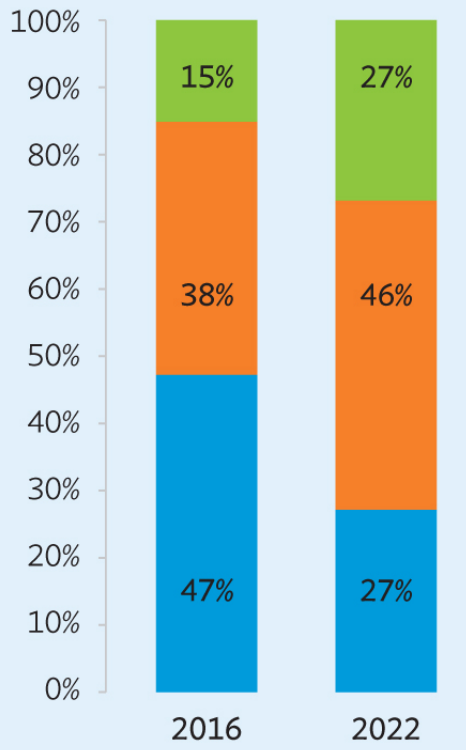
Technology for Innovation in the Age of 4IR

Addressing development challenges in Asia

Sameer Khatiwada | 12 April 2019

New technology is changing existing work...

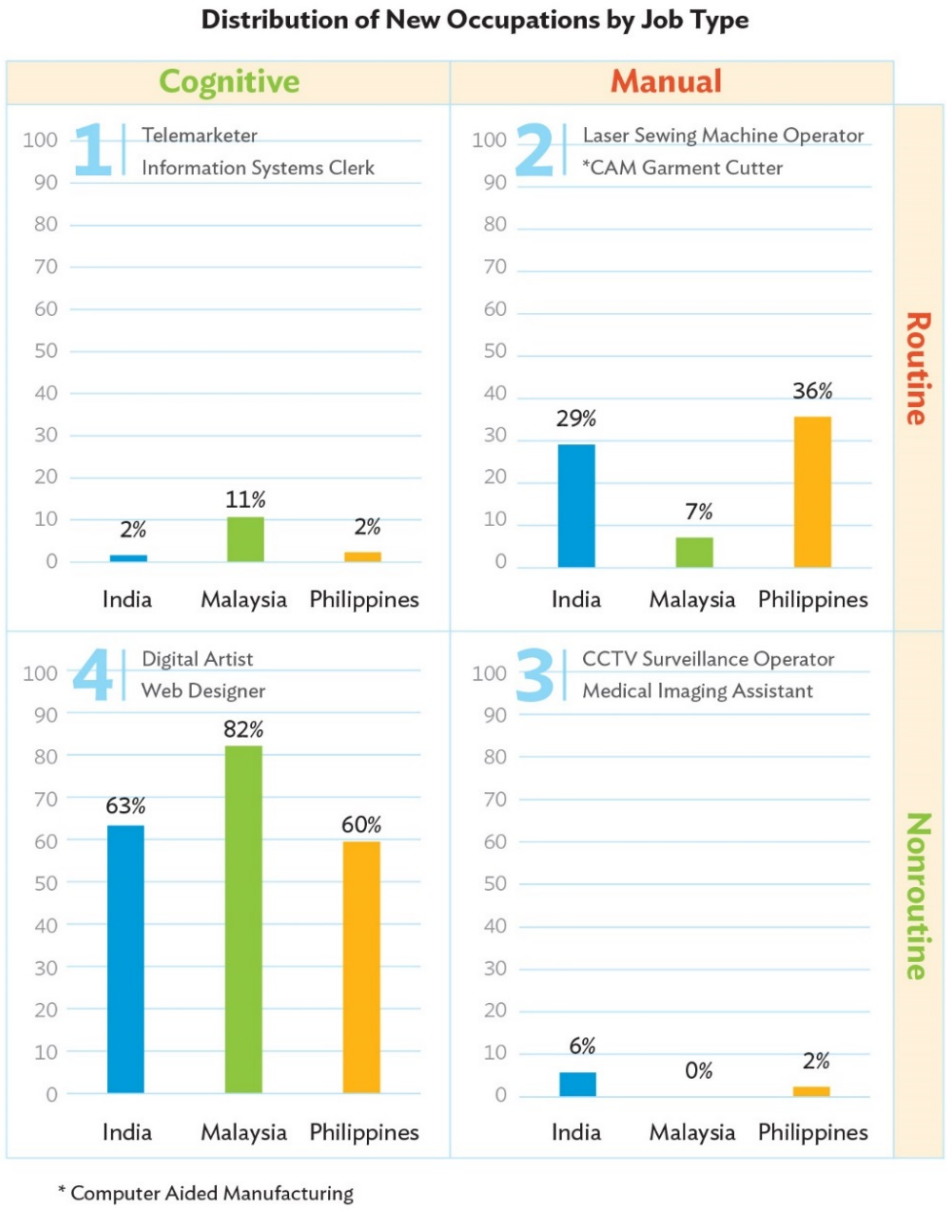
Adjusting to the impact of automation in the IT-BPO Sector in the Philippines



	Tasks	Jobs
High	Complicated tasks that require specialized expertise, abstract thinking and autonomy	Computer programmers, computer engineers, health professionals (nurses), financial experts, design professionals
Medium	Complicated tasks that require experience, abstract thinking and situational response	Accounting and book-keeping clerks, computer assistants (animation, data analysis, digital production), health assistants
Low	Simple entry-level, process driven tasks that require little abstract thinking and autonomy	Customer support clerks, data entry assistants, medical transcriptionists

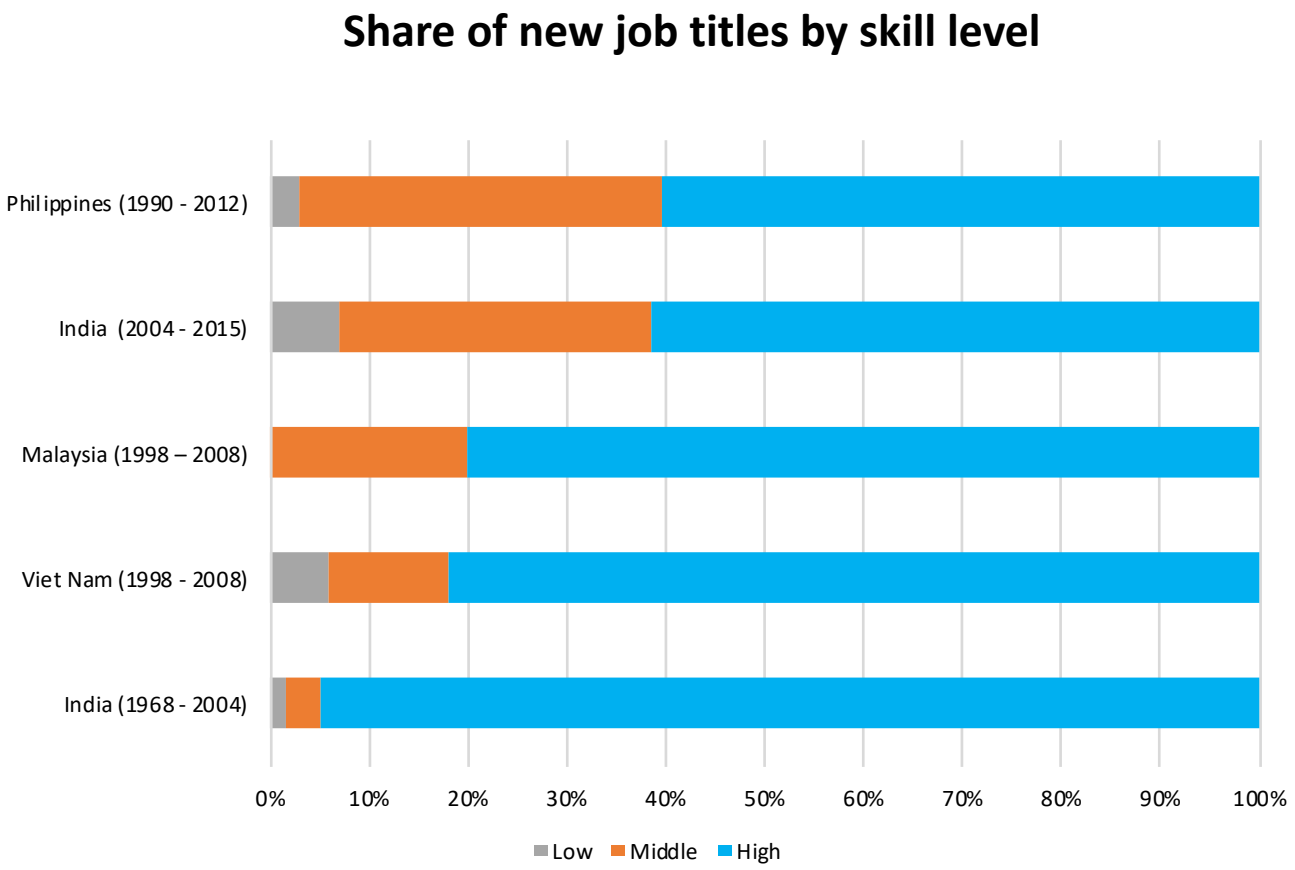
Source: *Asian Development Outlook 2018:* How Technology Affects Jobs.

…while also creating new work



Source: *Asian Development Outlook 2018:* How Technology Affects Jobs

High-skilled workers benefit the most from rapidly changing labour markets



Source: Khatiwada and Veloso (2019).

Government has an important role to play in harnessing new technology

The New Industrial Revolution: The Role of Government

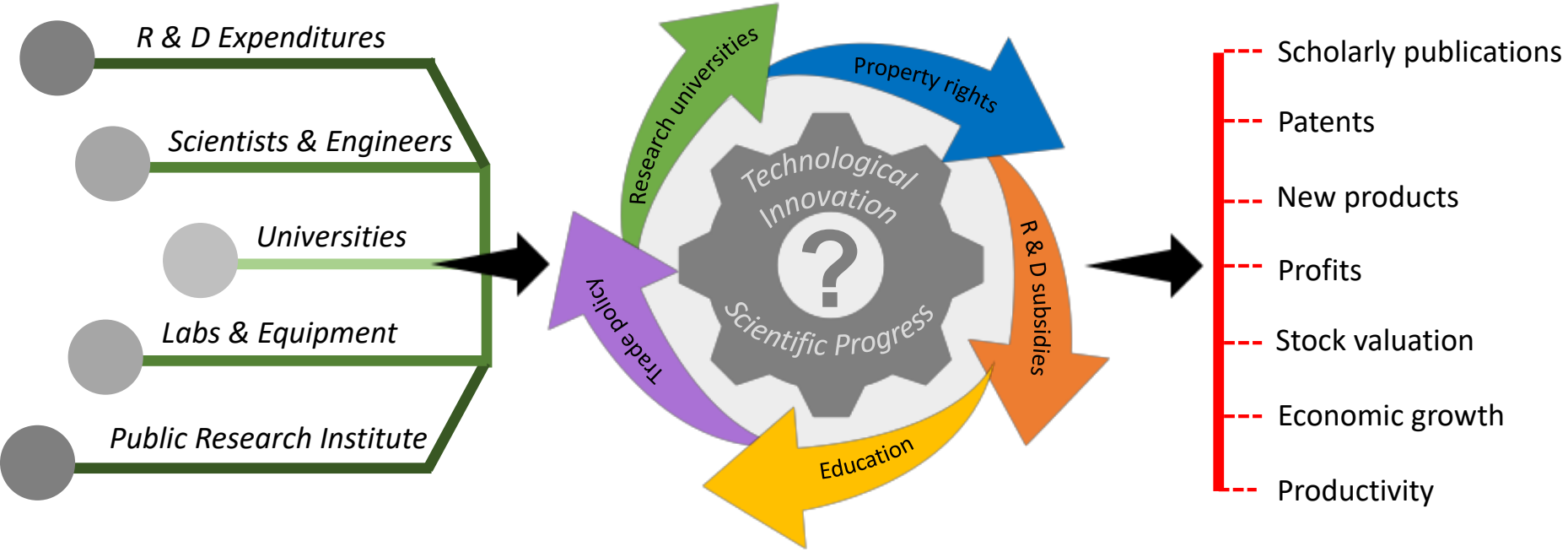
- Regulation of technology
- Support for displaced workers
- Responding to increased inequality

- Provision of public goods and services
- Improving governance and compliance

- Investments in infrastructure
- Education and training
- Support for innovation and technological adoption

Source: *Asian Development Outlook 2018:* How Technology Affects Jobs

There is a need to leverage technology for innovation

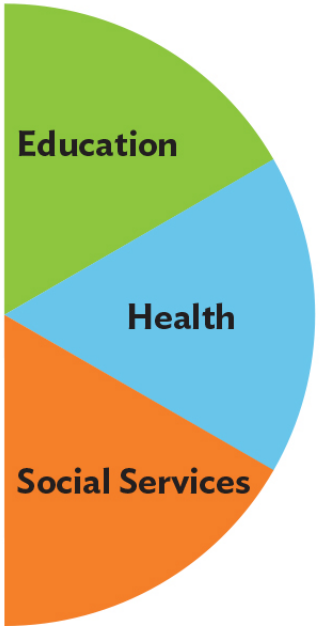


Source: Authors' illustration based on Taylor (2016).

ADB has been facilitating this process

Ongoing Initiatives in Innovation Using Technology

Agriculture and Food
Climate Change and Disaster Resilience
Energy
Finance
Governance
Telecommunications
Transport
Urban Development



Education
- Project to improve Lao PDR's higher education system and TVET programs
- Digital hub (IT park) in Pakistan & skills development in AI and IoT technologies

Health
- Surveillance and response to communicable diseases in CAREC countries
- Health information systems (e.g. Bhutan, Nepal)

Social Services
- National ID program in Cambodia (will help in delivery of social services)
- Digitization of civil registration and delivery of social protection (e.g., India, Nepal)

Countries have been quick to recognize the unfolding opportunities from new technology because:

- Most **developing countries don't have legacy systems** that need to be replaced → first upgrade of an existing inefficient system, or service that didn't exist before.
- Reflects an **underserved market** in terms of essential public services → faster adoption of technology.
- No regulation or **light regulatory infrastructure** in many countries → an opportunity, but it also raises some concerns as new technology matures.

Levels of ICT Development and Absorptive Capacity for Innovation

But we need to rethink our current strategy and adopt a differentiated approach

INITIAL

- Early stage of investment in ICT and other infrastructure
- Low-income or middle-income status
- Higher share of low-skill employment (e.g. agriculture, labor intensive manufacturing)
- Lower educational attainment (e.g. tertiary education, STEM fields)

Countries:
Cambodia, Lao PDR, Myanmar

DEVELOPING

- ICT infrastructure in place but national strategy at a development stage
- Middle income status
- Higher share of medium skill and high skill employment (e.g. manufacturing)
- Higher educational attainment (e.g. tertiary but still shortage of STEM graduates)

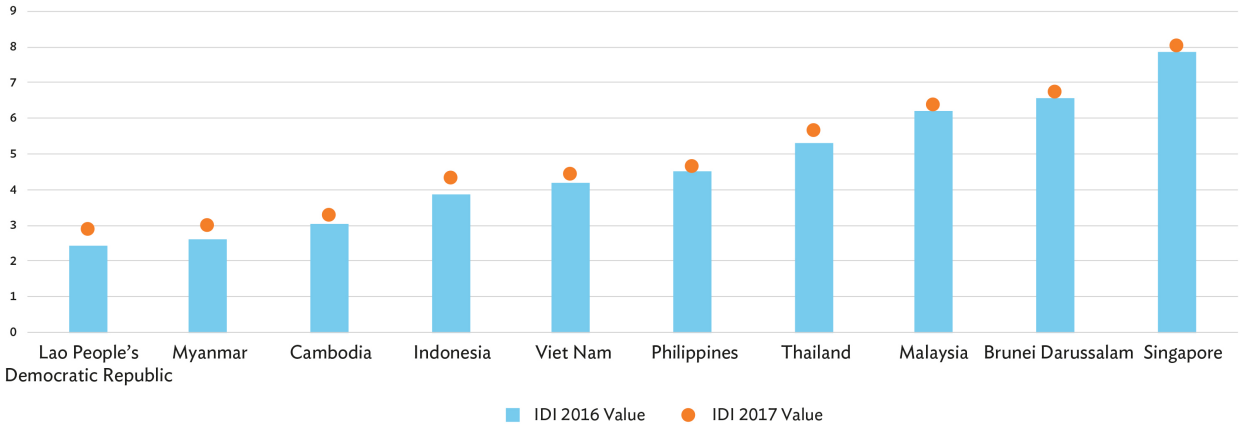
Countries:
Indonesia, Malaysia, Philippines, Thailand, Viet Nam

ADVANCED

- Mature ICT infrastructure with a national strategy to leverage technology for growth
- Upper middle or high income status
- Larger share of high-skill employment (e.g. professional business services)
- High educational attainment including in STEM fields

Countries:
Brunei Darussalam, Singapore

ICT Development Index, 2016–17



Challenges, opportunities and innovative technology solutions

Sector	Challenges	Opportunities	Tech Solutions
Agriculture	Low productivity and income	Commercialization of agriculture/agribusiness	ICT-based price information services; smart farming
Education	Gap in demand vs. supply of skills	Better monitor LM information	Artificial Intelligence (AI) and big data for real time LM analysis
Energy	Lower productivity and competitiveness	Increase access to electricity	State-of-art conductors with higher power transmission capacity
Finance	Underserved market	Increase access to finance	Mobile banking, Fintech
Health	Weak record-keeping and outdated standards	Increase access to basic care; decentralization to local govts.	ICT-enabled health information systems
Transport	Urban congestion	To re-think transport linkages	Internet of things; autonomous vehicles
Urban Dev.	Ineffective waste management	To create livable cities	New modes of treatment; ICT for logistics management

Source: Authors' summary.

"Making Indonesia 4.0": Investment in people and their skills vital for its success

Challenge

- 4IR Policy has identified automotive, electronics and chemicals among the priority sectors, but there is lack of enough skilled workers.
- Limited R&D spending (0.1 – 0.3 % of GDP) and there are no govt./private sector led innovation centers.

Opportunity

- Largest domestic market for auto, chemicals and electronics in SE Asia; electronics key inputs for multiple sector in the 4IR era .
- Possibility to increase R&D activities aimed at product/process innovation; re-skilling and up-skilling workers.

Tech Solution

- Redesign TVET and university curriculum in collaboration with the industry (e-learning, mobile learning, nanodegrees).
- Invest in R&D centers (innovation hubs) to facilitate diversification and upgrading in export products and services.

ADB

Thank you.