RFID/USN Technology in Korea

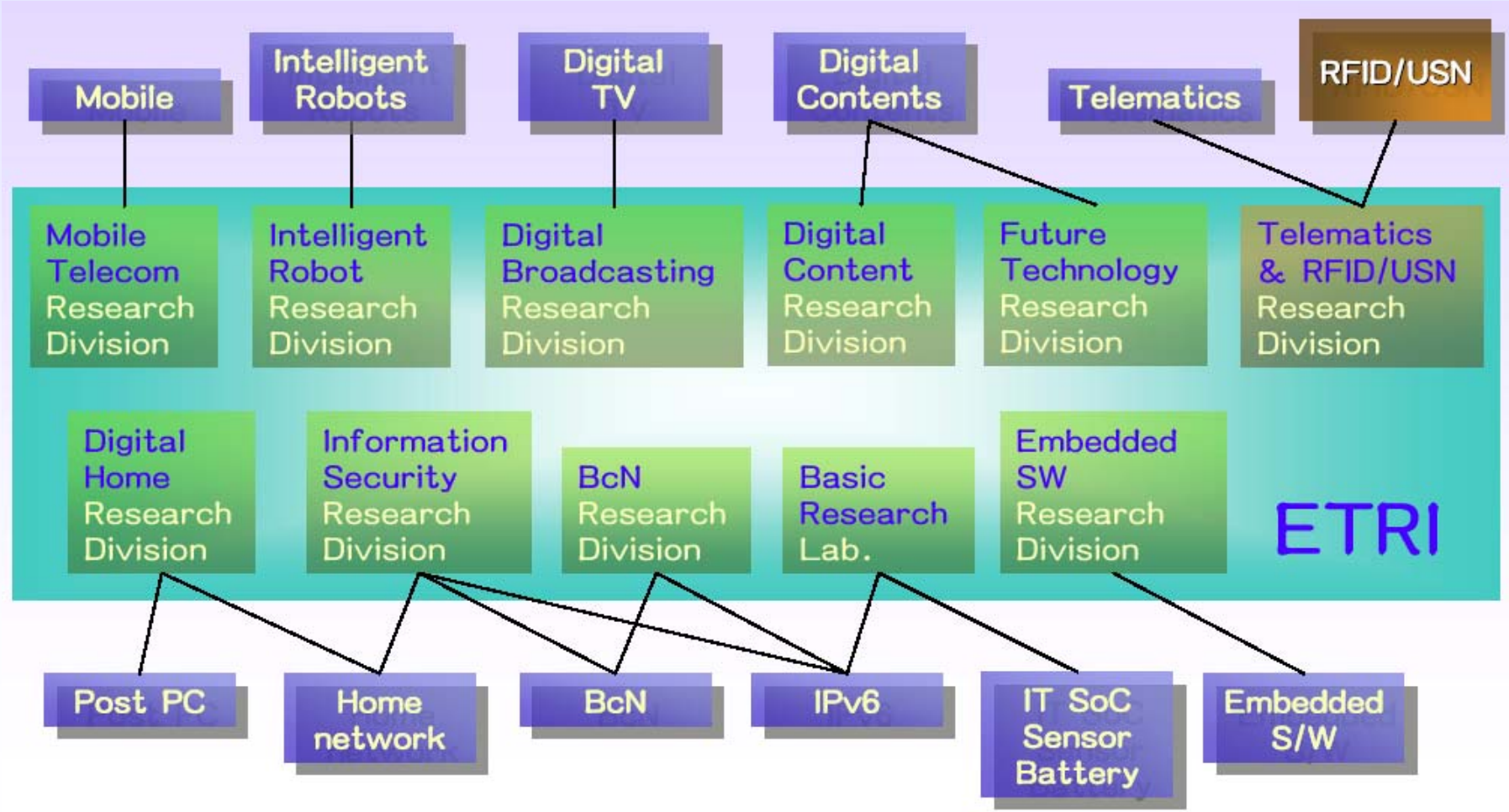
6. April. 2005.

RFID/USN Research Group

ETRI
Electronics and Telecommunications Research Institute

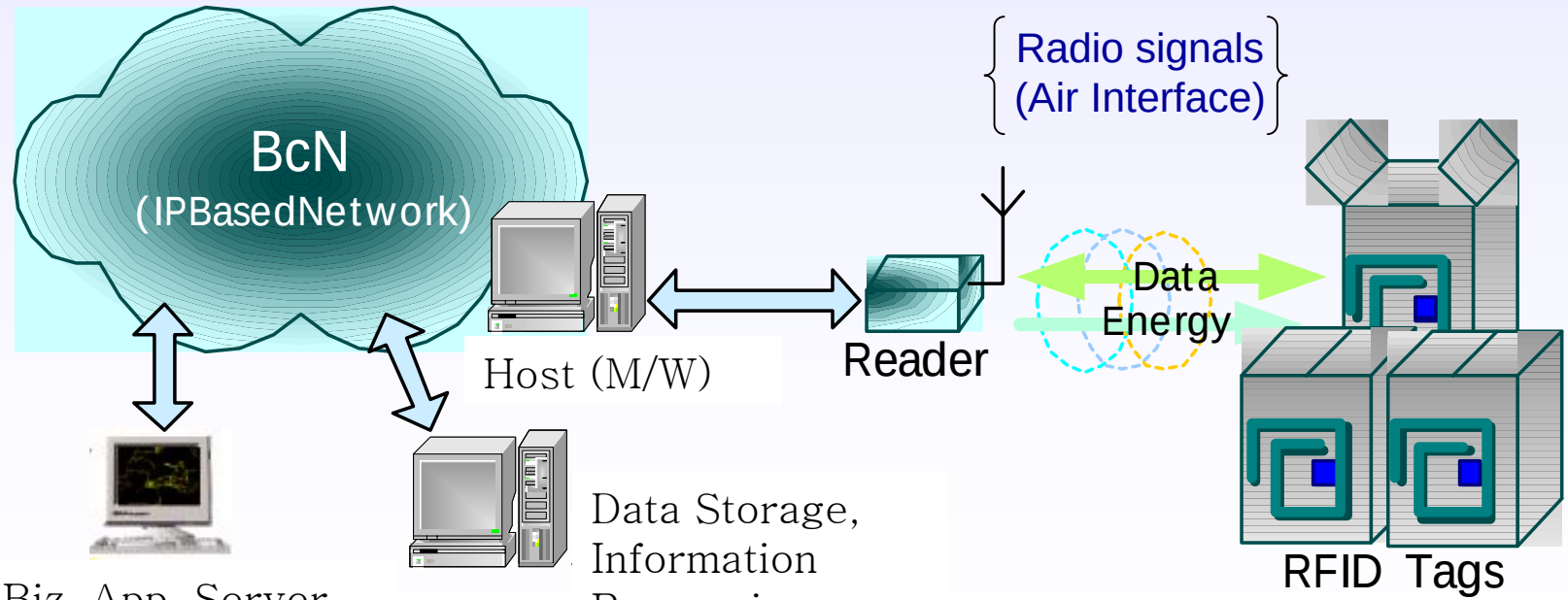
ETRI towards u-IT Korea

- ETRI is devoting to R&D on ubiquitous IT



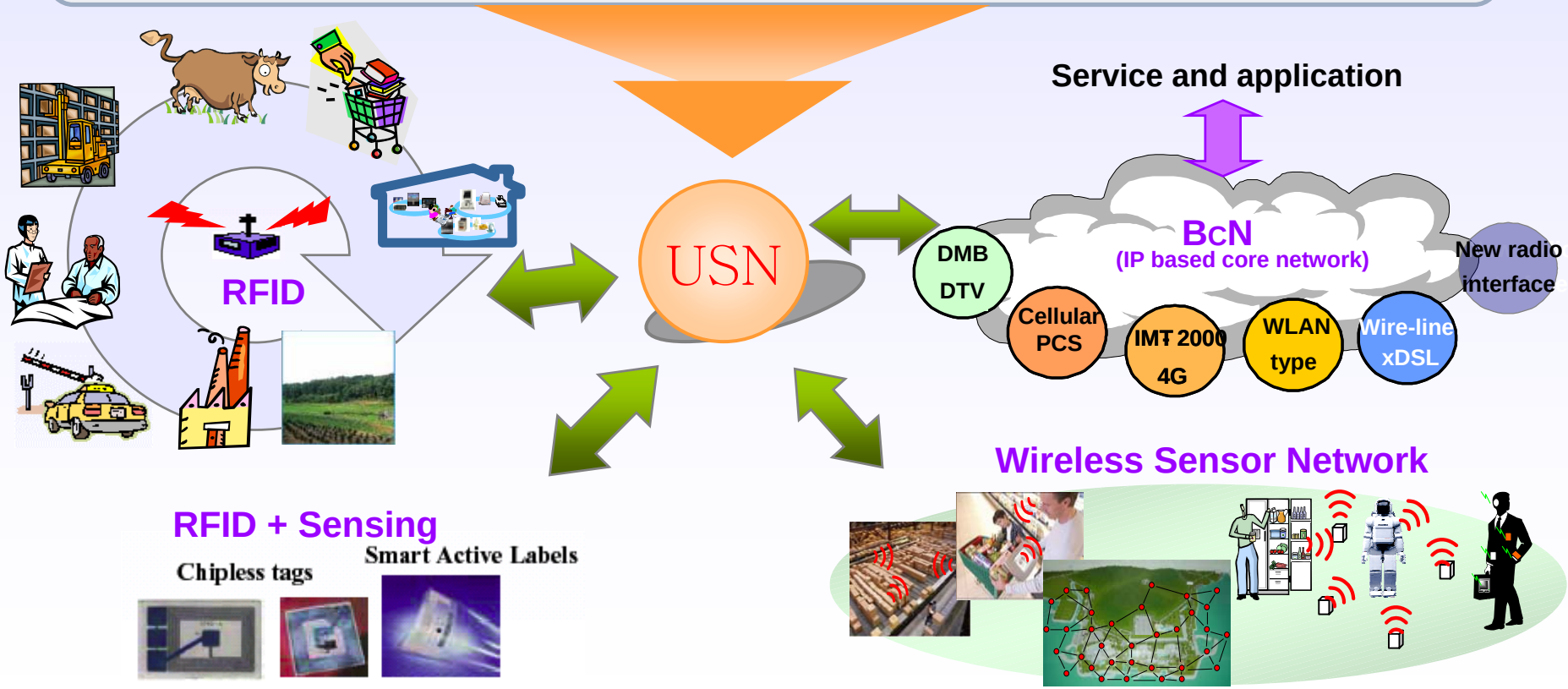
Radio Frequency IDentification

- Transferring of data and power, using contact-less technology
- Complementing limitations of barcode and other AIDC devices

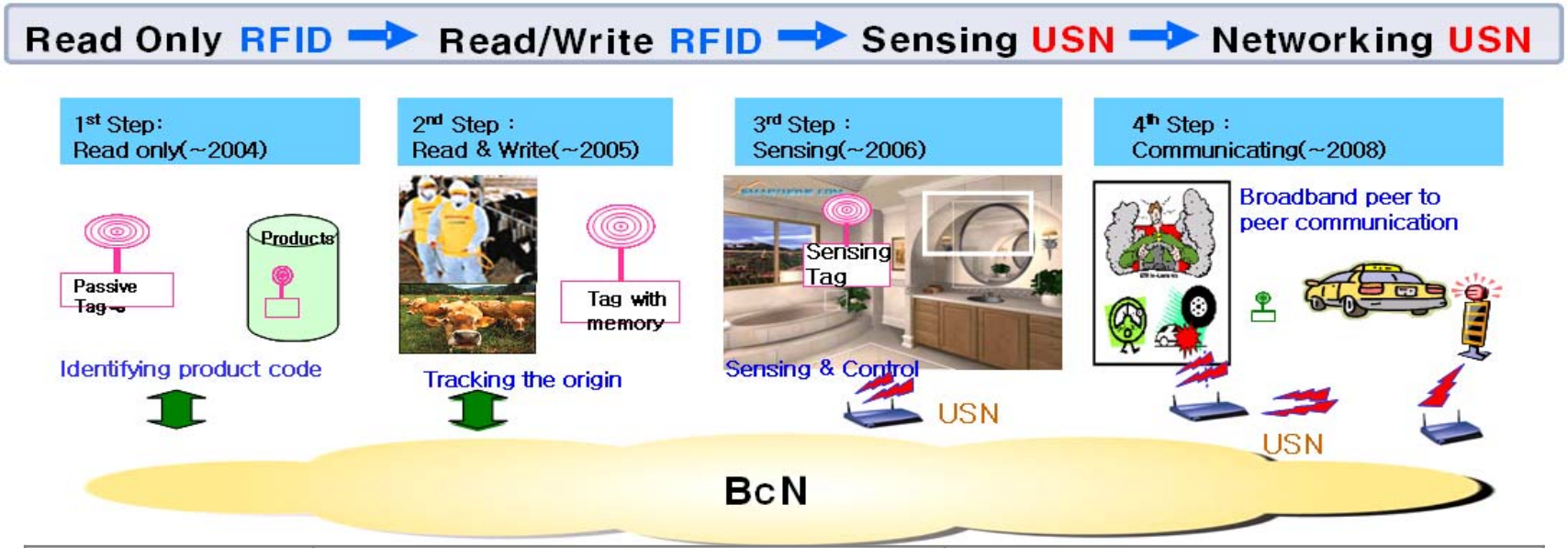


USN Concept in Korea

- UBIQUITOUS – Everywhere, everything with RFID tags
- SENSOR – Sensing ID and environmental information
- NETWORK – Real time management via network

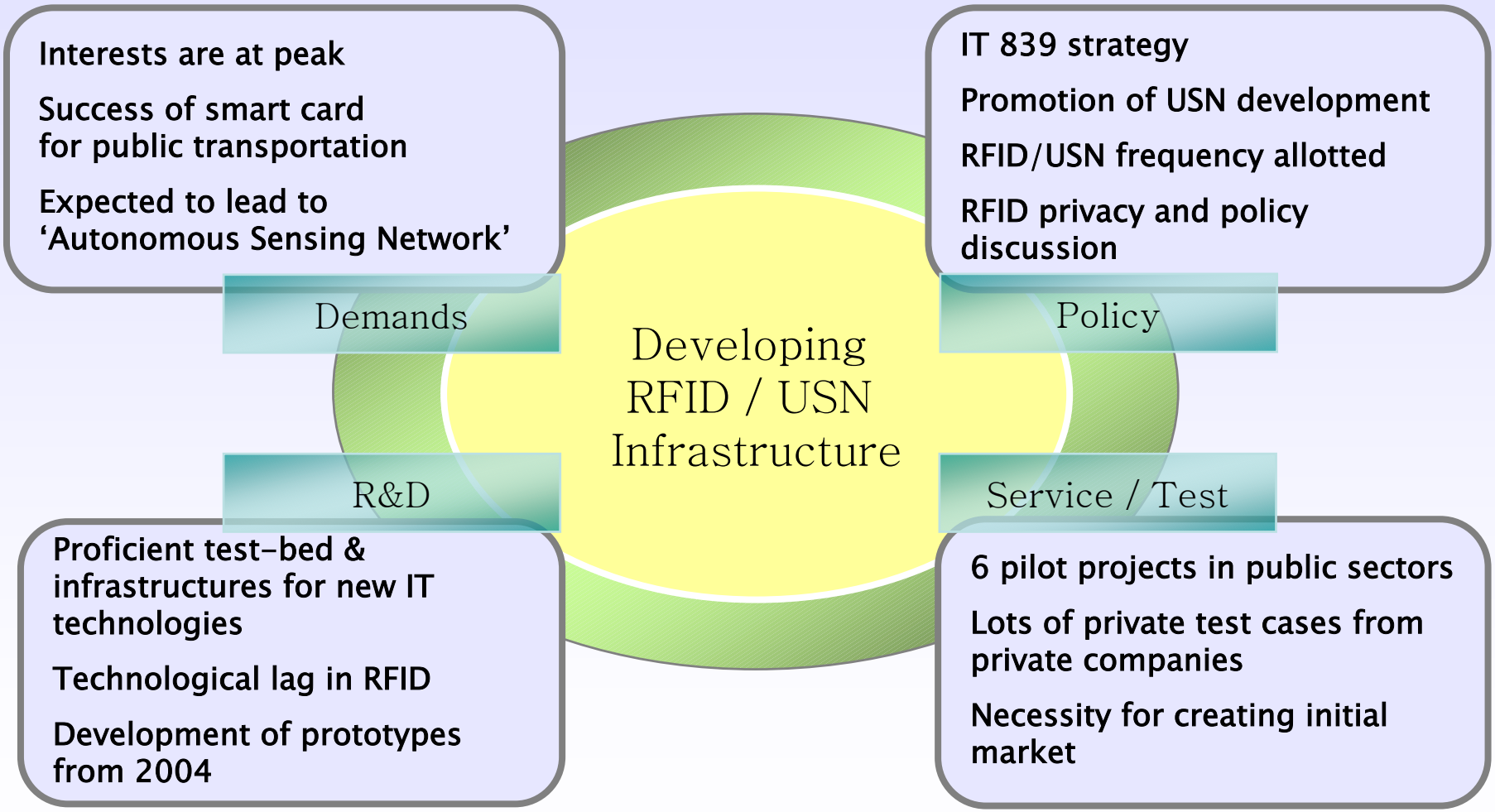


USN above RFID

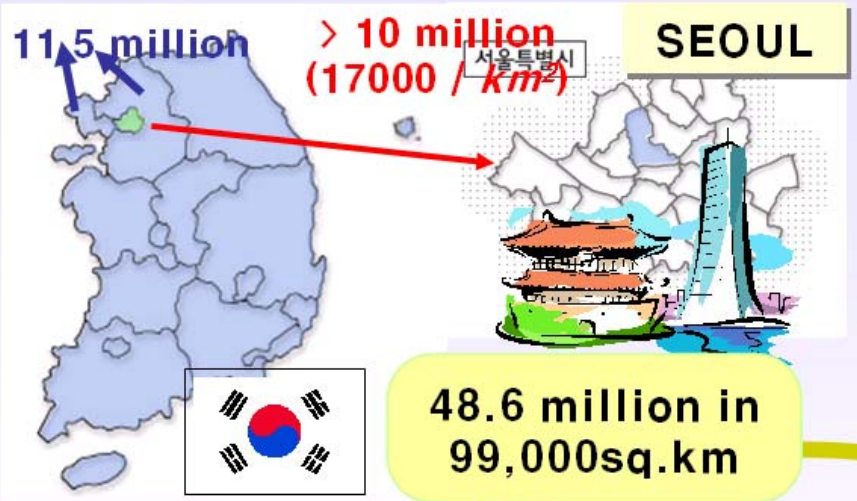


Area	Description	Category
RFID ('04~'07)	Wireless recognition technology of objects' information/record	▪ Tag (Chip) and Reader ▪ RFID Middleware and Service ▪ RFID System Engineering
USN ('04~'08)	Wireless Sensor Networking with collecting physical/environmental information including objects	▪ Sensor node and networking ▪ USN middleware and Service ▪ Context-Awareness / Algorithms ▪ USN System Engineering
Infrastructure ('04~'08)	Inter-networking RFID/USN with wired/wireless network and related techniques	▪ Standards and Identifiers, Policies ▪ Network Integration (IPv6, BcN) ▪ Practical Applications, Test-bed

RFID/USN Strategy



IT & Korea



48.6 million in
99,000sq.km

Internet User
> 30 million

IT Adoptors

Public Transportation Service
Seoul 7.1 million / a day

Broadband high-speed
Service 12 million

> 36 million uses
Mobile Phones

KTF
SK Telecom
LG TeleCom

KB 부산은행 citibank 조흥은행 농협
우리은행 신한은행 기업은행 하나은행 외환은행
EVERRICH 전북은행 제주은행 JEJU BANK 대구은행 광주은행

RFID Frequency

Newly Allotted Frequency for RFID/USN in 2004

~ 135kHz (ISO 18000-2)	13.56MHz (ISO 18000-3) (ISO 7816, 14443)	433.67MHz ~ 434.17 MHz (ISO 18000-7)	908.5 MHz ~ 914 MHz (ISO 18000-6) [4W EIRP, FHSS/LBT]
 Access Control	 Smart Card	 Inventory	 Container  Tire Pressure Sensor	  Logistics /Distribution

Low	Data Read Rate	High
Robust	Noise / Environment	Sensitive
Large	Tag Size	Small

Must consider Material, Tag/Antenna Orientation, Tag/Antenna Shape, Tag/Antenna Numbers, Dead Zones, Power, Antenna Efficiency, Product Package, Label, Geometry, ...

RFID Pilot Projects in Public Sector

- Government Procurement Management using RFID
  - Public Procurement Service (2004.9~2005.5)
- Ammunition Management using RFID
  - Ministry of National Defense (2004.9~2005.4)
- Import-Export Logistics Infra using RFID
  - Ministry of Commerce, Industry and Energy (2004.9~2005.4)
- Import Beef Tracing Service using RFID
  - National Veterinary Research and Quarantine Service (2004.9~2005.4)
- Airport Baggage Tracking System using RFID
  - Korea Airports Corporation (2004.9~2005.4)
- RFID based Harbor Logistics Efficiency Improvement
  - Ministry of Maritime Affairs & Fisheries (2004.12~2005.8)

With Successful Implementation

- Building Initial RFID Market and Infrastructure
- Verifying the Results of RFID R&D
- Expanding RFID-applicable Area
- Standardizing Platforms among Pilot Projects

RFID Test Cases in Private Sector

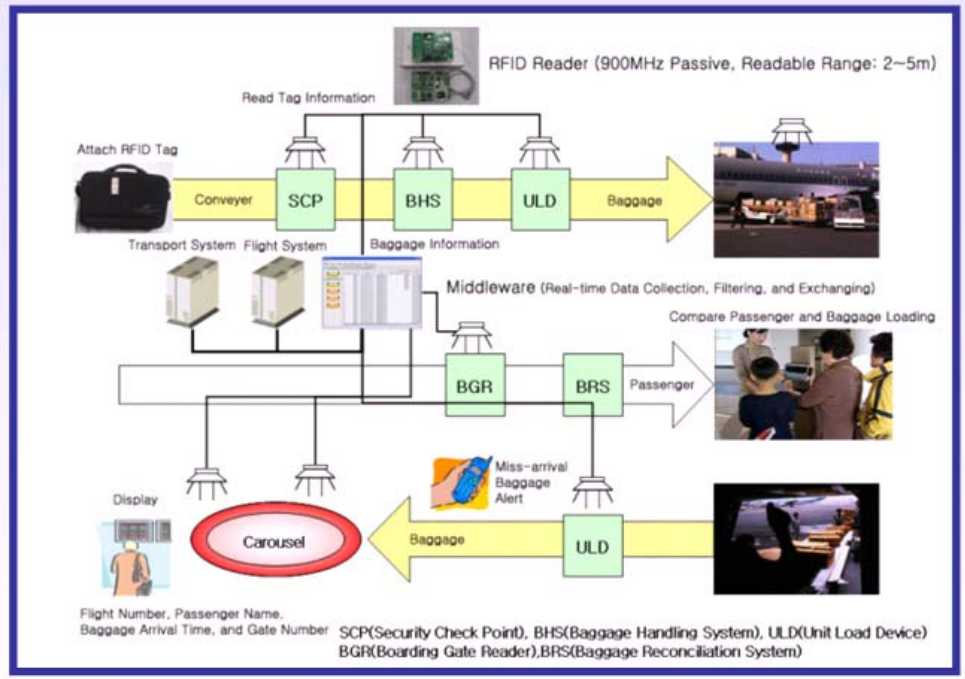
Wholesale & Retail

Parking Meter

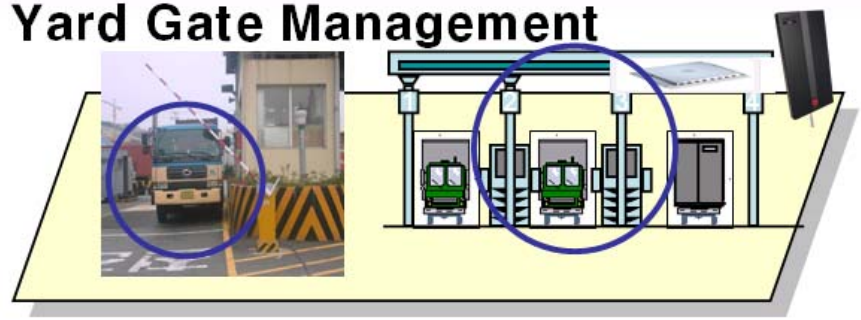
Integrated ID Card

Patient/Medicine Control

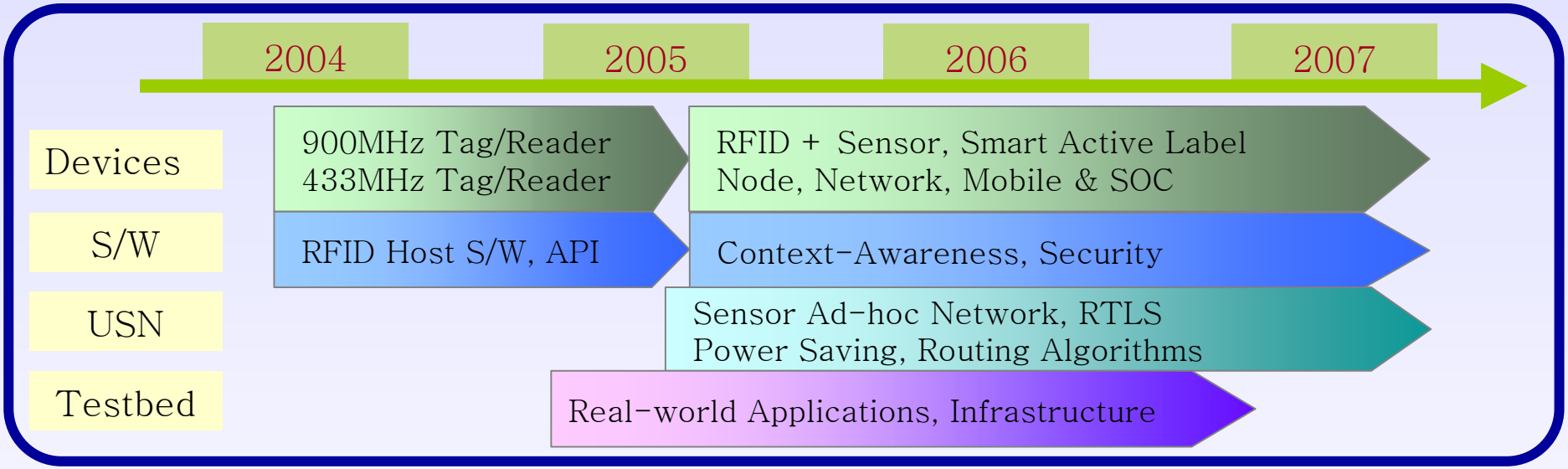
Aviation Baggage Management



Yard Gate Management



RFID/USN @ ETRI



RFID/USN Research Group

2005

- 1. 900MHz Reader Technology
- 2. 433MHz Reader Technology
- 3. Mobile RFID Technology
  - 2006 3Q : Design & Prototype
  - 2006 4Q : Test service
- 4. RFID Applications

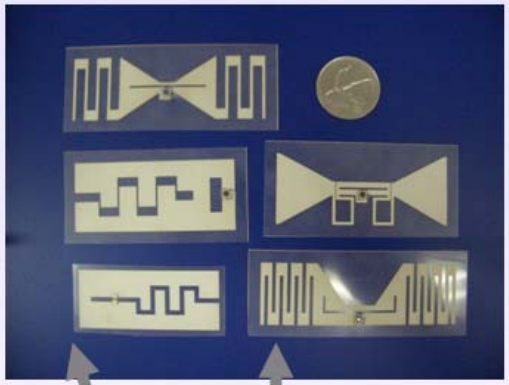
Korea Association of RFID/USN

Korea USN Center, USN Forum

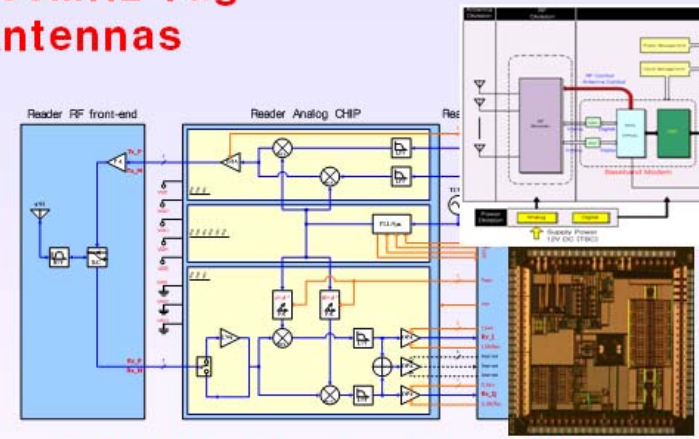
Telecommunications Technology Association - RFID/USN PG

Mobile RFID Forum

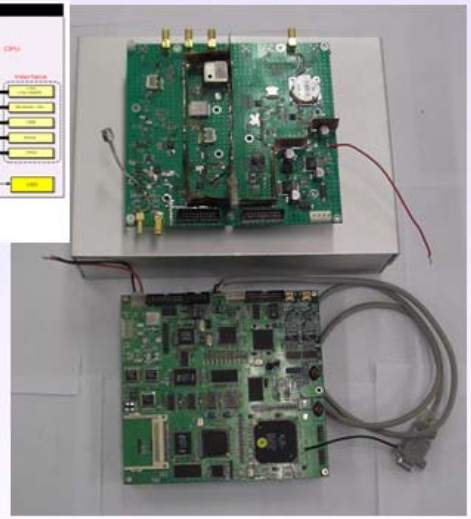
R&D @ ETRI



900MHz Tag Antennas

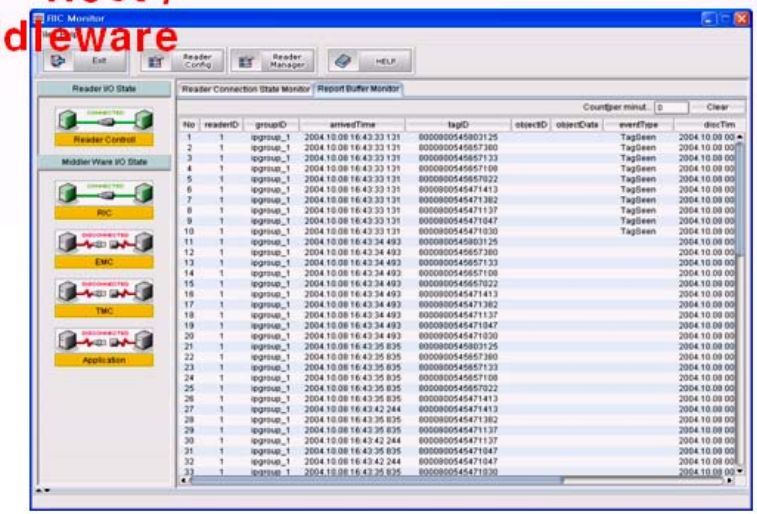


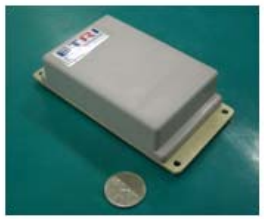
900MHz Reader



900MHz Reader/Tag Chip

Host / Middleware

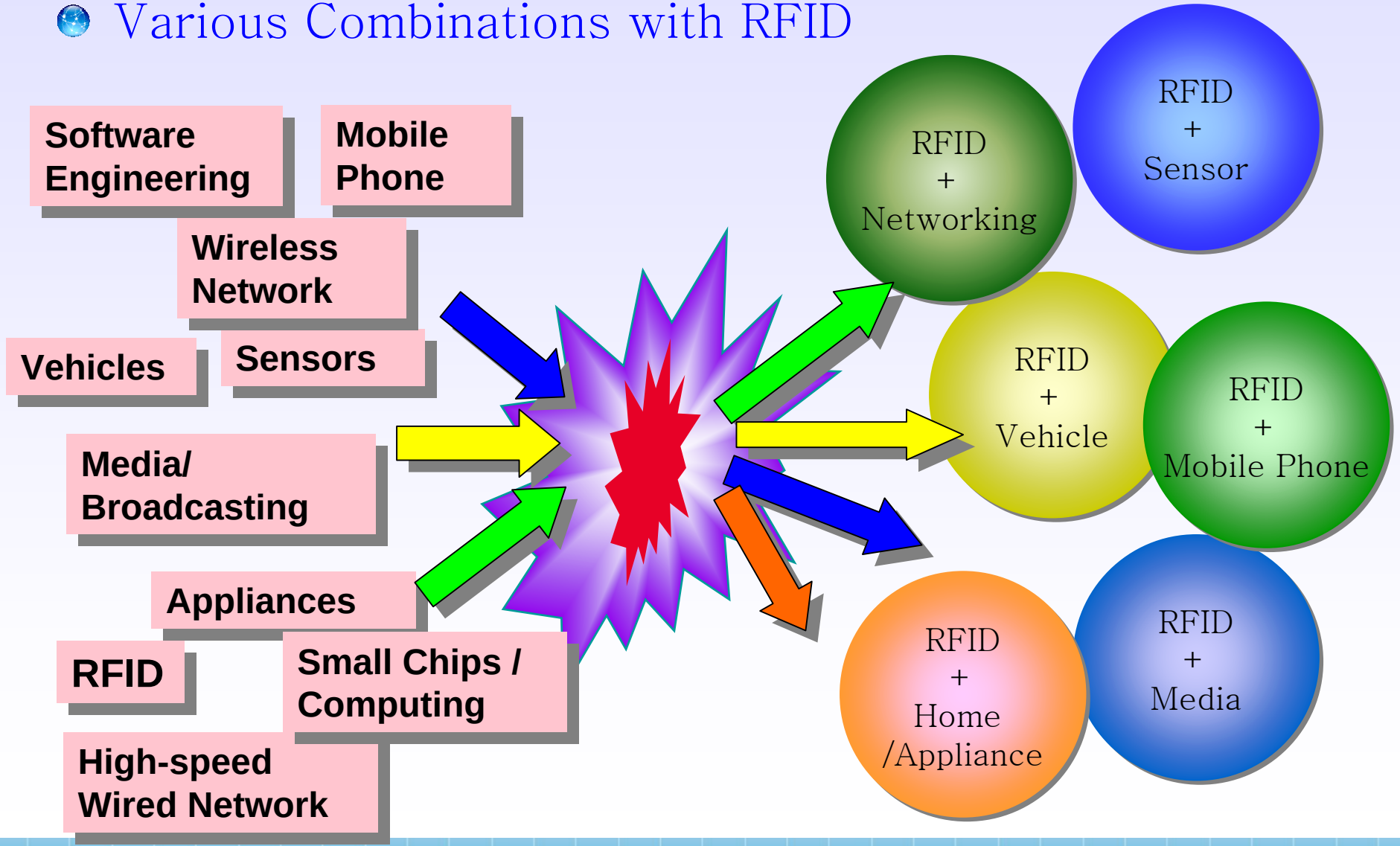




433MHz Active Reader & Tag

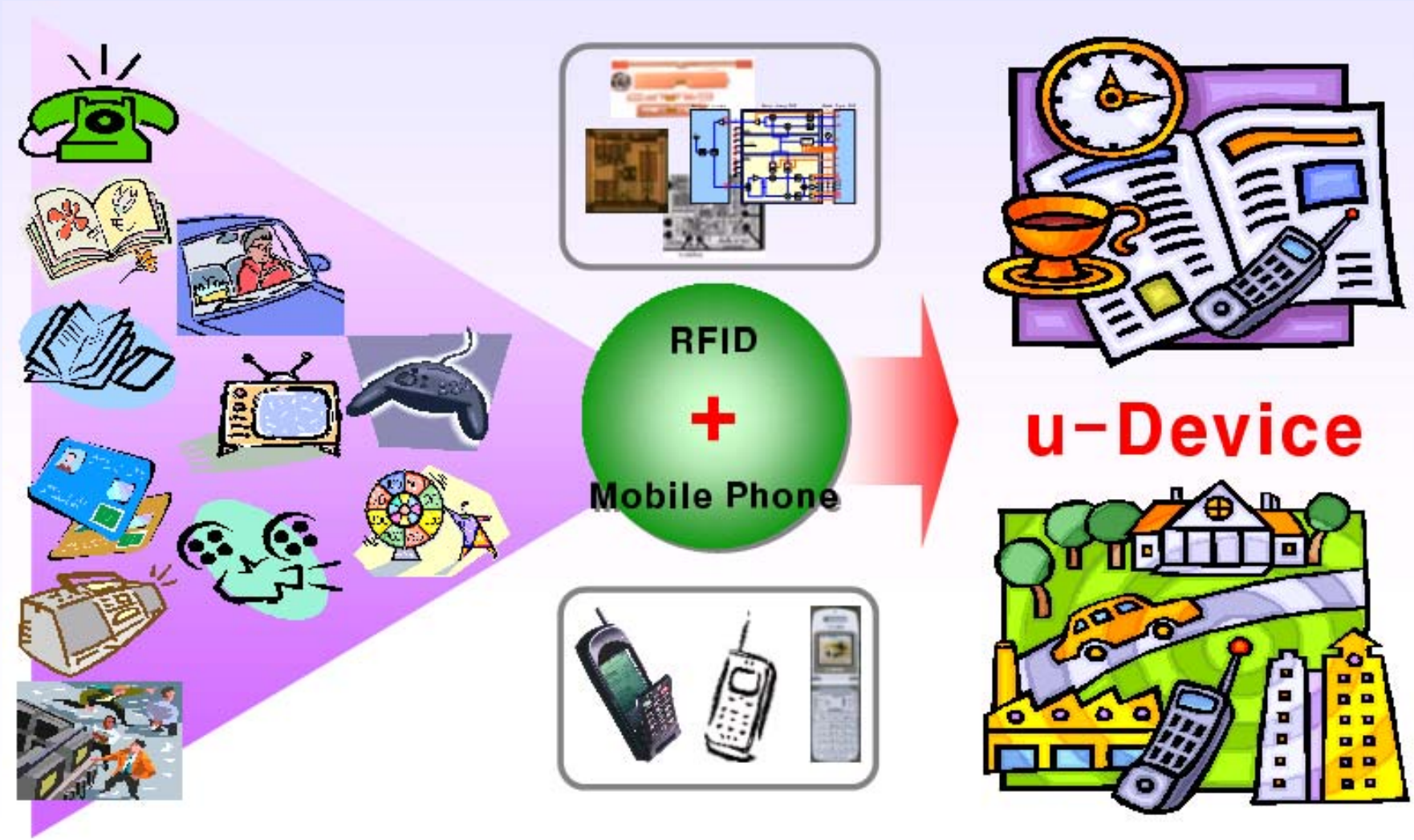
Technology Convergence

Various Combinations with RFID



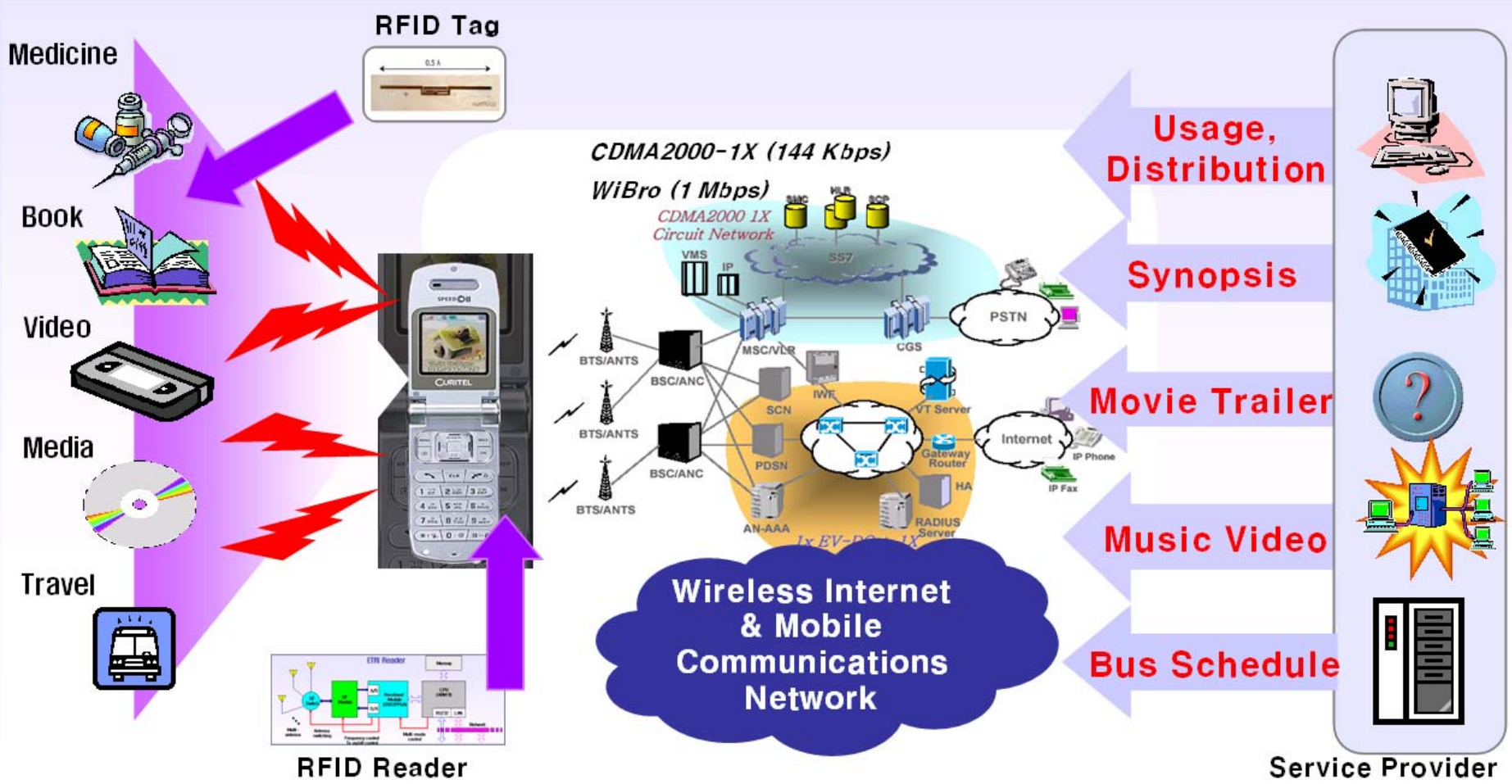
Mobile RFID

Evolution of Mobile Phone

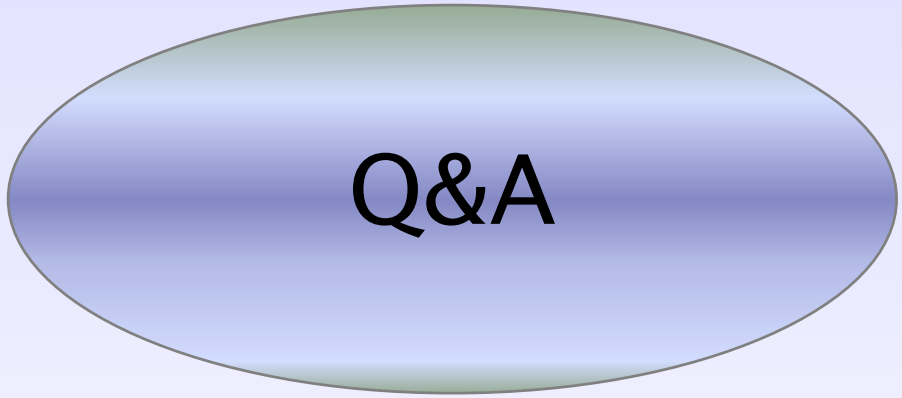


Mobile RFID Service

Ex) Information Providing Services



Thank you



Contact Information

Sewon Oh
Electronics and Telecommunications Research Institute
E-mail: sewonoh@etri.re.kr
Tel: +82 42 860 1643, Fax: +82 42 860 1611
http://www.etri.re.kr