Construction of an International Smart Supply Chain for the Realization of Connected Industries across Borders
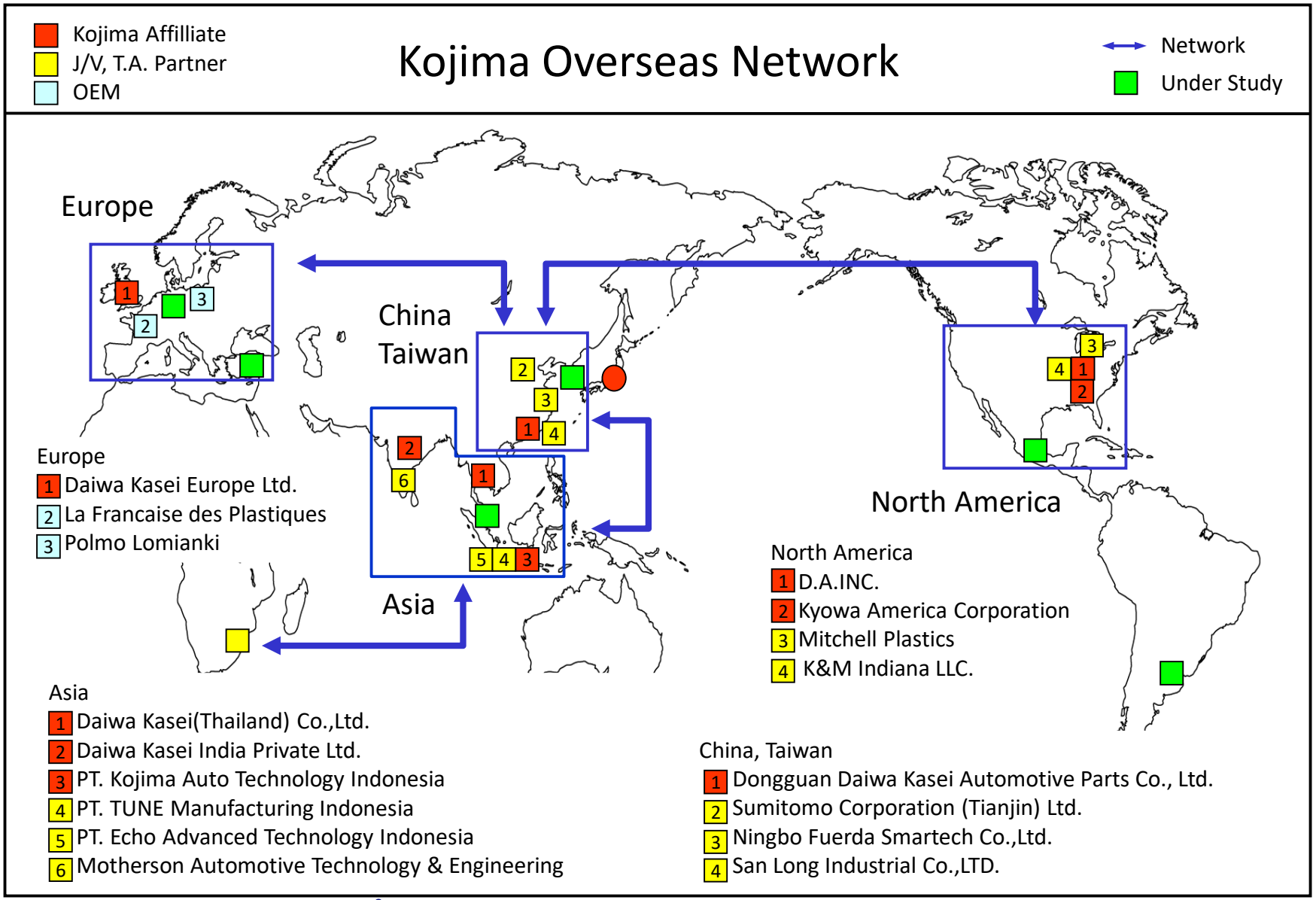

Kojima Industries Corporation
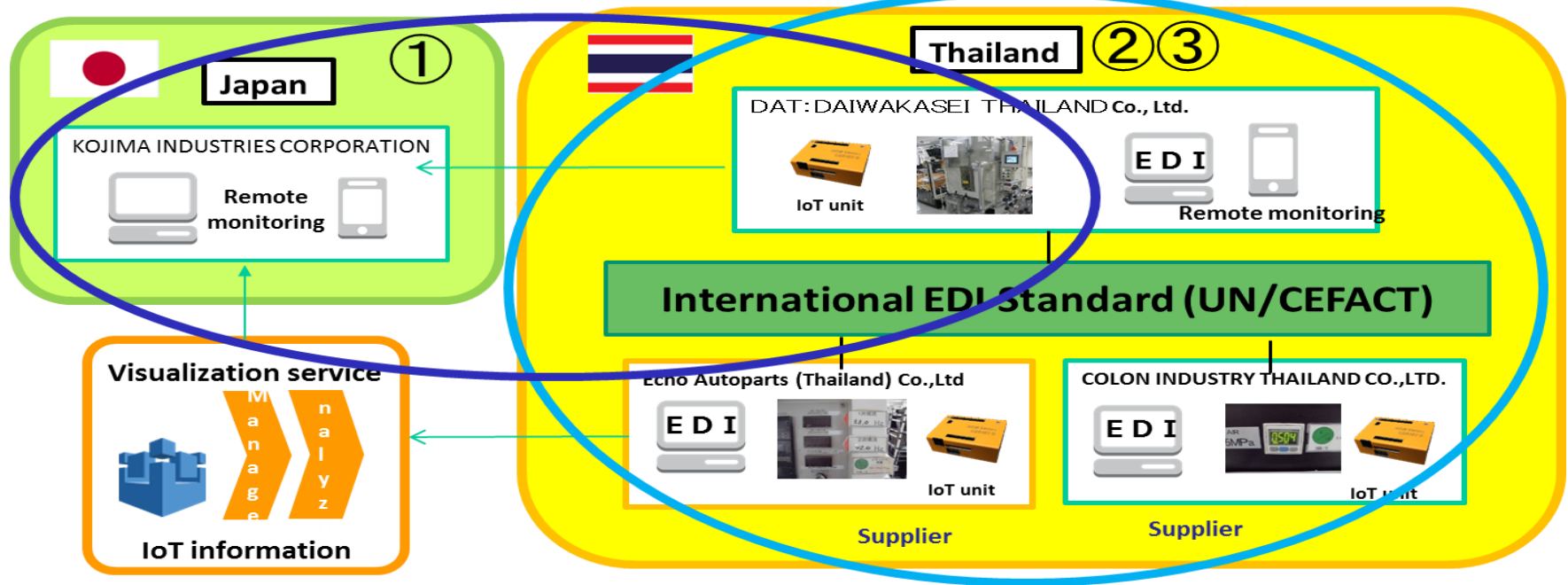
Company policy: Harmony

社是　和

- Address: Toyota City, Aichi Prefecture
- Capital: 450 million yen
- Founded on: May 20, 1938
- Number of employees: 1,703
- Sales: 174.2 billion yen

Kojima Overseas Network

Legend:
- 🟥 Kojima Affilliate
- 🟨 J/V, T.A. Partner
- 🟦 OEM
- ⬌ Network
- 🟩 Under Study

Europe

Europe
1 Daiwa Kasei Europe Ltd.
2 La Francaise des Plastiques
3 Polmo Lomianki

China Taiwan

Asia

Asia
1 Daiwa Kasei(Thailand) Co.,Ltd.
2 Daiwa Kasei India Private Ltd.
3 PT. Kojima Auto Technology Indonesia
4 PT. TUNE Manufacturing Indonesia
5 PT. Echo Advanced Technology Indonesia
6 Motherson Automotive Technology & Engineering

North America

North America
1 D.A.INC.
2 Kyowa America Corporation
3 Mitchell Plastics
4 K&M Indiana LLC.

China, Taiwan
1 Dongguan Daiwa Kasei Automotive Parts Co., Ltd.
2 Sumitomo Corporation (Tianjin) Ltd.
3 Ningbo Fuerda Smartech Co.,Ltd.
4 San Long Industrial Co.,LTD.

Kojima KOJIMA INDUSTRIES CORPORATION

①②　IoT collects and visualizes the operation status of manufacturing equipment in a timely manner.
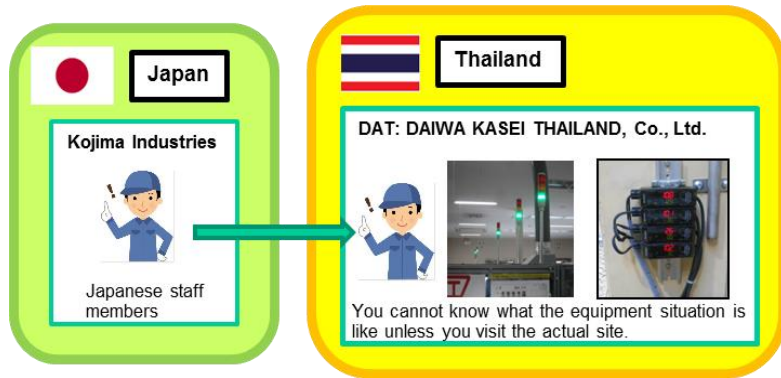
▼Effectively utilize production resources such as human, equipment, time, and optimize according to the situation.

③　Requirement definition and actual operation of international EDI in Thailand

▼Standardize and unify the ordering/order receiving operation, and pursue efficiency throughout the supply chain.
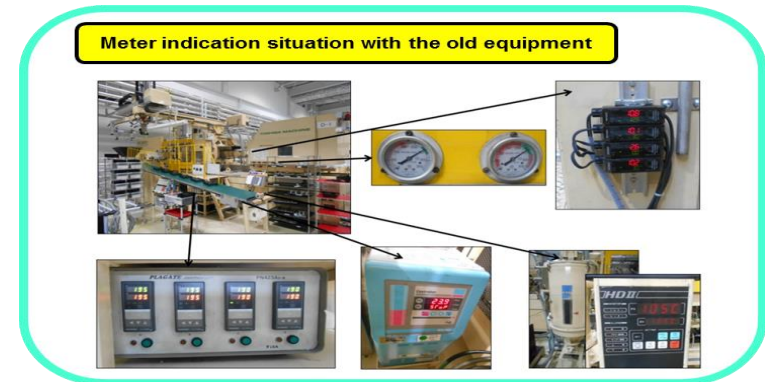
(1) Equipment maintenance cost
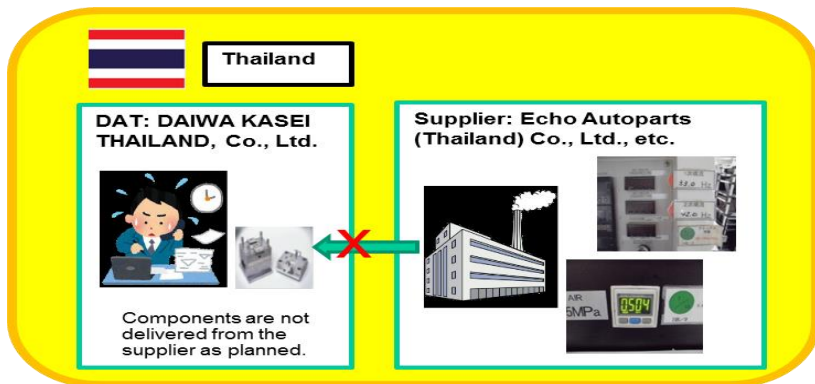
● **Long-term support of Japanese staff**

Japan — Kojima Industries — Japanese staff members

Thailand — DAT: DAIWA KASEI THAILAND, Co., Ltd.

You cannot know what the equipment situation is like unless you visit the actual site.

(2) Legacy equipment

● **Many old type equipment, unable to link with IoT**

Meter indication situation with the old equipment

(3) Sharing progress information on production

● **Unrecognized of production status of Thai suppliers**

Thailand

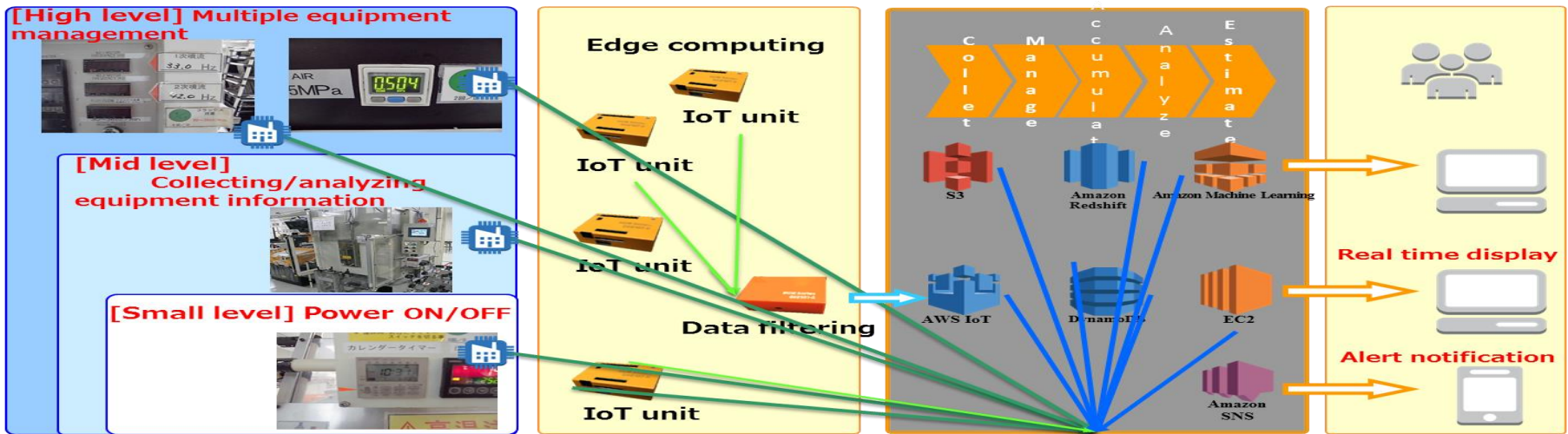DAT: DAIWA KASEI THAILAND, Co., Ltd.

Supplier: Echo Autoparts (Thailand) Co., Ltd., etc.

Components are not delivered from the supplier as planned.

(4) Ordering/Order receiving

● **A lot of inefficient ordering/order receiving process**

Thailand

Automobile manufacturer

Primary supplier — DAT — XXX — XXXX

Secondary supplier — Echo — COLON — ...... — ......

Unique Web-EDI, etc.
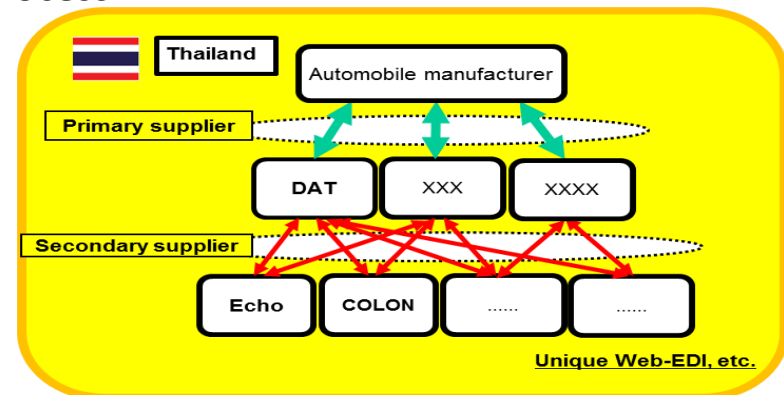
Case 1: Using web camera

●Convert meter number into data.

Web camera

Digitizing by using image recognition

Case 2: Using IOT unit
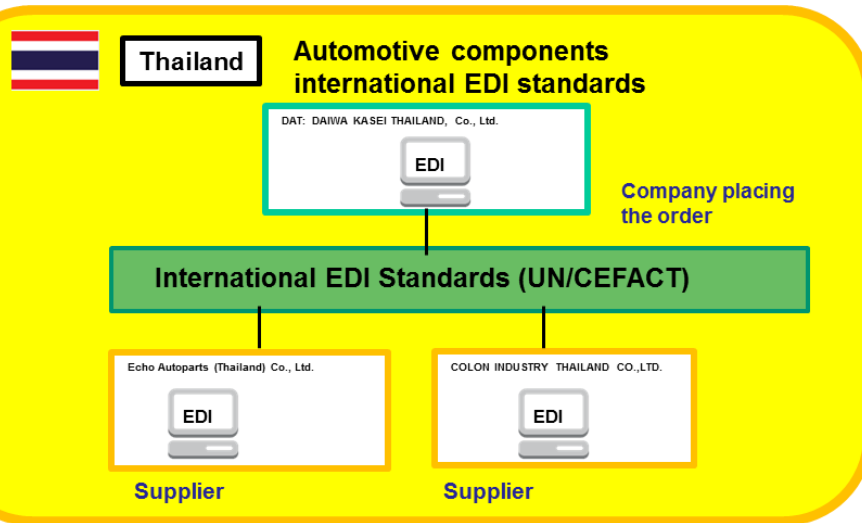
●Develop inexpensive data linking tool.

■*One set can be implemented at 70,000 yen.*

・IOT unit・・・60,000 yen

・Web camera, Light sensor・・・10,000 yen

KOJIMA INDUSTRIES CORPORATION

Case 1: Create an EDI system

Thailand

Automotive components international EDI standards

DAT: DAIWA KASEI THAILAND, Co., Ltd.

EDI

Company placing the order

International EDI Standards (UN/CEFACT)

Echo Autoparts (Thailand) Co., Ltd.

EDI

Supplier

COLON INDUSTRY THAILAND CO.,LTD.

EDI

Supplier

■ **Establish WG by 7 companies and define operation.**

→ **Decide transaction standard in Thailand.**
(Actual result: held 13 times of meeting)

■ **Register in the UN/CEFACT and make international standardization.**

■ **Developed EDI system.**

→ **(3 times of Design Review)**

Case 2: Actual trial with EDI

After standard EDI deployment

Company A Company B Company C

Common EDI

1

Standardization of data

2

Standardization of forms(KANBAN, PDS)

Operating procedure manual
1 xxx
2 xxx

Common operation manual

3

Standardization of operations
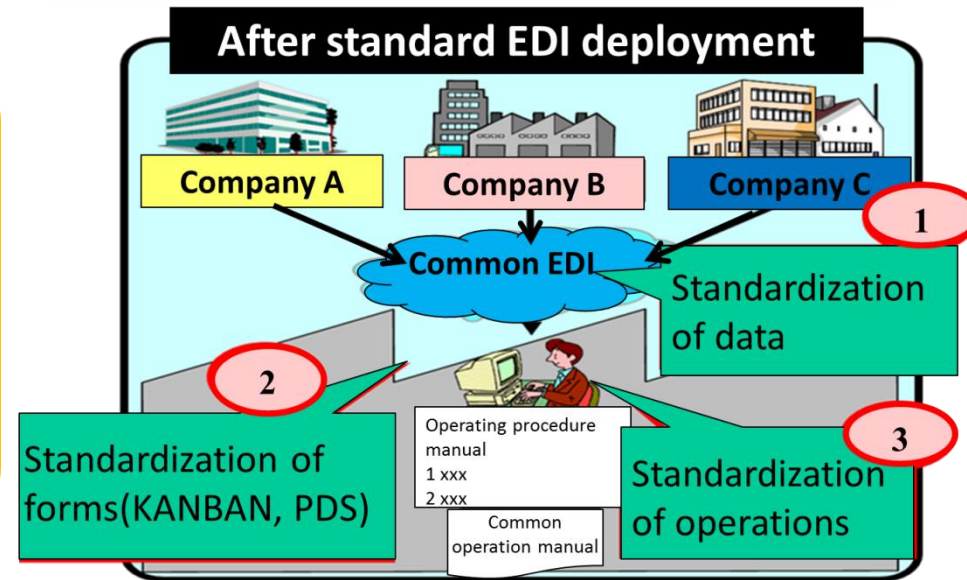
■ **Under actual trial in prototype version.**

・**Buyer (DAT)**
・**Seller (11 companies)**

→ **Currently ongoing**

■ **Retrial after the international EDI development.**

→ **January, 2019**

Actual	Items			Before	After	Bebefits	Year round benefits (10 thousand yen)
IOT Linkage	Benefits		Number of days and times of Japanese staff	728days /Year	210days /year	65% decrease	950
			Confirmation when problems occur Lead time reduction	24hours /year	1hour /year	97% decrease	7
			Inexpensive handling with legacy production equipment	5million yen /piece	70,000yen /piece	99% decrease	493
	Secondary benefits		Improve KPI, KGI skills of local staff				
Internationa EDI	Benefits	Buyer	Reduction of ordering work hours	332hours /month	142hours /month	58% decrease	180
			Loss reduction due to mistake in human error	16hours /month	0hours /month	100% decrease	9
		Seller	Reduction of order receiving work hours	363hours /month (11companies)	122hours /month (11companies)	76% decrease	192
			Loss reduction due to mistake in human error	55hours /month (11companies)	0hours /month (11companies)	100% decrease	30
		Both	Shortening education time by standardization	240hours /month (12companies)	48hours /month (12companies)	80% decrease	104
	Secondary benefits	Both	Unification of operation makes standard work unified				
Total							1,965

[Main benefits of DAT and 11 suppliers]

Japanese companies expanding in Thailand (Manufacturing industry)
2,346 companies

Number of supply chains
28,152 companies

*Calculated on the scale of the companies that carry out this trial.

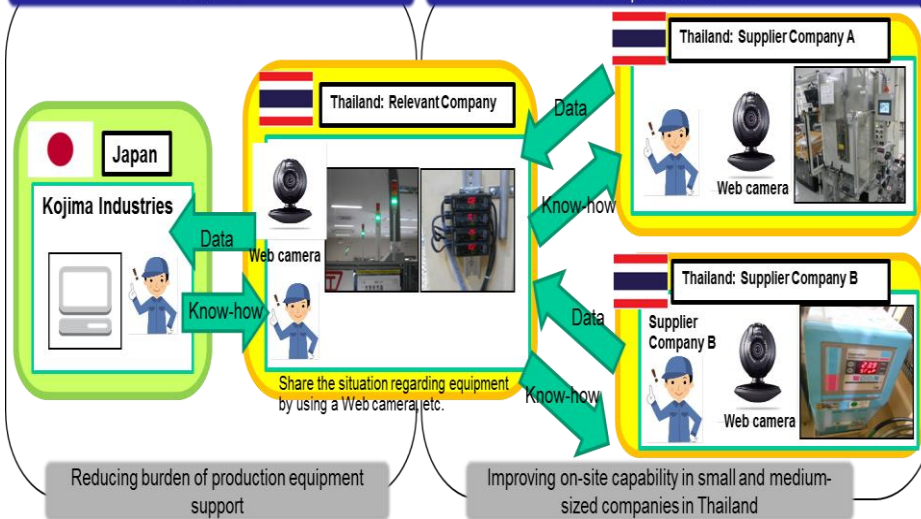～ *Even with 20% widespread deployment* ～

[Effect on economy]
¥ 110.6 billion

IOT equipment linkage

International EDI construction

(1) Sharing equipment information between Japan and Thailand

(2) Also making use of IoT in local small and medium-sized companies in Thailand

Japan — Kojima Industries

Thailand: Relevant Company

Data / Know-how

Web camera

Share the situation regarding equipment by using a Web camera, etc.

Reducing burden of production equipment support

Thailand: Supplier Company A

Web camera

Thailand: Supplier Company B

Supplier Company B — Web camera

Data / Know-how

Improving on-site capability in small and medium-sized companies in Thailand

Expansion of Thailand-based supply chain

[Features]

■Data accumulation with an inexpensive system.

■Real monitoring of equipment status with IOT

→Accumulating monitoring data and analyzing trends with AI will lead to improvement.

▼*Preventive maintenance of equipment and lines*

  = Improvement in quality and productivity can be expected.

[Features]

■Support electronic signature

■Ordering/order receiving with unit price

→In Japan, since the unit price is given in a separate system, it takes time for information linkage until billing.

▼*Reimportation of international EDI into Japan*

  = Simplify management can be expected.