



Technequality

Understanding the relation between technological innovations and social inequality



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The Technequality Project

Multidisciplinary group of scholars investigates effects of technological innovations on:

- The number of jobs.
- The nature of our tasks.
- Skill needs and education.
- Social inequalities.

Now: final year of a 3-year project

<https://technequality-project.eu/>



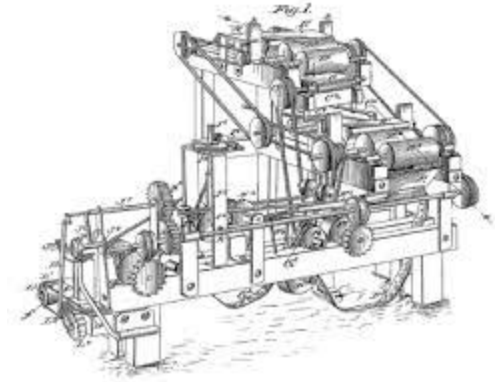
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Production and skills



Human capital



Output
(Goods & Services)



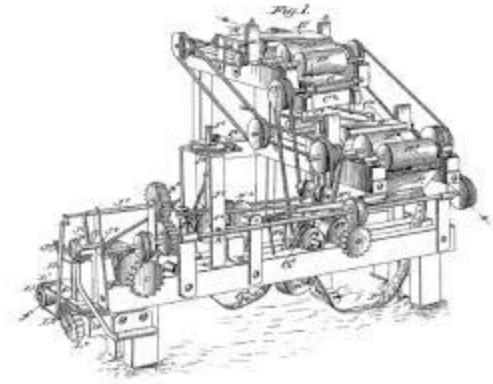
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Production and skills



Human capital



Physical capital/technology

Skills

Tasks

Output
(Goods & Services)

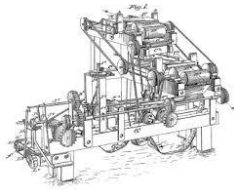


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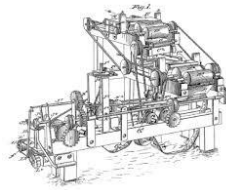
Human tasks & Machine tasks

Technology can **complement** human tasks



Non-routine analytical/creative tasks
Interactive tasks

Technology can **substitute** human tasks



Routine cognitive
Routine manual tasks



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Human tasks & Machine tasks



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Great variation in estimates of automation risk of occupations

50%

8%



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What jobs/tasks are likely to be automated?

'if-then' tasks easily automated

High risk

Bookkeepers

Secretaries

Cashiers

analytical & interactive tasks
not easily automated

Low risk

Teachers

Healthcare

ICT

Automation will:

- Destroy jobs
- Create jobs
- Change tasks/skills



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Scenario's on how current technological innovations will affect work

Policy brief on scenario studies of impact of technological changes on jobs: <https://technequality-project.eu/projects/policy-briefs>

Combines findings from:

1. **Qualitative** scenarios for the impact of intelligent automation on work
2. **Quantitative** labour market forecasting scenario's for automation risks



1. Qualitative scenarios for the impact of intelligent automation on work

- Thought experiment based on literature
- 8 qualitative scenarios for impact of technology based on 3 key variables:
 - 1-speed of innovation,
 - 2-speed of adoption,
 - 3-impact on tasks.



Scenarios for the Future of Work - Overview

		Variables shaping the impact of automation on work					
		speed of innovation		speed of adoption		impact on job tasks	
		gradual	boom	slow	fast	mostly augmenting	mostly substitution
Potential future scenarios	scenario 1 acute disruption	Smooth & fast integration of technologies in production processes → drop in demand for labour and increased inequalities in short run					
	scenario 2 incremental automation						
	scenario 3 delayed disruption						
	scenario 4 slow substitution						
	scenario 5 abrupt volatility						
	scenario 6 controlled adjustment						
	scenario 7 delayed substitution						
	scenario 8 gradual substitution	Incremental & slow integration of technologies in production processes → demography & (re)training with only qualitative effect on skills					

2. Quantitative labour market forecasting scenario's for automation risks

- Econometric estimations
- 18 scenarios for number of jobs in 2030 based on 3 key variables:
 - 1-automation risk,
 - 2-speed of adaptation,
 - 3-barriers to adoption.
- We build on:
 - Cedefop Skills Forecast 2018
 - OECD automation risk data (Quintini & team)
- We do not account for job creation



Parameter	Description	Values
Technical potential.	Value within OECD risk category ranges.	Low: lower bound in range, for 'significant' category equal to 50%.
		Middle: mid-point of range, for 'significant' category equal to 60%.
		High: upper bound in range, for 'significant' category equal to 70%.
Deployment potential.	Year in which full technical potential could be realised.	2035.
		2055.
		2075.
Socio-political restrictor.	Restriction on automation.	No restriction.
		New job opportunities.



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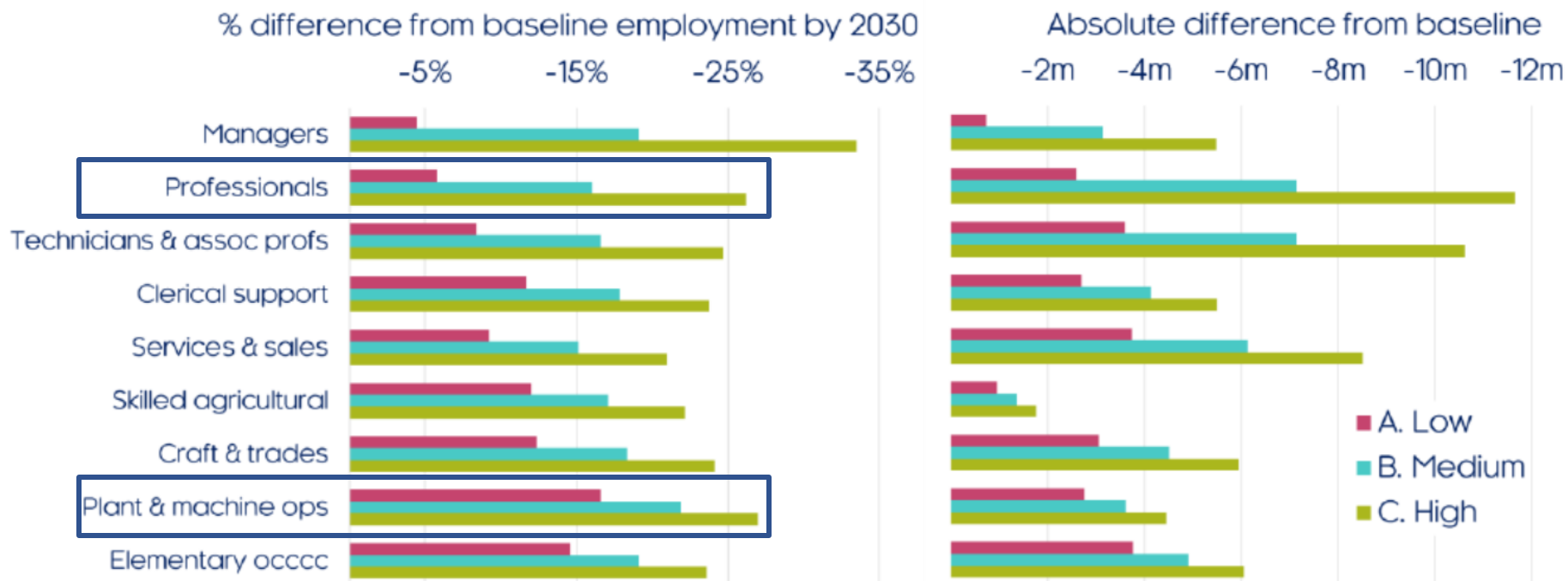
2. Quantitative labour market forecasting scenario's for automation risks

- Econometric estimations
- 18 scenarios for number of jobs in 2030 based on 3 key variables:
 - 1-automation risk,
 - 2-speed of adaptation,
 - 3-barriers to adoption.
- +3 scenarios for low/med/high automation risk, and
 - 1-speed of adoption depends on relative wages,
 - 2-employment protection legislation = regional barrier to adoption.



12.5 million to 106.6 million jobs lost by 2030

Figure 1: Additional scenario results (% difference from baseline by 2030 in EU-28 employment by ISCO-08 occupation)



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Web application

= 21 scenario's → [web app](#)

Employment composition differences under autonomy

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Select a country and industry sector to explore

Country

Industry group

Select scenario assumption combinations

Technical Potential

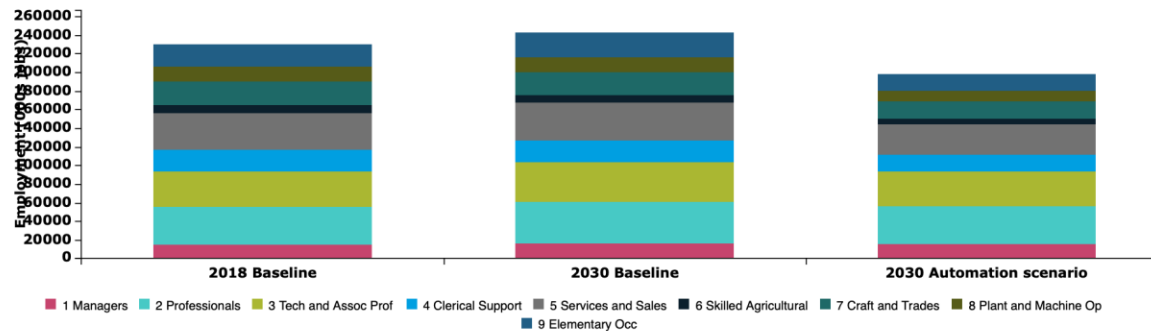
Low High

Time to Full Deployment

2035 2075

Main Restriction

Free



*The occupation group with employment less than 1000 jobs is not disclosed



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Conclusion

- Automation will:
 - Destroy jobs
 - Create jobs
 - Change tasks/skills
- Impact on jobs. We offer to policy makers:
 - Qualitative narrative to consider effects
 - Quantitative estimation by country, sector, occupation
 - Online tool to visualise 21 potential scenario's

