

Synergy between eHR & Authenticated Data from Daily Patient Care

eHR Engagement Initiative (EEI) Networking Session

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More Health-related information

➔ Better Quality of Life?

**Better information for
monitoring personal health?
Better insight on treatment
effectiveness?**

eHR

**Data-driven
HR**

Traditional health records:

- Diagnoses from clinical visits
- Treatments from hospitalization
- Drug application records
- Manually taken vital signs

Non-traditional health related data:

- Continuous streams of vital signs
- Activity patterns during hospitalization
- Activity levels under different drug applications or treatments

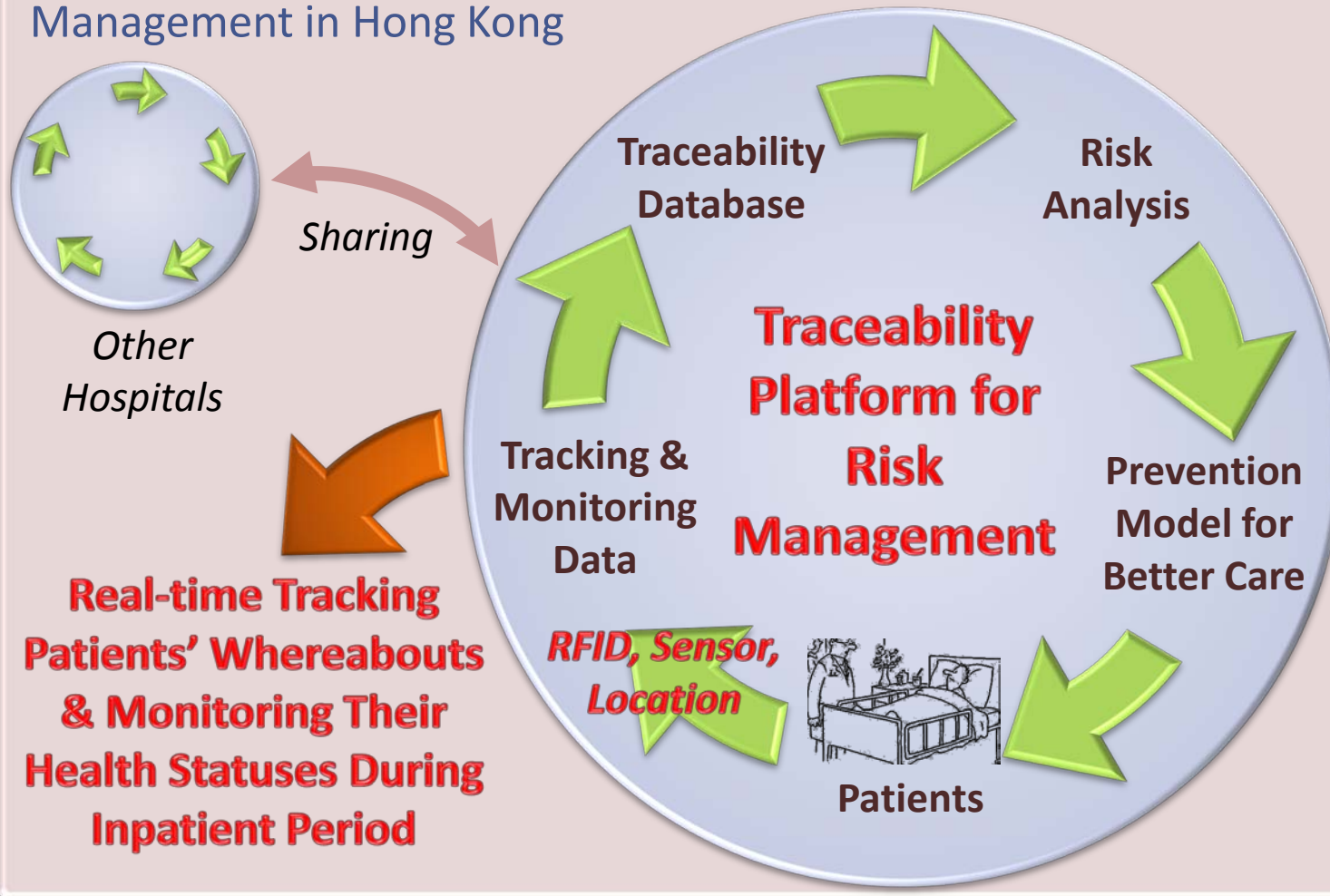
- Too much to keep?
- How to use them?
- How to ensure their authenticity?

Traceability for Healthcare Risk Management

Extending to Other Industries & Professional Fields

Exporting to Global Healthcare Risk Management

Standard-compliant Platform to Share Healthcare Risk Management in Hong Kong



HKSAR ITF-Funded Research Projects

- ***RFID Traceability for Risk Management in Hospital***

[ITP/020/09LP], HK\$11M, Sept 2009 – Nov 2011

- Developing low-cost, positioning-capable, sensor-pluggable active RFID system for tracking people and asset
- Enhancing hospital risk management such as infectious disease outbreaks & hospital-acquired infections
- Leveraging RFID traceability technologies for better patient care

- **Pilot Implementation in Prince of Wales Hospital (PWH)**

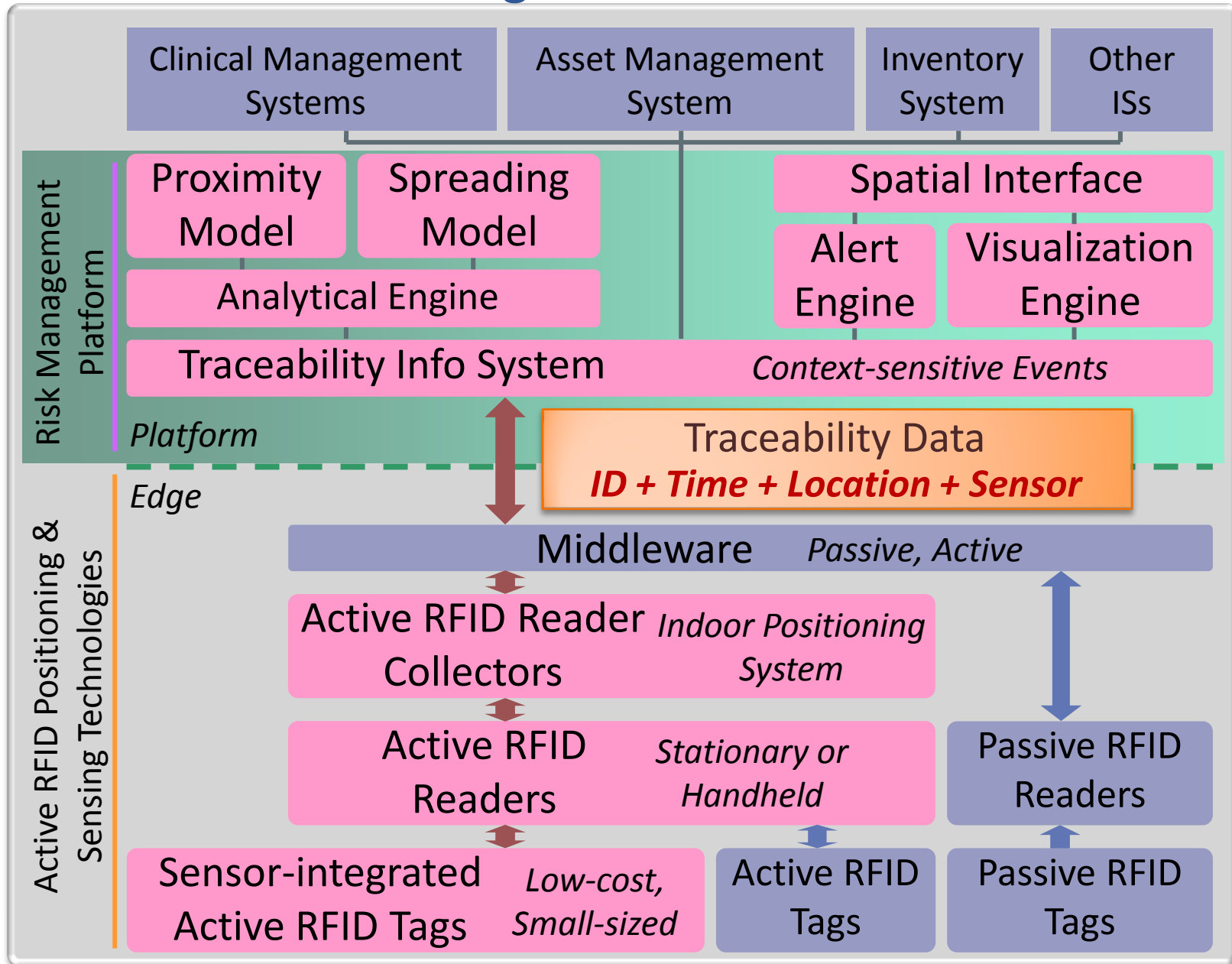
- Alerting ward staff for certain patient activities that may be at high risk if lack of timely attention
- Tracking people interactivities for tracing possible spreading paths

- ***Prototype: RFID Traceability for Risk Management in Hospital***

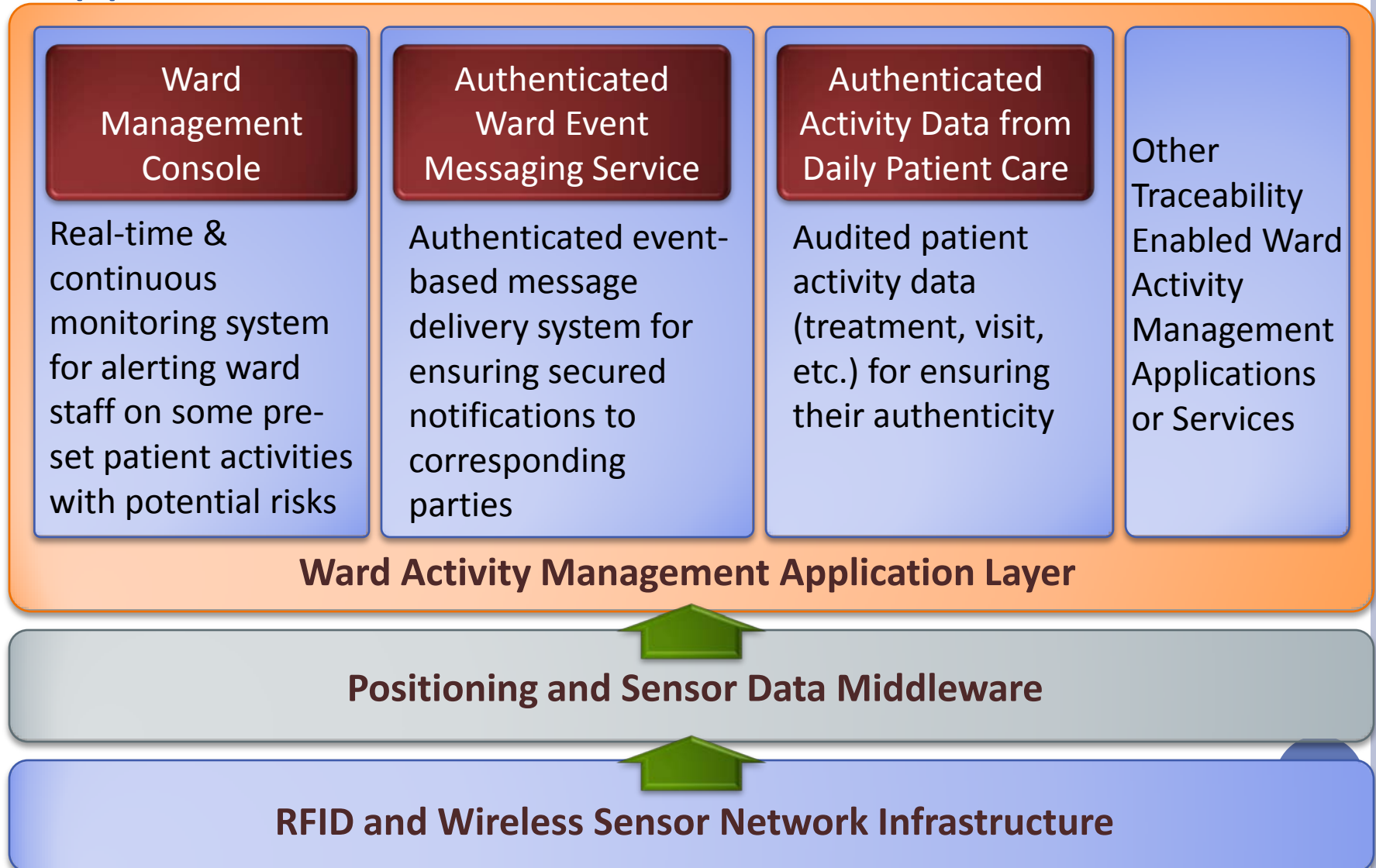
[ITT/006/11LT, HK\$3.3M, Oct 2011 – Sept 2012]

- Evaluating the prototype for the usage in other hospital departments
- Enhancing RFID technologies for different usages with different packaging


Healthcare Risk Management Architecture Framework



Traceability Enabled Ward Activity Management Applications



Event Monitoring for Alerting Issues that Require Attention



Unattended Alerts
Alert History
Refresh
2011-9-18 11:47:13 AM
LOGOUT

Patient

Tag Patient

Untag Patient

Suspend/Resume Tag

Edit Patient Info

Search Patient

Set Patient Rules

Caregiver

Equipment

Ward

Configuration

Patient

Enter Robotics ! 3

Patient Not in Ward List

Name	Patient Info.	Away (Mins)
PATIENT, ARNOLD PARAN TESTING ON ADULT WRISTBAND	F/27/HN07123456	2611
CHUK, ON HONG	M/36/HN10046725	4261

Patient Statistics

Statistics	Total	1	2	3	4	5	6	Else
# of Tagged Patients	2	0	2	0	0	0	0	0
# of Tagged Patients in Alerting Conditions	1							
# of Tagged Patients Not in Ward (<30 Mins)	0							
# of Patients Not in Ward (30-60 Mins)	0							
# of Tagged Patients Not in Ward (>60 Mins)	2							

Equipment

Equipment Not in Ward

Equipment	Away (Mins)	Remarks
Wheel Chair	1	0
Stretcher	0	0
O2 Cylinder	0	0
Oximeter	0	0
IV Pump	0	0
Cardiac Meter	0	0

Equipment Statistics

Statistics	TotalCount	Missing	1	2	3	4	5	6	Else
Wheel Chair	1	0	0	1	0	0	0	0	0
Stretcher	0	0	0	0	0	0	0	0	0
O2 Cylinder	0	0	0	0	0	0	0	0	0
Oximeter	0	0	0	0	0	0	0	0	0
IV Pump	0	0	0	0	0	0	0	0	0
Cardiac Meter	0	0	0	0	0	0	0	0	0

Caregiver

Check-in Records of Central Laboratory :

Schedule	Last Check-in Time	Diff. Time	LoS (Mins)
2011-09-18 10:45		0	0
2011-09-18 09:30		0	0
2011-09-18 08:00		0	0

Check-in Records of Central Pharmacy :

Schedule	Last Check-in Time	Diff. Time	LoS (Mins)
2011-09-18 11:00		0	0
2011-09-18 05:00		0	0
2011-09-17 11:00		0	0

Ward

Ward Condition (Hi/Lo in last 24 Hrs)

Zone	Curr. Temp.	Temp. (Min)	Temp. (Max)	Curr. Humid.	Humid. (Min)	Humid. (Max)
Robotics	0	0	0	0	0	0
Biomedical	0	0	0	0	0	0
Wireless & Mobile	0	0	0	0	0	0
Cloud Computing	0	0	0	0	0	0
Zone 10	0	0	0	0	0	0
Zone 11	0	0	0	0	0	0
Zone 32	0	0	0	0	0	0

**RFID Traceability
Pilot Implementation
in PWH**

**M&T
Ward
11A**

Prince of Wales Hospital

Ward Management Console

**Context-sensitive Event
Detection & Monitoring
In Hospital**

Patient

Caregiver

Equipment

Ward

M&T Ward 11C

Main Clinical Block & Trauma Centre

Authenticated Ward Event Messaging Service

Ward Events

Critical vital
sign change

Regular
periodical
measurement

Unexpected
incident

Scheduled or
unscheduled
physician visit

Unexpected
change in
environment

Authenticated Messaging Service

PKI: Public Key Infrastructure

Using public key cryptography & digital
certificates to ensure the integrity of the
content & message communications

Who am I dealing with?



Fabrication

Authentication

Has my communication been altered?



Modification

Integrity

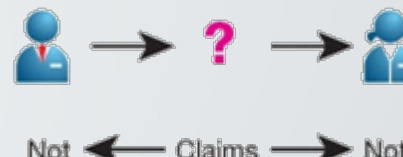
Is my communication private?



Interception

Confidentiality

Who sent/received it and when?



Not ← Claims → Not

Non-repudiation

Message
Compliance to
Electronic
Transactions
Ordinance
(Chapter
553)



Context-Sensitive Event Detection & Monitoring for Enhancing Patient Care in Ward

