

CAN AI TECHNOLOGIES BENEFIT MEDIUM-SKILLED JOBS AND DEMOCRATISE EXPERTISE?

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Digitalisation and automation before AI

- Five decades of digitalisation since 1970s: **the task composition of many jobs** has changed
- With each phase of digitalisation, **more tasks could be standardised** (medium- and high-skill jobs)
- As a result, more **routine manual** and **routine cognitive** tasks could be automated
- They happen to be mostly in **manufacturing jobs** in factories, **administrative jobs** in offices
- Most significant impact is felt on **medium-skilled jobs**, typically employing workers with upper secondary education
- **Dramatic growth in high-skilled jobs** for the application of new technologies: e.g. data processing, digital services, robotics, STEM, management
- **Rising demand for low-skilled personal services jobs**, increasing number of low-skilled low-paid jobs
- The middle is hollowed out: increasing **job polarisation** and **income inequality** in the labour markets

What distinguishes AI from other technologies?

3 key components of AI

- **Learning algorithms and models**
- **The Big Data** to train these models
- **The computational power/energy** to process Big Data

- **Diverse AI technologies:** not a single, uniform technology
- **Automating non-routine cognitive tasks** changes the rules of routine-based automation
- **The non-rivalry of algorithms:** no need to replicate, used anytime anywhere => winner-takes-all
- **Context-dependent impact of AI:** institutional & regulatory environment can moderate outcomes
- **AI in its infancy:** it is too early to see long-term impact
- **AI as general-purpose technology** comparable to computing, electrification and the steam engine?

Who will be affected most by AI

Highly skilled
white-collar
professions,
typically requiring
many years of
tertiary education

Most exposed occupations

- Engineering occupations
- IT technology/ software professionals
- Banking, insurance, auditors
- Physics/ mathematics/ data sciences
- Chief executives/ business professionals
- Life sciences (e.g. medicine, biology, zoology)
- Legal professions
- Social scientists / researchers
- Authors, writers, printing, translators
- Creative industry (e.g. graphic designers)
- Marketing, communication & public relations
- Clerical/ office/ secretarial workers
- Plant and system operators
- Transportation workers
- Customer services, wholesale/ retail workers

Less exposed occupations

- Cooks
- Helpers/ cleaners
- Care workers
- Food/ beverage service workers
- Food preparation workers
- Agricultural, forestry and fishery workers
- Elementary occupations
- Trade workers
- Construction trades
- Labourers

How can AI technologies affect jobs?

- AI changes how the knowledge tasks are done (i.e. analysis, research, programming)
- Further automates both routine and non-routine cognitive tasks. Impact changes if an 'expert' or 'inexpert' task is automated*
- Task replacement is higher in less complex tasks, e.g. office & admin roles, clerical workers, translators
- Reshapes knowledge-based services, putting more pressure on middle- and (junior) high-skill jobs in offices

*Autor D. and N. Thompson (2025), Expertise, MIT Economics, [Autor-Thompson-Expertise-22050620.pdf](#)

AI can either 'complement' or 'substitute' tasks in occupations

Three groups of occupations:

- **high exposure, high complementarity occupations** (e.g. judges, doctors)
- **high exposure, low complementarity** (e.g. office & admin workers, translators)
- **low exposure occupations** (e.g. elementary and agriculture workers)

Minimal impact on total employment

Observation 1: AI destroying entry-level jobs

- AI is better at low-complexity tasks, which are exactly what entry-level workers do
- Particularly Generative AI tools are quick at reading, synthesising, looking things up and producing text, audio, video
- Tasks such as research, data analysis, report writing and document review can be done by fewer experienced workers with an AI tool now
 - ✓ Tech firms hire fewer junior developers
 - ✓ Law firms cut some paralegal positions
 - ✓ Consultancy firms hire less market researchers & analysts
 - ✓ Basic customer services are delegated to AI chat boxes
- Traditional paths offering gradual skill-building via junior roles decline, making it more difficult for fresh graduates to enter professional careers

Observation 2: AI supporting medium-skilled workers

- AI tools enhance human capabilities in performing certain tasks and increase productivity: so-called **'job augmentation'**
- **Lower-skilled and novice workers** are observed to **benefit more from AI tools** than experienced workers, the biggest quality improvements are often at the bottom
- Using AI tools, less skilled workers perform faster and closer in quality to that of their more skilled peers
 - ✓ With Generative AI, average writers could produce text 40% faster and at better quality
 - ✓ Customer service agents: 15% productivity increase of novice and low-skilled workers, retention
 - ✓ Average programmers can develop software 56% faster with GitHub Copilot
- More AI tools can **boost the skills and expertise of medium-skilled workers** and enable them perform higher-value work in more occupations



Many examples of its good and bad use: “AI will not decide how AI is used”
Not technological determinism, but a future to be shaped by human agency & collective decisions

‘Human-complementary’ path vs ‘automation-path’

- AI can extend the relevance, reach and value of *human expertise for a larger set of workers* – by complementing most human tasks and augmenting their skills & expertise
- **‘Democratisation of expertise’** is a human choice. If intended, AI can create and support new occupational tasks and new capabilities, also for workers without a four-year university degree
 - ✓ e.g. using AI, qualified nurse practitioners could diagnose routine health problems, recommend courses of treatment, and route patients to further care options
 - ✓ e.g. AI could provide relevant information, real-time instruction, and decision-making support in electrical work, plumbing, expert repair, design, construction, etc.
- Many VET tasks require dexterity, flexibility, and judgment that are beyond the grasp of current AI robotics. **But AI tools can enable medical technicians, electricians, plumbers to do more expert work**, reducing inequality, raising productivity and pay
- Key precondition is strong **digital, data & AI literacy** gained in education and training, so all workers can take the advantage of AI tools.

AI Literacy for All

‘New driving licence’: Ability to understand, use, monitor, and critically reflect on AI applications

- **Technical skills:** basic knowledge of how AI systems operate, including familiarity with machine learning, algorithms, and data-driven technologies.
- **Analytical & data literacy:** ability to analyse, interpret and evaluate data & AI outputs in real-world settings
- **Ethics & fairness:** recognising its potential risks on data privacy, algorithmic bias, transparency, fairness, accountability

