



Toward a New Era of Healthcare:  
Raising Flexibility via Mobile Medical Services &  
Applications -  
*The Experience of Remote Image Reading Center  
in Taiwan*

EBM Technologies

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# ●●● Company Briefing

Who  
We  
Are

- Taiwan-based
  - 30 years experience in medical image
  - 3,500 installations
- Product Map
  - Image Solution
  - E-Health
  - Telemedicine
- International Certifications
  - FDA
  - CE

# 30 years experience in medical imaging applications

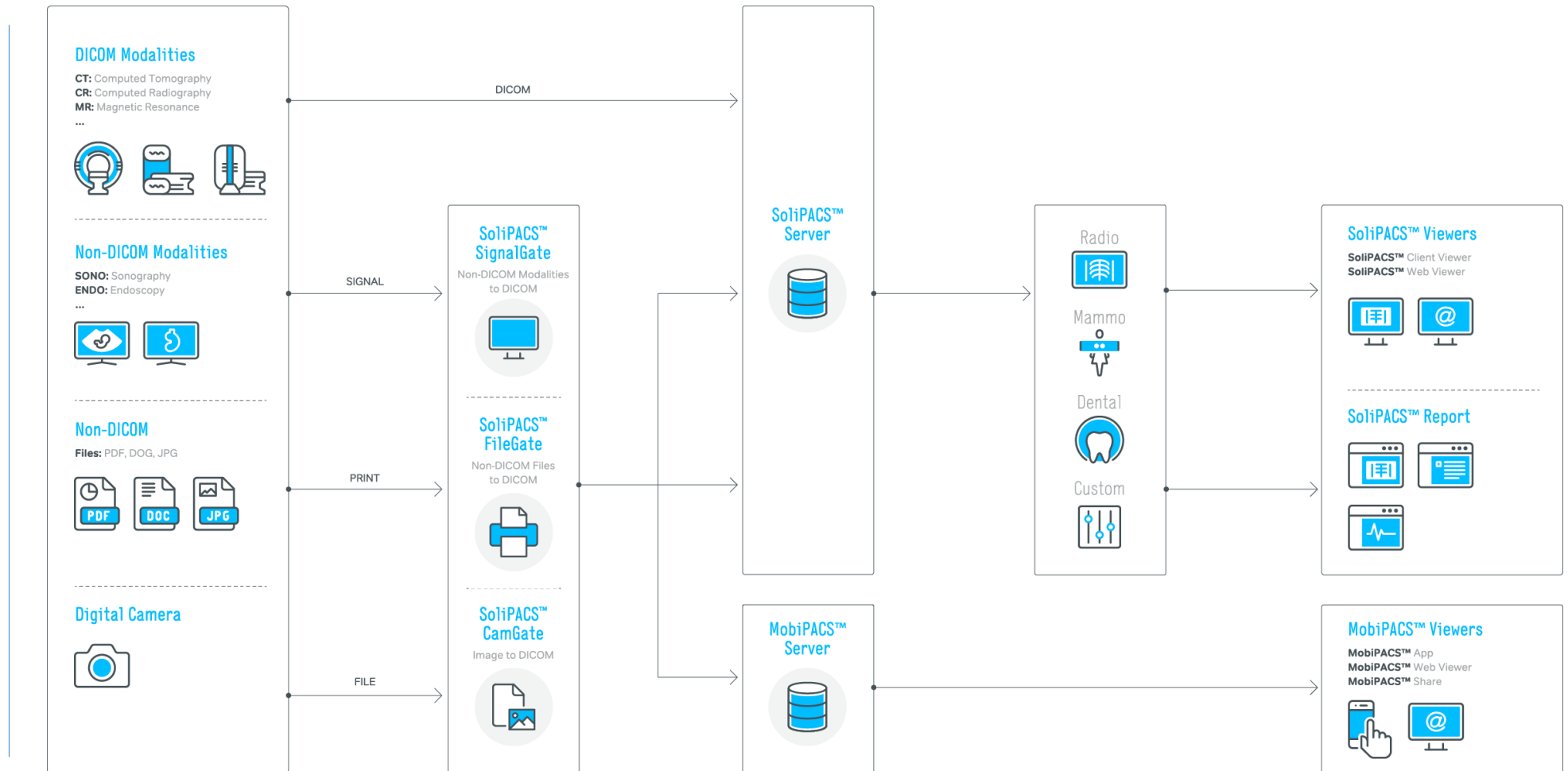
TAIWAN-based

3,500+ installations



- ✓ Established in 1988
- ✓ Experts in PACS (Picture Archiving and Communication Systems) as well as Telemedicine/eHealth solutions
- ✓ 150 employees are working in four locations: Taipei, Tokyo, Beijing and Honolulu
- ✓ Thousands of PACS licenses are installed in over 3,500 hospitals
- ✓ We support customers worldwide (Taiwan, Japan, China, Southeast and Central Asia, USA, EU)

# Product Map



# ●●● ebm international certifications

## Certifications

- FDA Class II : K023394, K062743, K071166
- CE : Certificate GB07/71180
- ISO 13485:2003 Certificate GB07/71179
- ISO 9001:2000 Certificate GB07/71178
- GMP Registration Number : 0930335513
- Health Canada LN/NH : 77976, 78149, 78150
- SFDA 2008 Registration Number : 2700121



# ●●● Agenda

## Cases in Mobile Medical Service

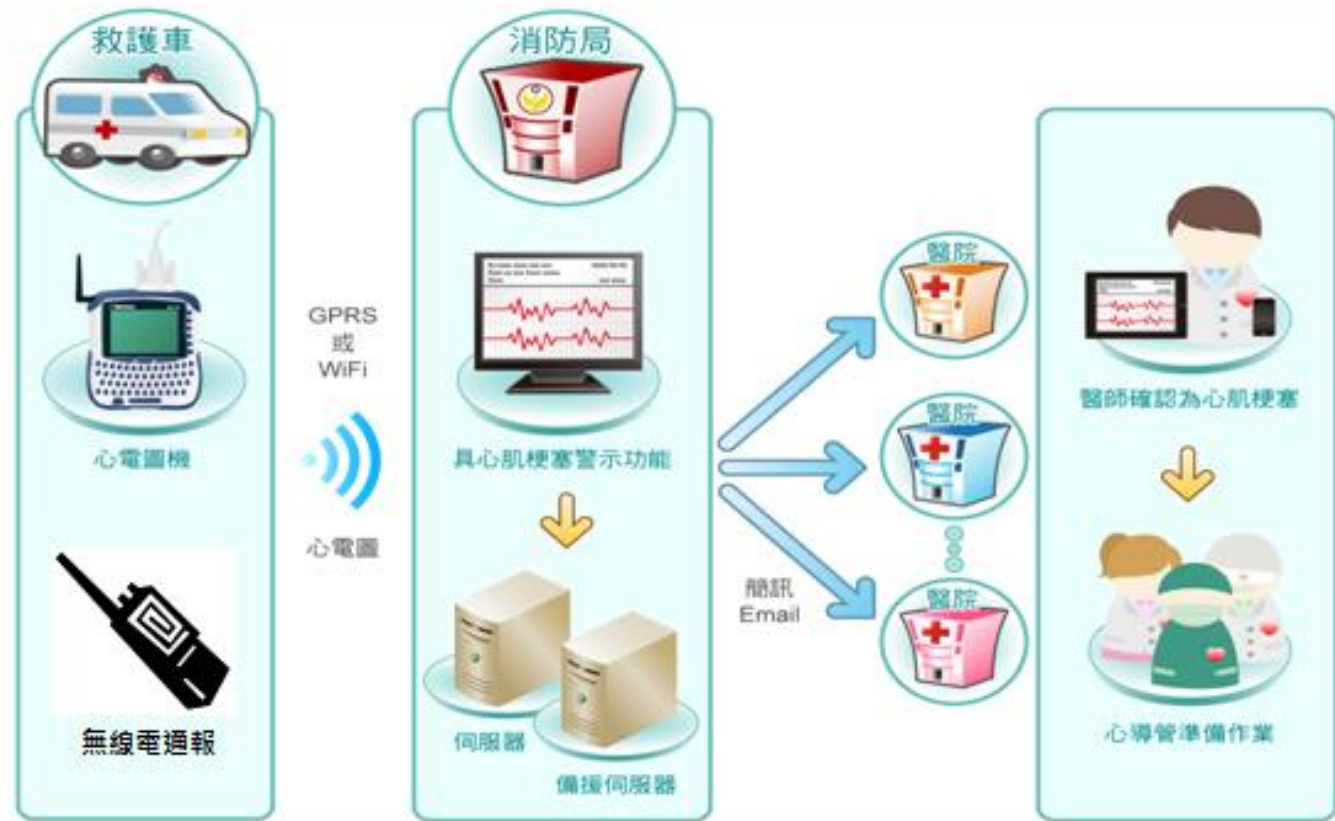
- **TeleECG, Pre-Hospital ECG**
  - 10 Cities Fire Bureau & 60+ ambulance
  - Transmit 12 Lead ECG directly to CV
- **VSOTG, Vital Sign On-The-Go**
  - Wireless Patient Monitor
  - Remote Central Monitor
  - Mobile Console on iPad
- **IRC, Image Reading Center**
  - Teleradiology between Health Centers and Hospitals
  - Mobile viewing on App
  - What We Do More than Teleradiology

# ●●● Pre-Hospital ECG

- History

- Startup from ER Unit
- Completed in Fire Department System

## Flow of TeleECG



# ●●● Pre-Hospital ECG

Ambulance



12 Lead ECG Performed  
on Ambulance  
&  
Transmit to FDCC

Command Center  
of Fire Dept.



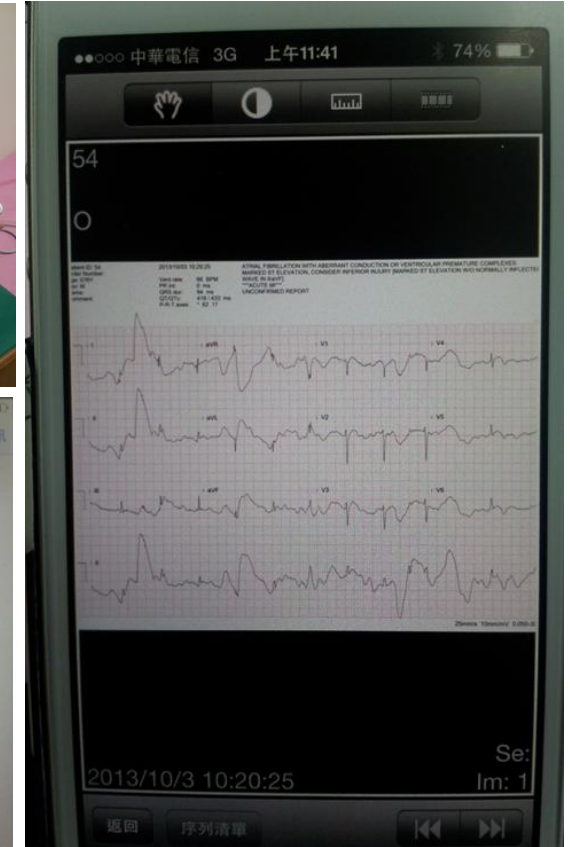
收到一筆自動判讀為  
**ACUTE MI**心電圖

ID: XXXXXX  
Name: XXXXXX  
Study Date Time: YYYY/MM/DD HH:MM:SS

關閉警示

Auto Detect Acute MI  
&  
Inform the CV on duty

Hospital w/ Cath Room

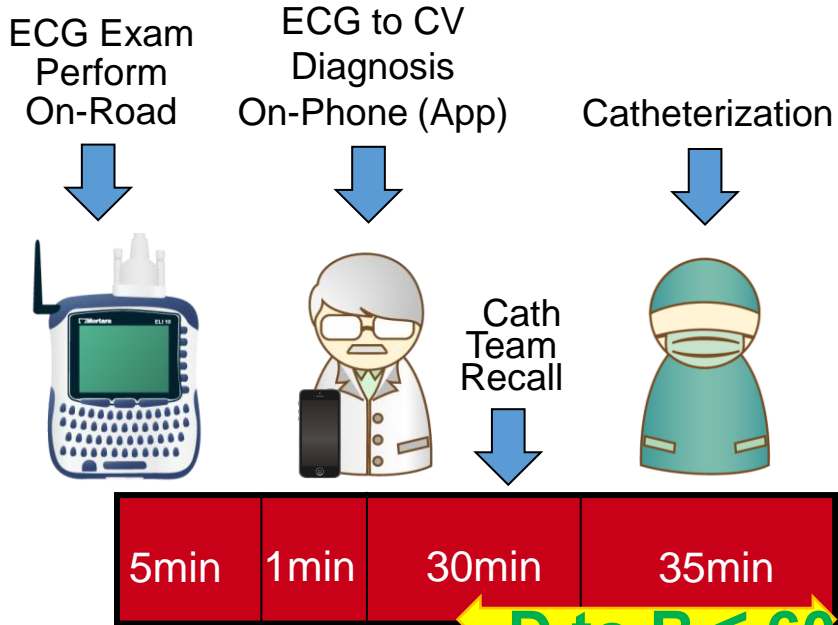


Links in Message could  
Open EBM iDO Viewer  
for ECG Checking

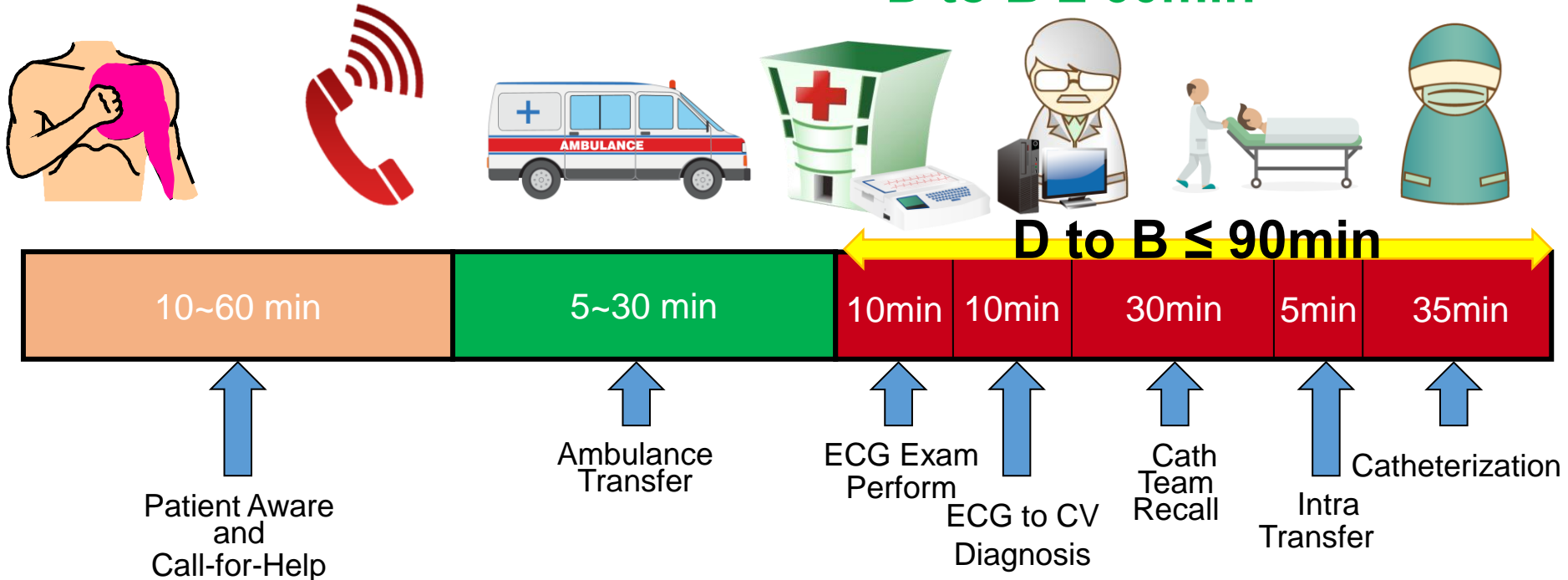


# ●●● Pre-Hospital ECG

TeleECG Mode



Traditional Mode

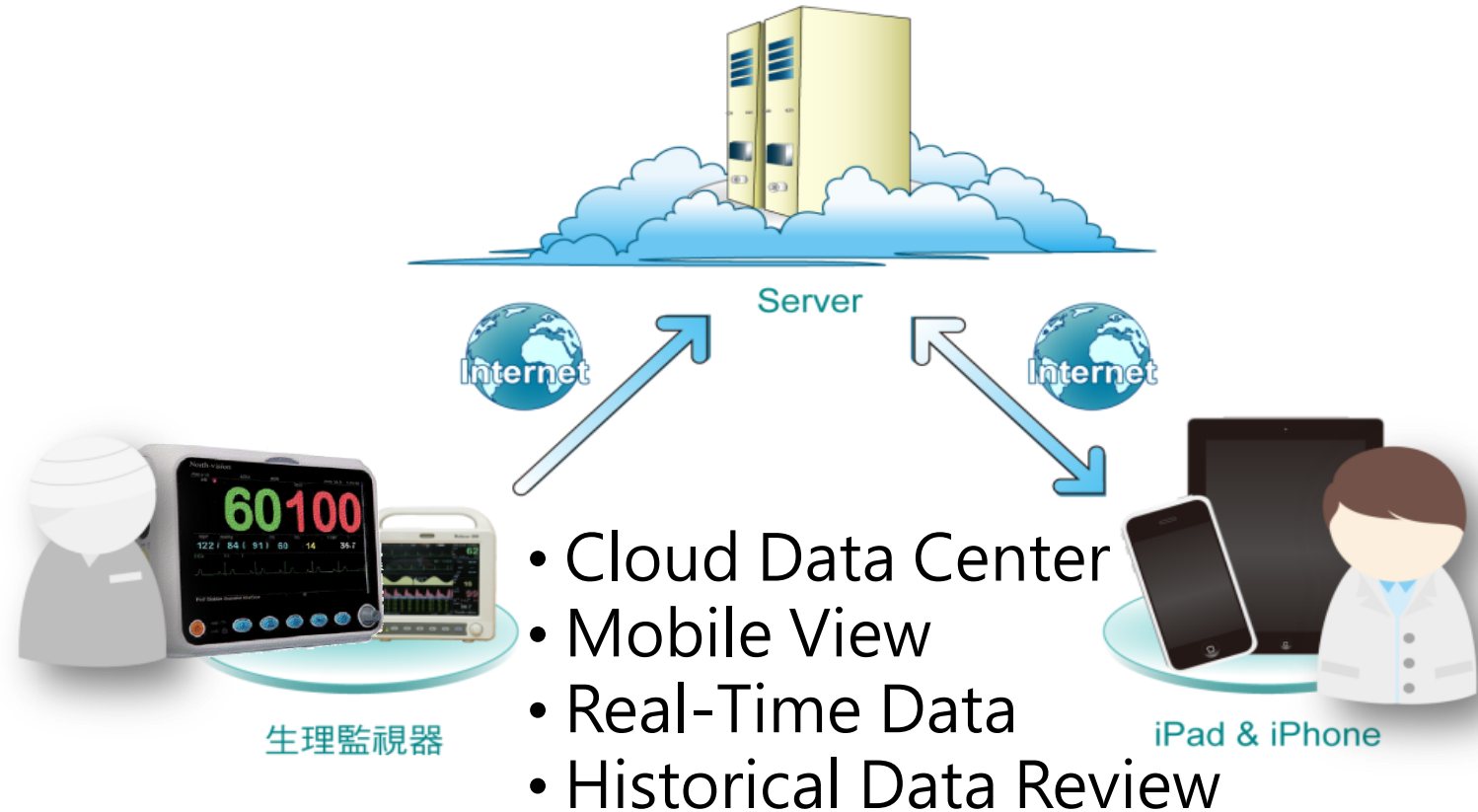


# ●●● VSOTG\_Cloud-based Vital Sign Monitoring System

- VS Cloud

- Wireless Patient Monitor + Cloud Server + Mobile App

VSOTG  
Flow



# ●●● VSOTG\_Wireless Vital Sign Solution

- Remote Monitor

  - IoT Patient Monitor

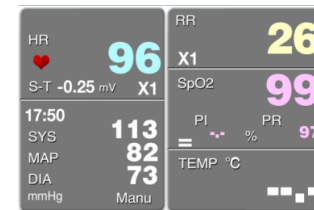
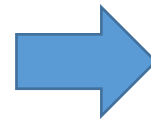
  - iPad as a Vital Sign Monitor Workstation

VS  
1000

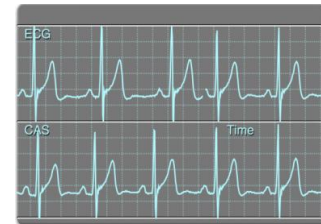
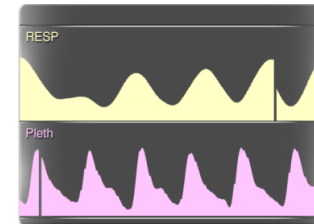


Wireless  
Patient Monitor  
ebm VS-70 or VS-100

Remote APP  
ebm VS-1000



| Time  | HR | SYS | DIA | MAP | PR | RR | TEMP | SpO2 | PR |
|-------|----|-----|-----|-----|----|----|------|------|----|
| 17:50 | 97 | 113 | 73  | 82  | 98 | 28 | --   | 99   | 98 |
| 17:48 | 74 | 107 | 74  | 81  | 79 | -- | --   | 99   | 79 |
| 17:47 | 85 | 112 | 77  | 86  | 87 | 16 | --   | 99   | 87 |
| 17:46 | 97 | 113 | 73  | 82  | 98 | 28 | --   | 99   | 98 |
| 17:44 | 74 | 107 | 74  | 81  | 79 | -- | --   | 99   | 79 |
| 17:44 | 85 | 112 | 77  | 86  | 87 | 16 | --   | 99   | 87 |
| 17:43 | 97 | 113 | 73  | 82  | 98 | 28 | --   | 99   | 98 |
| 17:41 | 74 | 107 | 74  | 81  | 79 | -- | --   | 99   | 79 |
| 17:40 | 85 | 112 | 77  | 86  | 87 | 16 | --   | 99   | 87 |
| 17:39 | 97 | 113 | 73  | 82  | 98 | 28 | --   | 99   | 98 |



# ●●● VSOTG\_Mobile Monitor

- Mobile Monitor Viewer
  - Remote Alarm and Real-time Viewing

VS  
1000



Patient in observation room  
w/ VS-70 or VS-100

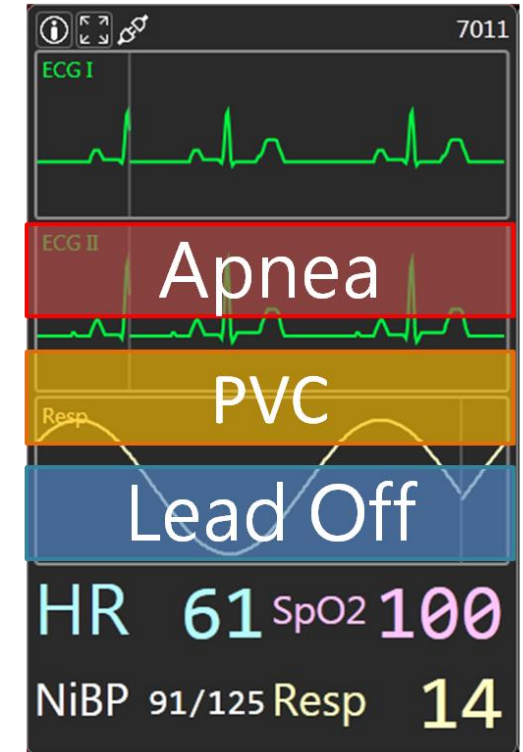
CV in OPD clinic room  
w/ VS-1000

# ●●● VSOTG\_Vital Sign Dashboard

VS  
2000

- Central Monitor

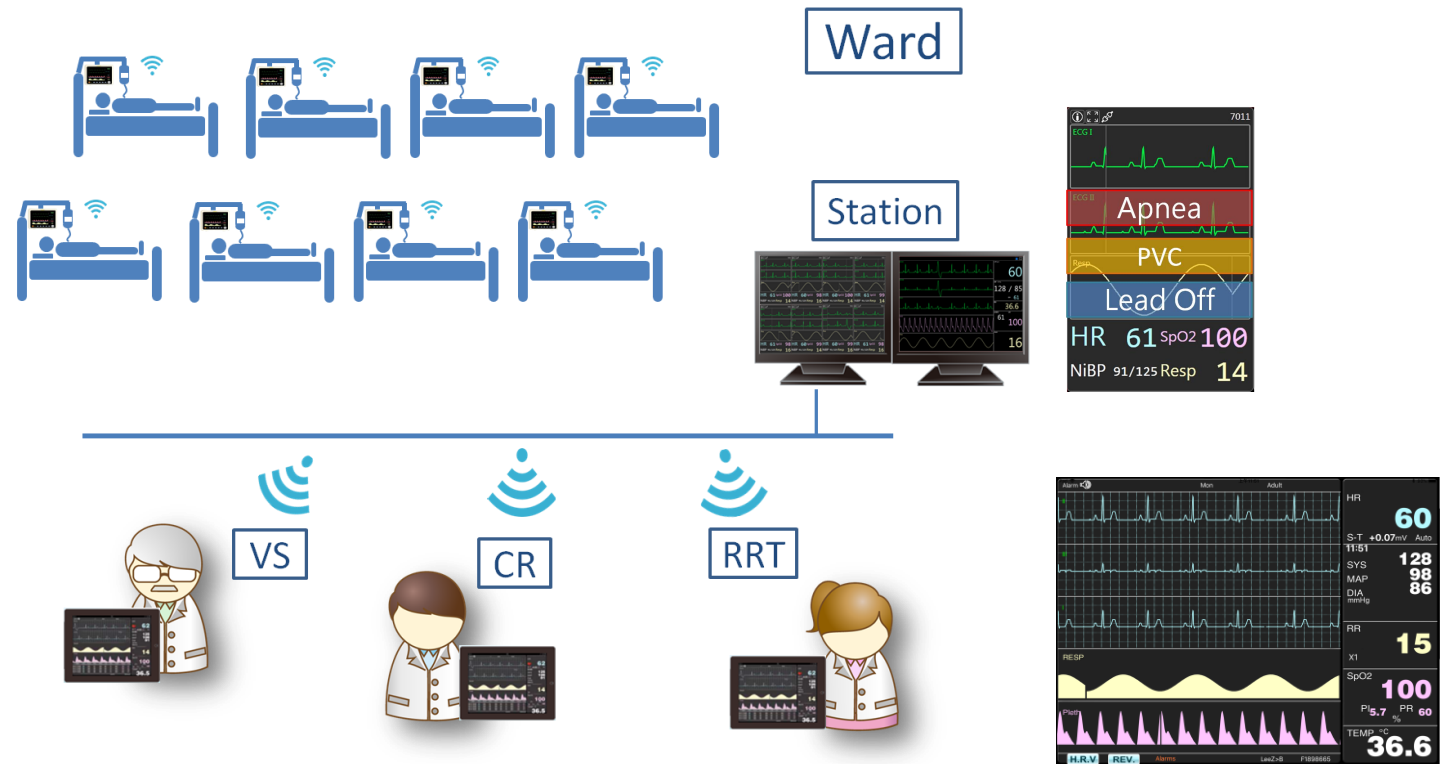
- 16 Devices Display Simultaneously
- Full Disclosure of Data, Alarm and Events
- Live Broadcast + Record + Review



# ●●● VSOTG\_Ward Scenario

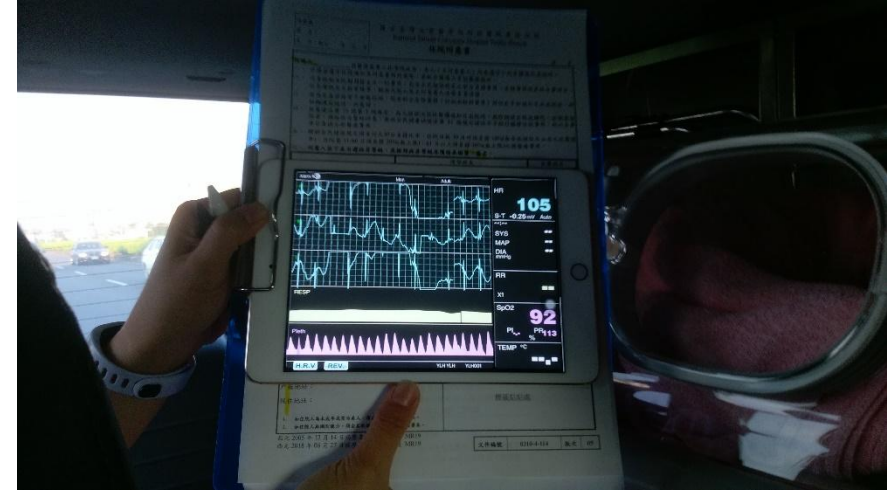
VS  
Series

- Wireless Patient Monitor in General Ward
  - Central Monitor + Remote Consult

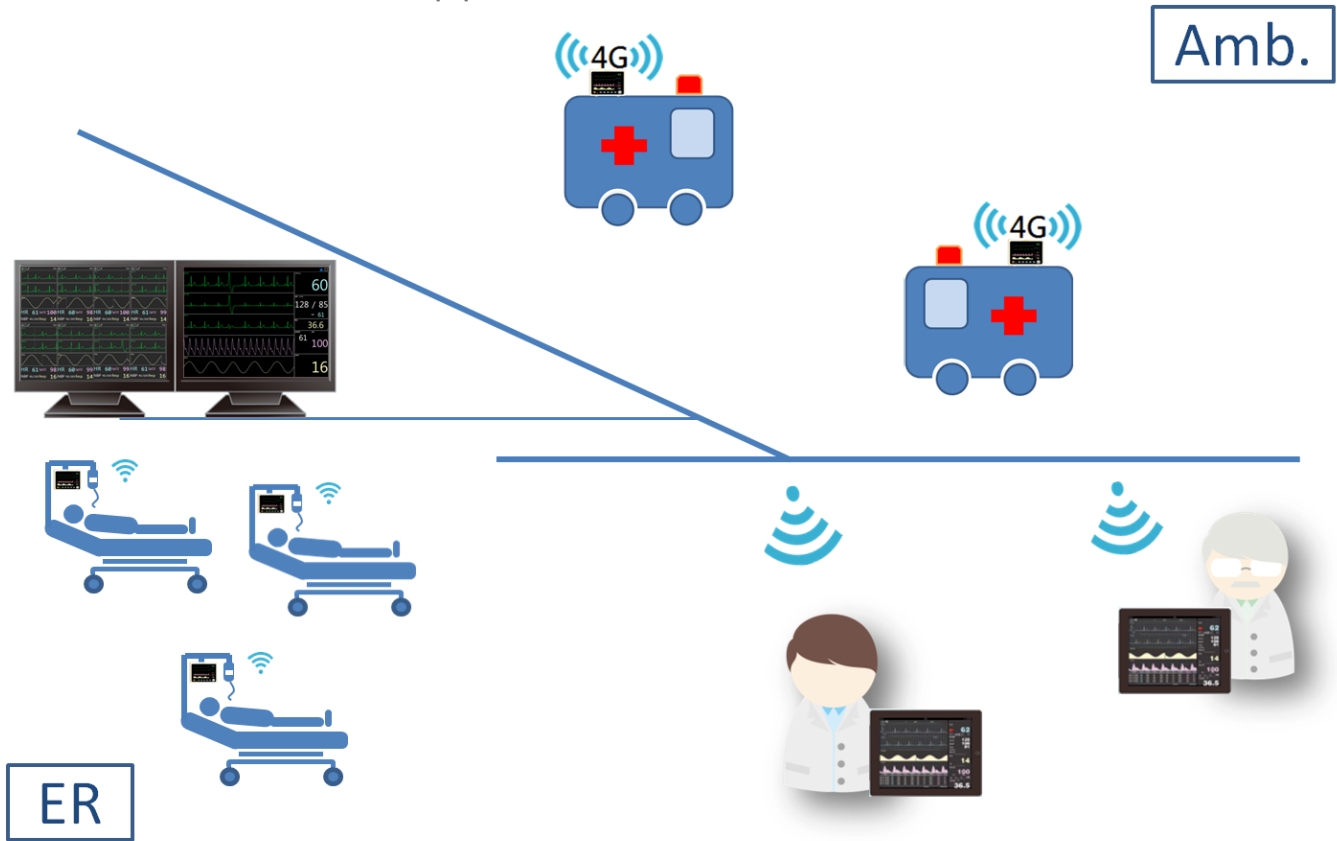


# ●●● VSOTG\_ER & Inter-Transfer

- VS on the Move
  - Patient Monitor w/ 4G Module
  - OB-GYN Clinic Support



VS Series

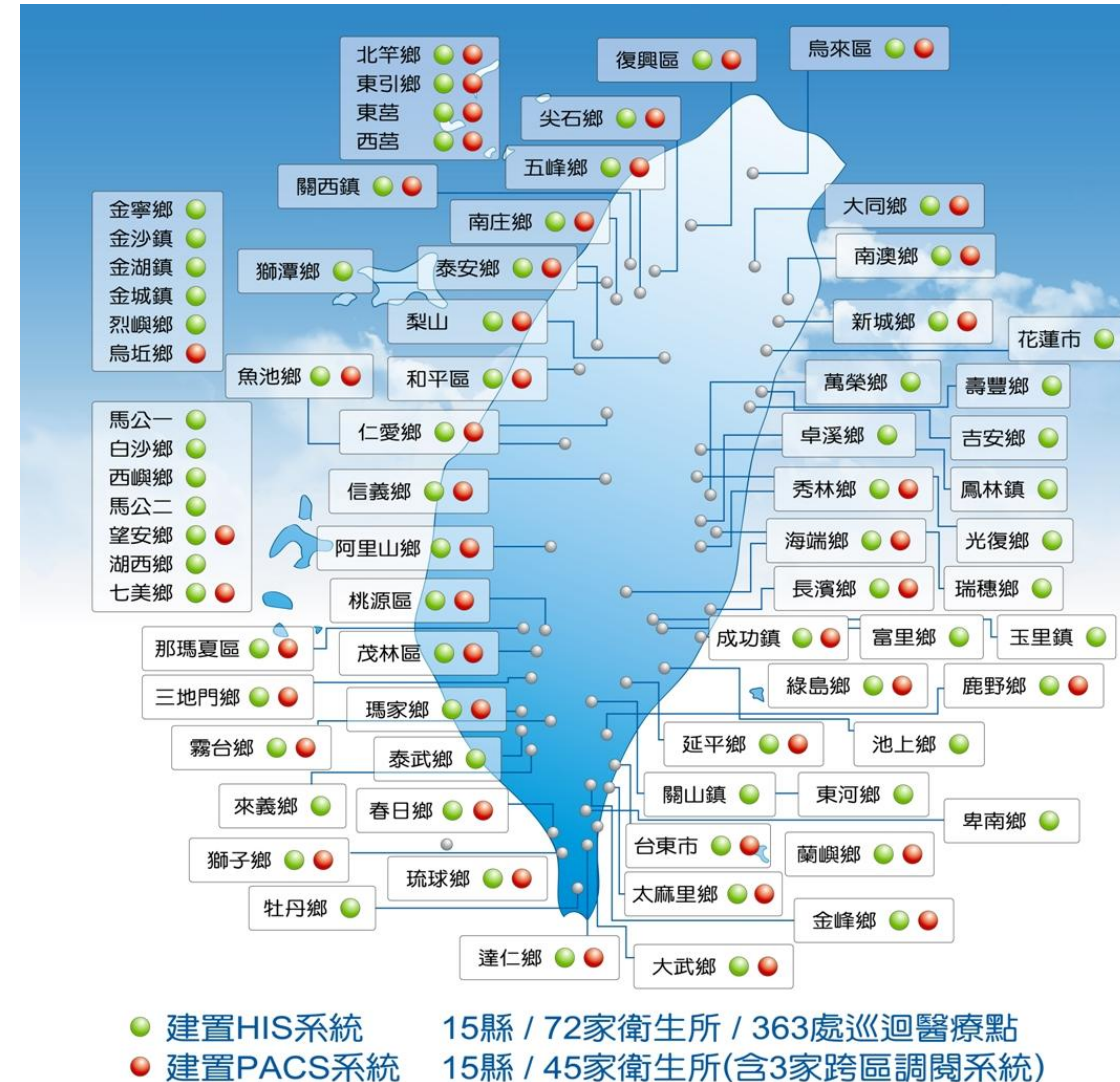


# ●●● IRC\_Service Scope

## Scope of IRC

### Image Reading Center, IRC

- Nationwide Teleradiology
  - 37 Public Health Centers w/ Radiology Exam Capability Located around Taiwan
  - 5 Medical Centers Provide Radiological Reading Support





# ●●● IRC\_Public Health Center

## Health Center

- Public Health Center

- PACS Scope



# ●●● IRC Project Scope\_Original

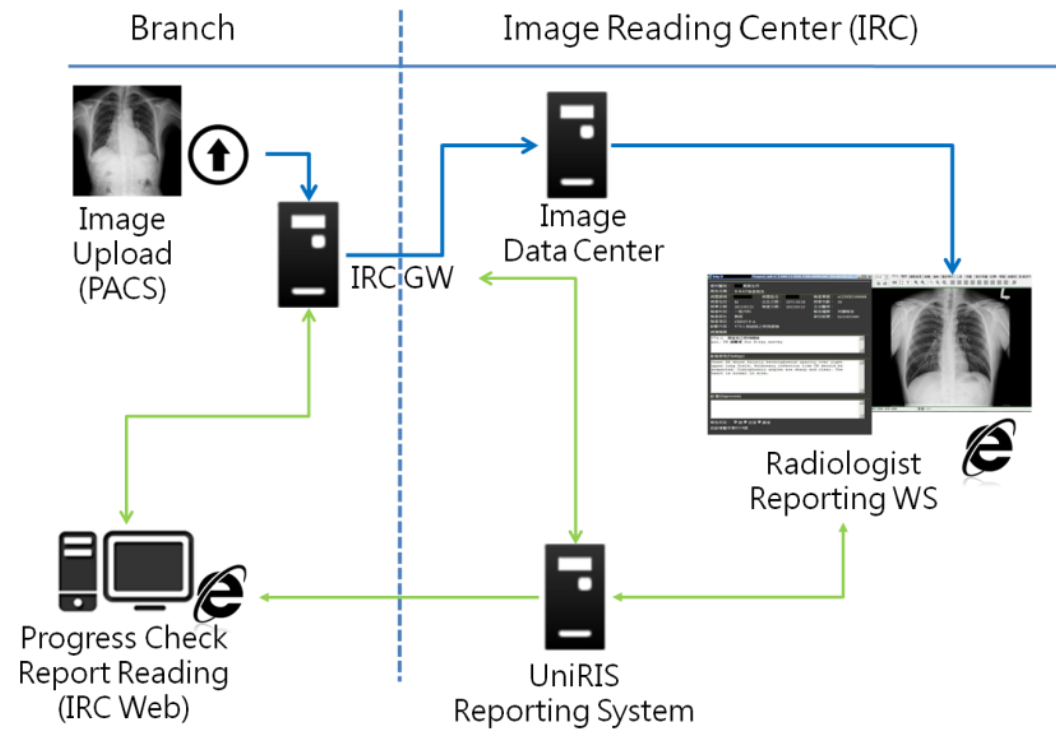
## IRC Scope Gen 1 2010-2014

- Remote Reporting Center
  - Radiology Report (X-Ray, CT, MRI)
- Medical Image Backup
  - 28 Facilities PACS Remote Backup
- DICOM image electronic signature
  - For the purpose of integrity, extracting the features of image and signing with CA from the original source.

# ●●● IRC\_Service Context

- Remote Reporting  
-Teleradiology

## Image Reading Center, IRC for Radiology



# ●●● IRC\_Mobile Clinic Service

## Clinic Tour

- Clinic Service Tour

- What could IRC do for the crew during the mobile clinic service?



# ●●● IRC Project Scope\_Current

## IRC Scope Gen 2 2015-2018

- Remote Reporting Center
  - Radiology Report
  - **ECG Report**
  - **Ultra Sound Report for Second Opinion**
- Image Data Center
  - 26 medical facilities image backup
  - DICOM image electronic signature
  - **37 Remote side Public Health Center**
- Mobile Solution
  - **Mobile access the patient' s data outside the Public Health Center via IRC App and iDO Viewer App for mobile image viewing.**
  -

# ●●● IRC\_Remote Support

## US Exam Event

- News Event

- Ultrasound Examination Campaign
- Remote Supported by Medical Center



# ●●● IRC\_Mobile Viewer in Mobile Clinic Service

- PACS Mobile Viewing

- Remotely Viewing PACS via iDO Viewer APP during mobile clinic service.

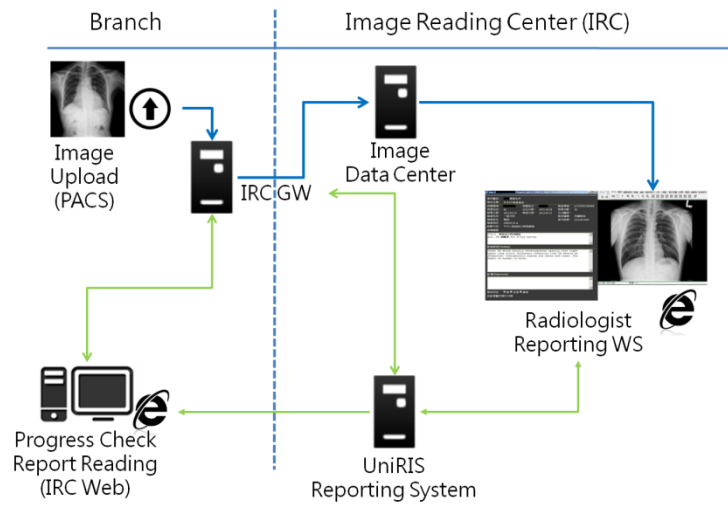
iDO  
Viewer



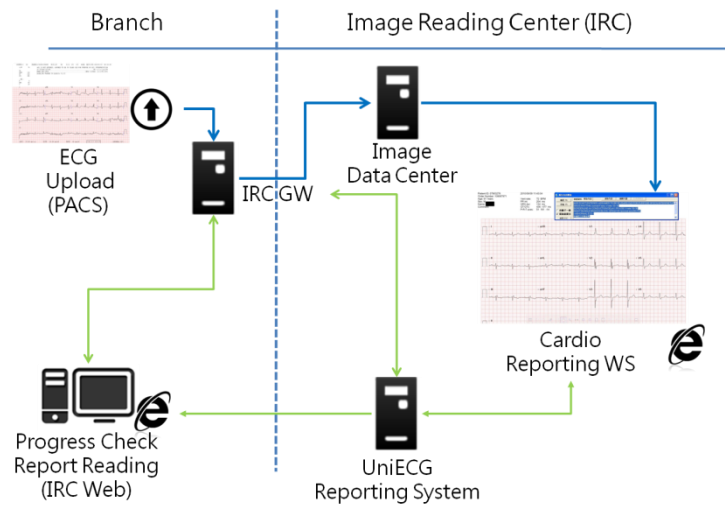
# ●●● IRC\_Service Context

- Scope of Remote Reporting
  - Radiology, ECG and Ultrasound

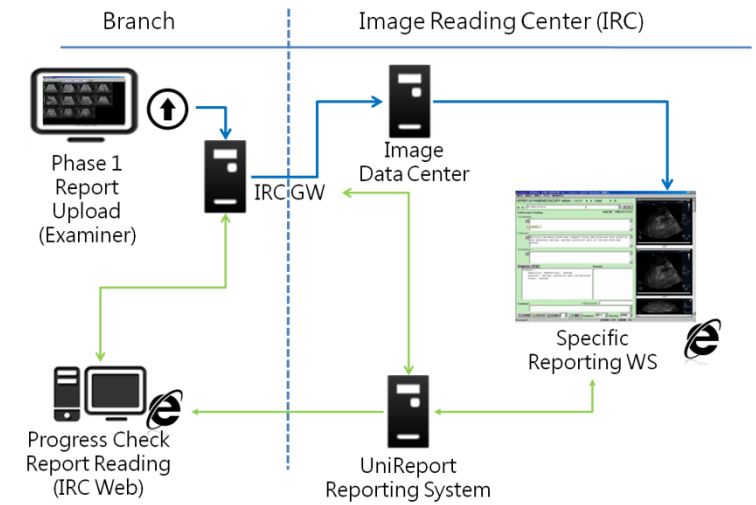
## Image Reading Center, IRC for Radiology



## Image Reading Center, IRC for ECG RPT



## Image Reading Center, IRC for Exam RPT

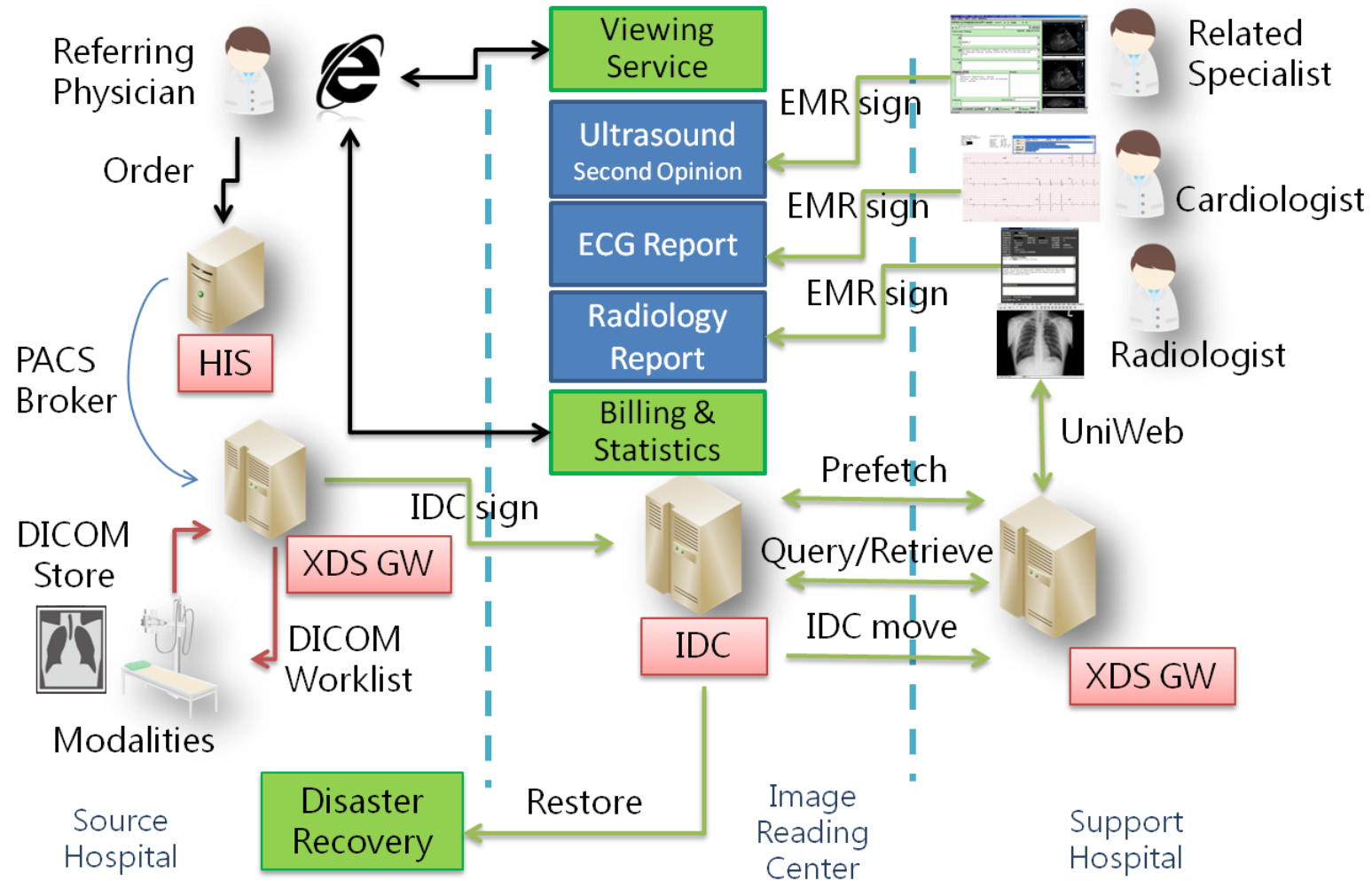




# ●●● IRC\_Service Context

- Flow of Remote Image Report

-Medical image remote reading and diagnosis



## ●●● IRC Scope\_Future

# IRC Scope Gen 3 From Now on

- Remote Reporting Center
  - Radiology Report
  - ECG Report
  - Ultra Sound Report for Second Opinion
  - **Fundus**
- Image Data Center
  - 26+37 medical facilities image backup
  - DICOM image electronic signature
  - **AI Function**
- Mobile Solution
  - IRC App for mobile management
  - iDO Viewer App for mobile image viewing
  - **Mobile Radiology Exam**
  - **Mobile Radiology Diagnosis**

# ●●● IRC\_Mobile Exam Service

- Care-based Radiological Examination

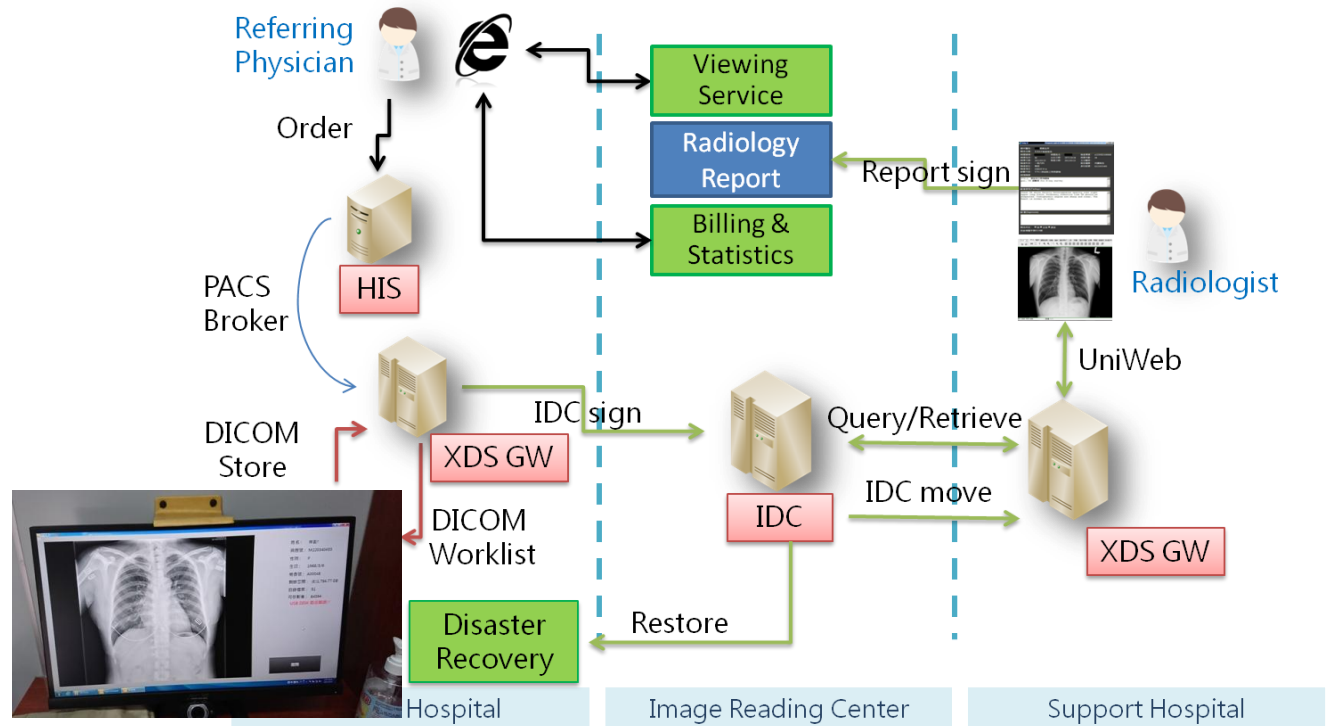
-X-Ray Exam w/ mobile radiology solution



X-Ray Car



Digital Radiology on board

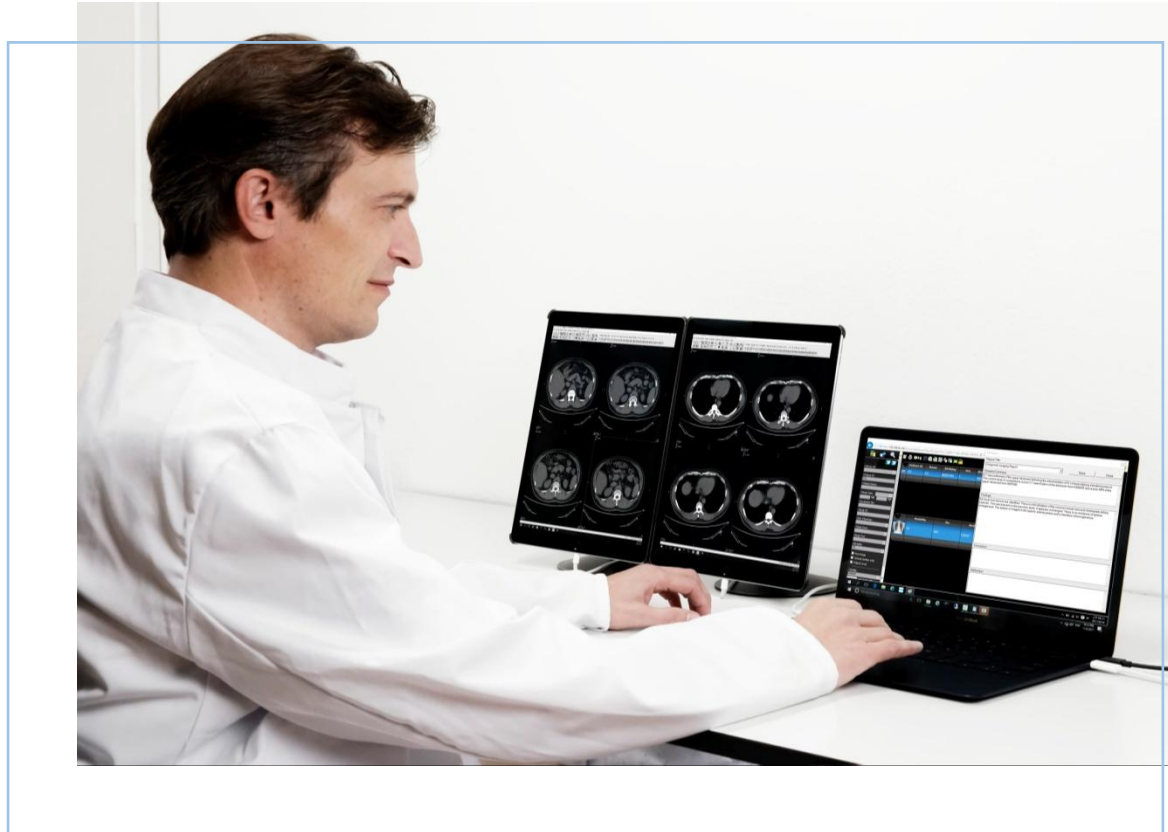


Console

# ●●● IRC\_Mobile Reporting

- Mobile Reporting Workstation
  - Radiological Report Go Mobile

Rad@



## Current Barriers

- **Hard to Carry**
  - Take your laptop with Rad@ Dongle (245 gram) and iPad Pro (692 gram)
- **Poor Image Quality of Laptop**
  - Rad@ supports 1MP, 2MP, 3MP image output, and fully support 5.6 Megapixel resolution of iPad pro 12.9"
- **Less-function in Mobile Viewer**
  - Rad@ supports full function of PACS viewer and extend to the 2<sup>nd</sup> monitor

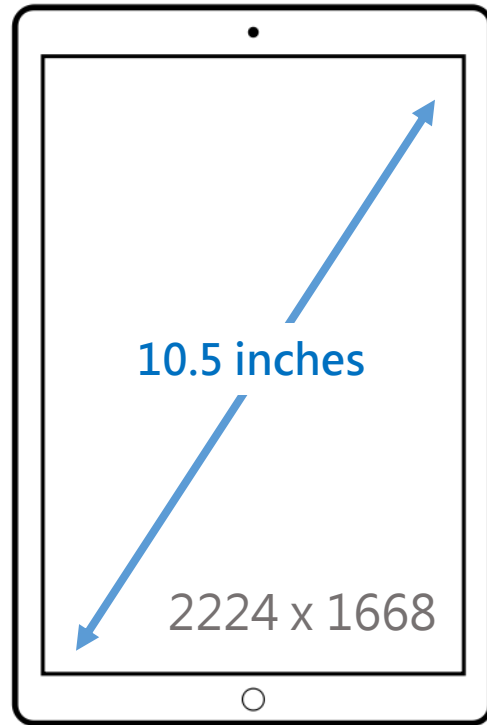
## ●●● Rad@\_Light but Strong

# Rad@ Feature

- **Lossless Image**
  - Rad@ support diagnosis class image and provide different mode depends on the network speed.
- **Upto 3MP Resolution**
  - Doctor could subscribe single or dual service package on his/her demand.
- **DICOM Curve**
  - For the best quality of clinic practice, ebm performs DICOM Curve adjustment for the display of iPad Pro in order to meet the standard requirement of FDA ClassII.
- **Vendor Neutral**
  - Via Rad@, there is no boundary across PACS vendor, feel free to make iPad Pro as a 2<sup>nd</sup> monitor anytime.

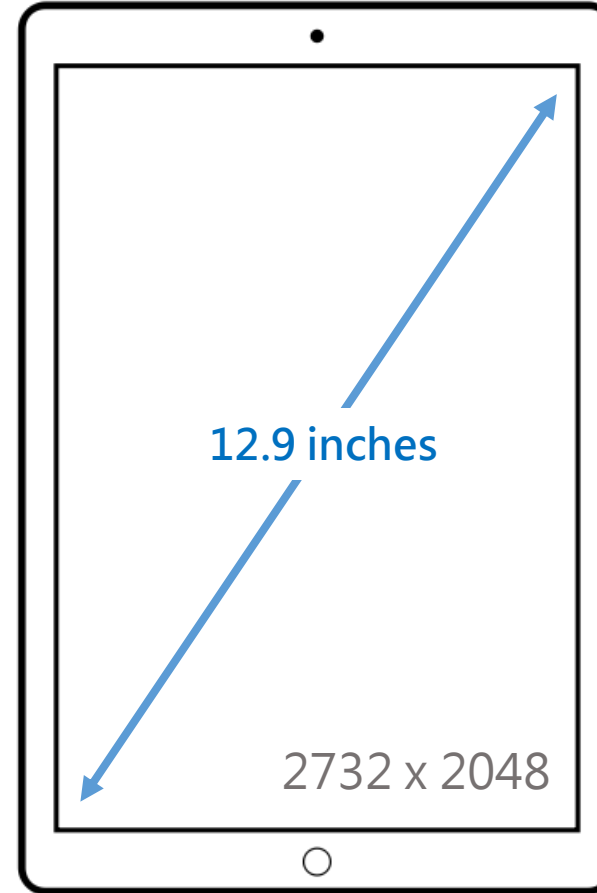
●●● iPad Pro with 5.6MP Resolution

iPad Pro 10.5



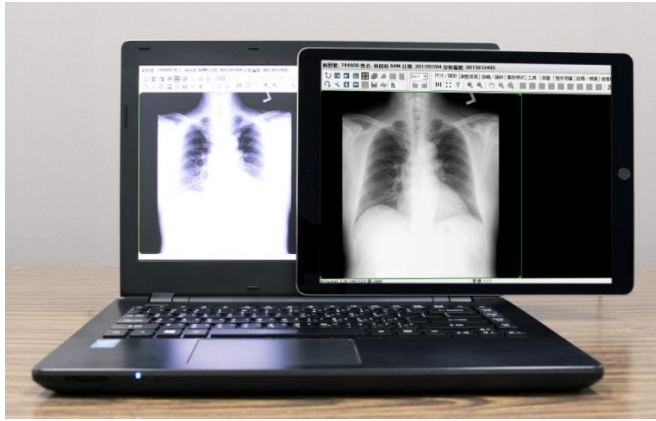
3.7 Mega Pixel

iPad Pro 12.9



5.6 Mega Pixel

# ●●● Rad@\_the Reason Why



<Rad@ vs Laptop>



<Single Monitor>



<Dual Monitor>



●●● Visions

Let  
**Mobility**  
brings  
More  
Flexibility  
Creates  
More  
Possibility

Let  
Mobility  
brings  
More  
**Flexibility**  
Creates  
More  
Possibility

Let  
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More  
**Possibility**



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