things and artificial intelligence, will prepare the ground for the necessary transformation.

New roles and capabilities:
In the context of current and future dynamics, the enhancement and change of roles and capabilities – such as the implementation – will define competitiveness and "compatibility" advantage in the Fourth Industrial Revolution. Along the supply chain, the roles of stakeholders are likely to change. Companies need to prepare for this development.

Ecosystem for skilling:
Shortage of talent and the right-skilling challenge will remain. These technologies but also new innovation and partnering models already require new competencies and skills – at all levels. A multi-stakeholder ecosystem for skilling is needed.

Neutral platforms:
The shaping of the Fourth Industrial Revolution is a co-creation effort that requires spaces for the exchange of ideas, information and experience to support the implementation of new roadmaps. These co-creation platforms have to be neutral and as much digital as traditional in nature.

Industry Examples

AI widespread adoption

Demand Forecasting
Use Case: Retailers and manufacturers use AI to anticipate demand, ensuring that they stock the right amount of inventory.
Danone / Apple

Inventory Management
Use Case: AI models can predict optimal inventory levels based on real-time demand, sales data, and market trends.
Zara / Coca-Cola

Supply Chain Risk Management
Use Case: AI monitors geopolitical events, weather patterns, and other variables that may disrupt the supply chain.
Predictive / Recovery

Route Optimisation
Use Case: AI can help logistics companies determine optimal delivery routes to minimise delays and reduce fuel expenses.
Optimal routes

Warehouse Automation
Use Case: AI-driven robots in warehouses streamline sorting, packing, and order picking, reducing operational costs.
Dark warehouse

Industry Examples

AI new adoptions

Supplier Relationship Management

Managing supplier relationships is critical to ensuring timely deliveries and high-quality materials. AI helps businesses evaluate supplier performance, track delivery reliability, and assess supplier risk. This allows companies to make data-driven decisions and maintain strong relationships with reliable suppliers.

- Use Case: AI analyses data on supplier performance, enabling companies to select the best partners and manage supply risks.

- Example: Unilever uses AI to monitor supplier performance and track sustainability metrics, ensuring that suppliers meet environmental and ethical standards.

Industry Examples

AI new adoptions

Sustainability and Environmental Impact Tracking

AI helps organisations track and minimise their environmental impact by monitoring carbon emissions, fuel usage, and waste. AI-based analytics tools provide insights into how companies can optimize their supply chains to reduce their carbon footprint and support sustainability initiatives.

- Use Case: AI tools measure environmental impact, enabling companies to adjust their processes to reduce emissions.
- Example: Nestlé uses AI to track carbon emissions across its supply chain, allowing it to set reduction targets and meet sustainability goals.

Final takeaway remarks

We're at a global inflection point. Technology is advancing faster than human capacity to adapt.

- We must reflect: Where is the human in the equation? What is the human's unique value proposition in an AI-driven world?

Rate of change has never been so high

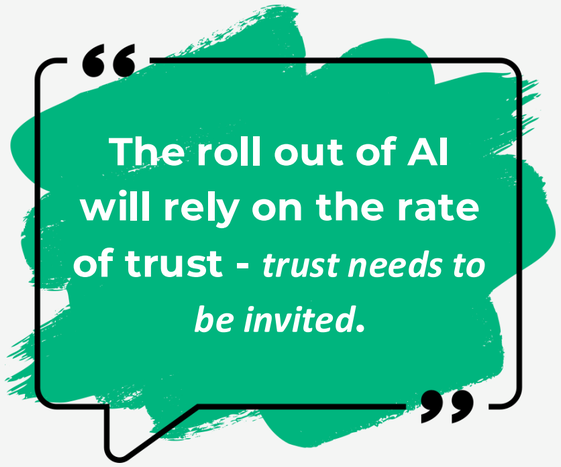
- Example of recent Google announce on payment form search point - where does this leave Amazon etc?

How the world sees AI

- East (Chines) see AI as infrastructure - 15 year game plan with all devices as data inputs
- West market short term thinking on AI as thinking tool

Your job is not going to be taken by AI, but by someone using AI.

- Companies have a big role to play. Helping people grow - with technical skills, learning strategies, resilience, and foundational skills like critical thinking - is essential to keeping them relevant throughout their careers



THANK YOU