

Workplace 4.0

what is *your*

human advantage?

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how will you
outperform
~~the competition~~ technology?

w o r k p l a c e 4 . 0



why?

“If we could first know where we are, and whither we are tending, we could then better judge what to do and how to do it.”

Abraham Lincoln
(House Divided speech)

A close-up, high-resolution photograph of a person's face, focusing on the eyes and forehead. The person's eyes are closed, and their eyebrows are slightly furrowed, suggesting a state of stress, contemplation, or conflict. The skin is a warm, brownish-tan color with visible texture. The word "conflict" is overlaid in the center of the image in a bright yellow, sans-serif font.

conflict



Dumb & Dumber effect
and the excluded middle

1 | Late 1700s factories

(Schwab, 2016)

2 | Early 1900s automobiles

(Schwab, 2016)

3 | Post 1945 computers

(Schwab, 2016)

4 | Today...

robotics, AI, ML &
nanotechnologies

(Schwab, 2016)

Machine Learning

robotics

Artificial Intelligence

cyber-physical

Nanotechnologies



The [Yorktown Patriots](#) triumphed over the visiting [Wilson Tigers](#) in a close game on [Thursday, 20-14](#).

The game began with a scoreless first quarter.

In the second quarter, The Patriots' Paul Dalzell was the first to put points on the board with a two-yard touchdown reception off a pass from quarterback William Porter.

Wilson was behind Yorktown 7-0 heading into the second half. Wilson's Anton Reed tied the score with a two-yard touchdown run. The Patriots took the lead from Wilson with a two-yard touchdown run by Tanner Wall. The Patriots scored again on Adam Luncher's 29-yard field goal.

Yorktown maintained their lead going into the fourth quarter, 17-7. The Patriots extended their lead over the Tigers on Luncher's 27-yard field goal. Wilson cut into the Patriots' lead with a three-yard touchdown run by Amir Gerald. The game ended with Yorktown defeating Wilson, 20-14.

Yorktown's top passer was Wilson, who completed 6 of 10 passes for 91 yards and one touchdown. Yorktown's top rusher was Wall, who had seven carries for 57 yards and one touchdown. The Patriots' top receiver was Wall, who had four catches for 54 yards.

Yorktown will play Wakefield High School (1-0, 0-0) on Sept. 8. Wilson will play McKinley Technical High School (0-1, 0-0) on Sept. 8.



Unintended Consequences

what does
workplace 4.0
look like?

1.5 (43%)
uncertainty

91%
skills not
qualifications

35% by 2020

33%

underemployed

6,000,000
unfilled jobs

US Department of Labor (2017)

25%

skills mismatch

Andrews & McGowan (2015)

38-45%

2030 threat

Frey & Osborne (2013) | Carney (2016) | PWC (2017)

optimism

$$25 - 15 = 10$$

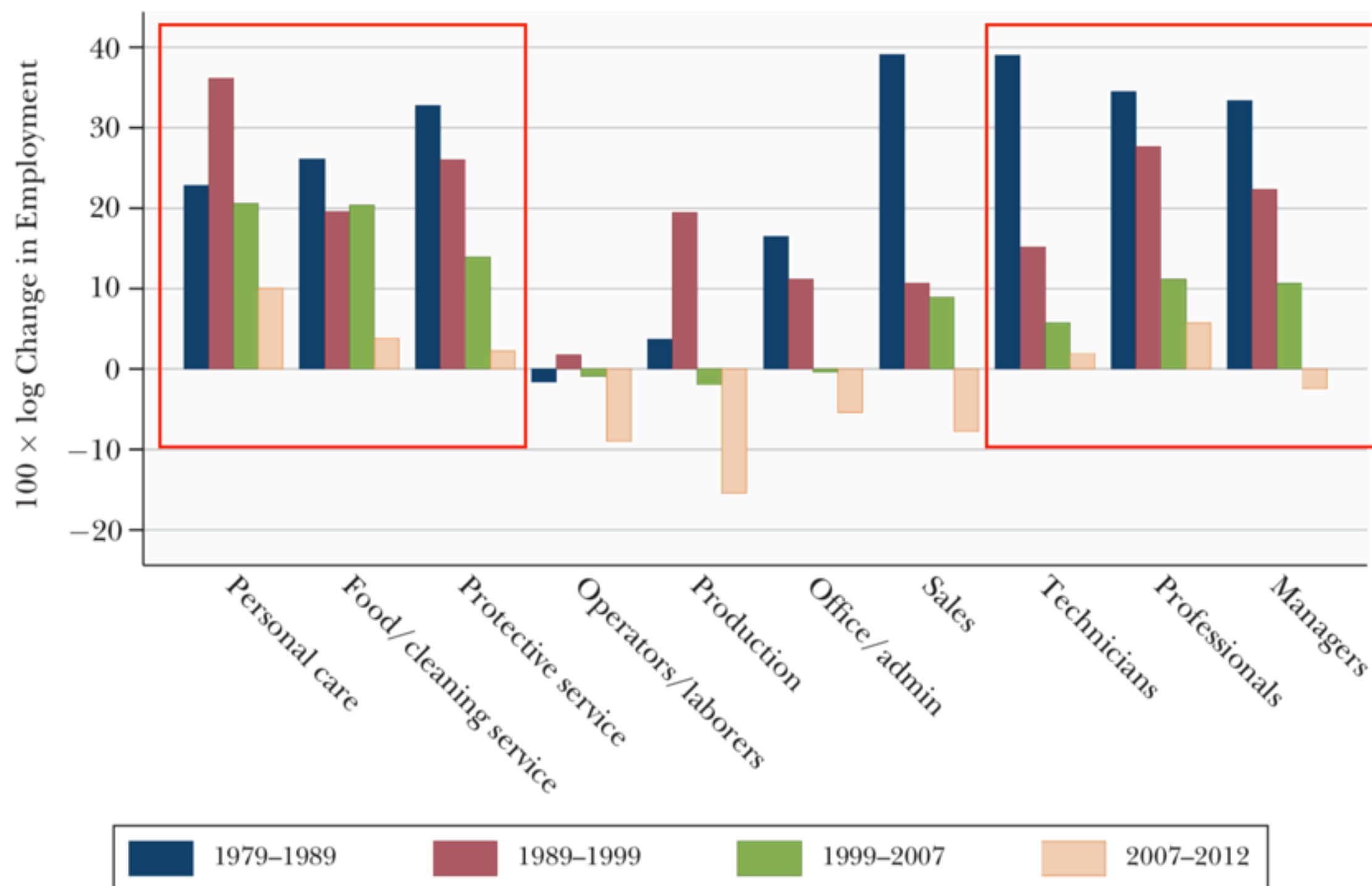
MILLION job loss

will you
you
be lost to the middle?

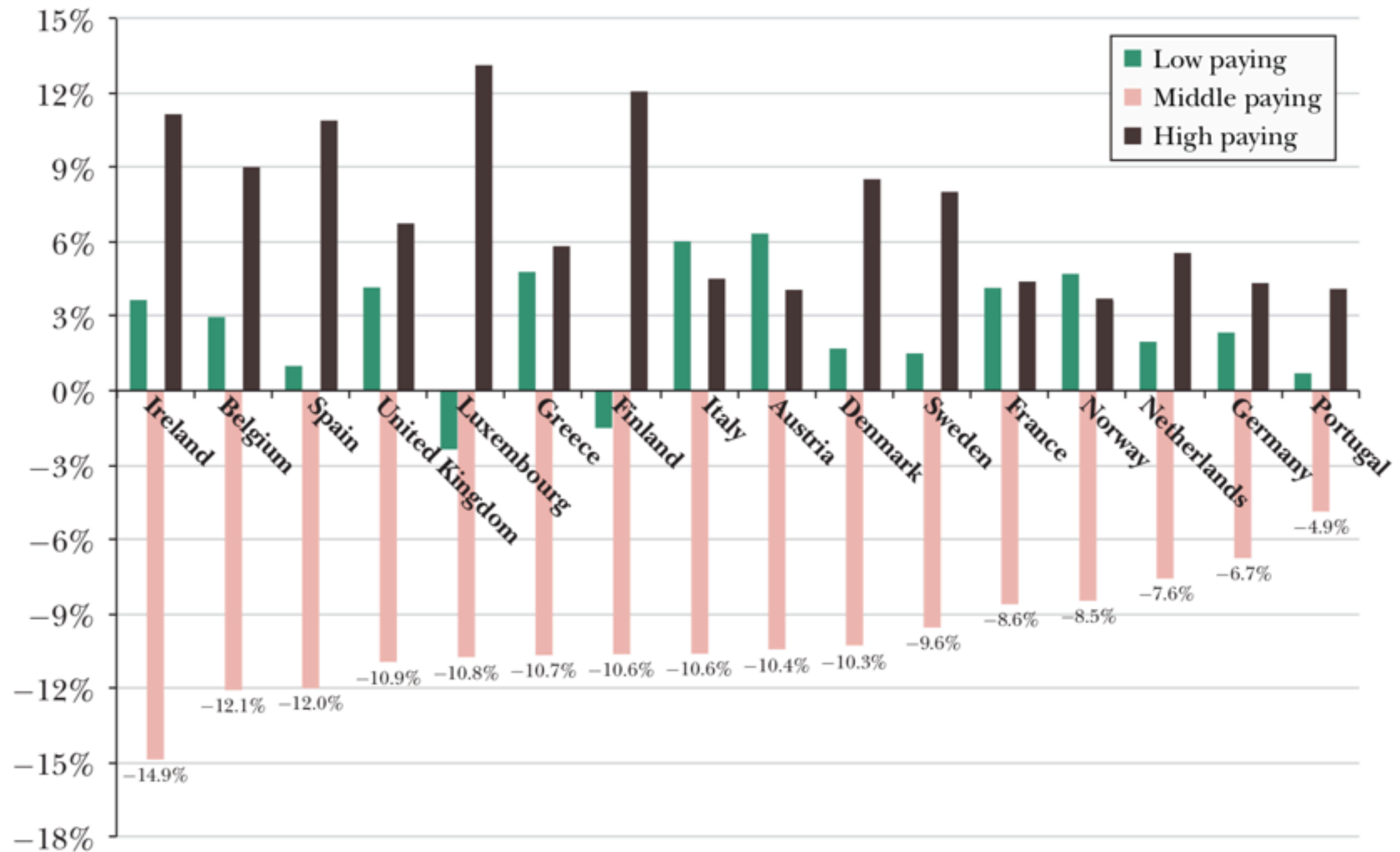
variety | adaptability | resilience

Change in Employment by Major Occupational Category, 1979–2012

(the y-axis plots 100 times log changes in employment, which is nearly equivalent to percentage points for small changes)

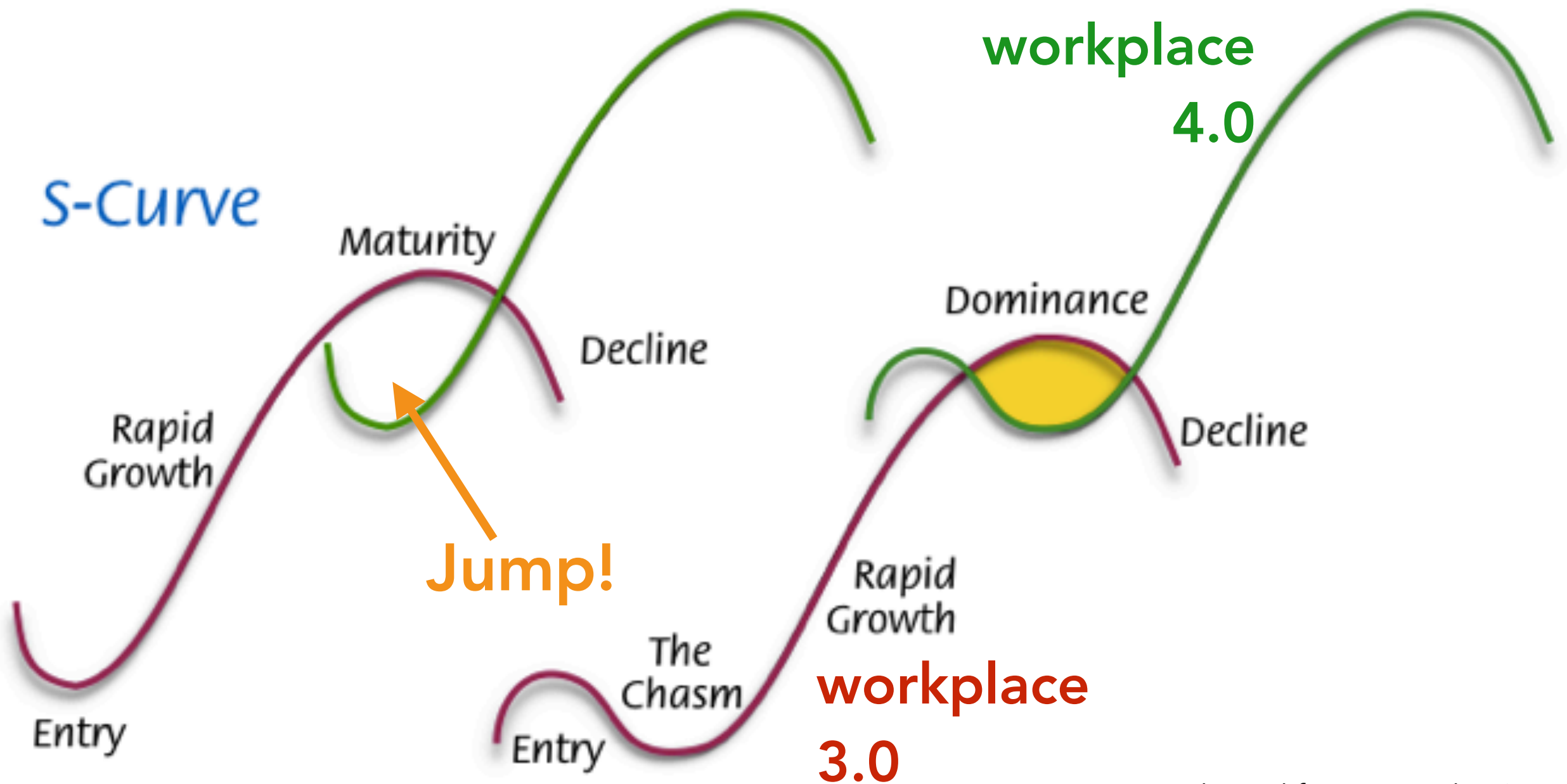


Change in Occupational Employment Shares in Low, Middle, and High-Wage Occupations in 16 EU Countries, 1993–2010



Outperform to thrive

can **you** make the jump?



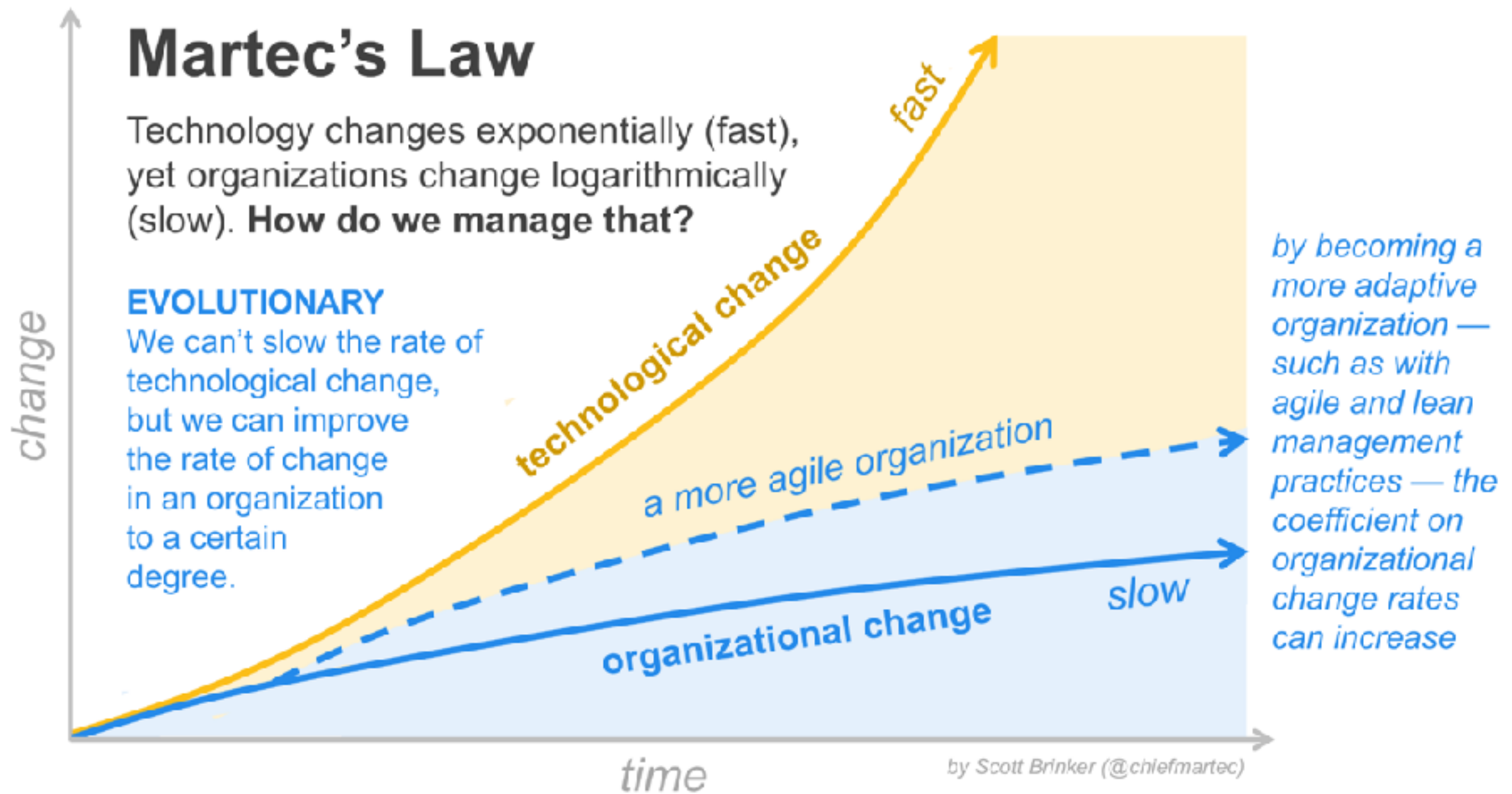
can you **outperform**?

Martec's Law

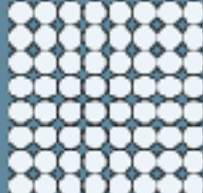
Technology changes exponentially (fast), yet organizations change logarithmically (slow). **How do we manage that?**

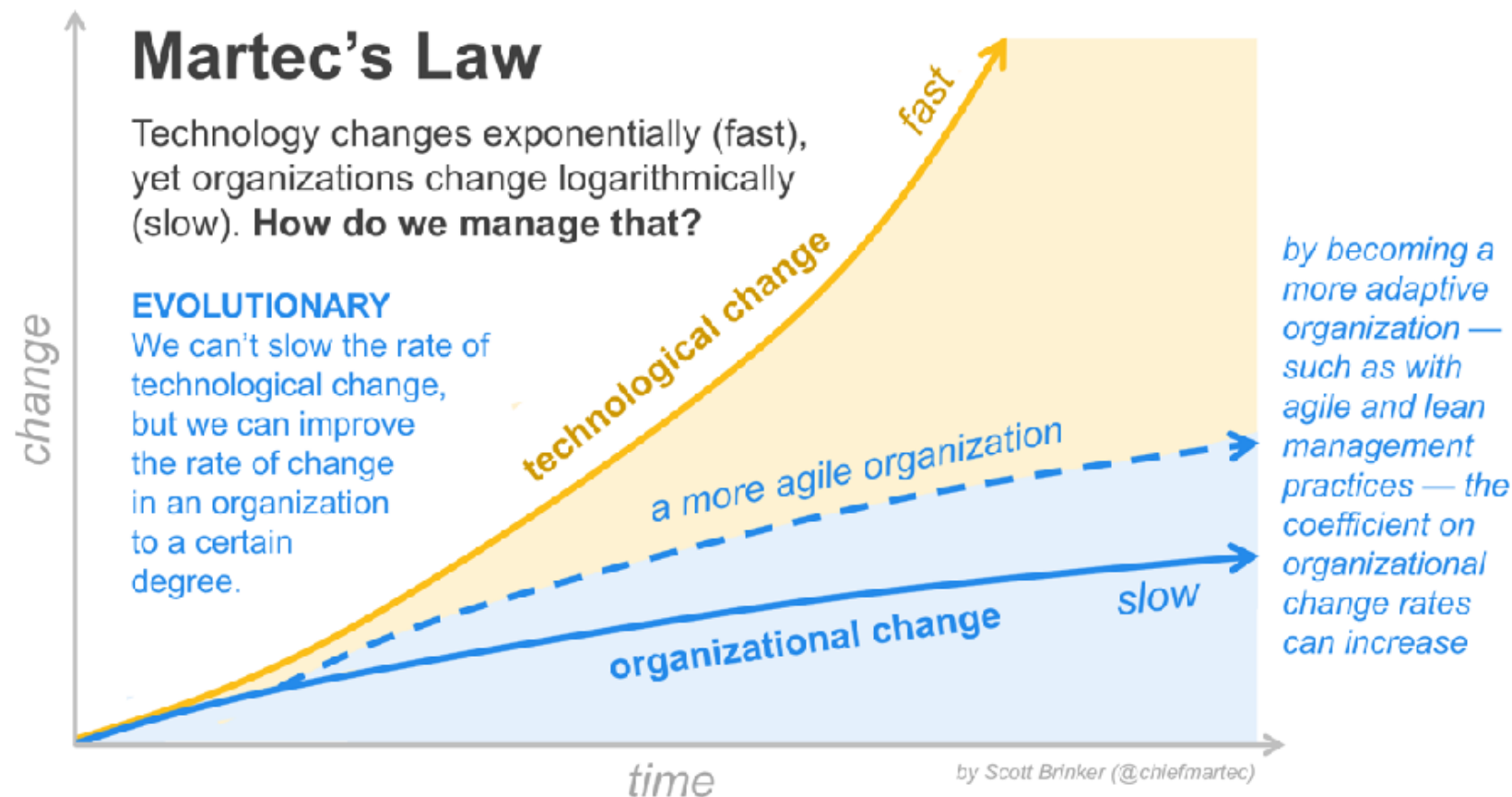
EVOLUTIONARY

We can't slow the rate of technological change, but we can improve the rate of change in an organization to a certain degree.

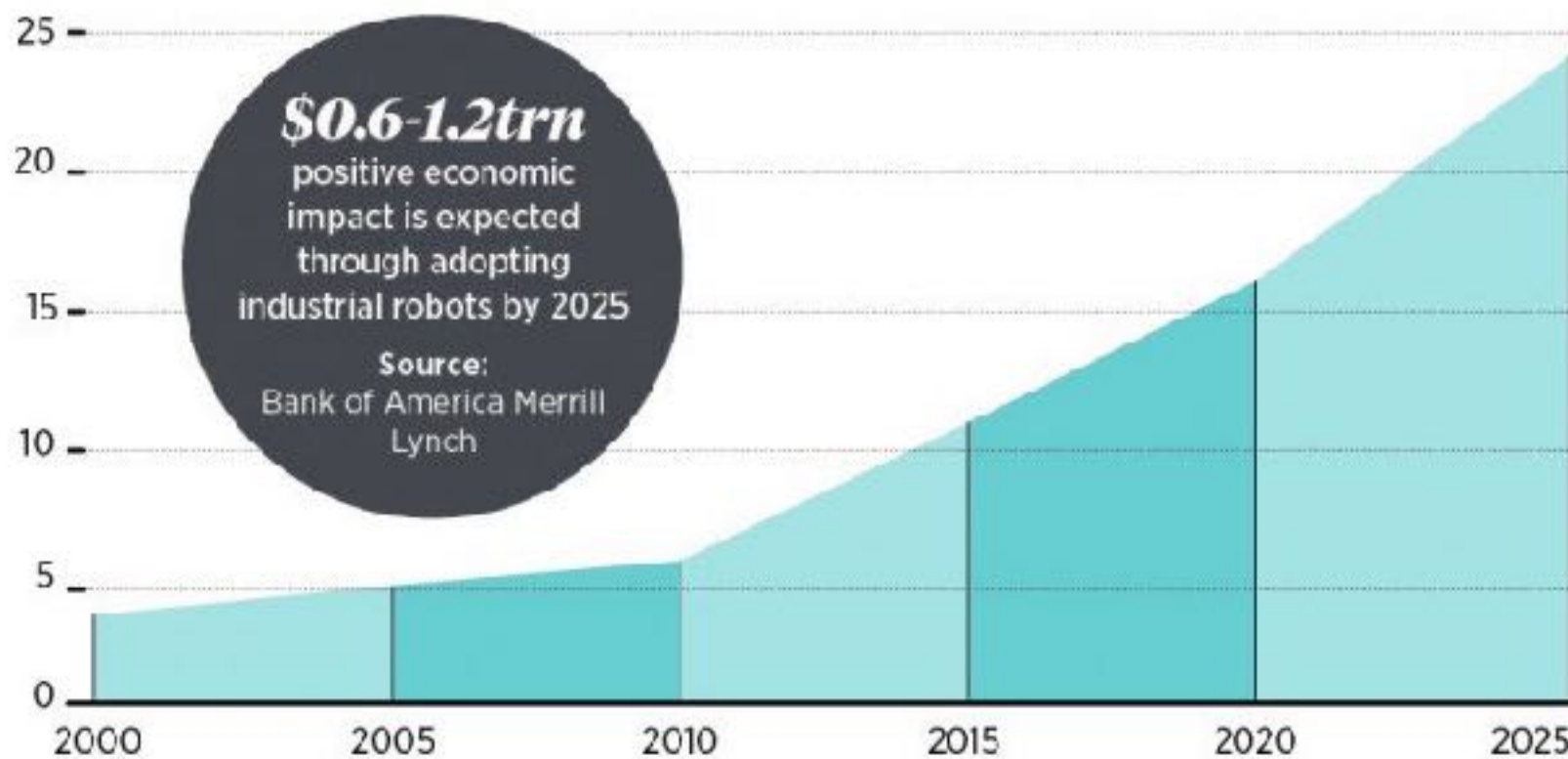


Outperform to thrive

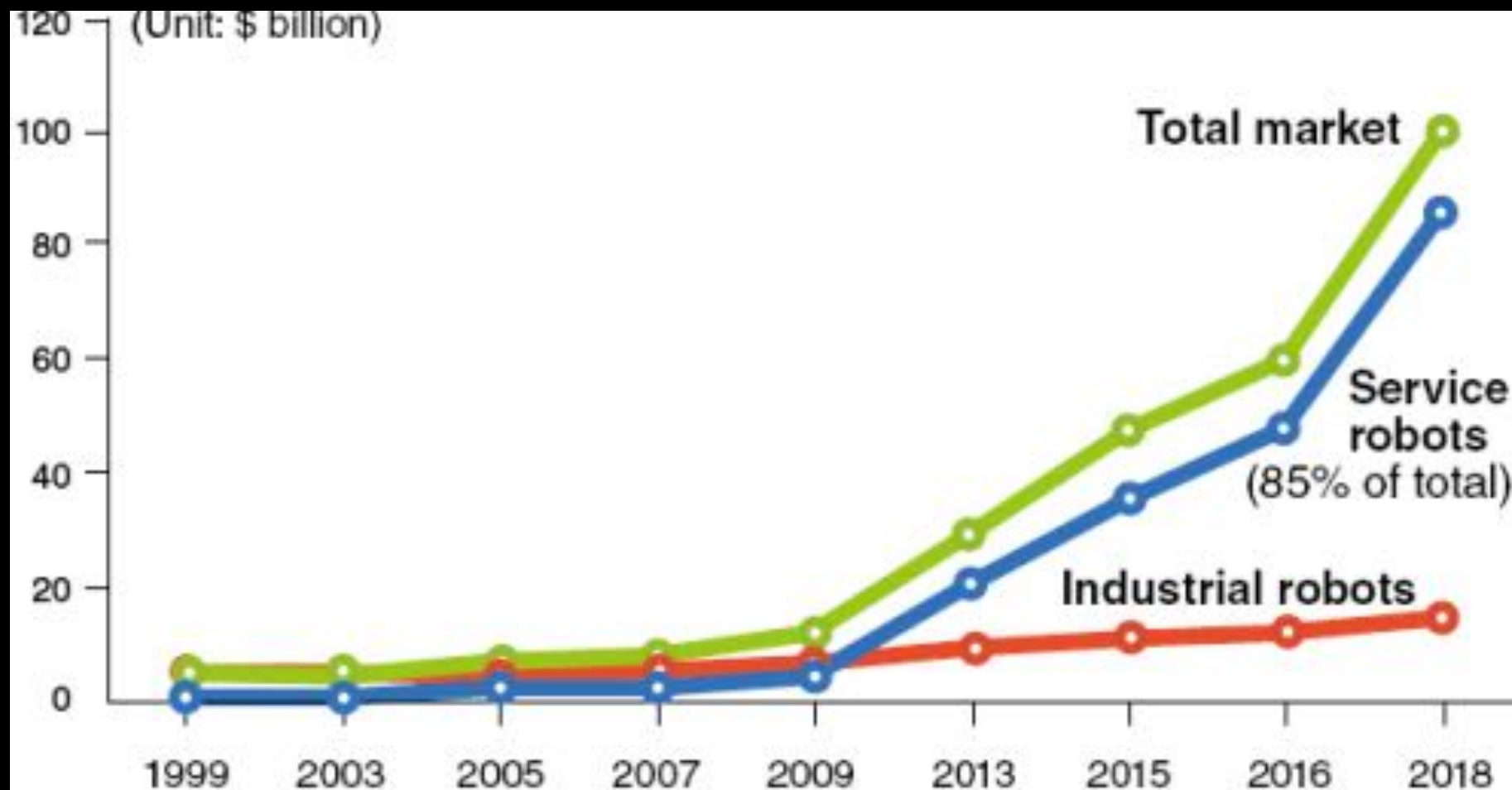
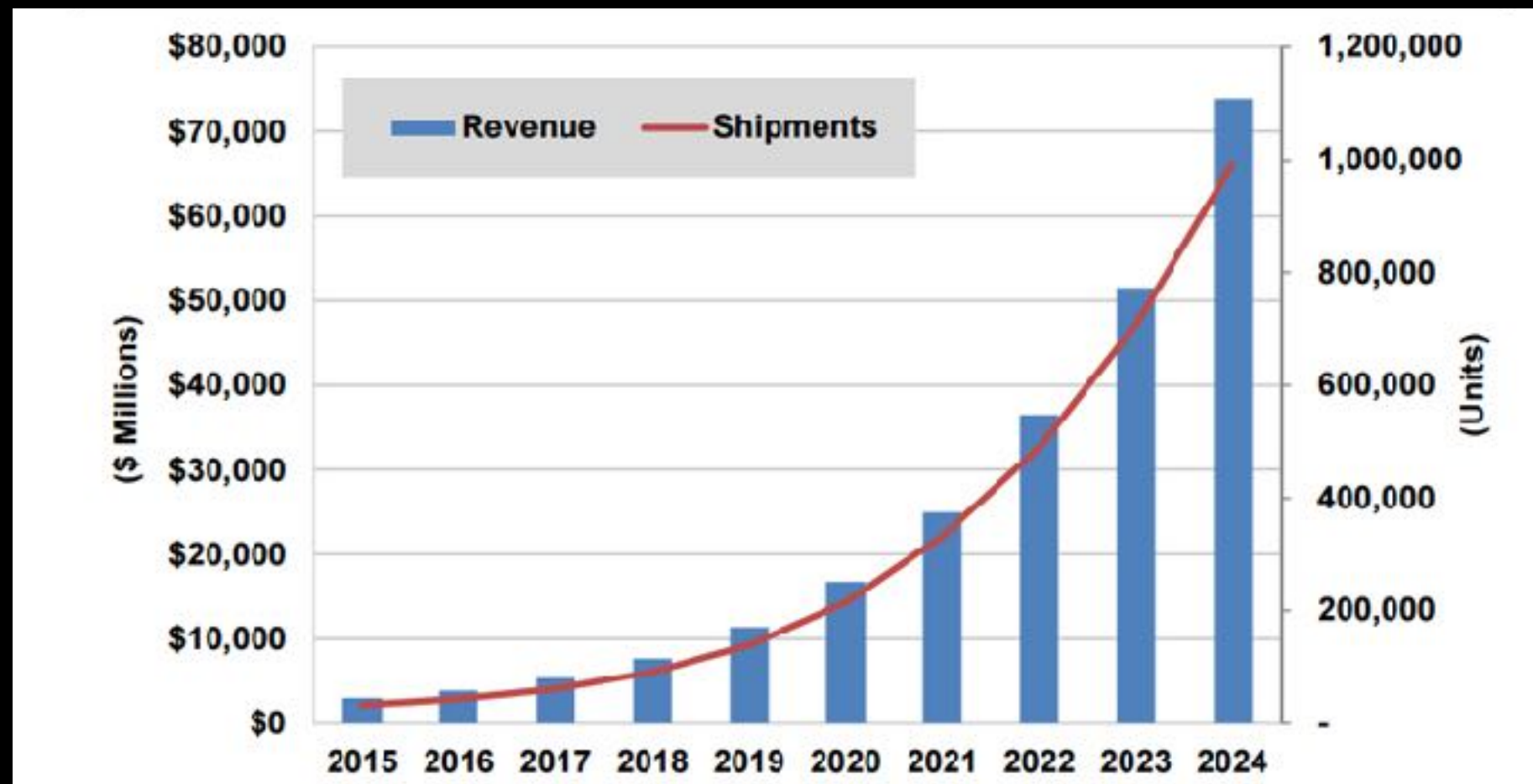
 1	 2	 4	 8	 16	 32	 64	128
256	512	1024	2048	4096	8192	16384	32768
65536	131K	262K	524K	1M	2M	4M	8M
16M	33M	67M	134M	268M	536M	1G	2G
4G	8G	17G	34G	68G	137G	274G	549G
1T	2T	4T	8T	17T	35T	70T	140T
281T	562T	1P	2P	4P	9P	18P	36P
72P	144P	288P	576P	1E	2E	4E	9E

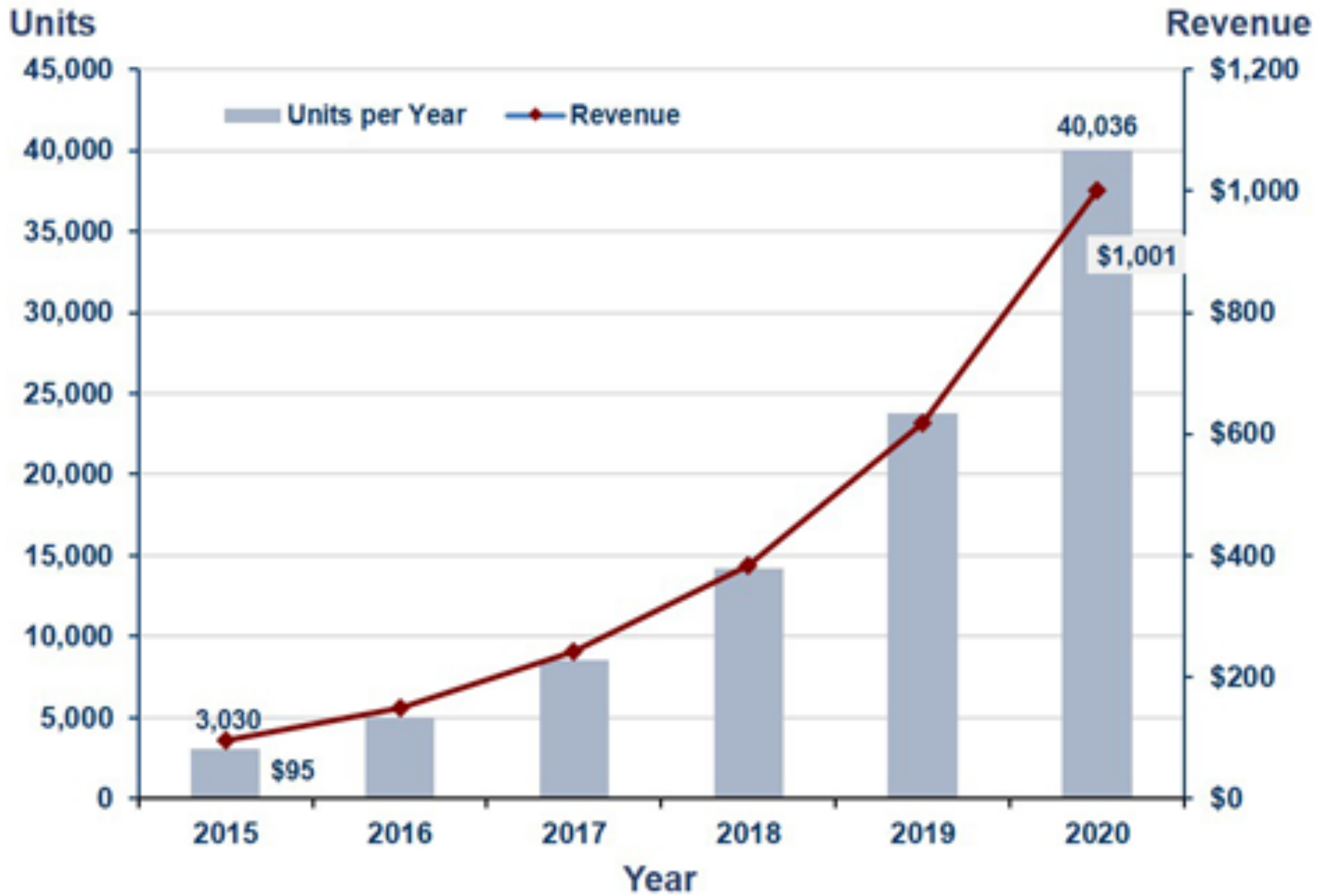


GLOBAL SPENDING ON INDUSTRIAL ROBOTS, 2010 – 2025 (\$BN)



Source: Boston Consulting Group 2015

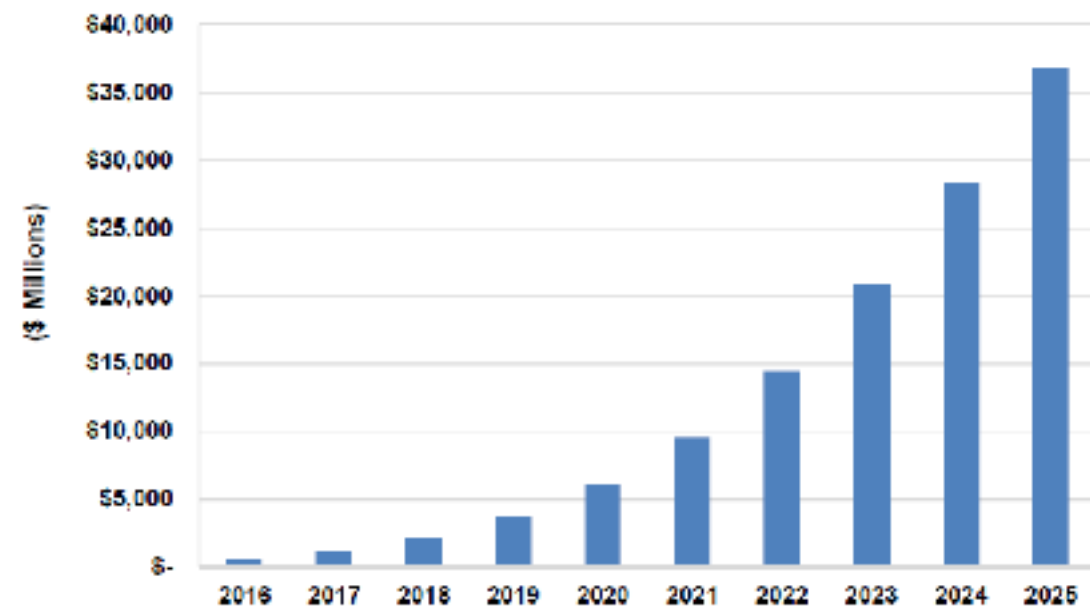




Collaborative robot sales projected to exceed \$1 billion by 2020.

(Courtesy of ABI Research)

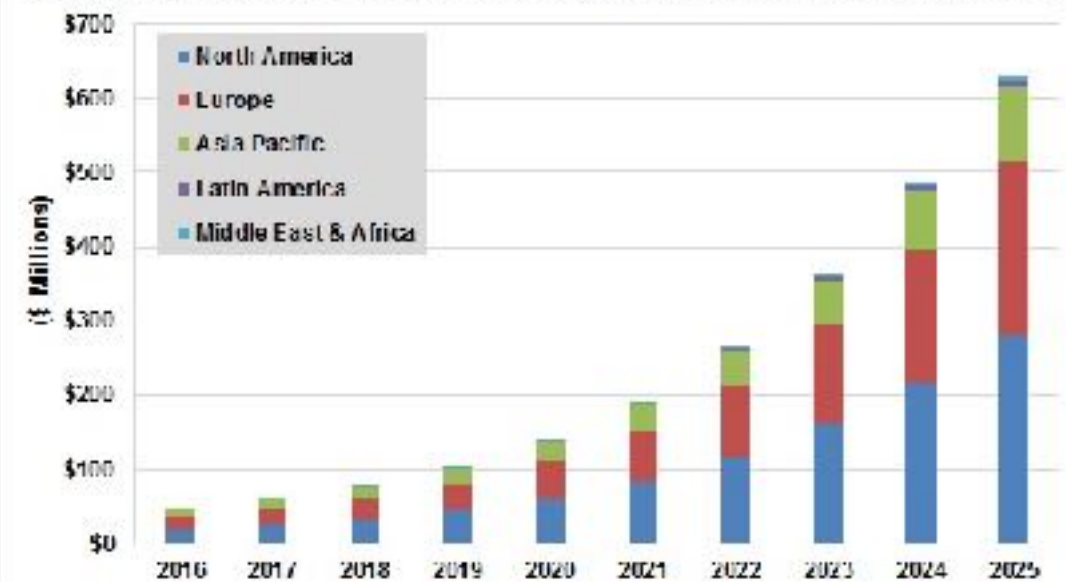
Chart 1.1 Artificial Intelligence Revenue, World Markets: 2016-2025



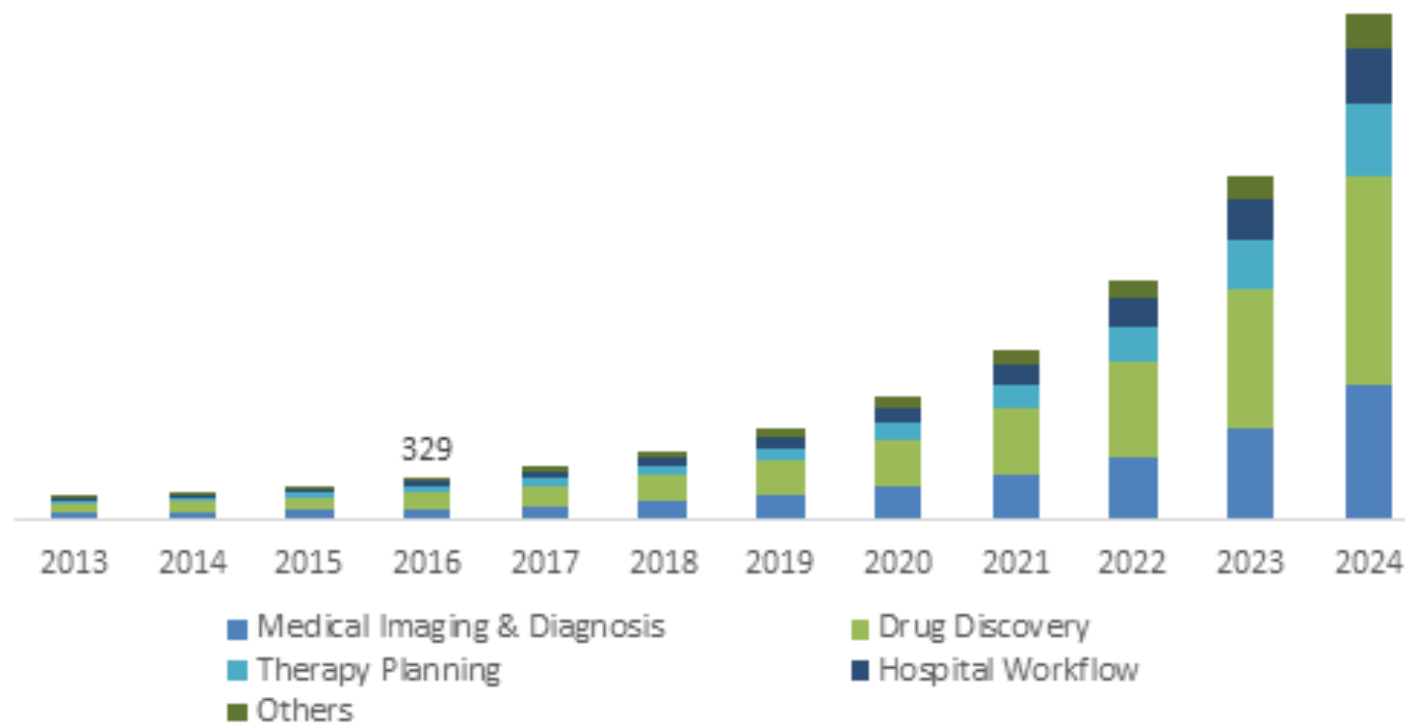
(Source: Tractica)



Enterprise AI Revenue in the Aerospace Industry by Region, World Markets: 2016-2025



(Source: Tractica)



Google | 2014
\$500M | DeepMind

GM | 2016
\$1B | CruiseAutomation

Ford | 2017
\$1B | Argo AI

John Deere | 2017
\$300M | BlueRiverTech





12 Years

Frey & Osbourne (2013) | Carney (2016) | PWC (2017)

Physicians &
Surgeons
(General)

SAFE!

338,820

0.42%

probability
of automation

Lawyers

SAFE!

619,530

3.5%

**probability
of automation**

Management (General)

Start worrying!

2,188,870

25%

probability
of automation

Medical Assistant

Start worrying!

623,560

30%

probability
of automation

Commercial Pilot

Robots are watching!

38,980

55%

probability
of automation

Dental Hygienist

Robots are watching!

647,380

59%

probability
of automation

Auto Technician

Robots are watching!

204,990

68%

probability
of automation

Paralegal Assistants

DOOMED!

277,310

94%

**probability
of automation**

Accountants & Auditors

DOOMED!

1,246,540

94%

**probability
of automation**

“Technological progress is going to leave behind some people, perhaps even a lot of people...there's never been a worse time to be a worker with only 'ordinary' skills and abilities to offer, because computers, robots, and other digital technologies are acquiring these skills and abilities at an extraordinary rate.”

Brynjolfsson & McAfee, 2015
(The Second Machine Age)

Outperform to thrive

Top 10 skills

in 2020

1. Complex Problem Solving
2. Critical Thinking
3. Creativity
4. People Management
5. Coordinating with Others
6. Emotional Intelligence
7. Judgment and Decision Making
8. Service Orientation
9. Negotiation
10. Cognitive Flexibility

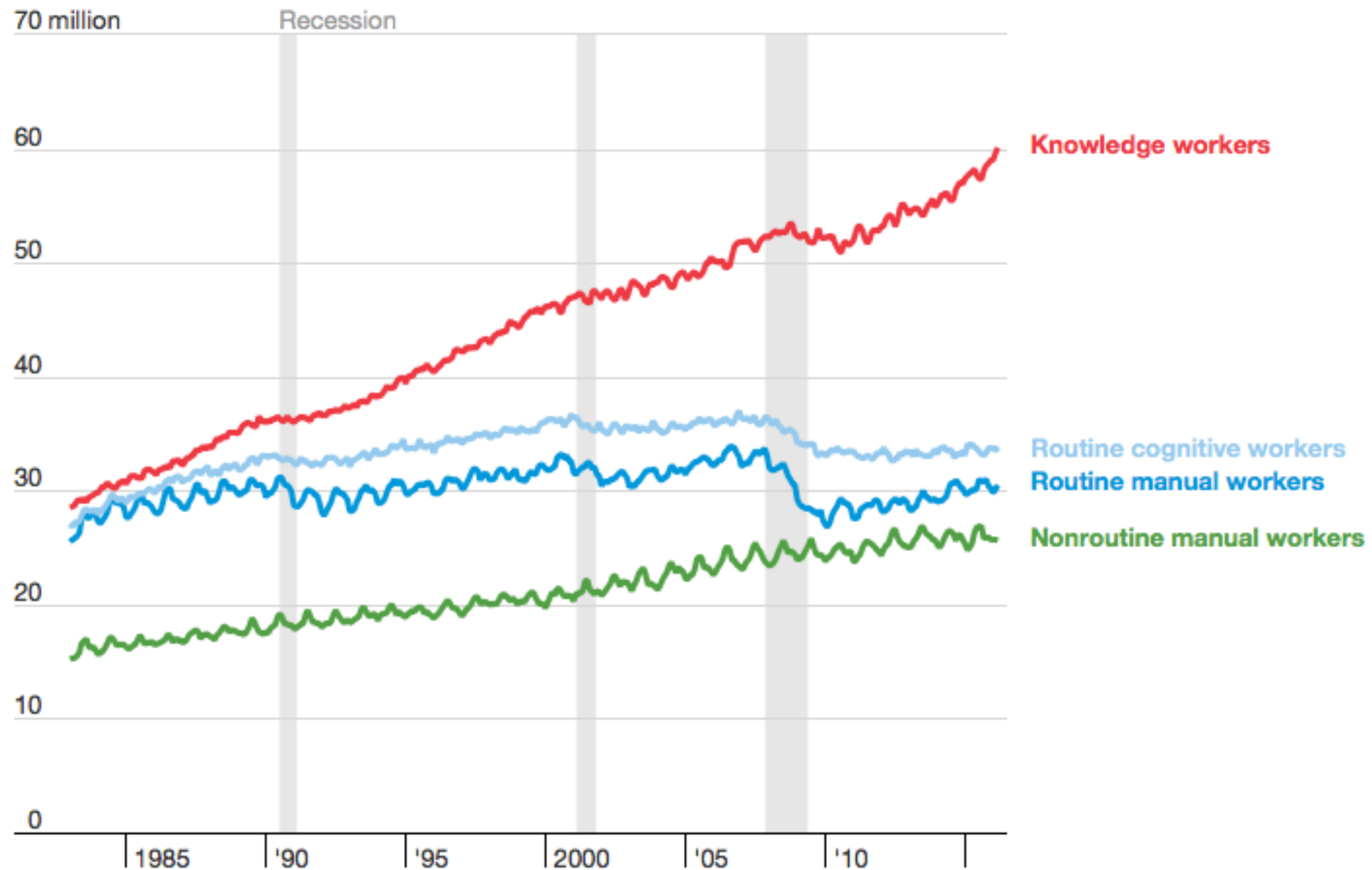


in 2015

1. Complex Problem Solving
2. Coordinating with Others
3. People Management
4. Critical Thinking
5. Negotiation
6. ~~Quality Control~~
7. Service Orientation
8. Judgment and Decision Making
9. ~~Active Listening~~
10. Creativity



workplace 4.0



Source: Labor Department via St. Louis Fed

THE WALL STREET JOURNAL

will you be an irrelevance?

will you just survive?

or will you thrive?

w o r k p l a c e 4 . 0

w o r k p l a c e 4 . 0

$$\text{Outperform} = \frac{\text{g e n e r a l i s t}}{\text{hyper-specialist}}$$

competence | competency | capability

David's Outperformance Law

“Your ability to **adapt**, to **outperform** the ~~competition~~ technology, is not contingent on the total resources available to you today.

Your ability to **outperform** the competition is constrained by the scarcity of the limiting data, information, knowledge, **skills**, behaviours, experience, time, finance and technology when you sense the need to change and **move to act**”



redefine
reorganise
or reinforce?

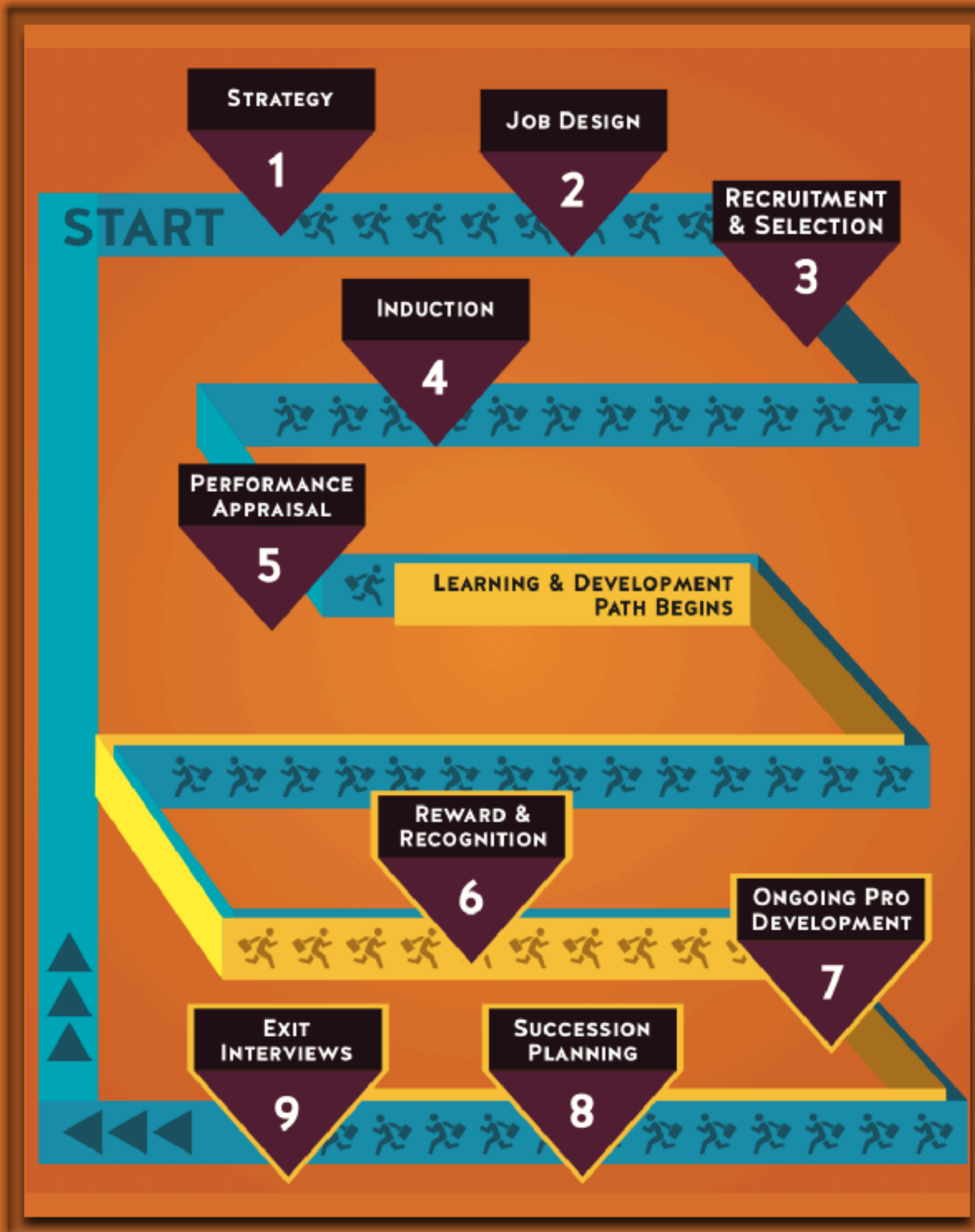
individual | organisation | society



The thing about **change**
if you don't do it,
someone else will!

MARGINAL GAINS

2004	2 Gold	1 Silver	1 Bronze
2008	8 Gold	4 Silver	2 Bronze
2012	8 Gold	2 Silver	2 Bronze
2016	6 Gold	5 Silver	1 Bronze



learn
to
learn

how will you
outperform
~~the competition~~ technology?

w o r k p l a c e 4 . 0

e n e r g y

you cannot bounce back

but

you can bounce forward

d i r e c t i o n

can you afford
the cost of
doing nothing?