

# R&D Promotions at Yokosuka Research Park

**Dr. Shingo OHMORI**  
**YRP International Alliance Institute**  
**YRP R&D Promotion Committee**

# What is YRP ?

- YRP opened in October, 1997 as a research complex with a strong support of Ministry of Internal Affairs and Communications.
- YRP is an R&D cluster focusing on wireless telecommunications technology, located in Yokosuka City.
- 70 public and private laboratories domestic and overseas-affiliated are established to engage in R&D activities on basic and advanced technologies.

- Location 60km south to Tokyo
- Area 600,000m<sup>2</sup> (east-west 2km, north-south 500m)
- Access 1 hour and 20min train ride or drive from Tokyo
- Laboratories Approx. 70 (as of Oct. 2007)
- Researchers Approx. 7,000



# YRP Participants

## Independent Research Institutes



## YRP Center No.1 Building



## YRP Center No.2 Building



## YRP Center No.3 Building



## YRP Venture Building

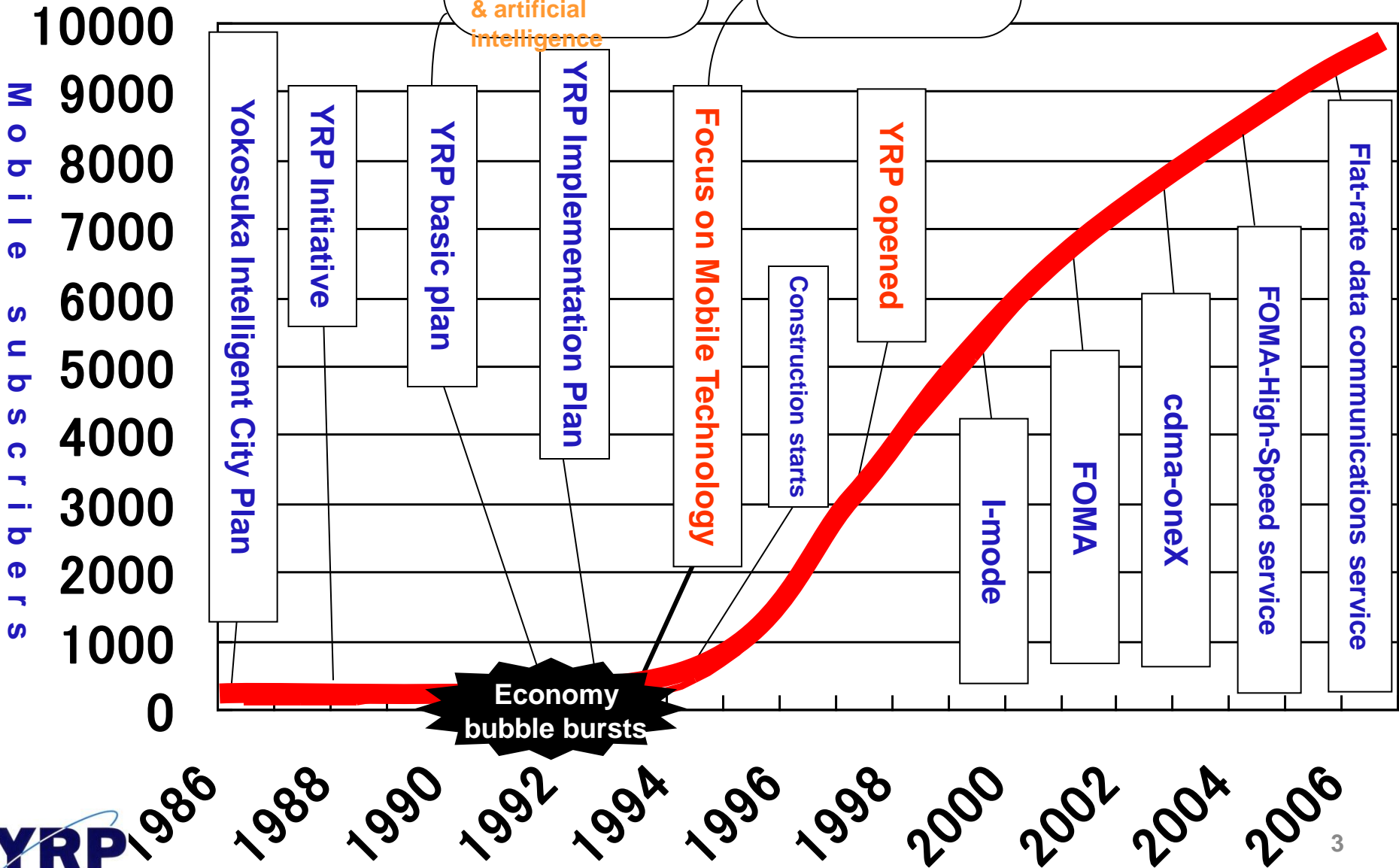


## YRP Center No.5 Building



# Growth of YRP

(unit: 10,000)



# YRP R&D and Promoting Bodies & Their Roles

- **National Institute of Information and Communications Technology (NICT)**
  - R&D under Ministry of Internal Affairs and Communications (MIC)
- **Ministry of Internal Affairs and Communications (MIC)**
  - R&D policies and budgets in ICT
- **YRP R&D Promotion Committee (140 members)**
  - Promote R&D, Invite laboratories  
[ annual membership fee: ¥300,000 / corporation ]
- **Yokosuka Telecom Research Park, Inc.(3rd sector)**
  - Manage test facilities for shared use and research wings
- **YRP International Alliance Institute**
  - Support of business collaborations and start-ups
- **Yokosuka City**
  - Political and Financial Support
- **Keihin Electric Express Railway, Co., Ltd.**
  - Support daily life, Construct research facilities, Regional development

# Outline of NICT



- **Former Communications Research Laboratory, Ministry of Posta and Telecommunications**
- **Reorganized: April 1, 2004**
- **Head Quarters: Koganei, Tokyo**
- **Wireless Research Center : YRP**
- **Main missions**
  - R&D of technologies relating to the information and communications technology (ICT) and radio waves
  - Support for R&D activities in telecommunications and broadcasting
  - Promotion of business sectors in telecommunications and broadcasting area
- **Budget & Personnel:**
  - Budget: ~ ¥45 billion (about 450M US\$)
  - Personnel: Permanent employees, ~ 450
  - Part-time employees, etc. ~ 600

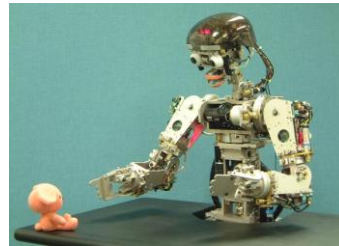


**Tenure researcher: ~ 300**  
**PhDs: ~ 190 (60% of researchers)**



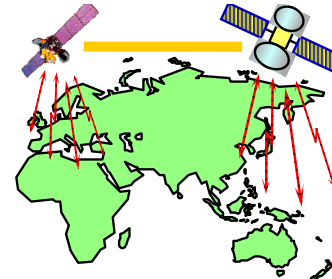
# NICT Main areas of intramural R&D

## Information & Network Systems



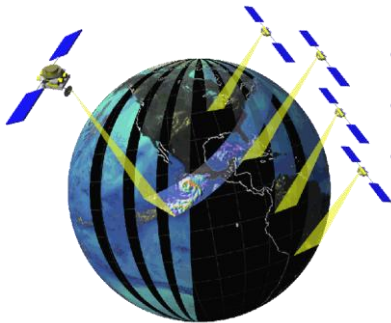
- Networking
- Human communications
- Security

## Wireless Communications



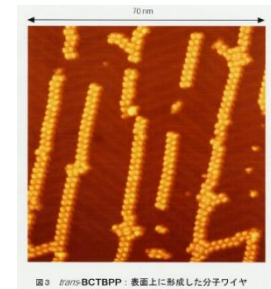
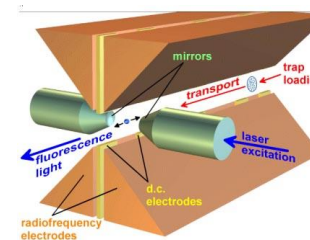
- Ubiquitous mobile communications
- Space communications

## Applied Research & Standard



- Remote sensing
- Space weather forecast
- Frequency & time standards

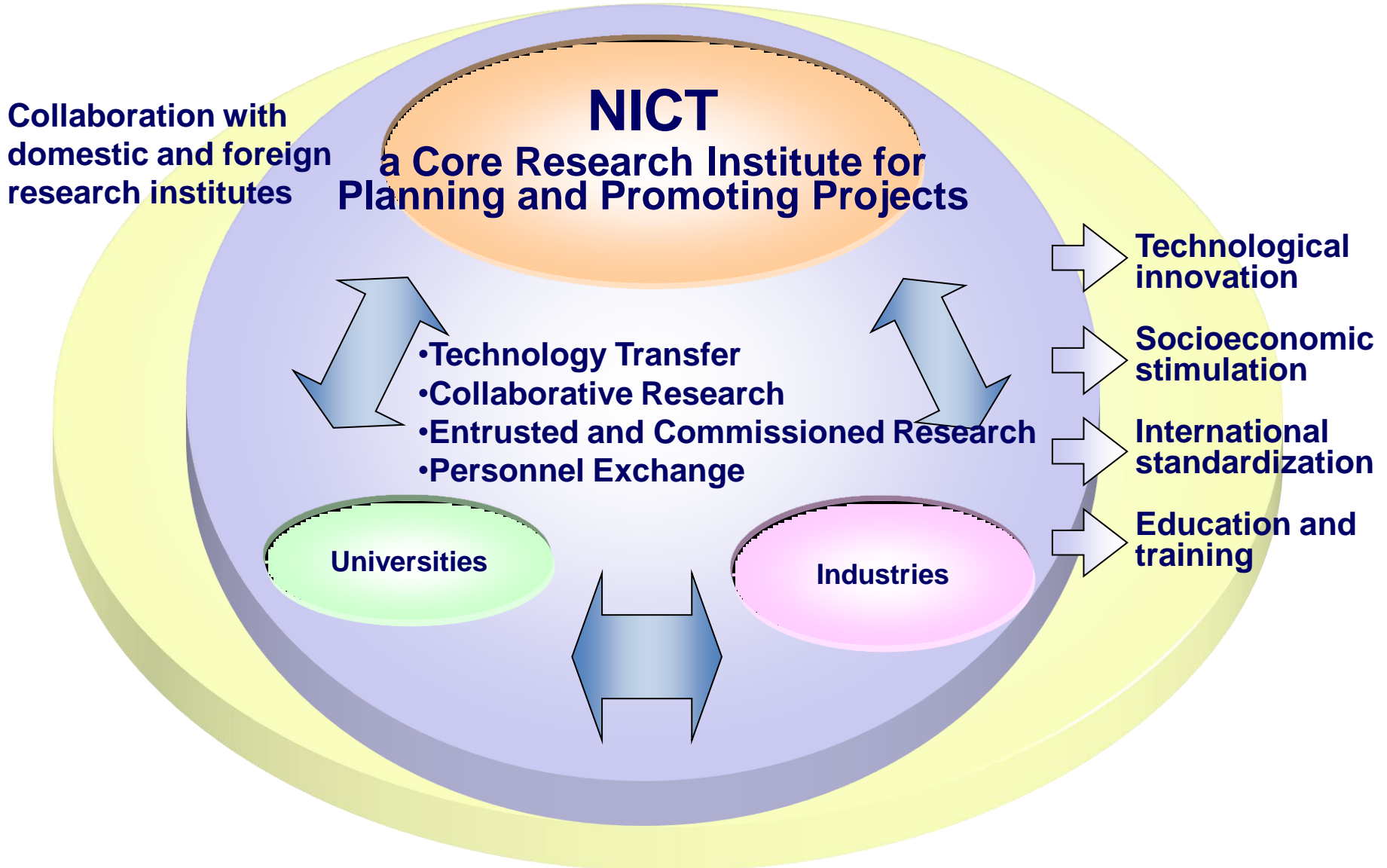
## Basic & Advanced



- Photonics
- Nano-technology
- Bio-technology

# Open platform policy

-Collaboration with external organizations to promote joint R&D programs-





# YRP Partners based on MOU

## MOU (Memorandum of Understanding) conclusion between Yokosuka Research Park and Science Parks/IT related organizations

**JAPAN**

- Kyoto Research Park 2000.02.24
- Softopia Japan 2002.02.05
- Intelligent Cosmos Academic Foundation 2003.12.18
- Intelligent Cosmos Research Institute 2003.12.18
- Tohoku Information Technology Industry Promotion Organization 2003.12.18
- Advanced Telecommunications Research Institute International 2004.06.01

**CHINA**

- Beijing University of Posts and Telecommunications 2001.05.11
- China Mobile Communications Association 2002.05.19
- Hangzhou Informatization Office 2004.04.09
- Dalian Bureau of the Information Industry, Dalian Software Park 2006.02.24

**KOREA**

- Electronics and Telecommunications Research Institute (ETRI) 2003.09.01
- Gwangju Techno Park 2004.07.13

**MALAYSIA**

- Multimedia Development Corporation 2005.01.26
- Multimedia University 2005.01.26

**TAIWAN**

- Industrial Technology Research Institute 2005.11.04
- Southern Taiwan Science Park Administration 2005.11.04
- Taipei Far Eastern Telecom Park, Far Eastern Resource Development Co., Ltd 2006.07.31
- Hsinchu Science Park 2007.12.13

**THAILAND**

- National Science and Technology Development Agency 2001.11.12
- King Mongkut's Institute of Technology Ladkrabang 2002.04.30

**VIET NAM**

- Posts and Telecommunications Institute of Technology 2004.06.01

**Items stated in MoU**

- 1.Exchange of information
- 2.Delegation, exchange of human resources and students
- 3.Public relations
- 4.Promotion of joint researches
- 5.Marketing of developed technologies
- 6.Joint organization of events etc.
- 7.Support to business matchmaking
- 8.Introduction of companies on both sides
- 9.Other associated matters

**Results of MoU Conclusion**

**Co-organization of Seminar/Event**

2006.10 TCP Workshop (North European Countries and Japan)



**Overseas Delegation**

2006.07 CNIT, Italy, visited YRP



**Establishment of YRP offices abroad**

- 2002.4.26 YRP Dalian Office
- 2006.8.22 YRP Beijing Office (in CMCA office)
- 2006.4.20 YRP Hangzhou Office

2005.11 Russian Delegation visited YRP



**Internship**

- 2002 Technopole Brest Iroise (France)
- 2004 Mobile VCE (U.K)
- 2005 Bremen City (Germany)

**DENMARK**

- NOVI Science Park 2001.01.16 (Aalborg University 2001.12.18 \*1)

**FINLAND**

- Technopolis, University of Oulu 2001.12.18 \*1
- Oulu Innovation Ltd (Octopus) 2008.01.28

**FRANCE**

- Technopole Brest-Iroise 2001.11.05
- Sophia Antipolis Science Park 2001.11.29
- Western France Wireless (Ouest Atlantique/MEITO) 2002.01.22
- Media & Networks Cluster 2007.07.26

**GERMANY**

- Free Hanseatic City of Bremen 2003.04.03

**ITALY**

- Department of Information Engineering, University of Padova 2005.04.01
- CNIT 2006.09.29

**RUSSIA**

- Radio Research & Development Institute (NIIR) 2006.04.26

**SWEDEN**

- Royal Institute of Technology 2003.03.31
- Lund Institute of Technology 2003.03.31
- Ideon Science Park 2003.03.31
- Kista Science City 2003.03.31
- Blekinge Institute of Technology 2003.03.31

**UNITED KINGDOM**

- BT Adastral Park 2002.07.17
- Mobile VCE 2002.11.18

\*1: Trilateral MOU Signed by NOVI Science Park, Denmark, Technopolis, Finland, and Yokosuka Research Park (YRP)



TAIWAN: Hsinchu Science Park 2007.12.13



39 partners in 14 countries and 1 region / As of January 28, 2008



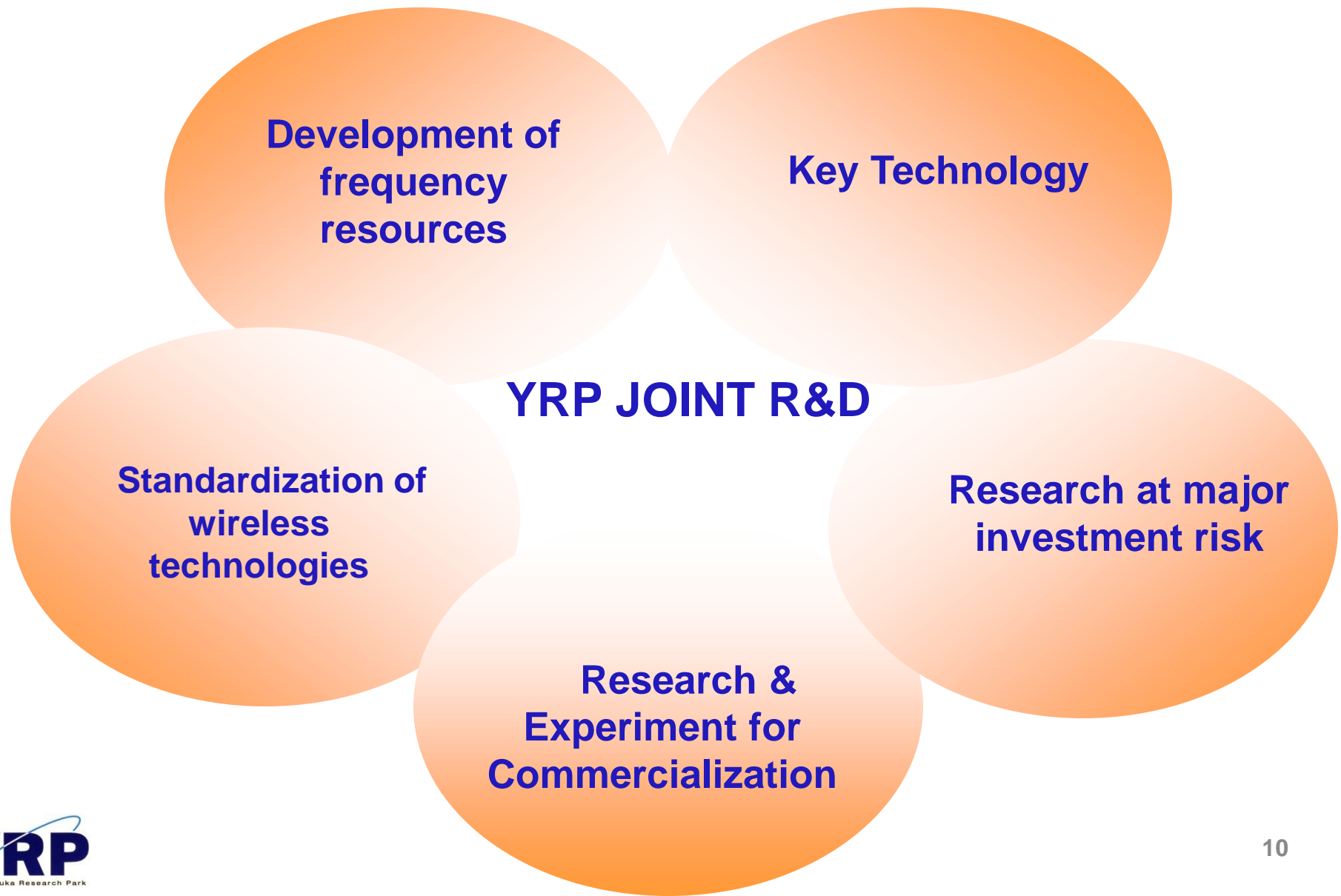
FINRAND: Oulu Innovation Ltd (Octopus) 2008.01.28

# Research Subjects of YRP

- **IMT-Advanced (Beyond 3G ;4G) mobile communication systems**
  - **Cognitive radio communication systems**
- **Millimeter-Wave Broadband Wireless Access Systems.**
  - **IEEE802.15.3c**
- **Medical ICT**
  - **IEEE802.15.BAN (Body Area Network)**
  - **UWB Wireless Systems**
- **Intelligent Transport Systems (ITS)**
  - **Beyond ETC (Safety, amusements,....)**
  - **New frequency band (700MHz) was allocated**
- **Digital terrestrial television broadcasting System**
  - **One-segment broadcasting services for mobile terminals**

# Research Field in YRP

## ■ Framework for Joint Research

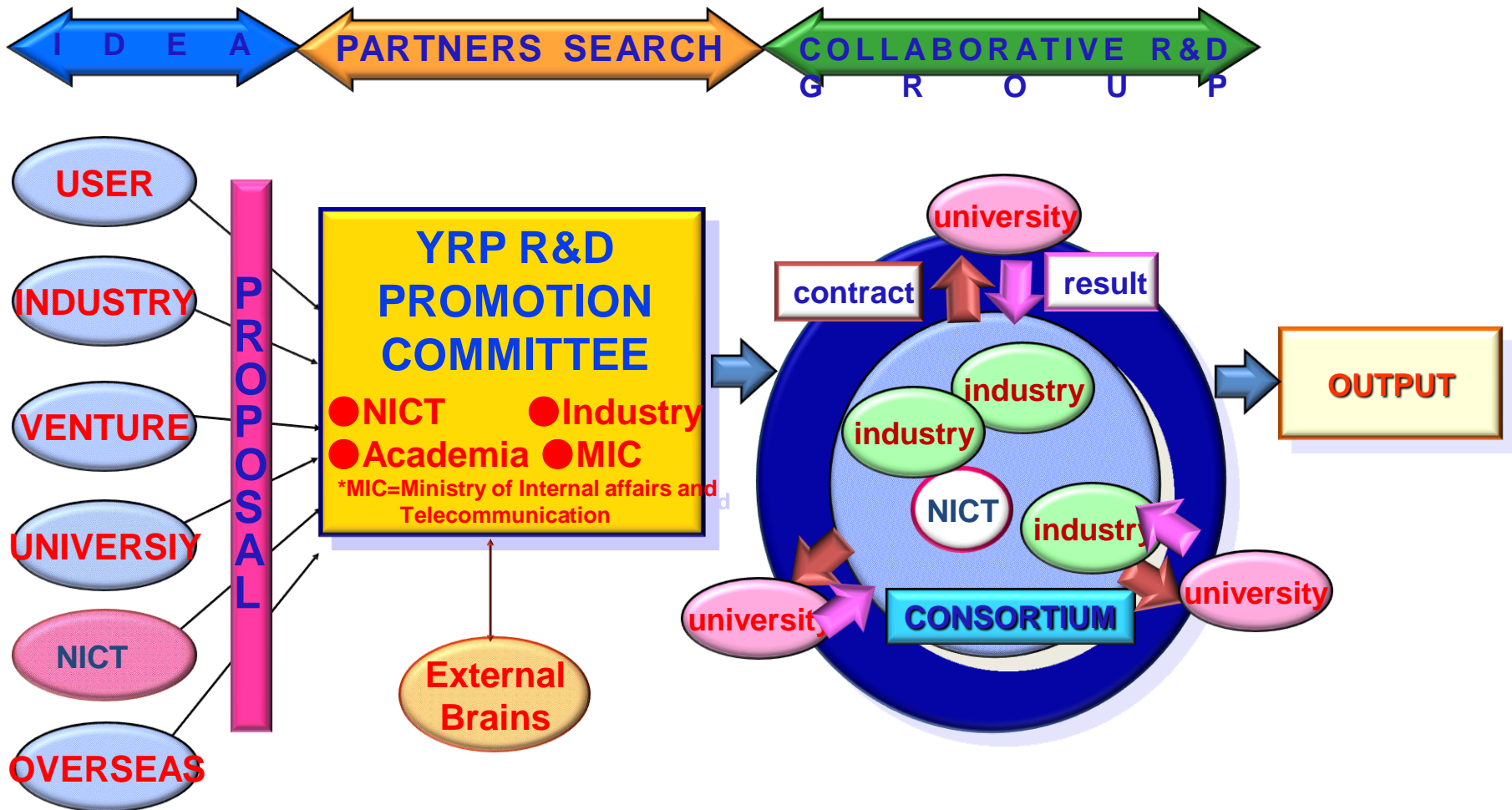


# R&D policy of YRP R&D Promotion Committee

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- 1. National Center for R&D in the fields of ICT.**
- 2. User oriented strategic R&D for the global standards.**
- 3. Center of excellence in Asian regions with collaborations and completions in the world.**

# Promotion of Global & Borderless Collaborations



Framework of Joint R&D with Industry, Academia & Government



# YRP Test Net ; Overview



To Overseas

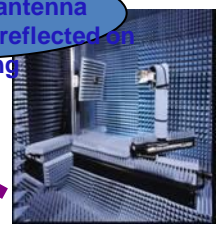
## PFI Center (YRP Test Net Center)



## Radio Anechoic Chamber



Results of antenna measurements reflected on testing



Near-field Antenna Measurement System

ITS for railways (underway)



Communication test for railways using leaky coaxial cables

## Optic Fiber Network



JGN II Connector at YRP



NICT GIS Center

Applications involving geographic information



UHF 15ch

Digital terrestrial television broadcasting testbed

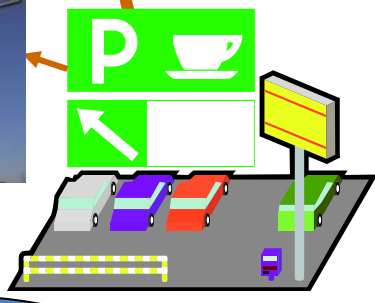


Road



Utility Pole for Base Station

Radio transmission by Experiment



Parking Space

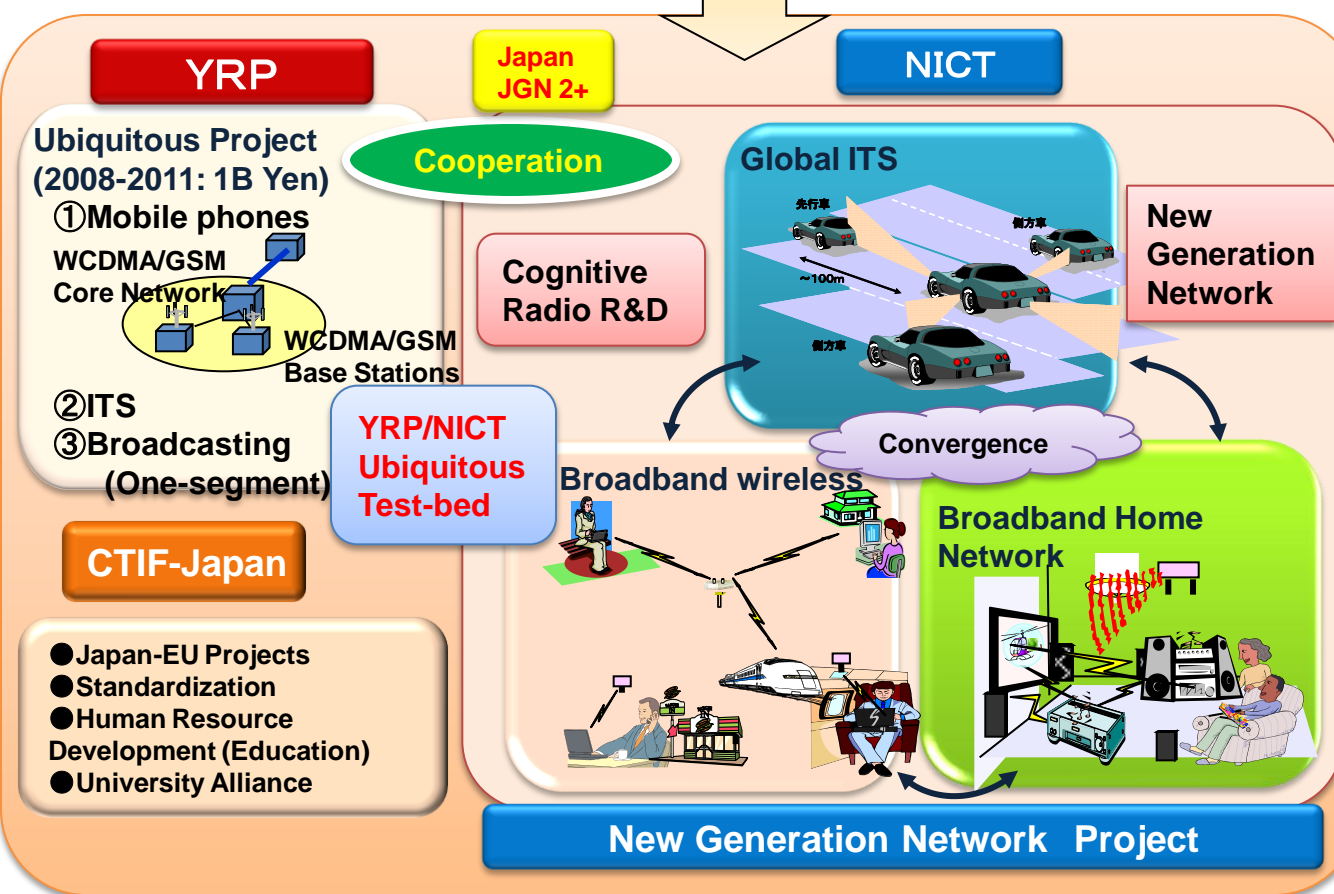
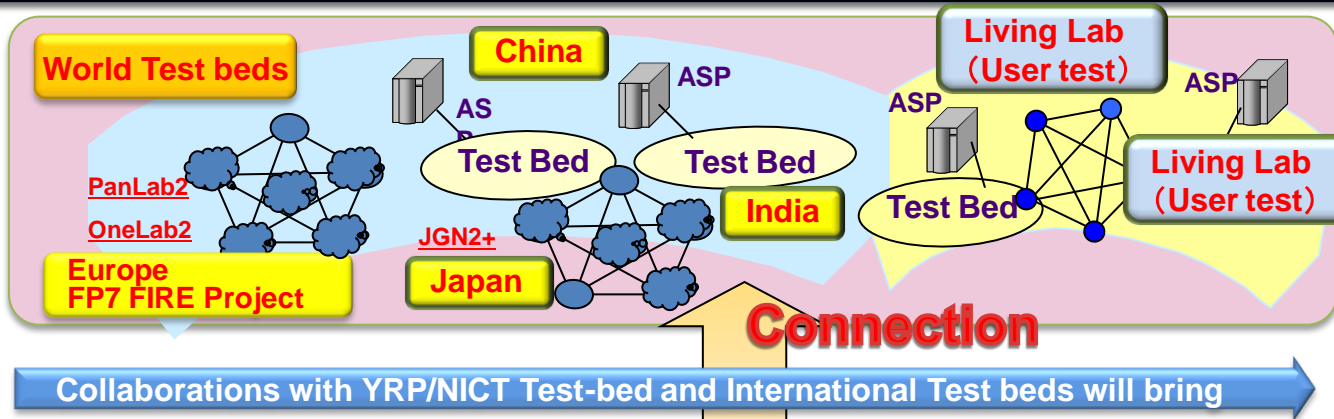
Verification testing on roads / parking space by Experiment Station



Experiment Station rooftop facility



# YRP/NICT Concept of Test beds for International Cooperation



- Future Prospect by International Cooperation**
- 1. International R&D**
    - New Generation Network
    - Cognitive Radio
    - Global ITS
    - Wireless Broadband
  - 2. Human Resource Development**
    - R&D Projects
    - University Education
    - International Test-bed
  - 3. World Standardization**
    - Cooperative R&D
    - ETSI, ARIB
    - GISFI (India)
  - 4. Interoperability**
    - GSM
    - TDS-CDMA
    - Global Market
  - 5. Competitiveness**
    - Cooperation with Europe
    - International Cooperation
    - Deployment of Living Lab

# Broadband Wireless Forum

- There will be a sharp increase of demand for radio waves in the near future, due to the prospective realization of innovative wireless communication systems and services, as well as the creation of new businesses, revitalization of regional economy, contribution to environmental protection, and other possible use of radio in different fields.
- In light of these circumstances, the Broadband Wireless Forum was established on July 3, 2009, aiming at serving as a platform to drive the development of cutting-edge wireless systems and services for global expansion.

Organization

## Broadband Wireless Forum - General Assembly

President: Norihisa Doi (Professor, Chuo Univ.)

Vice President: Teruyasu Murakami (Nomura Research Institute Ltd.)

### Advisory Group

President: Norihisa Doi (Professor, Chuo Univ.)

Vice President: Teruyasu Murakami (Nomura Research Institute Ltd.)

Consists of 19 members from MIC Radio Wave Policy Council

※Advise on total activities of the Forum from various viewpoint

### Steering Committee

Chairman: Dr. Shingo Ohmori (Director, YRP International Alliance Institutes)

Consists of 24 members from telecom operators, broadcaster, manufacturers, Organizations, etc.

### Planning and Strategy Group

Leader: Dr. Hiroyuki Morikawa (Prof. University of Tokyo)

### Planning and Coordination Meeting

\*Planning events and coordination between subcommittees by communicating with group/subcommittee leaders

### Testbed Operation Subcommittee

\*Discussing the utilization, operation and maintenance of existing and prospective testbeds (Subcommittee Leader: Dr. Kadowaki, NICT)

#### Testbed Use Working Group

(Studying the ways of using testbeds)

#### New Testbed Working Group

(Studying new testbeds and additional functionality)

### Projects Promotion Subcommittee

\*Discussing R&D and field experiments, and strengthening international industry-academia-government collaboration for each project (Subcommittee Leader: Mr. Yokoi, Nomura Research Institute)

#### Executive Committee

➢ Wireless Power Transmission Working Group

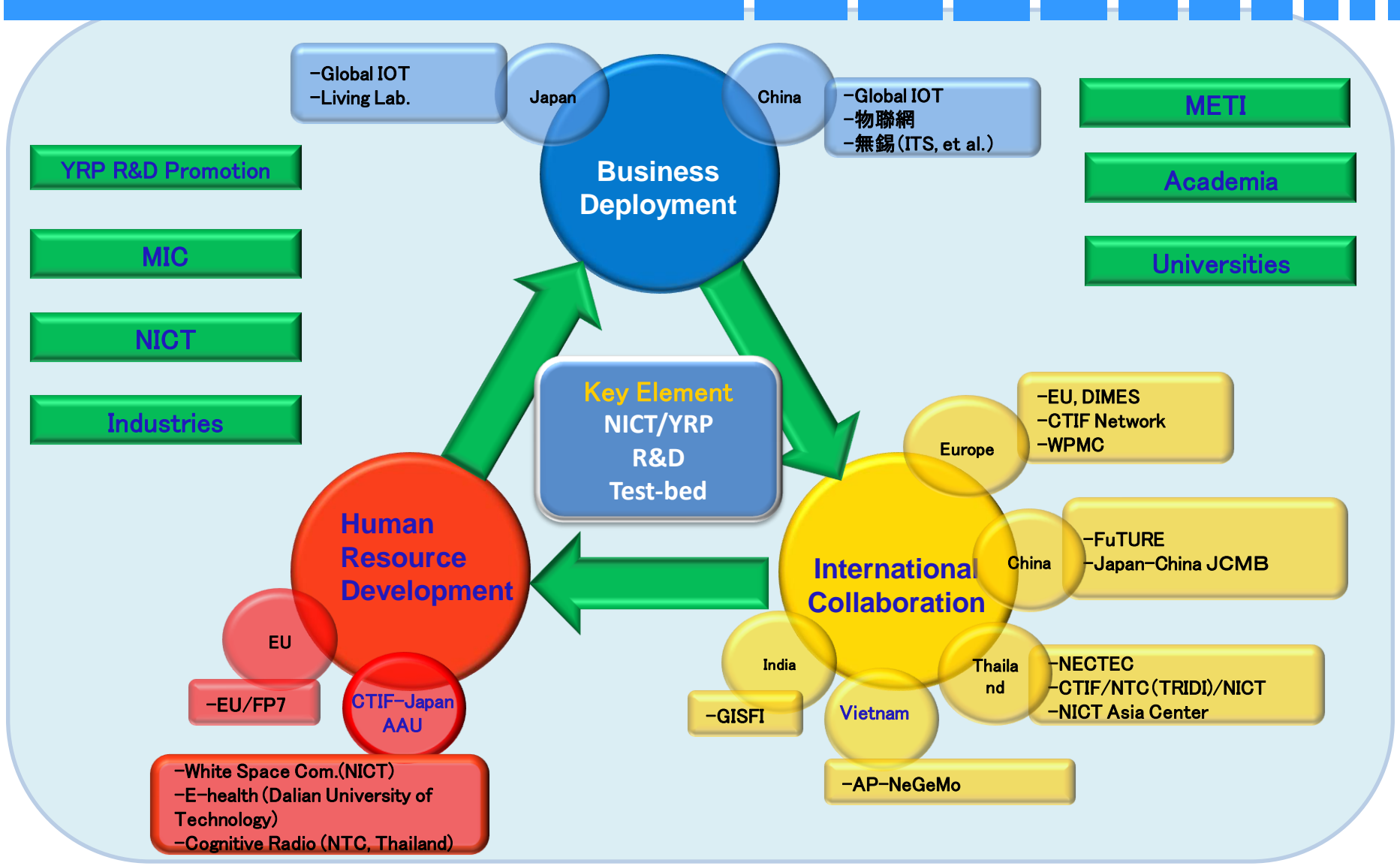
➢ New Wireless System Working Group

➢ Intelligent Terminal Working Group

➢ Business Development & Innovation Proposal Working Group

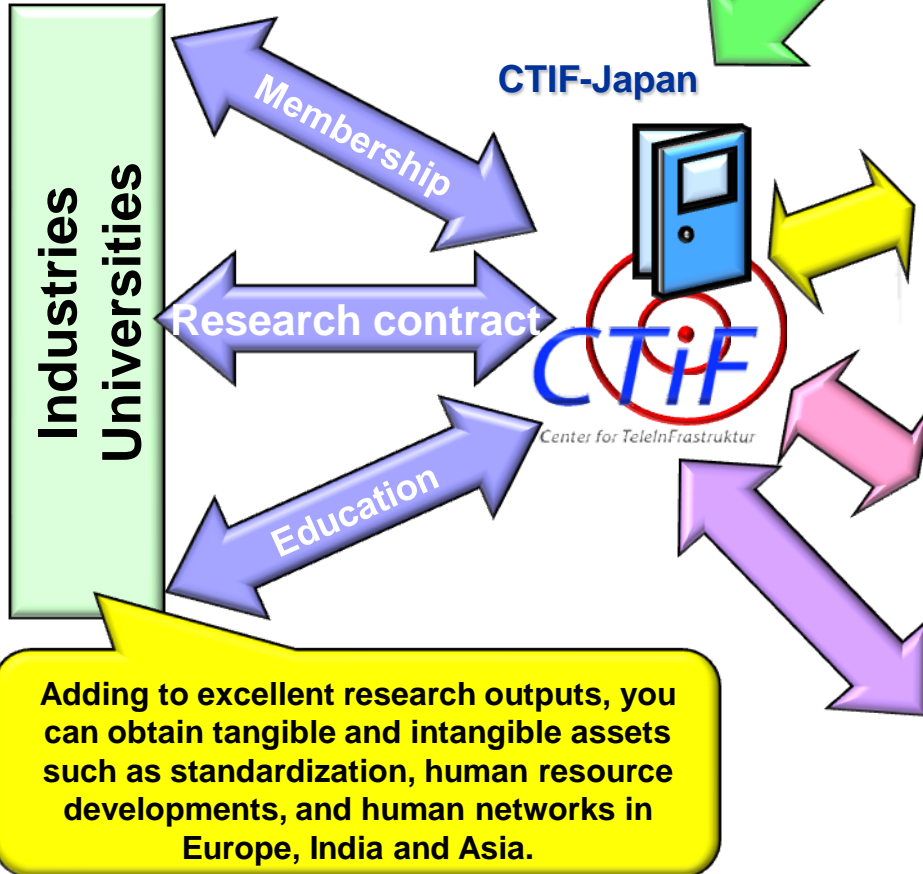
# YRP Global activities by YRP International Alliance Institute

- Business, Human Resource Development, Global collaboration -



# CTIF-Japan in a Nutshell

Portal site for  
 Global R&D,  
 Human resource developments,  
 Standardization and  
 Collaborations.



	Europe	Asia & India
Research and Development	Innovative Problem-Based Research EU-Projects (FP7, Galileo) Excellent professors and PhD students Startup companies with research outputs	R&D for new businesses (GSM, 4G)
Education and Human Resource Development	Problem-centered research and education User-oriented Research based on contracts World-wide collaboration Lectures and education in English	
Standardization	Clear target of R&D for standardization Collaboration with ETSI and European industries	Startup of standardization organization (India) Collaboration with APT
Global collaboration	Universities, research labs, companies, and standardization organizations Human networks in Europe and Asia	

# W P M C

WPMC stands for the International Symposium on **W**ireless **P**ersonal **M**ultimedia **C**ommunications, co-sponsored annually by YRP and NICT. Each symposium draws approximately 400 participants from around the world. It serves as an opportunity for international industry-academia-government interaction.

## ■ Past Venues

- 1998 Yokosuka, Japan
- 1999 Amsterdam, Netherlands
- 2000 Bangkok, Thailand
- 2001 Aalborg, Denmark
- 2002 Honolulu, U.S.A
- 2003 Yokosuka, Japan
- 2004 AbanoTerme, Italy
- 2005 Aalborg, Denmark
- 2006 San Diego, U.S.A.
- 2007 Jaipur, India
- 2008 Lapland, Finland
- 2009 Sendai, Japan
- 2010 Recife, Brazil
- 2011 Brest, France
- 2012 Taipei, Taiwan

## ■ Coming Venues

- 2013 Princeton, USA





# Asia Relation Program

## APT Technical Training Course

YRP is a member of **Asia-Pacific Telecommunity** and support APT by hosting an annual 10-day APT training course in YRP on the planning and management of next generation mobile telecommunications.

Trainees are from APT member nations.



Courtesy Visit to Ministry of Internal Affairs and Communications The 8<sup>th</sup> APT Training Course in 2007



Asia-Pacific  
Telecommunity



Observation of Research Institute /  
The 6<sup>th</sup> APT Training Course in  
2005



Lecture / The 5<sup>th</sup> APT Training  
Course in 2004

## AP-NeGeMo

**Asia-Pacific Seminar on  
Next Generation Mobile Communication**

AP-NeGeMo is an annual bilateral workshop with other Asian nation on R&D of mobile communications technology. It was approved as a commemorative event of Japan-ASEAN Exchange Year 2003.

### ■ Past Venues

- 2000. 01 Singapore, Malaysia, Thailand
- 2002. 02 Singapore, Thailand
- 2002. 08 Malaysia
- 2003. 03 Vietnam, Thailand
- 2004. 02 Vietnam, Malaysia, Thailand
- 2005. 01 Thailand, Malaysia, Vietnam
- 2006. 12 Vietnam
- 2008. 01 Vietnam



Malaysia, 2002



Thailand, 2004



Vietnam, 2006

## AP-WBF

**Asia Pacific Wireless Broadband Forum**



Malaysia, 2006

A bilateral workshop started in 2005 for Thailand and Malaysia on R&D of mobile communications technology and business interactive opportunity.

### ■ Past Venues

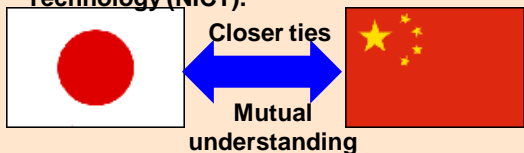
- 2005. 11 Thailand, Malaysia,
- 2006. 12 Malaysia
- 2008. 01 Thailand, Malaysia



# Partnership with China / India / Russia

## Japan-China ICT Forum

The forum aims to promote Japan-China private-sector exchange in the ICT field, based on the outcome of the Japan-China-Korea ICT Ministers' meetings. The forum works together with the National Institute of Information and Communications Technology (NICT).



Seminar held for China-Japan B3G Specialists  
(Nov.20-21, 2004 in Beijing)



Mr. Wang Xudong, China Minister of Information Industry, visited YRP  
(Jul.28, 2004)



## Partnership with India

YRP works with MIC Japan-India ICT Forum to promote Japan-India private-sector exchange in the ICT field by sending missions to ICT (including software) institutions in India, and hosting visitors from these organizations. To carry out its activities, YRP works together with NICT.



India-Japan Forum  
(March 18, 2005 in New Delhi)



The 2<sup>nd</sup> Mission to India  
(visited Mumbai, Bangalore, Chennai for Dec.11-17, 2005)



## Partnership with Russia

YRP is developing Japan-Russia partnership in the ICT field, in cooperation with MIC and NICT, based on an MOU concluded with Radio Research and Development Institute (NIIR). YRP sends delegations to NIIR and hosts visitors from NIIR.



Russian Delegation visited YRP.  
(Nov.17, 2005)



MOU Signing Ceremony with NIIR  
(Apr. 26, 2006)

# Wireless Technology Park

## Telecom Summit

### Wireless Technology Park



#### <Specialized Event on Technology/R&D for Wireless Communications>

Under the “industry-academia-government partnership to create tomorrow’s business,” WTP brings together major companies, universities, start-ups, policy makers, and public research institutes, both domestic and overseas, in pursuit of speedy commercialization and globally competitive R&D of wireless technologies.

WTP is an annual event, starting 2006.

High Speed Wireless LAN / IEEE802.1x / Wi-Fi  
WiMAX/Mesh Networks/ M2M  
Beyond 3G/4G Technology  
iBurst / PHS Infrastructure  
Disaster Measurement /Emergency Medical Network Technology  
Visible Light Communication Technology  
Ultra Wideband (UWB) Technology  
Bluetooth  
RFID/IC Tag / Sensor Network  
Digital Broadcasting Technology  
Satellite Communication Technology  
Navigation / GPS / Location Search  
RF Materials & Modular Component

VoIP  
Adhoc Wireless Network  
Gigabit IPv6 Network  
Wideband Millimeter Wave Access System  
Stratospheric Wireless Relay Network  
Software Wireless Technology  
Security / Authentication  
ITS / Telematics  
Motion Image Distribution Technology  
High Quality Digital Picture Technology  
Test Equipment  
Network Management & Control Materials & Parts

## United

### YRP Events

#### Next Generation Wireless Technology Showcase



Public, private and academic labs present research results and trends on key wireless technologies to achieve ubiquitous network society.

#### Asia Wireless Summit



Leaders in governmental, industrial, and academic sectors assemble from Asian nations to exchange views for better partnership in policy making, business investment, exchange and development of human resources.

#### Symposium on Cooperation between Industry, Academia and Government



CINAG presents public and academic research challenges for transferring possibility in pursuit of new industries and venture businesses in mobile communications and broadcasting fields. (CINAG)

#### Venture Support Programs



The events focus on marketable cutting-edge technologies of startups in YRP and Yokosuka city.



# Wireless Technology Park

## Specialized Event on Technology/R&D for Wireless Communications

Organizer : YRP R&D Promotion Committee  
YRP Academia Exchange Network  
National Institute of Information and  
Communications Technology (NICT)

Visitors to Exhibition Site : 5,112 (registered)  
Participants in Conferences: 2,600 (total)

Date: April 04-05, 2007 Venue: Pacifico Yokohama

### Opening Ceremony :

- ① Greeting from Chairman of WTP 2007 Organizing Committee :  
Mr. Akio Motai, President, YRP R&D Promotion Committee  
WTP2007 Vice Chairman  
Dr. Shingo Omori, in substitution of a Chairman Dr. Makoto  
Nagao, President of NICT / Chairman of WTP 2007 Organizing  
Committee
- ② Congratulatory speeches on behalf of the guests of honor :  
Mr. Yoshihide Suga, Minister for Internal Affairs and  
Communications  
Mr. Terushige Odaka, Vice Governor of Kanagawa Prefecture  
Mr. Ryoichi Kabaya, Mayor of Yokosuka City



Greeting from Mr. Akio Motai,  
President, YRP R&D Promotion  
Committee  
WTP2007 Vice Chairman



Greeting from Dr. Shingo Omori,  
in substitution of a Chairman Dr.  
Makoto Nagao, President of NICT /  
Chairman of WTP 2007 Organizing  
Committee



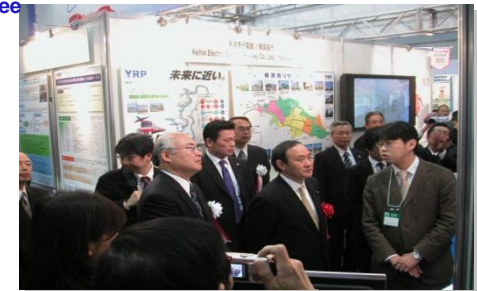
Greeting from Mr. Yoshihide  
Suga, Minister for Internal  
Affairs and Communications



Opening Ceremony



Exhibition (approx. 61 companies/organizations)



Mr. Yoshihide Suga, Minister for Internal  
Affairs and Communications, visiting YRP  
Exhibition

### Academia Session:

- ① Academia Speakers: 16
- ② Audiences: Aprox. 1,800
- ③ presentations: 29
- ④ Poster exhibits: 52



Academia Session

### Technical Conference : 371 audiences

- ① Broadband Mobile Forum
- ② MOT Forum
- ③ Disaster support Forum
- ④ RFID Forum
- ⑤ Cognitive Radio Forum
- ⑥ Russia/China/Malaysia Business Session



Technical Conference

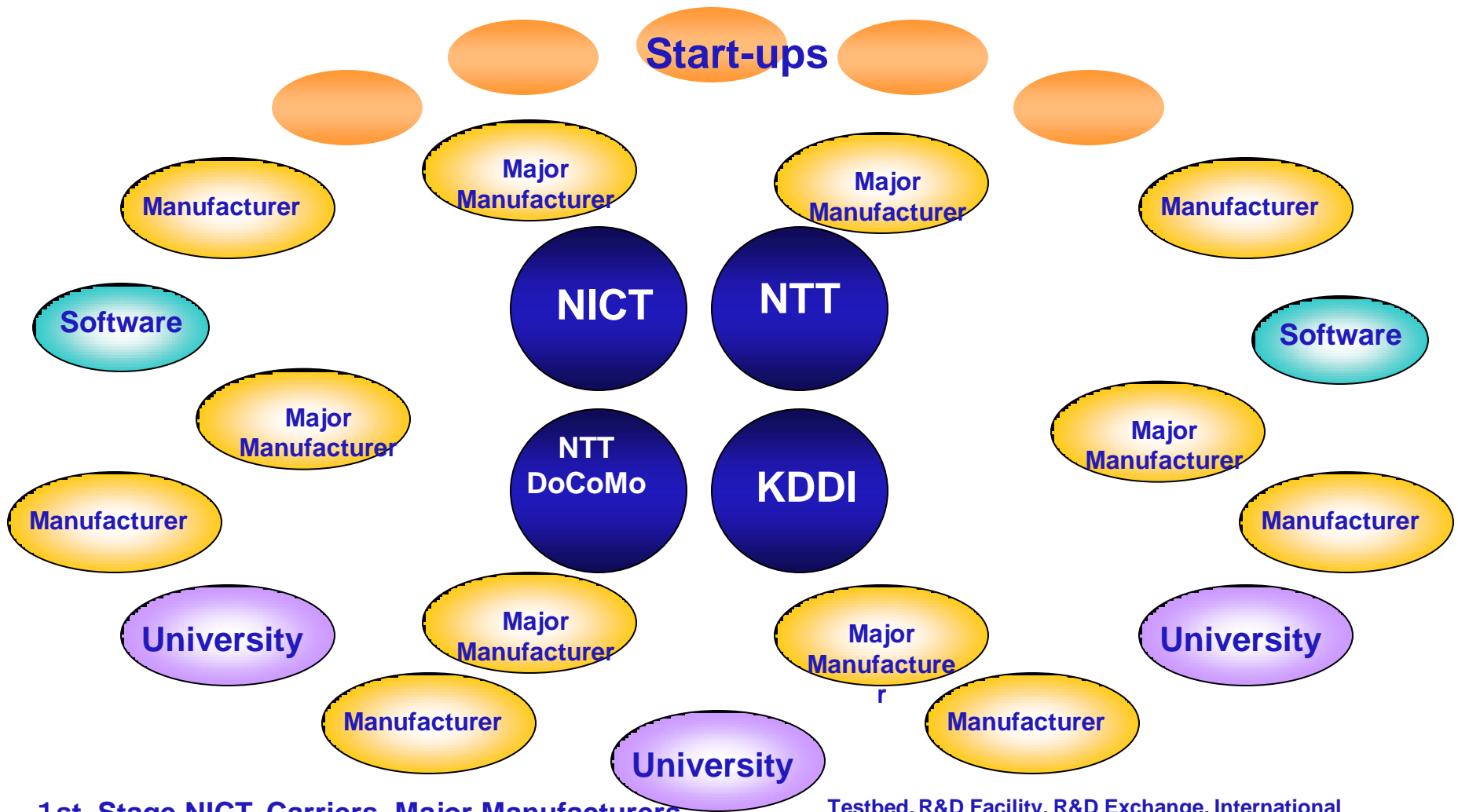
# Conclusion

- ✓ ■ A promotion organization in a science park has an important role to provide a platform for collaborative, large scale R&D projects and for developing global human networks.
- ✓ ■ As R&D on ICT has become globalized, YRP is promoting international alliances and collaborations with other science parks and ICT related Organizations around the world.

*Thank you for your attention.*



# Clustering Process in YRP



1st Stage NICT, Carriers, Major Manufacturers

2nd. Stage Major Manufacturers, Universities

3rd. Stage Carriers, Software, Start-ups,  
Manufacturers

Universities

Testbed, R&D Facility, R&D Exchange, International  
conferences, Joint research

Test Net Forum , Work with broadcast area

Work with start-ups