Contemporary Issues on Industrial Development

-- Implications for Policy-making Process--

Brookings Institution

ELE Times

Policy Formulation in Developing Countries
GRIPS Development Forum

Outline

1. Overview of emerging mega trends related to industrial development

2. What do these mega trends mean? How do they affect industrial development?
   - Digital revolution (DX)
   - Global value chains (GVCs)
   - SDGs (green, ethical correctness, etc.)

3. Implications for policy-making process
   - Example: Taiwan (digitalization)
   - What will change, and what will NOT change?

Mega Trends and New Landscape of Industrialization

- **Globalization** is not a new phenomena; but, today, it is proceeding simultaneously with **ICT/digital revolution**.
    - Broad impact on the world economy—speed and scale
    - Not only "trade" (goods), but also "know-how" (knowledge & info) are crossing borders.
- "**Sustainability, Inclusiveness, and Resilience**" are becoming essential elements of value chain management, as our globe faces various shocks.
    - The SDGs "Leave No One Behind"— is exactly for this purpose
- COVID-19 crisis has accelerated digitalization and trends toward sustainability, inclusiveness & resilience, while Ukraine crisis & US-China trade frictions are making the mega trends more complex.

Emerging Global Mega Trends

The shape of industrial development is changing in the 21st century.

Globalization

Digitalization

Environmental & Social Concerns

Expansion of global value chains (GVCs), Multi-lateral Corporations (MNCs), Trade agreements (FTA/EPA), protectionism?
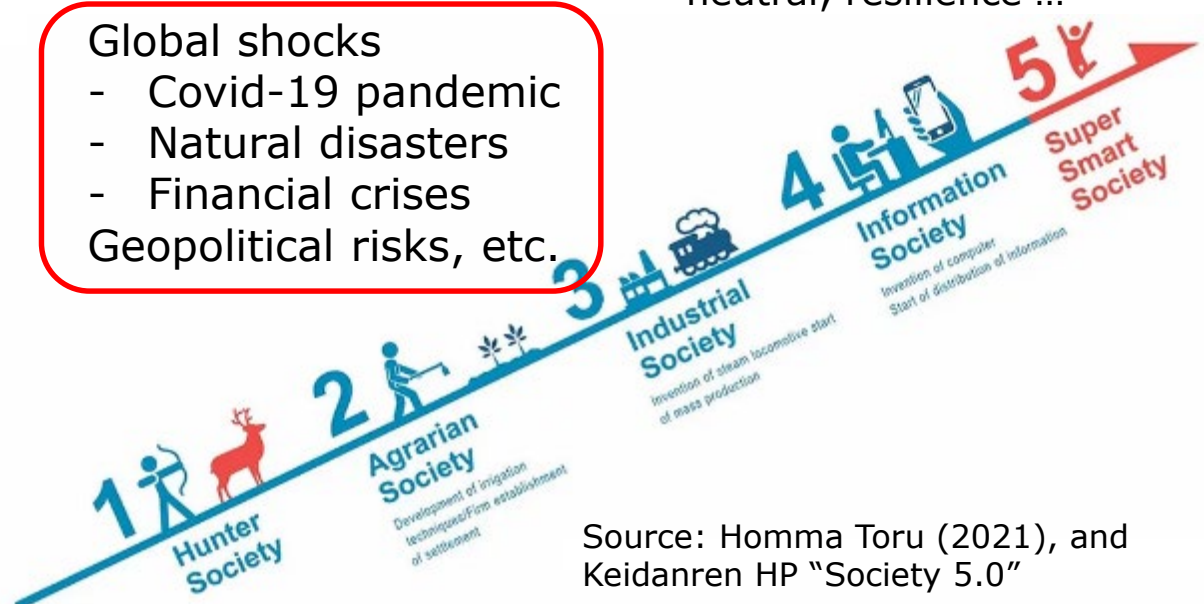
DX, 4th Industrial revolution Industry 4.0, IoT, AI

SDGs, ESG investment, Human rights, Green industrialization, Carbon-neutral, resilience …

+

Global shocks
- Covid-19 pandemic
- Natural disasters
- Financial crises
Geopolitical risks, etc.

Source: Homma Toru (2021), and Keidanren HP "Society 5.0"

(1) Digital Revolution

- Digital technology is transforming the process of manufacturing (greater efficiency, connectivity of various industrial activities through IoT) and driving innovation.

- With the development of new businesses (e.g., ICT, financial & business services), manufacturing and other sectors are becoming interdependent and mutually reinforcing.

- It also enables the emergence of start-up, which may lead to 'leapfrog' development.

Figure O.4 Digital transformation in action

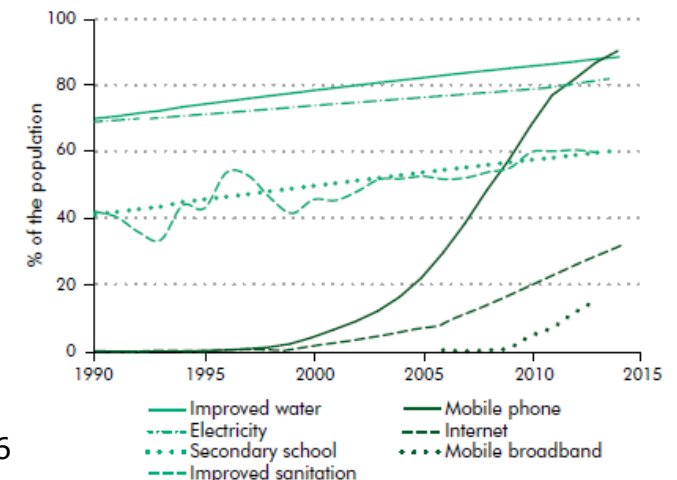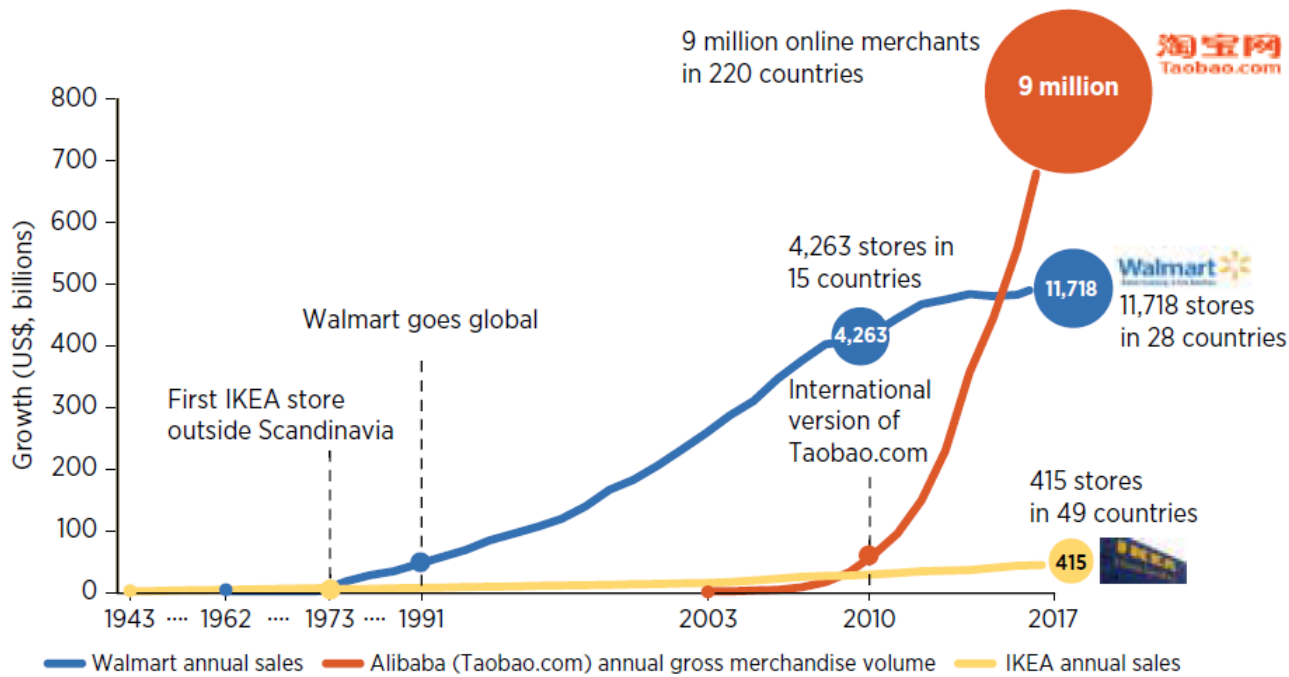a. Digital technologies are spreading rapidly in developing countries

Source: World Bank, WDR2016

FIGURE O.2 Recent technological advances accelerate the growth of firms

Alibaba
(e-commerce)

M-Pesa
(mobile money transfer)

Drone
(medicine delivery)

Aaadahar
(unique identification authority)

Source: WDR 2019 team, based on Walmart annual reports; Statista.com; IKEA.com; NetEase.com.

Figure O.5 The internet remains unavailable, inaccessible, and unaffordable to a majority of the world's population

a. ICT access by population

Total global population
~7.4 billion

Within mobile coverage **7** billion

Mobile phones **5.2** billion

Total internet users **3.2** billion

High-speed internet **1.1** billion

b. A closer look at the world's offline population

Congo, Dem. Rep. 68 million
Mexico 70 million
Ethiopia 95 million
Brazil 96 million
Nigeria 111 million
Bangladesh 148 million
Pakistan 165 million
Indonesia 213 million
China 755 million
India 1.063 billion
Philippines 65 million
Russian Federation 55 million
Iran, Islamic Rep. 54 million
Myanmar 53 million
Vietnam 53 million
United States 51 million
Tanzania 46 million
Thailand 44 million
Egypt, Arab Rep. 42 million
Turkey 41 million
Countries outside of the top 20
Total internet users **3.2** billion
High-speed internet **1.1** billion

Sources: World Bank 2015; Meeker 2015; ITU 2015; GSMA, https://gsmaintelligence.com/; UN Population Division 2014. Data at http://bit.do/WDR2016-Fig0_5.

Source: World Bank, WDR2016

- Only 15% of the world population has access to broadband internet.
- Nearly 60% of the world pop. has no access to internet.
- While 4/5 of the world pop. has mobile phones, 2 billion people do not have.

Digitalization: Opportunities and Risks, Policy Implications

Direct impact of Digitalization	**Opportunities**	**Risks**	**Policy Implications**
Search & information	Inclusiveness through eliminating information asymmetry	Control, due to lack of accountability	**Institutions** that are capable & accountable (access to information, privacy protection, participatory policymaking)
Automation & coordination	Efficiency improvement of firms, life & govt.	Inequality rises, if skill education is insufficient and informal labor expands	**Skills** to leverage digital (ICT literacy, foundational skills, lifelong education) & social protection
Scale economies & platforms	Scale economies & innovation through network externality	Monopoly due to lack of competition	**Regulations** that promote entry & competition

# Strategies for Industrialization and Digitalization Compared

	Systems for Industrialization	Systems for Digitalization
Human Resources & Skill Development	Primary & secondary education, TVET, OJT	Digital literacy, data scientist education, entrepreneurial education, life-long education
Infrastructure Development	Water, Power, Gas supply networks, transport infrastructure (road, railway, ports, etc.)	Telecommunication infrastructure, Cloud services, Electronic personal authentication system, Open API
Finance	SME finance, FDI, Policy loans to large-scale projects	Venture capital, deregulation for cashless payment
Support Measures & Policies	Post-ISI policy, EPZ (IPs), FTA, IPR	Incubation facilities (accelerators, etc.), Sandbox system, Privacy data regulation, fact checking

Source: Translated by the author, based on Asei Ito (2020), p.204, Figure 6-1.

(2) Global Value Chains (GVCs) Expansion

□ Advances in ICT & reduced logistics costs have enabled the fragmentation and dispersion of individual segments of a production process, while allowing for sufficient control and coordination (Baldwin 2011, AfDB/OECD/UNDP 2014)
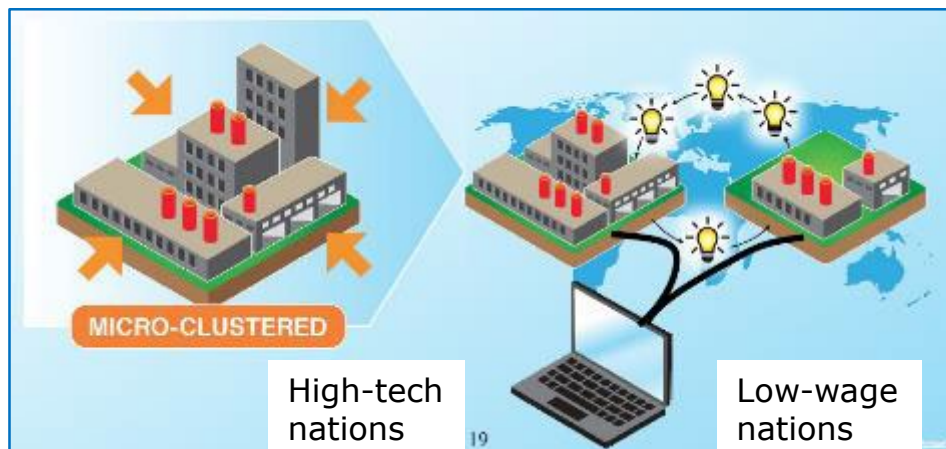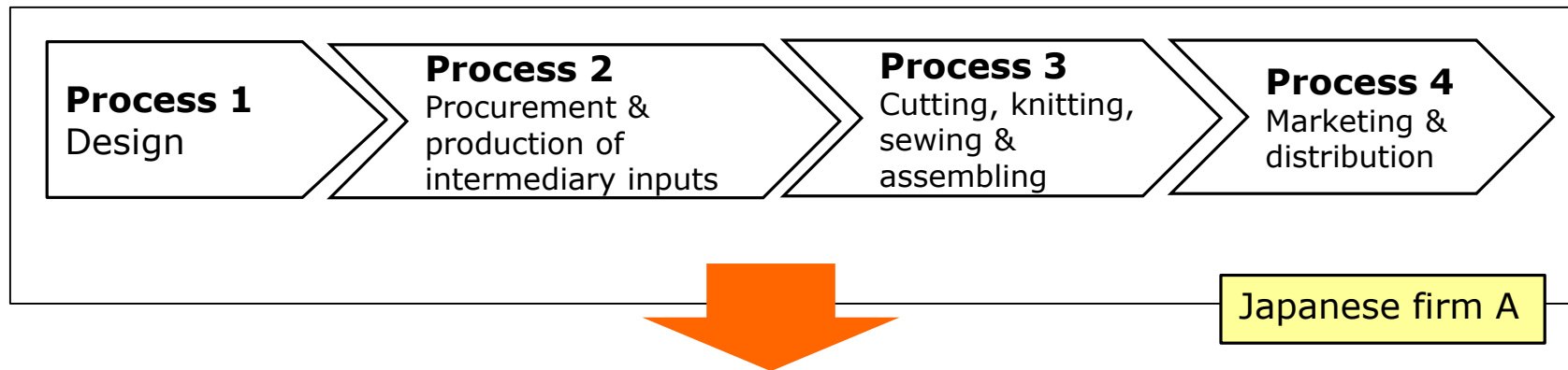

Lowering trade & ICT costs

Source: Baldwin (2016)

From Full-set Production System to Global Value Chains (GVC): Case of Apparel Industry
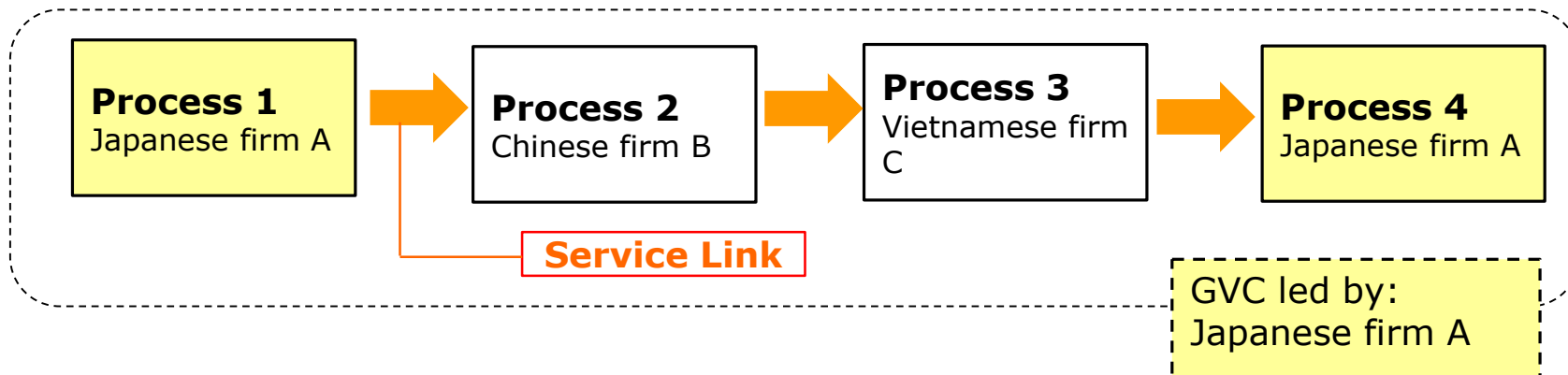
Production & Distribution Process (20th century)
Full-set production system (one company, one country)

Process 1 Design	Process 2 Procurement & production of intermediary inputs	Process 3 Cutting, knitting, sewing & assembling	Process 4 Marketing & distribution

Japanese firm A

Production & Distribution Process (21th century)
Fragmentation and Global Value Chains (GVCs)

Process 1 Japanese firm A	Process 2 Chinese firm B	Process 3 Vietnamese firm C	Process 4 Japanese firm A

Service Link

GVC led by: Japanese firm A

Source: Translated by the author, based on Kenta Goto (2019), p.10, Figure 3-1.

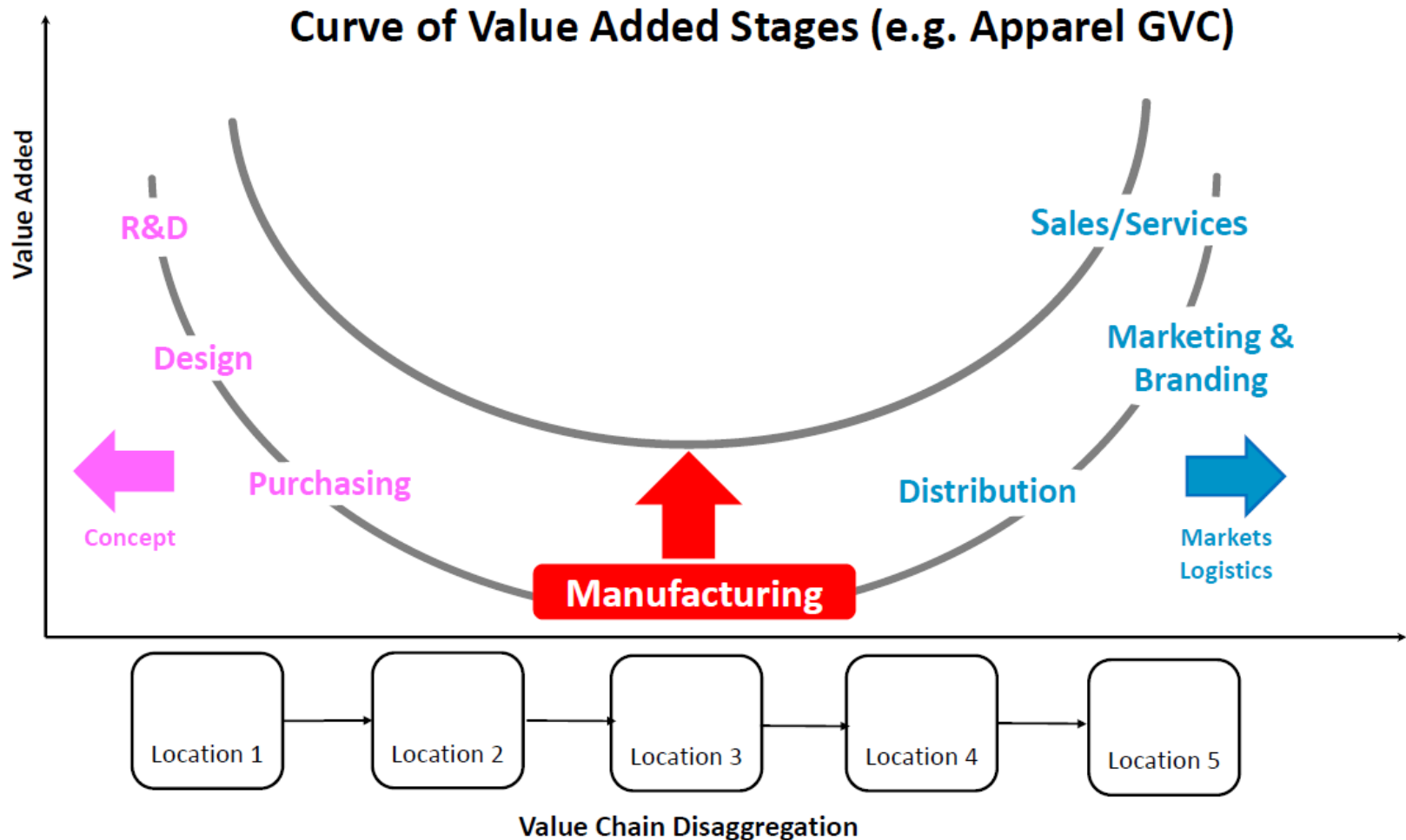# GVCs: Policy Implications for Developing Countries

- Developing countries have broader opportunities to industrialize by joining global production networks.

- Industrialization can happen "stage by stage" in GVCs, rather than "sector by sector."

- But, problems remain:
  - How to enter GVCs ?
  - How to expand and strengthen participation in GVCs ?
  - How to turn GVC participation into sustainable development ?

- How about geopolitical risks (de-coupling GVCs)?

Structural Transformation in East Asia
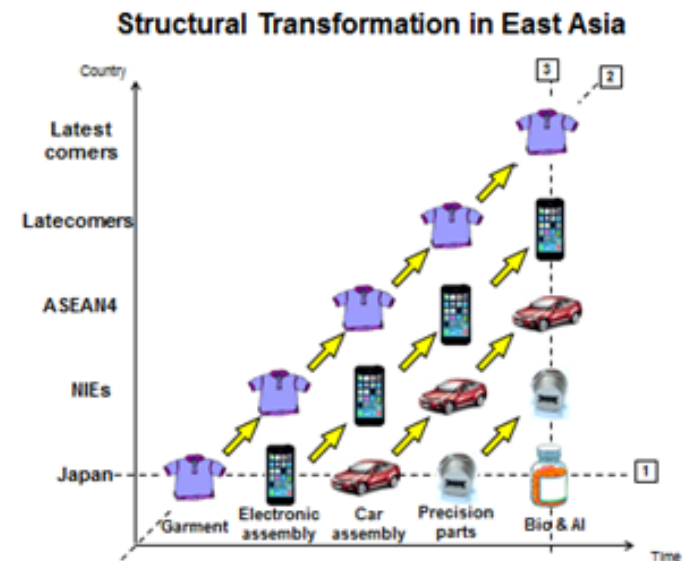
Flying Geese pattern of development (20st century)

For many developing countries, apparel industry is the first entry point into GVCs; but there are risks of leading to "**the race of the bottom**" or "**stacking at the bottom**" unless host countries make hard efforts for enhancing local firm capability and HRD.
- Social upgrading as precondition for market entry
- Economic upgrading essential to remain and move up the value chain ladder

Curve of Value Added Stages (e.g. Apparel GVC)

(Source) Modified by the author based on A. Wieland (2015) and R. Mundabi (2008)

Additional Challenges in Linkage Creation & Industrial Upgrading in the SDG Era

- Today, latecomer countries must satisfy **twin** global standards to successfully participate in GVCs.
  - Economic/industrial upgrading: QCD requirements
  - Social/environmental upgrading: labor and other ethical correctness, green/carbon neutral
- Both are crucial for market access and productivity enhancement; but require a different and complex set of capabilities at managerial and workers' levels.
- Digital infrastructure & skill are also important to be connected with GVCs.

GVCs: Actors and Governance
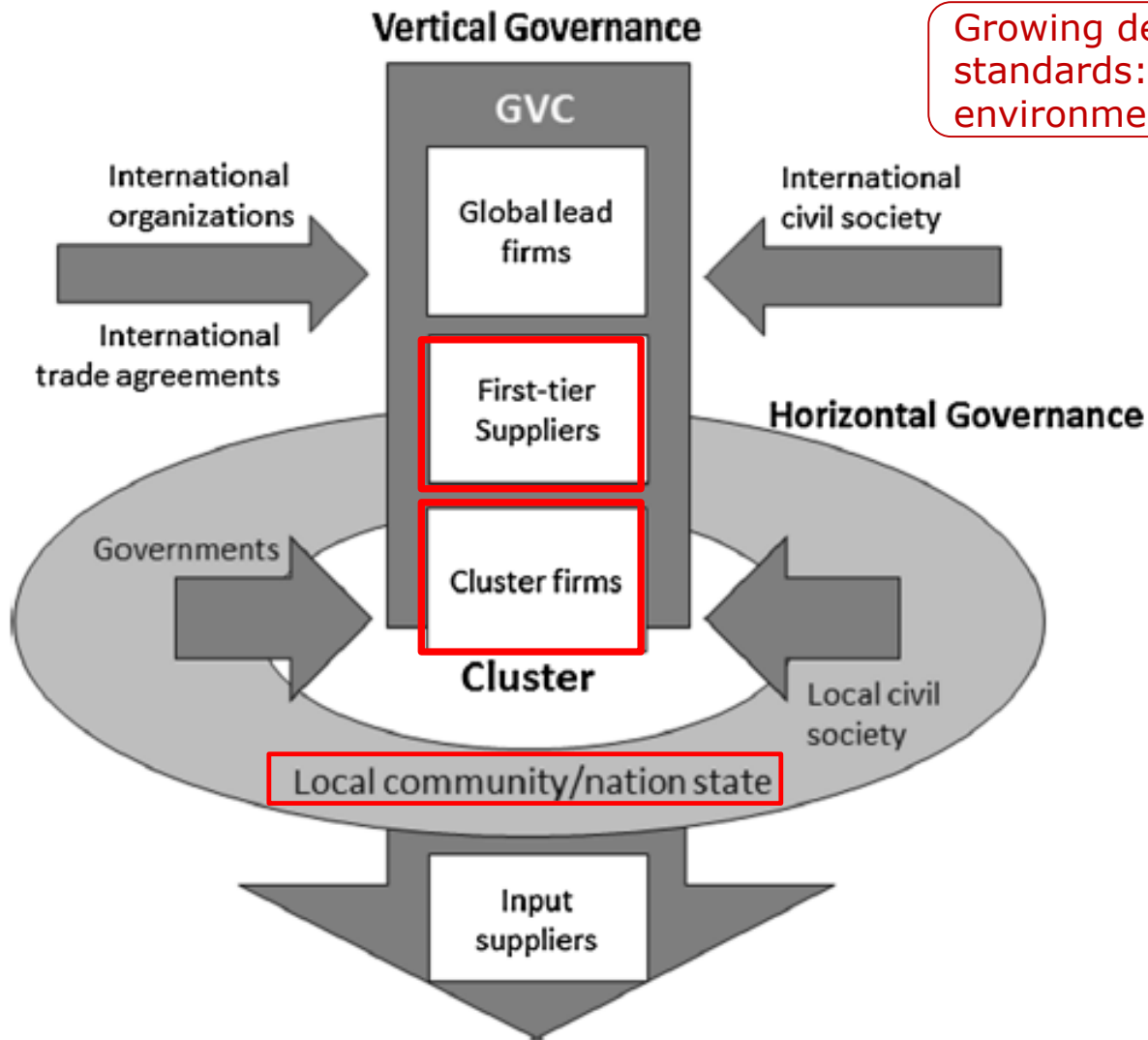
Growing demand for compliance with standards: quality, technology, social, environmental…

Linkage with domestic development

Comprehensive requirement (economic, social, environmental…) (digital…)

Policy capability of host-county govt.

Source: Adapted by the author, based on Gereffi & Lee (2016). "Economic and Social Upgrading in Global Value Chains and Industrial Clusters: Why Governance Matters"

# (3) Increased Focus on Societal and Environmental Goals

- **The SDGs (2015-)** as a driver of sustainable, inclusive and resilient development. The COVID-19 crisis also highlights the importance of green recovery & human-centered approach.

- Vital importance of the role of the private sector in the SDG achievement
  - Finance, new biz model, job creation & developmental impacts, etc.

- Compared to the MDGs, the SDGs have broader focus including: industry, innovation, decent work, economic growth, sustainable production & consumption
—in addition to gender, poverty reduction and social development

Aiginer & Rodrick (2020:191) "Rebirth of Industrial Policy and an Agenda for the Twenty-First Century"
- *Greening of industrial policy or new forms of industrial policy steered by employment concerns*
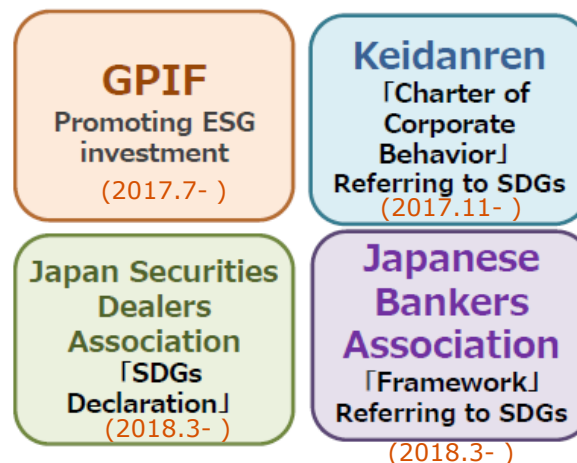
SDGs and ESG Investment

- Sustainable and responsible supply chains
  - Widespread adoption of sustainable standards by lead firms
  - Various kinds of public & private standards (mandatory, voluntary, multilateral, CSO-initiated, etc.)
- Expansion of ESG investment (esp. increased attention to "S", with COVID-19)
- Growing attention to "stakeholder capitalism" (WEF 2020)

Expansion of ESG Investment 2014-2020
(Unit: US billions)

Europe ▪ United States ▪ Canada ▪ Australasia ▪ Japan
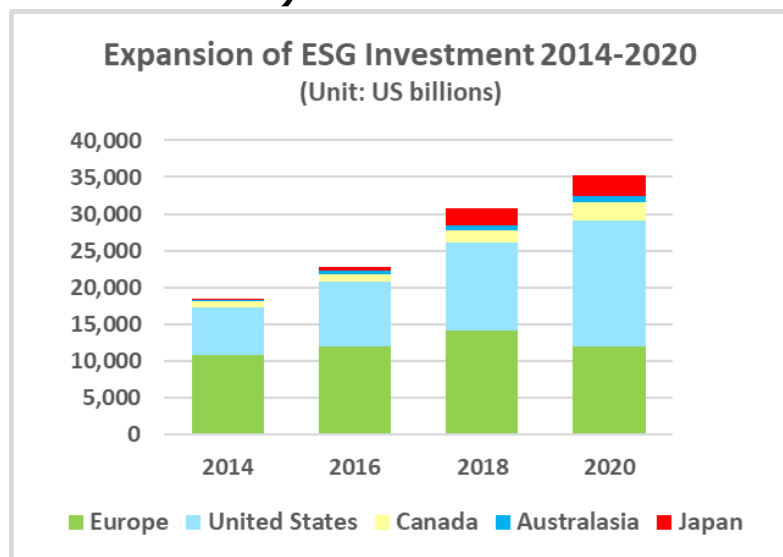
Source: Global Sustainable Investment Review
(by Global Sustainable Investment Alliance (GSIA))

Trend of ESG Investment & SDGs in Japan

GPIF
Promoting ESG investment
(2017.7-)

Keidanren
「Charter of Corporate Behavior」
Referring to SDGs
(2017.11-)

Japan Securities Dealers Association
「SDGs Declaration」
(2018.3-)

Japanese Bankers Association
「Framework」
Referring to SDGs
(2018.3-)

(Source) JICA

ESG: Environment, Social & Governance
CSO: Civil Society Organization
GPIF: Government Pension Investment Fund

Types of Corporate Standards and Their Motivations (Triple Bottom Line)

Standard	Type of standard	Function of standard	Primary driver
Economic bottom line	- Time - Quality - Cost	- T: Reduce inventories - Q: Enable JIT production and ensure quality of final product - C: Reduce cost of production in value chain	Lead firm and first-tier suppliers
Social bottom line	Working conditions in supply chain	-Competitive advantage -Licence to operate	Parties external to the chain (e.g. International Labour Organization (ILO))
Environmental bottom line	Environmental character of supply chain	Competitive advantage Licence to operate	Parties external to the chain (e.g. Greenpeace)

Source: Kaplinsky & Morris (2017). "How regulations and standards can support social and environmental dynamics in global value chains"

Making GVCs Sustainable, Inclusive, and Resilient

In action: Mapping the SDGs against the value chain

Source: Elaborated by the author, based on GRI, UN Global Compact, and WBCSD ("SDG Compass" https://sdgcompass.org/wp-content/uploads/2015/12/019104_SDG_Compass_Guide_2015.pdf)

Summary: Mega Trends Implications for Policymaking Process

- These mega trends are **mutually related**, and their inter-linkages need to be recognized for proper industrial policymaking. They include:
  - Usefulness of digitalization/Industry 4.0 for efficient GVCs
  - Accelerated digitalization/Industry 4.0 by COVID-19 for resilient VC management and contactless workplace
  - Ensuring sustainable & inclusive VCs throughout the entire VCs
  - Possibility of leapfrog innovation (e.g., Corona-Tech)

- This implies that even **more sophisticated policy capability** would be required:
  - Enhancing linkages btw. FDI (MNCs) & local firms, and building local industrial capability (connection with domestic devt.)
  - The whole-of-the government approach (as problems become more complex, comprehensive)
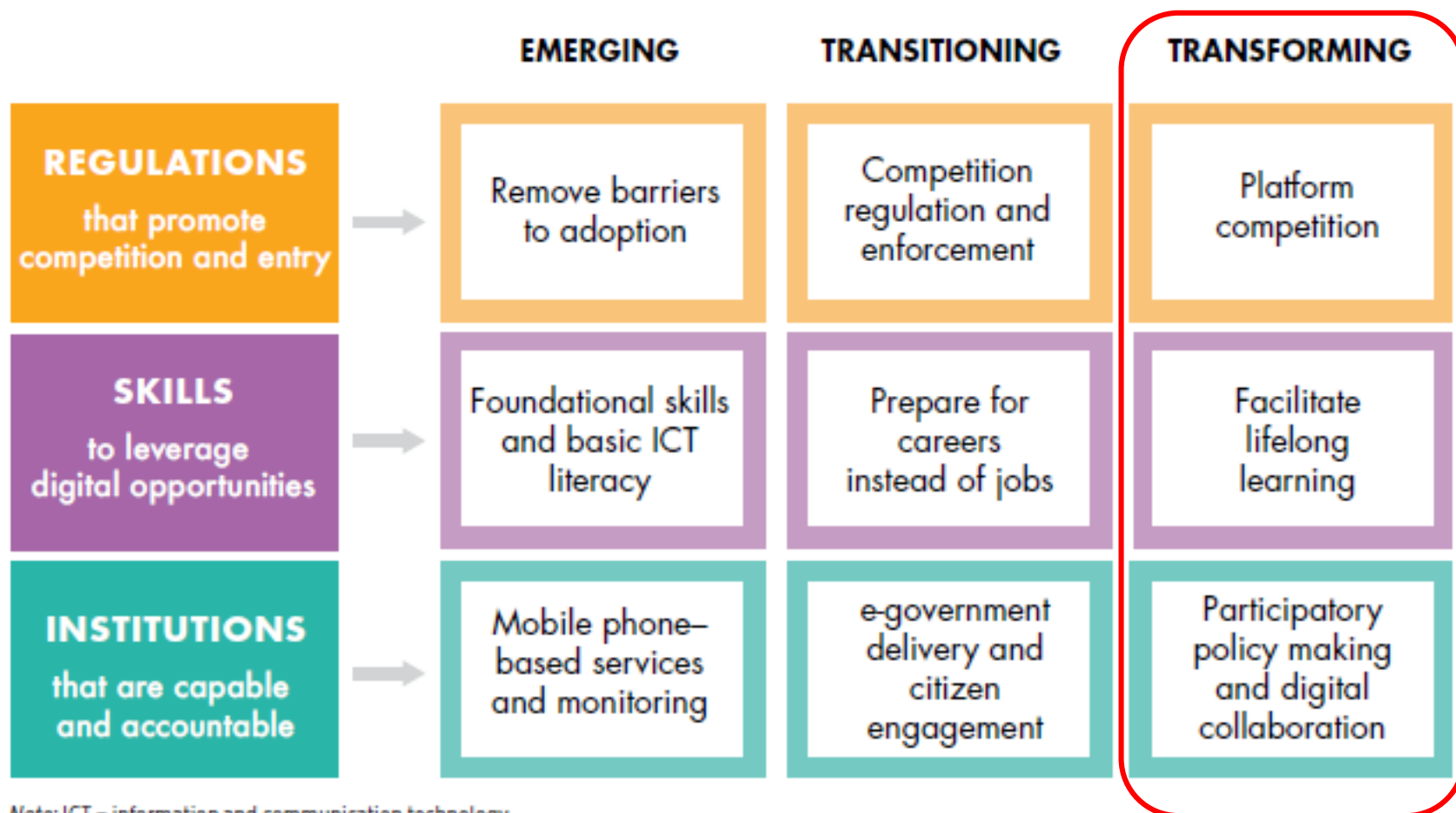 - Speedy response

Example:
Taiwan's Digitalization Experience

-Industrialization strategy
-Participatory policy-making process

Policy Priorities for Countries that are Emerging, Transitioning, or Transforming (from WDR2016)

	EMERGING	TRANSITIONING	TRANSFORMING
REGULATIONS that promote competition and entry	Remove barriers to adoption	Competition regulation and enforcement	Platform competition
SKILLS to leverage digital opportunities	Foundational skills and basic ICT literacy	Prepare for careers instead of jobs	Facilitate lifelong learning
INSTITUTIONS that are capable and accountable	Mobile phone–based services and monitoring	e-government delivery and citizen engagement	Participatory policy making and digital collaboration

Note: ICT = information and communication technology.

Source: World Bank, World Development Report 2016: Digital Dividends

Eg. (1) Digital Economy as a Game-Changer
Beyond Catch-up Industrialization Model

- Digital transformation is bringing about challenges to innovation management and policies.

- New digital technologies are driving and co-evolving with the organizational governance, institutional arrangements and regulatory regime for the economy.

- **Existing digital sectors**: export-oriented ICT industrialization (to serve primarily production & exports and focus on modularization & 'production interfaces' along the value chain).

- **Digital sectors to-Be**: strong flavor of cross-fertilization, solution-orientation and software & hardware integration. Also, more internationalized.

Source: Chen and Ou (2021), pp.50-51

A Scenario of the Digital Transformation of Taiwan's 'Digital Sector'

The Existing Digital Sectors → **The Digital Sectors to-Be**

Selected applied research institutes (ITRI, III, etc.)
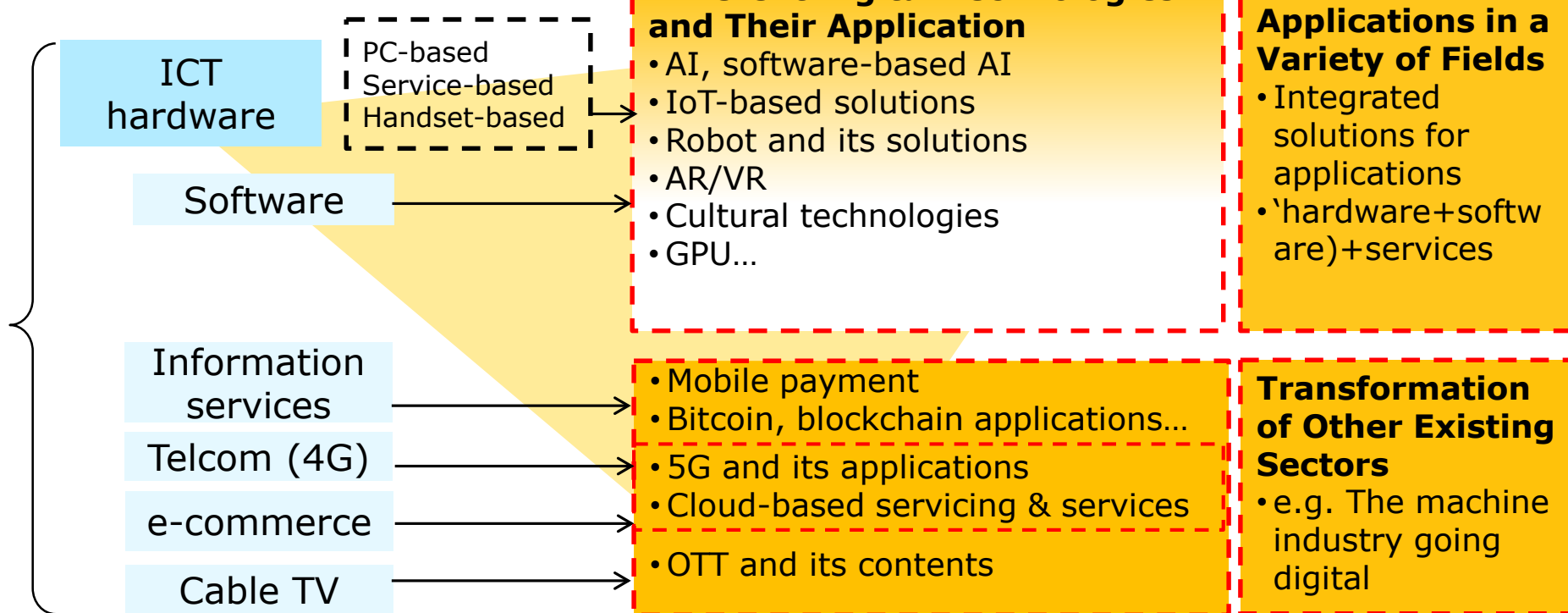--legacy of catch-up industrialization

'Digitalized economy' of multi-contextual spheres, ICT innovation at the societal level
--'Digital sector' of the digital economy

The Major Subsectors

- ICT hardware
  - PC-based
  - Service-based
  - Handset-based
- Software

- Information services
- Telcom (4G)
- e-commerce
- Cable TV

Different Digital Technologies and Their Application
- AI, software-based AI
- IoT-based solutions
- Robot and its solutions
- AR/VR
- Cultural technologies
- GPU…

Innovative Applications in a Variety of Fields
- Integrated solutions for applications
- 'hardware+software)+services

- Mobile payment
- Bitcoin, blockchain applications…
- 5G and its applications
- Cloud-based servicing & services
- OTT and its contents

Transformation of Other Existing Sectors
- e.g. The machine industry going digital

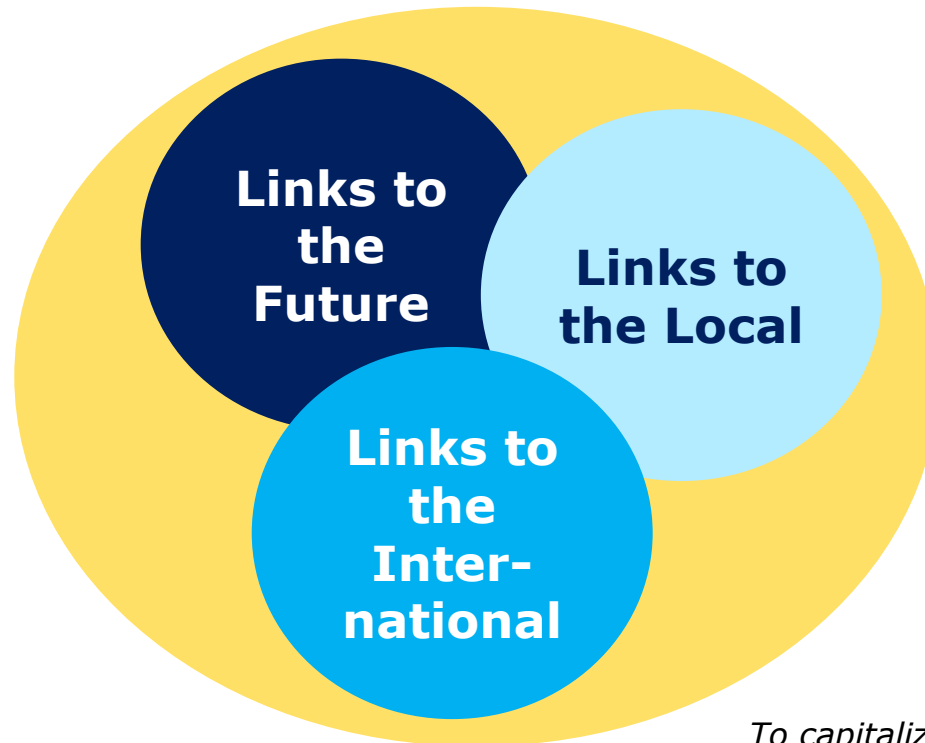# New Developmental Models and Innovation Trajectories

5+N innovative industries and transformation of Taiwan's national innovation system

To unleash the potential of next-generation industries

Innovations for Application

Cross-Fertilization

To strengthen the synergy of talent, capital and market across countries

Internationalization of the NIS & innovation ecosystem

Solution-oriented, software & hardware integration

Links to the Future

Links to the Local

Links to the Inter-national

To capitalize on advantage of industrial clusters & Establish connections with each local industrial clusters

Source: Chen and Ou (2021), P.42. Fig. 3-3

Eg. (2) Participatory Policy-making Process

Photo: LINE https://signal.diamond.jp/articles/-/292

GRIPS Forum 5 July 2021

Creating Open and Inclusive Societies with Digitalization

Discussions with Audrey Tang Taiwan's Digital Minister

デジタル技術で 開かれた包摂的な社会を創る

台湾のデジタル担当大臣
オードリー・タン氏との意見交換

https://www.youtube.com/watch?v=VJmBG3isXbQ

政策研究大学院大学
NATIONAL GRADUATE INSTITUTE FOR POLICY STUDIES
GRIPS

SUSTAINABLE DEVELOPMENT GOALS

About Audrey Tang
(Minister without Portfolio, Executive Yuan)

- In 2016, she became Taiwan's youngest ever minister—Digital Minister in charge of social innovation—at the age of 35.

- Central figure of mobilizing digital power to protect the citizens from the COVID-19 pandemic and to advance social innovation and democracy.

- Self-educated. Began programming work in Taiwan at the age of 15 and started her own IT company in the Silicon Valley at the age of 19 (such as Socialtext). Also, advised Apple on high-level artificial intelligence (AI) projects.

- Coming from the civic-tech community (**g0v**) and with the experience of participating in the Sunflower movement, she has committed to using her digital skills and intellectual ability to create open government (transparent, accountable, participatory and inclusive) for the whole society and citizens.

GRIPS Forum "Creating Open and Inclusive Societies with Digitalization: Discussions with Audrey Tang, Taiwan's Digital Minister" (July 5, 2021)

Speaker: Minister Audrey Tang, Minister without Portfolio, Executive Yuan

https://www.youtube.com/watch?v=VJmBG3isXbQ

Radical Democracy: Govt. Mechanisms for Creating Open and Inclusive Societies

Digital Minister
Audrey Tang (2016-)

- Various mechanisms exist <u>within the govt.</u> for sharing info. & ideas with civil society to improve public policies & actions.

- **Public Digital Innovation Space (PDIS)**
  - Minister Audrey Tang's office; cross-cutting functions within the govt.
  - Staffed by govt. officers (one person from each ministry/agency/ commission) and private-sector experts good at listening to citizen's voices.
  - Host "collaboration meetings," with PDIS acting as a platform to collect voices from minority opinions.

- **Participation Officers (POs)**
  - Represent each govt. office (32) and explain their policies and actions to the public.
  - Listen to citizen voices, share with govt. offices, and convene meetings as necessary; meet among POs to discuss cross-cutting issues across govt.
  - With more than 5,000 signatories and vote at monthly PO meetings, the govt. will be asked to put their proposals into policy actions.

- **Social Innovation Lab (SIL)**: Weekly office hour with organizations engage in social innovation.

g0V（零時政府）Movement
Existence of Active Civic Tech Community
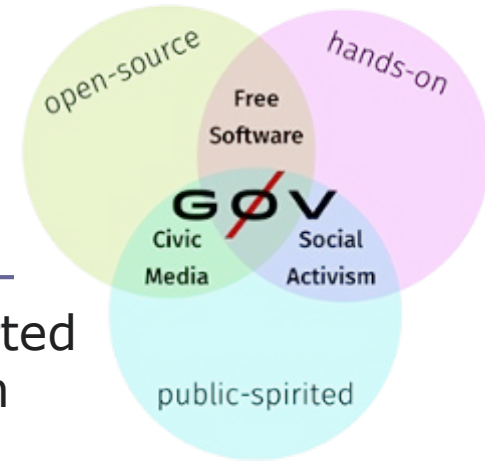
- **g0v** is a decentralized <u>civic tech community</u>, started by Taiwanese hackers (IT programming & system experts) in late 2012.
  - Rethinking the role of government from ZERO
  - Using internet & digital thinking to change the traditional govt.
  - Easy access to vital information & power for citizens to shape the civil society
- Aim to promote transparency of govt. info and build "tec solutions" for citizens to participate in public affairs from the bottom up.

- In Taiwan, there exist a cadre of young hackers who are interested in promoting democratic system and social innovation.
- Sunflower Movement (Mar.18-Apri.10, 2014) was an important "successful experience," widely shared among young generation, of reflecting citizens' voice on the political process.
- Minister Tang, coming from **g0v**, serves as the bridge btw. the govt. and the **g0v** community.

Taiwan's Digital Social Innovation: Creating Open and Participatory Platforms

President

Appoint

Prime Minister

Executive Yuan

Four elements of Open Government:
- Transparency
- Participation
- Accountability
- Inclusion

Changing the culture of public services:
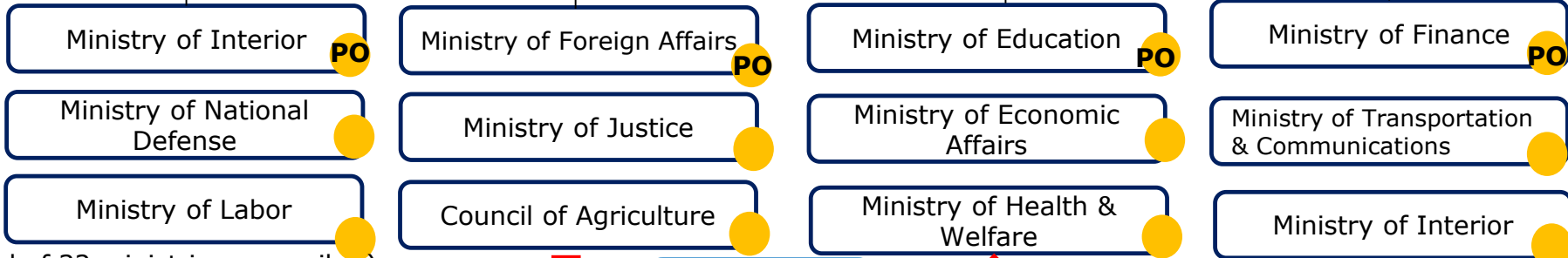- From "for the people" to "with the people"

Ministry of Interior **PO**	Ministry of Foreign Affairs **PO**	Ministry of Education **PO**	Ministry of Finance **PO**
Ministry of National Defense	Ministry of Justice	Ministry of Economic Affairs	Ministry of Transportation & Communications
Ministry of Labor	Council of Agriculture	Ministry of Health & Welfare	Ministry of Interior

(Total of 32 ministries, councils…)

Ministers without portfolio

Digital Minister

Participation Officer (PO)

Reverse mentoring

Public Digital Innovation Space (PDIS)

Social Innovation Lab (SIL)

Office hour: 10:00-17:00 every Wed.

Citizens

- Creating various mechanisms <u>within the govt.</u> for citizen participation
- Fostering mutual trust

g0v (Civic tech)

open-source
hands-on
Free Software
G0V
Civic Media
Social Activism
public-spirited

Public Digital Innovation Space (PDIS)
公共デジタルイノベーションスペース

pdis.nat.gov.tw/en/track/

https://pdis.nat.gov.tw/en/track/

Appointments open to
EVERYONE
Transparent meeting notes and recording

誰でもデジタル大臣とアポを取れる
会議記録・録画も公開

Online Public Policy Participation Platform
オンライン公共政策参加プラットフォーム

join.gov.tw

公共政策
網路參與平臺

キーワード入力/**Insert keywords**

請輸入關鍵字

Proposal/**提案**

Discussion/**議論**

Audit/**監査**

提點子

眾開講

來監督

網站導覽　登入

公共政策
網路參與平臺

提點子　參與式預算

首頁　｜　提點子　｜　提高行人友善設施普及率

Petitioner/提案者

提議者 Aaron

提高行人友善設施普及率

Increase passenger-friendly facilities
歩行者に優しい施設を増やすように

146 more seconds required
あと146同意が必要

53 Days left
残り53日

尚須146個附議
已附議：4

附議期限倒數
53 天

提議階段
2021-06-04
已完成提案

檢核階段
2021-06-08
檢核通過・自次日進入附議階段

附議階段
附議中

回應階段

Petition/提案　　　Verify/検証　　　Second/賛成　　　Respond/返答

Visualizing Execution Process
実行状況の可視化

COVID-19: Are Pink Masks Only For Girls?
Taiwan Health Officials Say "No!"

Source: Taiwan govt. website
https://pdis.nat.gov.tw/en/

Fight against COVID-19 with Innovative Measures

創造的な方法でコロナと闘う

Photo: https://signal.diamond.jp/articles/-/292

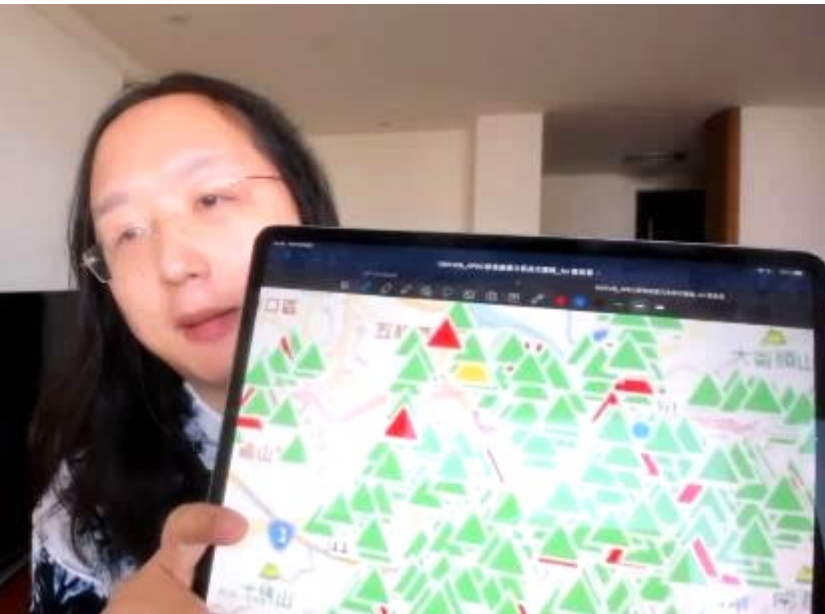Photo: https://twitter.com/audreyt/status/1384781337085714437/photo/2

Develop user-friendly APP of mask and vaccine mapping with DX

DXにより、使用しやすいマスクとワクチン地図アプリを開発

Mask Maps: Created by Hackers to Show Information on Stock Levels & Location of Masks

https://www.bbc.com/news/technology-52883838

- It started with a voluntary initiative by an IT engineer to build a convenience-store mask map (based on the information reported by the general public) to let people know where to buy masks.
- After finding out this initiative via g0v, Minister Tang facilitated the govt. to cooperate with private developers by making the National Health Insurance Administration (NHI)'s data available, so that the information on the Mask Map become more comprehensive.
- Cooperation of NHI and private developers in establishing the eMasks Mask-Distribution System Platform allows people to receive real-time information and to enjoy greater convenience in making purchases.

Source: BBC News website (June 7, 2020)

Digitalization with Warm Power
暖かいパワーでDXを推進

"Ring the bells that still can ring
  Forget your perfect offering
  There is a crack, a crack in everything
  And that is how the light gets in"

(from the lyrics of Anthem by Leonard Cohen)

「耐えず鳴り響き得る鐘を鳴らせ
  完璧な提案をしようと、夢中になるな
  すべてのものにはヒビがある
  そして、そこから光が入り込む 」

（レナード・コーエン のAnthem 歌詞より ）

Photo:
https://www.vogue.com.tw/fashion/article/%E5%94%90%E9%B3%B3

Photo: https://www.moeasmea.gov.tw/article-en-2442-5014

Promoting SDGs with Ministers and Cabinet Members
各省庁の大臣・閣僚と共にSDGsを推進する

Photo:
https://www.facebook.com/SocialInnovationLabTW/photos/a.115501712491232/328698851171516/?type=3&theater

Topics for Discussions

- How do you see new opportunities and challenges of such mega trends? Please share your country experiences.

- To what extent are the mega trends changing the policy-making process of your countries?

- What should change, and what should <u>not</u> change by such mega trends (esp. the policy-making process)?