Implementation Strategies for Making Indonesia 4.0 Presented on Plenary Session 3: Workforce of the Future

Sony Sulaksono

Head of R&D Center for Chemicals, Pharmaceutical, Textiles, Metal, Machinery, Transportation, and Electronics Industry



m Making Jon Indonesia 4.0 Jakarta, 31 October 2019

Digitalized Indonesia 2019



Industrie 4.0 is a response to these changing requirements Evolution of Production Systems



Source: Koren (2010), cited in Bauernhansl (2014).

Image sources: https://en.wikipedia.org (2015), https://www.impulse.de (2015), audi.de (2015), oZ.co.uk (2015), computerbild.de (2015).

technische un versitet continund



BENEFITS OF DIGITALIZATION ON PRODUCTION

	KPIs improvements	Impact range observed	
	Factory output increase		
	Productivity increase		
5 Productivity	OEE increase		
	Quality cost reduction	5-90% ★★ ★★ → → ★ ★ → → →	
	Product cost reduction	5-40%	
	Energy efficiency	•	
Agility	Inventory reduction		
	Lead time reduction		
	Time to market reduction	 ▲30 -90% 	
	Change-over shortening	<u> </u>	
2 Customization	Lot size reduction	50-90%	

Source: World Economic Forum and McKinsey & Company lighthouse site analysis

BENEFITS OF DIGITALIZATION ON WORKFORCE

Indonesia's positive story: many more jobs will be created to 2030 than are lost to automation.

23 million jobs could be displaced by automation

27 million to 46 million

new jobs could be created in the same period

10 million

of these jobs will be new types of occupations

Healthcare, construction, manufacturing, and retail

will benefit from increased labor demand



McKinsey&Company, 2019

The Impact of Industry 4.0 Optimization on the Distribution of Indonesian Workers

Sector share of lab %	or force,		Net additions Million	Employment 2030, Million	Change in percentage p.p.
3 1	<u>5</u>	Accommodation and food service	6.81	7.8 🕜	4
		Government	0.65	4.2 🕥	0
		Agriculture	9.69	57.0 🕥	(4)
41	37	Arts	1.21	1.5 🕥	1
		Construction	6.01	14.2 🕥	2
		Education	2.94	6.3 🕥	1
7	1	Finance	0.80	2.0 🕜	0
	9	Healthcare	2.58	4.3 🕜	1
- L - L	3 1	Manufacturing	4.48	24.4 🕥	(1)
17		Professional services	0.09	0.5 👚	0
	16	Real estate	0.03	0.7 🕥	0
15	14	Retail and wholesale trade	3.40	21.1 🕥	(2)
5	2	Transportation	-0.44	5.2 🕔	(2)
4	4 3	Other	0.76	5.6 🕜	(1)
2014	2030				

McKinsey&Company, 2019

INDONESIA HAS OPPORTUNITY TO GET ADDITIONAL GDP OF USD 155 BILLION BY 2025

Through the implementation of Industry 4.0, the additional GDP will be gained from Labour Input and Productivity Enhancement



Source: Global Insight (WMM), IHS data, Euromonitor International, Team analysis

Addition of Digital Workforces:

Workforce of Manufacturing 4,5 million people	Workforce of Manufacturing Supporting Industry 12,5 million people
Source: McKinsey	



Policy Direction 2020-2024





Increasing Productivity



Indonesia real labor productivity has stagnated in the past decade. China increased real labor productivity by 2X



Product design and core manufacturing skills are limited. Assembly/after-sales services dominate skills landscape



Fact 1 Manufacturing export share is 73 percent of total export; but Indonesia is significantly outcompeted by peers in manufacturing exports, and >50 percent of export are commodity-related

Fact 2

#3

Indonesian Export/GDP ratio (19%) is well below Thailand (69%), Vietnam (93%) and Singapore (172%)



Fact 1 71 p

71 percent of Indonesia total imports are for raw materials and intermediate input products



69 percent of Chemical import are subject to Non-Tariff Measures, further reducing firms cost competitiveness

Source: BPS, World Bank, WITS, Economist Intelligence Unit, Atlas of Economic Complexity, APINDO, Bappenas-ERIA Joint Study (2018), Bappenas-ADB Joint Study (2018), Bappenas-JICA Joint Study (2017)



ate, #2 and \$\$ Strengthening RD&D Capabilities, Innovation Drive and Acceleration of Technology Adoption 6 Key Strategies

- Increasing Economic Diplomacy and Utilization of Free Trade Agreements
- #4 Optimizing Potential Sources of Economic Growth



5 Strengthening the Supporting Pillars of Manufacturing

Manufacturing Sector Growth #6 Creating Conducive Macroeconomic Policies to Support Manufacturing

Development

Industry 4.0 can revive the Indonesian manufacturing sector; Indonesia should launch "Making Indonesia 4.0" initiative



5 priority sectors for Industry 4.0 implementation



10 National Agenda in Making Indonesia 4.0

Reform Material Flow	 Enhance domestic supply for basic materials while increasing cost competitiveness against imports Build capabilities for high value component manufacturing 	Attract Foreign Investments	 Initiate targeted negotiations with global top 100 manufactures for FDI while ensuring technology transfer to local talents/companies Prepare potential investors list for all industrial sectors
Redesign Industrial Geographical Footprint	 Build a single nationwide comprehensive industry zoning roadmap across industries including oil & gas Review and redesign economic zones; build new economic zones for industry 4.0 	Upgrade Human Capital	 Review and redesign national education curriculum under 4IR era Establish professional talent development program; e.g. foreign talent mobility program, vocational schools
Accommodate Sustainability Plan	 Mitigate risks and grab opportunities under global sustainability and clean tech trends (e.g. EV, Bio fuel/plastics, renewables, low emission tech, etc.) 	Establish Innovation Ecosystem	• Design masterplan for national innovation centers including government innovation/R&D center, private companies, universities, etc.
Empower SMEs	• Establish a SME empowerment plan by leveraging technologies (e.g. ecommerce platform for local farmers and craftsmen, microfinance through fintech, etc.)	Incentivize Innovation	 Introduce tax exemption, subsidies or other form of incentives for advanced technology adoption (e.g. new machine introduction, R&D spending, employee training, technology transfer, etc.)
Build Digital Infrastructure Nationwide	 Upgrade national broadband infrastructures i.e. fiber and 4G/5G Enhance digital platform capabilities e.g. datacenter and cloud, security mgmt., e-payment, etc. 	Reoptimize Industry Regulations & Policies	• Review key industry policies/regulations and align existing roadmaps from various ministries to maximize Indonesian national benefit, e.g. trade policies, labor policies, energy policies, tax policies, etc.













Indonesia Industry 4.0 Readiness Index (INDI 4.0)



INDI 4.0 Self-Assessment Result on 323 Companies



Industrial Sector	Total	INDI 4.0 Value
Food & Beverages	39	2,47
Textiles	10	2,51
Chemicals	30	2,31
Automotive	193	1,72
Electronics	28	1,84
Metal	11	1,57
Various	11	1,97
EPC	1	2,74



// PETROSEA

INDUSTRY 4.0 TRANSFORMATION MENTORING SCHEME

Deployment of I4.0 Project



COMPANIES ALREADY MENTORED TOWARDS INDUSTRY 4.0 TRANSFORMATION



RESULTS AND RECOMMENDATIONS



General Findings

- Lack of Understanding of Industry 4.0
- Limited Integration of the different systems
- Strategy for Industry 4.0 is not defined; no actionable roadmap





- Strong partners required to guide necessary transformation
- Training for leadership and operation
- Specific solutions and vendors to start implementation



Recommendations for companies

- Roadmap, Business Case Development
- Scalable pilots and implementation
- Individualized training and upskilling

FUTURE NEEDS ON SKILL AND COMPETENCE



INDUSTRIAL VOCATION REVITALIZATION PROGRAM

MINISTRY OF INDUSTRY 2020-2024



DIGITAL & INNOVATION CENTER 4.0 PERMATA HIJAU

- Pusat Inovasi dan Digital 4.0 (PIDI 4.0) -







News · Exhibition · Supporting Program · Register & Plan

HANNOVER MESSE NEWS

Partner Country at HANNOVER MESSE 2020 is Indonesia

Representatives from Indonesia set the stage for their country's role as Partner Country at HANNOVER MESSE 2020 with the unveiling of the official Partner Country logo. From 20 to 24 April 2020, the resource-rich country will be the center of attention at the world's leading trade fair for industrial technology. Indonesia belongs to the Association of Southeast Asian Nations (ASEAN) and has the biggest economy within the group.

02 Apr. 2019

www.hannovermesse.de





From 20 to 24 April 2020, one of the largest manufacturing economies in Asia takes center stage at the world's leading tradeshow for industrial technology. Indonesia is by far the largest economy within the Association of Southeast Asian Nations (ASEAN). The archipelagic country aspires to become a global top ten economy by 2030.



THANK YOU



MINISTRY OF INDUSTRY OF THE REPUBLIC OF INDONESIA JI. Gatot Subroto Kav. 52-53, Jakarta 12950 – INDONESIA

www.kemenperin.go.id

