ASEAN in
The Fourth Industrial Revolution

ASEAN Integration Monitoring Directorate
ASEAN Economic Community Department
A brief history of Industrial Revolution:

<table>
<thead>
<tr>
<th>18th Century</th>
<th>Late 19th Century</th>
<th>20th Century</th>
<th>2010-onwards</th>
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</thead>
<tbody>
<tr>
<td><strong>1st Industrial Revolution:</strong></td>
<td><strong>2nd Industrial Revolution:</strong></td>
<td><strong>3rd Industrial Revolution:</strong></td>
<td><strong>4th Industrial Revolution:</strong></td>
</tr>
<tr>
<td>Mechanisation of production</td>
<td>Mass Production</td>
<td>Automation</td>
<td>Cyber Physical Systems</td>
</tr>
<tr>
<td>(steam and water power)</td>
<td>(electricity)</td>
<td>(internet and computer)</td>
<td>(IoT, AI, etc.)</td>
</tr>
</tbody>
</table>

**Replacement of equipment (% installed base):**

- **100** Replacement of complete loom necessary
- **~10-20** Little replacement as tooling equipment could be kept, only conveyor belt needed
- **~80-90** High level of replacement as tooling equipment was replace by machines
- **~40-50** Existing machines are connected, only partial replacement of equipment
Benefits of 4IR in the Production System

- **Greater efficiencies**: optimized production lines which will boost productivity

- **Improved product quality**: the increased use of real-time data to spot errors, identify quality issues and their causes

- **Human-machine interaction**: workers will operate alongside collaborative robots, which would handle physically demanding and repetitive tasks, to maximise productivity

- **Mass customization of products and services**: the use of 3D printing allow customers active role in design, manufacturing companies flexibly produce product parts

- **Generate new types of business models**: technology advancement drives innovations in business models
What is the Readiness of ASEAN on 4IR?
ASEAN Digital Transformation: Facts & Figures

37.8 internet subscribers per 100 persons in 2017; 3.8 million users online/month – world fastest growing market

Cellular users – 147.3 per 100 persons in 2017

Fixed broadband – 7.2 per 100 persons in 2017

Automation – Singapore 2nd, other AMS in top 50

AI – Indonesia (24.6%) is leading in AI adoption in ASEAN, followed by Thailand (17.1%), Singapore (9.9%), Malaysia (8.1%)

Online travel to reach US$ 90 billion by 2025

4IR is Changing SEA Economic, Political, and Social Landscape in Significant Ways

- Digital economy – 7% of GDP – If tapped, could uplift the economy by US$ 1 trillion by 2025
- Only 16% of MSMEs truly utilise digital tools (Bain & Co, 2018)
- Future of jobs (refer to next slide)

Note: *Based on a 2018 survey carried out by the IDC Asia/Pacific involving 502 executives & IT heads in the Asia-Pacific (excluding Japan). Source: (ASEAN Secretariat, 2017; 2018; International Federation of Robotics, 2016; and International Data Corporation Asia/Pacific, 2018).
Future of jobs in ASEAN?

ILO (2016) – Cambodia, Indonesia, Malaysia, Philippines, Thailand, & Viet Nam would have to renounce 54-56% of jobs to automation

Workers will be displaced, but technology will also create new demand for workers across industries, by 2028 (CISCO, 2018):

- Wholesale and retail: 8.2% of full time equivalent (FTE) workers will be displaced, the numbers of jobs will grow 11.5%
- Transport: 9.6% of FTE workers will be displaced, the numbers of jobs will grow 14.5%
- In Manufacturing sector: 10.3% of FTE workers will be displaced, the numbers of jobs will grow 11.7%
- In Construction sector: 9.4% of FTE workers will be displaced, the numbers of jobs will grow 13.5%


With more than half of ASEAN’s population are below the age of 30 today, ASEAN stands to gain from the 4IR

Note: Data are simple average; ASEAN Secretariat's calculation based on ILO data.
**ASEAN 4IR Readiness Assessment Study**

**Background**
- **ASEAN Leaders recognised** for ASEAN to be well-prepared and able to maximise the opportunities from the 4IR to foster economic growth, promote inclusive and equitable economic development (April 2017).
- Upon recommendation from HLTF-EI and as mandated by the 49th AEM Meeting, the ASEAN Secretariat **conducted assessment of ASEAN readiness** for Industry 4.0 (August 2017).

**Objectives of the study:**

1. Measure the ASEAN Readiness for the 4IR by leveraging on existing work/methodology measure country readiness, while ensuring ASEAN-wide coverage.

2. Complemented with qualitative research on specific AMS relevant initiatives and relevant ASEAN initiatives.

3. Discuss on potential value-add that can be derived from regional platform to assist individual AMS prepare for Industry 4.0 and vice versa.
## Existing Readiness Assessment Frameworks:

<table>
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<th>Framework</th>
<th>Coverage</th>
<th>Key aspects/dimensions/pillars</th>
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<tbody>
<tr>
<td>WEF Readiness for the Future of Production 2018</td>
<td>100 countries (ASEAN: 7 AMS, excluding Brunei, Lao PDR, Myanmar)</td>
<td>Structure of production, and drivers of production</td>
</tr>
<tr>
<td>KPMG Change Readiness Index 2017</td>
<td>136 countries (ASEAN: 9 AMS, excluding Brunei Darussalam)</td>
<td>Enterprise capability, government capability, people and civil society capability.</td>
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<tr>
<td>DII Global Industry 4.0 Readiness Index 2017</td>
<td>120 countries (ASEAN: 7 AMS, excluding Brunei, Lao PDR, Myanmar)</td>
<td>Innovation aptitude, demand factors, driving forces, enterprise excellence, basic enablers, technological sophistication, and industry 4.0 specific enablers.</td>
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<td>Dell Future Ready Economies 2016</td>
<td>50 global cities (ASEAN: Singapore and Jakarta)</td>
<td>Human capital, infrastructure, and commerce.</td>
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### Why another assessment?
- None covers all 10 AMS
- Customise methodology to fit with the work under ASEAN
- But these existing assessments provide useful reference
The Assessment Framework:

01 Adjusted from WEF’s “Readiness for Future of Production Report 2018”

02 Covers all ASEAN Members

03 Structure of Production i.e. Economic Complexity and Scale (Manufacturing value-added)

04 Drivers of Production/Five Dimensions of Readiness:

- Innovation and Technology
- Human Capital
- Regulatory Frameworks
- Infrastructure and Connectivity
- Inclusive and Sustainable Growth
Archetypes of ASEAN Member States by Country Readiness for the Fourth Industrial Revolution
ASEAN’s 4IR Relevant Initiatives

**APSC**
- ASEAN Declaration to Prevent and Combat Cybercrime
- ASEAN Cyber Centre and Hub
- Memorandum of Understanding (MoU) on Cooperation to Counter International Terrorism between ASEAN and Australia
- ASEAN Leaders’ Statement on Cybersecurity Cooperation

**AEC**
- Science & technology: ASEAN Open Innovation & Entrepreneurship Platform
- Consumer protection: Guidelines on Cross-Border B2C for Online Businesses
- IPR: Technology Innovation Support Centres (TISC)
- Energy: Renewable Energy hub information sharing
- MSMEs: ASEAN SME Academy & ASEAN SME Service Centre
- FAF: Climate Smart Agriculture & Guidelines on Sustainable Forest Management
- E-Commerce: ASEAN Agreement on e-Commerce & ASEAN Digital Integration Framework
- ICT: ASEAN Framework on Digital Data Governance

**ASCC**
- Education: ASEAN Cyber University, Online Learning on Higher Education, ICT-ready Teachers, & ASEAN TVET 4.0
- Employment: Regional study on the impact of ICT & outsourcing on employment & on the adequacy of legislations in regulating employment relationship
### Non-exhaustive List of Major National Initiatives:

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<th>Initiatives</th>
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<td>Indonesia</td>
<td>Launch of ‘Making Indonesia 4.0’ Roadmap (2017); Indonesia Broadband Plan 2014-2019</td>
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*Source: ASEAN Secretariat’s compilation from various sources*
### Non-exhaustive List of Major National Initiatives:*

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<td><strong>Philippines</strong></td>
<td>Inclusive, Innovation-led Industrial Strategy (i3s) (2017); Philippines Digital Strategy 2011-2015 (2011); National Broadband Plan; e-Government Master Plan 2016-2020 (EGMP 2.0)</td>
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<tr>
<td><strong>Singapore</strong></td>
<td>AI.SG Initiative (2017); Research Innovation Enterprise 2020 Plan (2016); Industry Transformation Programme (2016); Intelligent Nation 2015 (2015); National Robotics Program (2015); Smart Nation (2014)</td>
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<tr>
<td><strong>Thailand</strong></td>
<td>Digital Government 2017-2021 (2017); Thailand 4.0 (2016); National Digital Economy Master Plan (2016-2020); Digital Economy Master Plan (2015)</td>
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<td><strong>Viet Nam</strong></td>
<td>Prime Minister’s Directive 16/CT-TTg on Strengthening Access to the Fourth Industrial Revolution (2017); Ministry of Industry and Trade’s Decision 4246/QD-BCT (2017); Prime Minister’s Decision 844/QD-TTg (2016); 2020 Broadband Plan (2016)</td>
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*Source: ASEAN Secretariat’s compilation from various sources*
Summary of Key Findings

- **Variation in AMS level of Readiness.** Uneven progress has been made in different areas highlighting areas for improvements.

- Various *regional and national initiatives* have been put in place by most AMS, although at differing levels of comprehensiveness and coordination.

- **Key areas** for further attention: ensure strong infrastructure, improve regulatory frameworks, *address skill needs*, engagement with stakeholders, and Enhance regional cooperation and cross-sectoral coordination.
Next Steps for Advancing the Work on 4IR

• In recognition of the expansive, multifaceted, cross-sectoral/cross-pillar implications of the 4IR, the Assessment study has been disseminated to the sectoral bodies across the three pillars of the ASEAN Community, along with a template for consolidating inputs from sectoral bodies.

• Further discussion on the next steps was undertaken at a Special Session on the 4IR, which was organised back-to-back with the 9th Meeting of Committee of the Whole for the AEC (CoW) on 14 - 15 January 2019 in Bangkok, Thailand.

• Following this Special Session, ASEAN will look into the development of the next steps for advancing ASEAN’s work on the 4IR, which should be cross-pillar, prioritise on areas where the regional platform can best deliver, and take into consideration existing and planned initiatives.

• Follow up on Thailand’s 4IR-related priority economic deliverables (under “strategic driver 1: future-orientation”) as quick wins.
Thailand’s 2019 Priority Deliverables

**ASEAN Political-Security Community**

1. **Enhance ASEAN’s ability in addressing different security challenges such as terrorism, transnational crime and cybersecurity**
2. Strengthen ASEAN’s capability to conduct preventive diplomacy
3. Promote enhanced border management cooperation within ASEAN
4. Promote constructive and inclusive maritime cooperation
5. Promote defence cooperation and defence diplomacy
6. Advance cooperation for sustainable security in ASEAN and the region by reinforcing strategic thrust
7. Promote the role of ASEAN Center of Military Medicine

**ASEAN Economic Community**

1. **ASEAN Digital Integration Framework Action Plan**
2. **ASEAN Innovation Roadmap 2019-2025**
3. **Guideline on Skilled Labour/Professional Services Development in Response to 4IR**
4. **ASEAN Declaration on Industrial Transformation to Industry 4.0**
5. **Digitalisation of ASEAN Micro Enterprises**
6. **ASEAN Single Window**
7. **Local Currency Settlement Framework**
8. **ASEAN Infrastructure Financing Mechanisms**
9. **ASEAN Gastronomy Tourism Masterplan**
10. **The Conclusion of RCEP in 2019**
11. **Promoting Sustainable Fisheries through ASEAN Cooperation**
12. **Roadmap for ASEAN Sustainable Capital Market**
13. **Establishment of ASEAN R&D Network Center on Biofuels and Bioenergy**

**ASEAN Socio-Cultural Community**

1. Establish ASEAN Centre for Active Ageing and Innovation
2. Disaster Emergency Logistic System for ASEAN
3. Advocate for ASEAN Network for Microbial Utilisation
4. Develop human capital through programmes and activities for life-long education
5. Initiate programs to address malnutrition, stunting and obesity
6. Organise the 20th ASEAN Conferences on Civil Service Matters
7. Organise ASEAN Civil Society Conference/ASEAN People’s Forum
8. Promote ASEAN Year of Culture in 2019 and Development of ASEAN Cultural Centre
10. Strengthen ASEAN University Network
11. Enhance capacity of ASEAN Centre for Sustainable Development Studies and Dialogue
12. Organise the Special ASEAN Ministerial Meeting on Marine Debris
13. Nominate Mu Ko Ang Thong National Park, Hat Chao Mai, Koh Libong Wildlife Sanctuary as an ASEAN Heritage Park
14. Monitor the progress of implementation of ASEAN Transboundary Haze Free Roadmap
Thank You!

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