

muRata SPEAKS

TECHNOLOGY | SOLUTIONS | INNOVATIONS

Murata Speaks - Monthly Webinar Series #22 [Jun 2022]

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นวัตกรรม RFID SOLUTIONS กับการใช้งานด้าน การแพทย์



วันพฤหัสบดีที่ 30 มิถุนายน 2565



14.30 น.



การบรรยายเป็นภาษาไทย



มยุภาด เสียงลอย
นักพัฒนาธุรกิจ



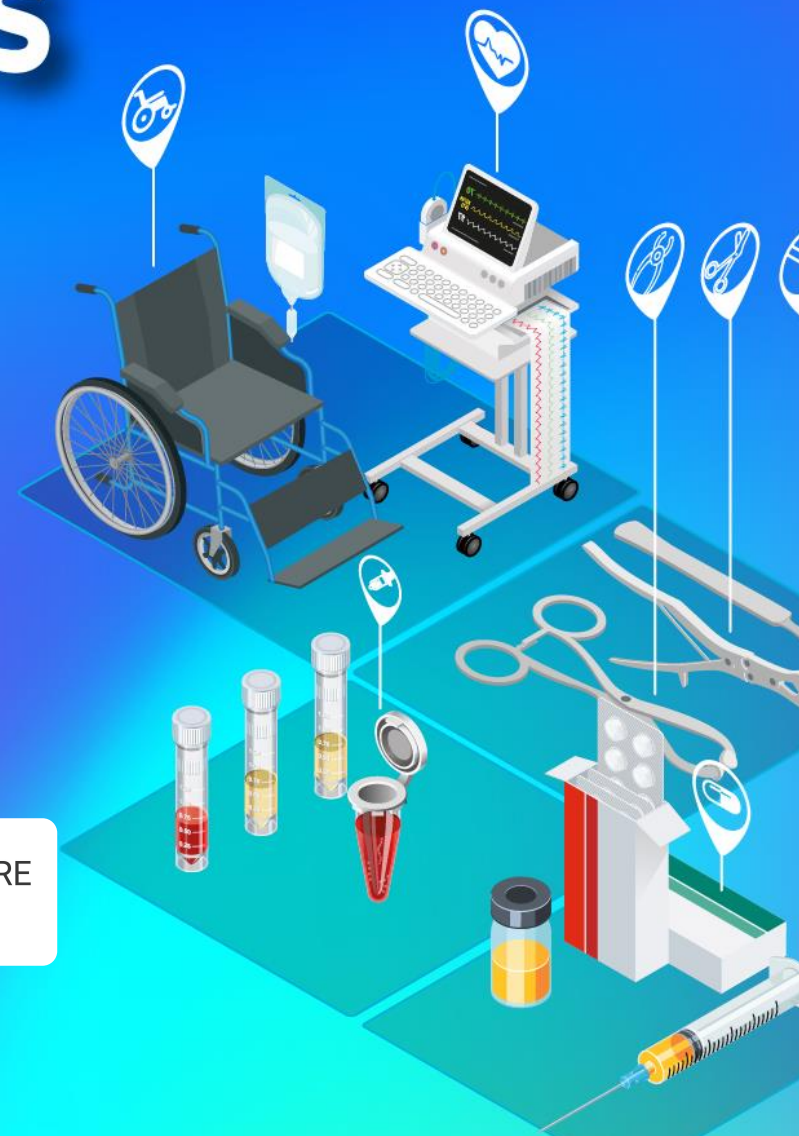
สมภพ ตาสอน
ซีอีโอ และผู้ก่อตั้ง

muRata
INNOVATOR IN ELECTRONICS

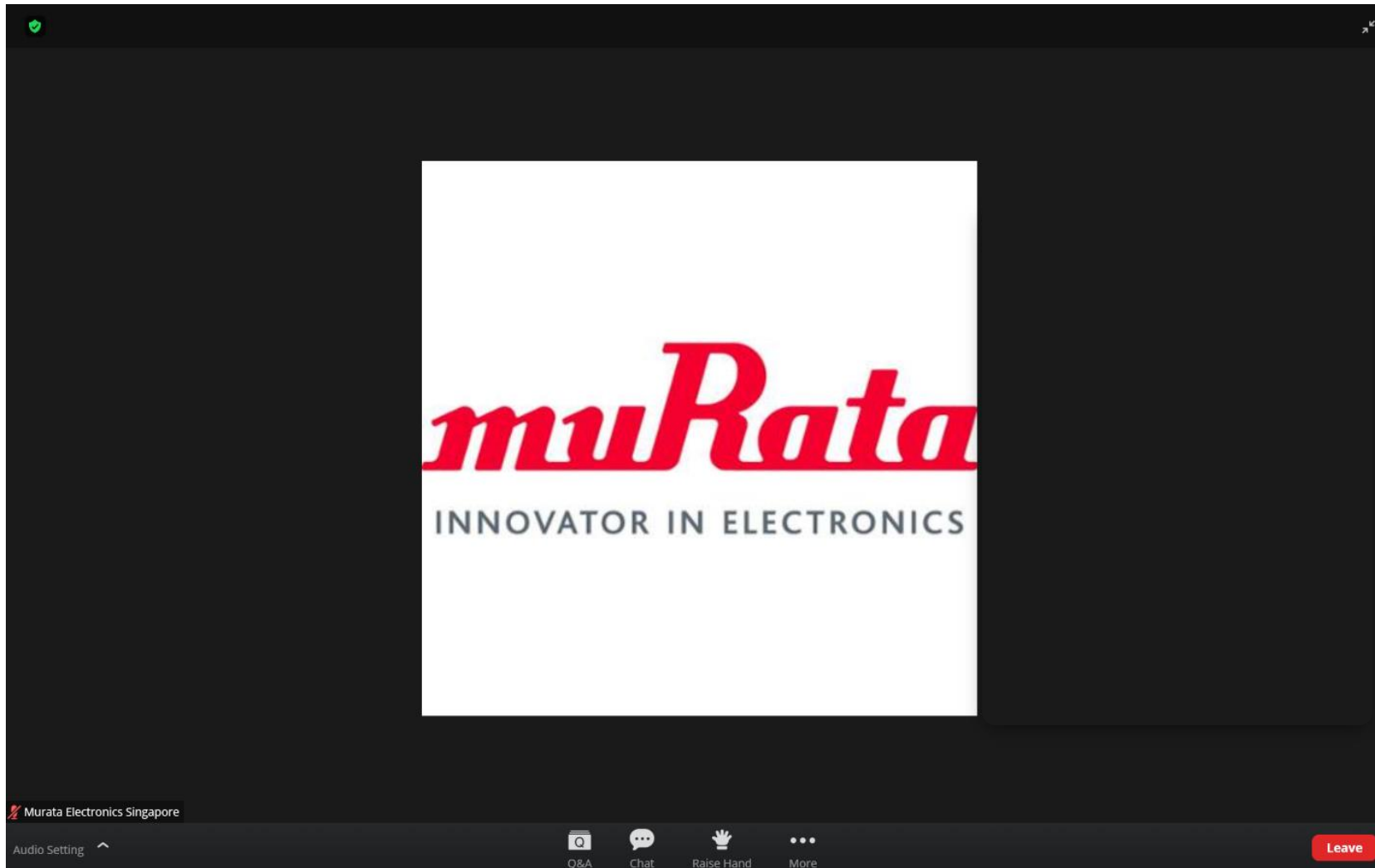
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House Rules | Navigation Guide



Enable
"Computer
Audio"



Attendees will be
kept on mute
during the
webinar.



Questions?
Please type
them into **Q&A**.



Slides and
recording will be
available after
the session.

Today's Presenters



Mr. Sompop Talson

CEO and Founder
Arcadia Software Development Co.,Ltd



sompop.talson@arcadiaapm.com



sompop-arcadia



With more than 20 years solid experiences in mission critical and enterprise software development works for various tech industries, financial tech, medical tech, manufacturing tech, property tech and travel tech.

An experienced technology consultant for several organizations.



Naruenart Siengloi

Sales Executive
Business Development
Thai Murata Electronics Trading., Ltd.



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@thaimurata



With 4 years experience in business development work especially for industry and RFID related applications.

- Introduction of Thailand 4.0
- RFID Complete Solution: Murata x Arcadia
- Target RFID Applications (Healthcare Industry Examples)
- Actual Use Cases
- Summary
- Q&A

Thailand 4.0 Policy

Thailand 4.0

Prosperity, Security, Sustainability



1.0
Agriculture



2.0
Light industry



3.0
Heavy industry



4.0
Innovative based Industry

HOSPITAL 4.0

Transformative shift driven by technology

■ Become Asia Pacific (APAC) Medical Hub by Y2025

■ Key Technology:

A.I., IoT, Health and Medical Technology

Smart Device
Robotics
Device

Y2017

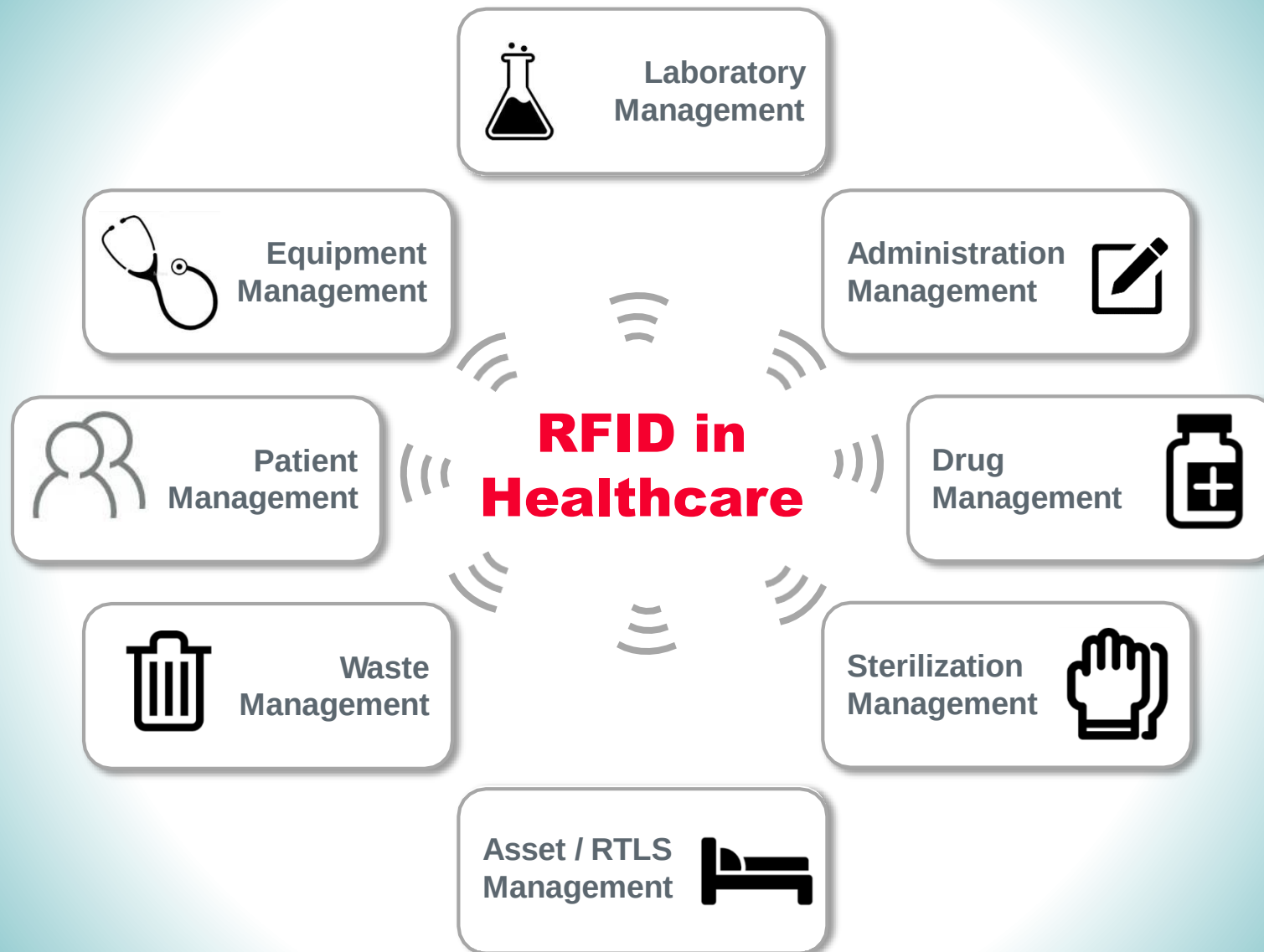
Medical Robotics
Smart Elderly
Village

Y2027

Medical
Robotics for
Operations

Y2032

RFID used in Healthcare Industry



RFID Value Proposition in Healthcare



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Security / safety

Reduce risk / improve protection

Automation

Reduce repetitive manual processes

Improve efficiencies

Streamline processes

Improve accuracy

Reduce/ eliminate errors

Improve work environment

Best in class, staff retention, etc....

Authentication

Brand protection

Cost control

Improve bottom line

Enhance patient experience

Often overlooked

Device product differentiation

Increase product value

Brand protection

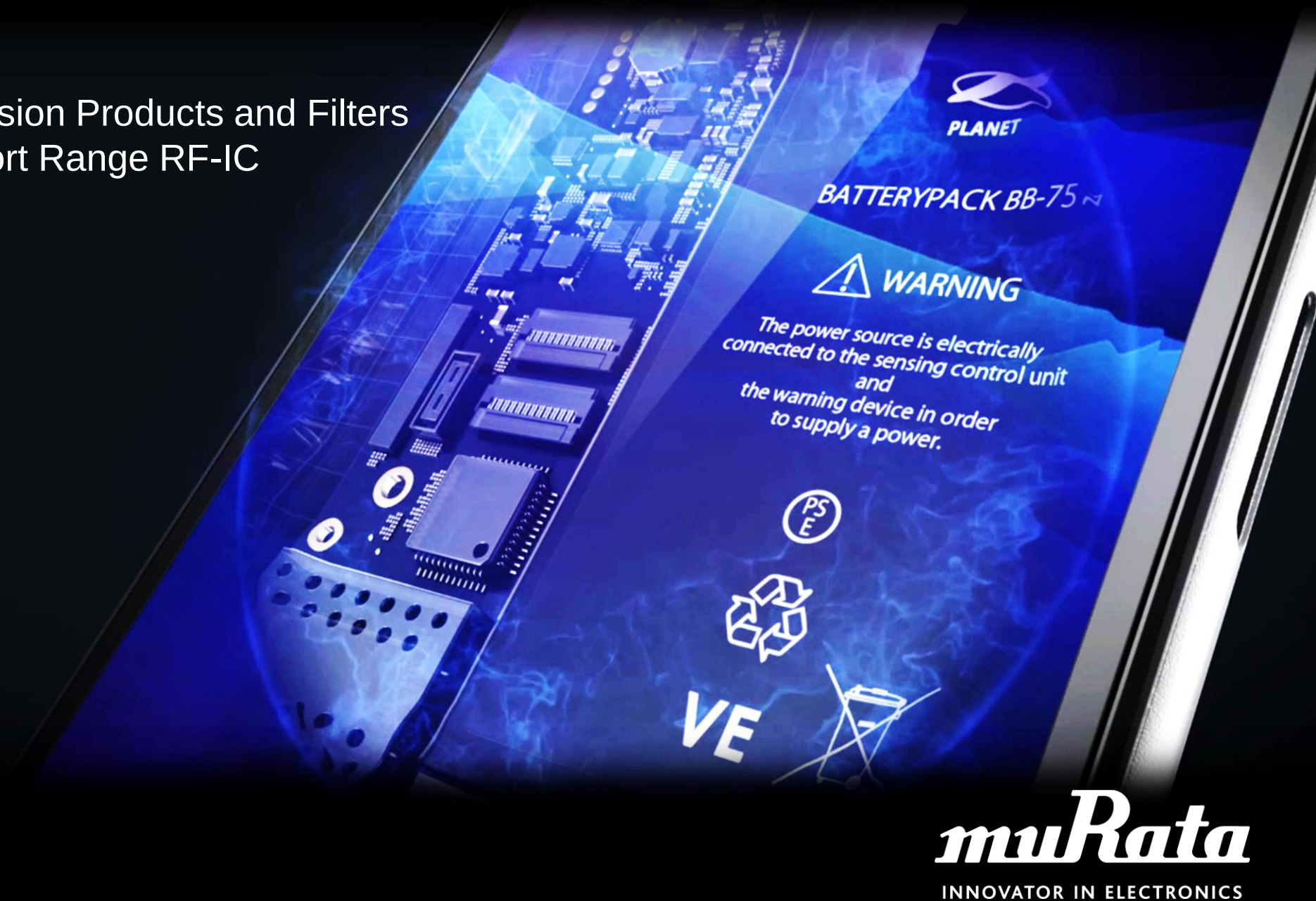
Secure name/ brand



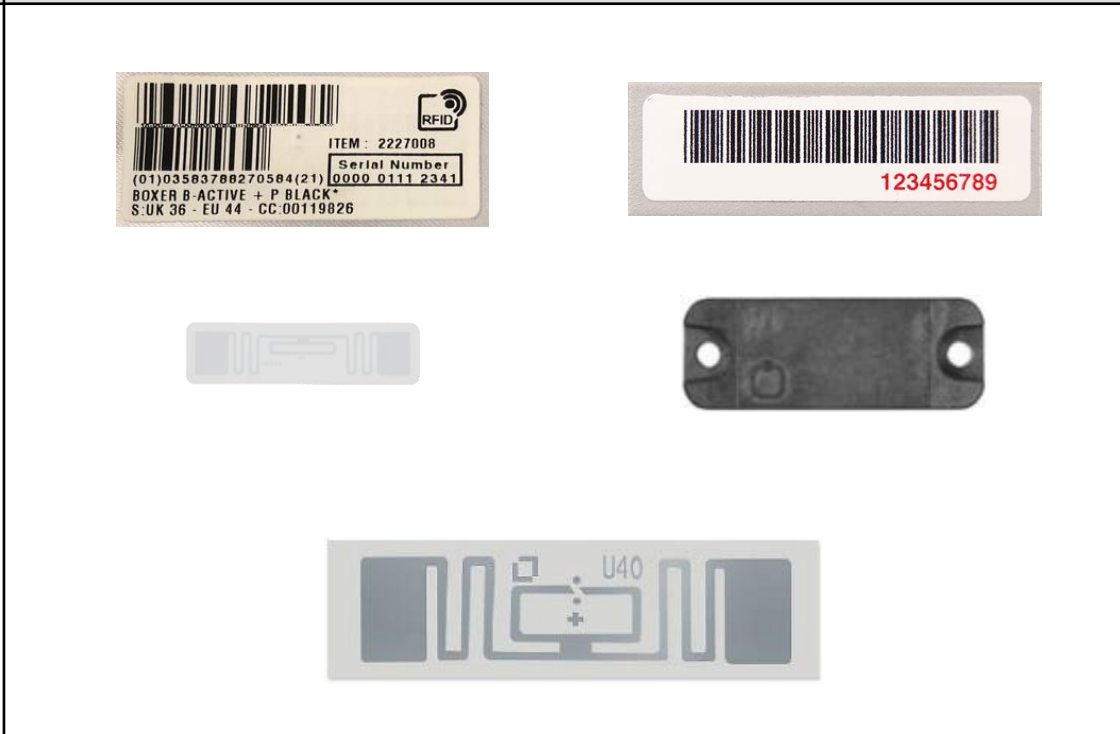
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INNOVATOR IN ELECTRONICS

- Capacitors
- Inductors (Coils)
- Noise / EMI Suppression Products and Filters
- Ultra Low Power Short Range RF-IC
- Resistors
- Thermistors
- Sensors
- Timing Devices
- Sound Components
- Power Devices
- Micromechatronics
- **RFID**
- Matching Devices
- RF Components
- RF Modules
- Batteries
- Filters
- Substrates
- Ionizers/ Ozonizers
- Front-end Modules



Common NFC / RAIN RFID Tags

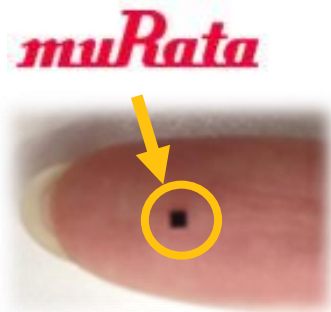
 NFC Tags (13.56MHz)	 UHF Tags (856 ~ 928MHz)
	

**Large tags may NOT be an option on small size products
for item level tracking!**

Murata RFID Micro Tags: Unique Proposition

1. Ultra Small and Robust

Murata's Tag Size:
3.2 x 3.2 mm ▶



2. Durable

- Ability to withstand extreme temperatures and high pressure due to chip solution
- Embeddable/ over-moldable



3. Unique Product Design

- Integrated antenna
– NFC & RAIN RFID
- On-metal chip tag for metal surfaces
- Easy integration of material and design
- Maximum performance for product size



4. Strong Knowledge

- Vast experience in RF technology
- UHF/ HF antenna design
- Materials, evaluation and testing



RFID Manufacturing Facilities and Evaluation Environments

Komatsu Murata Manufacturing

Own plant for RFID products with stable supply



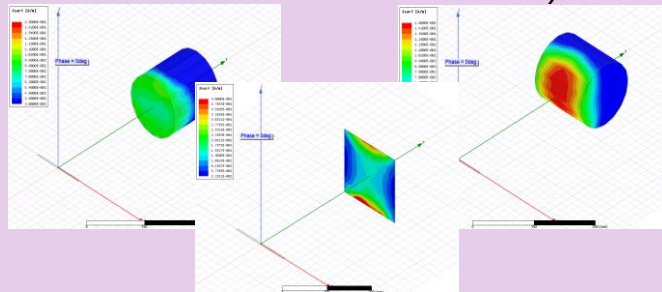
RFID Experimental Environment

With RFID for customer sites
Reading table, gate and tunnel experiment environment



Electromagnetic Field Simulation

Three dimensional analysis of RFID radio waves by HFSS
(Visualization of invisible radio waves)

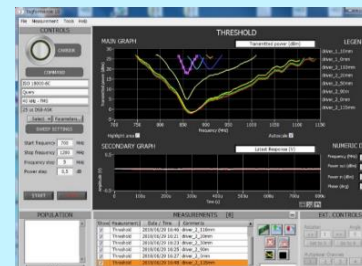


Simulation Measurement of Frequency Characteristics

Check RFID tag and label performance

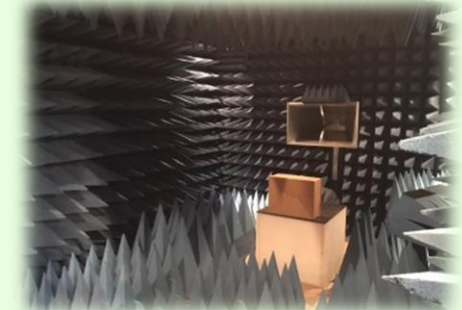


Tagformance



Actual Evaluation of Communication Distance

Accurate measurement evaluation in an anechoic chamber





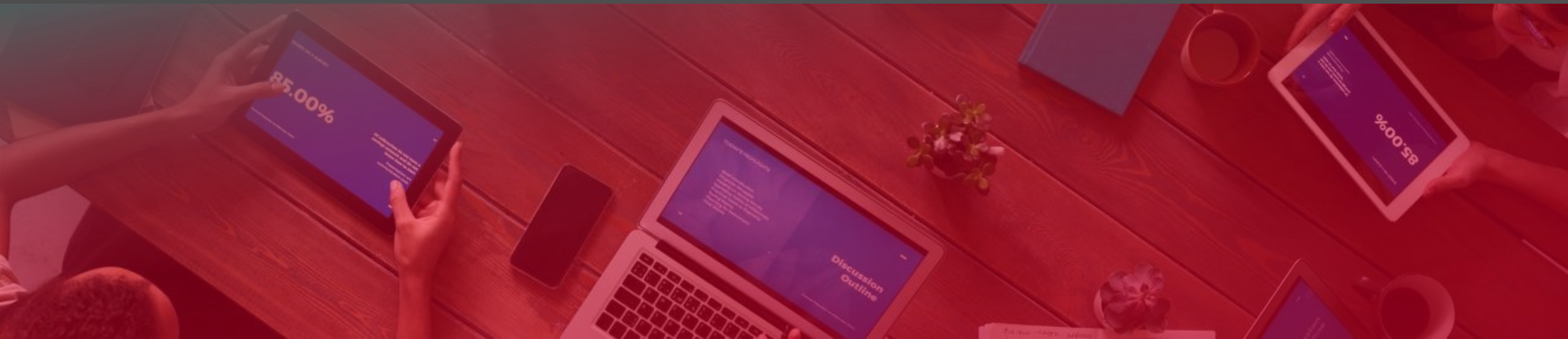
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ABOUT ARCADIA

Transform.Your.Business by Tech

Offer a wide range of software development services both turnkey and professional services which help customer's business grow and transformation. From cutting edge software technologies, consultation, and enterprise-level software implementation are delivered. In Arcadia, we have deep tech talent engineer from Arcadian talent crowd network.

- ✓ End-to-End Turnkey
- ✓ UI/UX as a Service
- ✓ Development as a Service
- ✓ Test as a Service
- ✓ DevOps as a Service



Innovation Awards



RFID Complete Solution from Murata x Arcadia

RFID Deployment Common Challenges



**Lack of knowledge on
RFID implementation**



**Easy disruption of
RFID systems**



Material handling



**Operating frequency
variances**

RFID Tech Expert

Arcadia Smart CSSD Platform

- The Smart Central Sterilize Supply Department Platform (Smart-CSSD) guarantees complete, correct and clean surgical instrument sets before and after surgery.
- Smart-CSSD is a SaaS cloud-based platform combined with advanced RFID technologies.
- Hospitals can save time pre- and post-op, and ensure patients are ready to undergo surgical procedures as planned.

Medical Team



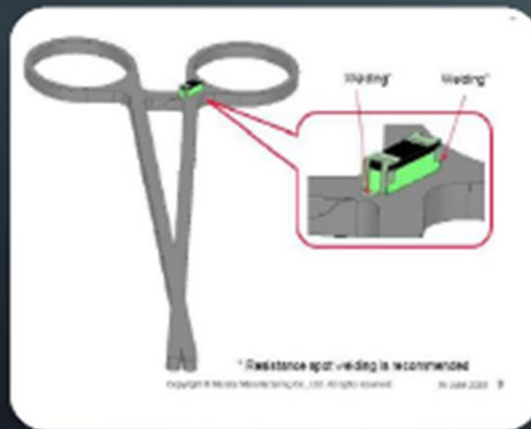
Engineering Team



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Complete RFID Solution

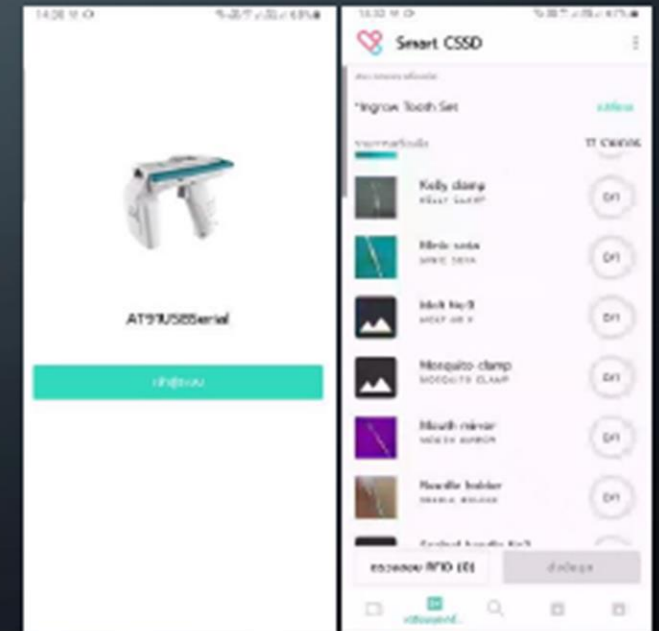
Advance
RFID Tag



Smart-CSSD
Platform on
Cloud
(SaaS)



Smart-CSSD
Mobile



RFID Tag Attachment Method

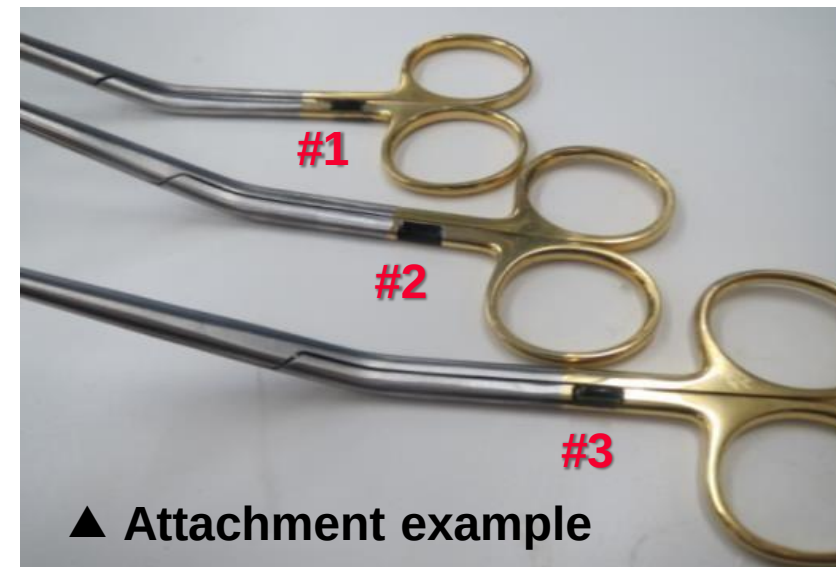
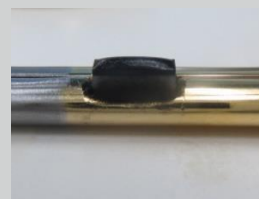
Method #1 Cavity



Method #2 Cavity (one face open)

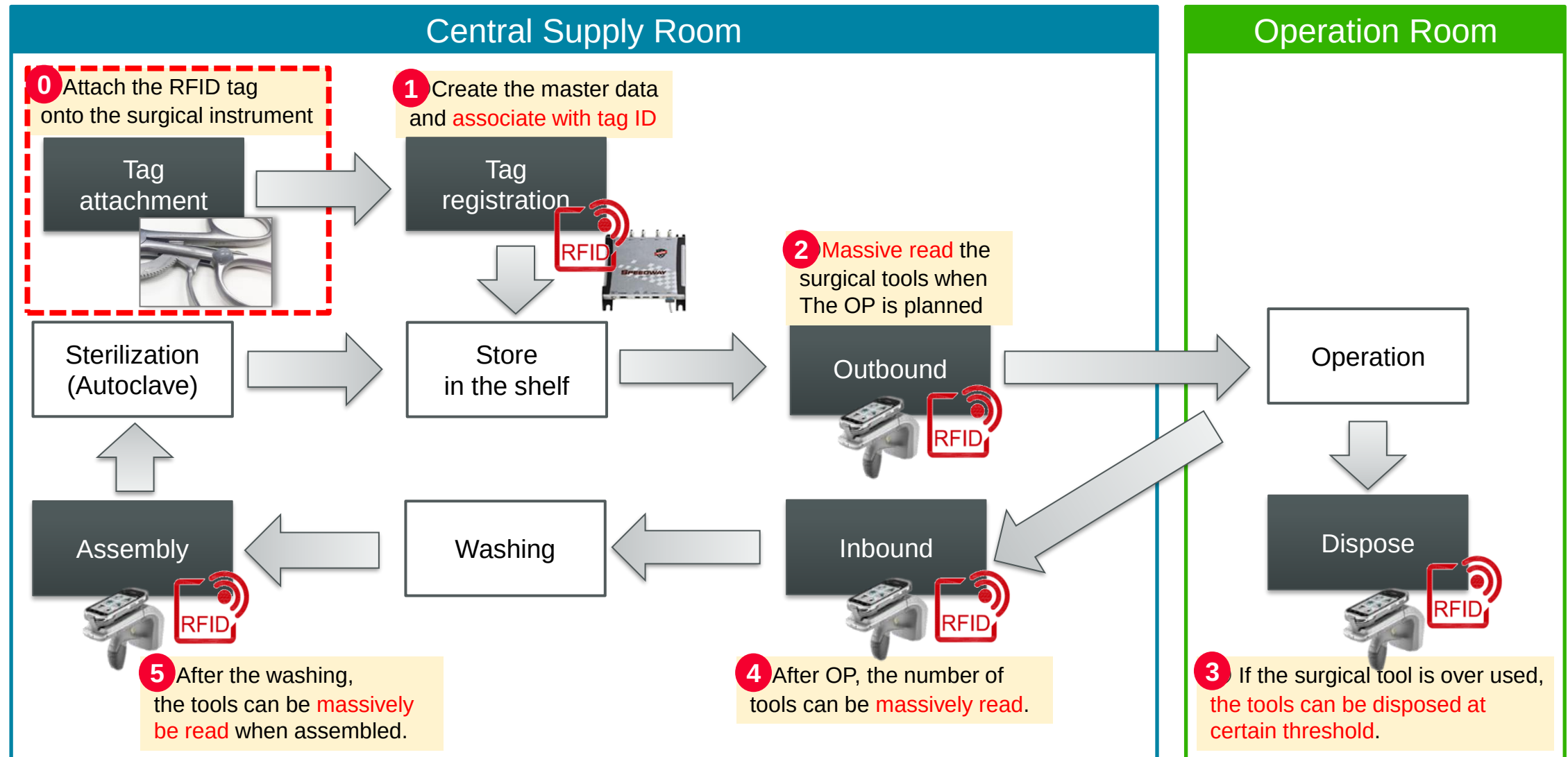


Method #3 Non-Cavity (Mounting & Molding)

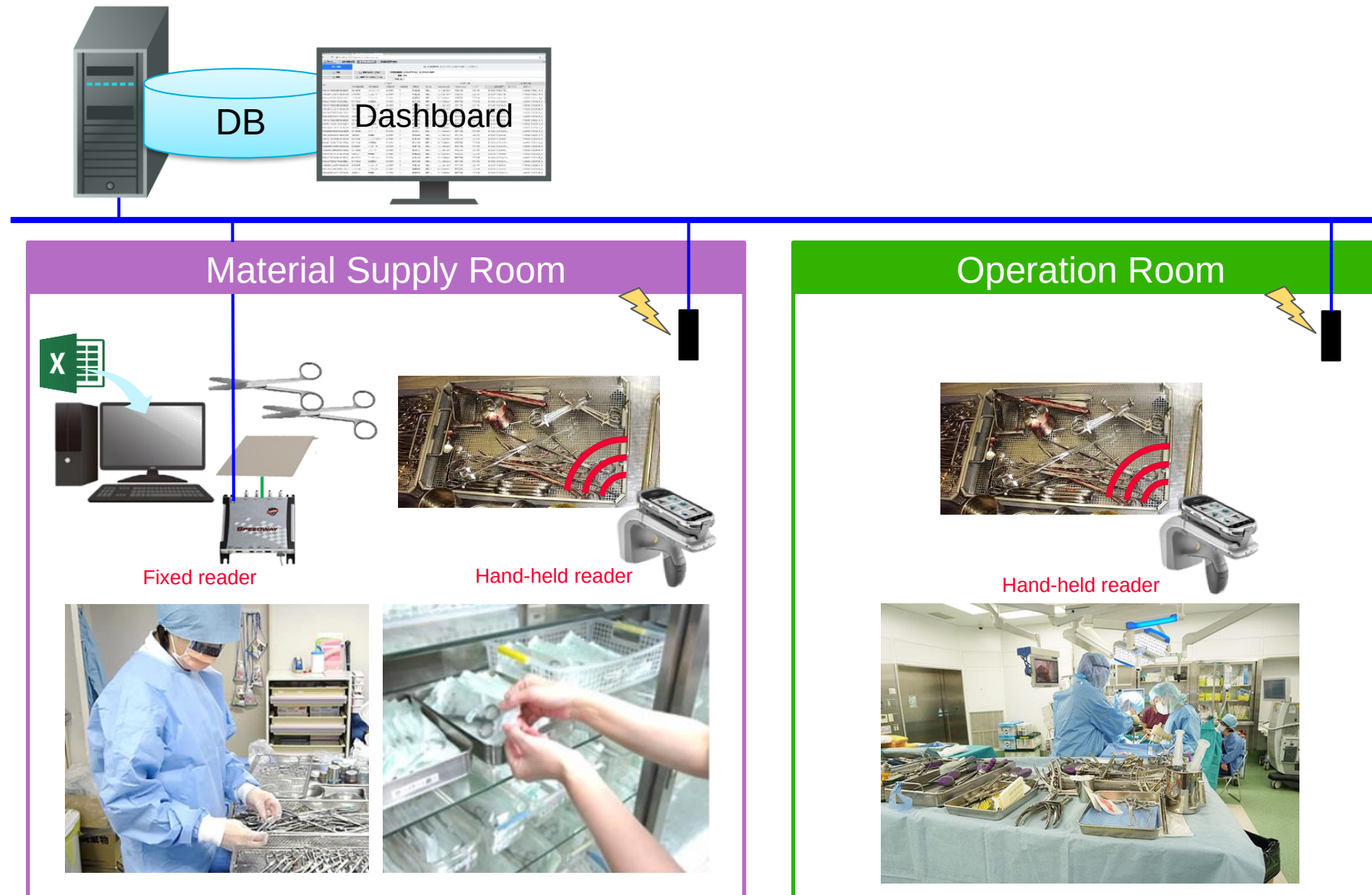


Cavity is made to slot in RFID tag on the surgical tool. Specification has been evaluated and confirmed beforehand.

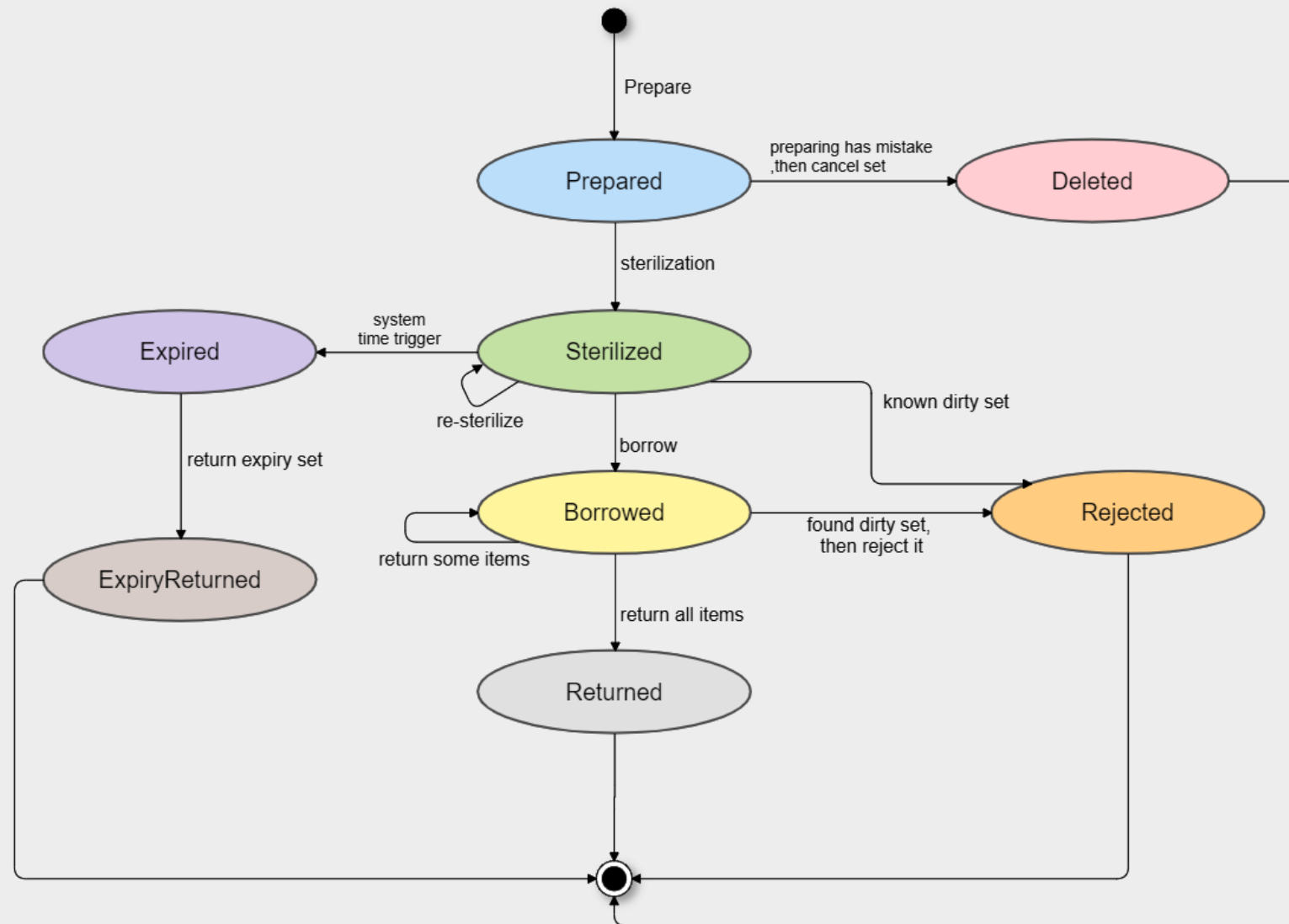
Operation Flow in Hospital



System/ Network Example



Complete RFID Solution (FLOW)



In the end, release all medical device items in set

Complete RFID Solution (Dashboard)



Hello
admina aa
Arcadia

Menu

USB device in use

Registration
Surgical Instrument
Registration

Unregistration
Surgical Instrument
Unregistration

Prepare
Surgical Instrument Set
Preparation

Cancel
Preparation
Surgical Instrument Set
Cancellation

Borrow
Borrow surgical
instrument set

Return
Return surgical
instrument set

Search
Query instruments and
instrument sets

QR code printing
QR code printing for
surgical instrument set

Non-USB device in use

Sterilization Room
Sterilization Room

Reject
Unqualified surgical
instrument set

Expiry Return
Expiry Return

Smart CSSD

PREPARE SEARCH

Bone Set CHANGE

List 6 List



Hammer
Hammer

1/1



Hohman big
Hohman big

1/1



Hohman lãn
Hohman lãn

1/1



Osteotome
Osteotome

1/1



Periosteal
Periosteal

1/1



Rongeur
Rongeur

1/1

SCAN RFID (0)

CONFIRM

Smart CSSD

BORROW SEARCH

Bone Set CHANGE

Status
Sterilized

Expired
17-Jun-2021

Surgical Instruments 6 List



Rongeur
Rongeur

1



Hohman lãn
Hohman lãn

1



Hohman big
Hohman big

1



Periosteal
Periosteal

1



Osteotome
Osteotome

1

CHECK (0)

BORROW

Smart CSSD

RETURN SEARCH

List 1 List

Surgical Instrument Name
Bone Set

Borrowing Date of
Surgical Instrument Set
15-Jun-2021

Id Card
2333555

Return Surgical Instrument
50%

CLEAR

RETURN

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**Actual use case:
At Fort Chiraprawat
Hospital**

RFID Technology help to Improve Surgical Safety and Efficiency



- Scanning with hand-held reader writer.



- Set reader writer and antennas to read tags without manual operation.

Real Use Case at Fort Chiraprawat Hospital

No.	การทำให้ปราศจากเชื้อ	รายละเอียด
1	Moist Heat	ใช้เวลาปราศจากเชื้อ 30 นาที อุณหภูมิ 134 องศา ความดัน 30 ปอนด์ (https://www.cssd-gotoknow.org/2014/10/sterilization.html)
2	Ethylene Oxide (EO)	การทำให้ปราศจากเชื้อด้วยแก๊ส EO อุณหภูมิที่ใช้จะอยู่ระหว่าง 49 – 60 องศาเซลเซียส https://www.cssd-gotoknow.org/2014/12/ethylene-oxide-eto.html?m=1
3	H2O2 Plasma Sterilizer	Low-temperature H2O2 Plasma Sterilizer https://www.cssd-gotoknow.org/2014/02/hydrogen-peroxide.html?m=1



RFID tag



◀ RFID tag for the surgical instrument
(Size : 6.0 x 2.0 x 2.3 mm)

Robust/ Durable

- Ability to withstand extreme temperatures and high pressure



Seamless Support for your entire Project Lifecycle

Arcadia and Murata support throughout the entire project lifecycle

Project Lifecycle



Design & Part Selection

Choose the suitable hardware (Tag, Reader)

Integration Software Development

Write and test software
**Customize application is allowed*

Testing & Certification

Lab, field, regulatory testing

Product Launch

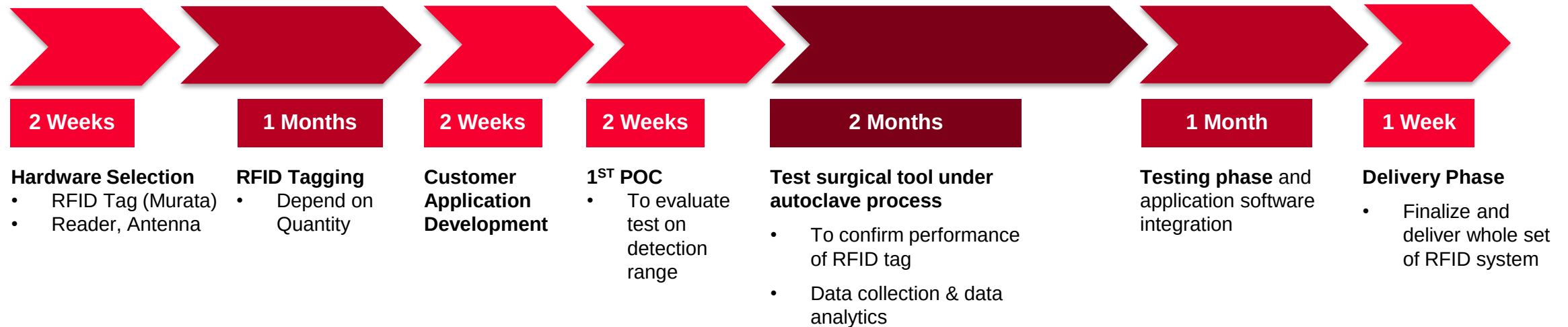
Launch product and quickly fix any issues

Product Maintenance

Ensure RFID-embedded tool are performing reliably in the field

Simplify and Accelerate the RFID Implementation

Implement RFID Tool Tracking System in just 5 months!



***Please note that the schedule is subject to change due to the actual evaluation situation**

Target RFID Applications (Healthcare Industry Examples)

Target Application: Healthcare

Tools



Injectable devices



Lab analysis & storage



Medical device with accessory (in use)



Disposables



Monitoring Products (in use)



Medication

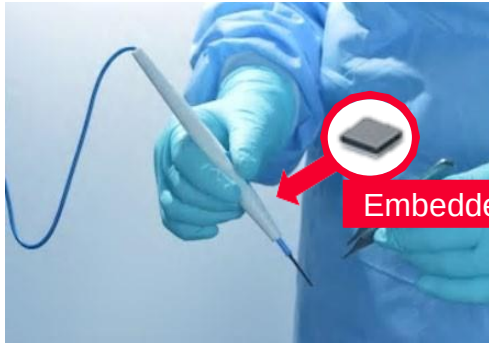


Actual Use Cases

Use Case : Medical Devices

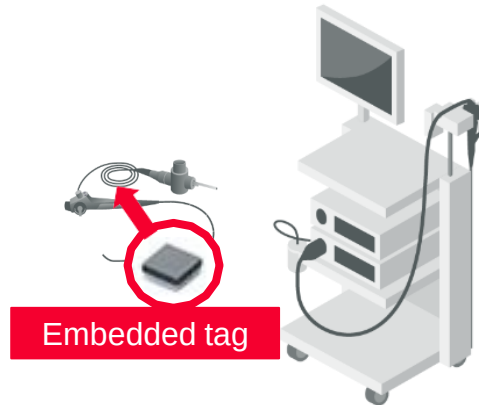


Need to manually input usage/ sterilization data of attachment during surgery/ treatment. How to eliminate unauthorized product being used?



Electric knife

- Authentication of attachment and individual setting
- Record usage data and prevent the use beyond the recommended limit



Endoscope

- Authentication of attachment and individual setting
- Save usage/sterilization history
- Record usage data



Disposable items

- Authentication to check if authentic product is used

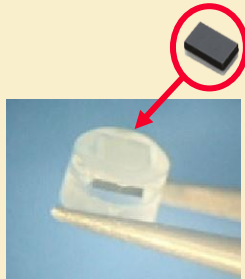
Use Case : RMA of Wearable Products



Problem

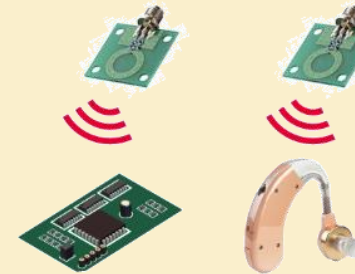
Manufacturing record and device setting are often written inside the products. Operator needs to open the product to check the serial/ barcode inside. RMA (Return merchandise authorization) process becomes more time consuming.

Production Line



RFID Assemble/ Attachment

- Injection molding, glue, press fit, soldering - use information on tracking in production process
- Write the information into user's memory
 - Serial number (*refer to the serial of main IC)
 - Model information, date code, production information, customer-specific settings, etc.



If nothing happen to the device, RFID will not be used

Market

- Feedback product's serial number is reported to production line
- Market malfunction is reported to production line for improvement
- Rewrite individual setting based on customer's requirement

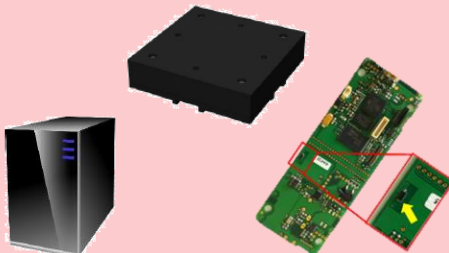
Warehouse/ Store/ Customer Service

- Operator will read the serial number from the outside of the enclosure
[No need to open the enclosure]



If any issue happens to the device, it will be returned to the warehouse

Product Applications: Murata UHF/ HF RFID Tags

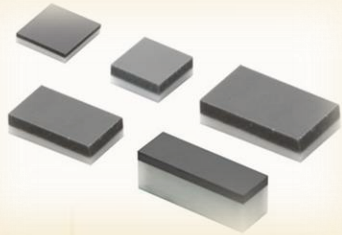
Part Number	UHF					HF	
	Micro Tag		PCB Mount Tag		On Metal Tag	Micro Tag	
	LXMSJZNCMD-217	LXMSJZNCMF-210	LXMS21ACMF-218	LXMS21ACMD-220	LXTBKZMCMG-010	LXMS33HCNG-134	LXMS33HCNK-171
Appearance							
Attachment	Adhesive glue or tape		Solder mount on PCB		Adhesive, heat shrink tube, etc.	Adhesive glue or tape	
Application	• Small item tracking • Product authentication • Brand protection • Item identification 		• Product authentication • Inventory control • Logistics tracking • Warranty and returns 		• Surgical tools • Industrial tools • Metal items 	• Small item tracking • Product authentication • Brand protection • Item identification 	

Summary



➤ **Hardware Provider**

Small robust RFID UHF & HF Tags are available for item level tracking (many options)



➤ **System Integrator**

End-to-End **Software Delivery** and On-Demand Services



ARCADIA SOFTWARE
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➤ **Complete RFID Solution for Healthcare Industry**

Offers **simple and efficient system** that can manage the surgical tools, medical devices, monitoring products

Enhanced User Experience – Solving all your concerns before implementation of RFID

- Wide selection of small, secured, robust RFID/ NFC tags
- Antenna design support
- Attachment recommendations provision

- Application/ System design consultation
- Integration Services (hardware & software)
- Proof of Concept (pre-/after-sales services)

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Questions & Answers



Contact Us



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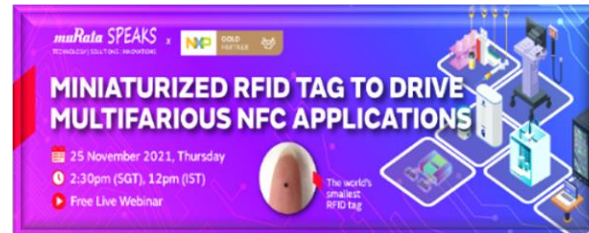


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October 2021



November 2021



December 2021
*Thai Language



January 2022
*Bahasa Indonesia



February 2022



March 2022
*Thai Language



April 2022



May 2022