# 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?
   - Global value chains (GVCs)
   - Digital revolution (DX)
   - SDGs (green, ethical correctness, etc.)
3. Implications for policy-making process
   - What will change, and what will NOT change?
   - Example: Taiwan (digitalization)

# 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
  - Up to 1990, globalization on "trade" (goods); now, "know-how" (knowledge & info) is also crossing borders; "servicification" of manufacturing.
- "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 seems to be accelerating digitalization and trends toward sustainability, inclusiveness, and resilience, while US-China trade frictions (decoupling?) are making globalization trends more complex.

# Emerging Global Mega Trends

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

**Globalization**

Expansion of global value chains (GVCs), Multi-lateral Corporations (MNCs), Trade agreements (FTA/EPA), protectionism?

**Digitalization**

DX, 4th Industrial revolution
Industry 4.0, IoT, AI

**Environmental & Social Concerns**

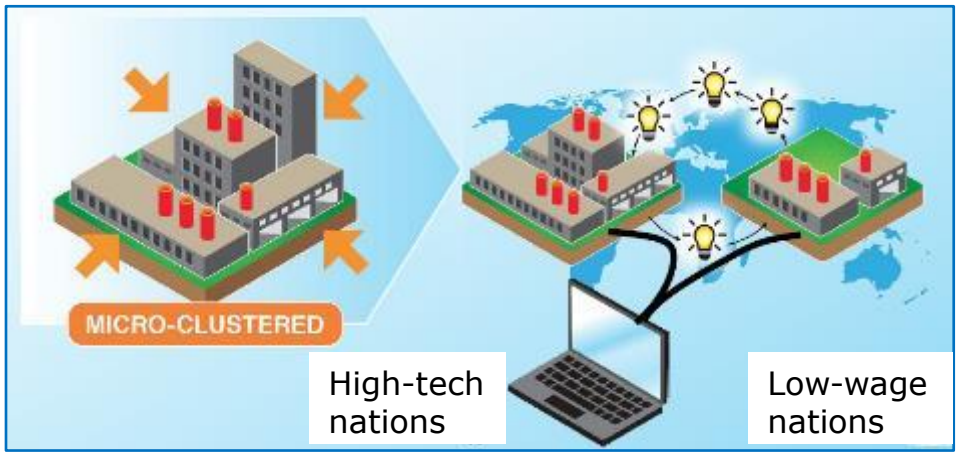
SDGs, ESG investment, Human rights, Green industrialization, Carbon-neutral, resilience …

Global shocks
- Covid-19 pandemic
- Natural disaster
- Financial crisis, etc.


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

# (1) 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)
- Such fragmentation provides opportunities for developing countries to participate in global production networks, or GVCs without nurturing a full-set of national industries in key sectors or outside the "Flying Geese pattern" of regional production networks.

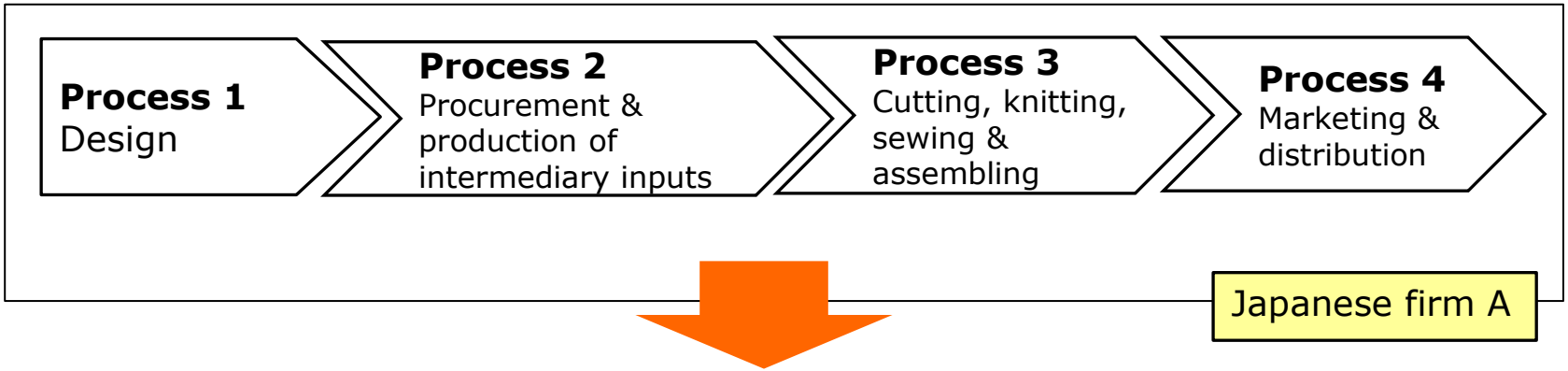



Lowering trade & ICT costs

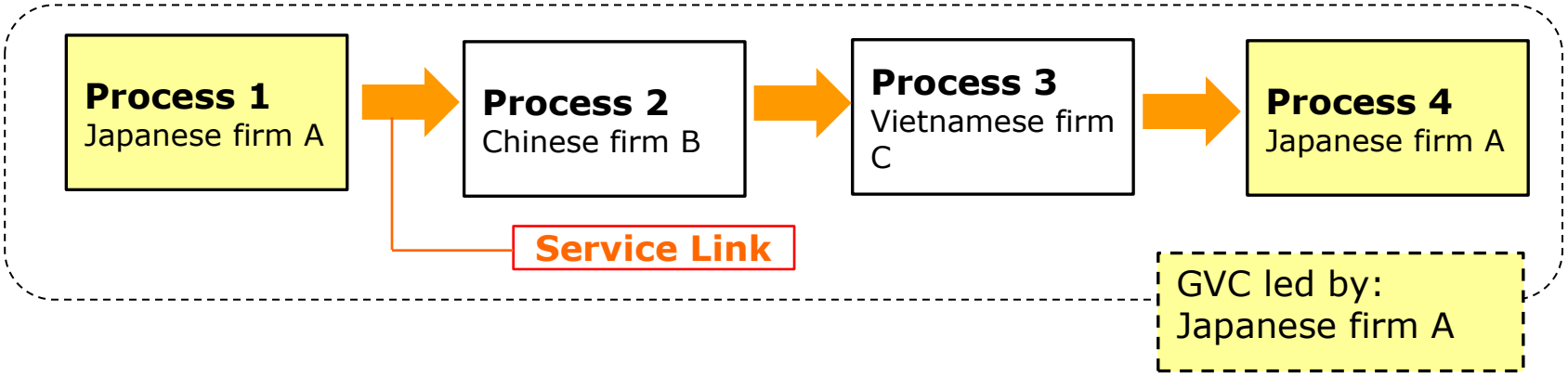
Source: Baldwin (2016)

# 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)**



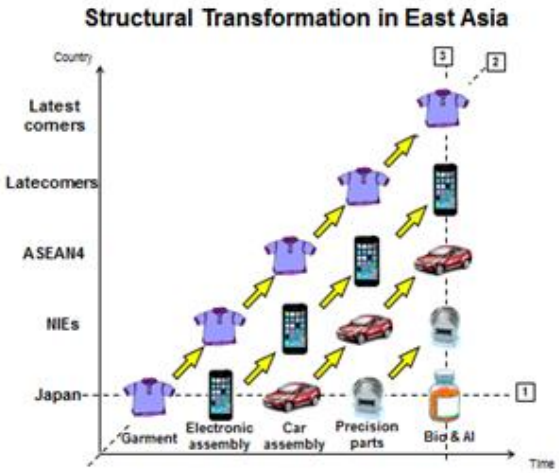

**Production & Distribution Process (21th century)**
**Fragmentation and Global Value Chains (GVCs)**




Source: 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 ?

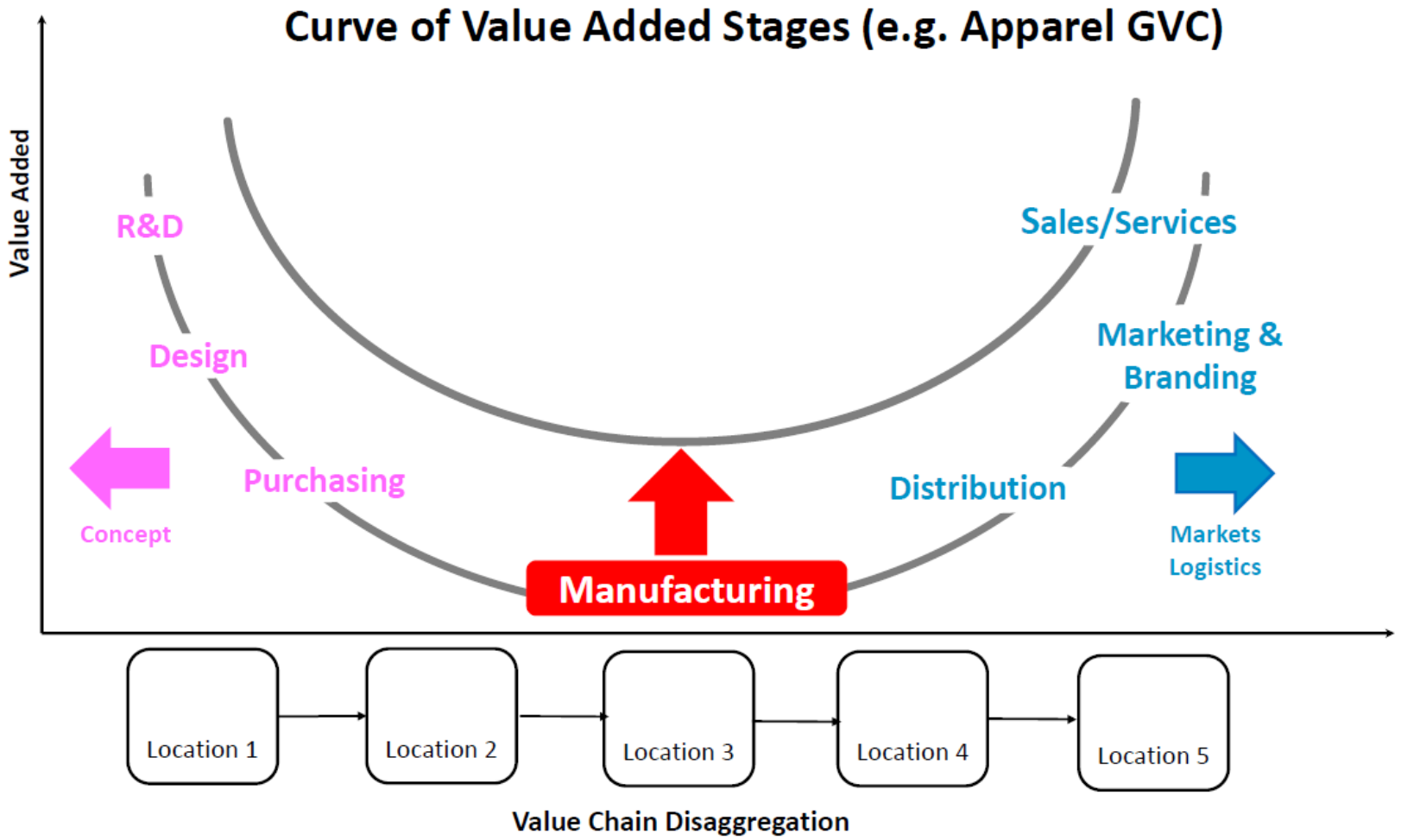



Flying Geese pattern of development (20st century)

- *Global value chains are not magical. They open a new way to industrialize, but they do not solve the hardest development problems.*
- *The New Globalization may change the nature of the "**master plan**" of industrialization.*
- *But, having the right "master plan" is one thing, and its effective implementation is another task.* (Baldwin 2016: The Great Convergence)

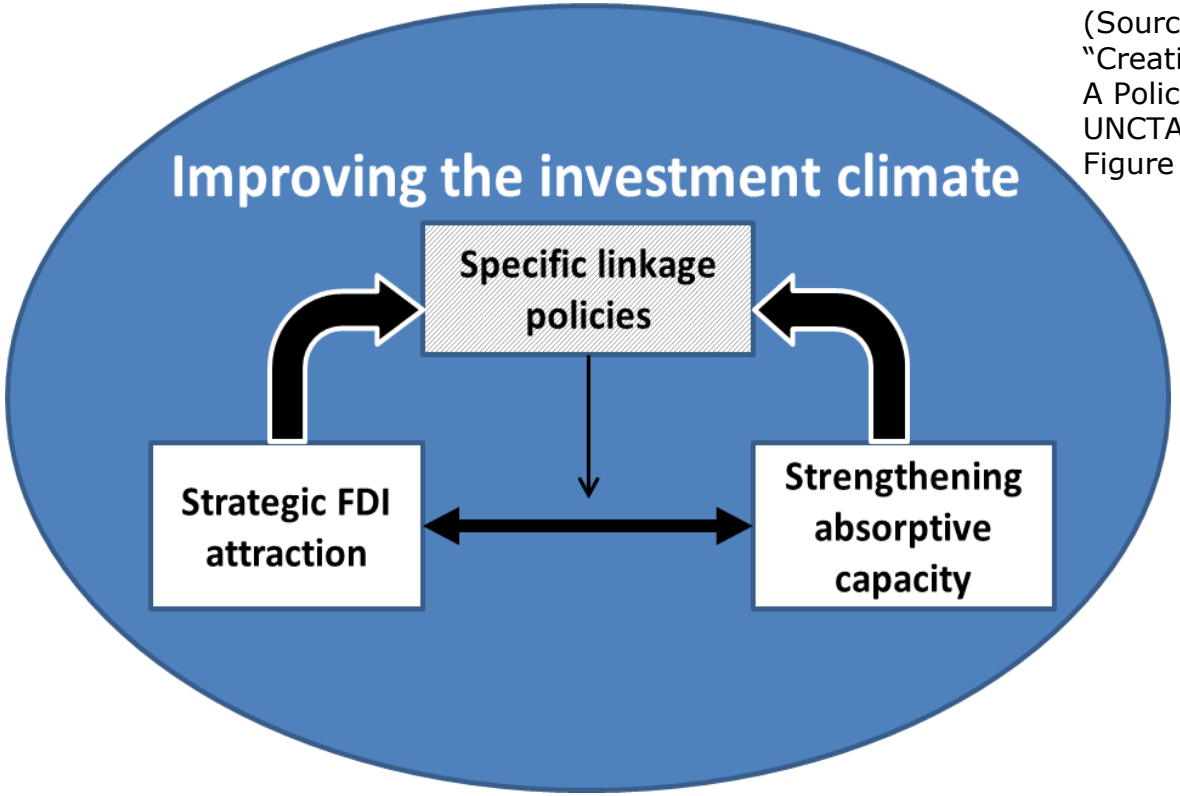
For many developing countries, apparel industry is the first entry point into GVCs; but there are risks of leading to "**the race of the bottom**" or "**stacking at the bottom**" unless host countries make hard efforts for enhancing local firm capability and HRD.

- Social upgrading as precondition for market entry
- Economic upgrading essential to remain and move up the value chain ladder




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

# Need for a Coordinated Approach to Linkage Creation and Local Capacity Development




(Source) UNCTAD (2010), "Creating Business Linkages: A Policy Perspective." UNCTAD/DIAE/ED/2009/1. Figure 1, p.14

(i) Strategic attraction of quality FDI
(ii) Building an effective selection & matching mechanism (linkage promotion itself); and
(iii) Building local capability (so that local firms can participate in the linkage).

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

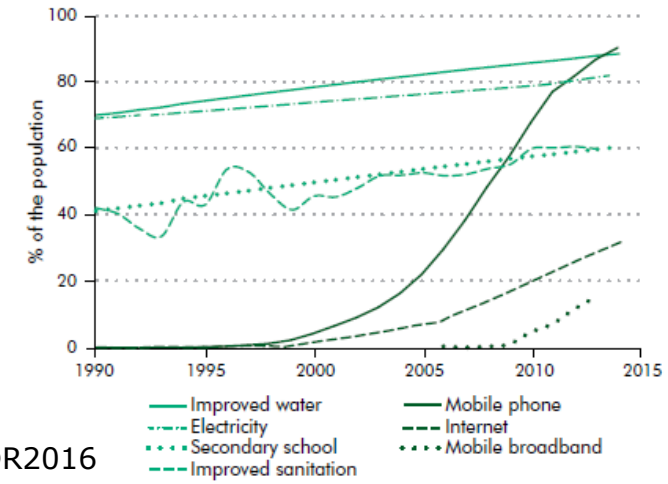
- Today, latecomer countries must satisfy **twin** global standards to successfully participate in GVCs.
  - Economic/industrial upgrading: QCD requirements
  - Social/environmental upgrading: labor and other ethical correctness, green/carbon neutral
- Both are crucial for market access and productivity 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.

# (2) 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.
  - E-commerce, mobile money transfer, medicine delivery by drone, personal ID for targeted subsidies, etc.

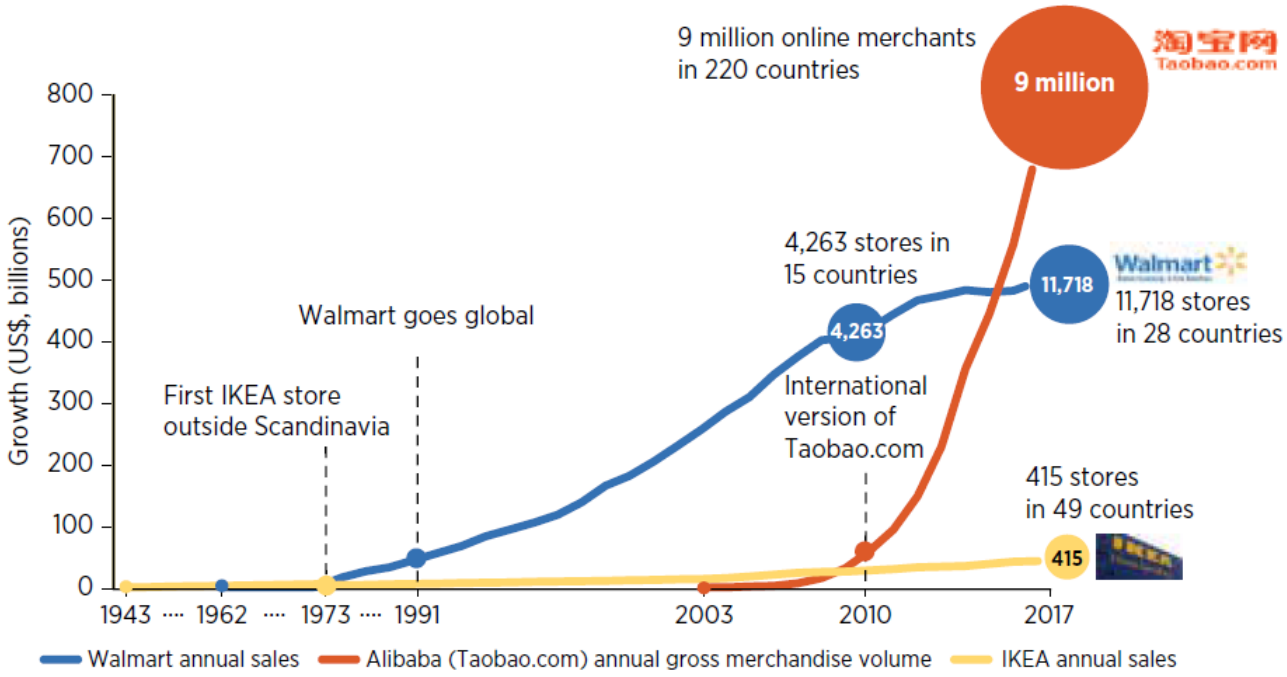
**Figure O.4** Digital transformation in action

a. Digital technologies are spreading rapidly in developing countries




Source: World Bank, WDR2016

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




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

Alibaba
(e-commerce)

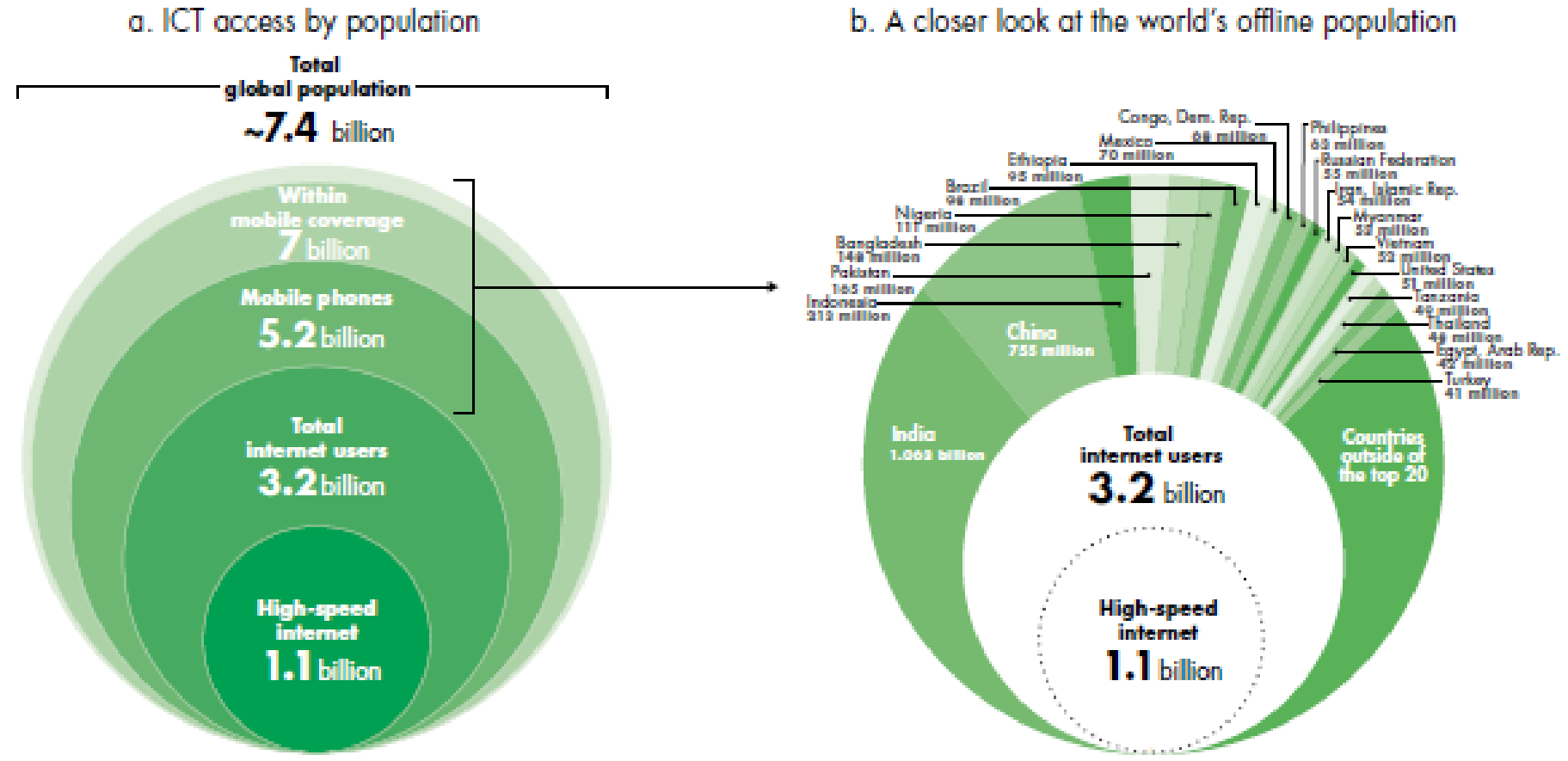
M-Pesa
(mobile money transfer)



Drone
(medicine delivery)

Aaadahar
(unique identification authority)

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




Sources: World Bank 2015; Meeker 2015; ITU 2015; GSMA, https://gsmaintelligence.com/; UN Population Division 2014. Data at http://bit.do/WDR2016-FigO_5.

Source: World Bank, WDR2016

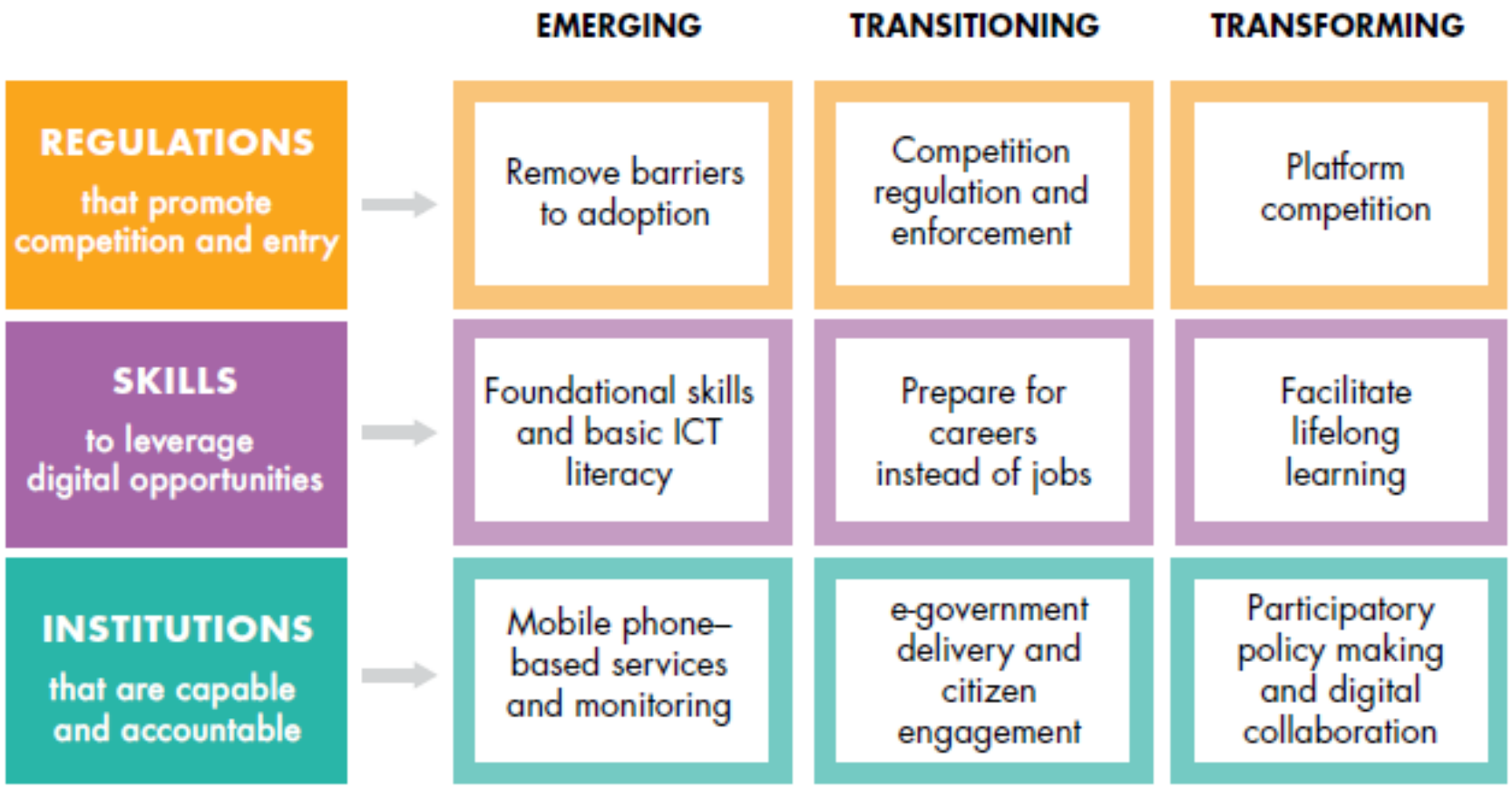
- Only 15% of the world population has access to broadband internet.
- Nearly 60% of the world pop. has no access to internet.
- While 4/5 of the world pop. has mobile phones, 2 billion people do not have.

# 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 rise, 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 |

Source: Asei Ito (2020), p.159, Figure 4-1

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




*Note:* ICT = information and communication technology.

Source: World Bank, WDR2016

# (3) Increased Focus on Societal and Environmental Goals


- **The SDGs** 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

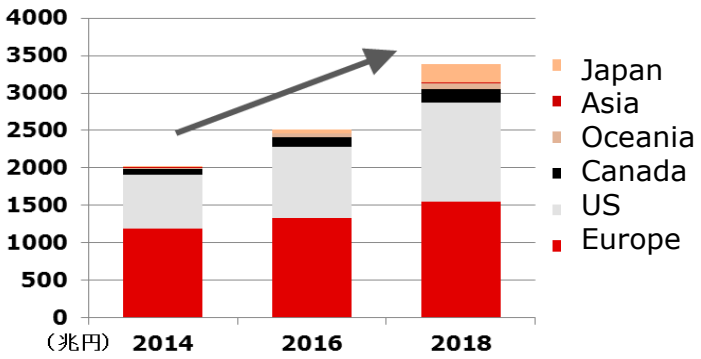
Aiginer & Rodrick (2020:191) "Rebirth of Industrial Policy and an Agenda for the Twenty-First Century"

- *Greening of industrial policy or new forms of industrial policy steered by employment concerns*

# SDGs and ESG Investment

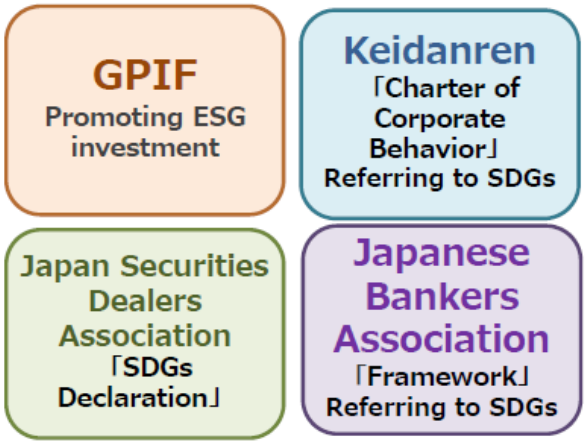
- Sustainable and responsible supply chains
  - Widespread adoption of sustainable standards by lead firms
  - Various kinds of public & private standards (mandatory, voluntary, multilateral, CSO-initiated, etc.)
- Expansion of ESG investment (esp. increased attention to "S", with COVID-19)
- Growing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

**Expansion of ESG Investment**




Global Sustainable Investment Alliance(GSIA)
http://www.gsi-alliance.org/wp-content/uploads/2017/03/GSIR_Review2016.F.pdf

**Trend of ESG Investment & SDGs in Japan**




(Source) JICA

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

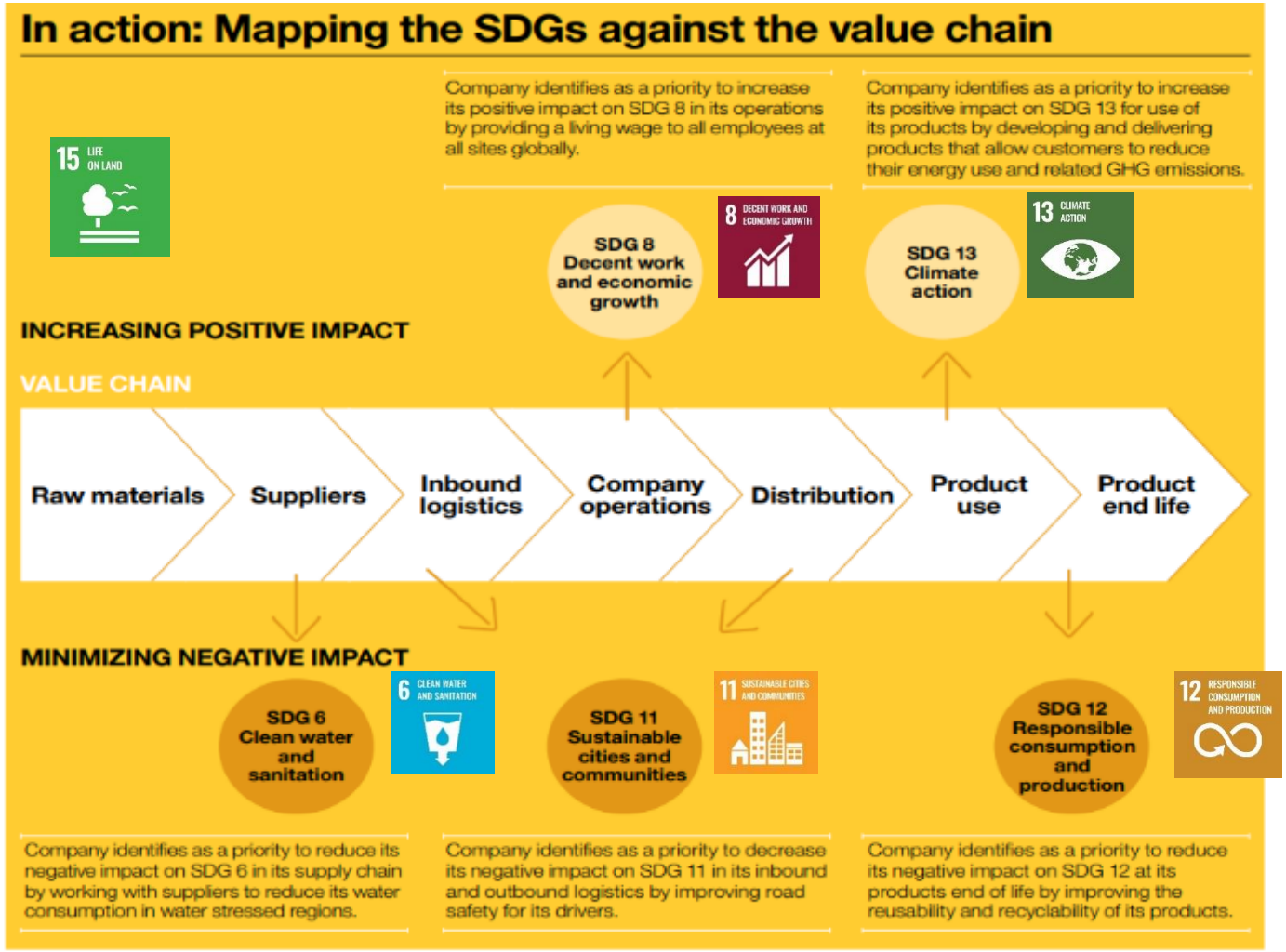
# Types of Corporate Standards and Their Motivations (Triple Bottom Line)

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




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 )

# Rana Plaza factory collapse
## (April 24, 2013, Dhaka)

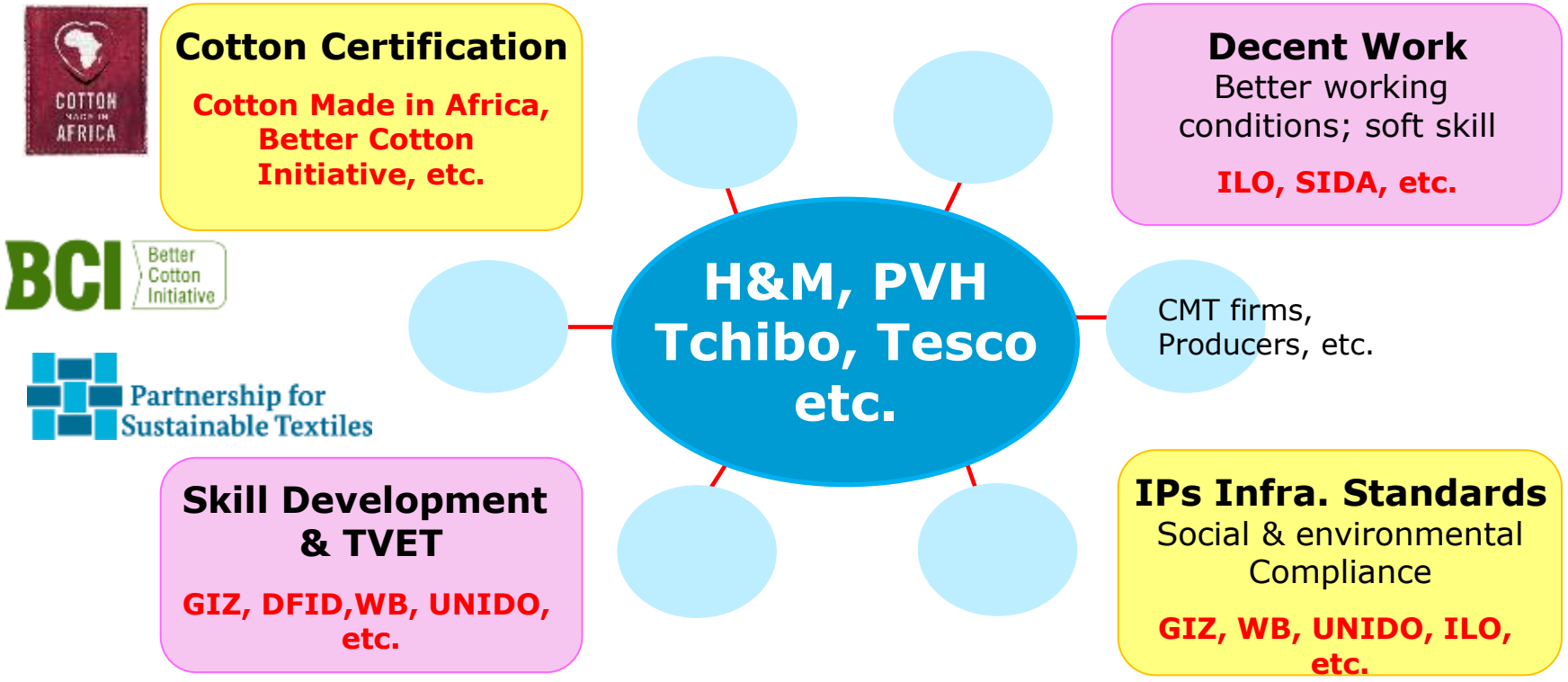
*Eight-story building housing 5 garment factories supplying global brands suddenly collapsed, killing more than 1,100 people (too many floors, too much heavy equipment for the structure to withstand….)*

Photos: Wikipedia

*Apparel industry is labor-intensive (employing more than 60 million workers with 80% are female).*

Photos: The Gurardian

# Ethiopia: Public-Private Partnership for Sustainable Textile & Apparel Supply Chains




(Source) Elaborated by the author based on the information obtained from Japan-Ethiopia industrial policy dialogue (July 2017)

**ITC Report (2015)**
- Major destination of Apparel exports: Germany (76%), US (14%), Sudan (6%), UK (6%)
- Major destination of Textile exports: Turkey (58%), Germany (14%), Italy (13%), China (11%), US (2%)

# Implications for Policymaking Process and Examples

- 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 for developing countries:
  - 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

# Taiwan: Digital Economy as a Game-Changer
## Beyond Catch-up Industrialization Model

- Digitalization is transforming innovation, and digital transformation brings about challenges to innovation management and policies.
- New digital technologies, as a driver, have had to co-evolve with the organizational governance, institutional arrangements and regulatory regime for the economy in an appropriate and desirable manner.
- **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**

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

**The Digital Sectors to-Be**

**'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

Note: ITRI: Industrial Technology Research Institute / III: Institute for Information Industry

Source: Shin-Horng Chen and Yi-Pey Ou (2021), "Digital Transformation and Structural Change in Taiwan's National Innovation System," P.44. Fig. 3-4

# New Developmental Models and Innovation Trajectories

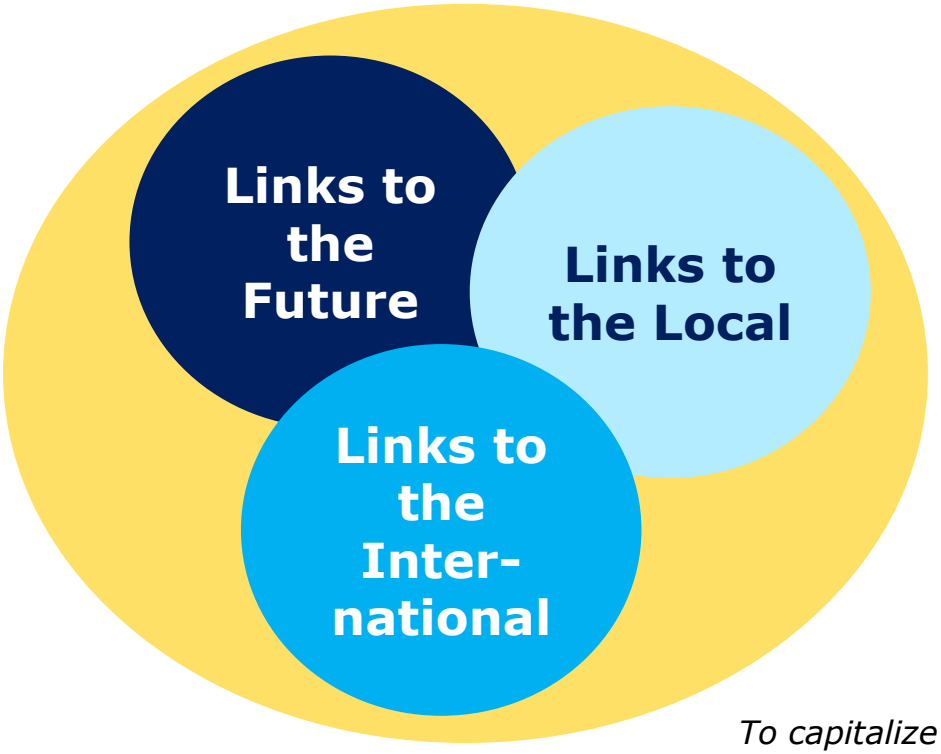
5+N innovative industries and transformation of Taiwan's national innovation system

*To unleash the potential of next-generation industries*

Innovations for Application

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

Internationalization of the NIS & innovation ecosystem




Cross-Fertilization

Solution-oriented, software & hardware integration

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

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

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**

GRIPS 政策研究大学院大学 National Graduate Institute for Policy Studies

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.

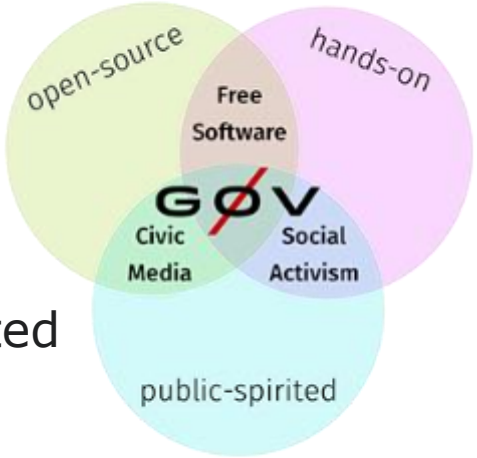
# Radical Democracy: Govt. Mechanisms for Creating Open and Inclusive Societies

Digital Minister Audrey Tang (2016- )

- Various mechanisms exist within the govt. 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.

# gOV（零時政府）Movement

## Existence of Active Civic Tech Community




- **g0v** is a decentralized civic tech community, 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

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

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

**President**

Appoint

**Prime Minister**

**Executive Yuan**

| | | | |
|---|---|---|---|
| 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.

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

**Citizens**

**g0v (Civic tech)**

# 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

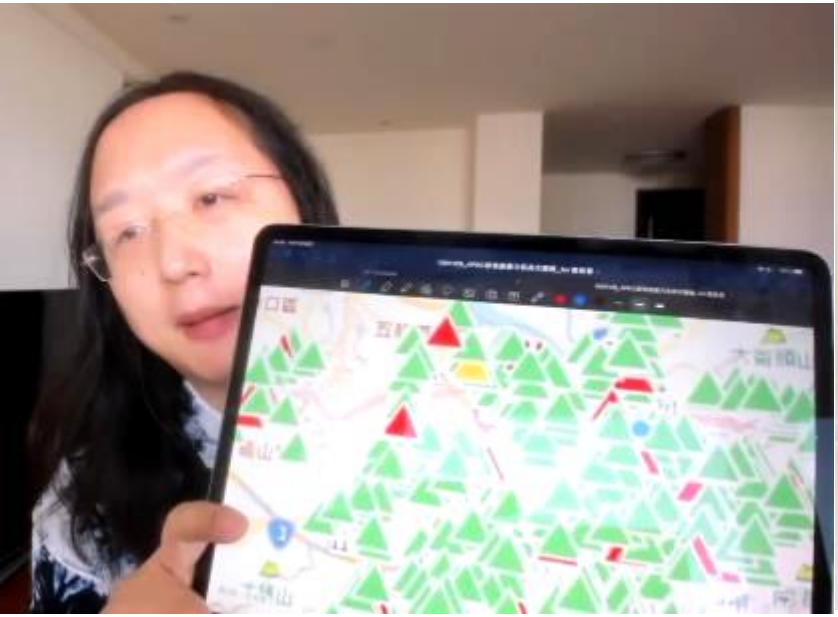


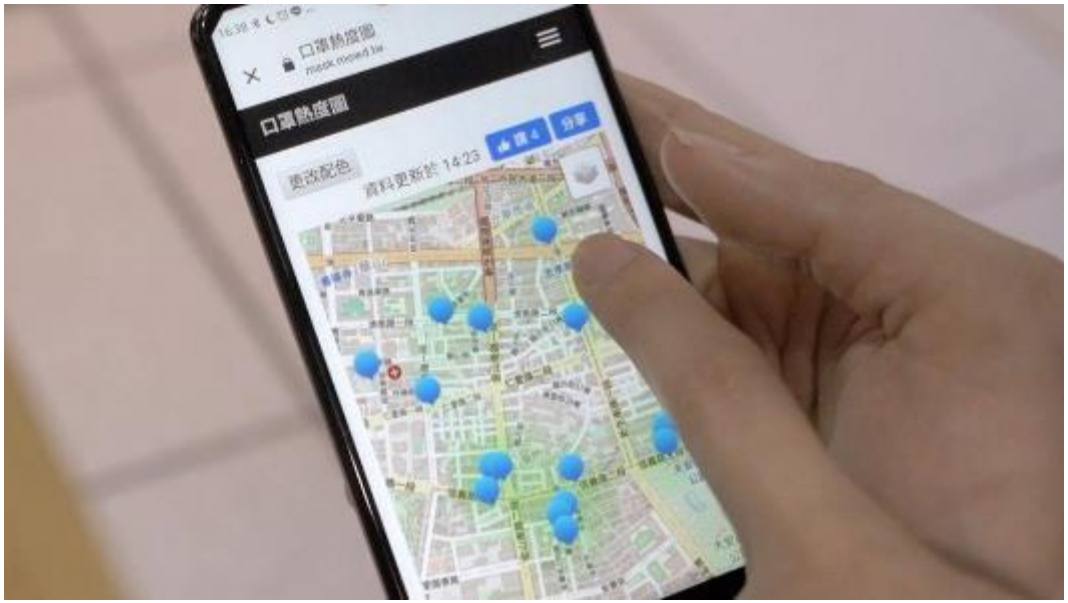
Photo: https://signal.diamond.jp/articles/-/292


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

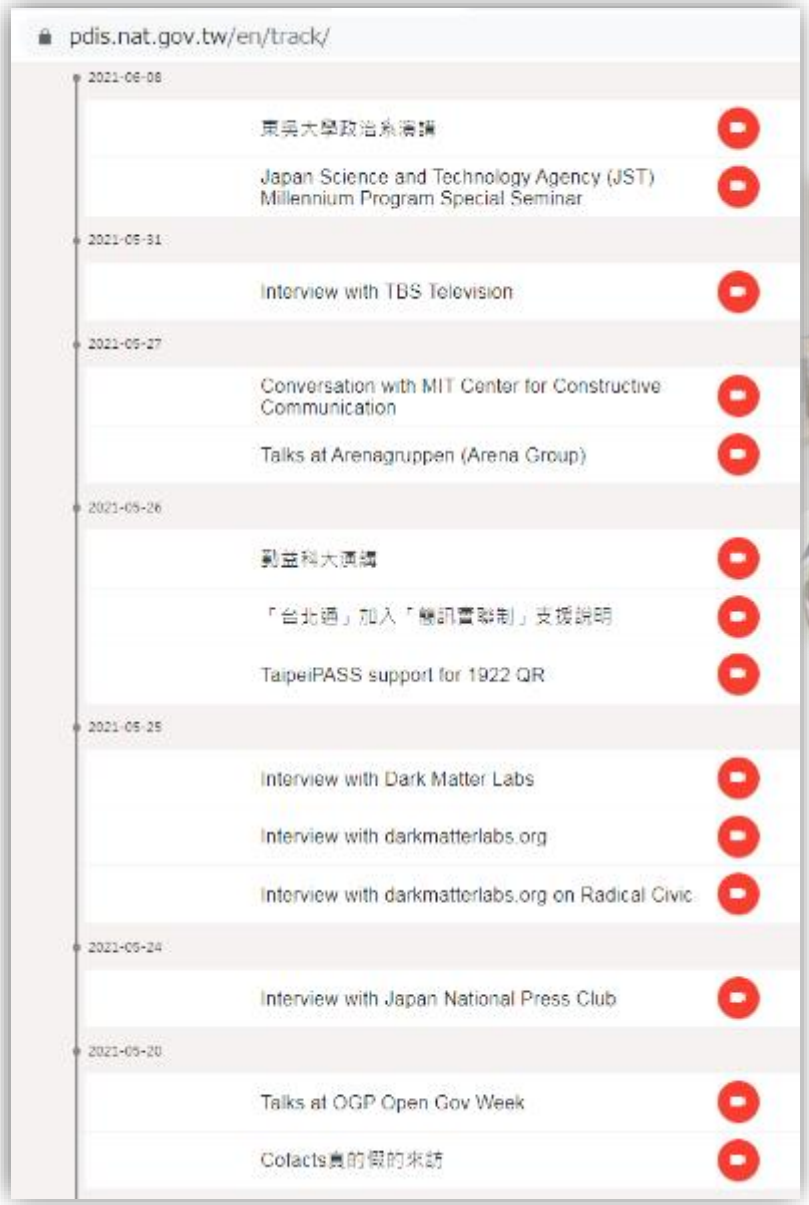



https://www.bbc.com/news/technology-52883838

- 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)

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




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

https://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**

提點子

**Discussion/議論**

眾開講

**Audit/監查**

來監督

https://join.gov.tw/


Petitioner/提案者

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

# Visualizing Execution Process
# 実行状況の可視化


| 年累計預定進度(A)(%) | 年累計實際進度(B)(%) | 進度比較(B-A)(百分點) |
|---|---|---|
| 19.8 | 20.03 | 0.23 |
| 年計畫經費(C)(千元) | 年累計執行數(D)(千元) | 年計畫經費達成率 (D/C*100%)(%) |
| 151,351 | 30,317 | 20.03 |

https://join.gov.tw/acts/detail/0881ae8a-f1af-458e-9a7a-cd08a0517def

# 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

# Mega Trends (Summary)

- Expansion of global value chains (GVCs)
- Digital revolution（DX）
- Environment, social & governance (ESG) concern
- Unexpected shocks (e.g. pandemic, natural disaster, fin. crisis)

- Opportunities: Possibility of leapfrog, participation of global production networks without regional "Flying Geese"
- Risks: Digital divides, ethics, use of personal data, privacy…
- **What may change?**
  - Policy details & priority settings; digital-oriented, sustainability, resilience…
  - Speediness of policymaking and implementation
  - The whole of government approach (complex problems, holistic approach…)
  - Likelihood of catch-up ("leapfrog" and even "reverse innovation"?)
- **What will NOT change?**
  - Importance of public policy & govt' role (more sophisticated policy capability)
  - Global cooperation

Source: Homma Toru (2021). "Contemporary Agenda for Policy Support to Industrial Development in Developing Countries"

# 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: Asei Ito (2020), p.204, Figure 6-1.