Institute of Strategic and International Studies
Economics, Trade
and Regional Integration

Novel AI technologies and the future of work in Malaysia

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Overview

- Motivation
- Methods
- Results

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- **Motivation**
- Methods
- Results

Why do we care about new technologies and work?

- **Technology is the main driver of change in the world of work.** Since early human history, it has repeatedly changed what work is and how humans perform it (e.g. first agriculture revolution[1], steam engine).

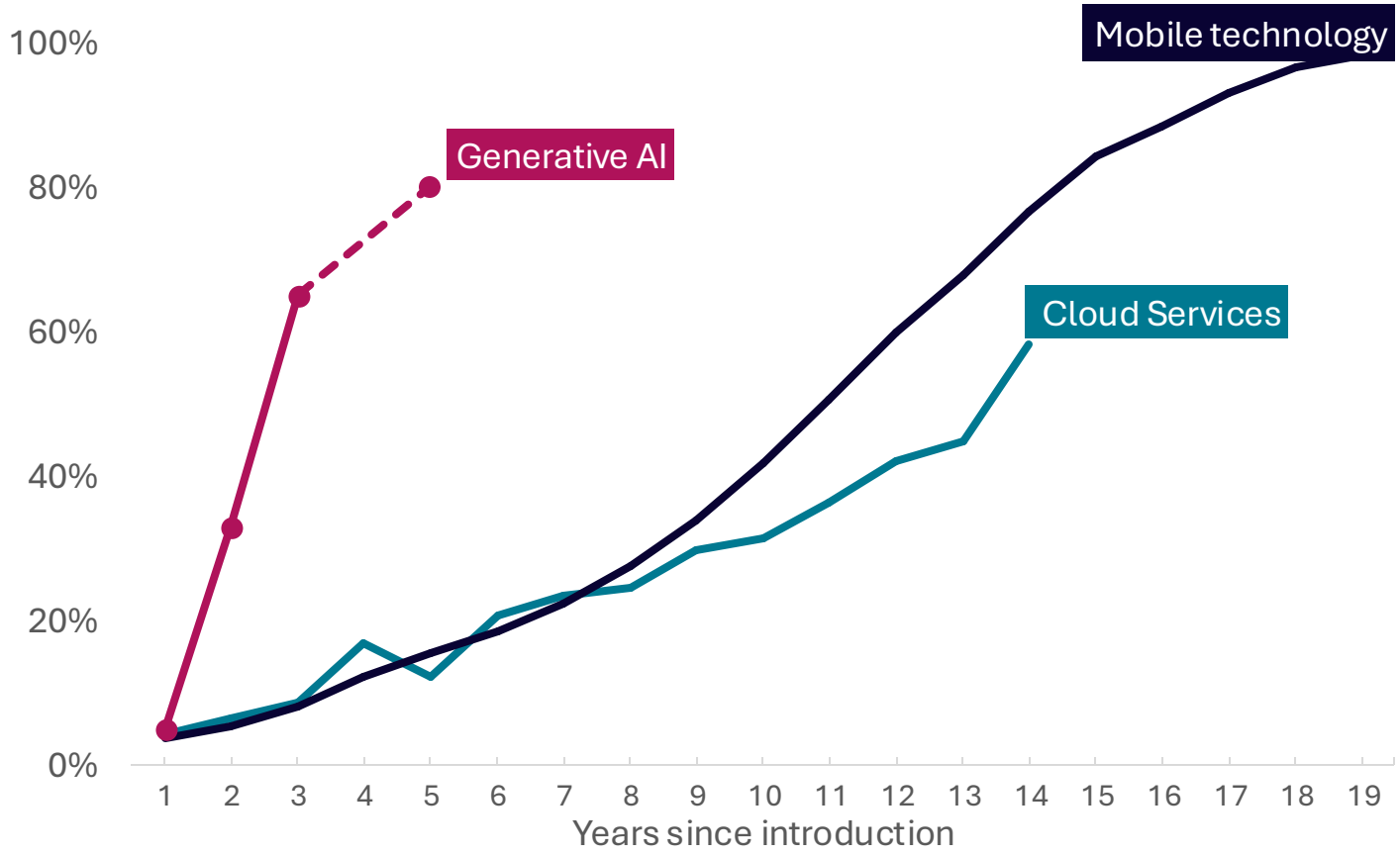
- **Each wave of technological change has brought anxieties around how work will be done.** Gains from technological progress are not universal; it can create negative consequences for workers (i.e. industrial revolution[2], robotisation [3], ICT [4]).

- **The pace of technological change is increasing**, and its consequences on work is becoming more widespread. How this affects societal wellbeing is a policy and political choice.[5]

Source: [1]Chu et al. (2020), [2]Frey (2024), [3]Graetz and Micheals (2018), [4]Acemolgu and Restrepo (2019), Katz and Goldin (2007), Autor (2020). [5]Acemoglu (2022), Bastani (2019)

What makes novel AI technologies different from past waves?

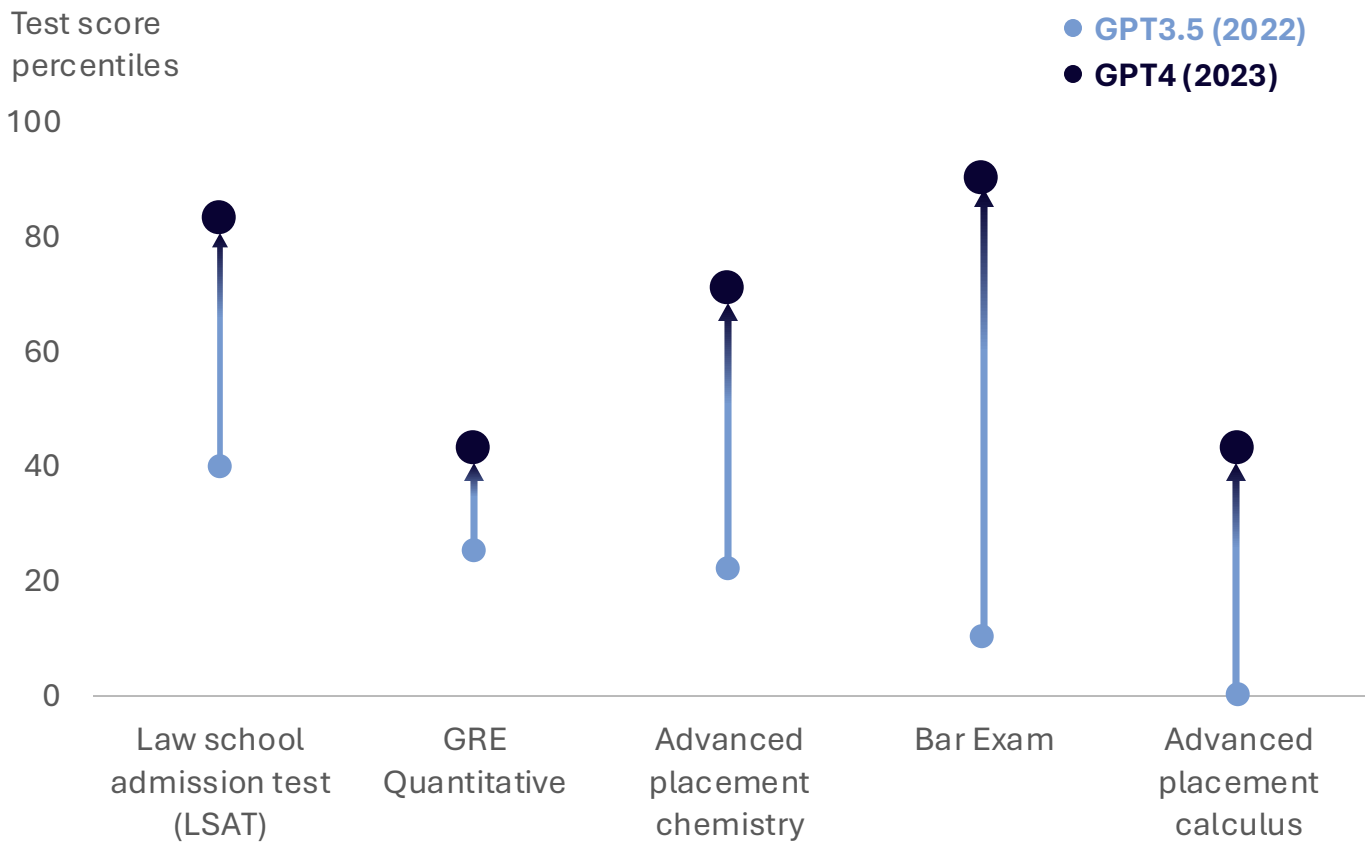
AI diffusion has been far more rapid than past tech.
Adoption of generative AI technologies have been about 5x faster than mobile phones



Source: ISIS Malaysia staff estimates using data from McKinsey & Co, Gartner, OECD, ITU
Note: Adoption of cloud services are OECD averages

What makes novel AI technologies different from past waves?

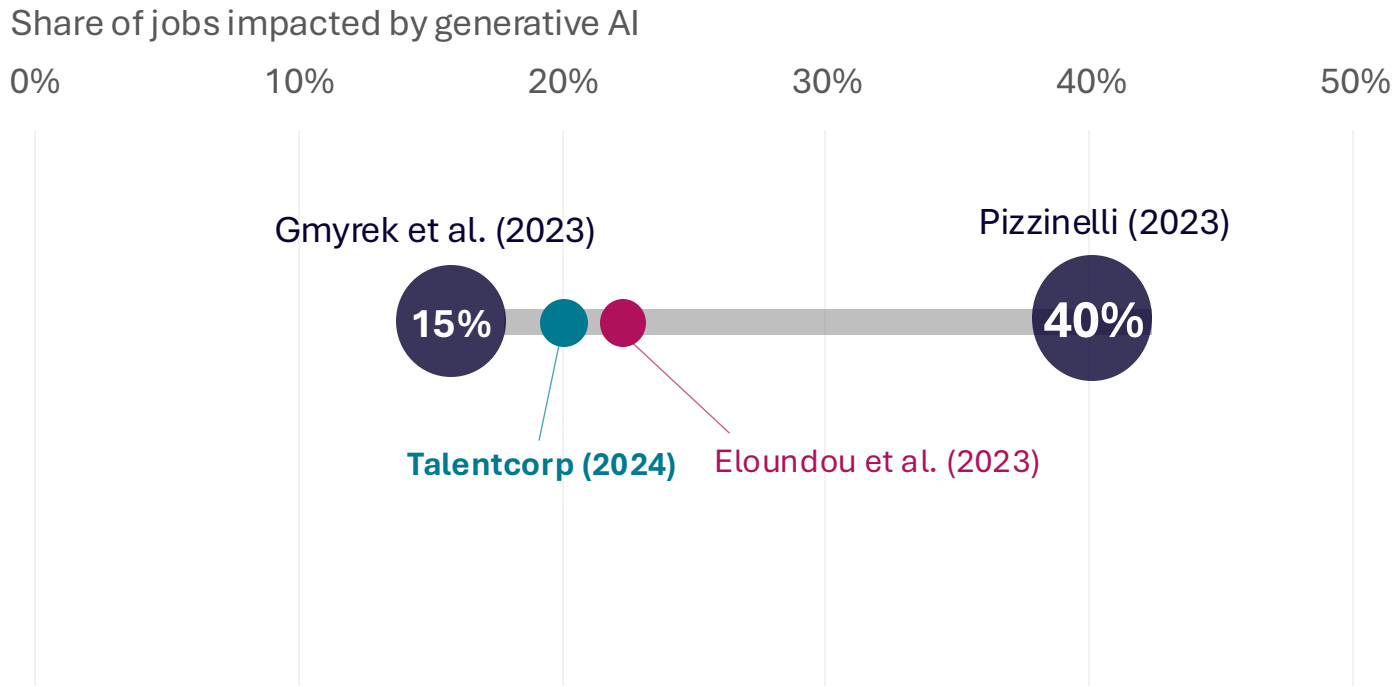
Pace of AI development has also far quicker.
Generative AI capabilities are converging to frontier of human cognitive abilities.



Source: Adapted from Eloundou et al. (2023)
Note: Estimates refer to the 2023 version of GPT4 and 2022 version of GPT3.

What does the recent literature say on the job impacts of generative AI?

- **Global estimates of AI exposure are high.**
  Talentcorp (2024) estimates 18% of Malaysian workers to be highly impacted by generative AI in the next 3-5 years.



Source: Authors' illustrations based on Gmyrek et al. (2023), Talentcorp (2024), Eloundou et al. (2023), Pizzinelli (2023).

Note: Gmyrek et al. (2023): % of global jobs, Talentcorp (2024): % of Malaysian workers, Eloundou et al. (2023): % of US workers, Pizzinelli (2023): % of jobs in emerging market countries.

Overview

Motivation

▶ **Methods**

Results

What questions are we trying to answer?

1

How does generative AI technologies affect jobs, and who does it affect most?

(across occupations, demographics, geography)

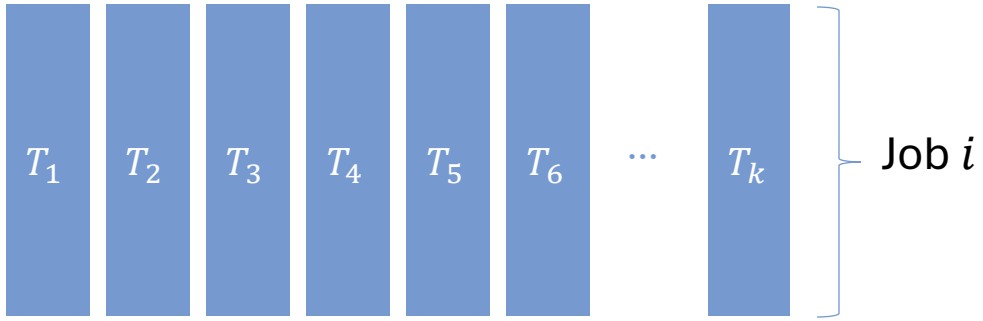
2

What types of policies are needed to maximise the benefits of technology diffusion while limiting its negative impacts?

(education, skills, social protection)

Start by building a conceptual framework of jobs

- **What is a job?**
  We define a job as a collection of discrete tasks



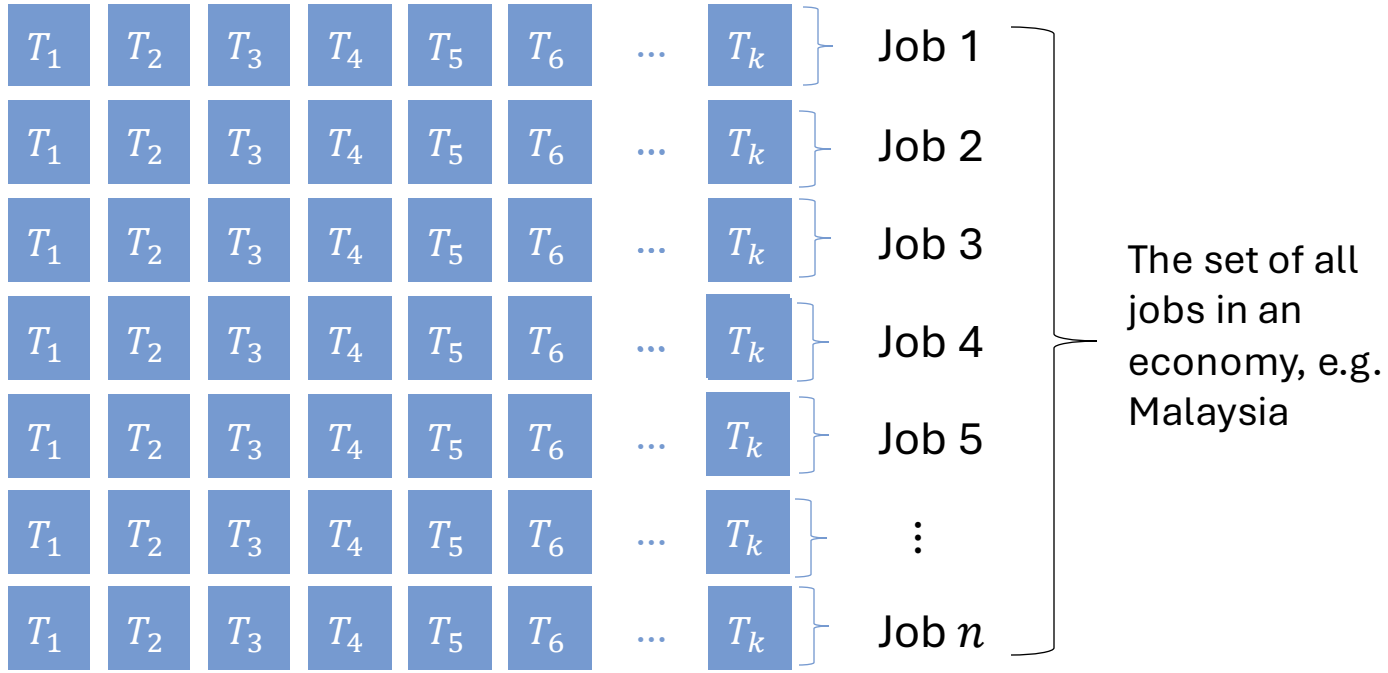
Task 1, Task 2, …, Task k

Source: Authors' illustrations based on Cheng and Chong (2024).

Start by building a conceptual framework of jobs

What is a job?

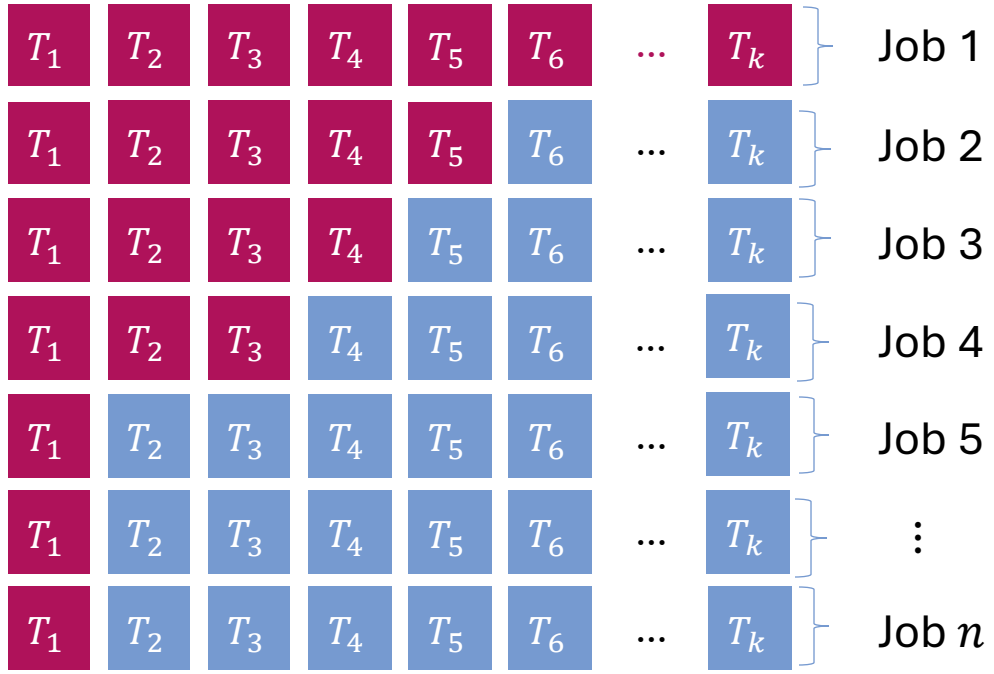
Jobs as a collection of discrete tasks.



Source: Authors' illustrations based on Cheng and Chong (2024).

How does technology affect jobs in our framework?

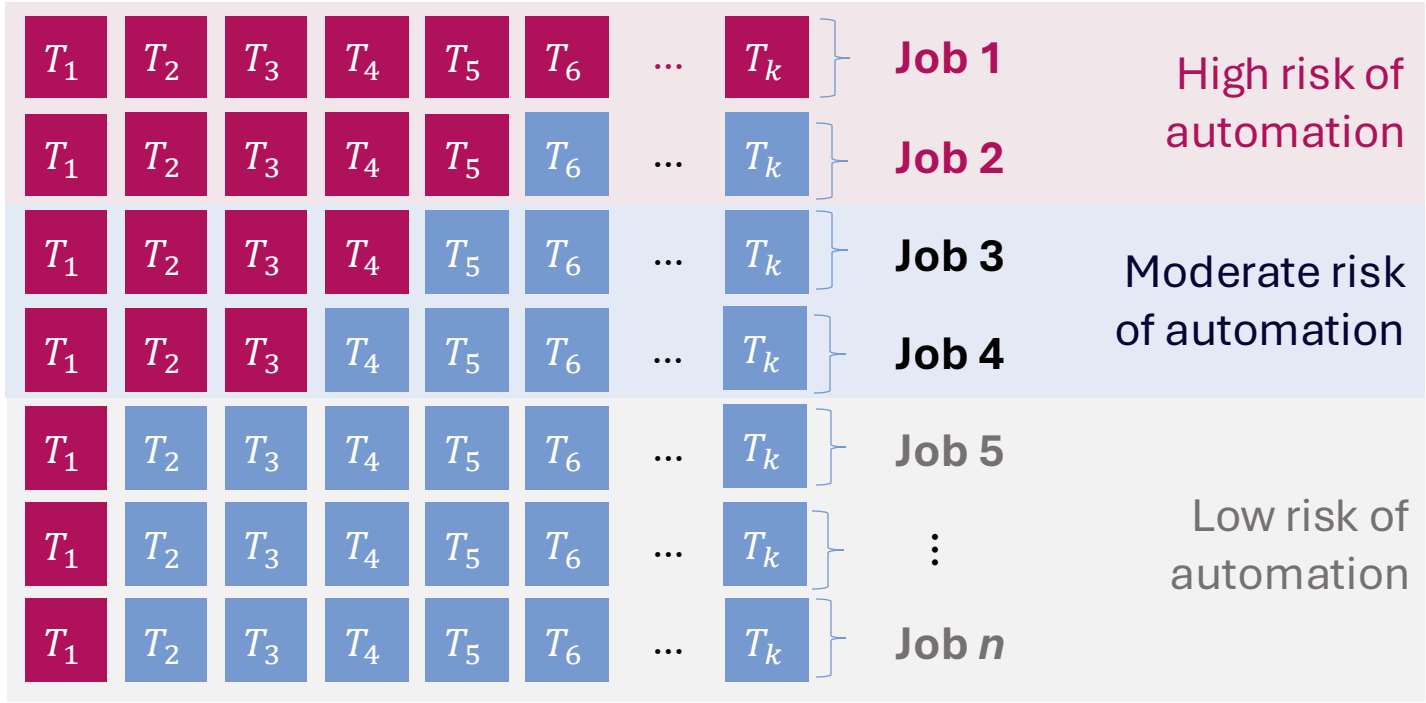
Technology affects jobs by affecting its tasks.
Generative AI will automate certain tasks in certain jobs.



Source: Authors' illustrations based on Cheng and Chong (2024).

How does technology affect jobs in our framework?

- We can assess the risk of automation of a job based on the automation intensity of its task mix.

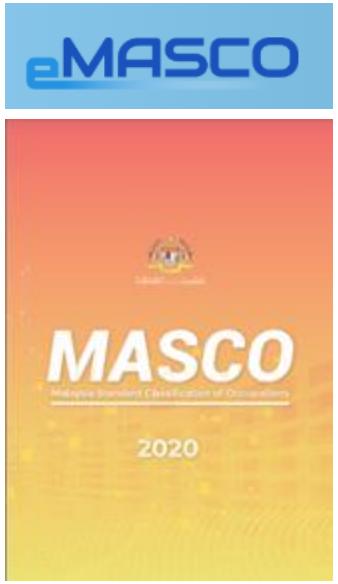


Source: Authors' illustrations based on Cheng and Chong (2024).

Bringing the conceptual framework to the real world

Retrieving the set of jobs and tasks in an economy

Using the Malaysian Standard Classification of Occupations (MASCO)



Classification Structure

- 1 Managers
- 2 Professionals
  - 21 Science And Engineering Professionals (8)
  - 22 Health Professionals (6)
  - 23 Teaching Professionals (9)
  - 24 Business And Administration Professionals (3)
    - 241 Finance Professionals (3)
    - 242 Administration Professionals (6)
      - 2421 Management And Organisation Analysts (16)
      - 2422 Policy Administration Professionals (2)
        - 2422-01 Administrative and Diplomatic Officer Grade M41
        - 2422-02 Policy Analyst
      - 2423 Personnel And Career Professionals (14)
      - 2424 Training And Staff Development Professionals (8)
      - 2425 Administrative Professionals (15)
      - 2426 Research And Development Professionals (21)
    - 243 Sales, Marketing And Public Relations Professionals (4)
  - 25 Information and Communications Technology Professionals (4)
  - 26 Legal Professionals (1)
  - 27 Hospitality and Related Services Professionals (1)
  - 28 Social And Cultural Professionals (4)
  - 29 Regulatory Government Professionals (1)
- 3 Technicians and Associate Professionals
- 4 Clerical Support Workers
- 5 Service and Sales Workers
- 6 Skilled Agricultural, Forestry, Livestock and Fishery Workers
- 7 Craft and Related Trades Workers
- 8 Plant and Machine Operators and Assemblers

492 jobs
(4-digit level)
3958 jobs
(6-digit level)

Source: MASCO 2020
https://emasco.mohr.gov.my/masco/

Bringing the conceptual framework to the real world

Retrieving the set of jobs and tasks in an economy

Using the Malaysian Standard Classification of Occupations (MASCO)

eMASCO

Economists

MASCO Code : 2821

Task Includes

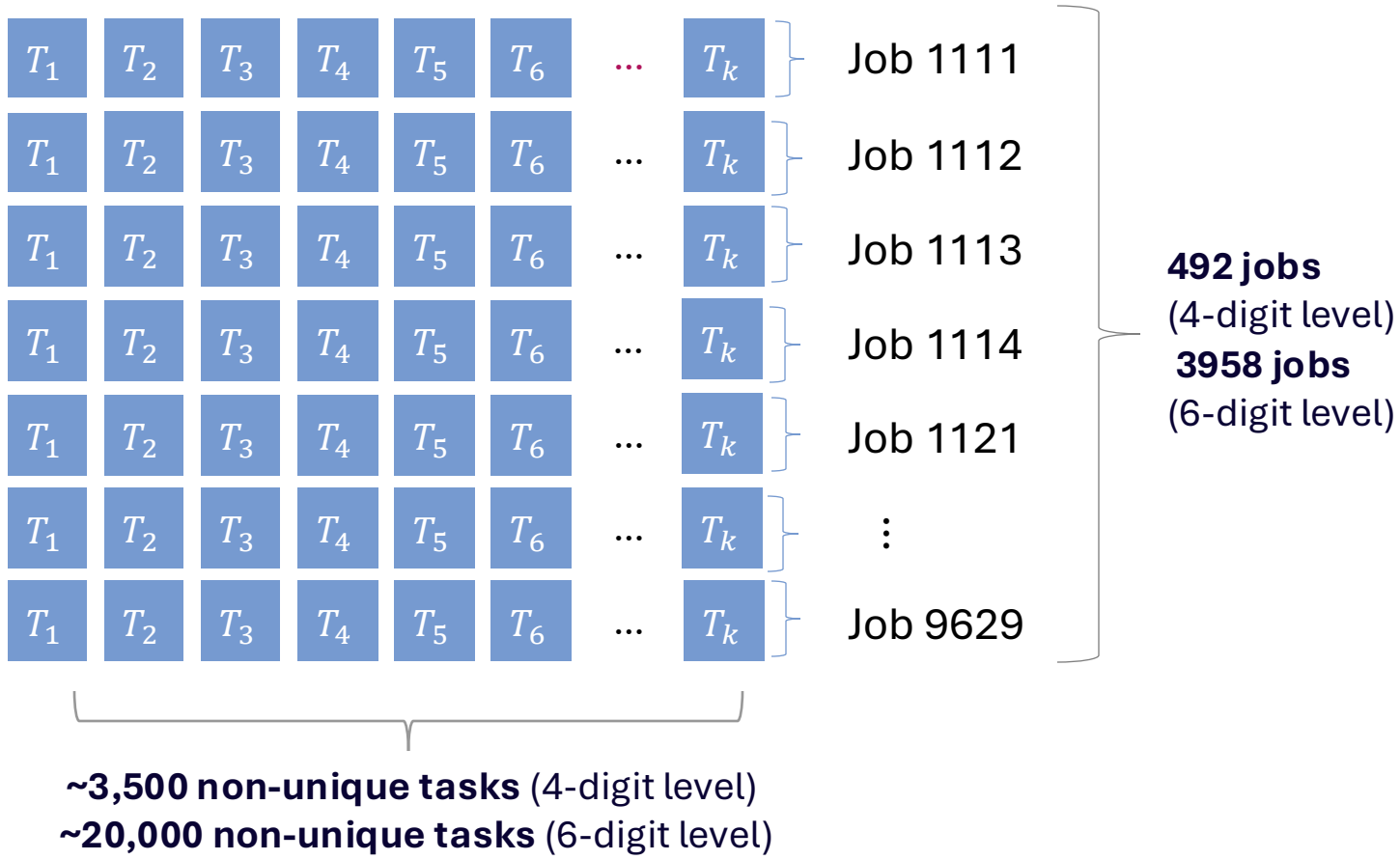
- Compiling, analysing and interpreting economic and statistical data
- Preparing reports on research findings
- Advising on economic policy and course of action to be followed in the light of analyses of past, present and projected economic factors
- Enhancing knowledge and coordinating work performance
- Performing related tasks

Source: MASCO 2020
https://emasco.mohr.gov.my/masco/2823-04

Bringing the conceptual framework to the real world

Retrieving the set of jobs and tasks in an economy

Using the Malaysian Standard Classification of Occupations (MASCO)



Source: Authors' illustrations based on Cheng and Chong (2024).

Assigning automatability scores to the job-task list

Using sequential API calls to GPT-4o

Following Gmyrek et al. (2023) and Eloundou et al. (2023), we assign automatability scores for tasks using a modified training prompt

- *"You are a skills and AI specialist."*
- *"You will provide a **score of potential automation with GPT technology for a given task**. Follow instructions closely."*
- *"Look at this job task: [task]"*
- *"It is related to this occupation: [occupation]"*
- *"Provide a score of potential automation of this task with Generative AI technology, given that the job is located in Malaysia: "*
- *"The score should range 0-1. Provide a score in one line, and a justification in next line. Do not provide any other commentary, only the score and justification. Do not give any ranges just one score for each task."*

Source: Authors' illustrations using Gmyrek et al. (2023), Eloundou et al. (2023).

Automatability scores for individual tasks

- **We generate automatability scores for each job-task**
  Scores range from 0 to 1 (high value = more automatable)

Economist
MASCO Code: 2821

No.	Task	$A(t_{ik})$
1	Compiling, analysing and interpreting economic and statistical data	0.65
2	Preparing reports on research findings	0.75
3	Advising on economic policy and course of action to be followed in the light of analyses of past, present and projected economic factors	0.45
4	Enhancing knowledge and coordinating work performance	0.45

T_1 T_2 T_3 T_4 } 2821 Economist

All tasks have automatability score more than 0.35 (sample median)
⟹ All tasks are deemed automatable by generative AI
⟹ Economist is an occupation with **high risk of of automation**

Source: Authors' illustration

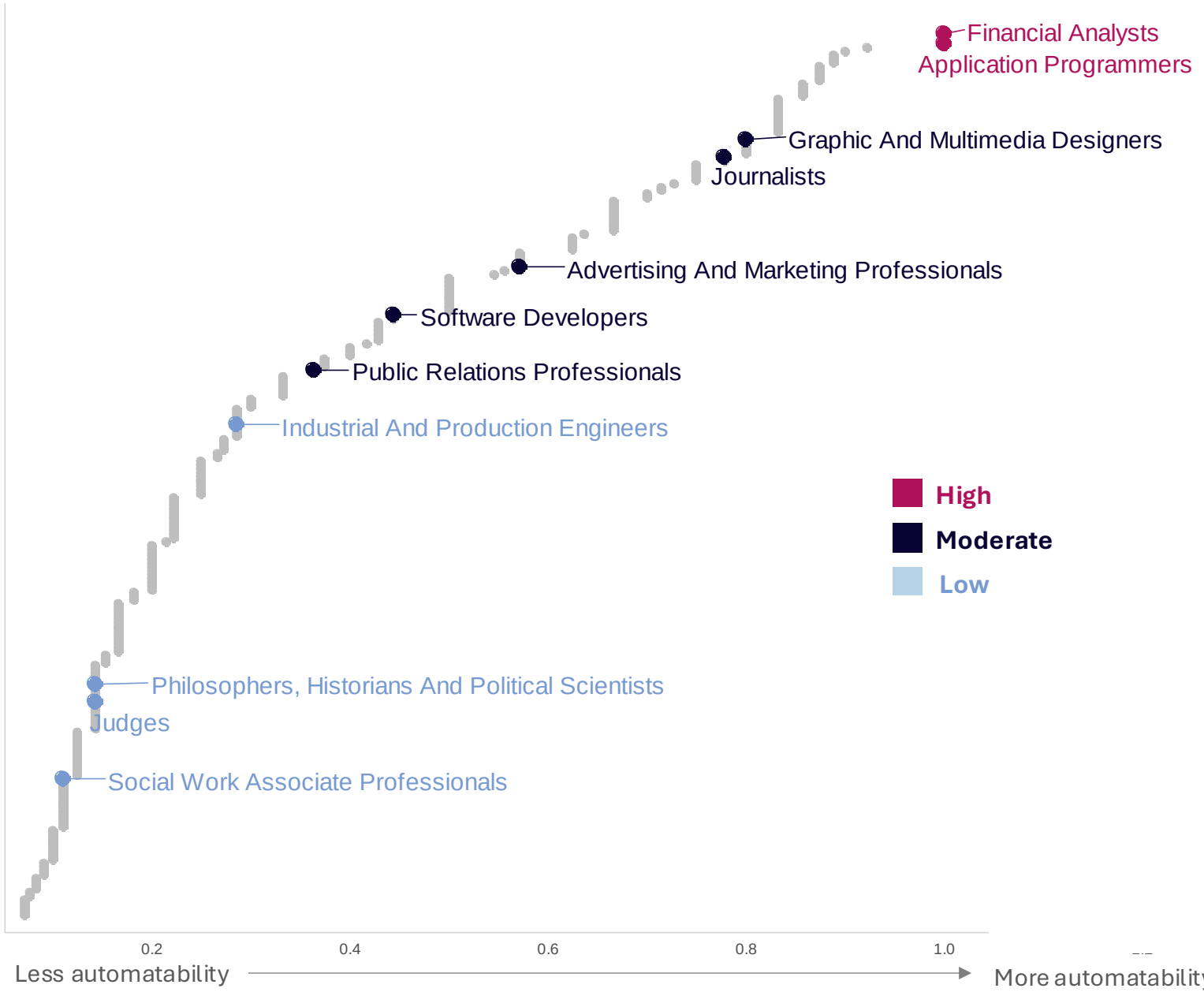
Overview

Motivation

Methods

Results

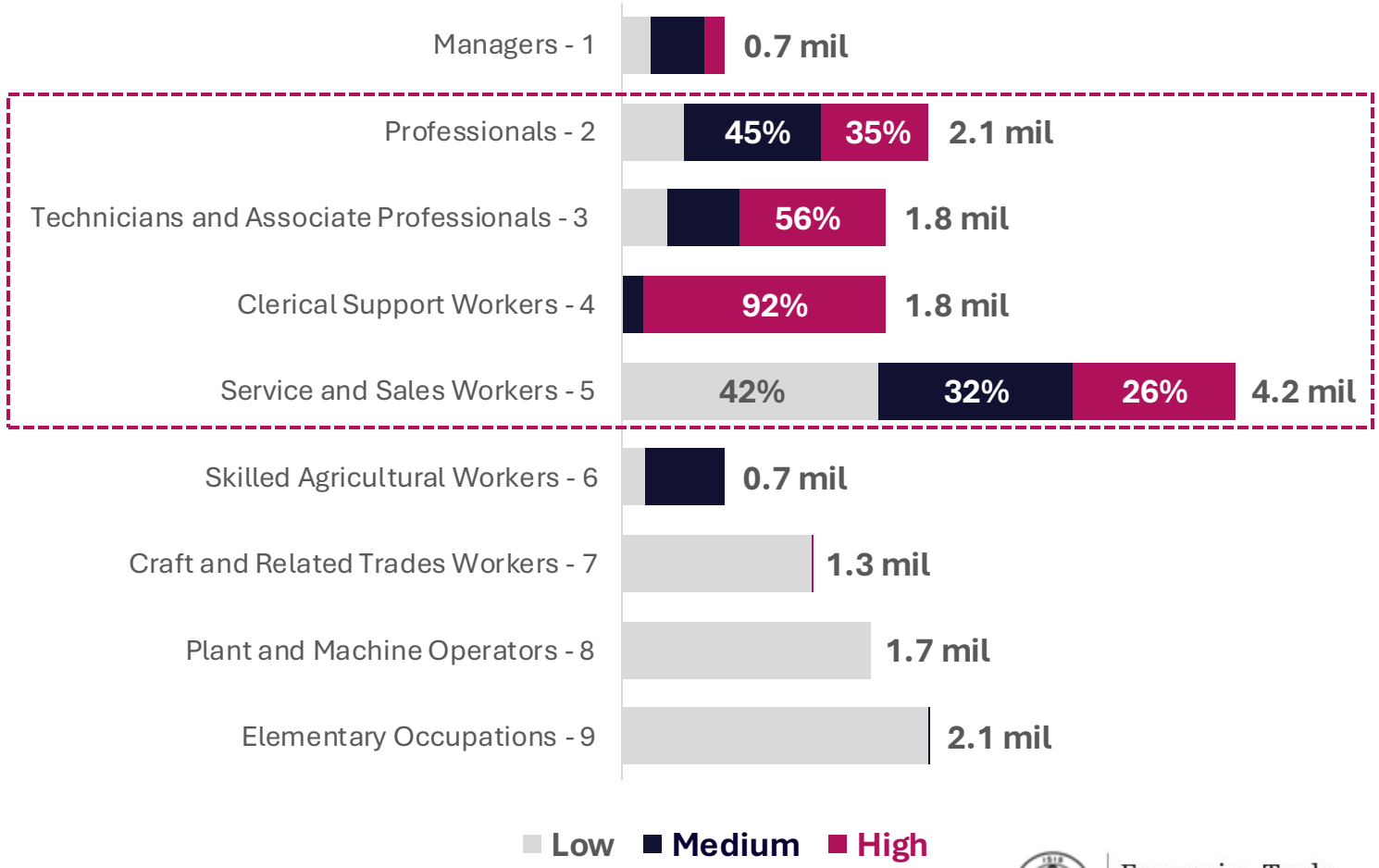
- Results at the 4-digit level: **Which occupations are most affected?**



Source: Authors' estimates.
Note: Selected occupations are highlighted are illustration purposes.

- Mapping results to the Malaysian workforce: **Which broad occupation is most affected?**

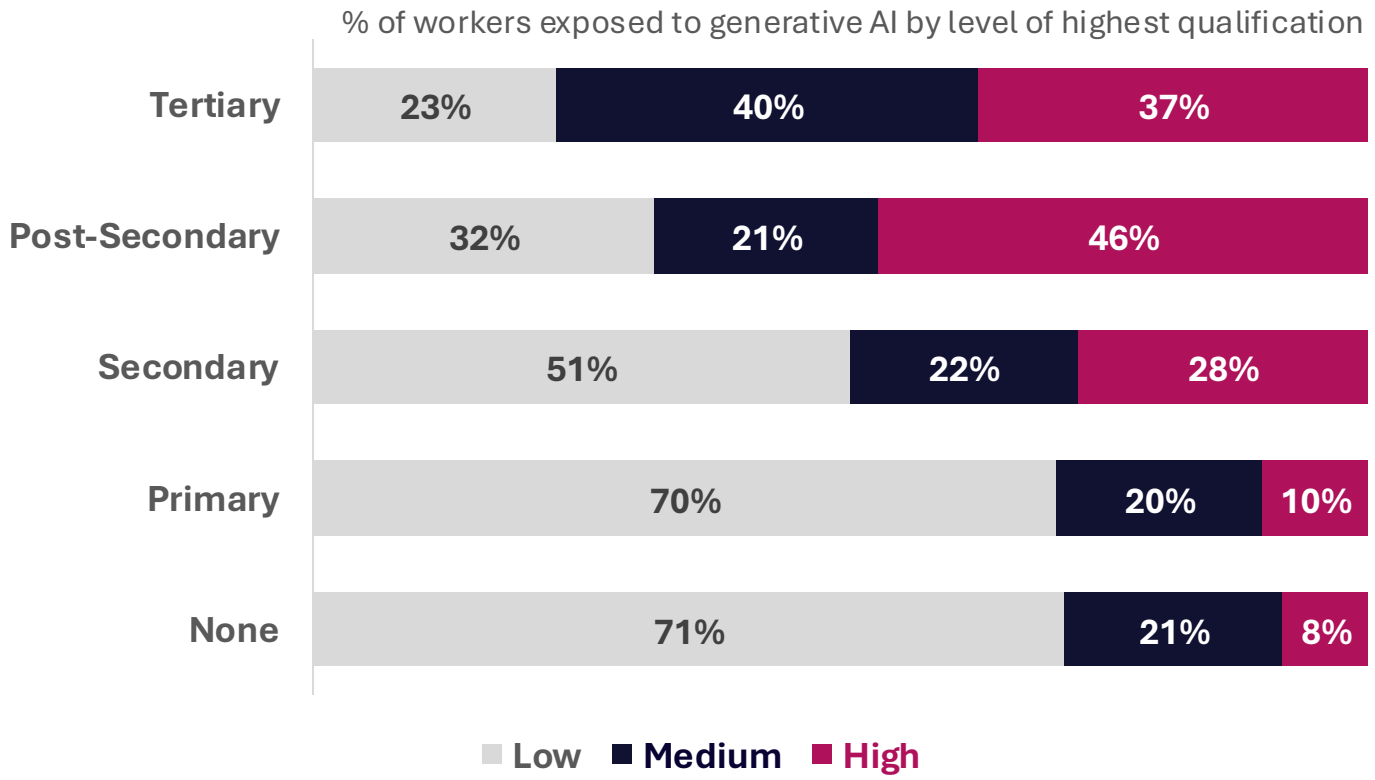
- **4.6 million Malaysian workers are in occupations that are highly exposed to generative AI.**
  These typically involve non-repetitive cognitive tasks.[1]



Source: Authors' estimates based on Malaysian Labour Force Survey data;
[1]Georgieff & Hyee (2021)

- Mapping results to the Malaysian workforce: **level of education**

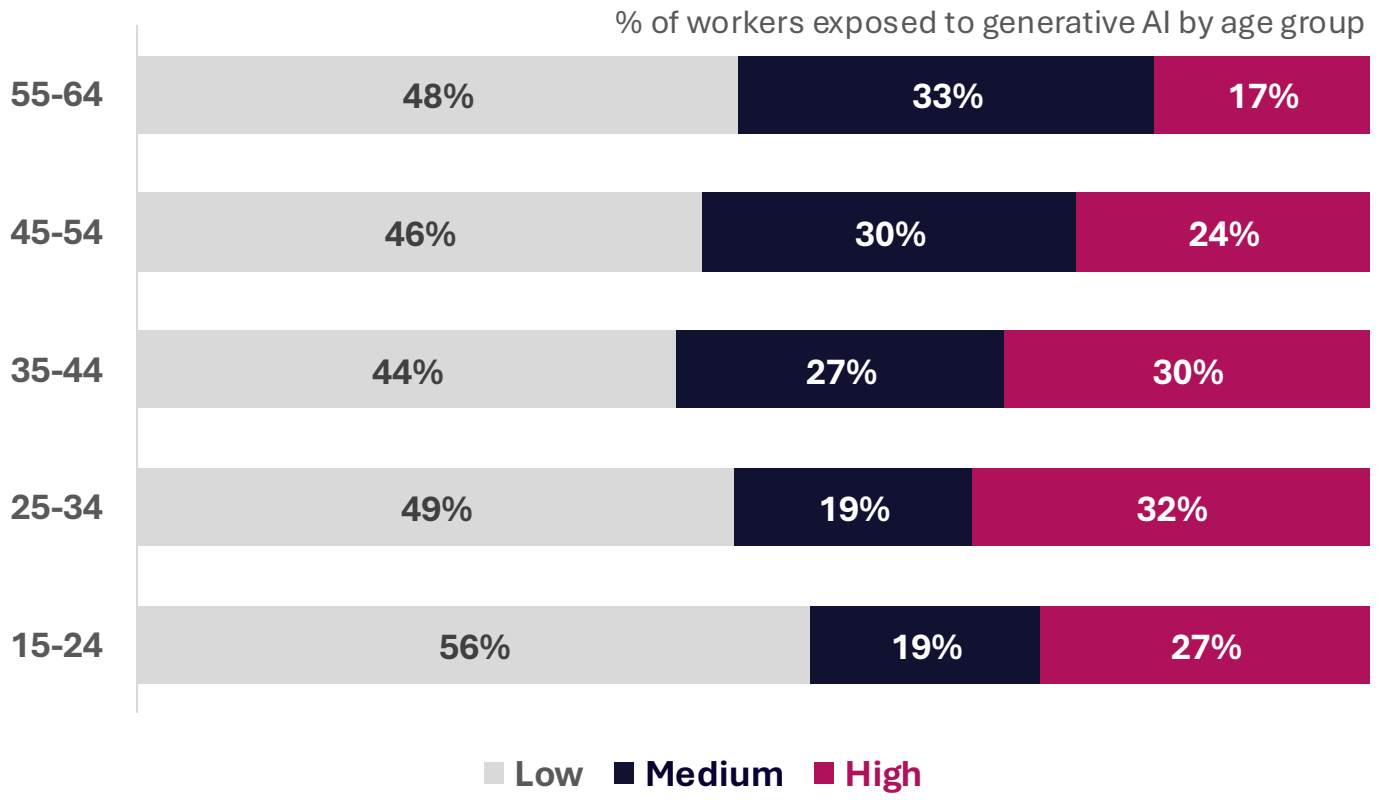
- **Higher educated workers are more likely to be in occupations exposed to disruption by generative AI.** However, more work needs to be done to disentangle the connection between education level and age.



Source: Authors' estimates.

- Mapping results to the Malaysian workforce: **seniority effects?**

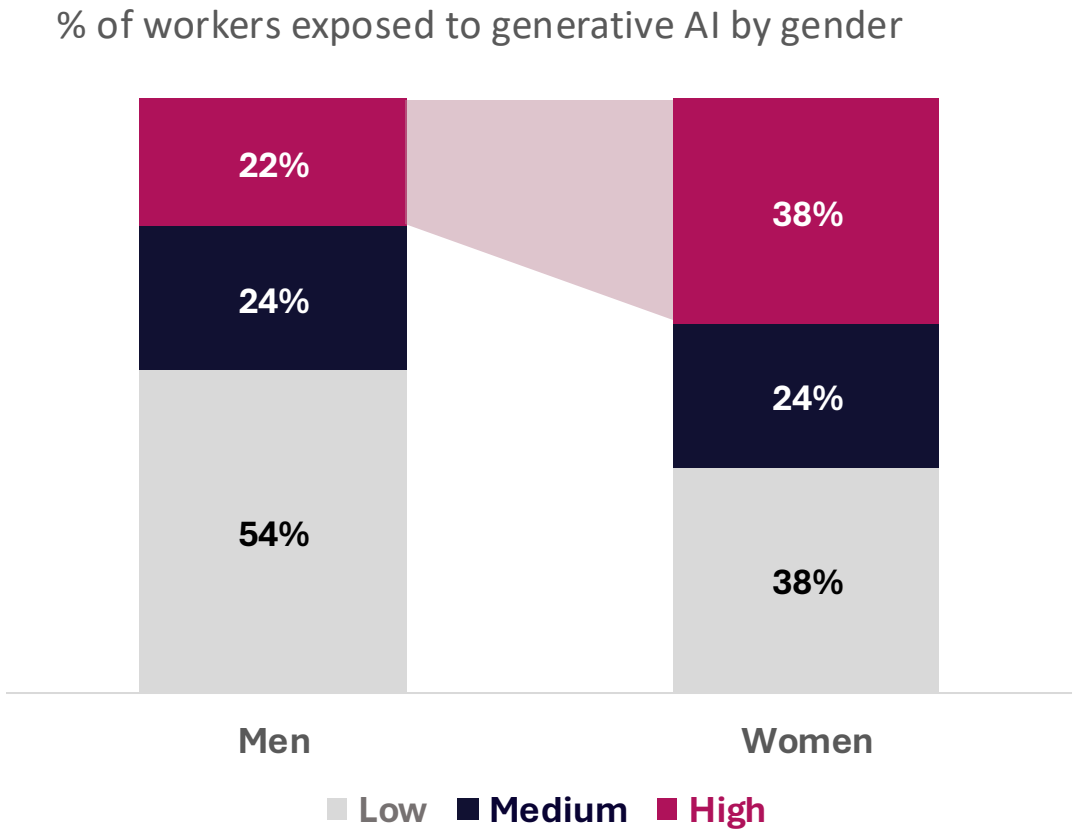
- **Workers under 45 years old are more likely to be in occupations that are highly exposed to generative AI.** The youngest workers (15 – 24) are also more likely to be in occupations that are insulated from generative AI disruption.



Source: Authors' estimates.

- Mapping results to the Malaysian workforce: **Gendered impacts?**

- **Women are more likely to be in occupations that are highly exposed to disruption by generative AI.**



Source: Authors' estimates.

Discussion of findings

- **High-skilled occupations are now exposed to automation.**[1] Professional and technician jobs which require tertiary education challenge the notion that higher education guarantees better job security and prospects.

- **Already-disadvantaged groups are most at risk of job displacement.** Existing inequalities are likely to worsen without inclusive policies and accessible skills development initiatives.

Source: [1]Acemoglu and Restrepo (2020)

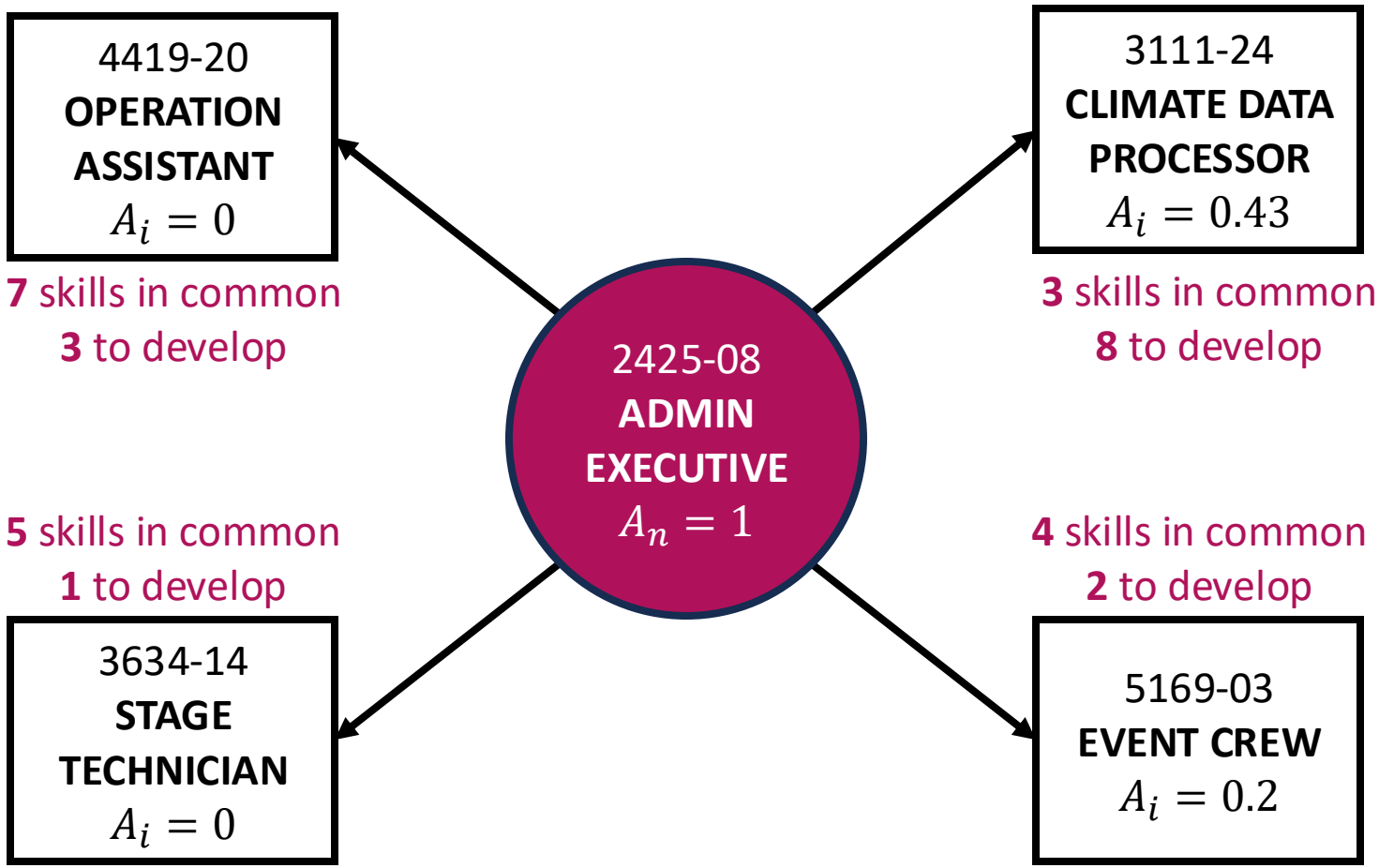
Next steps of this project

- **Disentangling the effects of individual variable:** given two workers with the same level of education, is the younger worker more likely to be in an occupation that are exposed to automation by generative AI?
- **Developing a skills-based framework:** policymakers need to identify key skills required to help people in employment transition.

Source: Authors' estimates.

- **Reskilling and upskilling through job-skills network analysis**

- **Connecting workers in the most exposed occupations to jobs forecasted to be in high demand.**



Source: TalentCorp (2024).

Key takeaways and concluding thoughts

- **The pace of technological change is increasing.** Generative AI is uniquely disruptive due to its rapid pace of development and diffusion.
- **Evidence suggest relatively high exposure, but not all workers are affected equally.** Skills that are not automatable are likely related to human creativity, socio-emotional intelligence, and physical labour.
- **Active labour market policies and skill building initiatives are required to limit the negative impacts.** Current financial and economic (capitalist) incentives tend to favour labour-replacing technologies over labour-enabling technologies.

Thank you.

About ISIS Malaysia

ISIS Malaysia has for over four decades conducted evidence-based research on economics, foreign policy, social policy, and climate. The Economics, Trade, and Regional Integration programme at ISIS Malaysia focuses on analysis of emerging economic policy issues in Malaysia and the region.

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