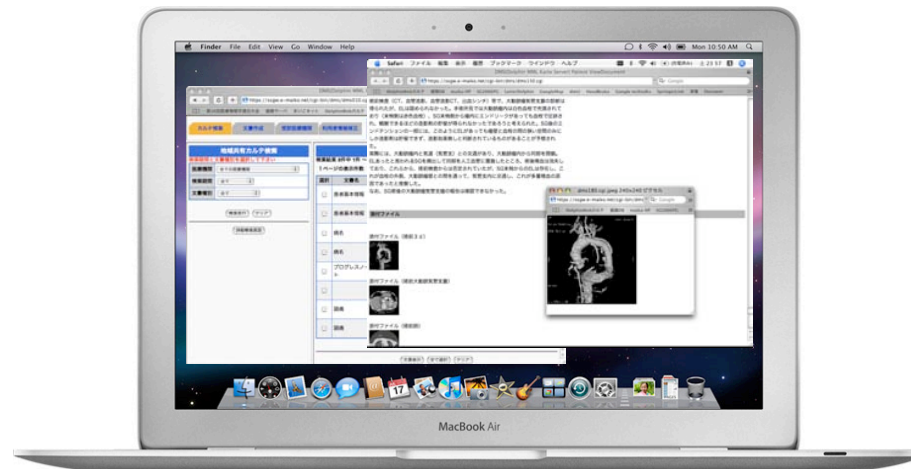# History of MML (Medical Markup Language) and its application for EHR (Dolphin Project) in Japan
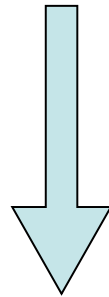
Professor of Kyoto University
CIO of Kyoto University Hospital

Hiroyuki Yoshihara, MD/PhD

Longest and the final day
of my academic life as a Professor

- Dept. of Medical Informatics in Kyoto University Hospital
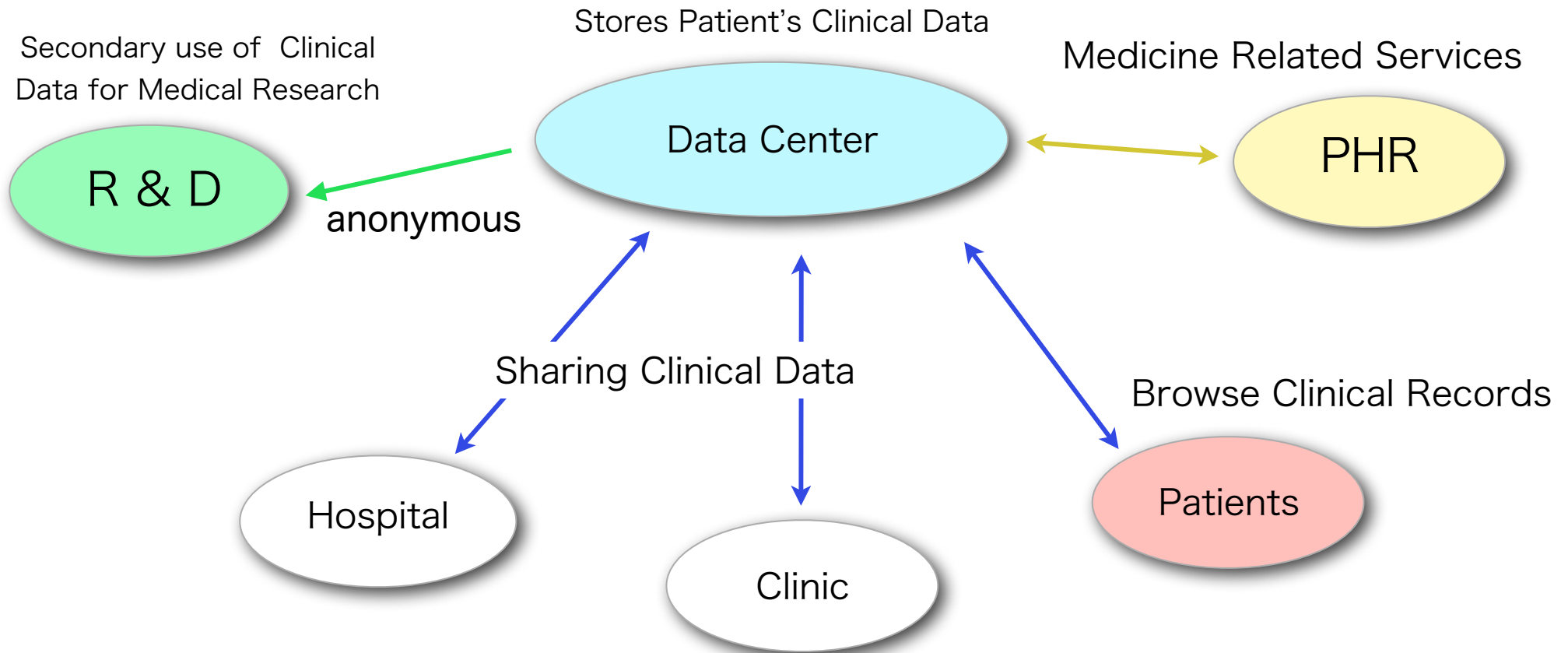
⬇

- Design School

Kyoto University Hospital

by Google Earth

- 1,121 beds
- Approx. 33 departments
- 500 Physicians, 900 Nurses
- 2500-3000 out-patients per day
- Mean Hospital Stay: 15days
- Mean number of in-patients: 1000
- Hospital Income: 31 billion yen/year

Concept of Dolphin Project

Stores Patient's Clinical Data

Secondary use of Clinical Data for Medical Research

Medicine Related Services

Data Center

R & D

anonymous

PHR

Sharing Clinical Data

Browse Clinical Records

Hospital

Clinic

Patients

Data Centers for accumulating information are established in each region. Corresponds to model centered on the RHIO (Regional Health Information Organization) in the U.S.

History of Dolphin Project

1995 MML (Medical Markup Language) project had started

1996 MML 1.0 (using SGML)

1997 Concept of Global EMR: Global Medical History Database (GMHD)

1998 idea of Dolphin Project

1999 MML 2.0 (using XML)

2001 Dolphin Project had started

2002 MML 3.0 (using CDA rel.1)

    iDolphin Service available (=RHIO)

    Haniwa Project (Miyazaki), Higo-Med Project (Kumamoto)
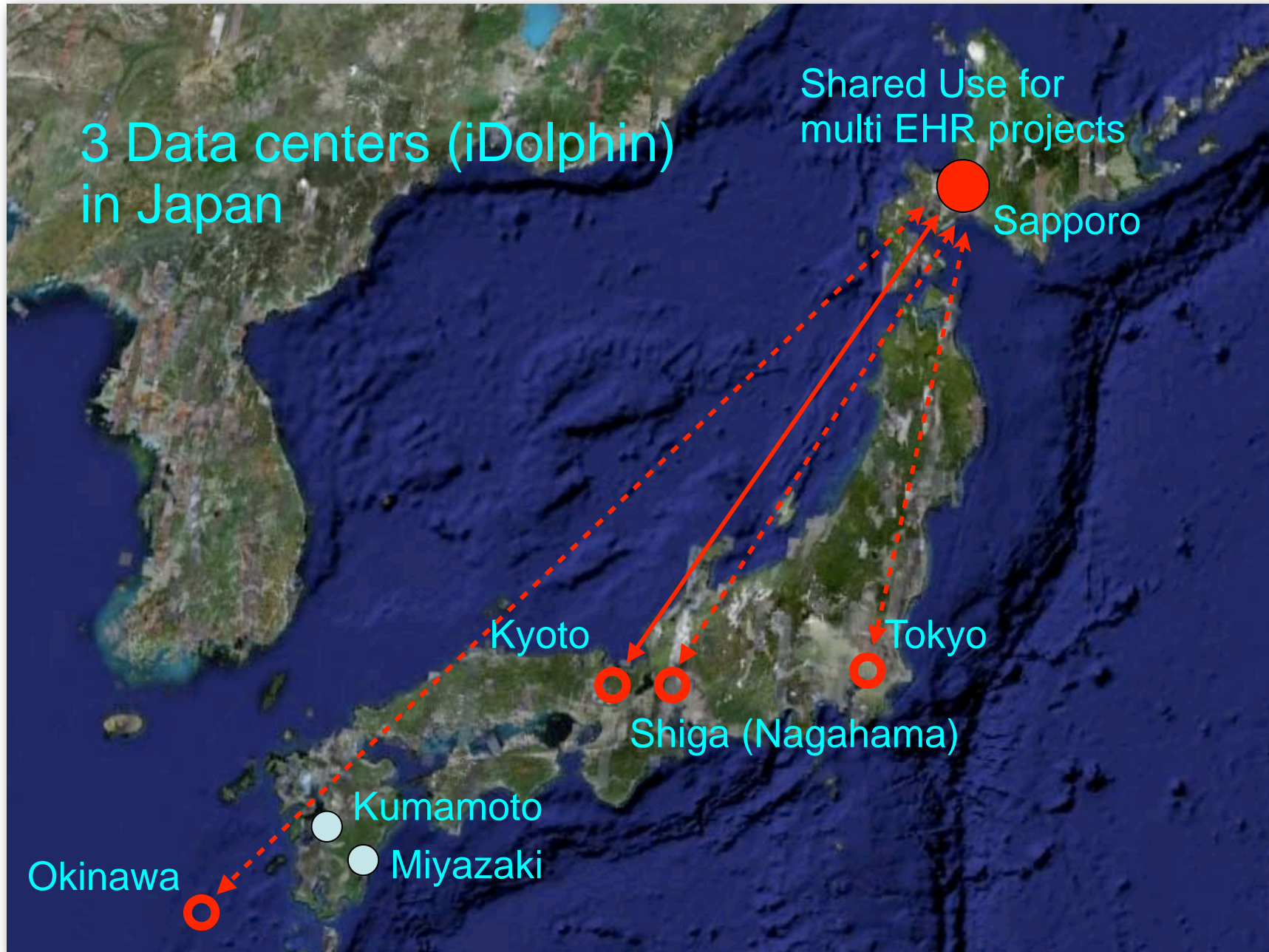
2003 HOT Project (Tokyo)

2006 Data Center was established in Kyoto (Maiko Net)

    Super Dolphin available (=NHIN)

2007 Maiko Net service started (Kyoto University Hospital)
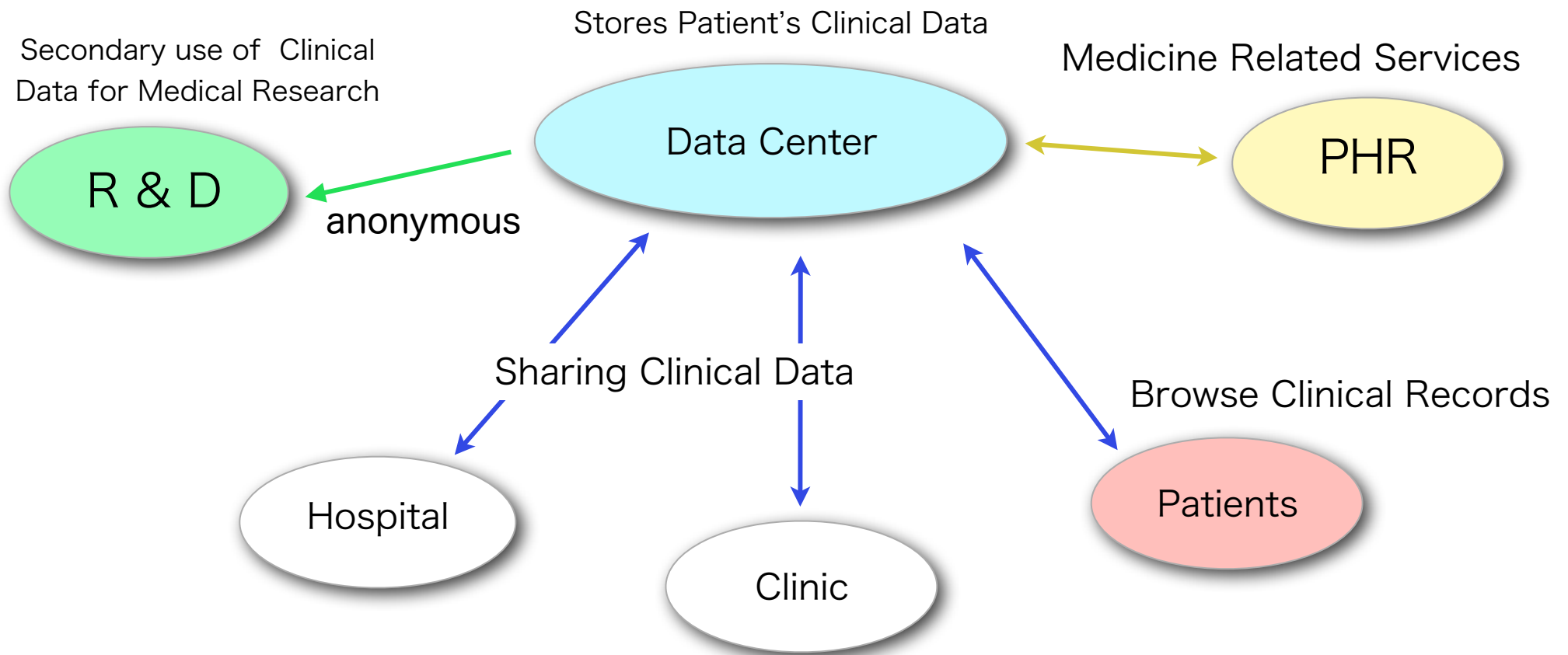
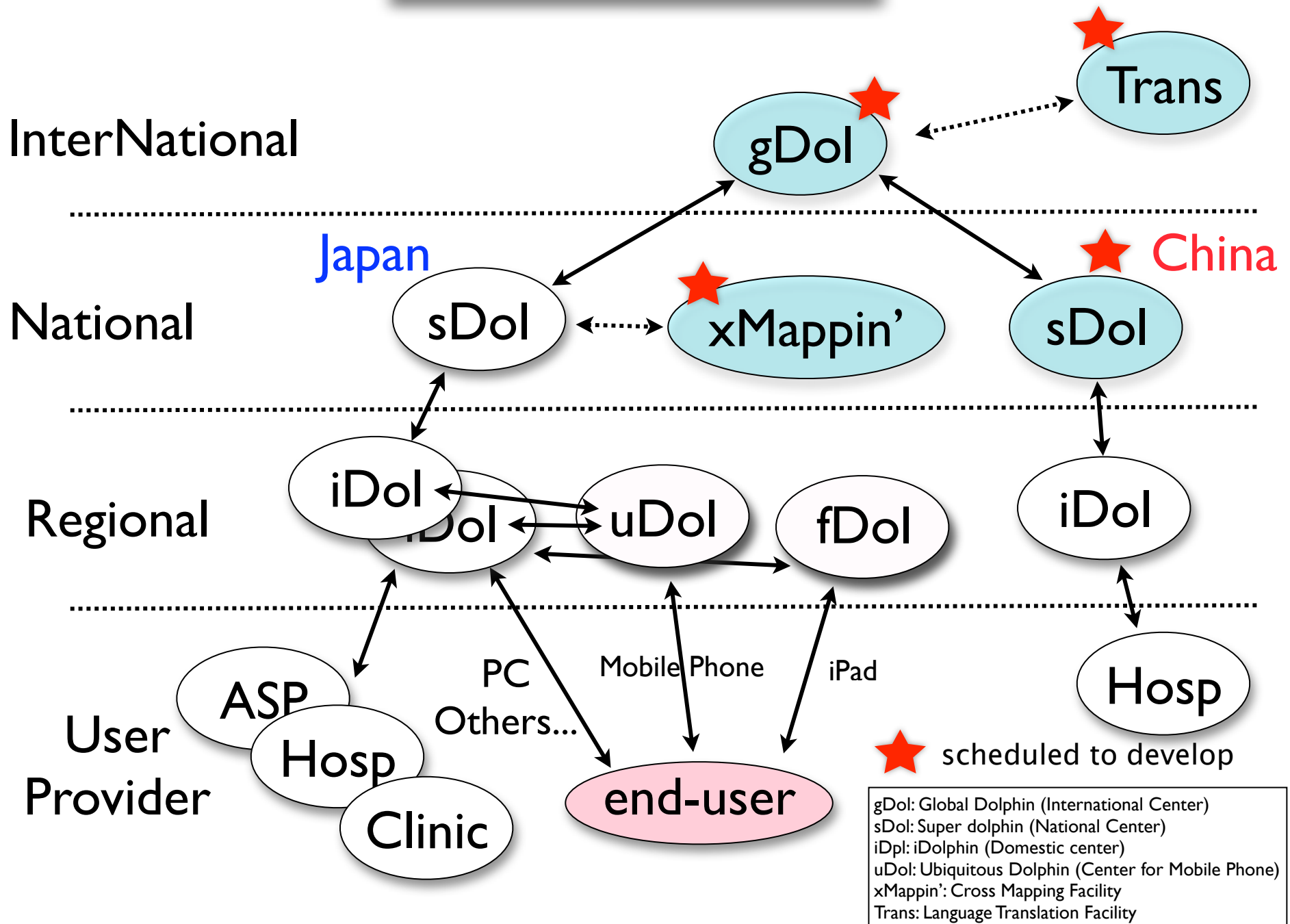2008 Service for Mobile Phone started

2012 Service for iPad started

3 Data centers (iDolphin) in Japan

Shared Use for multi EHR projects

Sapporo

Kyoto

Tokyo

Shiga (Nagahama)

Kumamoto

Miyazaki

Okinawa

by Google Earth

Services of iDolphin

1) Disclosure Clinical Records for Patient (B2C)
2) Sharing Clinical Record between Medical Institutions (B2B)
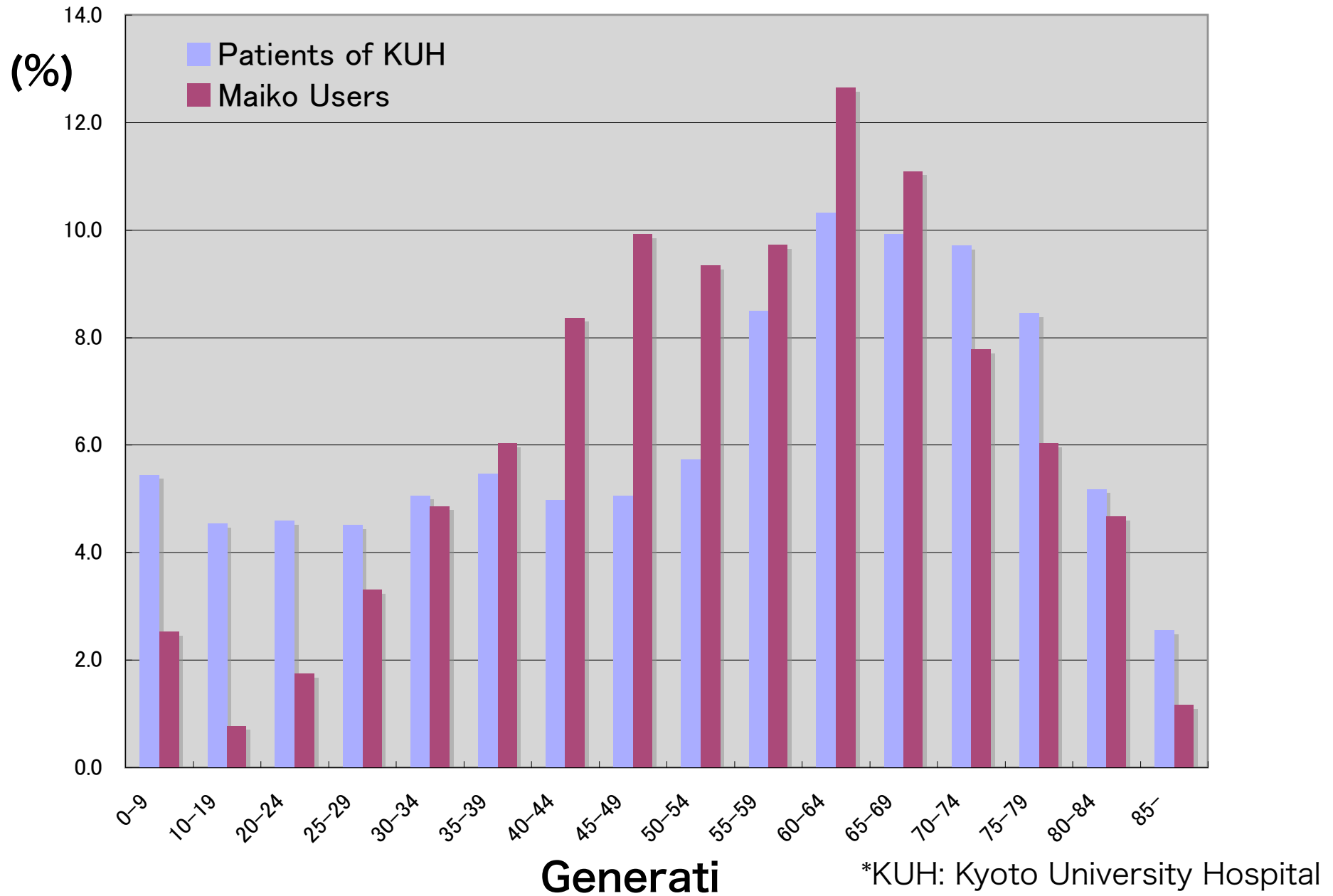3) Anonymous Clinical Data for Medical Research (B2R)

Scheme of Dolphin 4.0

InterNational

National

Regional

User Provider

Japan

China

Trans

gDol

sDol

xMappin'

sDol

iDol

iDol

uDol

fDol

iDol

ASP

Hosp

Clinic

PC Others...

Mobile Phone

iPad

end-user

Hosp

⭐ scheduled to develop

gDol: Global Dolphin (International Center)
sDol: Super dolphin (National Center)
iDpl: iDolphin (Domestic center)
uDol: Ubiquitous Dolphin (Center for Mobile Phone)
xMappin': Cross Mapping Facility
Trans: Language Translation Facility

Maiko Net

http://www.e-maiko.net/

Kyoto Association for Cooperative Medicine (Non Profit Organization)

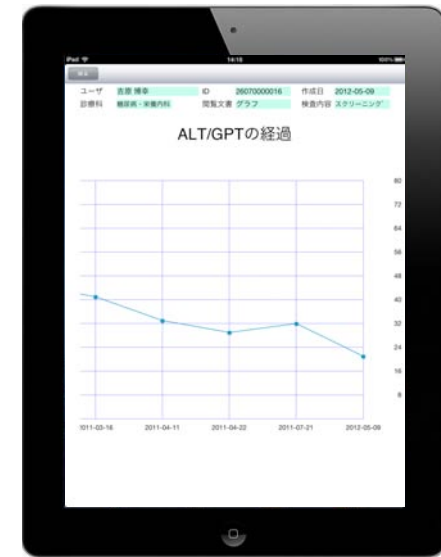Age Distribution in Patients of KUH and Maiko Net Users

DEMO
Access to Maiko Net
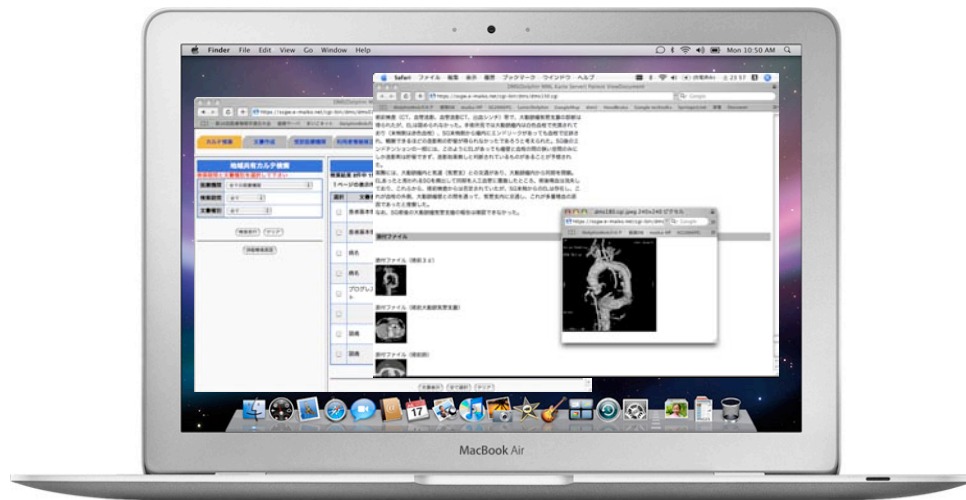
Service for PC
Since Jul. 2007...

Service for Mobile Phone
Since Oct. 2008...

Service for Mobile Phone
Since Apr. 2012...

Conclusion

- Data center (iDolphin) in 3 region (=RHIO)

- Patients can access by PC, Mobile Phone & iPad

- Medical providers can access their patient's data
 (Cooperative medical care)

- Secondary use of clinical data (anonymous data)

- More than 10,000 users in Kyoto project including Nagahama area

Thank you !

Hiroyuki **YOSHIHARA**, MD/PhD
Kyoto University, Japan
lob@kuhp.kyoto-u.ac.jp