Auto- ID Labs

2005. 11. 07.

Auto- ID Lab Korea

1.

2.

3.

4.

5.

6.

7.

(1)

Auto- ID Labs

❑ EPCglobal
  • RFID   promote   (de facto standard)
 •   450   (2004. 12.)
  • MIT Auto- ID Center   2002   RFID

❑ Auto- ID Labs
  • EPCglobal   ,
  •   MIT, Cambridge, St.- Gallen, Adelaide, Keio, Fudan, ICU 7
  •   6   Auto- ID Lab   EPCglobal   110
  • Auto- ID Affiliate Lab / Auto- ID Lab Academic Partner

  •   ,   ,   ,   ,   (2006   )

❑ Auto- ID Labs
  •
    –   2   face- to- face meeting, next meeting, 2005   9 : EPCglobal US Conference 2005, Atlanta, USA
    – Bi- weekly teleconference: directors + president of EPCglobal
  •   ,

EPCglobal Organization Chart
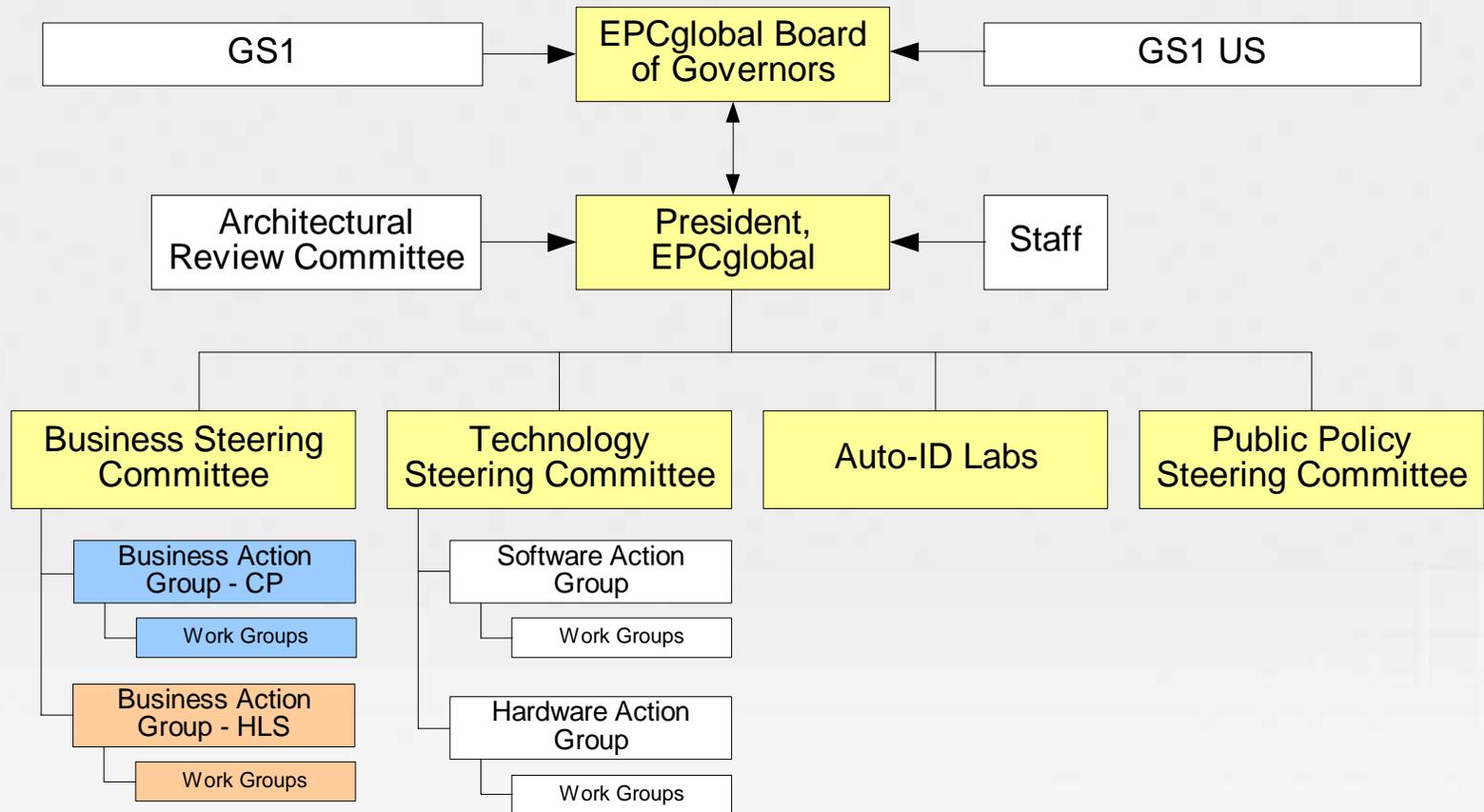
Auto- ID Lab Korea

❏ U- society
  - IT- Hub , IT
  - RFID/USN → IT

❏ RFID/USN ( )
  - Auto- ID Lab Korea

❏ 2004 8 : MIT Auto- ID Lab
  - MIT Sanjay Sarma (RFID)

❏ 2004 10~12 : Auto- ID Lab Korea ICU
  - 2004 10 – MIT
  - 2004 11/12 – MIC/ / PM
  - 2004 11 – ICU

Auto- ID Lab Korea

❑ 2005   1 : Auto- ID Labs, Board of Directors
Auto- ID Labs   , ICU

❑ 2005   1 ~3 :   ,   ,
  • 2005   2   2   – Auto- ID Lab Korea
  • 2005   3   8   – Auto- ID Labs   ICU
  • 2005   4   1   – Auto- ID Lab Korea   ICU

❑ 2005   5   6 : Auto- ID Lab Korea   (ICU)
  • Auto- ID Labs, Board of Directors Co- Chair, Jun Murai
  • Auto- ID Lab Korea Certificate

❑ 2005   10 : [Auto- ID Lab Korea] – [Auto- ID Labs] – [MIC]

❑ 2005   11   10- 11 : Auto- ID Lab China/Japan/Korea
            (   )

❑　　　　　RFID/USN　　　　　　(　　　　　)

-
-
-
-

❑ EPCgolbal　　　　　　EPC
- EPCglobal
- EPCglobal　RFID/USN
- EPCglobal

❑

-

Auto- ID Lab Korea

❑ RFID/USN _____

❑ RFID/USN _____   ・ ・

❑   RFID/USN

❑   ・ ・

❑ RFID/USN

❑   RFID/USN

❑   RFID/USN

2.

❑ Auto-ID Lab 2005-2006

[Auto-ID Labs Research Map, Sidney 2005]

Business, Application, Privacy & Security	Fundamentally New Business Processes	Payment, Leasing, Quality Mgmt, Factory Design, Brand Protection, Grey Markets, Counterfeiting, etc.	4: RFID/USN 3: EPC
Networking & Software	System Architecture vs. Infrastructure	EPC Sensor Network, NFC, Apps-versus Event-Servers	2: EPC Sensor Network
RF & Chip Design	Class 2 to 5	Memory, Semi-active, Active, Sensors, Wireless	1: EPC 2,3,4,5 RFID

1: EPC   2, 3, 4, 5   RFID

: EPC   2, 3, 4, 5   ,   ,
RFIC,   , MAC(Air Interface), Network

:   RFID   Auto- ID Labs
   EPCglobal   ,   ISO/IEC

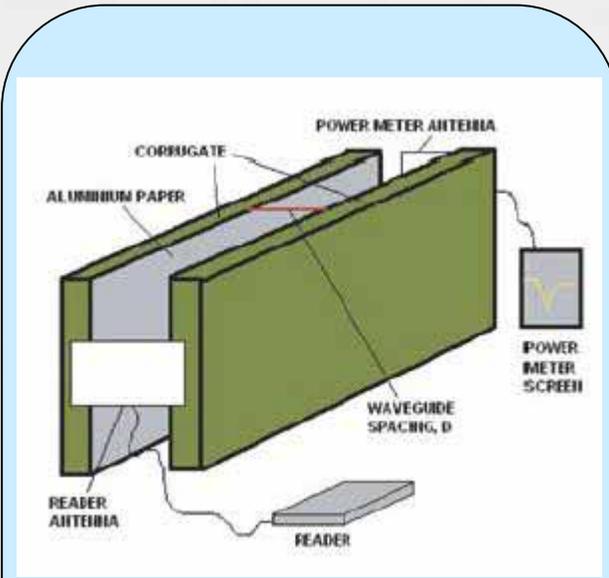   : Fudan(C1 Gen 2   ), Adelaide(RFID
  ,   , RFIC   ), ETH(C2, 3, 4, 5   , Air Interface), Keio(
       ),   (RFID   )

Class 3 Tag

Class 4 Tag

Class 5 Tag

EPC   2, 3, 4, 5   RFID

Auto- ID Labs

RFID / EPC Sensor Network	Adelaide
	Fudan / Adelaide
RFIC	Fudan / Adelaide
	Fudan
Air Interface / MAC	Fudan / Keio / ETH
	Keio / ETH
EPC 3, 4 Integration	Cambridge / ETH / Fudan
EPC 5 Integration	Cambridge / ETH

Waveguide: a packaging feature to improve tag readability

: 2005   , Auto- ID Labs white paper series, MIT
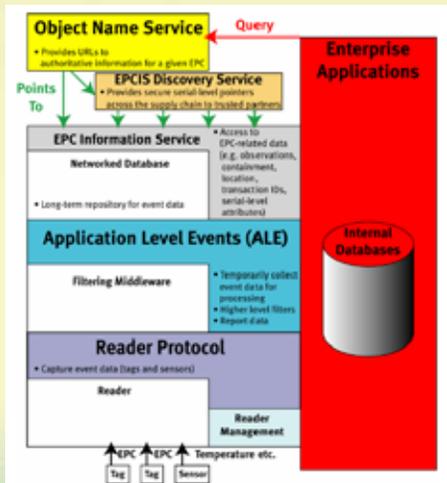
2: EPC Sensor Network

: EPCglobal EPC

: EPCglobal   EPC Sensor Network
        EPCglobal   ISO/IEC   .
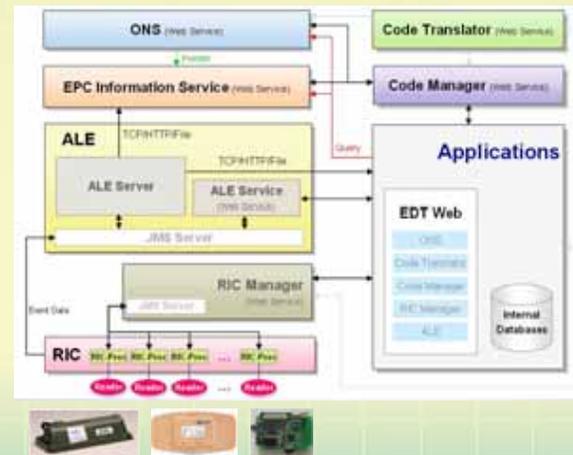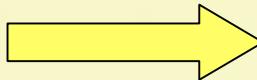
                : ETH(   ), Keio(ONS), MIT(EPC Webservices)

EPC Network   EPC Sensor Network

● EPC Sensor Network

	Auto- ID Labs

EPC Sensor Code	MIT / Keio / ETH
EPC Sensor Reader Management	ETH / Keio
EPC Sensor Reader Protocol	ETH / Keio
EPC Sensor Filtering and Collection	ETH / Keio
EPC Sensor Information Service	MIT / ETH / Keio
EPC Sensor Discovery Service	MIT / ETH / Keio
EPC Sensor Physical Object Markup	ETH
EPC Sensor Object Naming Service	Keio

Realm : EPC Web Service middleware, MIT, Auto- ID Labs conference, 2005

2.
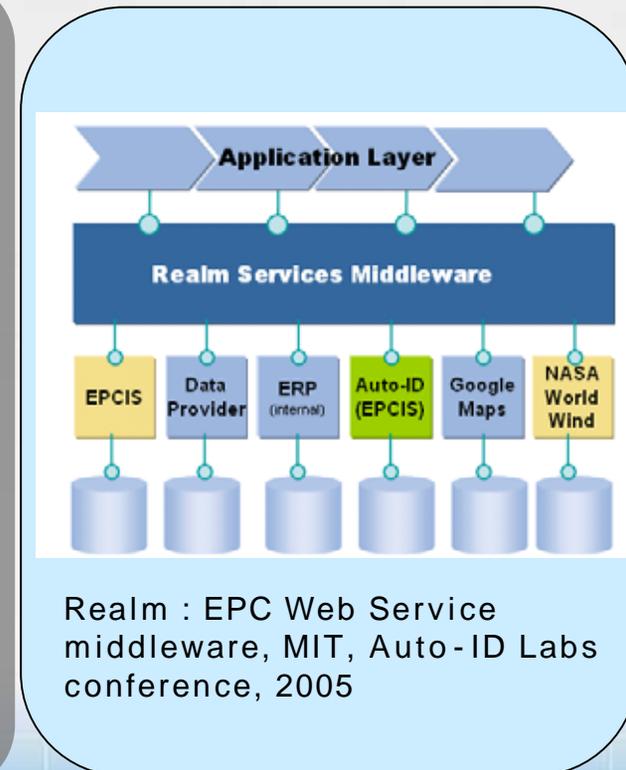
3: EPC

: EPC RFID/SN

RFID/SN

: QoSS

EPC

ISO/EPCglobal

: MIT( ), St. Gallen(,), Keio(EPC)

EPC Class 1, 2, 3, 4, 5	ISO EPCglobal
	EPC Class 1 Gen2
	EPC Class 2, 3, 4, 5

● EPC

	Auto-ID Labs
/	MIT
	MIT
EPC ,	St.Gallen
RFID	MIT
EPC	Keio
RFID	Fudan
	St. Gallen

Here's Mr. Jones in 2020...
- Wig model #4456 (cheap polyester)
- Replacement hip medical part #459382
- Das Kapital and Communist-party handbook
- 1500 Euros in wallet Serial numbers: 597387,389473
- 30 items of lingerie

Blocker Tag

: / RSA Security

4: RFID/USN

: RFID/USN (RBMF)

: RBMF

: St. Gallen(/), Cambridge(,), Keio( ), Fudan( )
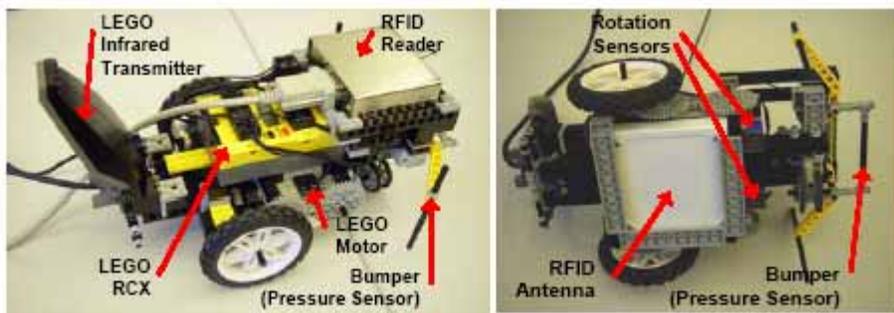
Location-Aware Autonomous Vacuum Cleaner

Jurgen Bohn and Friedemann Mattern, 'Super-Distributed RFID Tag Infrastructures

Future Store

RFID

- St. Gallen & Metro

RFID

RFID/USN

	Auto- ID Labs
RFID	St. Gallen
RFID	St. Gallen / Keio
RFID	Cambridge
	St. Gallen
, ,	St. Gallen
RFID	Keio
RFID	St. Gallen / Fudan

Future Store

Metro Future Store
: 2004 , M- Lab & IBM & SAP,
St. Gallen /

RFID/USN

Consulting Committee

MIC, IITA
,

AIDL Korea

,   ,

.

MIT, Cambridge,
St.Gallen/ETH, Keio,
Adelaide, Fudan

, ETRI

EPCglobal

4.

(1- 2   )
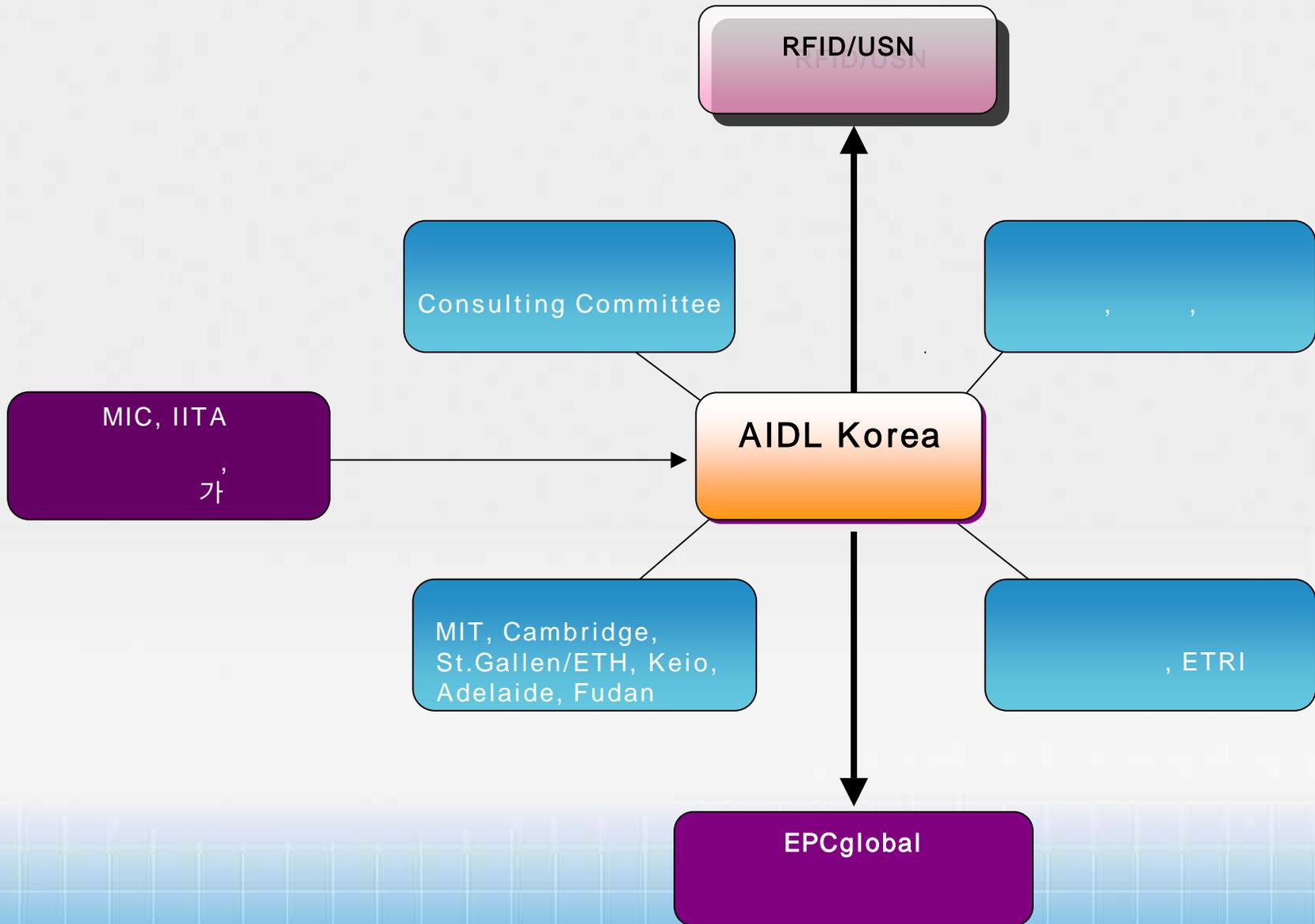
- AIDL Korea   AIDLs

   ⇨   (,   ,   , automotive, healthcare,
      sensor network   )

-        AIDLs   AIDL Korea

   ⇨   EPC Sensor Network

- 2   1   , 6   1

  AIDL   (3- 5   )

-                ,   , healthcare   ⇨   AIDL

 - EPC Sensor Network   H/W, S /W,   ⇨   6
    AIDLs   AIDL Korea

 - 7   AIDL   EPC

4.

1~2

- AIDL Korea   AIDLs   : AIDLs
              (,   ,   , automotive, healthcare, sensor network   )

-          AIDLs   : AIDL Korea   EPC Sensor Network   AIDL

3~5

- AIDL Korea   AIDLs   : AIDL Korea
                  AIDLs

-          AIDLs   :   6   AIDLs
         AIDL Korea   EPC Sensor Network

4.

EPC Class 2, 3, 4, 5   RFID
- ▪
- ▪   : ETRI,   (SAIT), LS   ,

 EPC Sensor Network
- ▪
- ▪   : ETRI,   ,   SDS

EPC
- ▪

- ▪ EPC   (   )
- ▪   : ETRI,   SDS, LG-CNS

❑

1	2	3

Draft
(Auto- ID Labs)

Draft

EPCglobal
draft
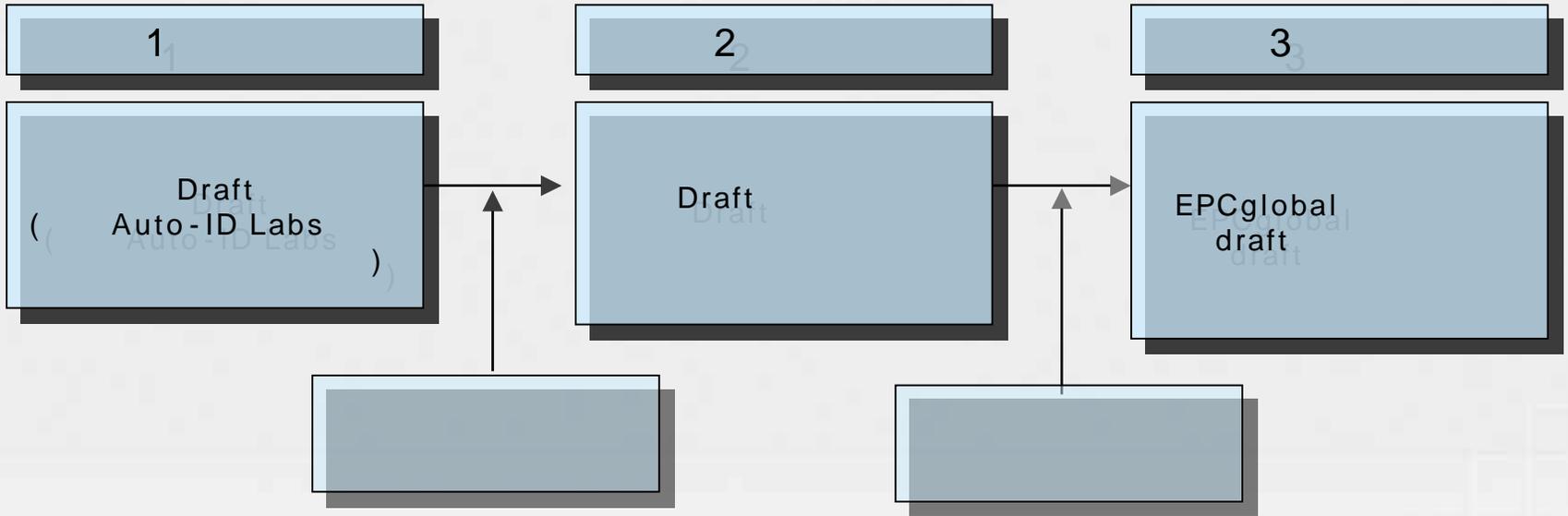
❑   10

❑

4.

1   AIDL Korea

| Auto- ID Labs | ICU | | |

EPC   2,3,4,5   RFID

Elgar Fleisch (St.Gallen / ETH)	EPC Class 2,3,4,5	6
Hao Min (Fudan)	EPC Class 2,3,4,5	6
	EPC Class 2,3,4,5	6

EPC Sensor Network Middleware

Jun Murai (Keio)	EPC Sensor Network Middleware Arch	6

EPC

R. Rivest (MIT)		6
S. Sarma (MIT)	RFID	6

RFID/USN

Elgar Fleisch (St.Gallen)	RBMF	6

4.

●1　　　　AIDLs

| Auto- ID Labs | ICU | | |

EPC　　　2, 3, 4, 5　　　RFID

| Fudan | Junyu Wang | EPC Class 2, 3, 4, 5 | 6 |
| Adelaide | Behnam Jamali | EPC Class 2, 3, 4, 5 | 3 |

EPC Sensor Network Middleware

St.Gallen / ETH	C. Floerkemeier	EPC Class 2, 3, 4, 5	3
Keio	Jin Mitsugi	EPC Sensor Network Middleware Arch	3
Cambridge	Hugo Mallinson		

EPC

| MIT | Sanjay Sarma | | 3 |

RFID/USN

| St.Gallen | Thorstein Staake | RBMF | 3 |

		’05. 11. ~ ’06. 10	’05. 11. ~ ’07. 10.
	AIDL Korea ( )	10.0 ( )	30
	AIDLs ( )	3.6 ( )	10.8
		13.6	40.8
		36 (12.3 M/Y)	108 (36.9 M/Y)
AIDLs : - (6 7), AIDLs - (Bench Fee: 3 /)			

7.

● EPC Sensor Network

- ·

- ●

- ● EPC

   -

   - EPCglobal   EPC   ISO/ISE

- ● IPR

      IT

- ●   RFID/USN

- ● RFID/USN

EPC Class 2,3,4,5   Sensor Network

- ❑   :   RFID   USN   /
- ❑   RFID / USN   (2010   540.8   )
- ❑   ,   ,   ,   ,
                  /

(단위: 억 US$)

구분		2004	2005	2006	2007	2008	2009	2010
RFID	HW	13.5	18.3	24.6	31.1	36.0	41.1	47.4
	서비스	6.5	11.8	16.4	21.9	31.0	41.9	52.6
	소계	20.0	30.1	41.0	53.0	67.0	83.0	100.0
USN	HW	43.9	64.6	90.4	117.5	152.5	207.9	278.5
	서비스	40.4	64.0	71.9	85.7	108.3	138.4	162.3
	소계	84.3	128.6	162.3	203.2	260.8	346.3	440.8
총계		104.3	158.7	203.3	256.2	327.8	429.3	540.8

(자료출처 : ETRI/IDTechEx/VDC 추정, 2004.11)

⬤ EPC

- ☐   :   ,
- ☐   RFID/USN

        RFID/USN

- ☐

                  ,   ,

RFID/USN

		2004	2005	2006	2007	2008	2009	2010
RFID	HW	13.5	18.3	24.6	31.1	36.0	41.1	47.4
		6.5	11.8	16.4	21.9	31	41.9	52.6
		2.7	7.9	14.4	20	26.7	37.7	51
USN	HW	43.9	64.6	90.4	117.5	152.5	207.9	278.5
		40.4	64	71.9	85.7	108.3	138.4	162.3
		11.4	13.9	16.9	20.6	25.1	30.5	37.1
		104.3	158.7	203.3	256.2	291.8	429.3	540.8

(:   US $)

           :
ETRI/IDTechEx/VDC   , 2004.11
IDC   , 2002

RFID/USN

- ❑ RBMF

- ❑ RFID/USN   RFID/USN

- ❑   RFID/USN   RFID/USN   /

Hype Curve

Success Momentum
- RFID/USN
  =>   RFID/USN

SUCCESS

FAILURE
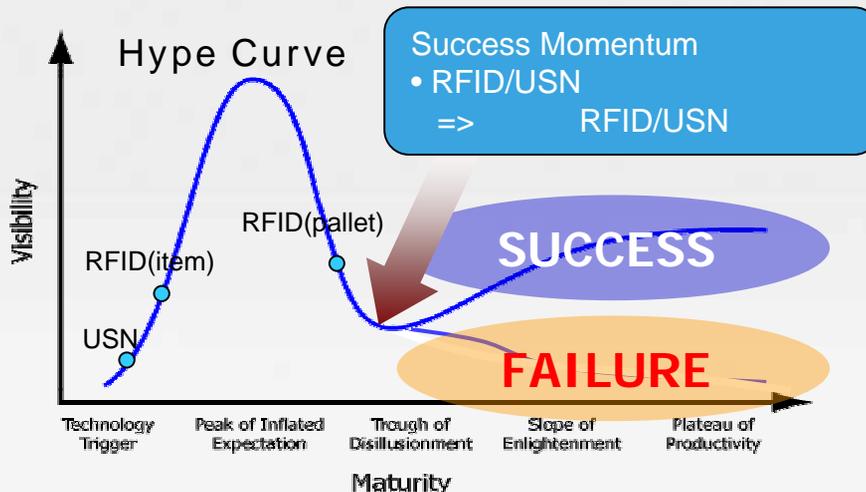
Success Momentum
RFID/USN

USN

(2010   ,   US$,   )

43.29	40.76	84.04
13.76	21.77	35.53
19,404	38,391	57,795

(ETRI, USN   , 2005)

🔴 Auto- ID Lab Adelaide

: MIT   RFID

                              Peter Cole   Lab
      2000   Auto- ID Center   2003   Auto- ID Lab
Adelaide

                    :   , RFID Tags, Readers,   RFID

      :   1   ,   1   ,   3   ,   2
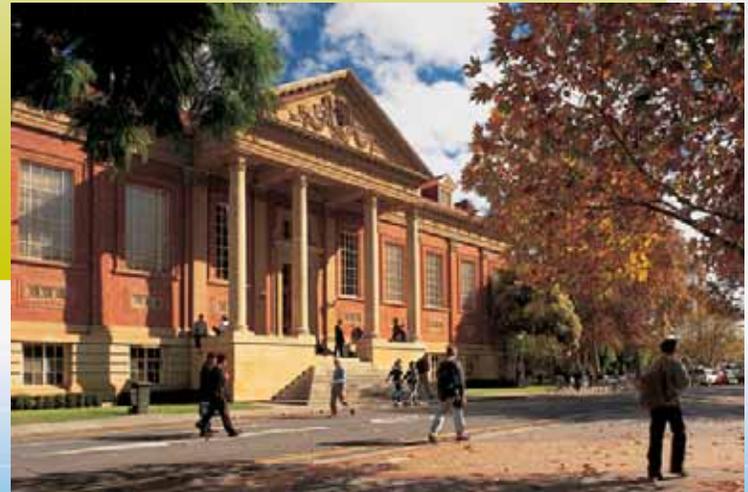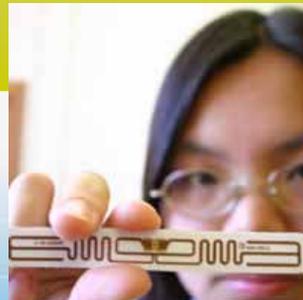
      : Peter Cole
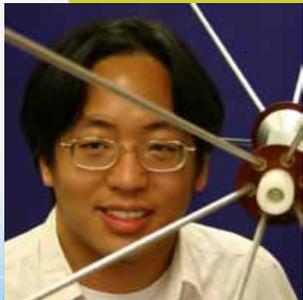
🔴 Auto-ID Lab Cambridge

          :   Lab   , 2000
Auto-ID Center   2003   Auto-ID Lab Cambridge   .
McFalane

                    : Aerospace ID   , PLM(Product Lifecycle
Management)

          :   1   ,   4   ,   2   , director 1   , senior industrial
fellow,   6

          : Duncan McFarlane

UNIVERSITY OF CAMBRIDGE

🔴 Auto- ID Lab Fudan

: Auto- ID Lab   Lab.
2003   Auto- ID Lab China   Lab
            :   , RFID Tag/Reader
    Gen2   , Reader SOC, USN,

:   1   , Associate Director 2   ,   1,   8   ,
    6

: Hao Min

Auto-ID Lab Keio

: 2002   Auto-ID Center   2003   Auto-ID Lab
Japan   .   Keio   Lab
Jun Murai
          12   Lab   290   , 337
                              . Auto-ID Lab Keio   Lab

          : RFID wireless system engineering   EPC
network, ONS,

      :   1   ,   8   ,   2   ,

   : Jun Murai

Auto-ID Lab MIT

: Auto-ID Lab   1999   Auto-ID Center
RFID   2002   EPCglobal
                                     de facto standard
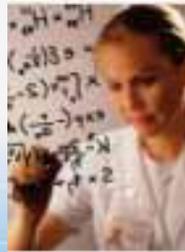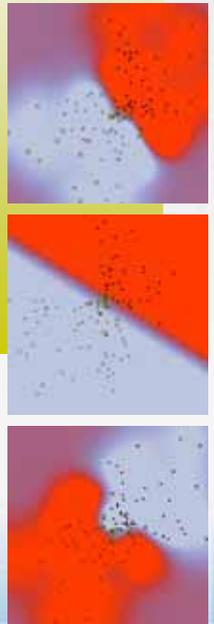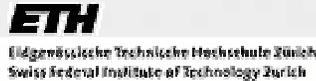, Center   Auto-ID Lab MIT   .
                 :   ,   , EPC network architecture,
, healthcare,   , sensor network
:   1,   8, +
: John Williams

Auto-ID Lab St.Gallen/ETH

University of St.Gallen

ETH
Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

: Auto-ID Center   2003   Auto-ID Lab St.Gallen/ETH   .

7   /   2   2001   .

: Mobile computing application, Business Management, Distributed S/W & Network Architecture, Class 2-5

: 7   , St. Gallen   (HSG)   1 (   ), ETH (Swiss Federal Institute of Technology) Zurich   1   (   ),   2, 11   ,   1

: Elgar Fleisch   (HSG)

: F. Mattern   (ETH Zurich)

M-Lab – The Mobile and Ubiquitous Computing Lab