Characteristics of Automotive Industry and using Data Carriers
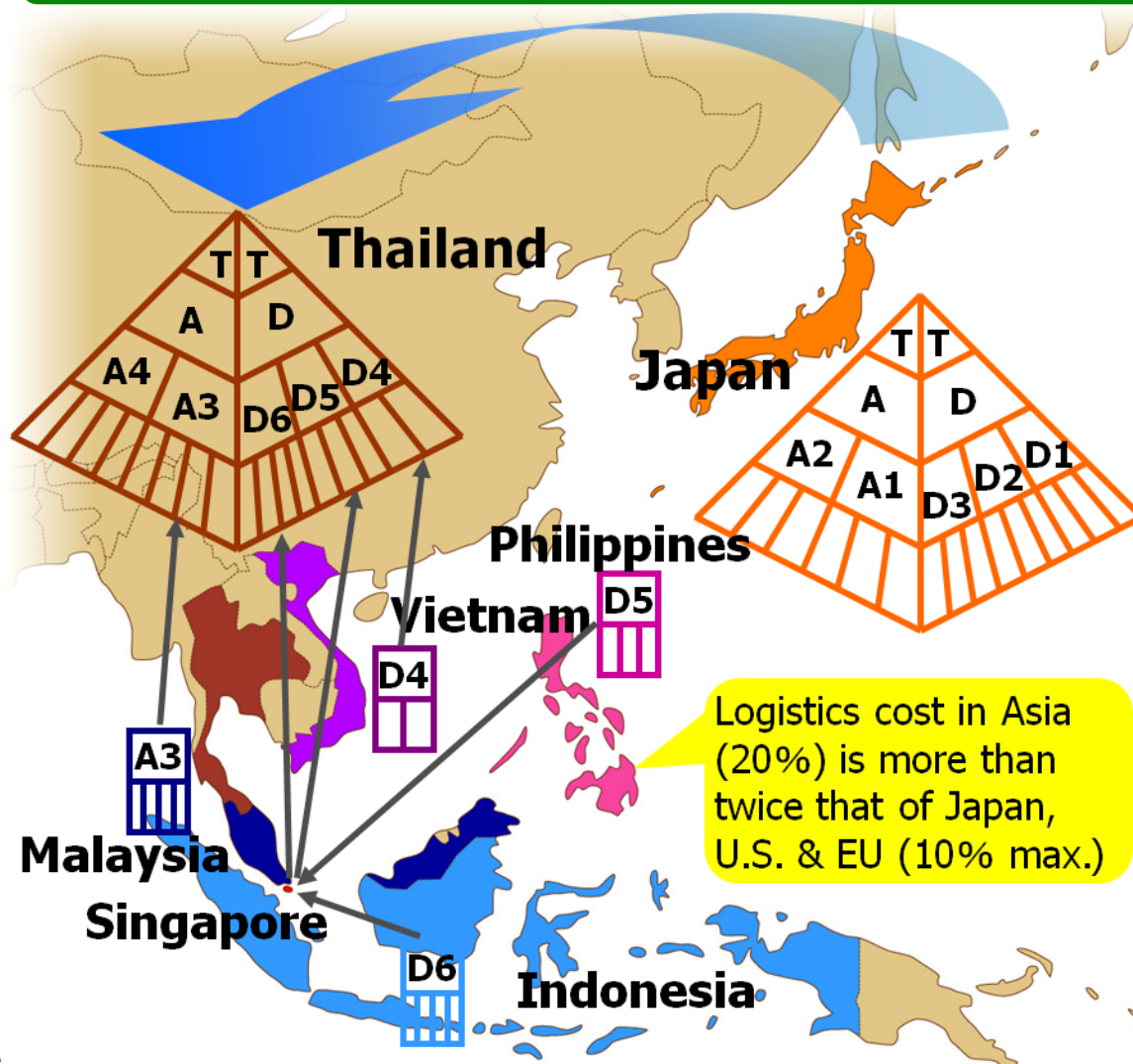
Business Globalization and Local Companies

Automotive Industry in ASEAN

Thailand

T T
A D
A4 A3 D6 D5 D4

Japan

T T
A D
A2 A1 D3 D2 D1

Philippines

Vietnam D5

D4

A3

Malaysia

Singapore

D6

Indonesia

Logistics cost in Asia (20%) is more than twice that of Japan, U.S. & EU (10% max.)

Business globalization will bring a big chance to Local companies(LC).

Production is difficult within one country in ASEAN (each nation has its own expertise).

Production based on each nation's expertise can cover wide areas.

Reduction of logistics cost is essential.

Characteristics of Automotive Industry

T Company					
Dev.	Design	Mfg.	Sales	Service	Reuse/ recycle

● **Technological diversity extending to wide areas**
● **Localized administration to handle many parts**
● **Variety in company sizes**

D Company					
Dev.	Design	Mfg.	Sales	Service	Reuse/ recycle

A Company					
Dev.	Design	Mfg.	Sales	Service	Reuse/ recycle

Education
High quality
KANBAN system
Continuing innovation
Concurrent works
Reduction of environmental loads

Technology, standard, intellectual property, etc.
Zero defects, quality of products & transport, etc.
Just-in-time, first-in first-out, etc.
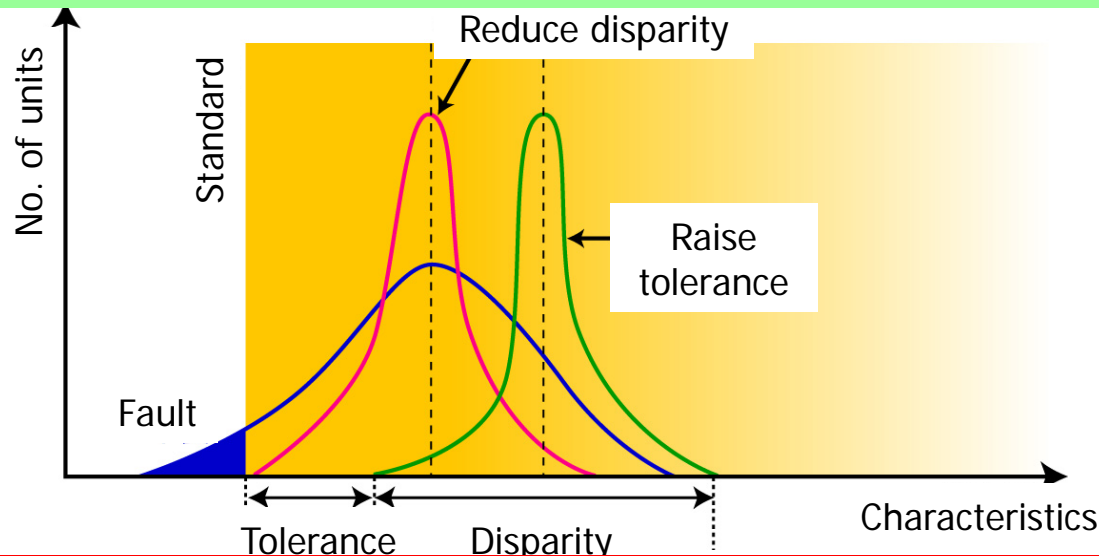**KAIZEN** (Improvement)
Business group & cooperation

Intellectual property

Process standard

	Significance of company standard
Process	A
Development	C
Design	B
Expertise	A

High Quality

Policy: Any faults in the car may result in fatal injuries!

●**Cultivate corporate culture：Education is of primary importance.**
  Zero defects, just-in-time, first-in first-out, *KAIZEN*
●**Zero defects：Uniformity of performance at component level**
  Delicate spec. that cannot be put in the drawings shall also be observed.
  ➡ **Inspections conforming to drawings + master samples**
  ➡ **Quality shall be established during the production process.**

Reduce disparity

No. of units

Standard

Raise tolerance

Fault

Tolerance   Disparity

Characteristics

**High product quality in technology & Expertise required**

KANBAN System

Just-In-Time Operation

"Making only what is needed, when it is needed" (Lean production)

"*KANBAN*" is a key tool for just-in-time control

● *"KANBAN"*

・ **Has information on the purchase order, invoice, receipt & work instructions.**

・ **Can replace less efficient network access in the fields.**

・ **Operates with EDI but it can be also used for non-EDI.**
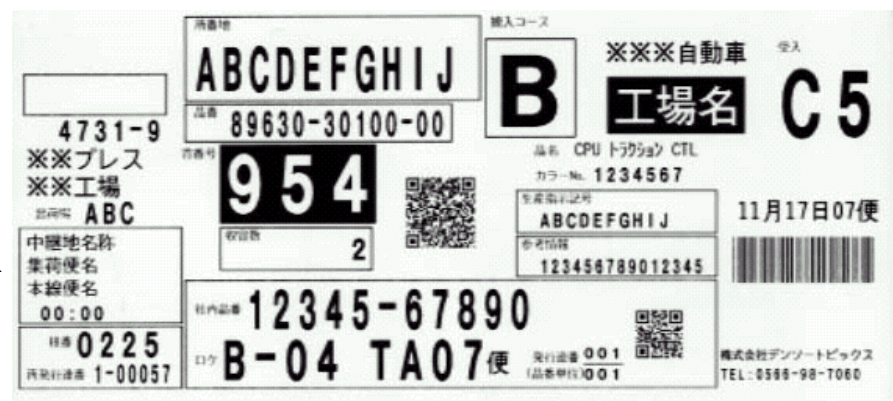
New *KANBAN* system reflecting globalization is critical.

Applications for global supply chain hold the key.

● **Selection of database system and data carriers**
● **Selection of data contents and data carriers**
● **Integration of open system and closed system**

KANBAN System

Production/Logistics improvement using "Kanban"
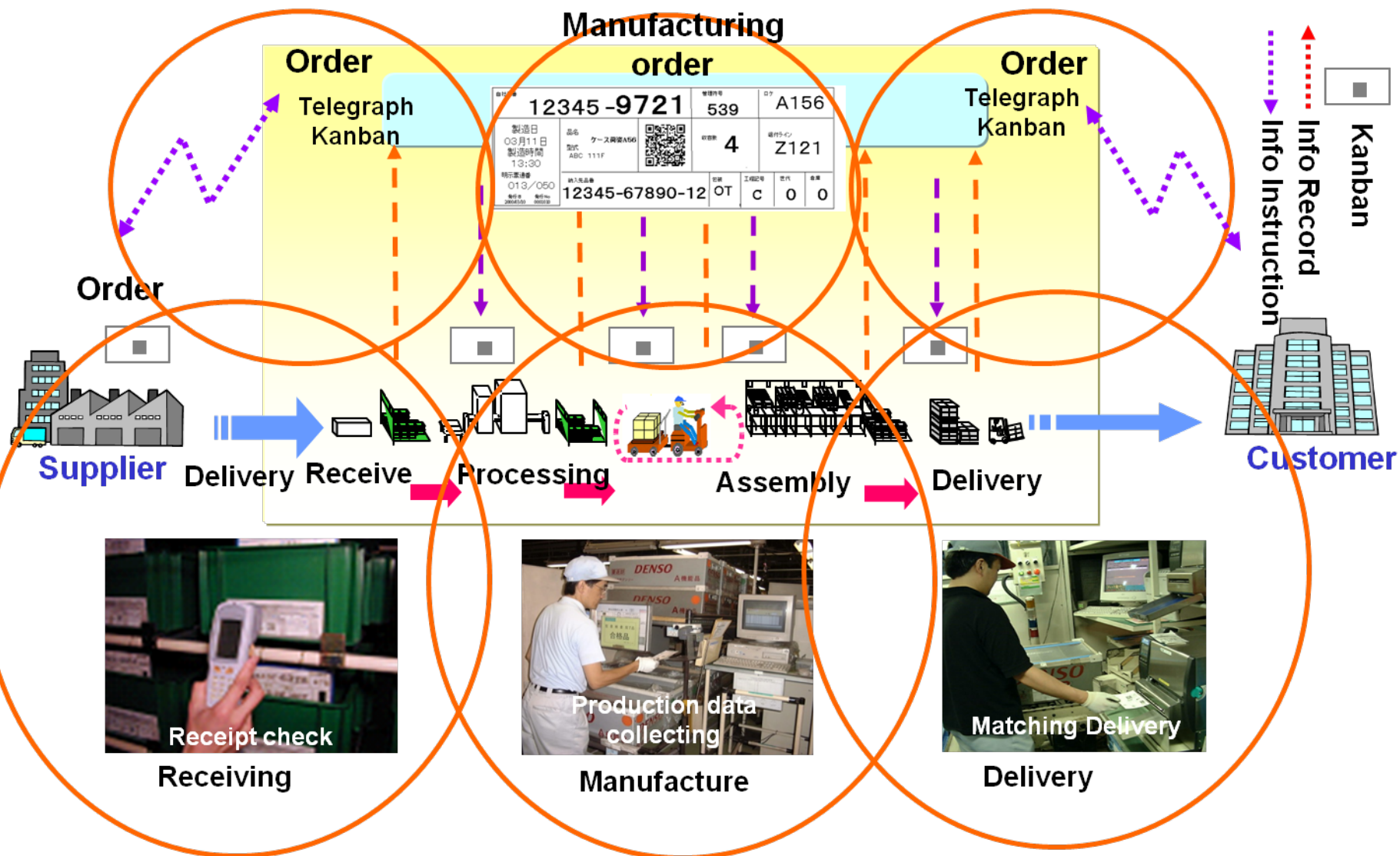
KANBAN utilizing the Rewritable Hybrid Media (RHM)

Example of utilizing RHM for not only returnable containers, but also for Transport Unit.

**Unlike paper KANBAN where it will be disposed after used,
for the purpose of conservation of environment,
RF tag is applied in a RHM sheet,
hence allowing KANBAN to be read from distance.**

Front Side (written)

Colourized

Reusable for approx. 800 times

De-colourized

Front Side (erased)

Reverse Side (RF Tag Applied inside)

Data encoded into the QR code on the front side is written into the RF tag.
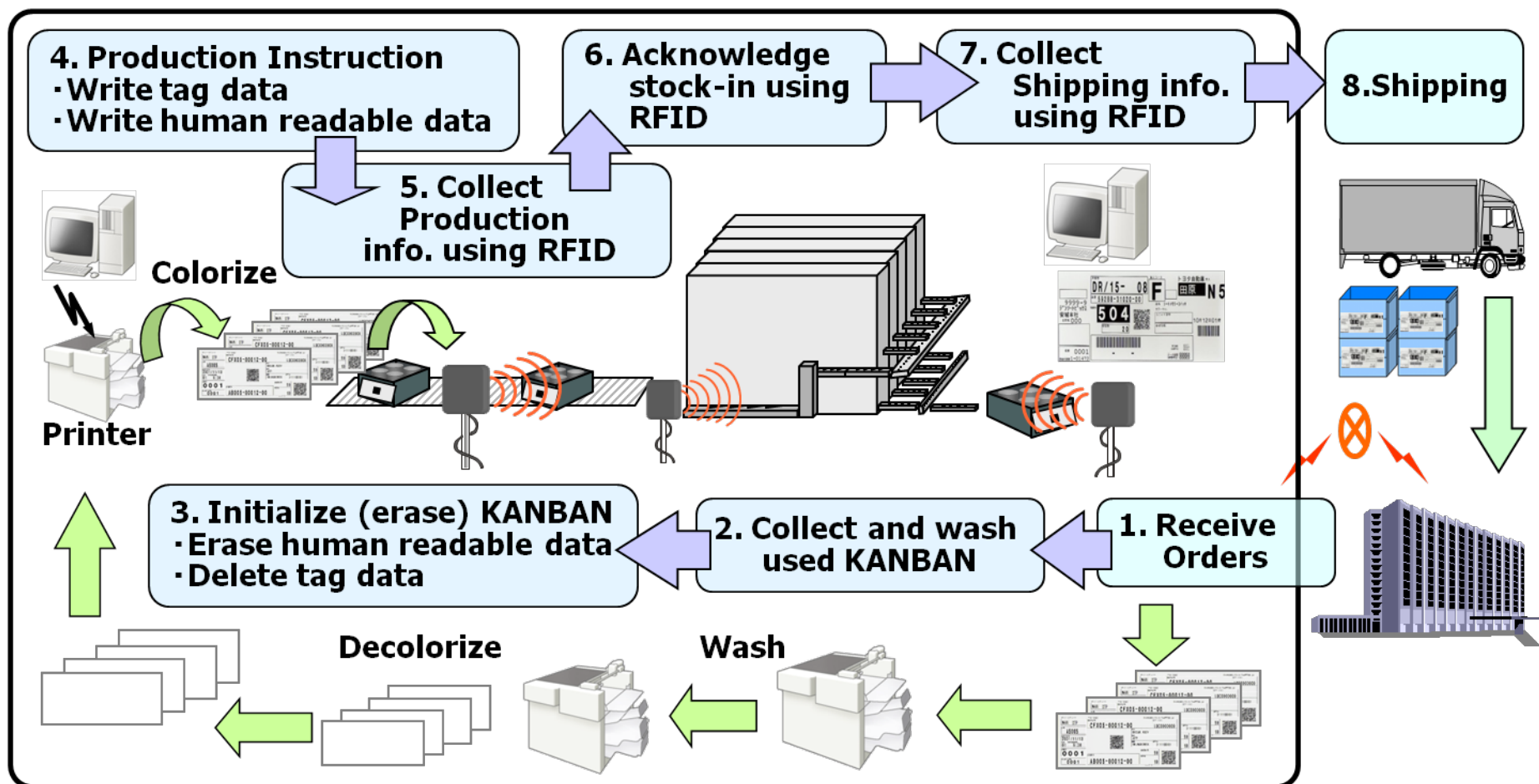
KANBAN utilizing the Rewritable Hybrid Media（RHM）
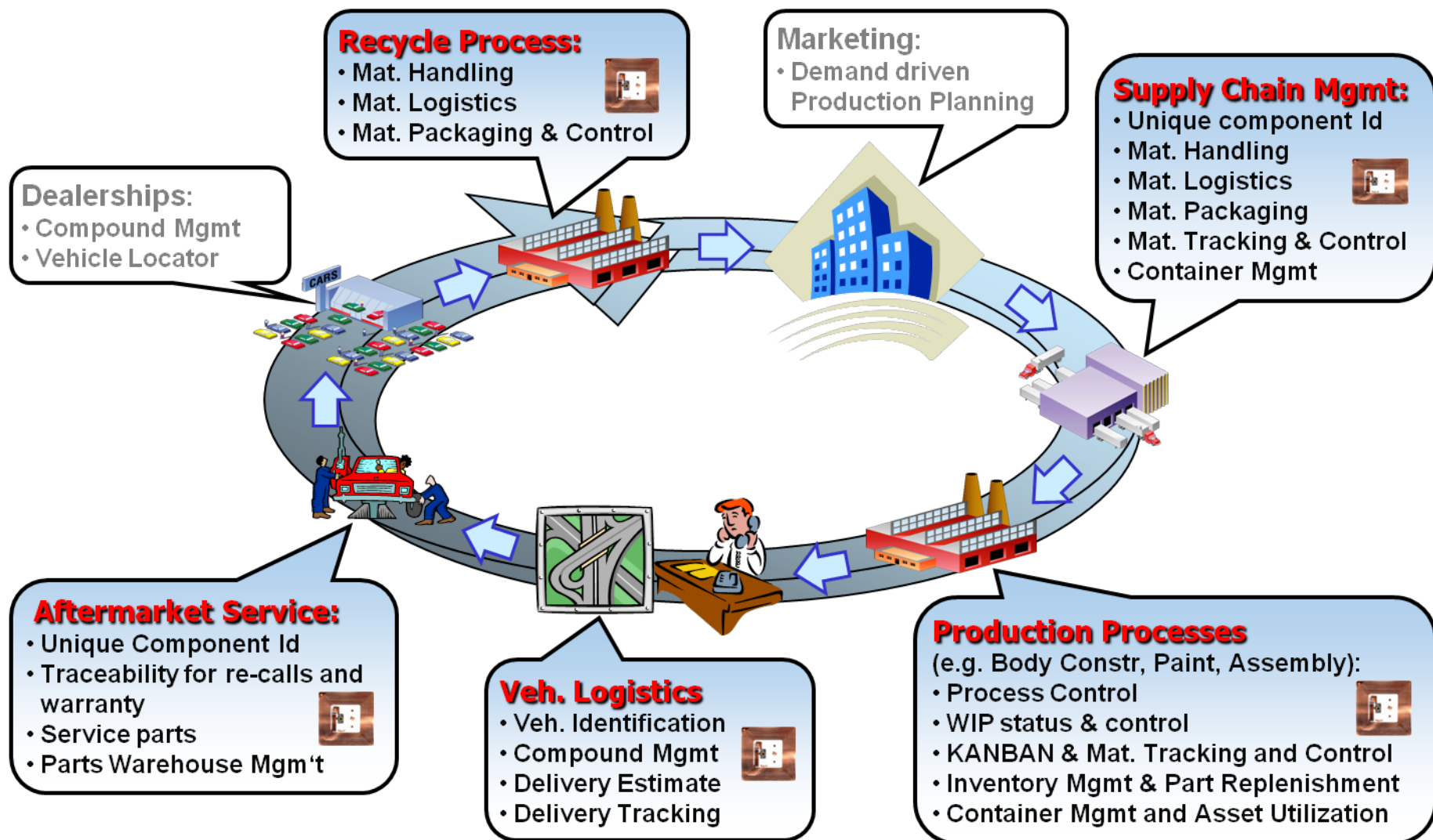
RF Tag

Rewrite Kanban

KANBAN utilizing the RHM

Example of utilizing the RHM for In-house KANBAN

Improve read-rate using RFID, and conservation of environment using RHM KANBAN

Automotive Industry Value Stream

Recycle Process:
• Mat. Handling
• Mat. Logistics
• Mat. Packaging & Control

Marketing:
• Demand driven Production Planning

Supply Chain Mgmt:
• Unique component Id
• Mat. Handling
• Mat. Logistics
• Mat. Packaging
• Mat. Tracking & Control
• Container Mgmt

Dealerships:
• Compound Mgmt
• Vehicle Locator

Aftermarket Service:
• Unique Component Id
• Traceability for re-calls and warranty
• Service parts
• Parts Warehouse Mgm't

Veh. Logistics
• Veh. Identification
• Compound Mgmt
• Delivery Estimate
• Delivery Tracking

Production Processes
(e.g. Body Constr, Paint, Assembly):
• Process Control
• WIP status & control
• KANBAN & Mat. Tracking and Control
• Inventory Mgmt & Part Replenishment
• Container Mgmt and Asset Utilization

RFID can be used for various kinds of applications.

Experiment on Returnable container in ASEAN

example of joint activity with other industries/associations

Aim : To establish Asian-wide seamless distribution network.
Half the distribution cost and lead-time in ASEAN

Partnership Meeting for Competitive International Distribution

Board of Secretaries

Logistics Materials etc. WG

Personnel Training WG

Import/Export Customs WG

Wide Area Distribution N/W WG

High utilization of Pallets/Returnable Containers

Infrastructure maintenance lead by Government for spreading RFID

Mutual cooperation between Japan-ASEAN for maintenance / implementation of regulations etc.

Share best practices

Chair   ・Prof. Araki   (Sophia University)
        ・Izumi (Fujitsu)   ・Sakaguchi (Mitsui OSK Lines)   ・Tsujimoto (Daifuku)   ・Hirano (NEC)
        ・Makino (DENSO)   ・Mizuno (Nippon Cargo Airlines)   ・Mitarai (Mitsui & Co.)
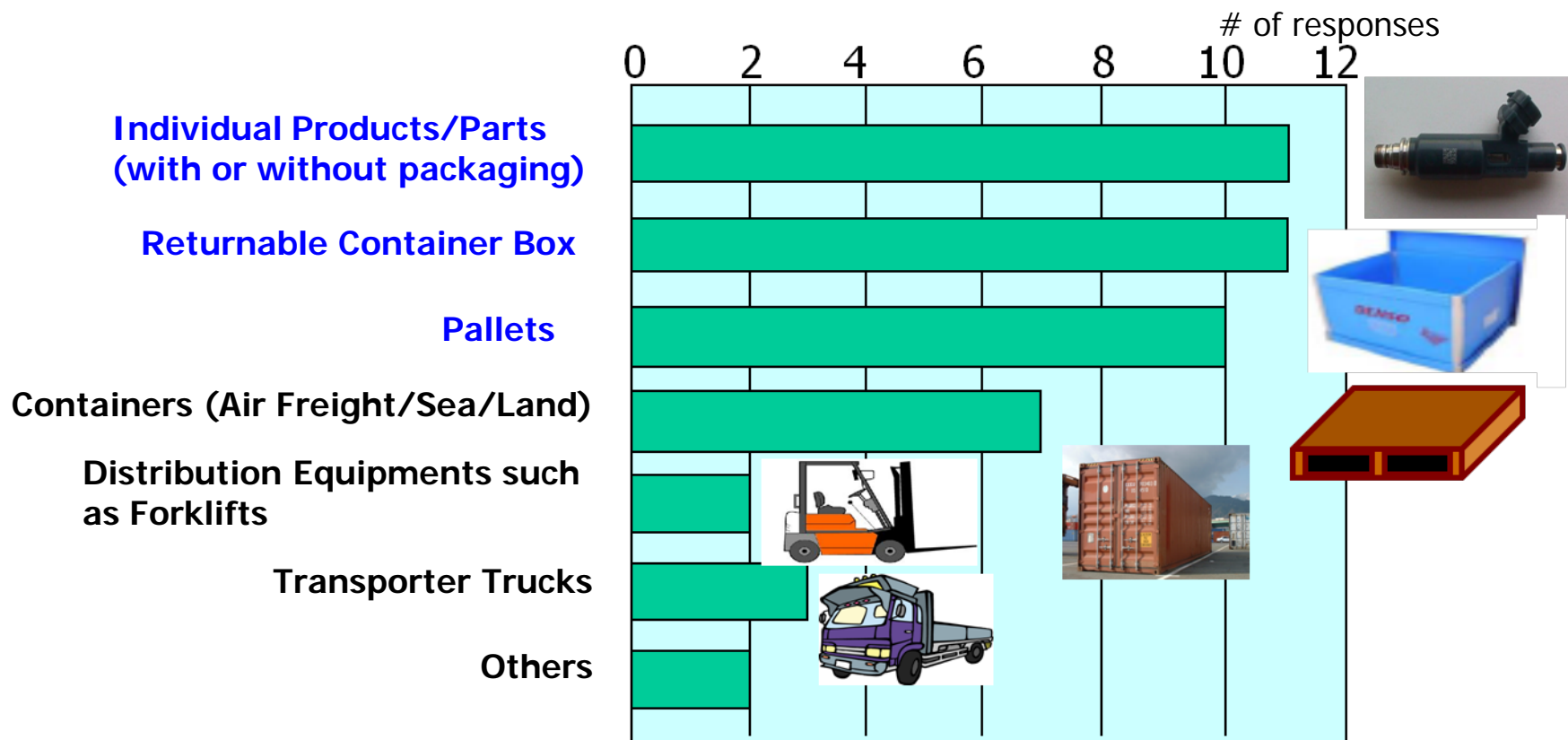
Finding activities of the Logistics Materials etc. WG

Which "logistic/distribution materials" do you wish to track using RFID?

◆Question answered by 25 companies

・Automotive   7 Companies
・Electric/Electronic   7 Companies
・Distribution/Logistics 11 Companies

# of responses

Chart categories (vertical axis):
- Individual Products/Parts (with or without packaging)
- Returnable Container Box
- Pallets
- Containers (Air Freight/Sea/Land)
- Distribution Equipments such as Forklifts
- Transporter Trucks
- Others

Horizontal axis: 0 2 4 6 8 10 12

Summary RFID Pilot Project

◆Standardized returnable containers used in the project

- •4 sides collapsible, 1/48 container module size reusable box.

◆Benefits of using returnable containers

i) Economic advantages
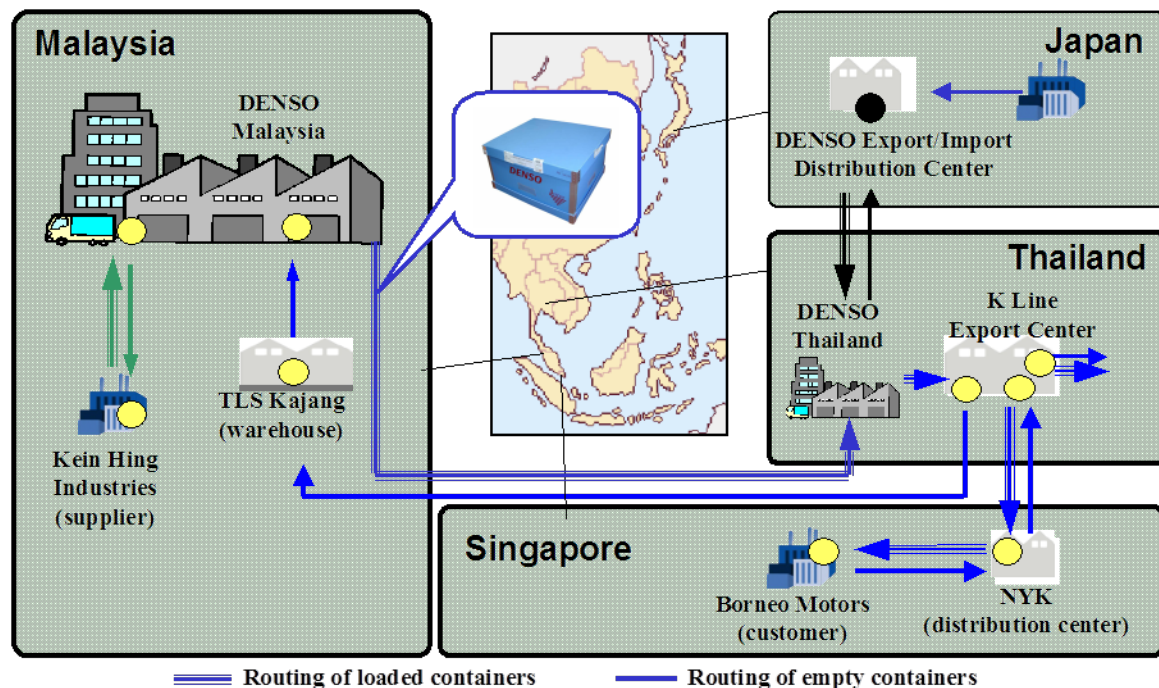- •Over 19% packaging cost reductions by replacing cardboard boxes to returnable containers.

Container Lifecycle	Circulation Cycle	Cost reduction ratio
3 years	2 mths/cycle	19 %
	1.5 mths/cycle	24 %
5 years	2 mths/cycle	27 %
	1.5 mths/cycle	29 %

ii) Contribution to natural environment protection.

By implementing 2,400 returnable containers, we were able to save paper resources equivalent to 1,500 timber wood/year.
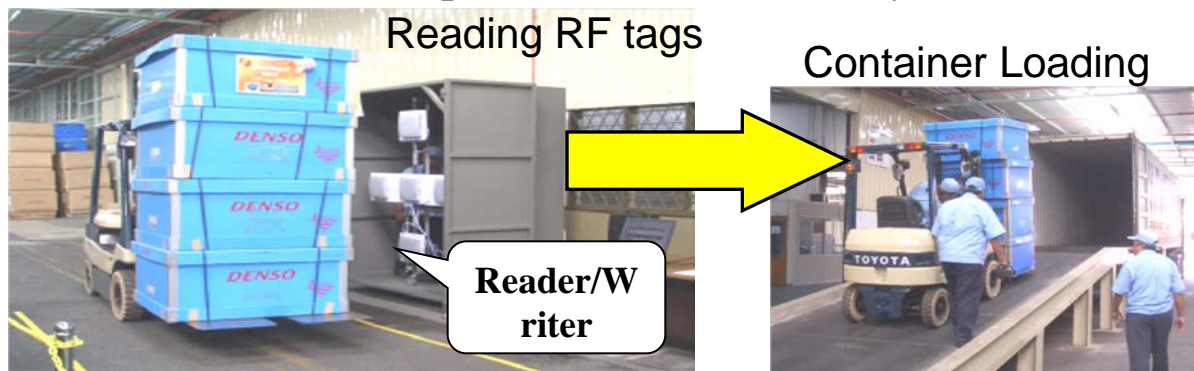
Summary RFID Pilot Project

◆ **Test Locations**

Malaysia
- DENSO Malaysia
- TLS Kajang (warehouse)
- Kein Hing Industries (supplier)

Japan
- DENSO Export/Import Distribution Center

Thailand
- DENSO Thailand
- K Line Export Center

Singapore
- Borneo Motors (customer)
- NYK (distribution center)

═══ Routing of loaded containers ─── Routing of empty containers

◆ **Reader/Writers**

○ **Panel Type**

● **Hand-held Type**

◆ **Test Site** (example from DENSO Malaysia)

Reading RF tags

Container Loading

Reader/Writer

◆ **RF Tag**

Container identification label with 2D code (QR code)

Returnable Container

Corporate number	Packing No.	Purchase Y.M.	Serial No.
560630	N5TH	0507	0024
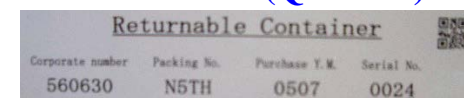
RF Tag attached behind the label

Summary RFID Pilot Project Ⅲ

◆ **Returnable containers being used.**

Currently, rapidly expanding as "Standard" Returnable Containers for international trade within ASEAN.
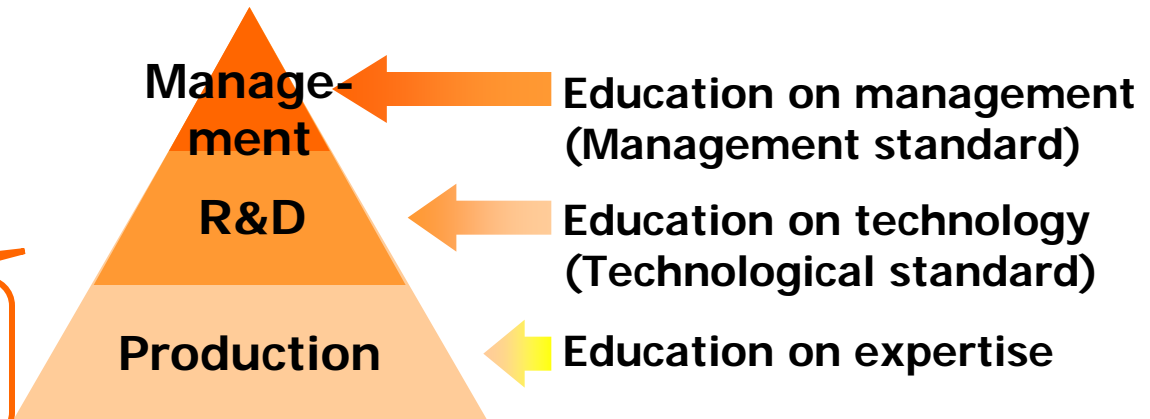
Summary

How can LC participate in the value chain?

●**Study the target industry. (for higher management quality)**
●**Enhance technologies & techniques. (How to use the data carrier)**
●**Gain access to other markets.**

Government level promotion activities

●**Human education**
●**Watch for a global standard that works against LC's interest**

Key is a stabilization of employment.

Manage-ment

R&D

Production

Education on management (Management standard)

Education on technology (Technological standard)

Education on expertise

Improvement of supply chain

●**Make customs procedures more simple, unified and speedy.**
●**RFID: Promotion of radio laws & technology standards.**

Thank you for your attention!