CERTIFIKAT

No. /e/sk/miceba/m/IX/2019

THIS IS TO CERTIFY THAT

Dr. Jongkers Tampubolon

As Keynote Speaker in Medan International Conference
On Economics And Applied Business 2019 (MICEAB 2019)

"Competitiveness And Innovation Management For Economic Development In The New Era"

Medan, August, 9th 2019

Dr.Aaron Loh, MSc, PhD	Dr. Jongkers Tampubolon	Sunday Ade Sitorus, M.Si	Dr. Nikous S. Sihombing
Speaker	Speaker	Chairman of Commitee	Chairman Of DPW ISRI SUMUT

YBhg. Dr Jongkers Tampubolon

Re: Invitation to be a Keynote Speaker

Dear **Dr. Jongkers Tampubolon**

We are From a Research Institution Makarioz and the committee of **MICEB (Medan International Conference Economic and Business") 2019, with theme "Competitiveness and Innovation Management For Economic Development In The New Era"**. We are pleased to invite you to the "MICEB 2019" scheduled to be held between August 9, 2019 in Medan-Indonesia. This conference is a joint effort of Our Research Institution Makarioz with several institutions and organizations from various countries, to present diverse scientific discussions according to the scope that we have determined. It will examine local and international research and development in economic and business management disciplines and etc.

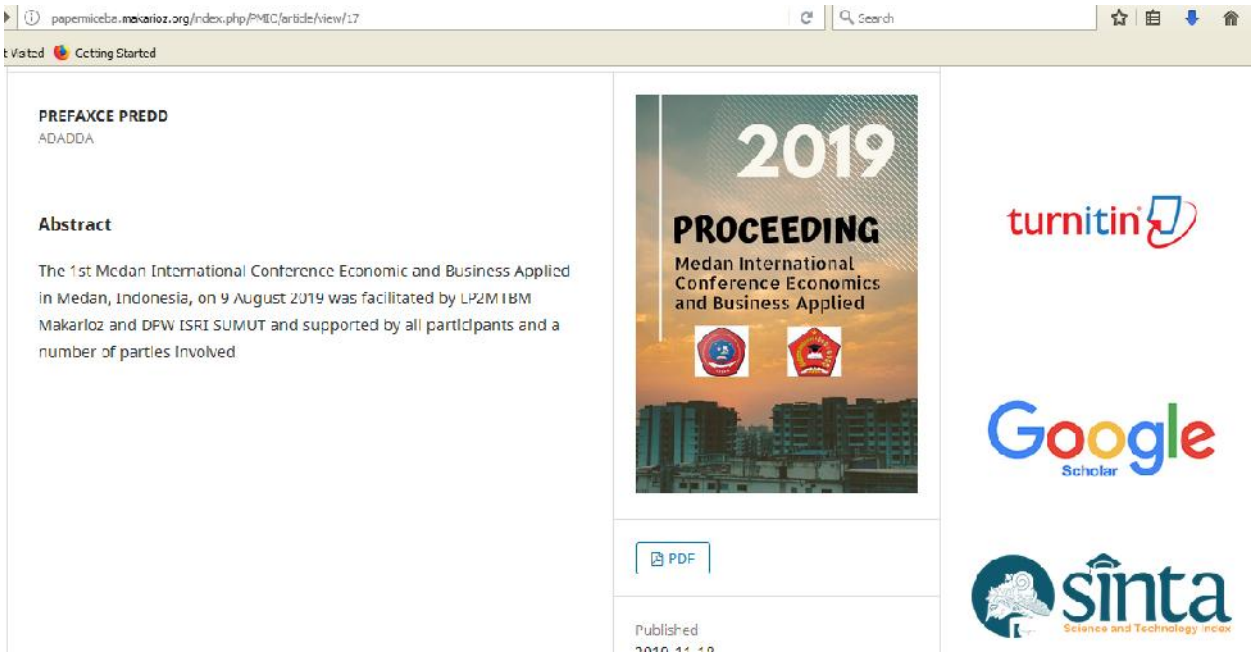
It is an honor and privilege to invite you to participate in this Conference as a Keynote Speaker. We believe that your contribution to this field is unparalleled and your stupendous expertise on this topic will be of great benefit.

We look forward to a positive confirmation about your arrival date in Medan to the Conference Secretary at micebevent@makarioz.org or micebevent@gmail.com. Please, feel free to contact us to get any additional information you require

Best Regards

Sunday Ade

Chief Of Event (WA 081264009048)



http://papermiceba.makarioz.org/index.php/PMIC

THE FUTURE OF ASEAN's FACTORY ECONOMY
IN THE 4TH INDUSTRIAL REVOLUTION ERA

Prepared for
Medan International Conference on Economics and Business

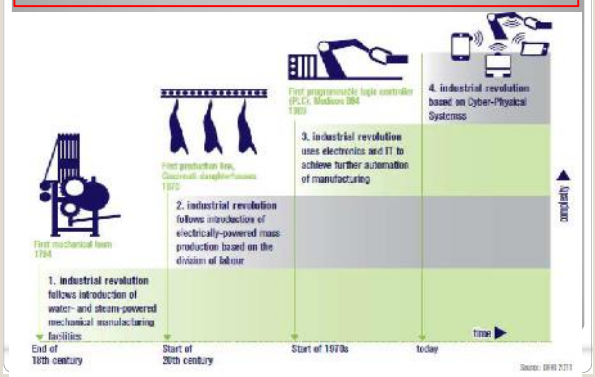
August 9, 2019

Background: What is Development ?

Technology and Industrial Revolution

Steam engine, Production line and automation

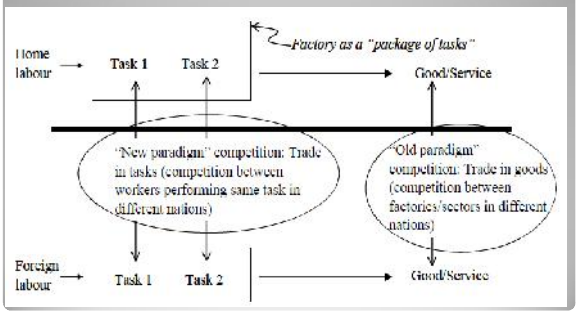
The Four Industrial Revolutions



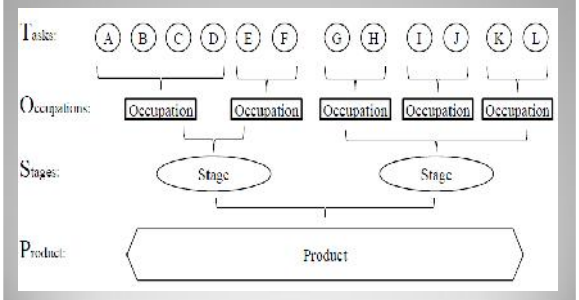
Industrial Revolution and Production Management

- 1st Industrial Revolution: division of labor/ specialisation (Adam Smith).
- 2nd Industrial Revolution: assembly line production (Henry Ford).
- 3rd Industrial Revolution: Fragmentation of production (cross-border or international distribution of tasks)

Production Fragmentation (1)



Production Fragmentation (2)



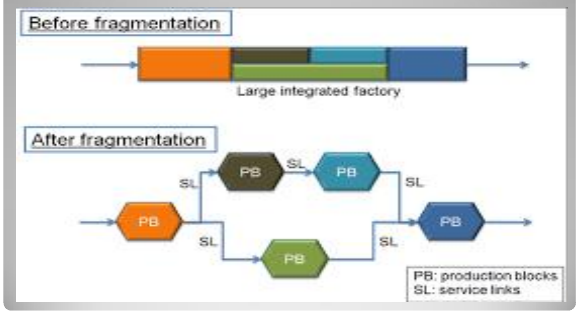
Stages are distributed in various countries based on the lowest costs

Production Fragmentation (3)

Regional Factories (Factory North America, Factory Europe and Factory Asia) consist of:

- Headquarter economies (advanced technology, high-wages)
- Factory economies (low-wages)

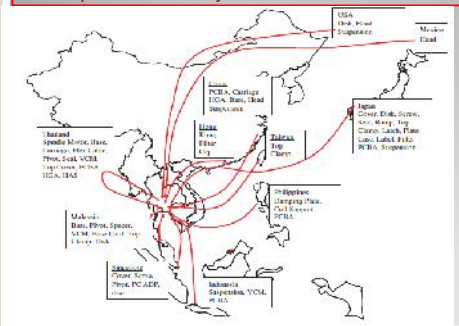
Production Fragmentation (4)



Production Blocks are located in various countries based on the lowest costs

Production Fragmentation (5)

Example of Factory Asia: hard-disc-drive assemble



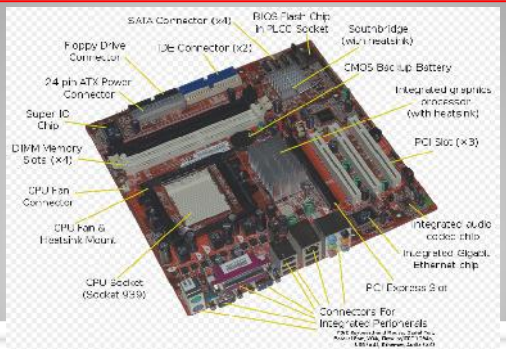
Hard-disc-drive assemble in Thailand the disc drives are then shipped on to various markets to be used in various electronics.

Production Fragmentation (5a)

Example of Factory Asia: hard-disc-drive assemble

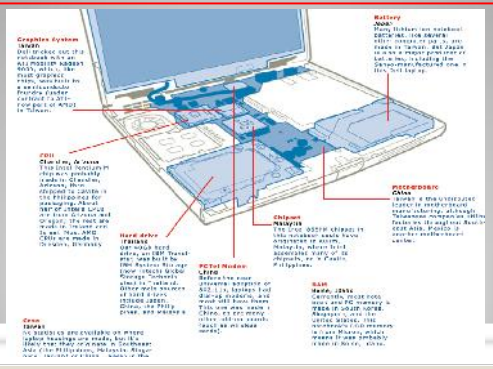
Production Fragmentation (5b)

Example: main components of a laptop



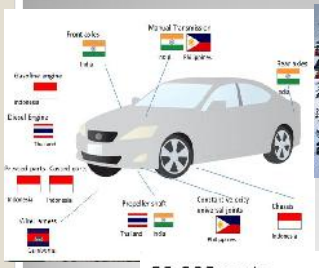
Production Fragmentation (5c)

Example: main components of a laptop



Production Fragmentation (5c)

Example: car assembling



30,000 parts

A single **car** has about 30,000 **parts**, counting every part down to the smallest screws. Some of these **parts** are made at Toyota, but we also have lots of suppliers that make **many** of these **parts**. The 30,000 or so **parts** use different raw materials and different manufacturing processes

Factory Asia Success Story

- The emergence of NICs: Korea, Taiwan, Hong Kong and Singapore.
- High economic growth (above 6 % p.a.) for more than three decades.
- ASEAN become the main exporter in parts and components.

Factory Asia Success Story (2)

JATO Global-54 Top 25 Brands & Models 2018

Brand*	Sales	ΔYoY
1 TOYOTA	8,091,277	+3%
2 VOLKSWAGEN	6,746,204	+1%
3 FORD	5,529,290	-11%
4 HONDA	4,966,037	0%
5 NISSAN	4,750,863	-2%
6 HYUNDAI	4,076,353	+3%
7 CHEVROLET	3,881,747	-1%
8 SUZUKI	3,046,585	+5%
9 KIA	2,638,782	+4%
10 MERCEDES	2,551,806	+1%
11 RENAULT	2,288,406	-3%
12 BMW	2,077,314	+2%
13 AUDI	1,812,411	-2%
14 MAZDA	1,550,131	+2%
15 JEEP	1,548,333	+11%
16 PEUGEOT	1,535,574	-1%
17 GEELY	1,384,836	+1%
18 FIAT	1,377,699	-1%
19 BUICK	1,291,266	-1%
20 SKODA	1,243,494	+1%
21 MITSUBISHI	1,060,436	+2%
22 SUBARU	1,053,457	+1%
23 OPEL/VHALL	1,005,340	-1%
24 CITROEN	1,000,273	+1%
25 BAOJUN	879,077	-1%

Table: Global Ranking of Smartphone Production and Market Share by Vendors 2017-2018

Rankings	2017 Company	2017 Market Share	2018F Company	2018F Market Share
1	SAMSUNG	21.5%	SAMSUNG	22.3%
2	Apple	15.7%	Apple	15.7%
3	HUAWEI	10.4%	HUAWEI	11.6%
4	OPPO	7.6%	Xiaomi	7.1%
5	vivo	6.8%	OPPO	7.5%
6	Xiaomi	6.4%	vivo	6.2%
	OUhers	31.5%	OUhers	32.2%
Total Global Production Volume (Unit: M)		1,467.5		1,498.3

Table: Top Notebook Brands by Global Shipments for 2016~2018

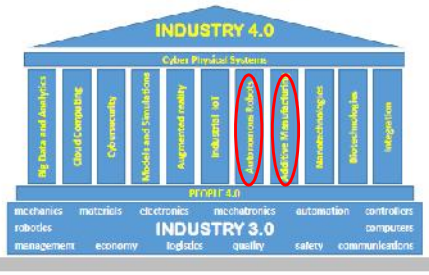
Company	2016 Ranking	2016 Market Share	2017 Ranking	2017 Market Share	2018(F) Ranking	2018(F) Market Share
HP	1	22.4%	1	24.5%	1	24.1%
Lenovo	2	21.7%	2	20.5%	2	20.8%
Dell	3	15.0%	3	13.8%	3	13.6%
ASUS	4	10.0%	5	9.6%	5	9.9%
Apple	5	8.3%	4	9.8%	4	10.4%
Acer	6	8.1%	6	8.0%	6	8.2%
Other		13.8%		13%		11%
Total Shipment (in million)		161.8		161.7		163.0

THE 4TH INDUSTRIAL REVOLUTION

Disruption ???

The 4th Industrial Revolution

Pillars of Future Industry Evolution



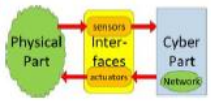
Industry 4.0 as Engine of The 4th Industrial Revolution

Industry 4.0: Cyber -Physical Systems

- A cyber-physical system (CPS) is; a system of collaborating computational elements controlling physical entities.
- CPS are physical and engineered systems whose operations are monitored, coordinated, controlled and integrated by a computing and communication core.
- They allow us to add capabilities to physical systems by merging computing and communication with physical processes.

Cyber-Physical Systems (CPSs)

CPSs **merge the physical and cyber worlds** by a **tight integration of computation, communication, and control cores** with **physical processes** using sensors, actuators and feedback loops where **physical processes affect computation and vice-versa**



- **cyberizing the physical:** by modeling physical systems and interacting with them
- **physicalizing the cyber:** by acquiring and processing information about physical systems

coupling occurs from the **micro-scale to large-scale wide-area systems of systems,** and at **multiple time-scales**

Cyber-Physical Products

CPSs enable **every factory component** to be represented as **an object with properties in the virtual world** (create a virtual copy of the physical world)

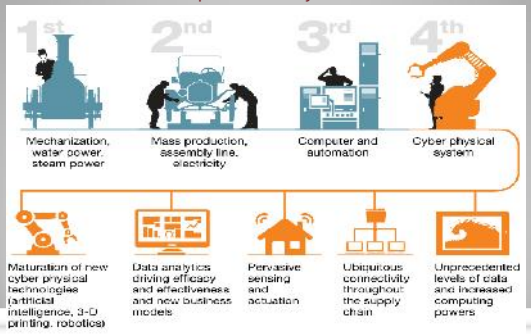
SMART PRODUCTS:
products with **integrated CPSs** that store all the relevant information about the sequence of production steps (e.g. using RFID) so to steer their production autonomously

Industry 4.0 as Engine of The 4th Industrial Revolution

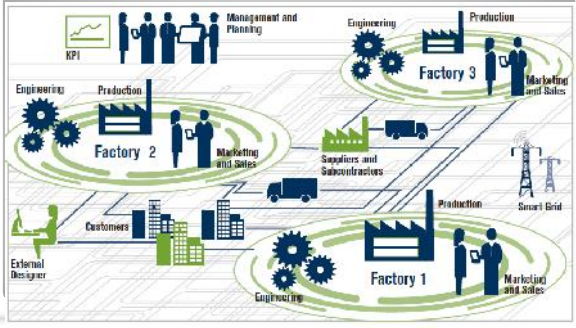
"Cyber-Physical Systems comprise smart machines, storage systems and production facilities capable of autonomously exchanging information, triggering actions and controlling each other independently. This facilitates fundamental improvements to the industrial processes involved in manufacturing, engineering, material usage and supply chain and life cycle management."

The 4TH Industrial Revolution:

digital analytics enables a new level of operational productivity



Horizontal Production Organization in The 4th Industrial Revolution



4th Industrial Revolution (present)

EXPECTED OUTCOMES:

- change the competitiveness of companies and regions
- strengthening the potential of offering new business models
- **mass customization:** switch from "**pull from the market**" to "**pull from the customer**", i.e. individualized solutions to satisfy specific customers' needs
- a reversal of the trend to relocate production to low-wage countries, promoting domestic production (**reshoring**)

RISKS:

- exacerbate **inequality:** concentration of wealth
- fundamental **societal changes:** reshape of government, work, relations

Economic Impacts of The 4th Industrial Revolution

- Robotics and additive technology (3D Printing) making production cheaper and more flexible because it allows output to be adjusted to individual consumer tastes
- Re-shore instead of off-shore:
  - - Philips shaver backs in the Netherlands
  - - Adidas shoe backs in Germany
- "The end of Factory Economy" (ADB, 2017).

Empirical Findings

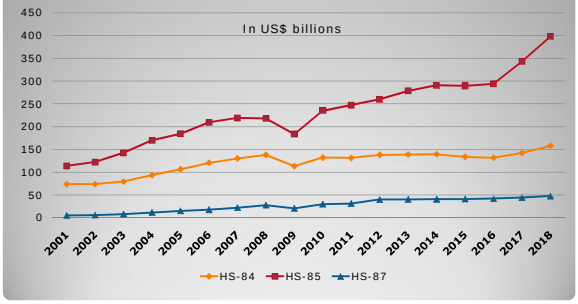
- Manufacture products(machinery, electronics and vehicle) remain ASEAN's top export.
- These three sectors contribute 35 – 50 % to ASEAN's export value.

Top Export ASEAN-6

Country	Ranking		
	HS-84	HS-85	HS-87
Singapore	2	1	14
Malaysia	3	1	17
Thailand	1	2	3
Indonesia	6	3	4
Vietnam	4	1	20
Philippines	2	1	11

Empirical Findings (2)

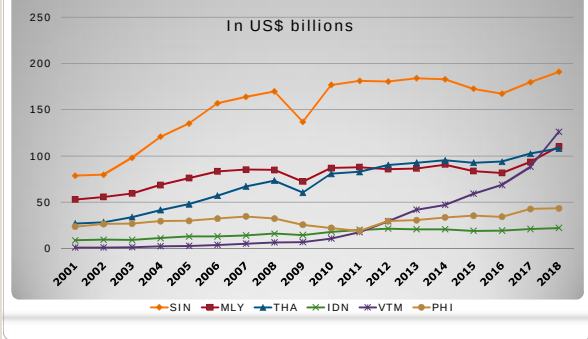
ASEAN's exports in manufacture continue to increase



HS-84: Mechanical machinery HS-85: Electrical machinery
HS-87: Vehicle (Transportation)

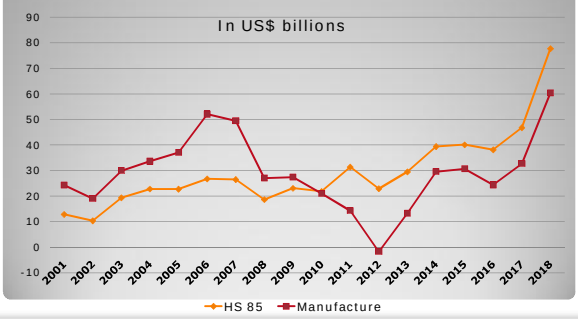
Empirical Findings (3)

Variation among ASEAN's members in manufacture exports



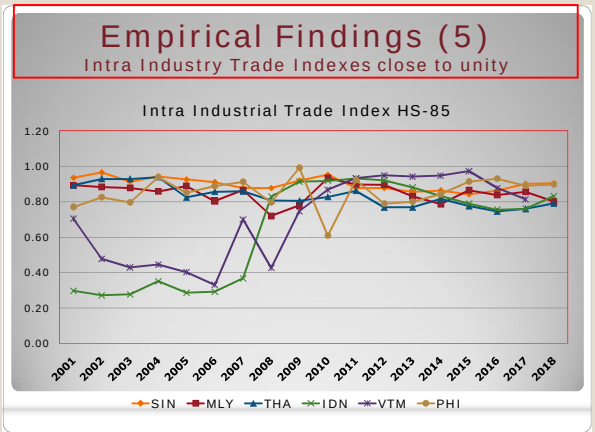
Empirical Findings (4)

ASEAN's balance of trade in manufacture exports



Empirical Findings (5)

Intra Industry Trade Indexes close to unity



Empirical Findings (6)

Intraregional Trade Intensity highlights the role of Japan as a headquarter economy and the emerging of Korea

Region	2001	2005	2010	2013	2014	2015	2016	2017	2018
	Machinery, mechanical appliances, parts thereof (HS-84)								
ASEAN/USA	0.80	1.00	0.92	0.84	0.80	0.74	0.78	0.77	0.77
ASEAN+Japan	2.00	2.15	2.18	2.50	2.49	2.36	2.19	2.16	2.15
ASEAN+China	1.90	1.38	1.00	1.05	1.03	1.04	1.07	1.01	0.97
ASEAN+Korea	2.36	2.71	2.31	2.60	2.53	2.38	2.34	2.33	2.15
	Electrical machinery and equipment and parts thereof (HS-85)								
ASEAN+USA	1.00	1.12	1.00	0.97	0.97	0.92	0.94	0.92	0.93
ASEAN/Japan	1.79	1.75	1.75	1.79	1.79	1.76	1.68	1.64	1.57
ASEAN/China	1.30	0.90	0.65	0.53	0.53	0.63	0.61	0.66	0.67
ASEAN/Korea	1.81	1.59	1.56	1.61	1.58	1.58	1.63	1.60	1.49
	Vehicles and parts and accessories thereof (HS-87)								
ASEAN/USA	0.08	0.23	0.42	0.38	0.38	0.34	0.37	0.38	0.41
ASEAN+Japan	1.21	1.69	2.12	2.55	2.59	2.51	2.46	2.47	2.53
ASEAN/China	7.77	6.60	2.74	2.46	2.28	2.64	2.64	2.49	2.39
ASEAN/Korea	4.15	4.56	3.76	3.27	3.30	3.09	3.42	3.60	3.76

Discussion

- Empirical findings demonstrate that the contribution of manufactures in ASEAN's exports continues to increase and the high intensity of intra-industry trade indicates horizontal integration in the scheme of a factory economy.
- Japan as a developed country (advanced in technology) still plays a role as headquarter economy, and there are no signs of re-shore activities.
- Korea developed into a new headquarter for the three observed sectors, while China is prominent as a new headquarter in the vehicle (transportations) sector.

Discussion (2)

Reason for Factory Asia is not disrupted by the application of industry 4.0 in the 4th industrial era

(i)Developed countries have different goals in the formation of industry 4.0:

USA aims to bring manufacturing back to America, thus re-shoring, while Germany pursues to maintain its position as one of the most influential countries in machinery and automotive manufacturing, thus more in global marketing of technology and industrial design

Discussion (3)

(ii) That technology companies such as Google, Tesla and Xiaomi enter the automotive market and become major players in the development of autonomous cars indicates that in the future, the technology and licensing software may prove more strategically beneficial than manufacturing the car per se.

(iii)Advanced technology will focus on technology-based services there are embedded in the production process such as software developer, like Uber and Grab providing taxi service without owning any single car.

Conclusion

(i)After two decades in the era of the 4th industrial revolution, Factory Asia, which was the source of economic growth and prosperity in East Asia, was not disrupted.

ASEAN as factory economies in the Factory Asia still enjoys advantages in horizontal relations among members and vertical integration with headquarter economy (Japan, Korea and China).

Conclusion (2)

(ii) Headquarter will continue to supply technology and industrial design with manufacturing and assembling in factory economies. This will widen the gap between the developed world (technology and industrial design) and the developing world (industrial manufacturing).

In this pattern, it is difficult to expect the emergence of NICs in the context of advanced technology, as is the experience of Korea, Taiwan, Hong Kong and Singapore in the third industrial revolution (transfer of technology as spillover effect of FDI).