

Big Data for Labour Market Intelligence

Capacity development programme 2024

Workshop 1

Session 4

Case Studies: AI for Education

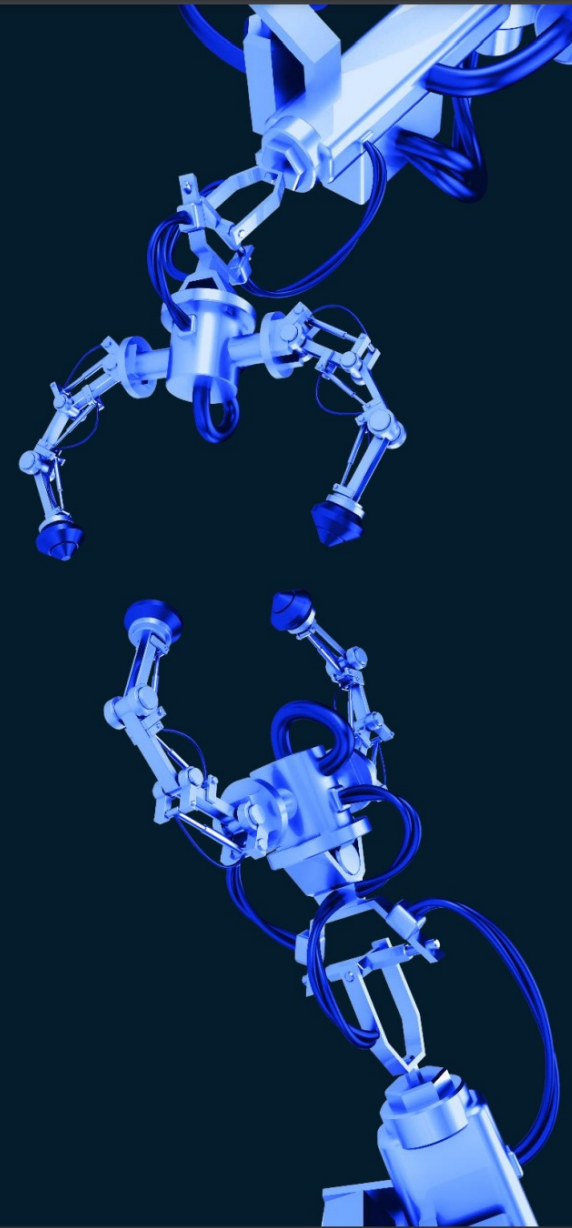
Speaker: Fabio Mercorio

CRISP

 **Lightcast**

Roadmap

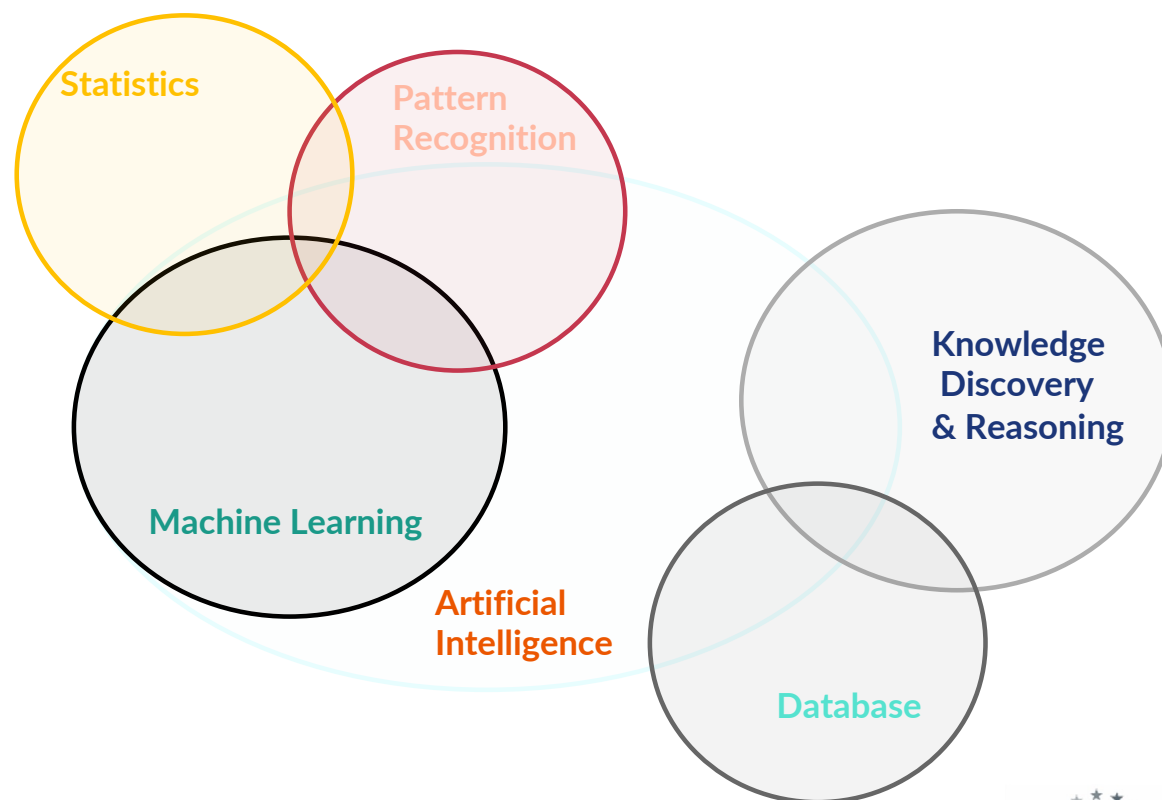
1. What is AI, how do deductive and inductive AI differ and what is the role of big data
2. The Impact of AI on Education
3. Case studies on Learning AI
 1. Digital Agreements in Italian Schools
 2. JobIN to support students in finding University courses
4. Case studies Learning **with** AI
 1. Skill2job: a tool for people to plan upskilling and reskilling
 2. Micro-credentials might change the way acquiring certifications
5. Final remarks and takeaway concepts



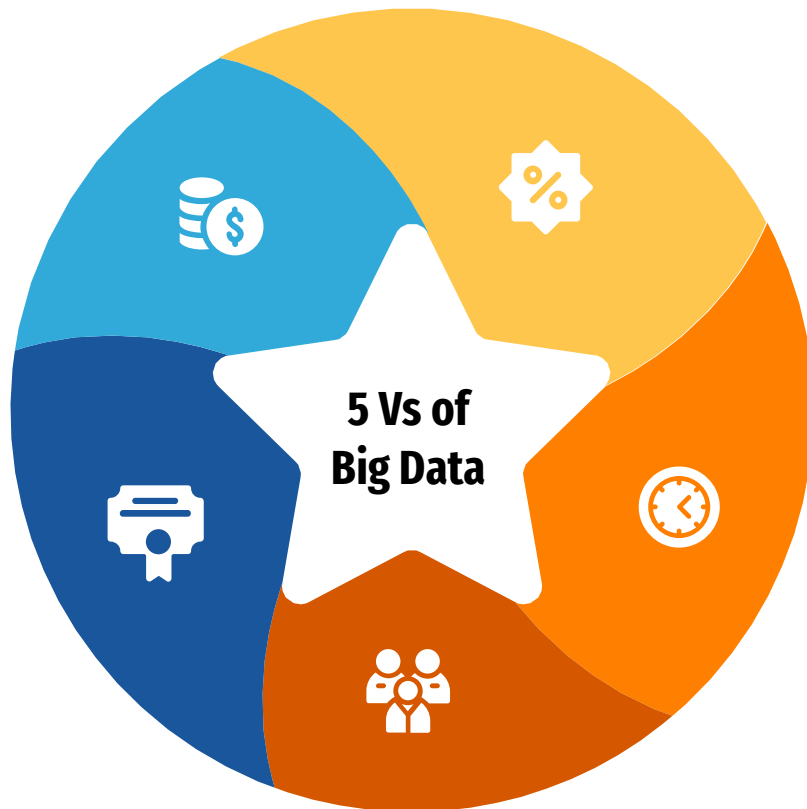
Big Data is the fuel of AI

Artificial intelligence (AI) refers to **systems** that **show** intelligent behaviour: by analysing their **environment** they can perform various tasks with some degree of autonomy to achieve **specific** goals.

European Commission. AI for Europe (2018)



Big Data is the fuel of AI: Why?



01 Volume

The data size

02 Velocity

Speed of data change/production

03 Variety

Different formats of data sources

Top 10 emerging jobs



- 1 Big Data Architects
- 2 Automation Technicians
- 3 Renewable Energy Engineers
- 4 Automation Engineers
- 5 Organisational Development Specialists
- 6 New Technology Specialists
- 7 IT Administrators
- 8 Digital Transformation Specialists
- 9 IT Project Managers
- 10 Data Analysts (General)

Sources: US Bureau of Labor Statistics and World Economic Forum's *Future of Jobs Report 2018*.

04 Veracity

Uncertainty of data / data quality

05 Value

What you get after processing data to support decision making

**Two kinds of AI
(inductive
and
deductive)**

VIDEO

**The latter reasons
on data, the former
on concepts**

Why do we need to change our way to teach?

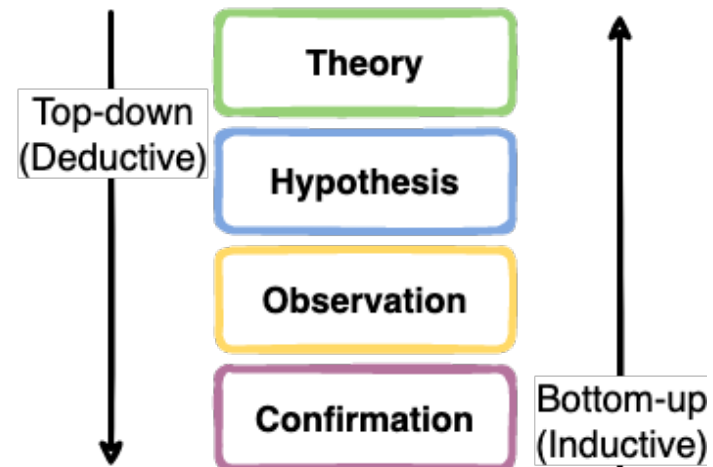
1. Because AI can now engage in inductive reasoning (for the first time in human history), a capability that was previously exclusive to humans.
2. While AI can observe more, it tends to reason less than humans (no common sense). This warrants the exploration of new ways to collaborate.
3. Human-AI teaming represents the new paradigm, but it requires humans and AI to establish shared criteria to ensure trustworthiness.

A paradigm shift

Big Data: large-scale data, usually having a varied and complex structure. They

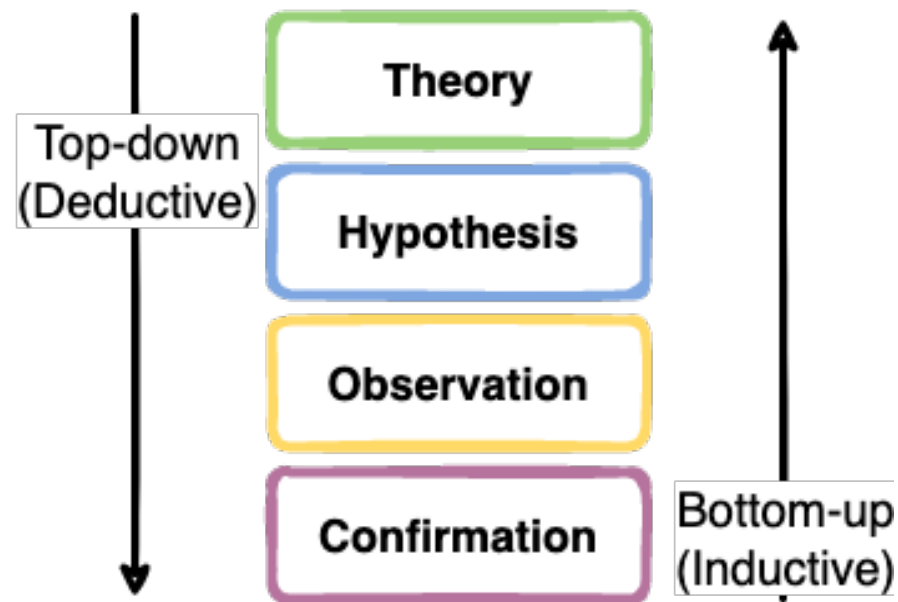
Big Data Analytics (BDA): processing big data and looking for valuable information, correlations and patterns within them.

The use of BDA to support decision making requires a paradigm shift in the way decisions are made, moving from deductive reasoning to inductive reasoning.

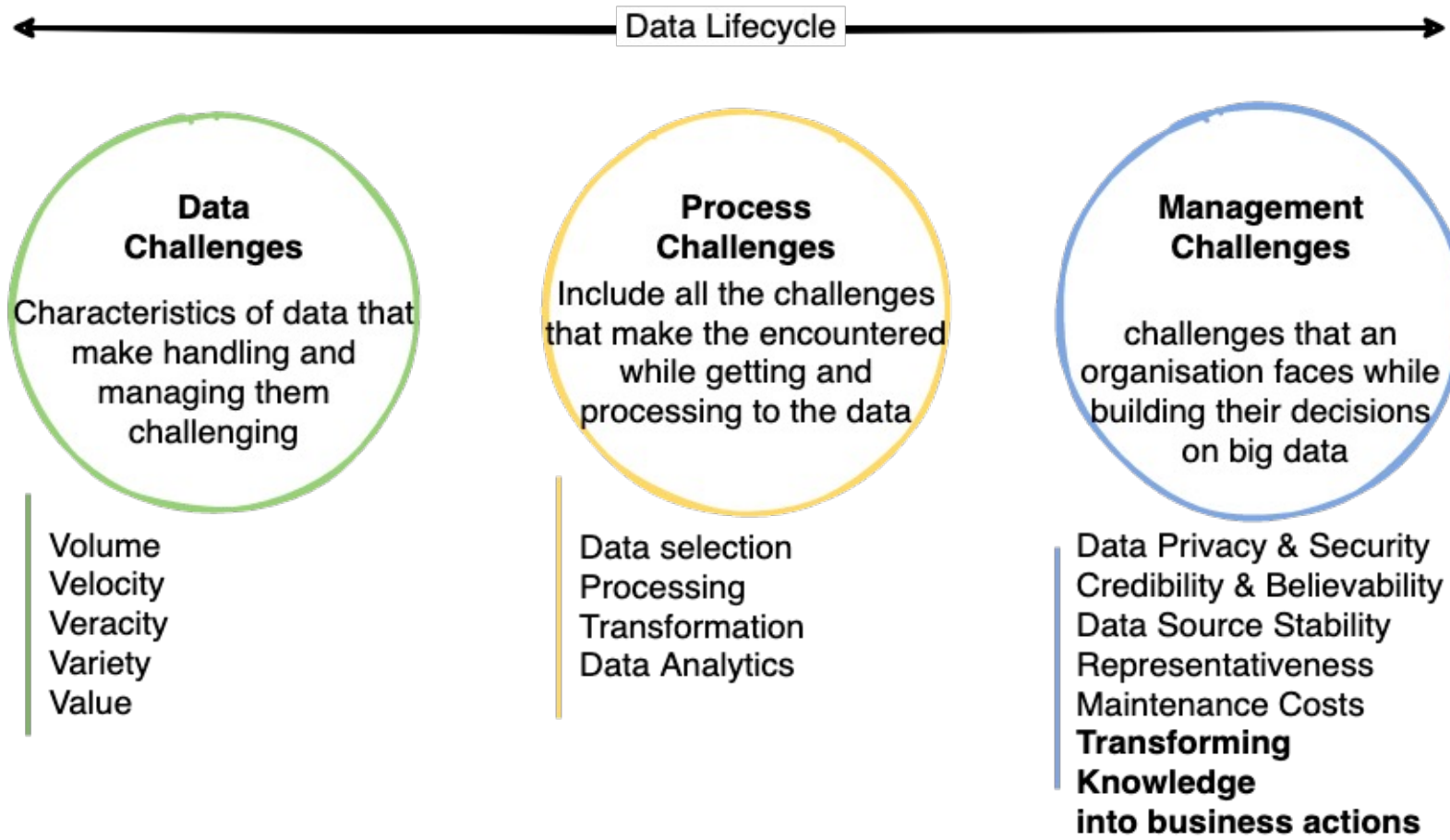


An example in the labour market

Alternative labels: different terms used to describe the same occupation.
For instance, in some job descriptions the recruiter can refer to a software developer also as a programmer or a software engineer.

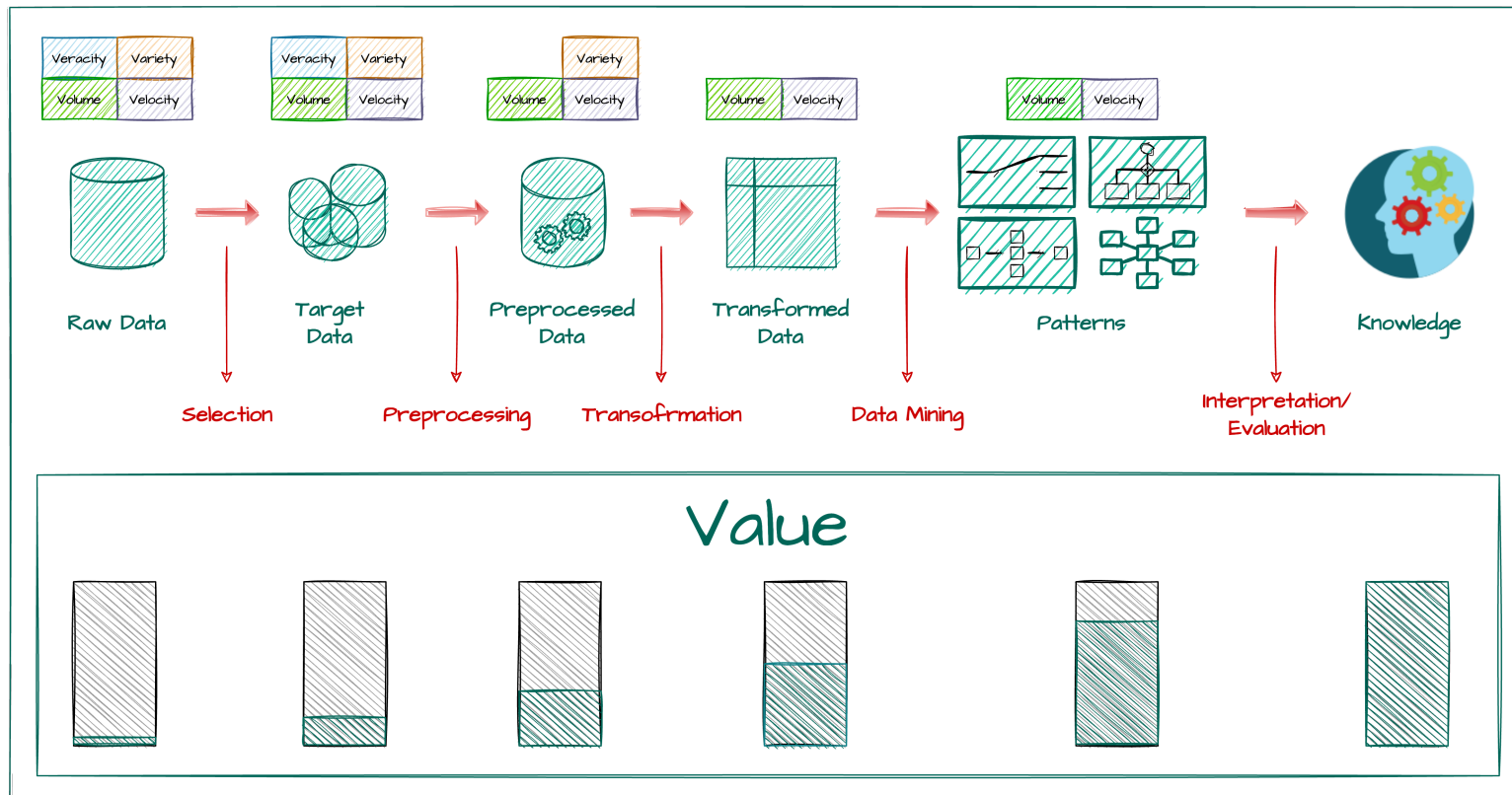


Big data challenges

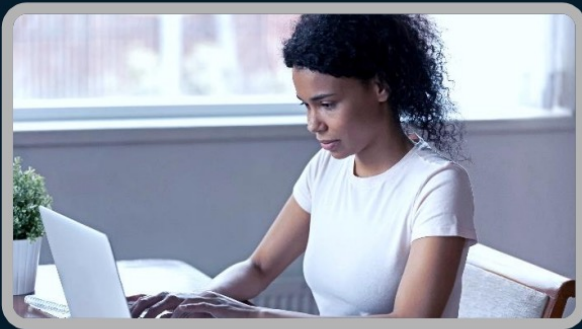


The big data lifecycle

Are the difficulties due to the process of getting and transforming data into value



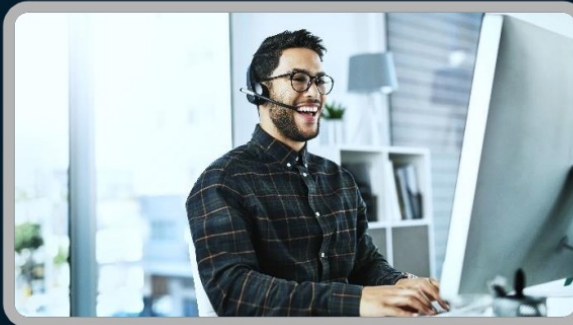
Artificial General Intelligence (AGI) has the potential to bring about enormous productivity gains for individual tasks, but the economic impacts at scale are still being determined.



Task level example

70%

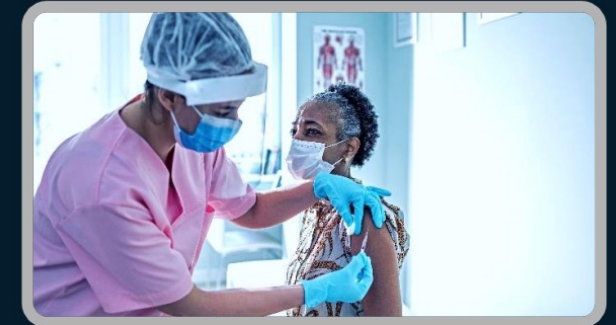
productivity improvement
for generating new code



Occupation level example

14%

improvement in call center agents'
overall productivity



Economy level example

<1%

of occupations have more
than 60% of their workload
currently automatable by AI

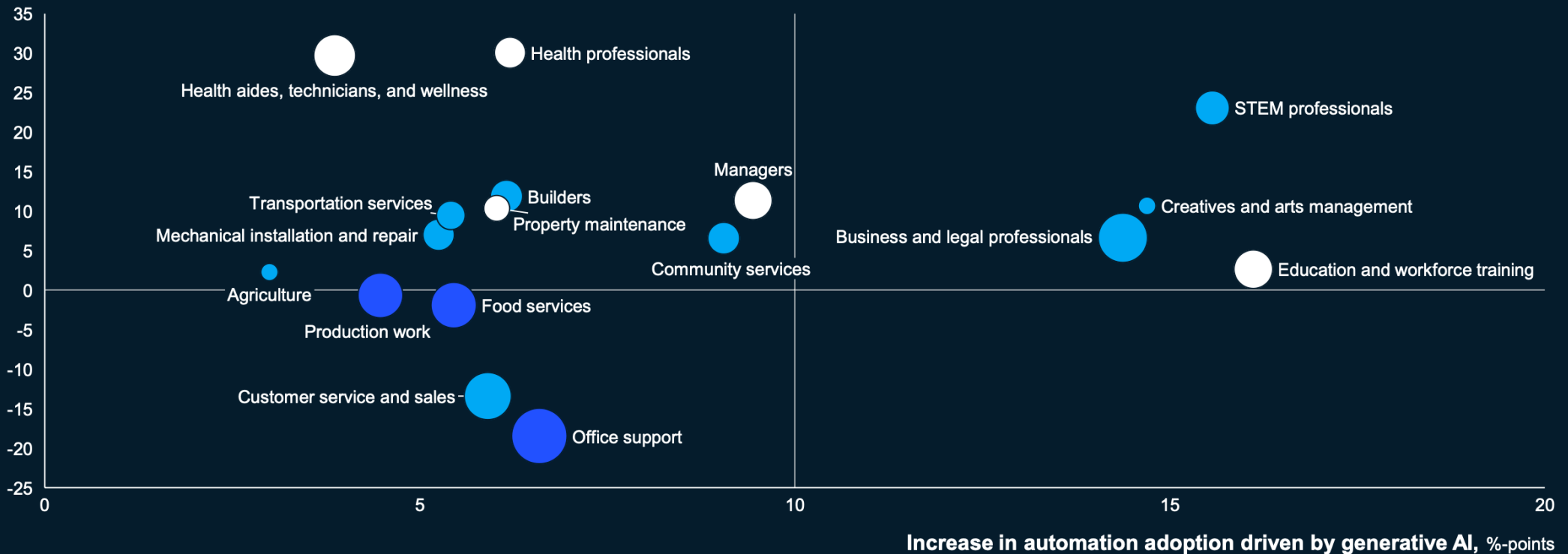
AGI has increased the likelihood of automation of occupations that are likely to grow due to multiple other drivers.

Estimated labor demand change and generative AI automation acceleration by occupation
US, 2022 – 30

Midpoint automation adoption by 2030, %

● 15-25 ● 25-35 ● 35-40

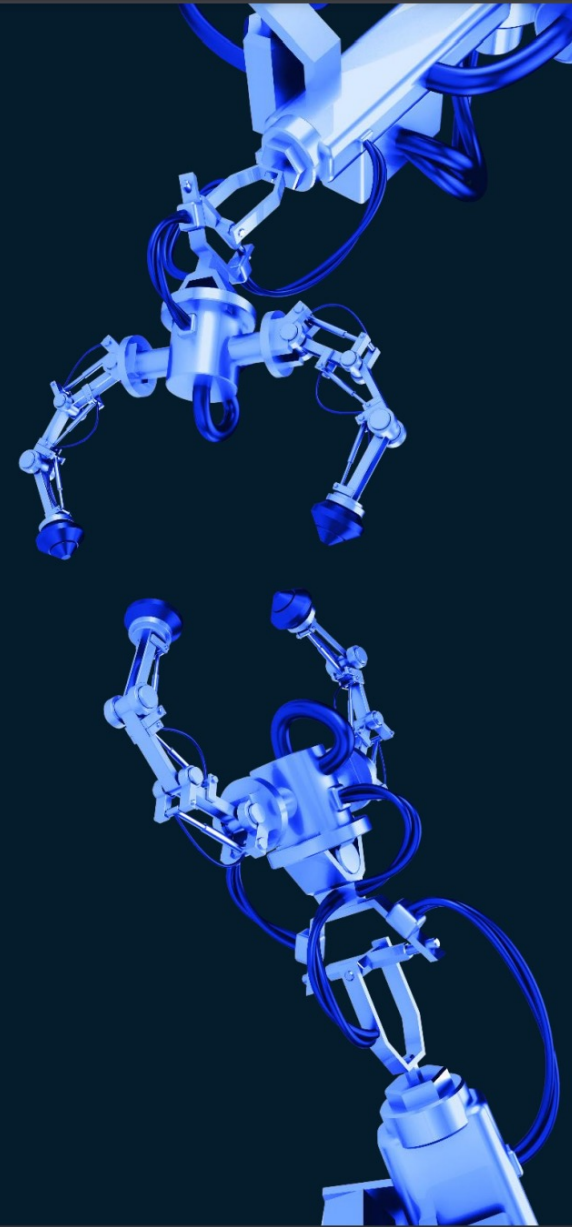
Change in labor demand¹, %



1. Incorporates multiple drivers affecting demand, including rising incomes, aging populations, infrastructure investment, net-zero transitions, marketization of unpaid work, creation of new occupations, technology investment, automation and AI, increased remote working and virtual meetings, and e-commerce and other virtual transitions.
Source: US Bureau of Labor Statistics; Current Population Survey, US Census Bureau; McKinsey Global Institute analysis

AI in education two pillars:

1. Learning AI
2. Learning with AI



1. Learning AI

«In our environment of AI acceleration and uncertainty, we need education systems that help our societies construct ideas about what AI is and should be, what we want to do with it, and where we want to construct guardrails and draw red lines. Too often we only ask how a new technology will change education.»

A more interesting question is: How will education shape our reception and steer the integration of new technology – both technology that is here today and technology that remains on the horizon? Our education systems can define a trajectory and establish norms for how we understand world-changing technology – and, by extension, how we allow it to influence us and our world. This is perhaps the ‘raison d’être’ of education: to help us make informed choices of how we want to construct our lives and our societies.»

UNESCO, 2023 – GAI and Education

1. Learning AI: Italian Digital Agreements for Italian Education System

DIGITAL AGREEMENTS is an initiative for a community-based education
On the use of technology, the challenge for healthier digital use can only be overcome together.

Digital education is effective when coordinated by a community (parents, schools, paediatricians, institutions, youth centres, scouts, sports clubs, etc.) where mutual support is emphasized.
For example, by collectively agreeing on the age at which smartphones are given to preadolescents or regulating their access to social media.

This reduces social pressure for early adoption and creates a space for dialogue among families.

The network of **Digital Agreements within communities promotes educational alliances among families, educators, and local entities across the national territory.**



1. Learning AI: JobIN as a tool to support students in finding University courses with High Digital Skill rates

VIDEO

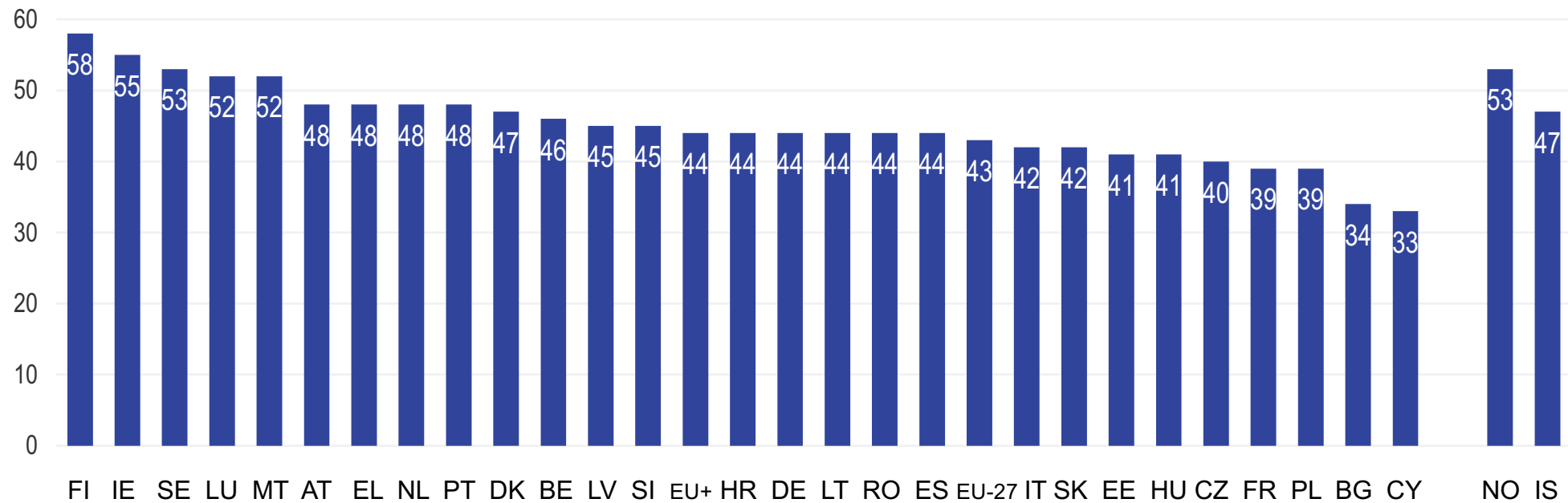
2. Learning with AI

Digital upskilling in EU jobs is unequal

35% of EU+ adult employees had to learn to use new digital technologies to do their main job in 2020-21

ESJS2: In the last 12 months, did any of the following changes take place in your workplace?

New digital technologies i.e. new computer systems/computer devices/computer programmes (Total, %)



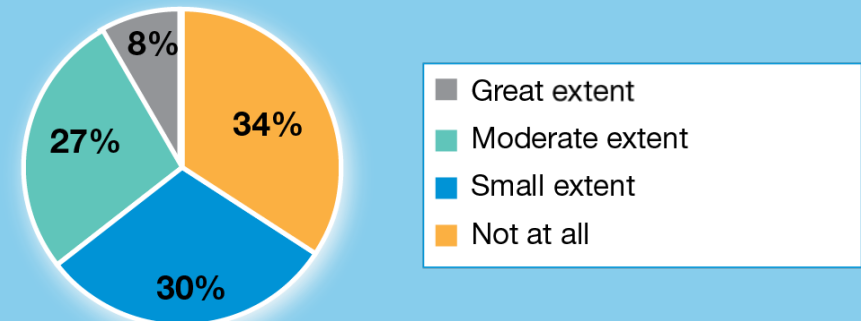
Task automation – fear vs. reality

45% of the EU+ workforce believe that they need or will need new knowledge and skills because of the new digital technologies in their workplace

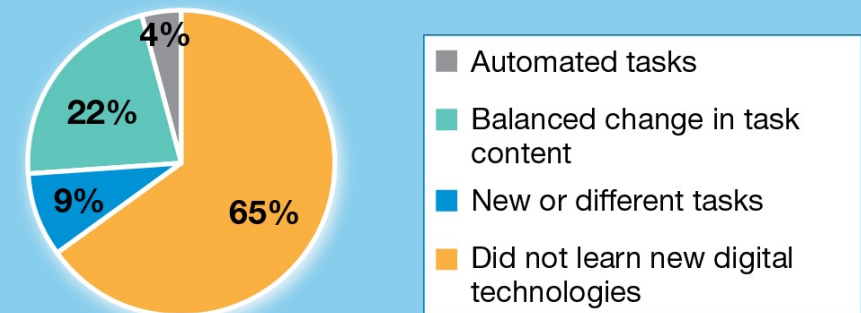
Mostly affected by task automation

- Males
- Lower-educated
- Manual and low-skilled, elementary, jobs
- Routine jobs
- Larger-sized firms
- Agriculture, finance, utilities sectors

(a) Extent to which adults think digital technology can or will do their main job partly or fully



(b) Actual change in job tasks resulting from new digital technology



2. Learning with AI: Microcredential as a new way reshaping how to acquire certifications

Acquiring skills by topics (vertical), certified and stored on blockchain

VIDEO

So what? Take away concepts

- 1. AI is here to stay:** many studies, including Gartner, have definitively stated that the initial technological hype related to AI has passed: we are therefore facing an AI ecosystem that is emerging and thus requiring entrepreneurs, companies, and professionals to rethink their business, production, and decision-making processes, integrating "data" as an enabling factor to gain a competitive advantage;
- 2. They were tools. Before now, they are entities.** People now interact with entities rather than digital tools (e.g. office, email, web, etc.). This means knowledge of how interacting with systems that have their comprehension and vision of the world is crucial to moving towards a Human-AI teaming paradigm.
- 3. Learning AI with AI:** There are differences between learning AI (to understand how machines reason) and with AI (to convey well—established knowledge and concepts through AI).