



**R&D Activities
for RFID sophisticated Application
FY2004 – FY2007**

**March 05, 2008
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Japan





1. Development

2. Field Test

3. Standardization



1. Development

1-1. Outline of development

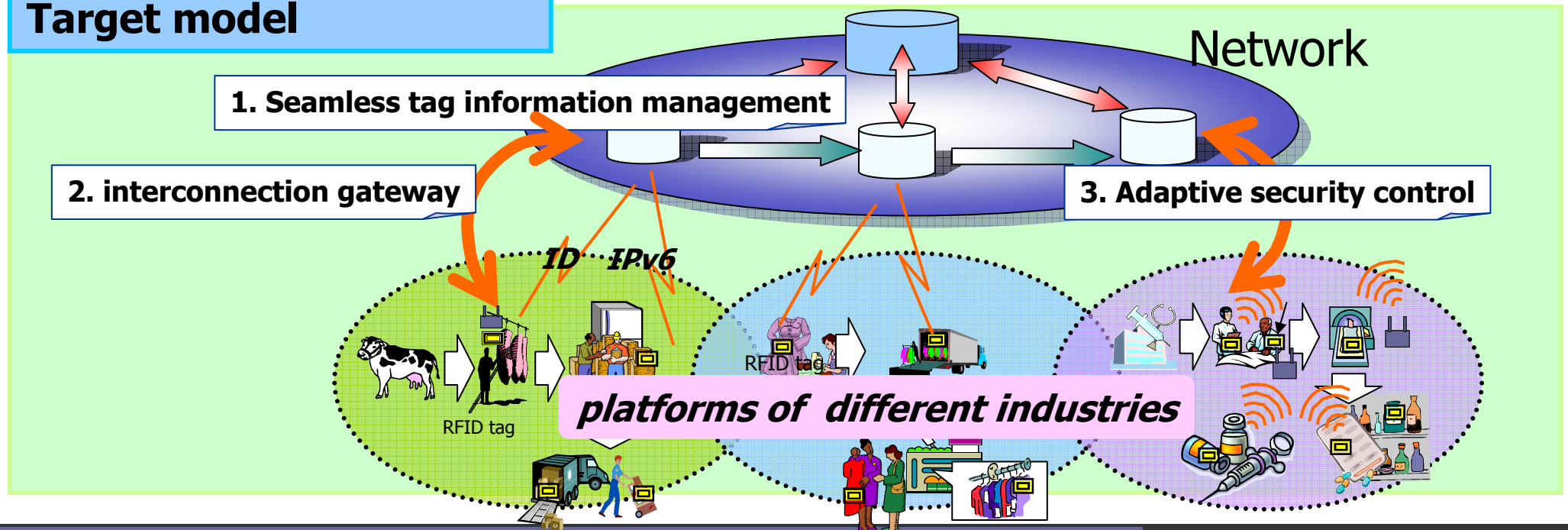
Scope of development

Advance the developments and field tests on the following three technologies

1. Technologies to exchange and monitor the RFID information among different platforms
2. Technologies regarding interconnection of RFID tag
3. Technologies to control network securities

Establish core technologies for advanced application of RFID utilization

Target model



1-2. Development Structure

Six companies collaborate and advance development.

Representative

NTT Communications

1) Seamless tag information management

IBM Japan

NTT Data

2) Interconnection gateway

NEC

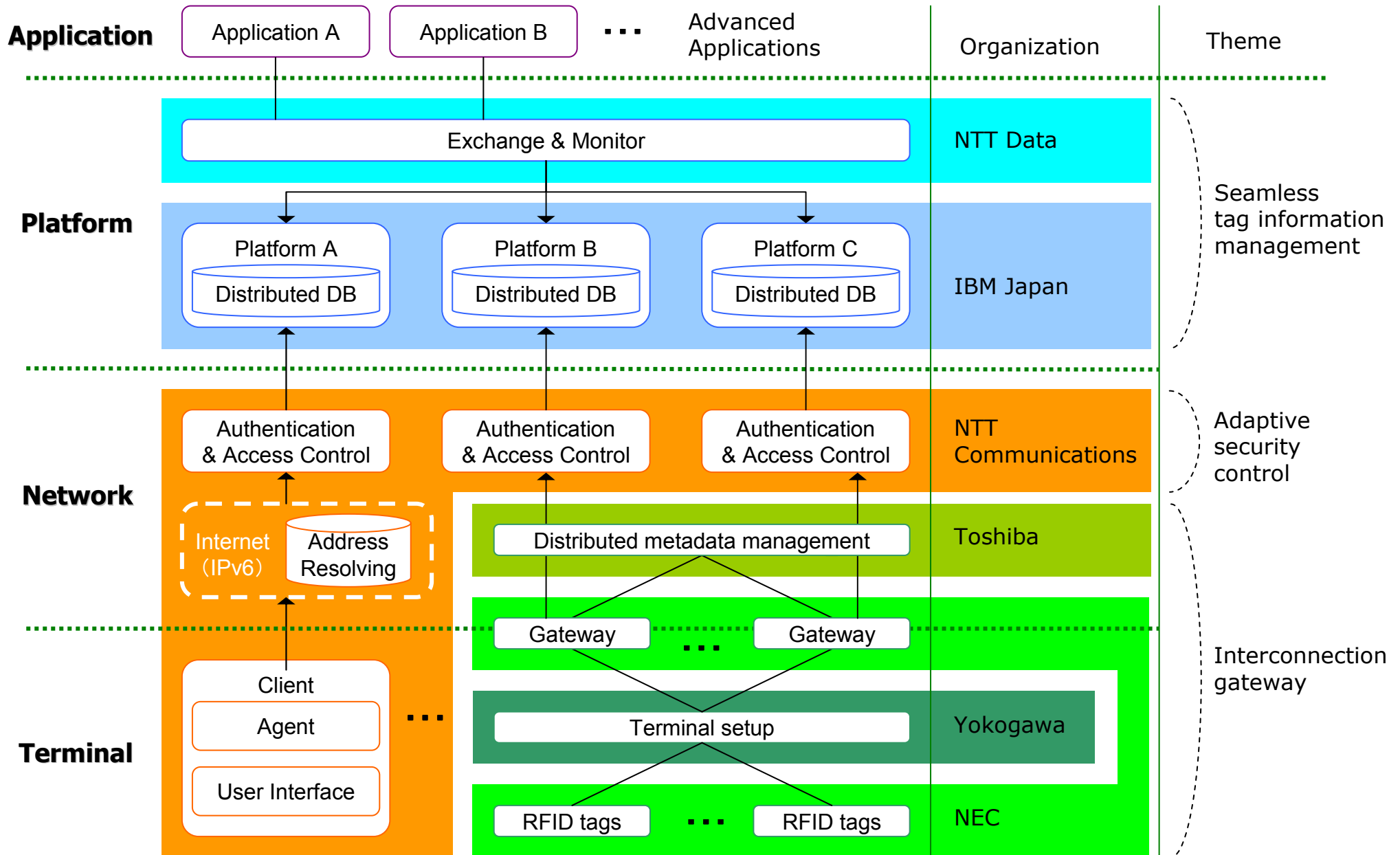
Toshiba Corp.

Yokogawa Electric Corp.

3) Adaptive security control

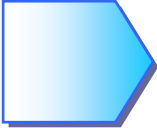




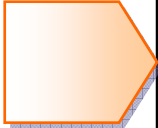
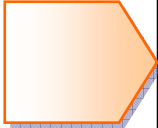
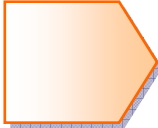

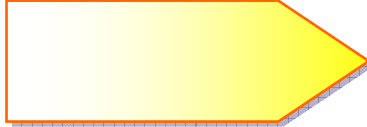
NTT Communications

1-3. Architecture



1-4. Development execution plan



	FY2004	FY2005	FY2006	FY2007
Survey				
Prototype	 Prototype (1)	 Prototype (2)	 Prototype (3)	 Prototype (4)
Field Test	 Field Test (1)	 Field Test (2)	 Field Test (3)	
Standardization			 Standardization (1)	 Standardization (2)

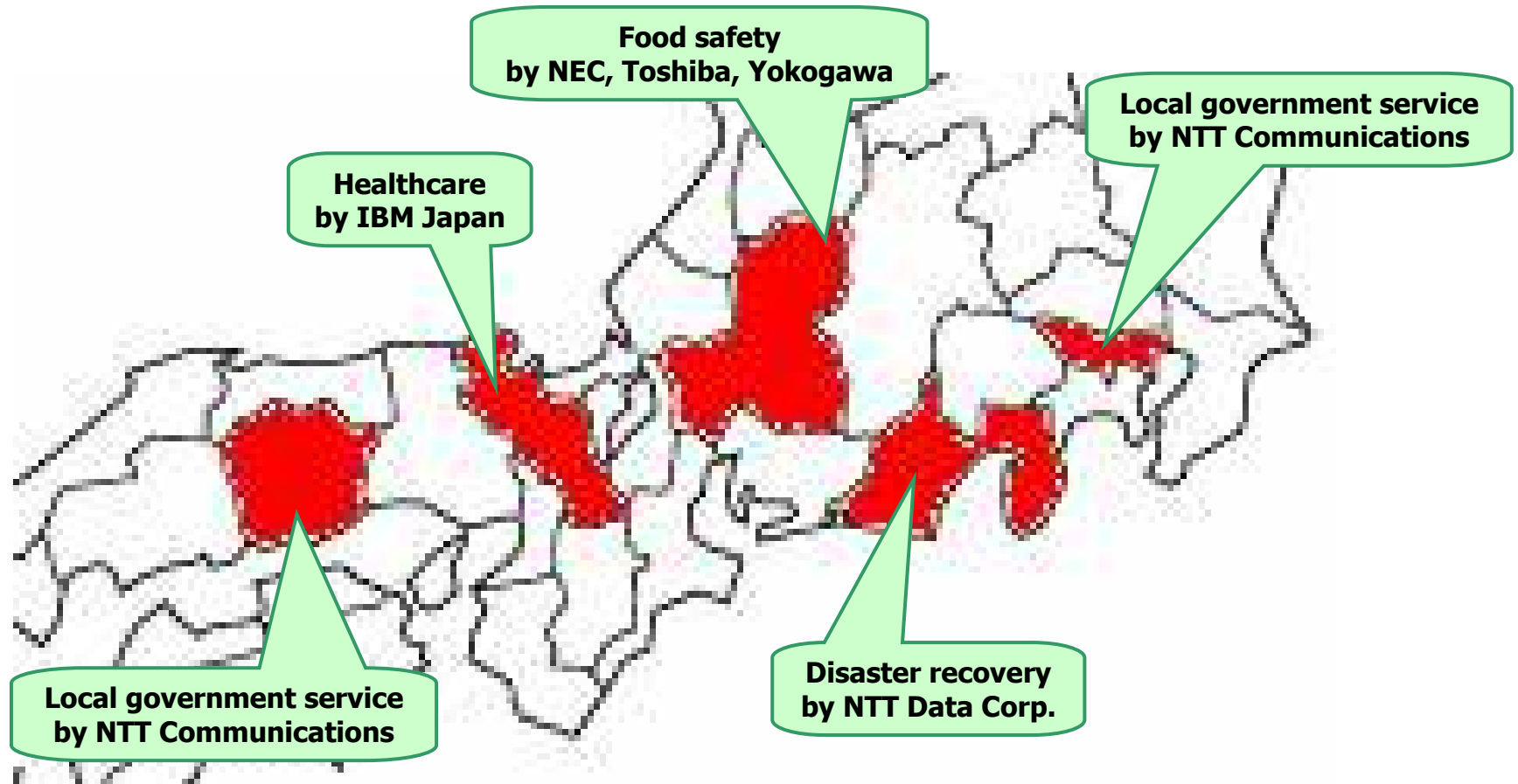


2. Field Tests

List of Field Tests

Technology	Sler	Targeted field	Cooperator	Period
Seamless tag information management	IBM Japan	Healthcare	National Hospital Organization Kyoto Medical Center	Several weeks in FY2004, FY2005, FY2006
	NTT Data	Disaster recovery	Shimizu social welfare council	
Interconnection gateway	NEC Toshiba Yokogawa	Food safety	Agricultural cooperative in Gifu	
Adaptive security control	NTT Communications	Local government service	Bicycle parking lot in Mitaka city Science museum, elementary school in Okayama	

Map of Field Tests

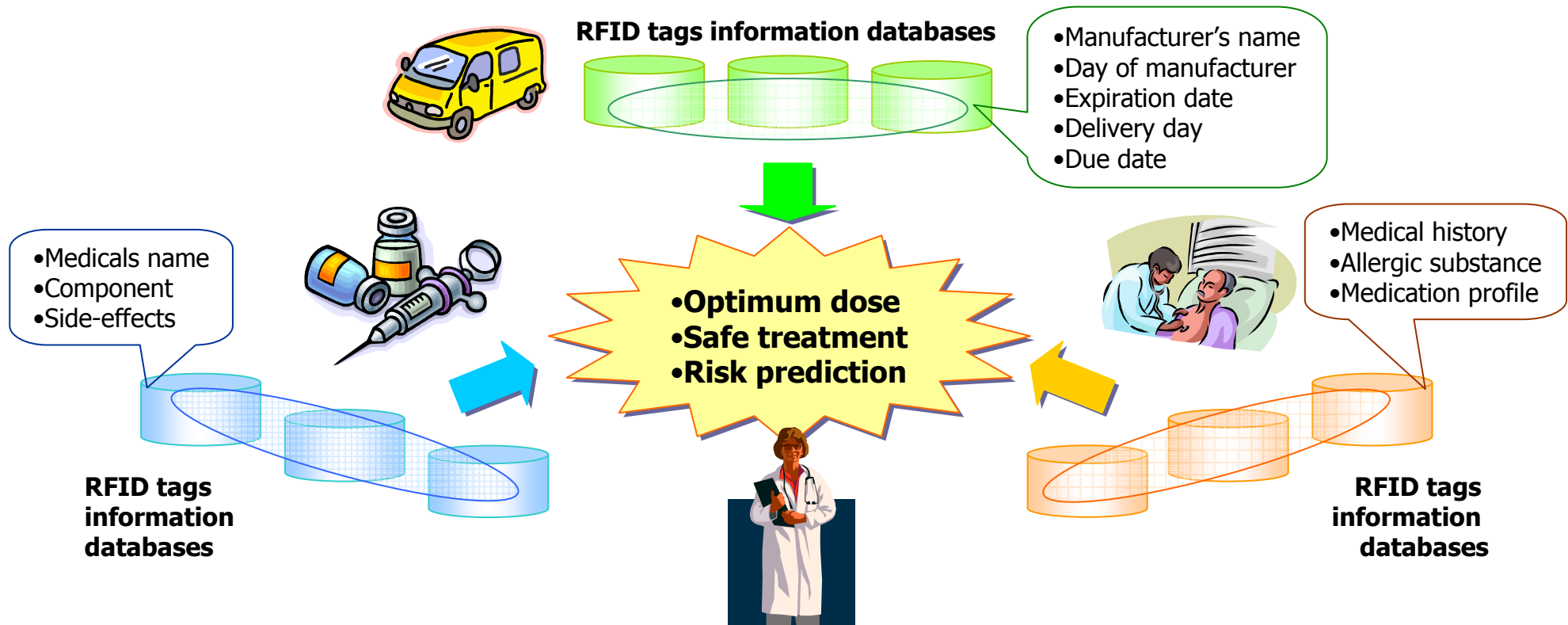


Field Test in Healthcare (1/2)

Technology: Seamless tag information management
System Integrator: IBM Japan
Targeted field: Healthcare
Cooperator: National Hospital Organization Kyoto Medical Center
Period: FY2004, FY2005
Trial Overview:



- Attached RFID tags to the medicines for individual recognition.
- Demonstrated operating effectiveness, medical error avoidance and prompt action in an emergency.



Field Test in Healthcare (2/2)



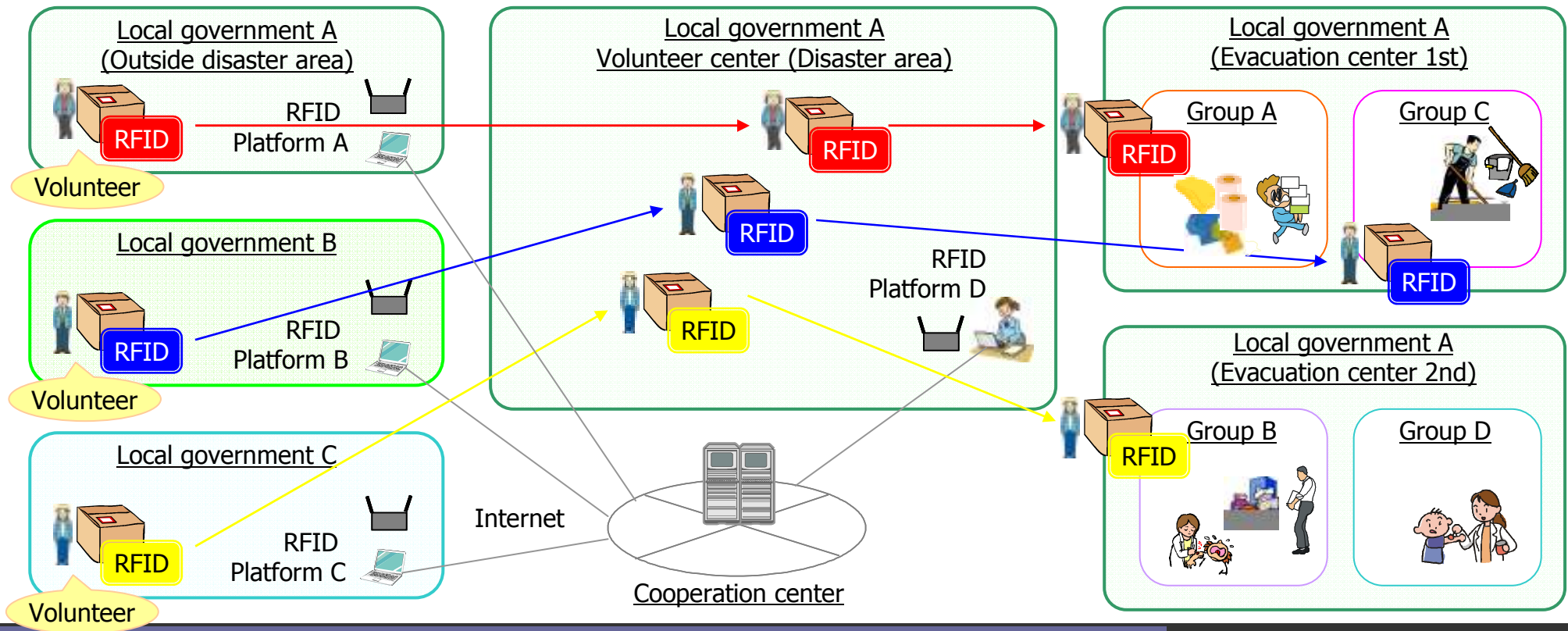
*Checking medicine information
by reading a RFID tag*

Field Test in Disaster Area (1/2)

Technology: Seamless tag information management
System Integrator: NTT Data
Targeted field: Disaster recovery
Cooperator: Shimizu social welfare council
Period: FY2004, FY2005, FY2006
Trial Overview:



- Attached RFID tags to relief goods for individual recognition.
- Verified that volunteers from different local governments could supply support service in the disaster area.



Field Test in Disaster Area (1/2)



Volunteer center



Sorting a relief goods



Relief goods



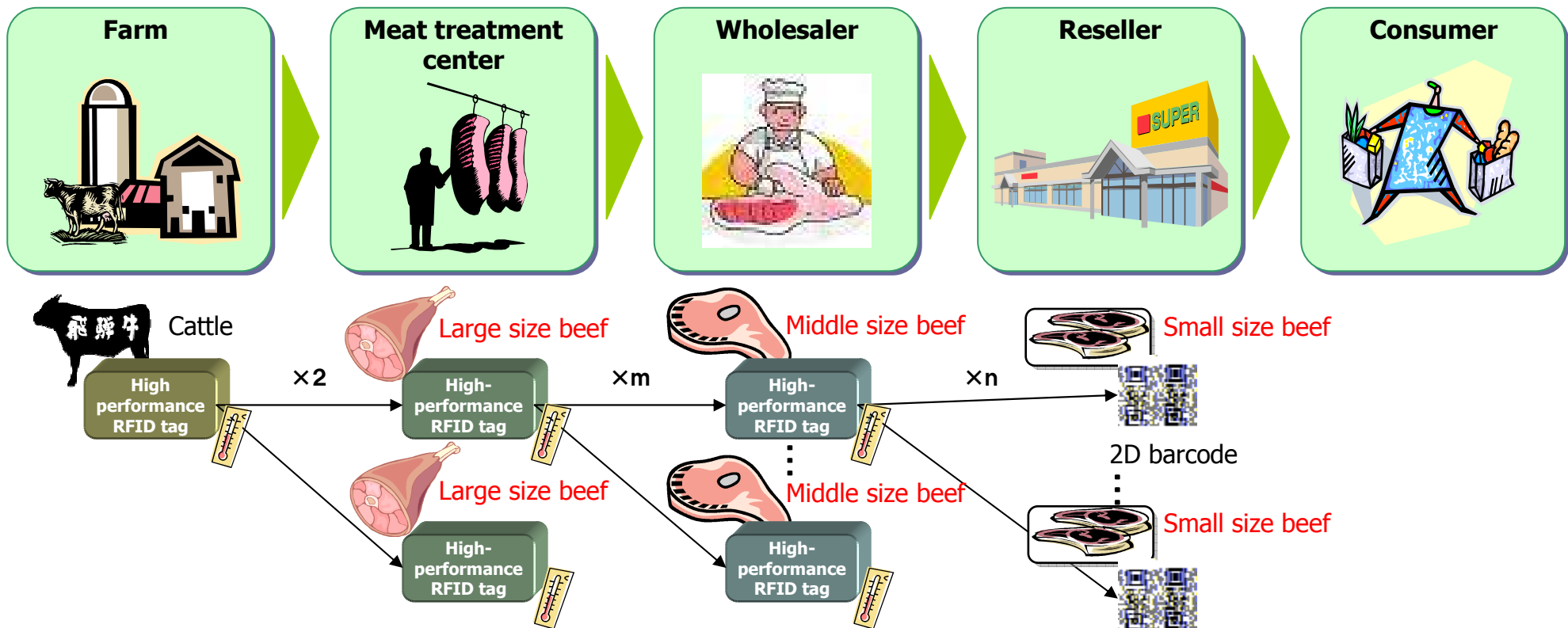
RFID tag

Field Test in Food safety(1/3)

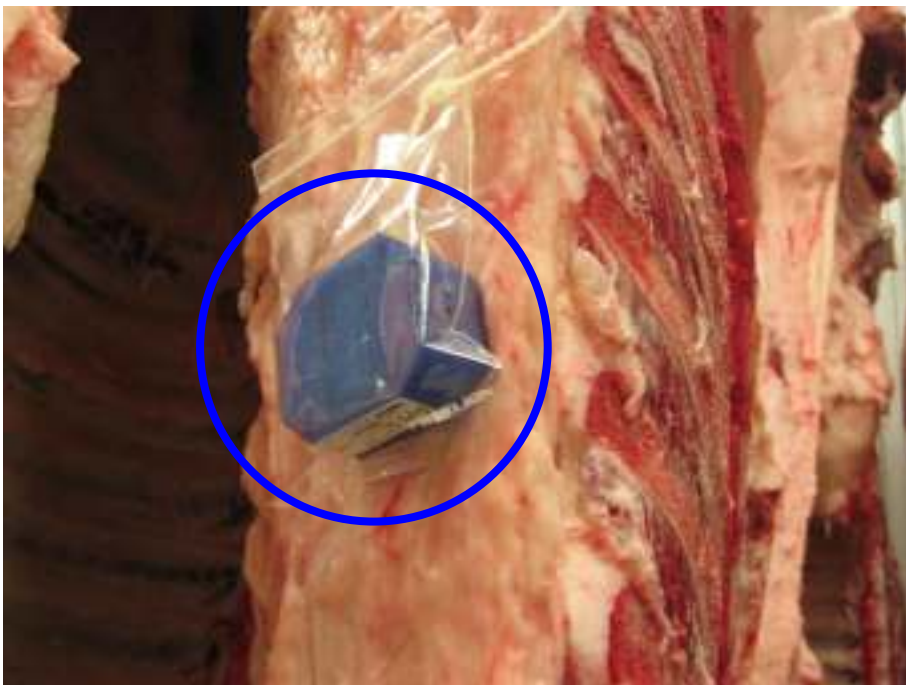
Technology: Interconnection gateway
System Integrator: NEC, Toshiba Corp., Yokogawa Electric Corp.
Targeted field: Food safety (from cattle to beef)
Cooperator: Agricultural cooperative in Gifu prefecture
Period: FY2004, FY2005, FY2006
Trial Overview:



- Attached RFID tags equipped with temperature sensor to cattle and beef.
- Shared information on preservation state of cattle and beef among the people concerned.



Field Test in Food safety(2/3)



Checking the air temperature in the storage

Field Test in Food safety(3/3)



Beef with 2D barcode



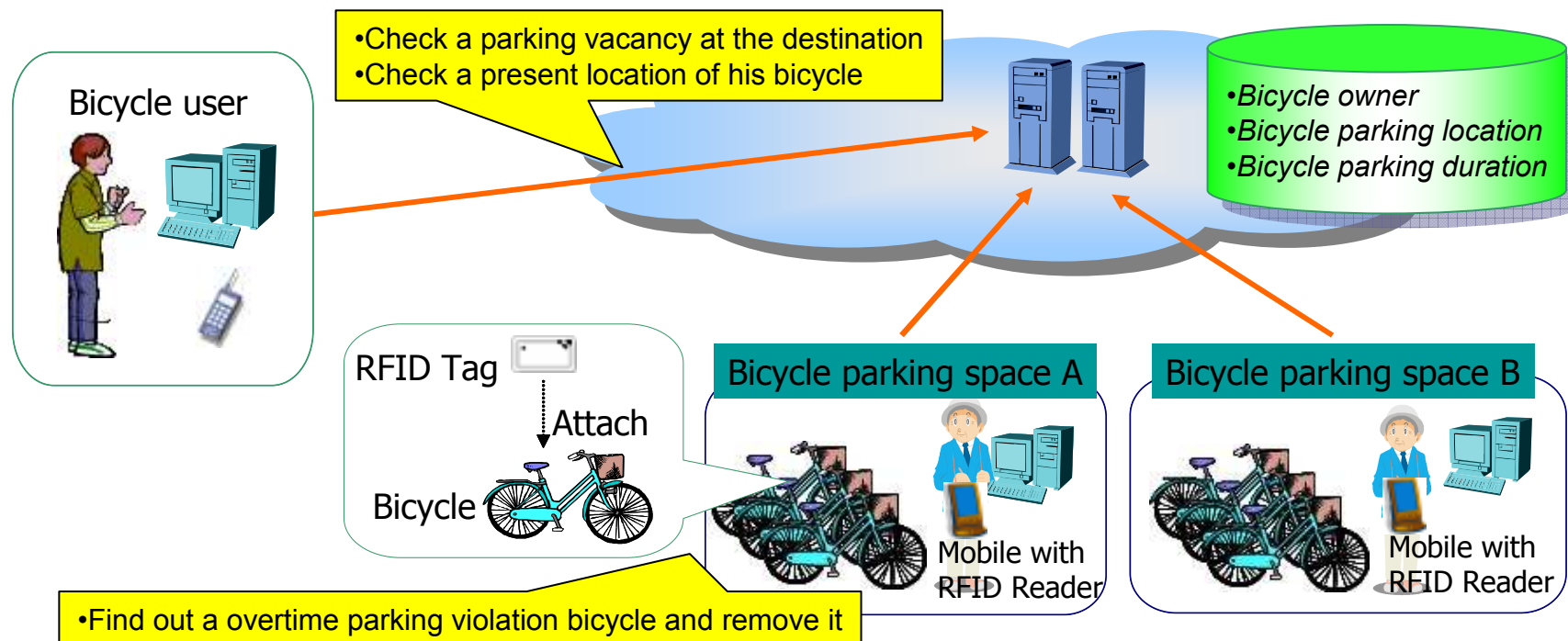
*Checking information on beef
by mobile phone
(with 2D barcode reader)*

Field Test in Local government service (1/5)

Technology: Adaptive security control
System Integrator: NTT Communications
Targeted field: Management of bicycle parking space
Cooperator: Bicycle parking lot in Mitaka City
Period: FY2004
Trial Overview:



- Attached RFID tags to bicycles and checked a parking location and duration of them.
- Developed a database system managing bicycle parking information (its owner, location, duration).
- Verified the improvement of convenience for bicycle users and parking space managers.



Field Test in Local government service (2/5)



RFID tag attached to bicycle



Hello, ****

Your bicycle is parked as follows.

Parking lot:
Sangyo Praza
Zone: E

Mobile showing a present location of his bicycle

Field Test in Local government service (3/5)

Technology: Adaptive security control
System Integrator: NTT Communications
Targeted field: Support for education outside school
Location: Science museum in Okayama prefecture
Period: FY2004
Trial Overview:

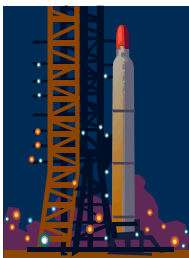


- Elementary school children waved their RFID tags over tag readers near exhibits of their own interests.
- Developed a contents management system to provide a detailed explanation about the exhibits.
- Verified the improvement of the level of understanding about the exhibits in the science museum.

•Set up tag readers near exhibits



• Elementary school children walked around in the science museum.
• And they waved their RFID tags over tag readers near exhibits of their own interests.



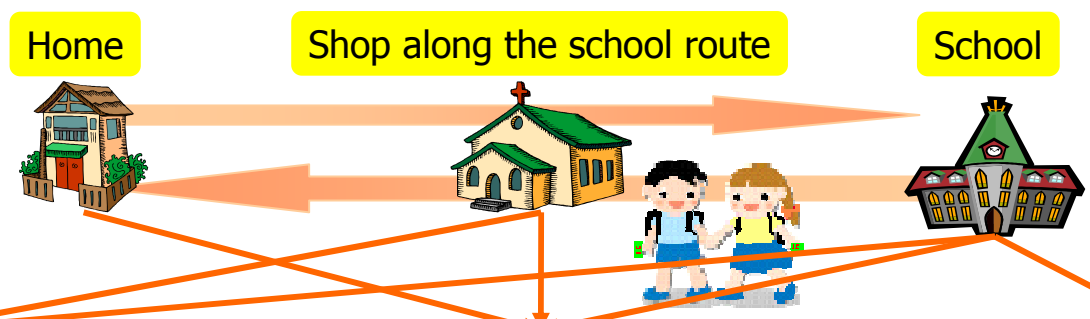
• They viewed a detailed explanation about the exhibits with a Web browser.

Field Test in Local government service (4/5)

Technology: Adaptive security control
System Integrator: NTT Communications
Targeted field: Children safety on their way between school and home
Location: Elementary school in Okayama prefecture
Period: FY2005
Trial Overview:



- Elementary school children waved their RFID tags over tag readers installed along the school route.
- Developed a database system to manage the children's actual location and moving history.
- Verified this service gave the parents and teachers a feeling of safety.



Providing the actual location via a mobile e-mail to the parents

An illustration of a purple mobile phone and a screen displaying a text message in Japanese, representing the service of providing location data via mobile email to parents.

Providing the movement history via a web browser to the parents

A screenshot of a web browser displaying a map with a route, representing the service of providing movement history to parents via a web browser.

Providing the attendance at school via a web browser to the teachers

A screenshot of a web browser displaying a table of attendance data, representing the service of providing attendance information to teachers via a web browser.

Field Test in Local government service (5/5)



Waving his RFID tag over a tag reader at the entrance



3. Standardization

Guidebook & Interface specification

1. Introduction

2. Guidebooks

Use case

3. Interfaces

Functions &
interfaces of
developed modules



2.1 Healthcare

2.2 Disaster recovery

2.3 Food safety

**2.4 Management of
bicycle parking
space**

2.5 Children safety

*2.5.1
Use case*

*2.5.2
System architecture*

Interface specifications

3.1 Seamless tag information management

3.1.1 RFID federation framework for traceability

3.1.2 RFID attribute information interoperability

3.1.2.1 Introduction

3.1.2.2 Basic configuration

3.1.2.3 Interfaces

3.2 Interconnection gateway

3.2.1 IPv6 protocol stack for sensor tags

3.2.2 Context composition mechanism

3.2.3 Distributed metadata indexing and management

3.2.4 Secure autonomous bootstrap mechanism

3.2.4.1 Introduction

3.2.4.2 Basic configuration

3.2.4.3 Interfaces

3.3 Adaptive security control

3.3.1 Authentication and access control

3.3.2 RFID tag address resolving

3.3.2.1 Introduction

3.3.2.2 Basic configuration

3.3.2.3 Interfaces

RFID Networking Technology can meet some application.

But ///

**Some participants of the field tests look still stressful.
Does barriers of application still remain outside technology??**

e.g.

- 1. Privacy issue**
- 2. Efficiency of operation**
- 3. Administrative guideline**
- 4. Cost issue**



Thank you for your attentions.