ITU Workshop on
"E-health services in low-resource settings: Requirements and ITU role"

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Fujitsu Healthcare Business Overview

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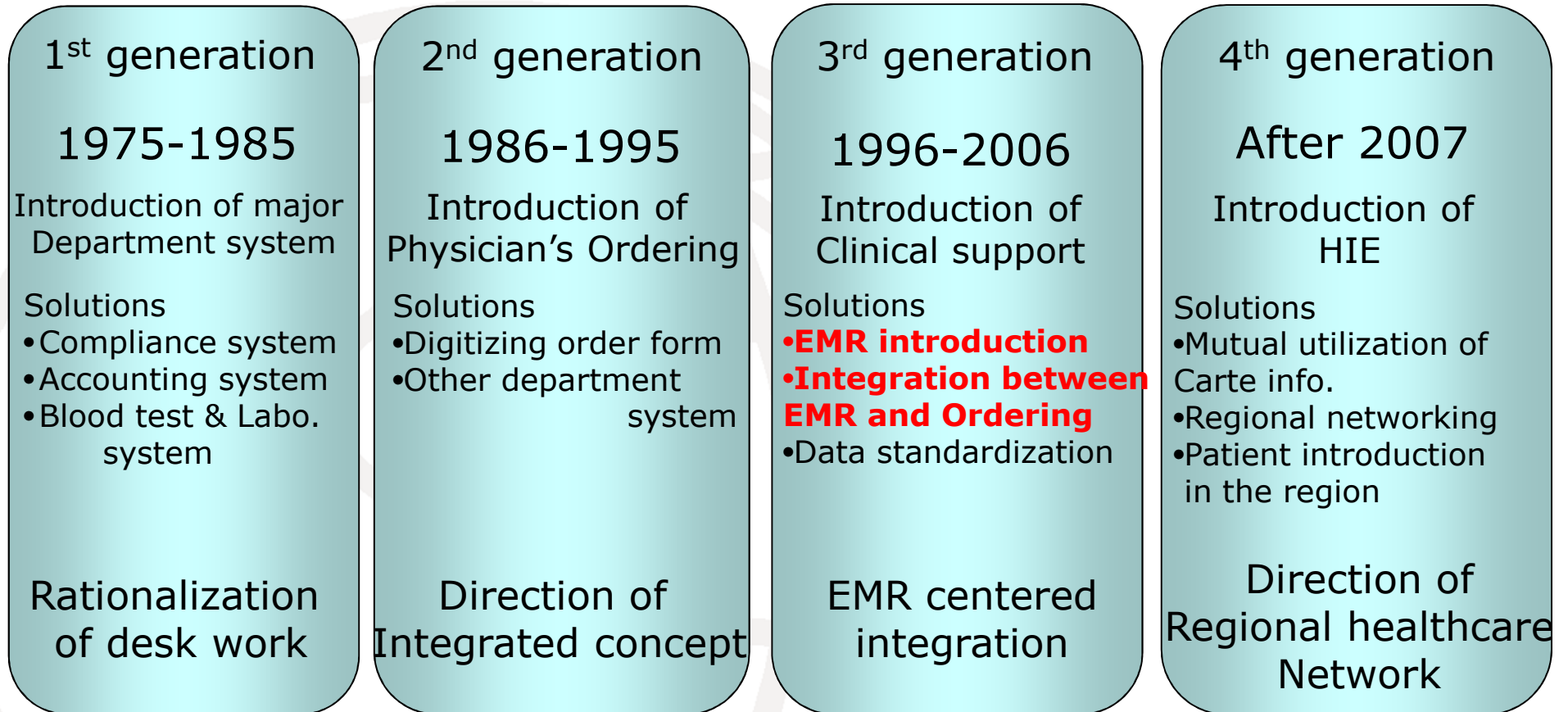## Healthcare and Educational System Business Unit
Fujitsu Ltd.

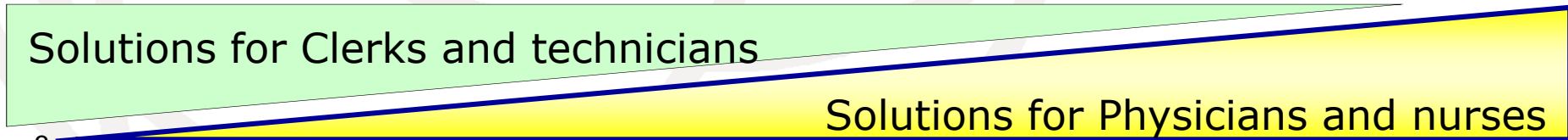# EMR Business Overview

Japanese Footsteps of ICT solution biz.

1st generation

1975-1985

Introduction of major Department system

Solutions
- Compliance system
- Accounting system
- Blood test & Labo. system

Rationalization of desk work

Adding line-up of department system based on customization

2nd generation

1986-1995

Introduction of Physician's Ordering

Solutions
- Digitizing order form
- Other department system

Direction of Integrated concept

Developing core HIS based on customization

3rd generation

1996-2006

Introduction of Clinical support

Solutions
- **EMR introduction**
- **Integration between EMR and Ordering**
- Data standardization

EMR centered integration

Developing core HIS based on customization

4th generation

After 2007

Introduction of HIE

Solutions
- Mutual utilization of Carte info.
- Regional networking
- Patient introduction in the region

Direction of Regional healthcare Network

Developing EMR system on Ordering system Customization -> PKG

Solutions for Clerks and technicians

Solutions for Physicians and nurses

EMR installation in Japan

◆# of EMR introduced in medical Institution nationwide

Change Record of EMR introduction

346　704　969　1220

Fujitsu
NEC
CSI
SS
IBM/Kameda
Others
EMR

2004: 100, 36, 64, 46, 30, 70
2006: 225, 72, 113, 94, 56, 144
2008: 293, 127, 122, 146, 60, 221
2010: 386, 131, 165, 197, 60, 281

Penetration ratio14%
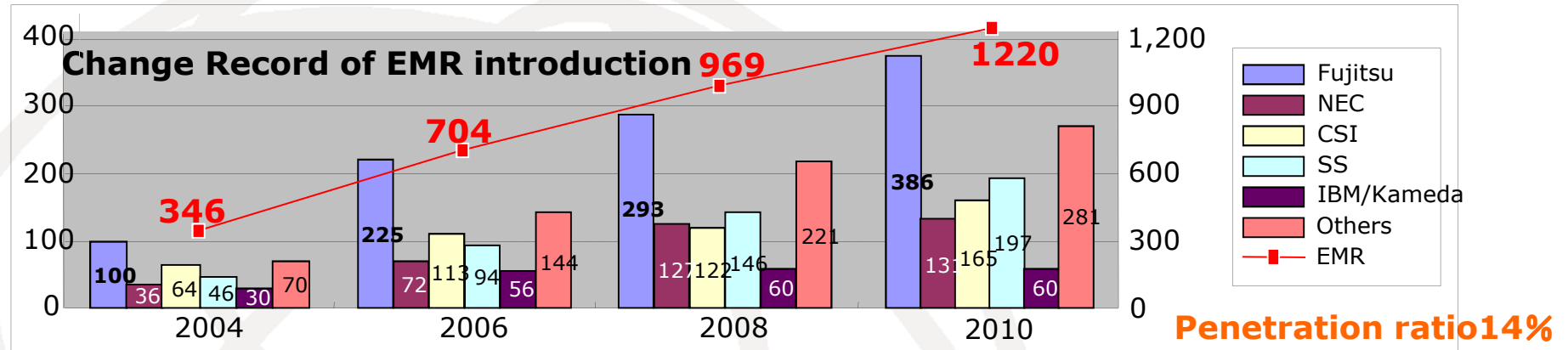
◆EMR <u>unit-base</u> Market Share in Japan (Major 5 Vendors)

2008
Total 969　TOP5 748
Fujitsu 293 (39.2%)
NEC 127 (17.0%)
CSI 122 (16.3%)
SS 114 (15.3%)
IBM/Kameda 60 (8.0%)

2010
Total 1,220　TOP5 939
Fujitsu 386 (41.1%)
NEC 131 (14.0%)
CSI 165 (17.6%)
SS 197 (21.0%)
IBM/Kameda 60 (6.4%)
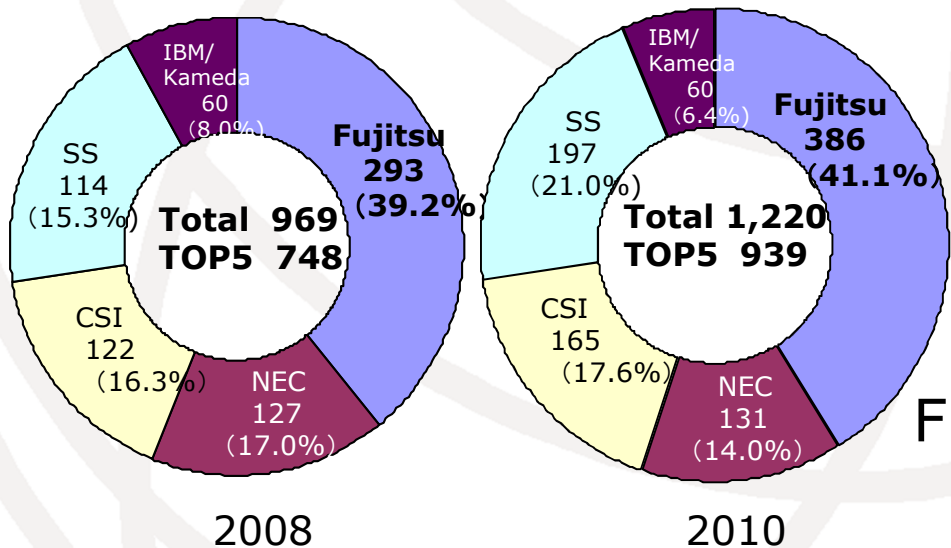
We cover all range of hospitals
- National Medical Centers, Univ. Hospitals
- Prefecture Medical Centers & Hospitals
- Private Hospitals (Large - Small)
- Private Clinic etc.

Fujitsu currently has >50% share in high-end market in Japan.

(Source: New Medical in Japan Sep, 2010)

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Fujitsu Healthcare Solution Offerings in Japan

■Fujitsu Japan has over 2,000 SEs and sales staff.
■Fujitsu innovates workflow with standard package applications.

■<u>Healthcare Packages</u>

●EMR solution
1. HIS
2. CPOE
3. Electronic carte
4. Nursing system
5. Medical accounting system

●Department solutions
1. RIS / PACS
2. LIS
3. Management support system
4. Health check-up system
5. HIE

■<u>Business Model</u>

●One-stop solution
1. IT Prime Contractor
2. <u>Total integration and maintenance</u>
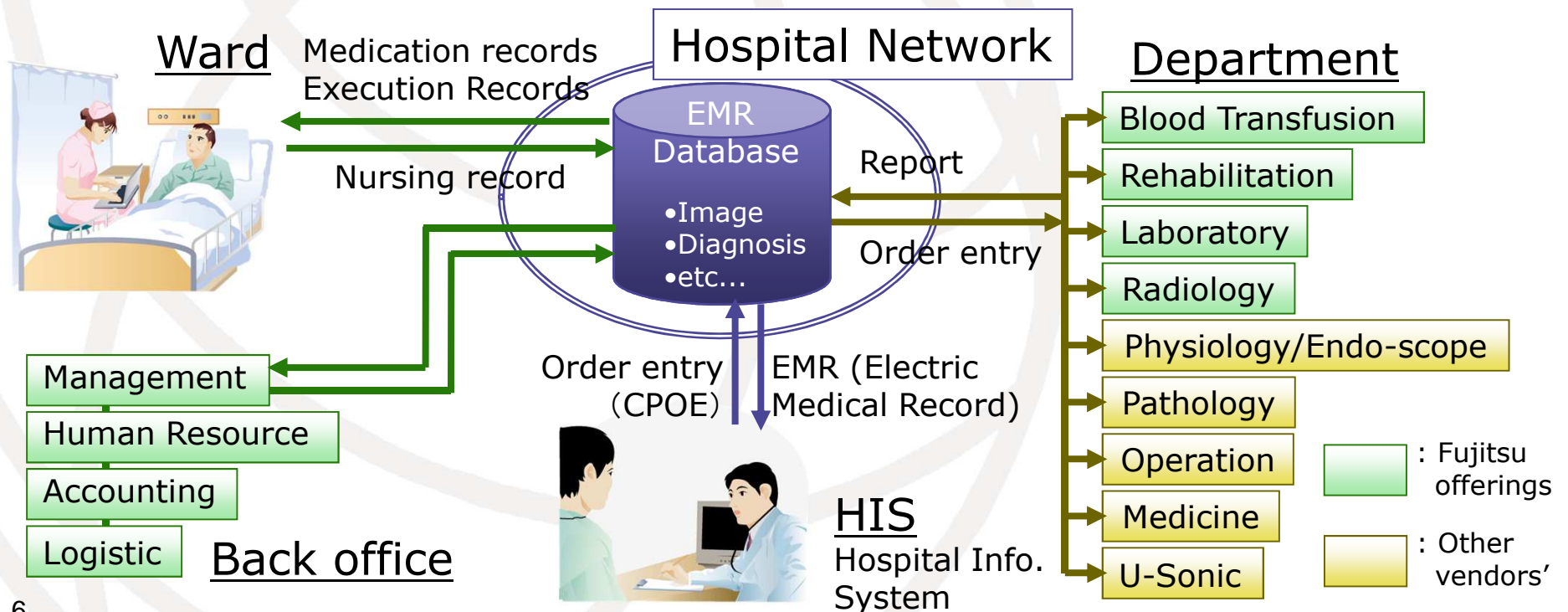
●Non-customize solution
1. Adopt standard package into all hospitals w/o customization
2. Std. PKG covers entire workflow in all hospitals.
3. Annual level-up for the PKG
   ・ About 350-400 functions are added.
   ・ User's meeting decides Level-Up contents.

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Features of Fujitsu EMR Solution

Fujitsu's EMR system includes the entire hospital ICT systems (HIS, network and department systems) including electronic carte.

Continuous updates and improvement

- Flexibly adapt changes in medical systems and advancements in medicine.
- Periodically reflects opinions from medical staff via user forums.
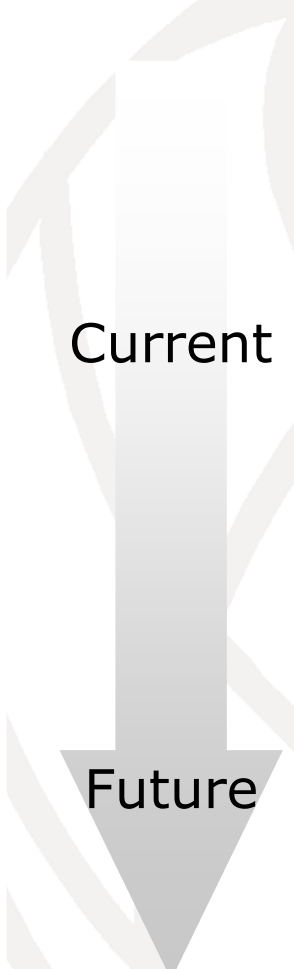- Include knowledge collected from all over the country.

Ward

Medication records
Execution Records

Nursing record

Hospital Network

EMR Database
- Image
- Diagnosis
- etc...

Report

Order entry

Department

Blood Transfusion

Rehabilitation

Laboratory

Radiology

Physiology/Endo-scope

Pathology

Operation

Medicine

U-Sonic

Management

Human Resource

Accounting

Logistic

Back office

Order entry (CPOE)

EMR (Electric Medical Record)

HIS
Hospital Info. System

: Fujitsu offerings

: Other vendors'

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HIE solution

Transition of Healthcare Systems

Healthcare system has been changing to cover wider info.

	Network	Information	Administrator	Examples
EMR (Electronic Medical Record)	Within hospital	✓Patient carte ✓Order info. ✓Management info.	Hospital	Current EMR solution
EHR HIE (Electronic Health Record)	Among hospitals and clinics	✓Some info. of carte for medical introduction	Regional core hospital and municipality National Government	・NHS in UK ・Info.Way in Canada ・KanTa in Finland
PHR (Personal Health Record)	Regional area	✓Carte ✓Healthcare info. ex. Home care info.	Municipality National Government	Best Life Promotion
PLR (Personal Life Record)	Regional area (wide)	✓PHR ✓Life record ex. Social service info.	Municipality National Government	

Current

Future

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Needs for HIE network

Change of medical env.

Rapid aging & Increase in lifestyle diseases

✓ Change of disease structure

✓ Increase in elderly households, single-living of elderly

Lack of doctors and nurses

✓ Cruel overwork due to lack of doctors and nurses

✓ Difficulty in medical care in remote rural areas

Advancement of healthcare services needs

✓ Concentration of patients to large hospital

✓ Evaluation of hospitals by patients (e.g. ranking)

Financial crunch of public medical institution

✓ Public hospital reform plan, review of management

Change of medical system

✓ Optimization of medical expenses

✓ Reform of medical system, optimization of beds for acute phase

✓ Decrease in days in hospital by introducing DPC*

✓ Incentive for computerization & HIE path

✓ Online receipts   *DPC=Diagnosis Procedure Combination

Solutions

✓ Medical systems considering regional feature

✓ Optimization of limited human resource

✓ Proper role sharing of hospitals / clinics

✓ Functional differentiation of hospitals in a region

✓ Sharing medical info in a region

✓ Remote medical service by utilizing ICT

Solve

HIE network
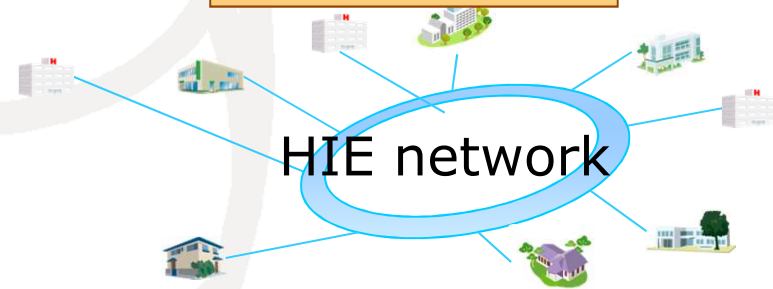
Equipment of cooperation network is immediately required in order to promote transfer from hospital-closed healthcare to regional healthcare

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EHR Solution in Japan

Enables info sharing among different hospitals/clinics.

Regional area (town/city) network

Nursing facility

Clinic

HumanBridge

Rehabilitation hospital

Clinic

- Shares reference of the whole carte information, including prescription, inspection and doctor's diagnosis.

⇒ <u>Patients can receive medical care at any convenient sights.</u>

Core hospital

HumanBridge

Core hospital

Core hospital

Core hospital

- Shares long-term info. such as prescription, inspection results, and allergies.
- Realizes optimal emergency medicine.

⇒ <u>Patients can receive appropriate medical care at the best hospital.</u>

Inter prefecture/state network

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Effects of HIE

Patients (Residents)

- Receiving high quality medical service
- Decreasing economical and mental burden of patients and their families

Realize patient(residents)-oriented, effective and efficient medical delivery system

Medical facilities

- Efficient management by selection and concentration of medical functions
- Effective medical treatment by sharing info
- Decreasing burden of medical staff

Administration

- Establishing sufficient medical delivery system by effective use of medical resources
- Realizing reasonable medical expenses by differentiation and connection of medical functions
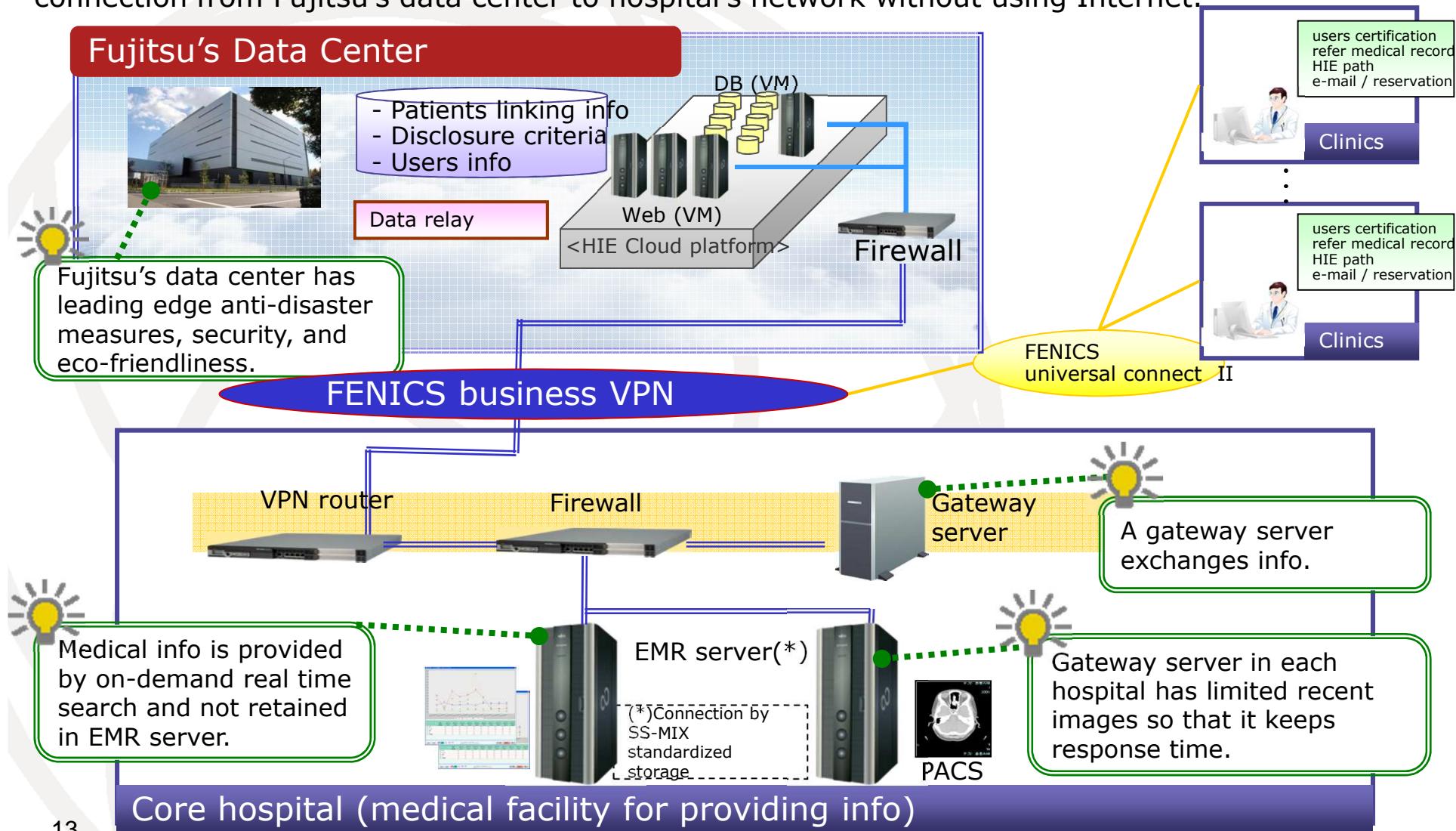
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Feature of HumanBridge
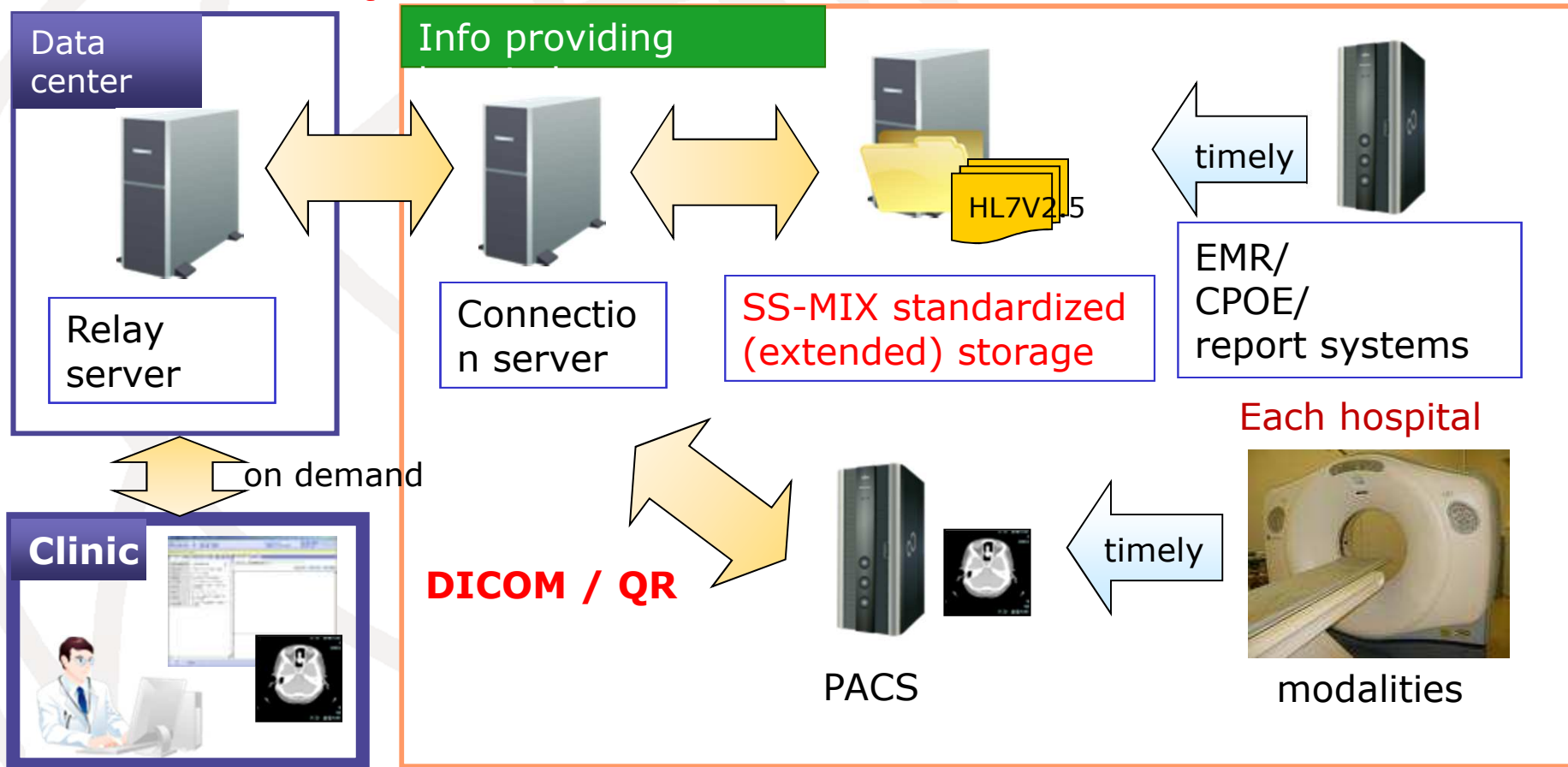
HIE with robust security

HumanBridge has robust security based on MHLW's guideline concerning safety administration of medical information systems. The security supports sharing medical information via network. Especially, SaaS model adopts closed network connection using FENICS-VPN, so that it can realize connection from Fujitsu's data center to hospital's network without using Internet.

Fujitsu's Data Center

- Patients linking info
- Disclosure criteria
- Users info

DB (VM)

Data relay

Web (VM)

<HIE Cloud platform>

Firewall

Fujitsu's data center has leading edge anti-disaster measures, security, and eco-friendliness.

users certification
refer medical record
HIE path
e-mail / reservation

Clinics

users certification
refer medical record
HIE path
e-mail / reservation

Clinics

FENICS business VPN

FENICS universal connect II

VPN router   Firewall   Gateway server

A gateway server exchanges info.

Medical info is provided by on-demand real time search and not retained in EMR server.

EMR server(*)

(*)Connection by SS-MIX standardized storage

PACS

Gateway server in each hospital has limited recent images so that it keeps response time.

Core hospital (medical facility for providing info)

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HIE construction w/o depending on vendors

Any EMR made by any vendor can provide information via connection server, if it outputs data into SS-MIX standardized (extended) storage.
(*) Most of vendors has already implemented output of data into SS-MIX storage.
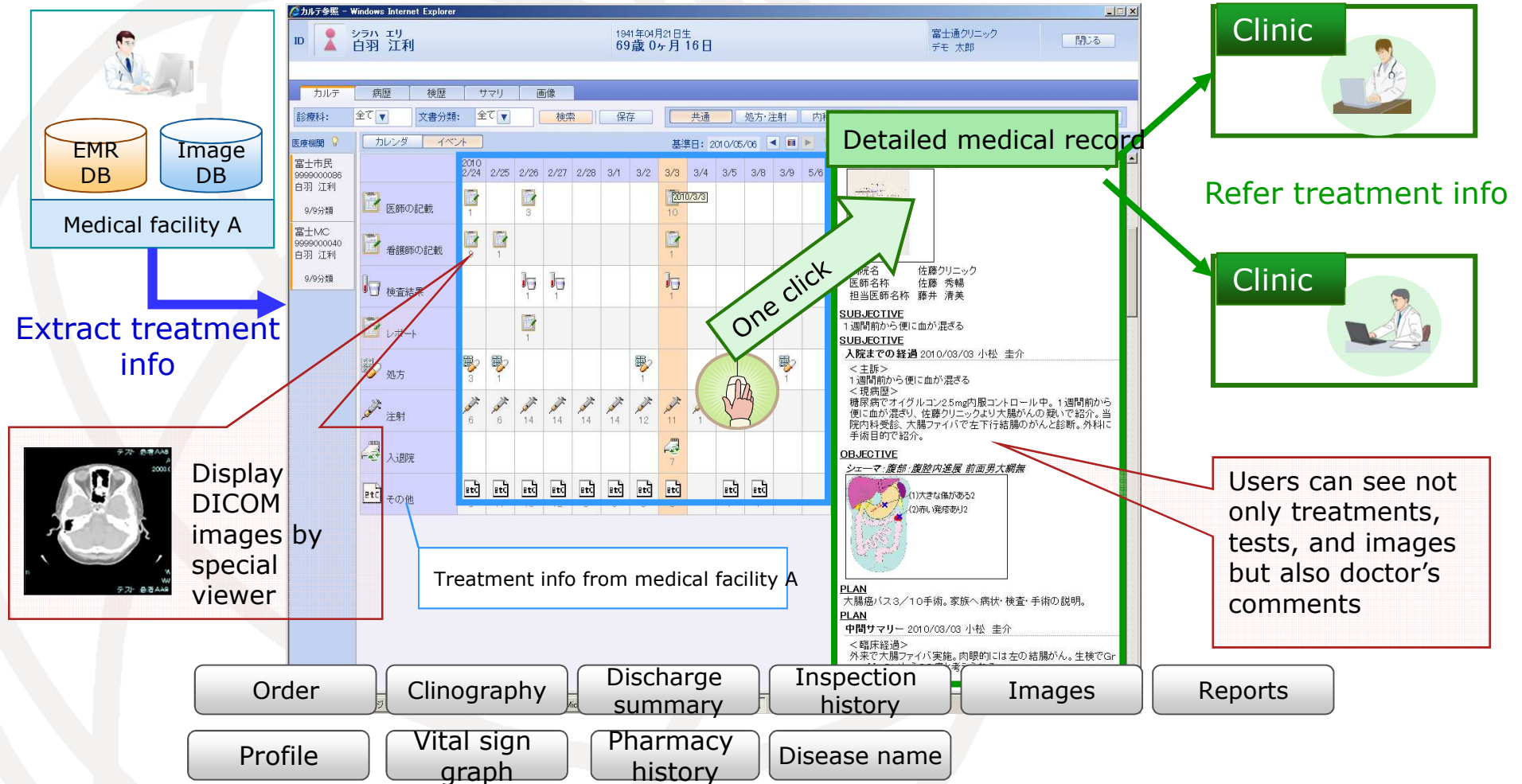Any PACS made by any vendor can provide information via connection server by means of DICOM Q/R.

Data center

Relay server

on demand

Clinic

Info providing

Connection server

HL7V2.5

SS-MIX standardized (extended) storage

timely

EMR/ CPOE/ report systems

Each hospital

DICOM / QR

PACS

timely

modalities

SS-MIX : MHLW's promotion of electronic medical information
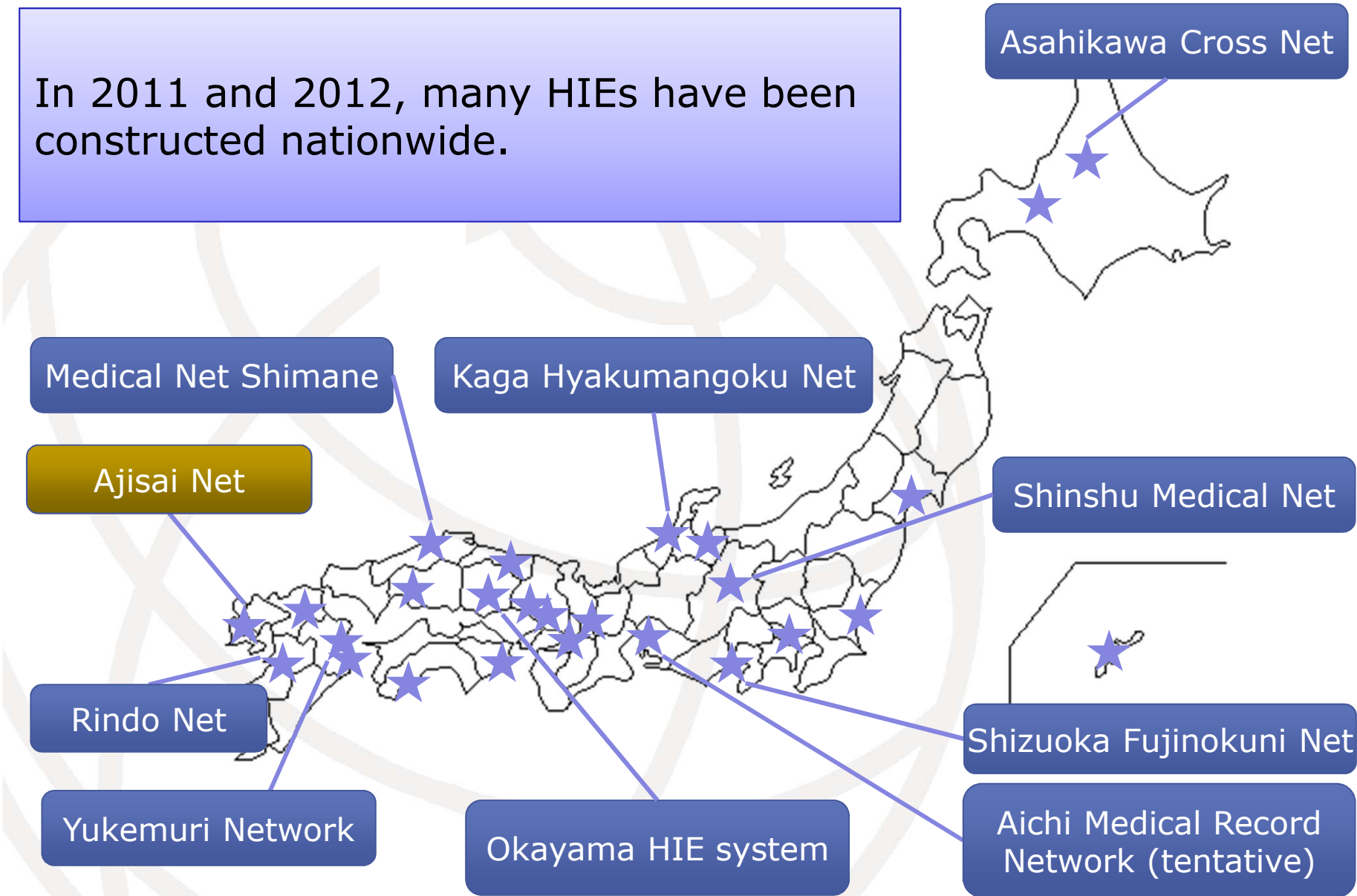
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Sharing all medical info in EMR

Clinic staff can refer medical treatment info of core hospitals.
Therefore, patients can receive consistent medical service in a region.

Extract treatment info

Medical facility A

EMR DB   Image DB

Detailed medical record

Clinic

Clinic

Refer treatment info

One click

Display DICOM images by special viewer

Treatment info from medical facility A

Users can see not only treatments, tests, and images but also doctor's comments

| Order | Clinography | Discharge summary | Inspection history | Images | Reports |

| Profile | Vital sign graph | Pharmacy history | Disease name |

Sharing medical info beyond letter of introduction and attached documents

Examples of HIE
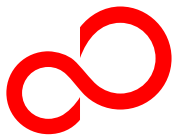
In 2011 and 2012, many HIEs have been constructed nationwide.

Asahikawa Cross Net

Medical Net Shimane

Kaga Hyakumangoku Net

Ajisai Net

Shinshu Medical Net

Rindo Net

Shizuoka Fujinokuni Net

Yukemuri Network

Okayama HIE system

Aichi Medical Record Network (tentative)

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e-Health Pilot Project in Laos

◆ e-Health Pilot Project in Laos supported by APT Program

◆ Employ video facility to improve communication between Central and Provincial Hospitals based on the real needs of doctors

◆ File server implemented also for educational purpose
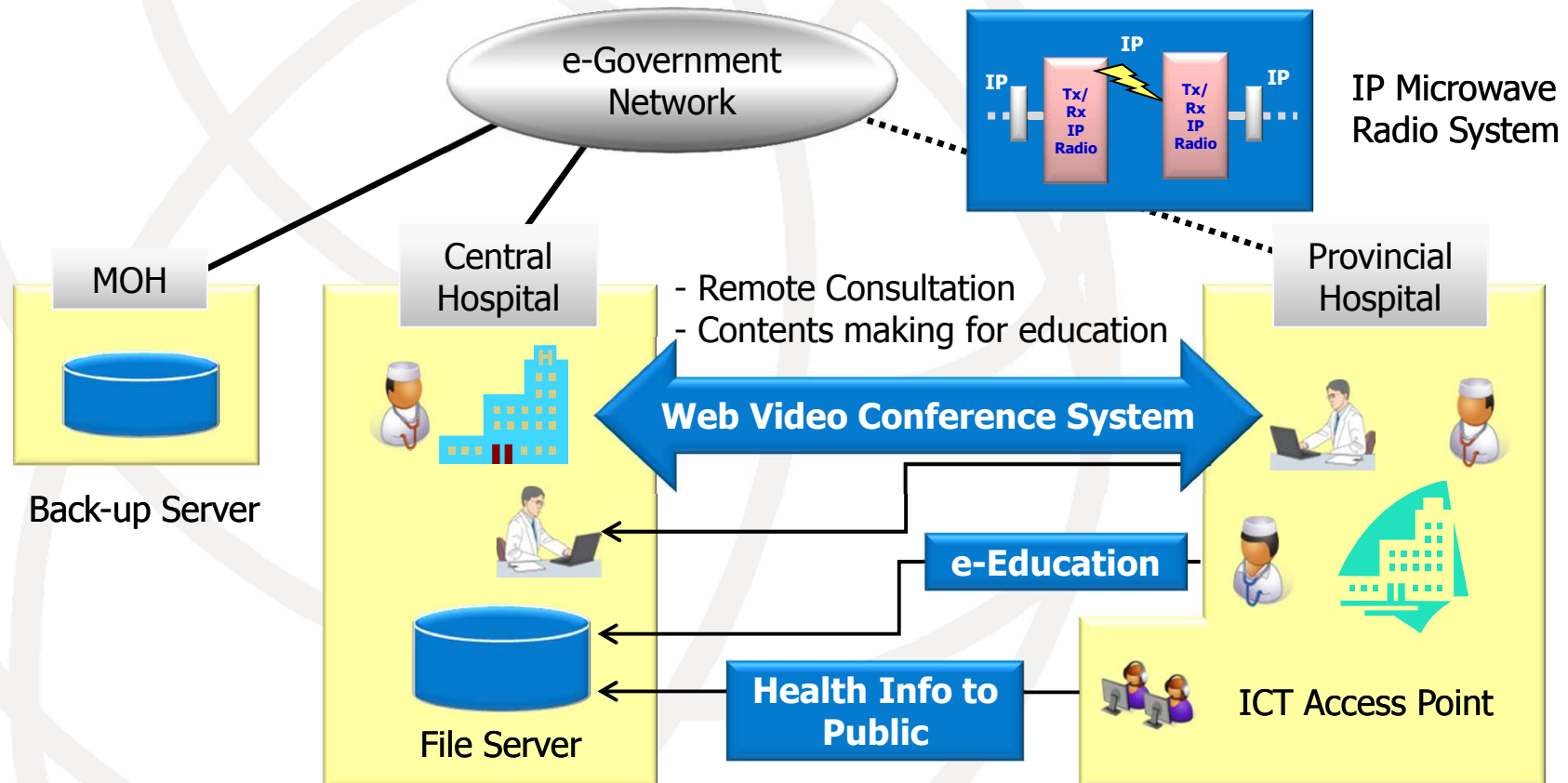
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