



# Transforming America's Industries

Industrial Metaverse and Skills for the Future

March 2025

## Topics to Discuss

- US Labor Market
- Industrial Metaverse Defined
- Speed of Change
- Industrial Skills for the Future
- Collaboration Model







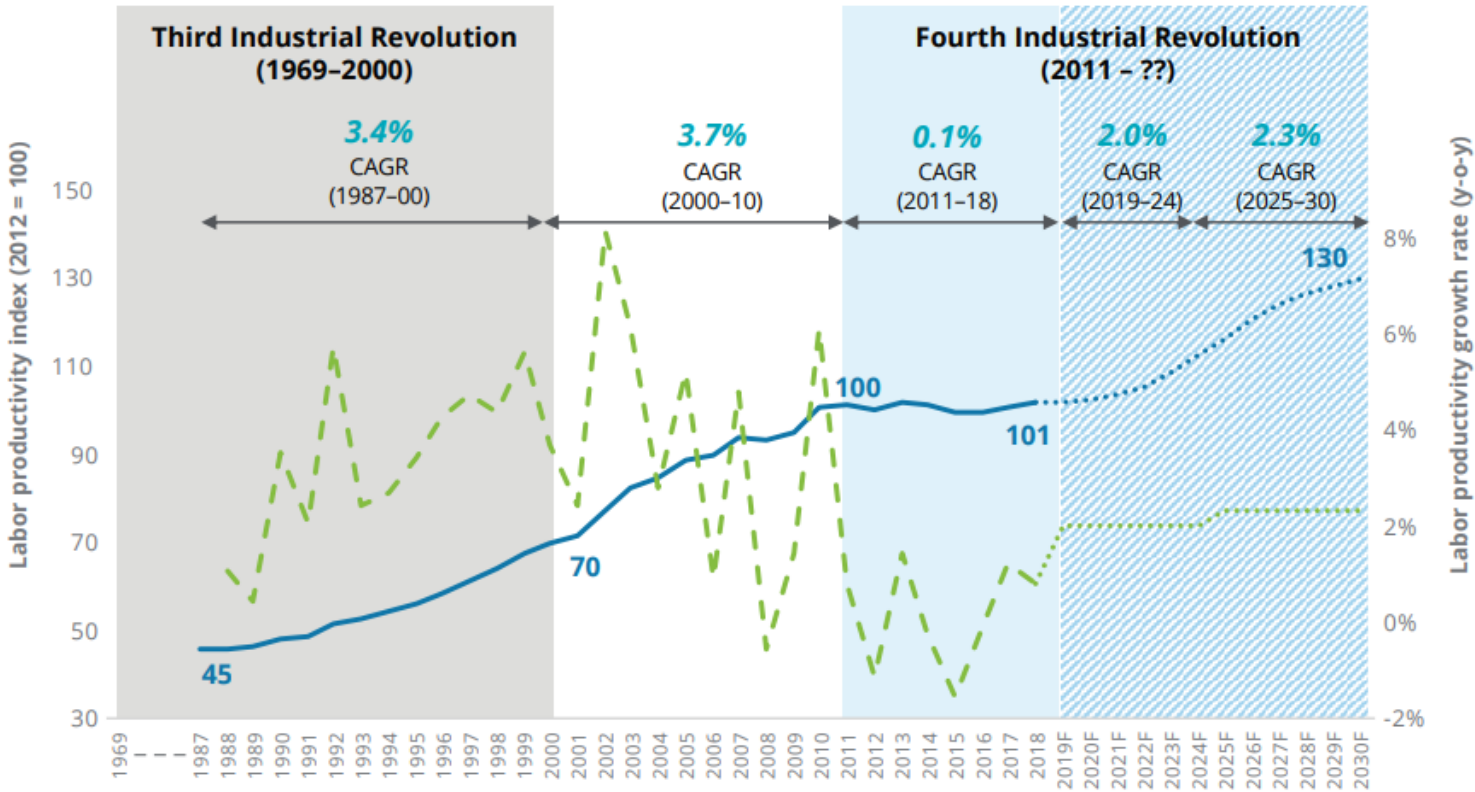
# US Labor Market Trends

- Boomer, Women exits
- 'Worker Market' → Employer Market
- Hybrid Work → RTO
- Flexible Benefits
- 'Work for Purpose'
- Speed of Change

# Labor Productivity Trendline

Manufacturing labor productivity, forecast, 1987-2030 (2012 index = 100)

— Labor productivity index (2012 = 100)    - - - Labor productivity year-on-year growth rate



Sources: Data from Bureau of Labor Statistics, Deloitte and MAPI Smart Factory Survey, and Deloitte Analysis.





# The Industrial Metaverse

What is It?



# The Industrial Metaverse



Industrial Metaverse is Coming. Are you read...  
world.com



Is the 'Industrial Metaverse' the Next Big Thing? | Ind...  
industryweek.com



Microsoft is Getting a Head Start on the Virtual Un...  
insidetelecom.com



Manufacturing the Future in the Metaverse  
blog.techdesign.com



A Sketch of the Industrial Metaverse | Exponential In...  
docrogers.com



Industrial Metaverse and Manufacturing - IoT Worl...  
iotworlds.com



ution on the factory floor: benefits...  
manufacturer.com



The Industrial Metaverse  
nextspace.com



5 Ways the Industrial Metaverse Will Impact Manufacturers | ...  
automate.org



Siemens and NVIDIA want to Enable Indus...  
rapid-meta.com



What is the Industrial Metaverse? - Homo Digitalis  
homo-digitalis.net



What does the metaverse mean for the Industrial Internet? ...  
coinyuppie.com



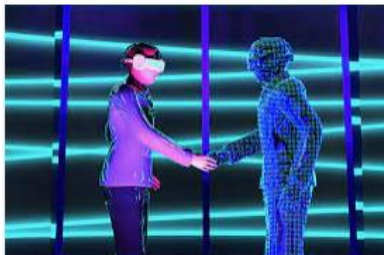
Comes the 'Industrial Metaverse' - RTInsig...  
ights.com



The industrial plant workforce training of the future...  
vr.linde.com



iFACTORY Brings The 'Industrial Metaverse' To Life ...  
metrology.news



Unleashing The Power Of The Industrial Metave...  
forbesindia.com



The Industrial Metaverse. Catalyzing the next in...  
arvrjourney.com



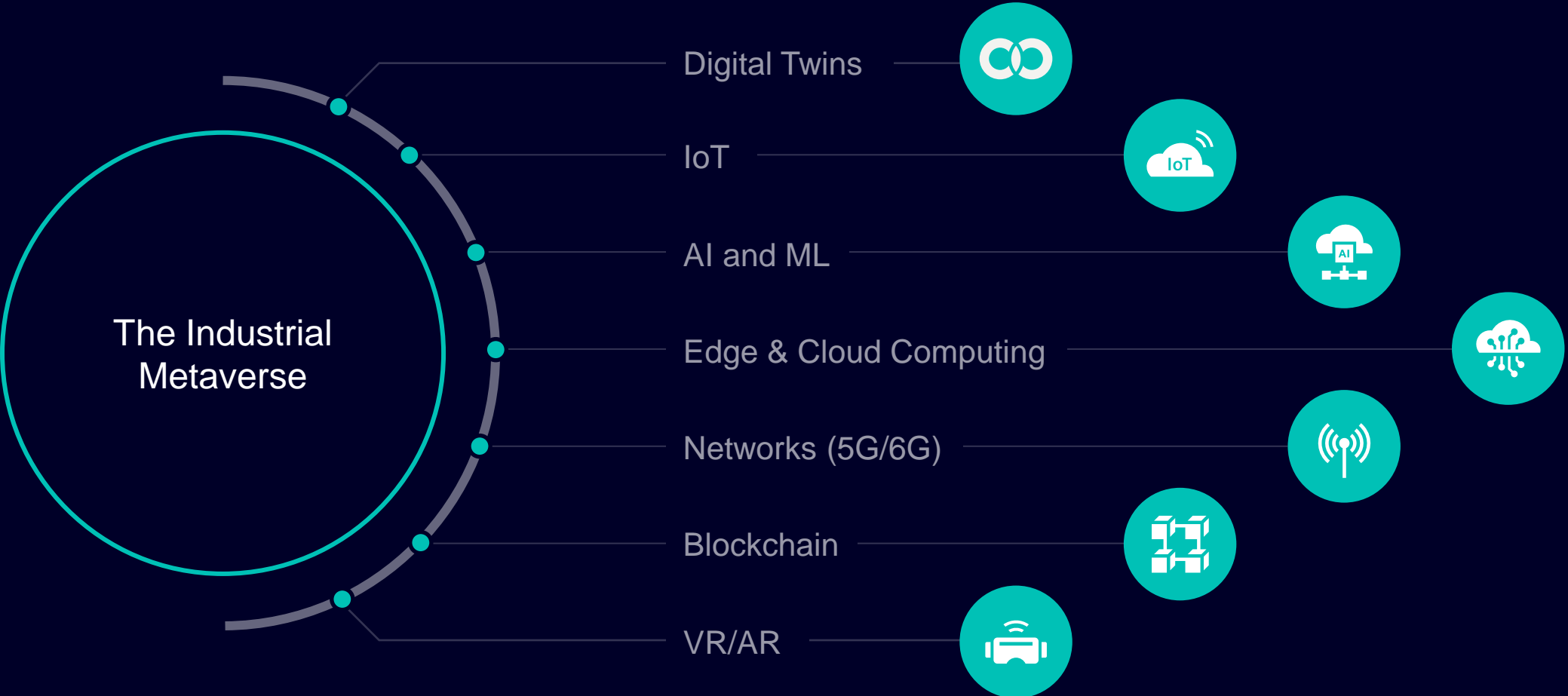
Reliabilityweb Siemens and NVIDIA to Enable Industrial  
reliabilityweb.com



# Why the Industrial Metaverse matters

In a world that faces multiple crises  
the industrial metaverse will empower people and companies  
to solve real-world problems more efficiently

# Evolution and convergence of key technologies will enable the industrial metaverse





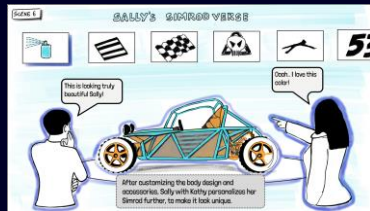
# Key industry trends will catalyze new experiences in the Industrial Metaverse

## Personalized products

**Today**, some suppliers can tailor the products according to customer needs and profiles.



MINI configurator



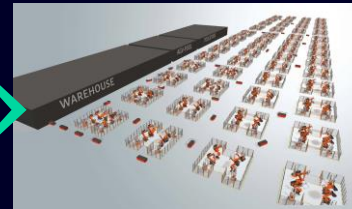
SALLY's Simroverse  
(See Appendix III)

**Tomorrow**, customers will actively participate in product creation together with professional designers.

**Industrial Metaverse** provides a co-working space and suitable tools for professionals and amateurs to create together.

## Resilient production

**Today**, production in modern factories is performed by automated systems, built to follow predefined processes.



Matrix production

**Tomorrow**'s factories feature highly autonomous production and transport units, which can react to disturbances and dynamics during operation without intervention.

**Industrial Metaverse** offers the environment to train and validate autonomous machines both individually and collectively.

## Efficient supply chain

**Today**, actors adjacent on the value chains join in collaboration programs for mutual benefits, supported by cloud-based software to share info and improve communication.



Catena-X Ecosystem

**Tomorrow**, actors in the industry network will have complete visibility of real-time status of the entire supply chain, which is optimized and coordinated by cloud-based services.

**Industrial Metaverse** supports decentralized production over a network of dispersed facilities with first time right decision making.

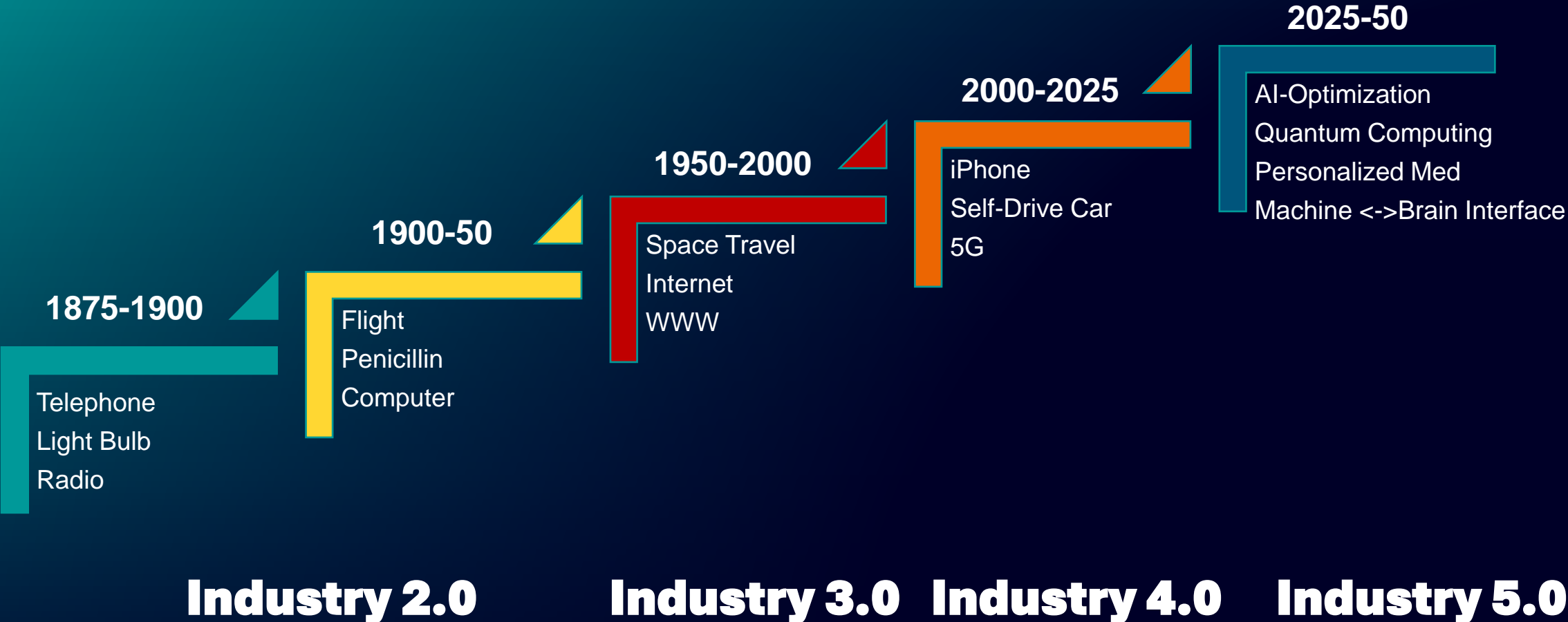


# | Technology Change:

Impact on Skills for Future



# Technology Trends over Time



# Transforming Core Skill Sets Over time

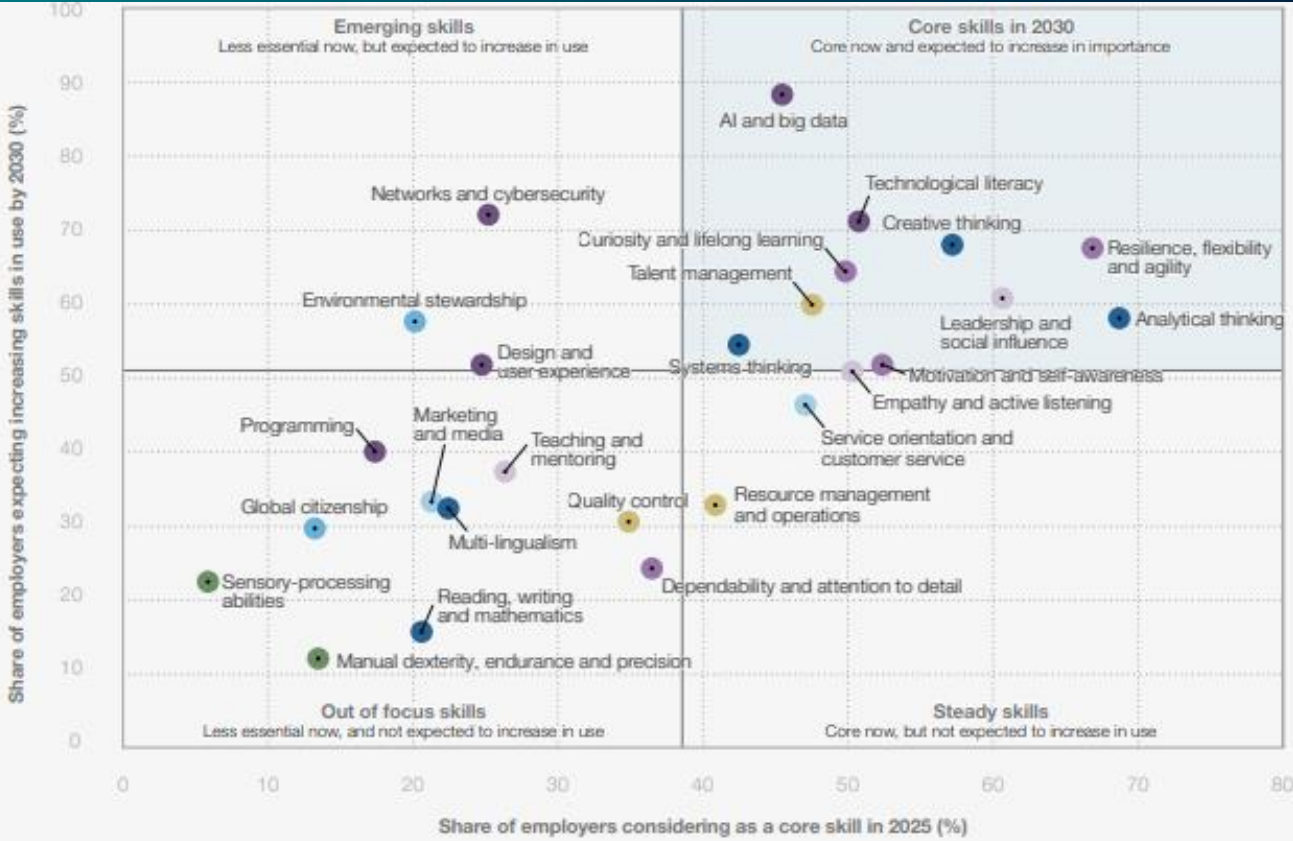
## Top 10 Skills

...in 1970	...in 2015	...in 2025	...in 2030
Writing	Complex Problem Solving	Analytical thinking and innovation	Creative thinking
Computational Skills	Coordinating with Others	Active learning and learning strategies	Resilience, flexibility and agility
Reading Skills	People Management	Complex Problem Solving	Curiosity and lifelong learning
Oral Communications	Critical Thinking	Critical Thinking and Analysis	Leadership and social influence
Listening Skills	Negotiation	Creativity, originality and initiative	Analytical thinking
Personal Career Development	Quality Control	Leadership and social influence	<b>Systems thinking</b>
Creative Thinking	Service Orientation	Technology use/procedure/control	Motivation and self-awareness
Leadership	Judgment and Decision Making	Technology design and programming	Empathy and active listening
Goal Setting/Motivation	Active Listening	Resilience/stress tolerance/flexibility	Service orientation and customer service
Teamwork	Creativity	Reasoning/problem solving/ideation	Dependability and attention to detail

Source: Fortune 500 Most Valued Skills; Future of Jobs Survey, World Economic Forum.



# Skills Demand and Change



- Cognitive skills
- Engagement skills
- Ethics
- Management skills
- Physical abilities
- Self-efficacy
- Technology skills
- Working with others

Source  
World Economic Forum, Future of Jobs Survey 2024.

Note  
The Future of Jobs Survey uses the World Economic Forum's Global Skills Taxonomy.  
Bold lines represent the median values across all skills.

# Potential Use Case Impacts to Manufacturing Processes from 4<sup>th</sup> Industrial Revolution/Industrial Metaverse

**Quality sensing and detecting:**  
Real-time equipment monitoring,  
visual analytics, in-line quality testing

1

**Factory asset intelligence and performance management:** Predictive maintenance, Augmented Reality (AR) to assist maintenance personnel, sensor-enabled asset monitoring

2

**Plant consumption and energy management:** Sensor-based waste, scrap, and utility consumption tracking; energy, water, waste optimization platform

3

**Advanced manufacturing:** 3D printing and prototyping

4

**Engineering collaboration and digital twin:** Fast prototyping, virtual reality production cell configuration, digital product modeling

5

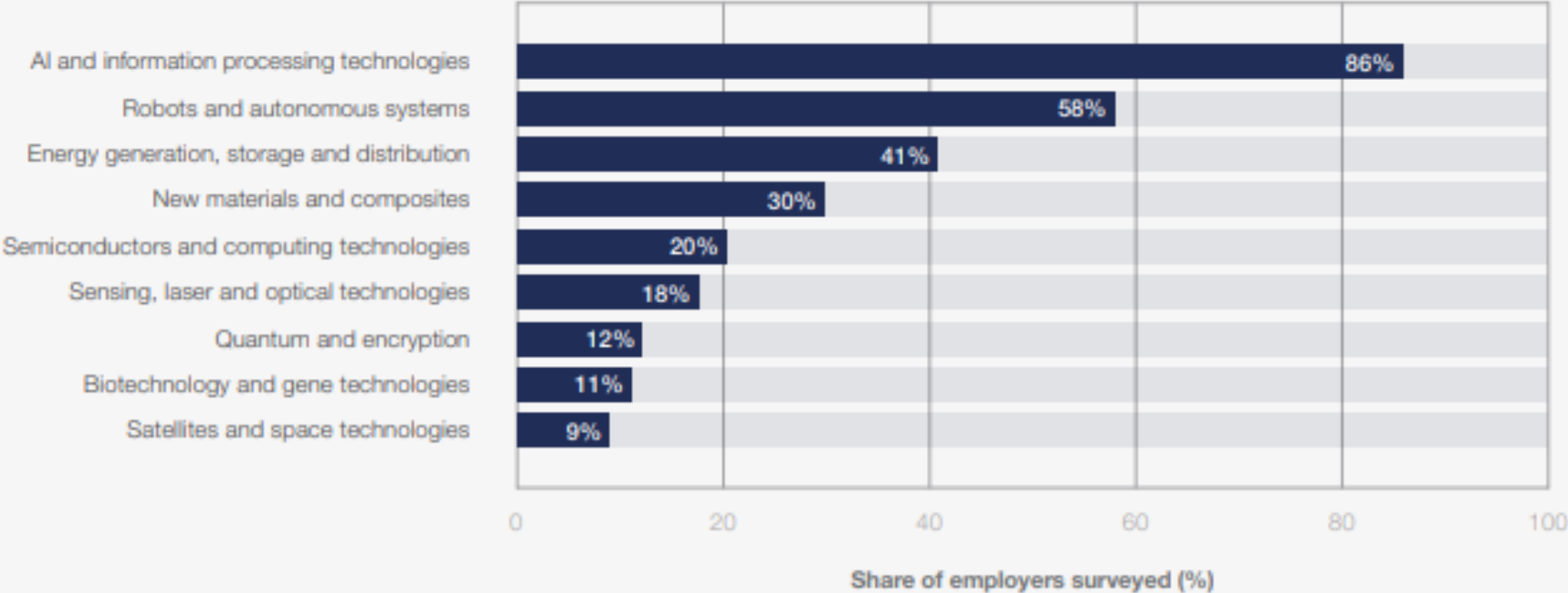
**Robotic and cognitive process automation:** Robotic process automation, machine learning, natural language processing, AI

6

Source: 2019 Deloitte and MAPI Smart Factory Study

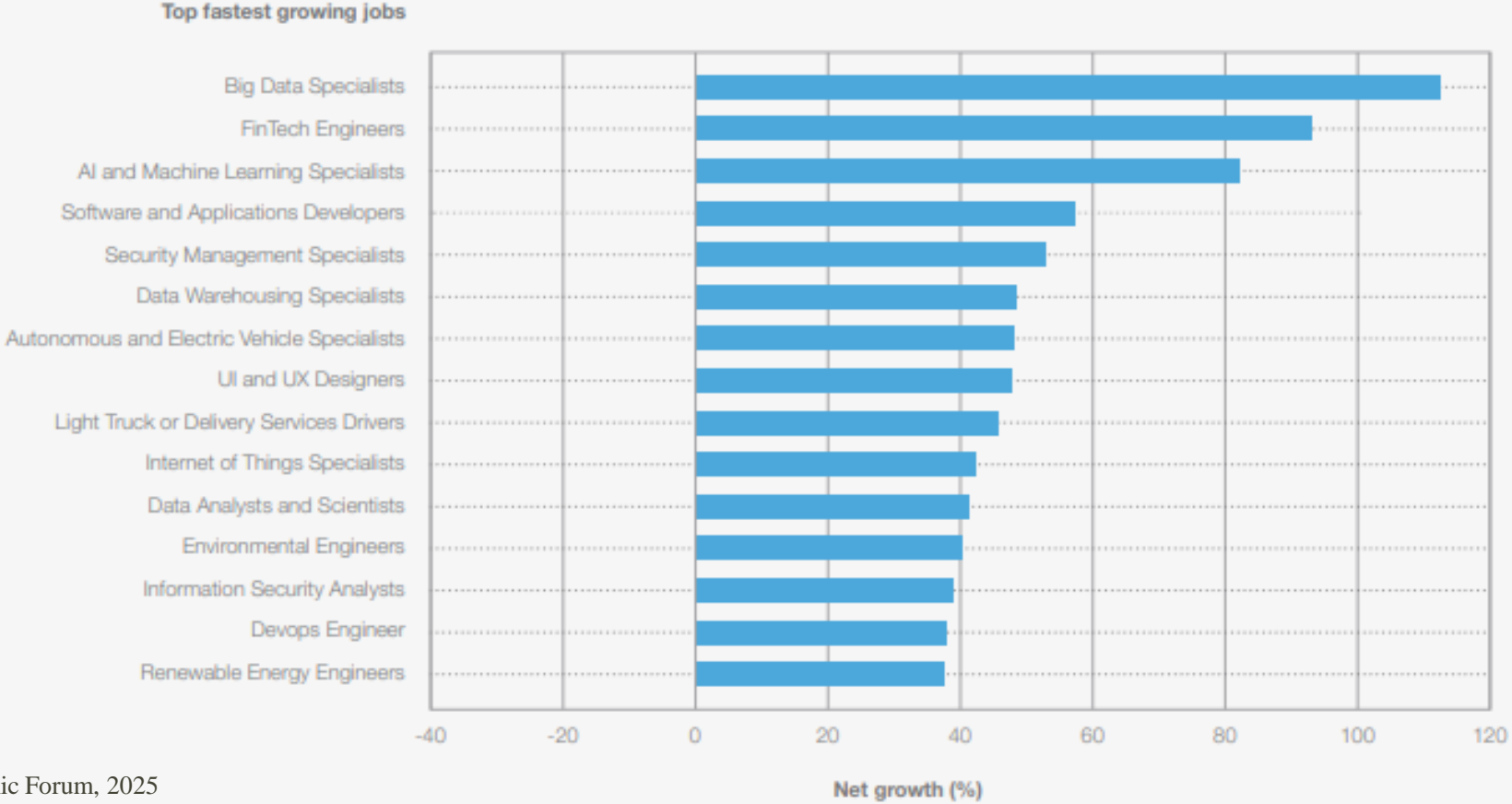


# Technology Driving Business Today: Business Transformation Impacts, 2025-30



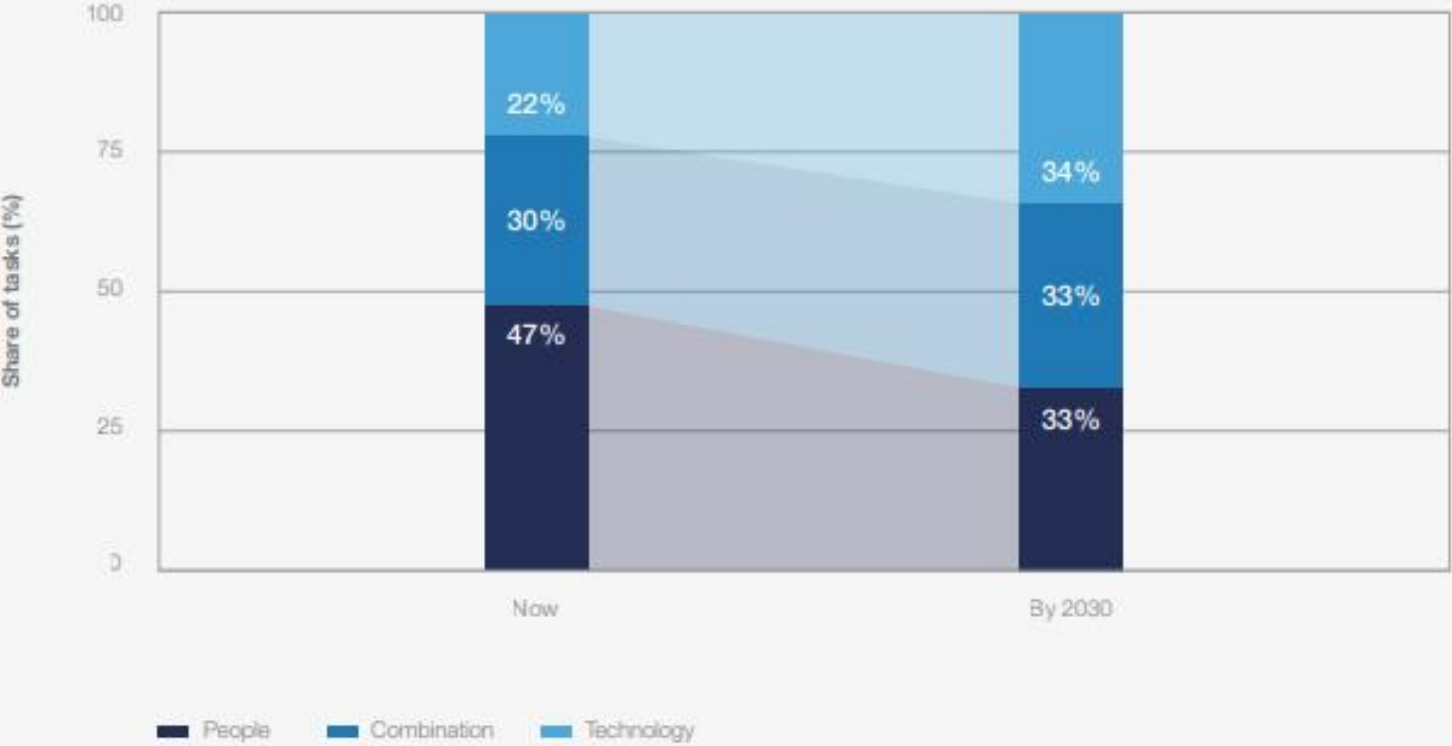
Source  
World Economic Forum, Future of Jobs Survey 2024.

# Top Fastest Growing Jobs, 2025-30



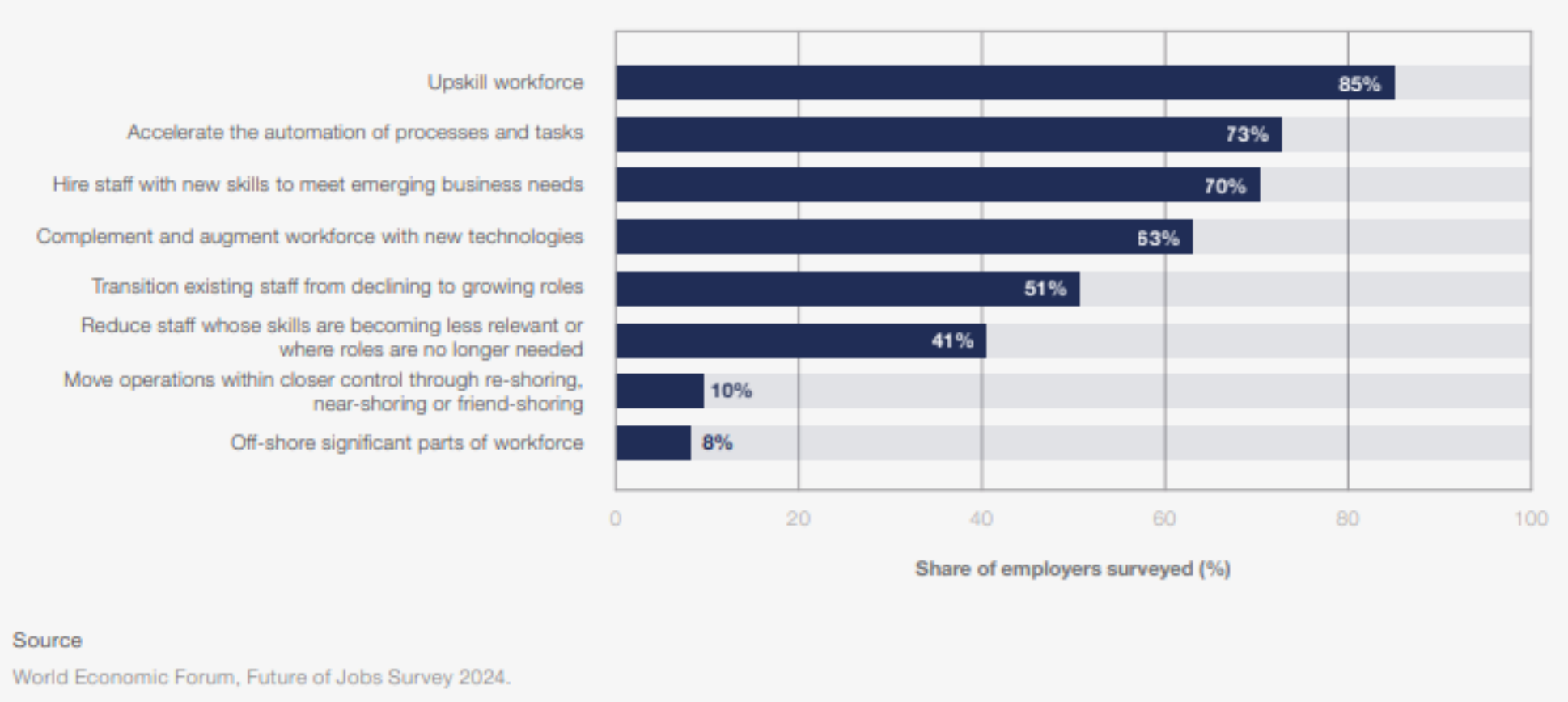


# Shifting Human-Machine Workload: Automation vs Augmentation, 2025-30



Source  
World Economic Forum, Future of Jobs Survey 2024.

# Employer Workforce Strategies





# Upskilling or Reskilling? 2025-30



Source  
World Economic Forum, Future of Jobs Survey 2024.



# Skills Hiring: Siemens Example and Future Options



# Service Delivery US Core Skills Needs

Rationalized  
across TS, FS  
and TR

Technical Support Skill	SITRAIN Skill	Field Service
	Customer Service Attitude	
	Patience and Perseverance	
	Communication: Written & Oral	
	Influencing without Authority	
	Problem Solving	
	Teamwork / Team Player	
	Self Learner / Learning Agility	
	Creative Thinking	
	Self-motivated / Initiative	
	Critical thinking / Analytical Thinking	
	Time Management / Multitasking / Prioritization	
	Conflict Resolution / Negotiation	
	Systems / Tools to Support Function	
	Mentoring	
	Listening	
	Organizational	
	Cognitive Flexibility	
	Emotional Intelligence	
	System / Application Understanding	
	Technical Writing	
	Didactic Theory Understanding	
	Facilitation / Presentation / Classroom (Group) Management	
	Technical Skills (MySkills)	

Core Skills

# Knowledge and Skill Development for NextGens- *What are we looking for?*

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## Cognitive Flexibility

Shift across multiple roles  
Remain agile  
Maximize changing resources

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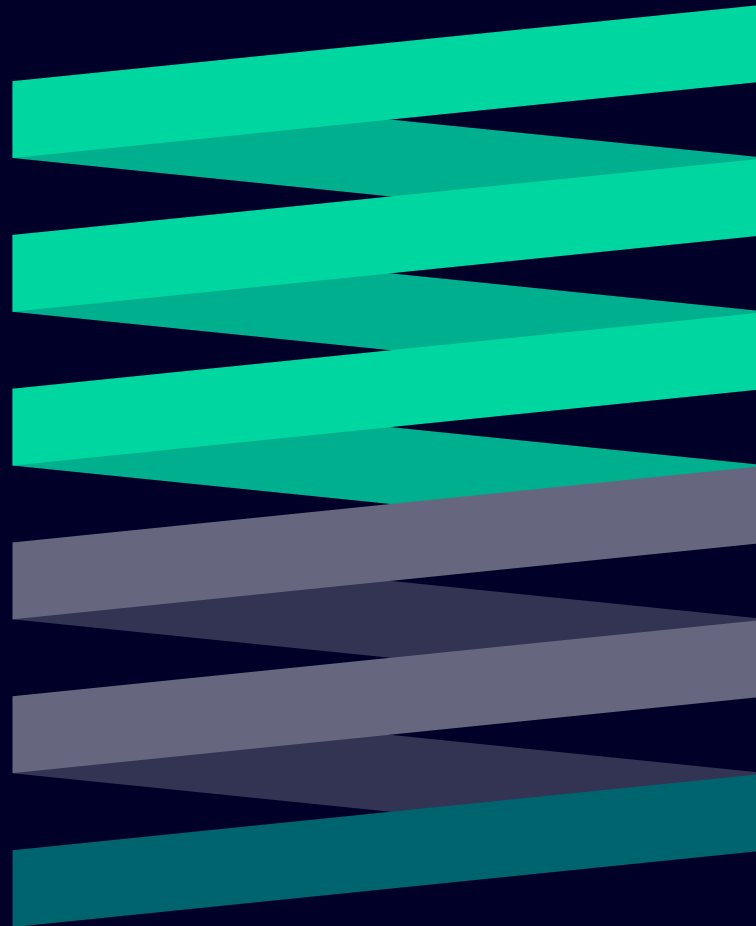
## Customer Focus

Create and curate training materials  
Deliver knowledge transfer  
Discover new service opportunities

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## Problem Solving

Develop system analysis and evaluation techniques  
Apply critical thinking to assess information  
Recommend solutions and guide specialists



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## Active Learning

Ongoing development  
Apply learning strategies  
Enrich internal and external interactions

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## Complex Systems Thinking

Broad perspective  
Explore structures, patterns, cycles  
Systems approach to analysis

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## Communication

Technical writing  
Effective information transfer



# Assessment Center Approach for Candidate Selection



<u>Assessment Center Skills</u>	<u>Assessment process</u>	<u>Details</u>	<u>Resources needed</u>
<b>Customer Skills</b>			
Customer focus/relationship management Coordination with subject matter experts	Role play	Customer service role play, with SME available for callout	Observer, 2 employees (x 3)
Communication skills - written/verbal	Mailbox/Interview	Series of items they may encounter, with request to prioritize and explain prioritization	Plausible situations
Collaboration skills	Team exercise	TBD	Observers, 2 (x 3)
<b>Core Skills</b>			
Cognitive flexibility Learning agility Complex system thinking	Individual Exercise	Tech Support hands on exercise; Learning topic delivery; on line assessment; Hackerearth	Observer (x 3)
Problem solving	Team Exercise/Mailbox		
<b>Technical Skills</b>			
Industry understanding Knowledge of A&D Hardware/Software	Interview		Technical Interviewer (x 3)

# How do we Collaborate to Build the Future?



## Schools

Didactics

Foundational

Custom Approach



## Employers

Skills Demand

Strategy for Industrial Future

Funding Model – EX

Experience / Knowledge

# Contact

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