

Smart Factory DIY?



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บริษัท นิเด็ค ชิบาอูระ อิเล็กทรอนิกส์ (ประเทศไทย) จำกัด

日本電産テクノモータ株式会社
NIDEC TECHNO MOTOR CORPORATION

Our Activities



The Scope of Industry 4.0

MES & Production Profile including OEE

- Information between the front-end equipment & MES application
- Production Traceability

Production Testing Equipment

- Machine Vision
- Motion I/O Cards
- Computing Platform
- Controller

Factory Environmental Monitoring

- Electricity Monitoring
- Factory Waste Water
- Energy Management

Predictive Maintenance

- Production Performance Analysis
- Machine Status
- Abnormal Diagnosis
- Sensor Measurement

Machine Automation

- Industrial Robots
- Automated Guided Vehicle
- Industrial Machinery

MES : Manufacturing Execution System
OEE : Overall Equipment Effectiveness

Smart Factory in 2018

Step 1

IoT to make “Speaking Machine”

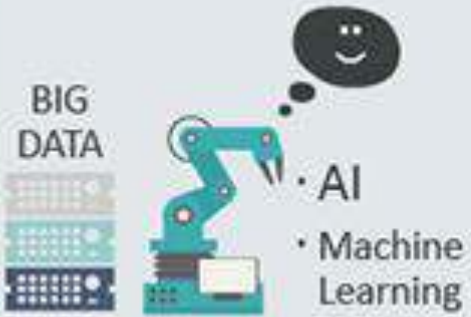
ใช้ IoT เพื่อให้เครื่องจักรและอุปกรณ์ “พูดได้”



Step 2

MeS & Adv. Traceability System

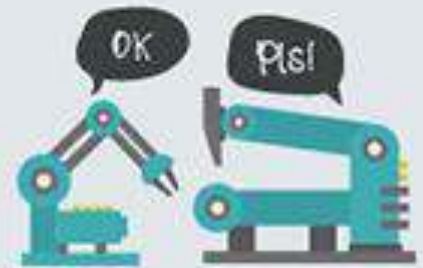
สั่งสมประสบการณ์ รับรู้ความสัมพันธ์ และขยันในการวิเคราะห์ข้อมูล



Step 3

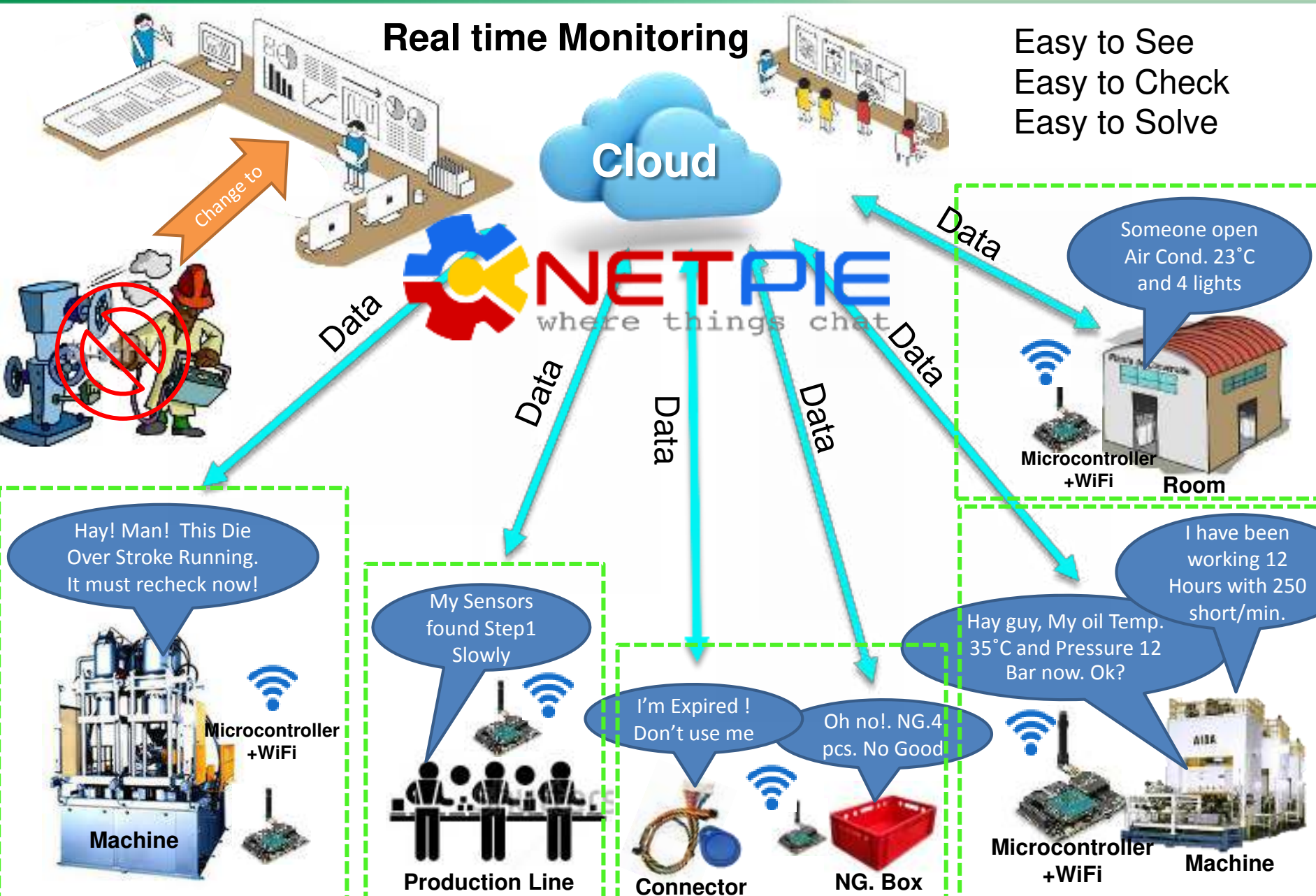
Machine to Machine (M2M)

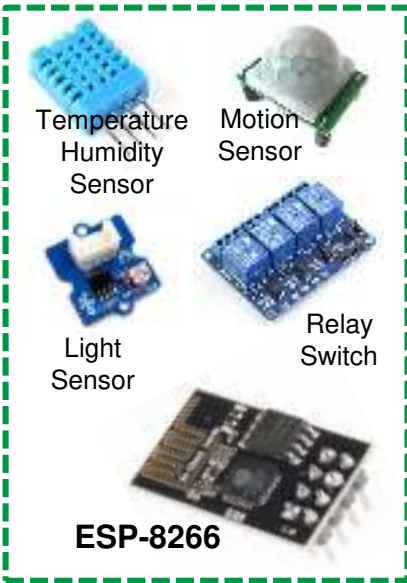
ทำให้เครื่องจักรเชื่อมโยงสั่งการได้ด้วยตัวเอง



Real time Monitoring

Easy to See
 Easy to Check
 Easy to Solve





1st Project of IoT Activities



Temperature Box



Before



ROOM NAME	TEMPERATURE	HUMIDITY	STATUS
ELECTRICAL	26.00	10.31	OK
FAIRY DO	28.00	27.00	OK
OFFICE	29.00	20.63	OK
RECEPTION	27.00	10.31	OK
SR	26.00	10.31	WARNING
KEMETAL	28.00	10.31	OK
SECRETARIAT	27.00	9.69	OK
SECRETARIAT	30.00	9.69	OK
RT	24.00	12.19	OVER HEAT

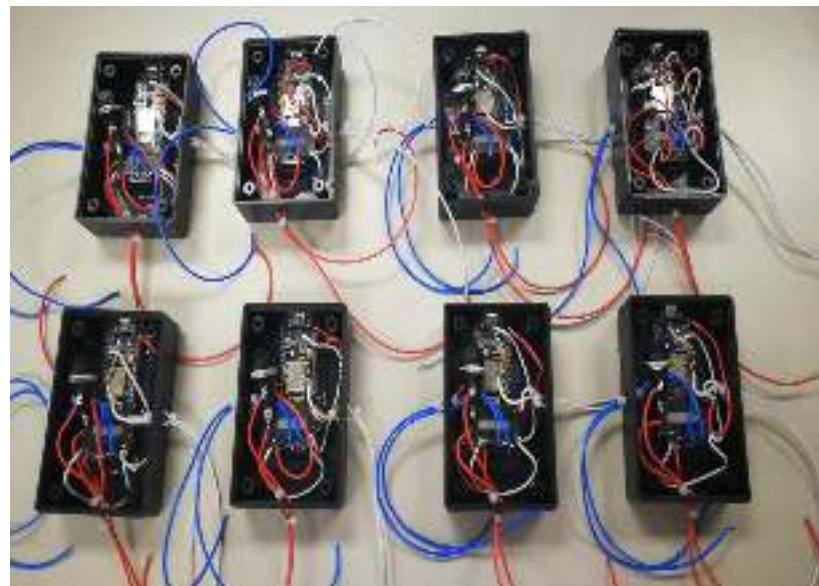


After

ห้องควบคุมอุณหภูมิ 12 ห้อง + ตู้เย็นเก็บสารเคมี 3 ตู้ → 15 x 24 x 30 = **10,800** นาทีต่อเดือน
 → 65 บาทต่อชั่วโมง = **140,400** บาทต่อปี



Smart Remote
For Air Conditioner (Top View)



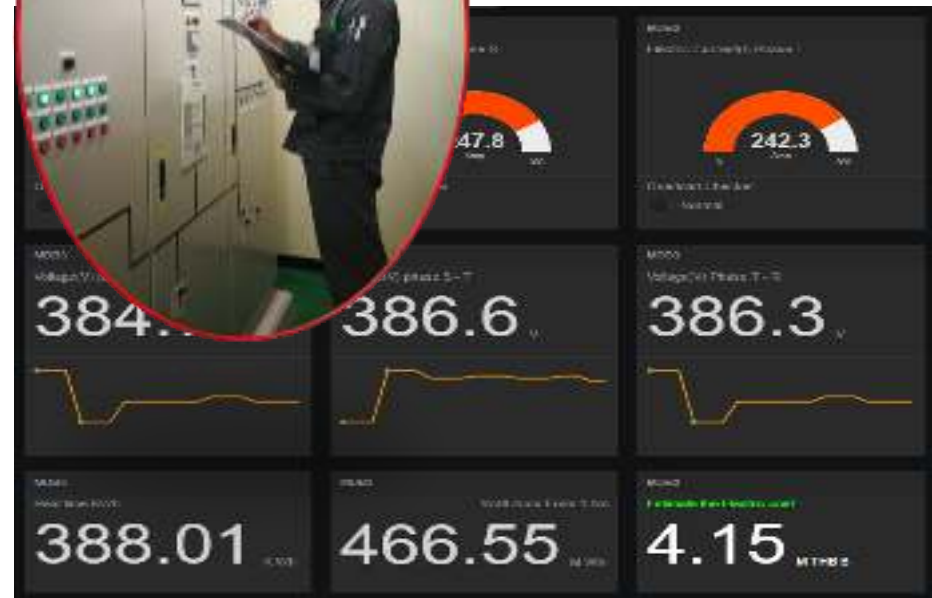
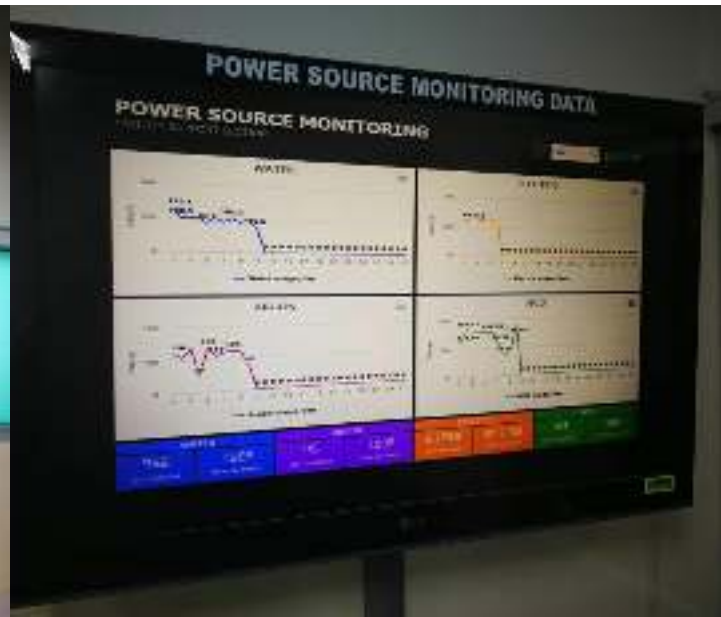
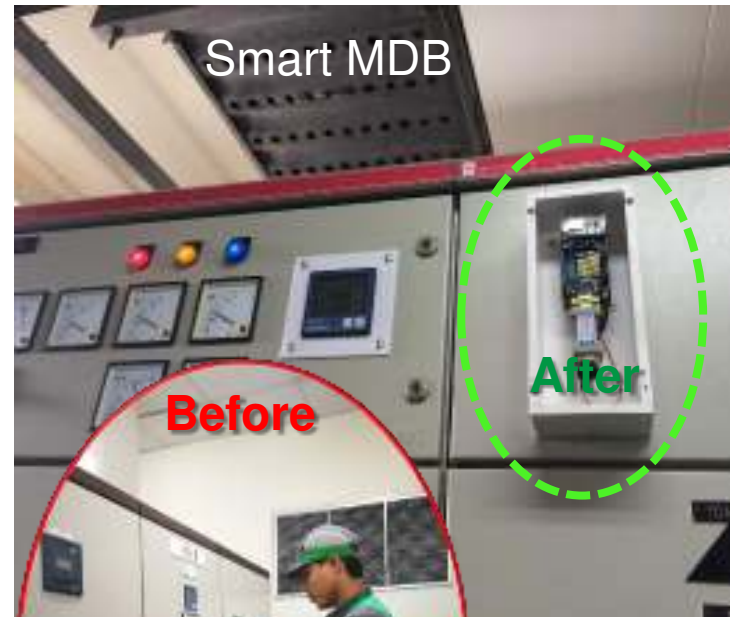
Smart Light







Air Conditioners Center Control (Office Area)

Smart Energy Management:

Smart MDB



Overview Energy Consumption Monitor

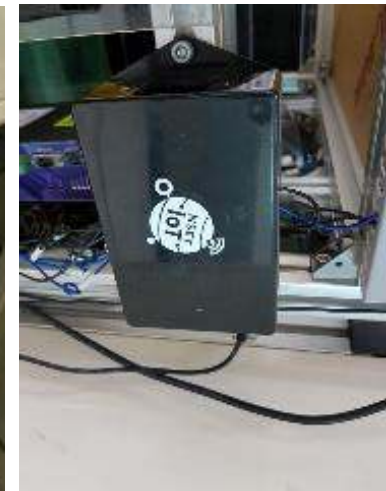
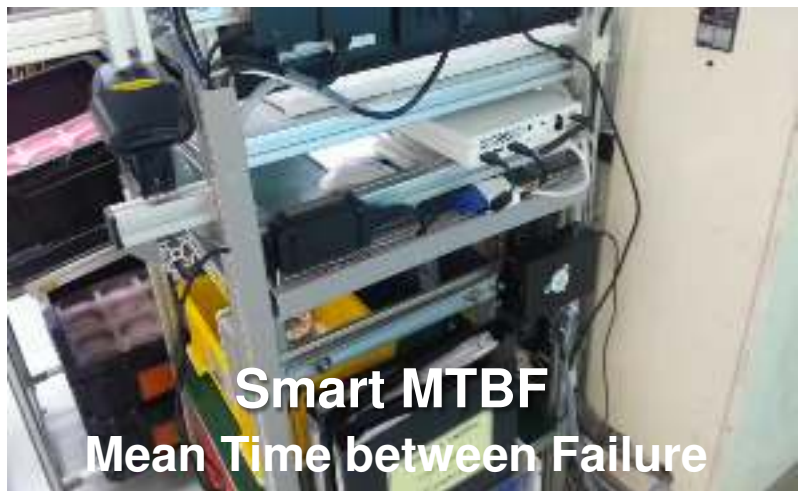
-  Lubricant Temperature Sensor
-  Cooling Water Flow Rate Sensor
-  Pressures Sensor
-  Omron PLC



Smart Machine Condition

Real-time Monitor on Mobile and Web

Smart Production Line:



MTBF | REALTIME MONITORING [AM50 Winding & Forming] Production Line Efficiency Control

09:27:37
  where things chat

LINE	MTBF (min)	MTTR (min)	STOP (time)	LOSS (min)	STATUS
A	48	3	13	42	ON
B	70	4	9	36	ON
C	42	4	15	67	ON
D	90	5	7	38	ON
E	70	2	9	18	ON
F	70	2	9	21	ON
G	78	6	8	54	ON
H					



After



SHOT DIE CONTROL

Shot Die Injection Mold Control Monitor



15:19:53

No.	Motor	Die No.	Position	Shot Control	Shot actual	Remark
1	AM50	0569	Mc.P A1	5,000	3,167	Normal
2	AM50	0602	Mc.P A2	5,000	1,920	Normal
3	AM50	0568	Mc.P A3	5,000	4,316	Normal
4	AM50	0599	Mc.P B1	5,000	1,160	Normal
5	AM50	0580	Mc.P B2	5,000	2,497	Normal
6	AM50	0601	Mc.P B3	5,000	406	Normal
7	AM50	0600	Mc.P C1	5,000	1,632	Normal
8	AM50	0581	Mc.P C2	5,000	3,861	Normal
9	AM50	0579	Mc.P C3	5,000	3,690	Normal

Normal 0 1250 Shot

Warning 4351 4369 Shot

240 Shot 5100 more than

Smart Shot Die Counting



Smart Shelf



Space Utilization

Stock Searching



RFID



Smart Forklift



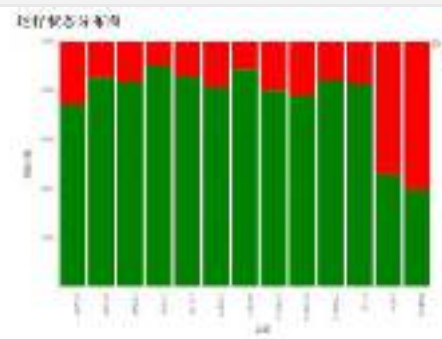
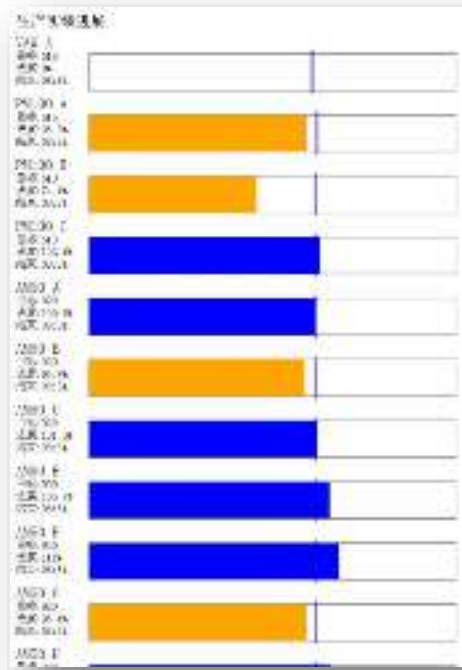
Inventory Real-time Monitor



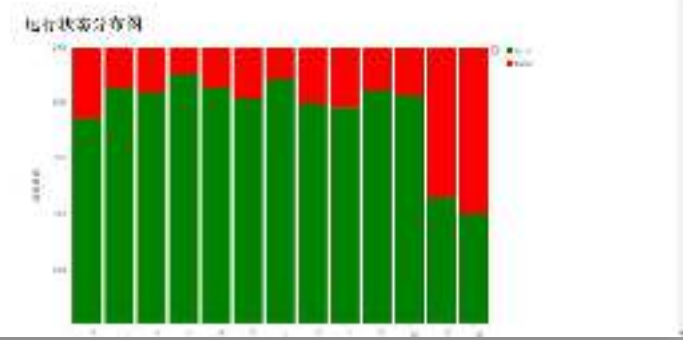
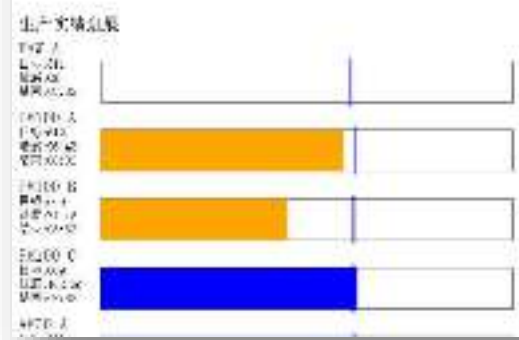
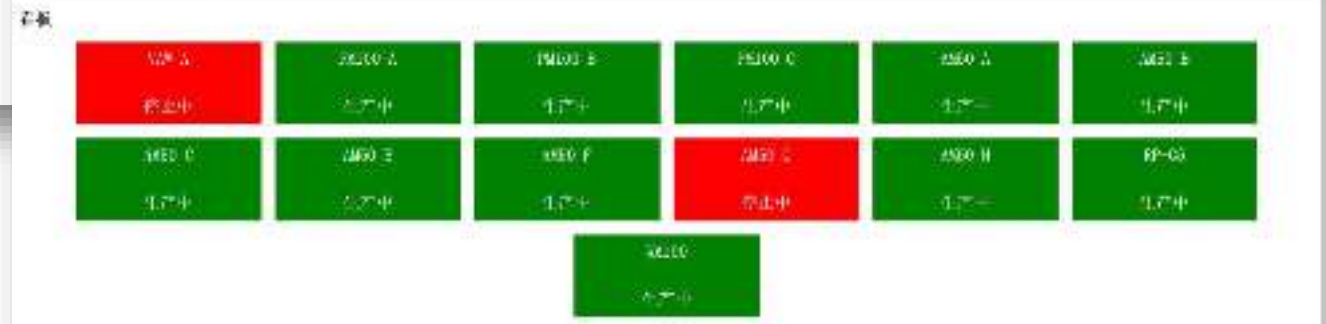
Smart Management:



Real-time Monitor in Japan & China:



NETPIE 生产实绩可视化系统



Smart Factory in 2018

Step 1

IoT to make “Speaking Machine”

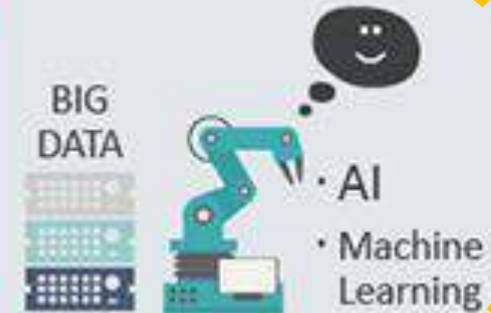
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Step 2

MeS & Adv. Traceability System

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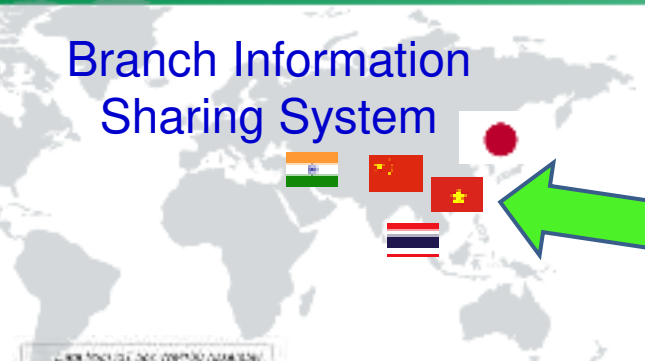
Step 3

Machine to Machine (M2M)

ทำให้เครื่องจักรเชื่อมโยงสั่งการได้ด้วยตัวเอง



Branch Information Sharing System



Predictive Maintenance System

A dashboard showing various data points, graphs, and charts, representing a predictive maintenance system.

Efficiency Control or OEE

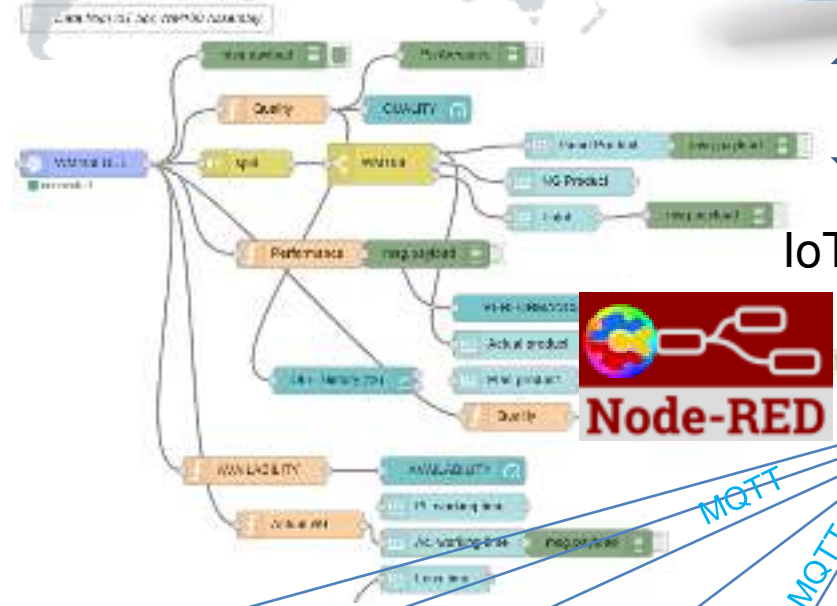
A dashboard displaying 'Real Time Production Data' with metrics like 'Machine: Cell', 'Product: jkxw', and 'Date: 12/12-2014'. It includes a bar chart and several gauges, including one showing '34'.

Smart Quality Control

Smart Control Limit Alerting

An illustration of a person sitting at a computer workstation, with a thought bubble above their head, representing smart quality control and alerting.

IoT Gateway



Intelligent Production Line



Dynamic Line Concept



Repairing Alerting



Smart Weight
"Cu-Robot-Car"
Version 1.0



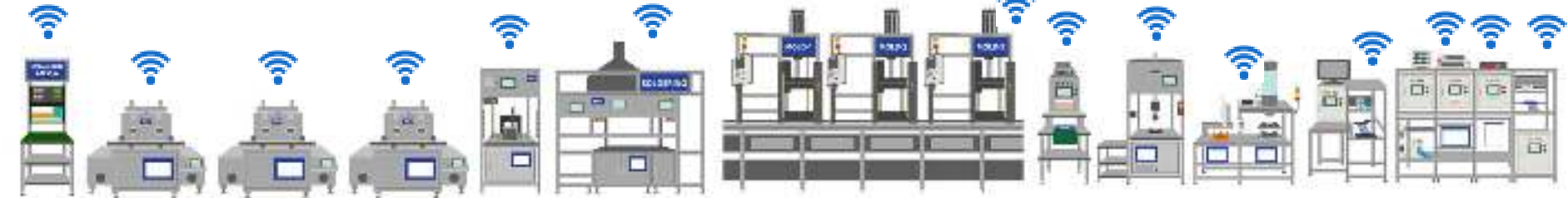
OEE Alerting



Mobile Machine Daily Checking



Mobile Working Manual



E-Check Sheet System:



Automatic Entry Data



Inspection Monitor

Materials Usage
Confirmation Process



Mobile Device



Manufacturing Order System



PRODUCTION DATA
SECTION : PCB ASSY

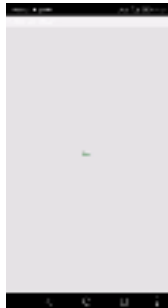
Trace ME Web Application



php



Mobile App.



Smart Factory in 2018

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Step 3

Machine to Machine (M2M)

ทำให้เครื่องจักรเชื่อมโยงสั่งการได้ด้วยตัวเอง



RFID Gate
(for F/G Warehouse)



Intelligent Warehouse Management System



Intelligent Guard House System



Intelligent Transportation Mng. System
(Customer & Supplier)

Augmented Reality Technology

Working Manual

Smart Shelf

Inventory Taking

RFID Gate
(for Materials)



RFID Gate
(for Finish Goods)



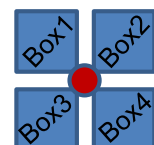
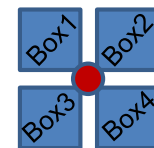
AGV
(for FG)



AGV
(for Packaging)



RFID Gate
(for Packaging)

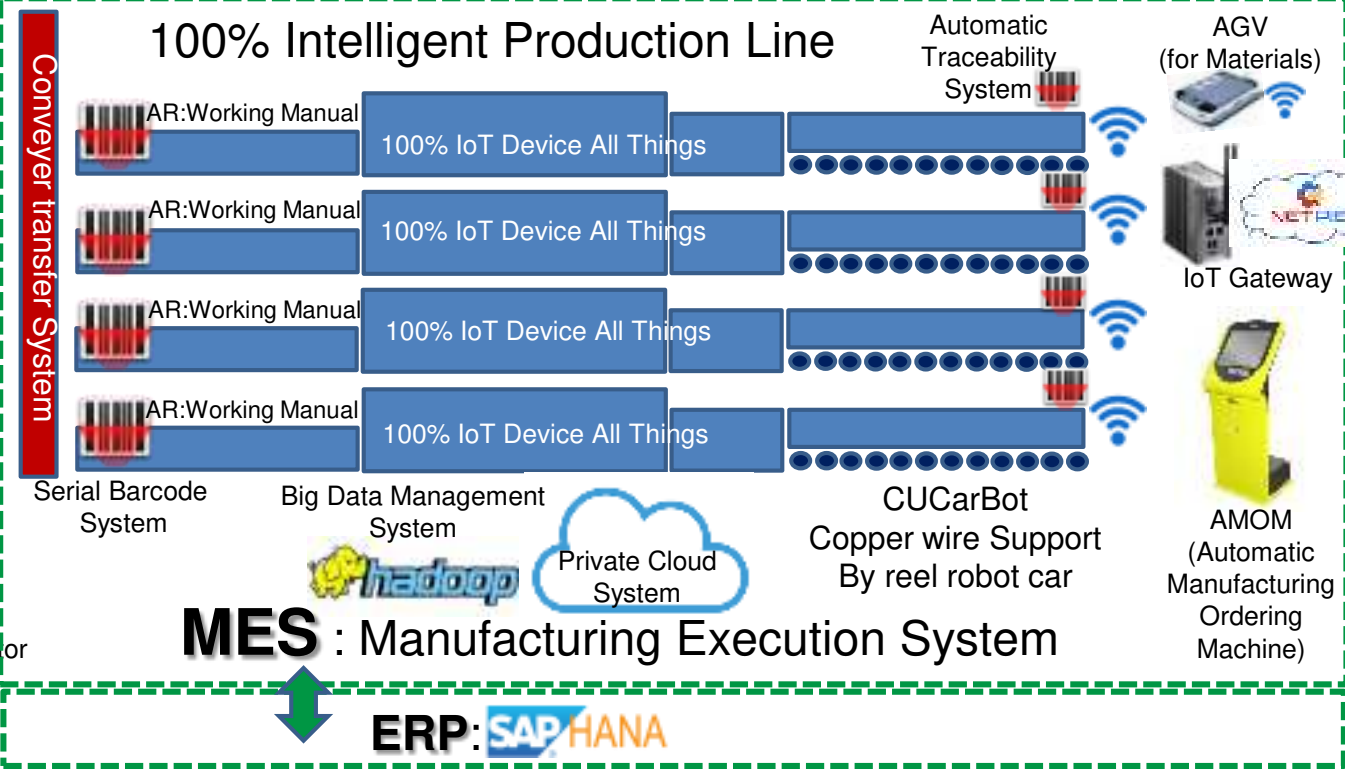


● Robot Arm
For pick up motor

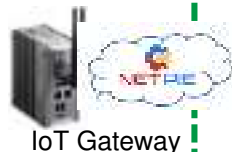
Packaging Stock

Intelligent Packaging Support System

100% Intelligent Production Line



AGV
(for Materials)

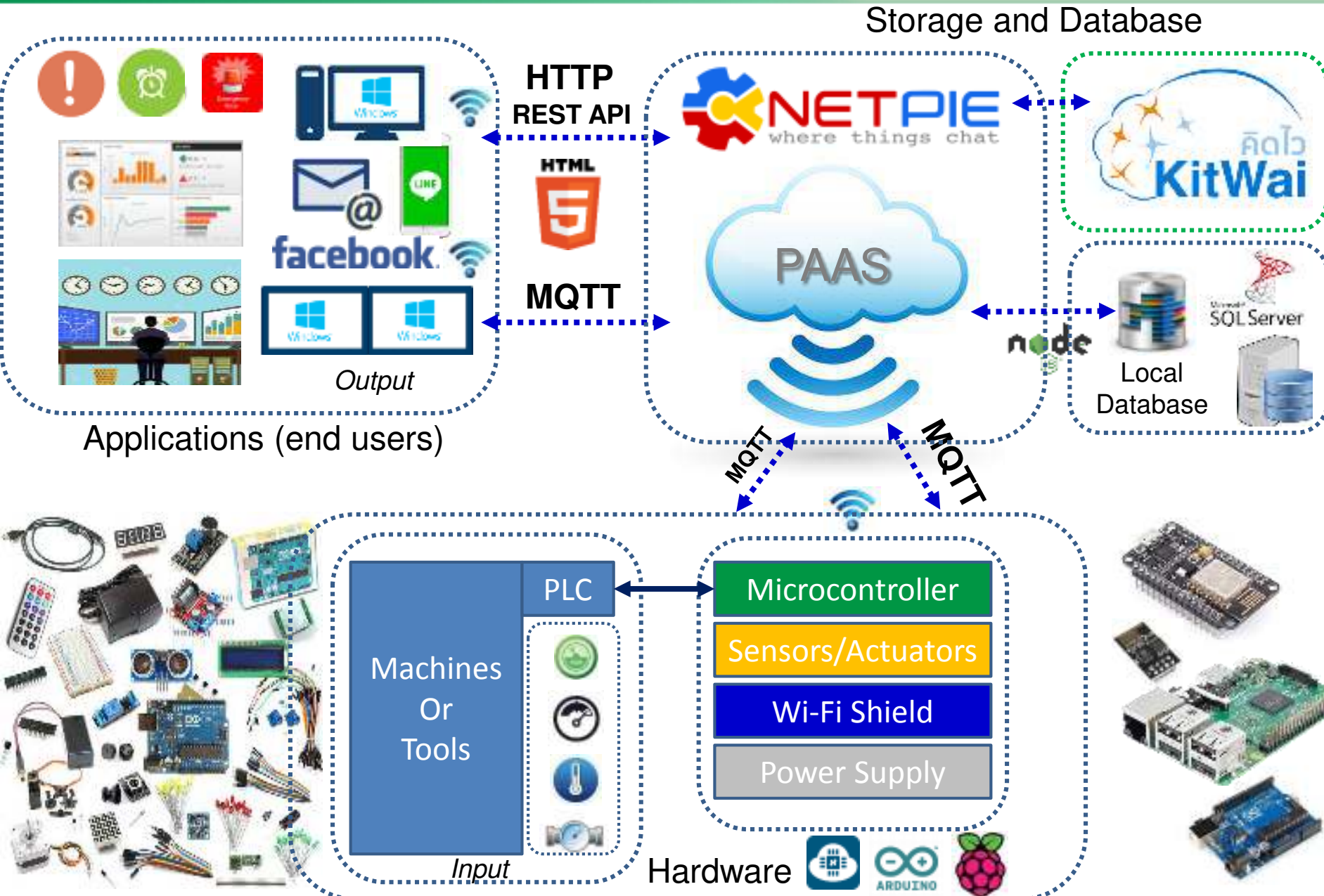


IoT Gateway



AMOM
(Automatic Manufacturing Ordering Machine)

CUCarBot
Copper wire Support
By reel robot car



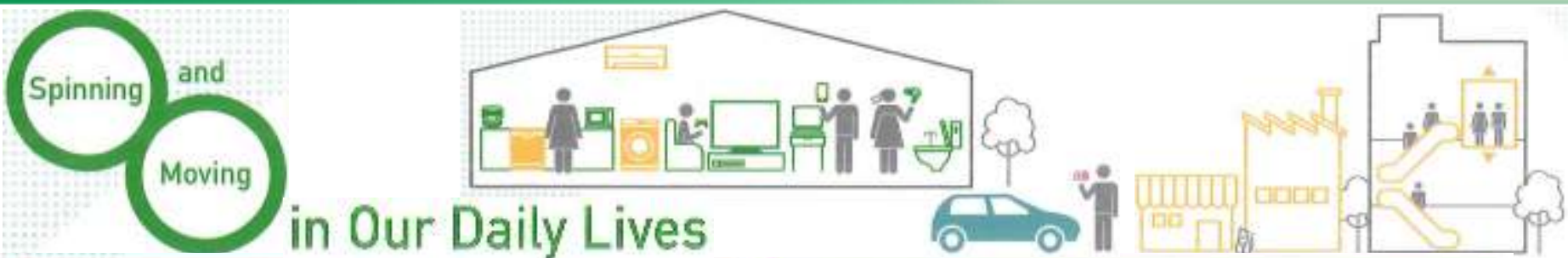


October 2016



October 2017





Other products

④

Percentage of Group sales: **14.9%**

Industrial robots

Shutters for digital cameras

Small precision motors

①

Percentage of Group sales: **38.0%**

HDD motors

Drive motors

Vibration motors



Appliance, commercial, and industrial products

②

Percentage of Group sales: **24.1%**

Air compressor motors

Traction motors

Direct current motors

Automotive products

③

Percentage of Group sales: **23.0%**

Millimeter wave radar units

Electric power steering (EPS) motors

Adjustable water pumps



Thank you