Henry Ford

“Walter, how are you going to get those robots to pay your union dues?”

Walter Reuther

“Henry, how are you going to get them to buy your cars?”

An apocryphal conversation between Henry Ford, chairman of Ford Motor Company, and Walter Reuther, union leader of the United Automobile Workers.
WORKERS AT HIGH RISK OF AUTOMATION IN ASEAN-5
Simulations on jobs susceptible to digitalization

Source: ASEAN in transformation: Future of jobs at risk of automation (ILO, 2016)
PERCENTAGE OF WAGE WORKERS AT HIGH RISK OF AUTOMATION IN KEY SECTORS IN ASEAN-5
Simulations on jobs susceptible to digitalization

Cambodia Garments 88%
Indonesia Retail 85%
Philippines BPO/call centres 89%
Thailand Motor vehicles 73%
Viet Nam Garments 86%

Source: ASEAN in transformation: Future of jobs at risk of automation (ILO, 2016)
INTRODUCTION

YET ASEAN’S INCOMING WORKFORCE IS OPTIMISTIC ABOUT FUTURE WORK OPPORTUNITIES

2,700 students in ASEAN-10 say 2025 will bring greater opportunities for

- Good work for young women: 63%
- Maintaining relevant skills: 54%
- Starting a business: 58%
- Productive and well-paid work: 56%
- Interesting and rewarding work: 58%

Source: ASEAN in transformation: Perspectives of enterprises and students (ILO, 2016)
**YOUNG PEOPLE’S AREA OF INTEREST**

**Top choice of study:** Business, commerce and finance (almost 30%)

**STEM uptake**

<table>
<thead>
<tr>
<th>Male student</th>
<th>Female student</th>
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<tbody>
<tr>
<td>28%</td>
<td>17%</td>
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**Top career choice – Male**

- **ICT:** 14%
- **Finance or insurance:** 9%
- **Manufacturing:** 8%

**Top career choice – Female**

- **Finance or insurance:** 11%
- **ICT:** 10%
- **Arts and entertainment:** 8%

**BUT ARE THEY STUDYING FIELDS ALIGNED WITH GROWTH SECTORS?**

Source: ASEAN in transformation: Perspectives of enterprises and students (ILO, 2016)
ASEAN ENTERPRISES ARE NOT AT THE FOREFRONT OF TECHNOLOGICAL INNOVATION BUT SEE IT’S IMPORTANCE

Of 4,000 enterprises surveyed in ASEAN-10

- less than 16% protect IP
- around 20% invest in R&D

But technology is seen as a positive enabler:

Over 50% agree that technology will increase domestic sales, labour productivity, profits and number of highly skilled workers employed

Source: ASEAN in transformation: Perspectives of enterprises and students (ILO, 2016)
Enterprises report that affordability and skills are the biggest obstacles to technology implementation.

- High fixed capital cost: 29%
- Lack of high skilled workers: 13%
- High licensing cost: 10%

Source: ASEAN in transformation: Perspectives of enterprises and students (ILO, 2016)
Technology is driving up enterprise demand for technically skilled workers who are difficult to find.

Skills most important:
- Technical knowledge: 40%
- Teamwork and communications: 33%

Skills most difficult to find:
- Strategic thinking and problem solving: 32%
- Technical knowledge: 27%
- Innovation: 25%
- Creativity: 25%

Source: ASEAN in transformation: Perspectives of enterprises and students (ILO, 2016)
Enterprises think 2025 will bring greater opportunities for:

- Labour productivity: 69%
- Profits: 65%
- High skilled workers employed: 65%
- Domestic sales: 64%
- Women employed: 46%
- Export: 46%

Source: ASEAN in transformation: Perspectives of enterprises and students (ILO, 2016)
Develop an in-depth understanding of technological trends across different sectors:

- Focus on labour-intensive and economically important sectors
- Assess enterprises’ skills needs
- Understand impact on people

Provoke thought and discussion among enterprises, workers and their representative organizations, as well as national and regional policy-makers, on how best to prepare for the discernible changes most likely to come by the year 2025.
INTRODUCTION

HOW THE RESEARCH WAS CONDUCTED

Research methodology

- **330** interviews
- **4,000** enterprise surveys
- **2,700** student surveys
- **6** national and regional consultation meetings
- **extensive** secondary research

Sectoral approach of five prominent sectors in ASEAN:

- **Automotive and auto parts**
- **Electrical and electronics (E&E)**
- **Textiles, clothing and footwear (TCF)**
- **Business process outsourcing (BPO)**
- **Retail**
OVERVIEW OF ASEAN

- Population: 632 million
- Expanding middle class: Tripled over the past 20 years
- Demographics and urbanization
  - Population growth is slowing
  - Young women and men account for about 17% of the population
  - Portion of ASEAN urban population has risen above 40%
- Workforce characteristics
  Only 13% are high skilled
DRIVERS OF TECHNOLOGY
ENTERPRISE COMPETITIVENESS

- Continuously improve quality, precision and productivity
- Manage and stabilize total production cost and staff turnover
- Consider movements of key competing countries, like China
- Keep up with technological trends in other sectors
Consumers are:

- Becoming wealthier, with more disposable income in ASEAN
- Demanding sophisticated products
- Seeking instantaneous purchases and want a variety of designs/functions
- Globally, this is accentuated by consumers wanting individualized products

Governments are adding regulations to:

- Address environmental concerns during production and reduce waste
- Create a safer workplace
OVERVIEW OF ASEAN TECHNOLOGY

Automation and robotics

- Automation is increasingly applied across all sectors
- Automotive and electronics are the largest consumers of robots
- In ASEAN, robots sales increased for Indonesia, Malaysia, Singapore and Viet Nam in 2014

Additive manufacturing (AM) or 3D printing

- Global market grew 29% between 2012-13

Internet of Things

- Connected devices embedded with sensors to grow from 10 billion today to 30 billion devices by 2020
SECTOR ANALYSIS

AUTOMOTIVE AND AUTO PARTS
ASEAN was the 7th largest global producer of vehicles in 2015.

More than 800,000 workers employed.

Regional leaders: Thailand, Indonesia.
TECHNOLOGICAL DRIVERS

- Stronger government regulations to lower carbon emission
- A wealthier ASEAN with more disposable income demanding higher-end cars
- Increased demand for improved quality
- Enhanced pressure to manage production cost
Global trends:

- Electric/hybrid electric vehicles
- Advanced, lightweight materials
- Autonomous vehicles

In ASEAN, robotic automation is most prominent

- Production-line robots are becoming smaller, better, cheaper, easier to install, more adaptable and increasingly able to collaborate with people
- Over 60% interviewed have seen significant increases in automation
- Over 70% interviewed say that cost is the major driver for automation
“Cost down” agreements between original equipment manufacturers (OEMs) and suppliers make automation attractive as it provides process improvements.

Automation becomes even more attractive as ASEAN automakers are often confronted with unpredictable spikes in minimum wage.
Barriers that limit consumer and production demands for advanced technologies in ASEAN are:

- The high costs of electric/hybrid electric vehicles and lightweight materials
- Unresolved legal and infrastructure issues for autonomous vehicles
- Lack of R&D
- Lack of skilled workers who can lead this effort
- Lack of technological and production capacity of local auto makers
IMPACT ON ENTERPRISES AND PEOPLE

- Robots are replacing lower-skilled jobs
- The industry needs new types of higher-skilled workers who are difficult to find
  - Increased need for engineers with specialized knowledge on automation and robotic programming
  - Increased demand for workers with STEM backgrounds
- The sector needs to rebrand its image among young people and women
SECTOR ANALYSIS

ELECTRICAL
AND ELECTRONICS
ASEAN's E&E directly employs over 2.5 million workers and exports reached $382.1 billion. The E&E sector is becoming increasingly connected to every economic sector. Regional leaders: Thailand, Malaysia, and Singapore (beyond ASEAN: China).
Robotic automation: replacing simple tasks

- Foxconn: replaced 60,000 workers with robots in one factory
- But poor execution of automation can be costly
- Robots today are not sufficiently flexible to account for short product development cycles and product lifespans

The IoT: presents a major growth opportunity for the entire sector

- Demand for sensors, connectivity and memory to increase
- The IoT may increase semiconductor global revenue by 3-4%

3D printing: currently limited but likely to expand

- 3D printed circuits projected to be available in market by 2018
- 3D production of simple electronic parts will appear first
AUTOMATION

• When automation occurs, it is often “human centric”

• The technology aids workers rather than replaces them

• Collaborative robots, or “cobots” perform more repetitive and difficult to perform tasks

• Human workers have advantages in terms of adaptability and perception
China has the most developed ecosystem and outpaces ASEAN in terms of E&E exports by a large margin.

Total production of selected E&E goods has increased with less people employed.

As China moves up the value chain, ASEAN may reap short-term opportunities by scooping up lower skilled work.

However, relocation decisions from China to ASEAN is complex, as they require large amounts of capital investment for initial development.
IMPACT ON ENTERPRISES AND PEOPLE

- Automated processes are replacing low-skilled jobs in assembling and packaging
- Production in E&E will be catalysed, encouraging the creation of more innovative products and new jobs opportunities
- Demand for higher skills with strong technical, engineering and science fields will increase
- Workers need to scale up their skills, especially in STEM
SECTOR ANALYSIS

TEXTILES, CLOTHING AND FOOTWEAR
Provides jobs to over 9 million people in ASEAN, the majority of whom are young women.

The female share of employment exceeds 70% in Cambodia, Lao PDR, the Philippines, Thailand and Viet Nam.

While globally, TCF exports are dominated by China, a number of ASEAN economies like Indonesia, Thailand and Viet Nam join the top rankings of TCF exports.

In some ASEAN countries, TCF accounts for high manufacturing employment.

Cambodia 60%
TECHNOLOGICAL DRIVERS

- Increased demand for customization
- Pressure to speed up production to market
- Environmental issues
  
  Knit technology: 80% less waste than typical design for shoes
- Increased need for quality and precision
- Increased need for higher productivity
  
  Labour productivity levels in TCF sector is significantly lower than overall manufacturing.
- China may accelerate automation
China monopolizes TCF production globally

- Textile exports: 31%
- Clothing exports: 37%
- Footwear exports: 39%

Rising labour costs and demographic changes make China less attractive, providing compelling reasons for companies to relocate to ASEAN.

But China has critical competitive advantages:

- Full vertical supply chain
- Good infrastructure
- Higher worker productivity
- More initiative to improve competitiveness through technology
- TCF production and exports are increasing with less people employed
3D printing, body scanning and CAD enable enhanced individualization of apparel.

Smart apparel

- Integrates medical, fitness and wellness features that monitor heart rate, calories burned and other biometric data
- Expected to increase from US$20 billion in 2015 to US$70 billion in 2025

Nanotechnology

- Nanoparticles render odour-free, waterproof, UV-blocking or antistatic clothing
Robotic automation forms the biggest future threat to both enterprises and workers in ASEAN’s TCF sector.

“Sewbots”: robots capable of sewing will change the calculus of apparel production

- Enable reshoring of production closer to destination market
- US sees immediate saving of using sewbots in 2016 of about US$180,000 over 5 years
- China sees considerable savings if investment in sewbots are made in 2020 (robots are 50% cheaper)
• Immediate term: better skilled production-line workers required

• Of all the sectors analysed, TCF is at highest risk of displaced workers.

  This risk disproportionally affects female workers

• Enterprises lack higher skilled workers who can manage technology: more engineers and technical experts with backgrounds in medical science, material science and electronics needed
SECTOR ANALYSIS

BUSINESS PROCESS OUTSOURCING
BPO in the Philippines grew from technology and connectivity:

**GDP contribution**

to reach 7% in 2016

In 2014, over 1 million workers were employed, mostly young graduates

*Women comprise of* 59% of the workforce

Call centres (voice work) account for 60% of BPO employment
TECHNOLOGICAL DRIVERS

- Make BPO services accessible to SMEs
- Increased need for greater productivity and accuracy
- Higher value service
  
  Improving customer experience through multiple channels, such as Twitter and SMS

- Benefits of labour arbitrage using outsourced BPO services is around 15-30%
  
  Cost reduction achieved through automated technology is around 40-75%
Cloud computing:

- Makes BPO services accessible to SMEs, presenting a growth opportunity

Software robots, or robotic process automation (RPA), work like human agents:

- RPA can cut down back-office costs 25-50%
- Clients move operations back to their own companies (inshore) rather than outsourcing to the Philippines
• BPO players need to shift services towards knowledge process outsourcing (KPO), processes that require specialized knowledge and skillsets

• These services will require **highly educated employees** with certifications in medicine, business, law, finance, accounting and data analysis

• The Philippines’s BPO workers can no longer rely on English proficiency
SECTOR ANALYSIS

RETAIL
Local and traditional retail outlets are the largest channel for retail sales.

Retail sales in ASEAN countries accounted for US$767 billion in 2013.

Employs a total of 44.6 million workers, which is 16% of the region's total employment.

44% of jobs in the services sector.
TECHNOLOGICAL DRIVERS

• Of the five sectors analysed, ASEAN’s retail industry appears to be the least threatened by technology.

• However, following factors will provide the push:
  • ASEAN is becoming increasingly connected to the Internet
  • Increased urbanization
  • Increasing labour costs
Mobile and e-Commerce platforms could displace ASEAN’s “brick-and-mortar” retail establishment

- Products online can be sold more cheaply
- The spending power of tech-savvy, younger shoppers is increasing
- Currently, e-Commerce has a low share in the ASEAN retail market – less than 1% of all sales

Even in Singapore, e-Commerce accounts for only 3.4% of all retail sales
The IoT is converging with other technologies and seen as the most significant disruptor to come.

Combined with cloud and big data:

Significant improvements in optimizing inventory management, product tracking and shopping intelligence can be made.
More than 90% of enterprises agreed that labour and skills requirements will change with adoption of technology in retail.

- Data management skills
- Digital marketing and social media skills
- Soft skills
- In-depth product knowledge

While no imminent, large scale threats to ASEAN’s retail workforce, modern retail outlets – who are leaders of technological upgrading – are expanding aggressively.
FINAL REMARKS
FINAL REMARKS

- Manufacturing production processes are transforming in terms of geography, jobs and efficiency
- Certain sectors and groups will face particular disruption
- Technology will “change” a lot of jobs rather than “replace” them
- Making skills, training and education systems “fit for purpose” will require major effort
- Comprehensive multifaceted growth and investment strategies are now required in the technological age
“Progress is not to be measured in technological advancement or innovation, it is to be measured by what we make of the application of that technology or innovation”.

Guy Ryder, Director General, ILO
ASEAN IN TRANSFORMATION
HOW TECHNOLOGY IS CHANGING JOBS AND ENTERPRISES

AUTOMOTIVE AND AUTO PARTS: SHIFTING GEARS

ELECTRICAL AND ELECTRONICS: ON AND OFF THE GRID

PERSPECTIVES OF ENTERPRISES AND STUDENTS ON FUTURE WORK

TEXTILES, CLOTHING AND FOOTWEAR: REFASHIONING THE FUTURE

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