



Development of Taiwan Healthcare Industry

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OUTLINES

- 1. Institute for Biotechnology and Medicine Industry (IBMI)**
- 2. Precision Medicine and Precision Health**
- 3. Healthcare industry in Taiwan**
- 4. Training program for interdisciplinary talents of Precision Health**

About IBMI

Institute for Biotechnology and Medicine Industry (IBMI) is an independent, not-for-profit organization voicing Taiwan-based healthcare industry, promoting interdisciplinary collaborations through its global platform, and creating policy dialogues between public and private sectors. On top of that, IBMI is also a trusted awarding and certification body to healthcare providers and an incubator to health care startups in areas of novel biotechnologies, services and innovations.



Founder
Jin-Pyng Wang

**Former president of
the Legislative Yuan,
Taiwan**



President
Chi-Huey Wong

**Scripps Family
Chair Professor of
the Scripps
Research Institute**



Vice President
Barry Lam

**Chairman & CEO
Quanta Group**



Vice President
Pan-Chyr Yang

**Academician of
Academia Sinica**



Vice President
Chang-Hai Tsai

**Chairman of the
Board of China
Medical University
& Health Care
System**



Supervisor
Wei-Jao Chen

**Professor Emeritus,
Department of
Surgery. National
Taiwan University
College of
Medicine**

About IBMI

The board members consist of leaders from hospitals and R&D institutes, and C-level representatives from electronics, ICT, biotech and pharmaceutical sectors. Currently, IBMI has more than 400 members from across industries relating to healthcare.

Healthcare

Chang Gung Memorial Hospital
Changhua Christian Hospital
China Medical University Hospital
College of Medicine, National Taiwan University
Hualien Tzu Chi Hospital
Kaohsiung Medical University Hospital
MacKay Memorial Hospital
National Cheng Kung University Hospital
National Defense Medical Center
Shin Kong Wu Ho-Su Memorial Hospital
Show Chwan Memorial Hospital
Taichung Veterans General Hospital
Taipei Medical University
And more.

R&D

Development Center of Biotechnology
Industrial Technology Research
Institute
KPMG in Taiwan
National Health Research Institutes



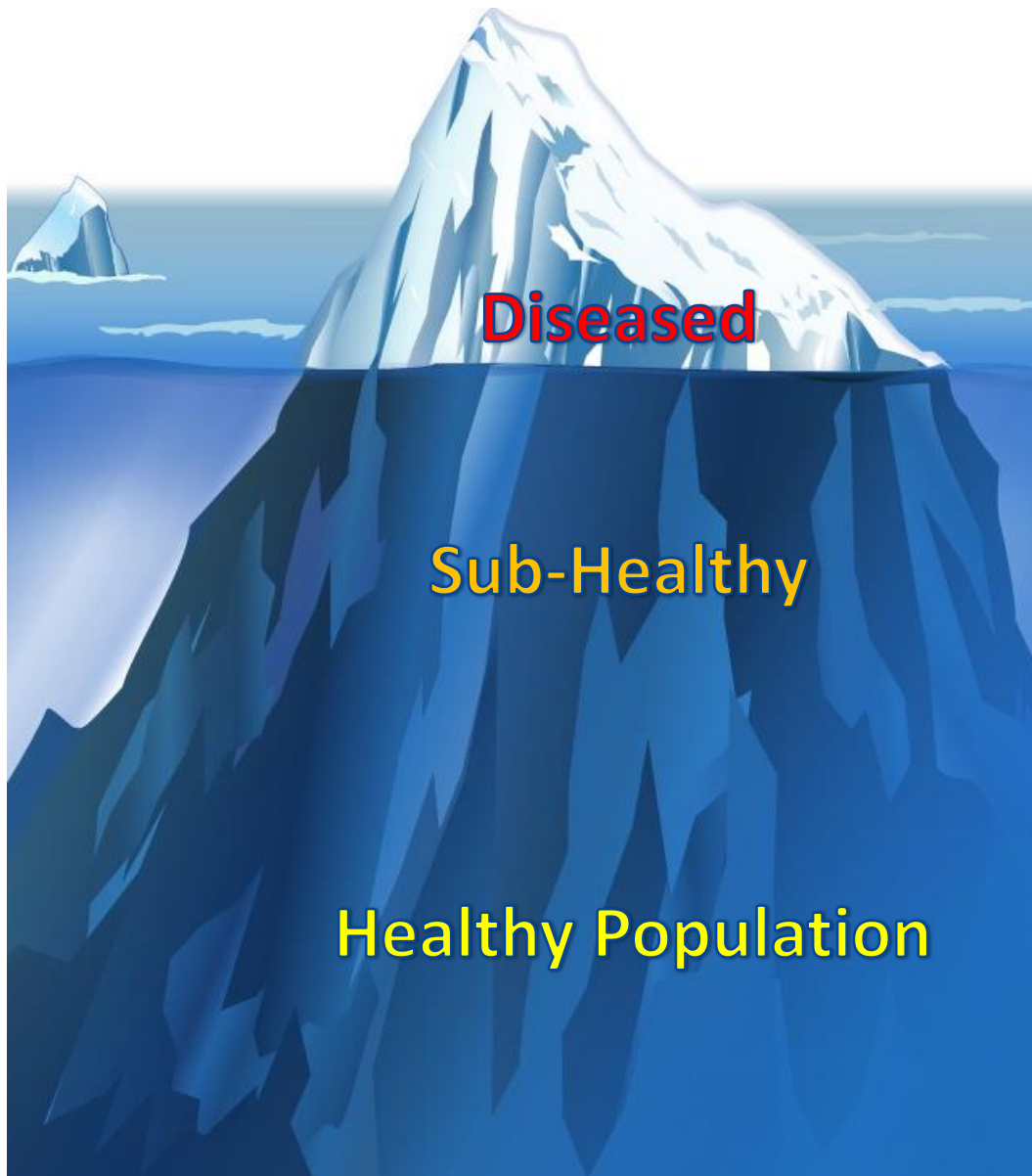
Electronic & ICT

Advantech Co., Ltd.
Catcher Technology Co., Ltd.
Foxconn health technology business group
iKala Interactive Media Inc.
Pegatron Corp.
Powerchip Semiconductor Manufacturing Corp.
Qisda Corp.(BenQ)
Realtek Semiconductor Corp.
Topco Group
Wistron Corp.

Bio-Pharmaceutical

Bora Pharmaceuticals Ltd.
Maywufa Biopharma Group
Missioncare Medicine Co. Ltd.
St.Shine Optical Co., Ltd.
CHC Healthcare Group
Orient Pharma Co., Ltd.

Precision Medicine and Precision Health



【 Precision Medicine 】

Precision Diagnosis : NGS, Liquid Biopsy, Medical AI, POC devices , Digital Imaging Equipment *etc.*

Precision Treatment : Targeted Therapy, Cell Therapy, Immunotherapy, Surgical Robot, *etc.*

Medical Care: Smart Hospital, Smart healthcare, *etc.*

【 Precision Health 】

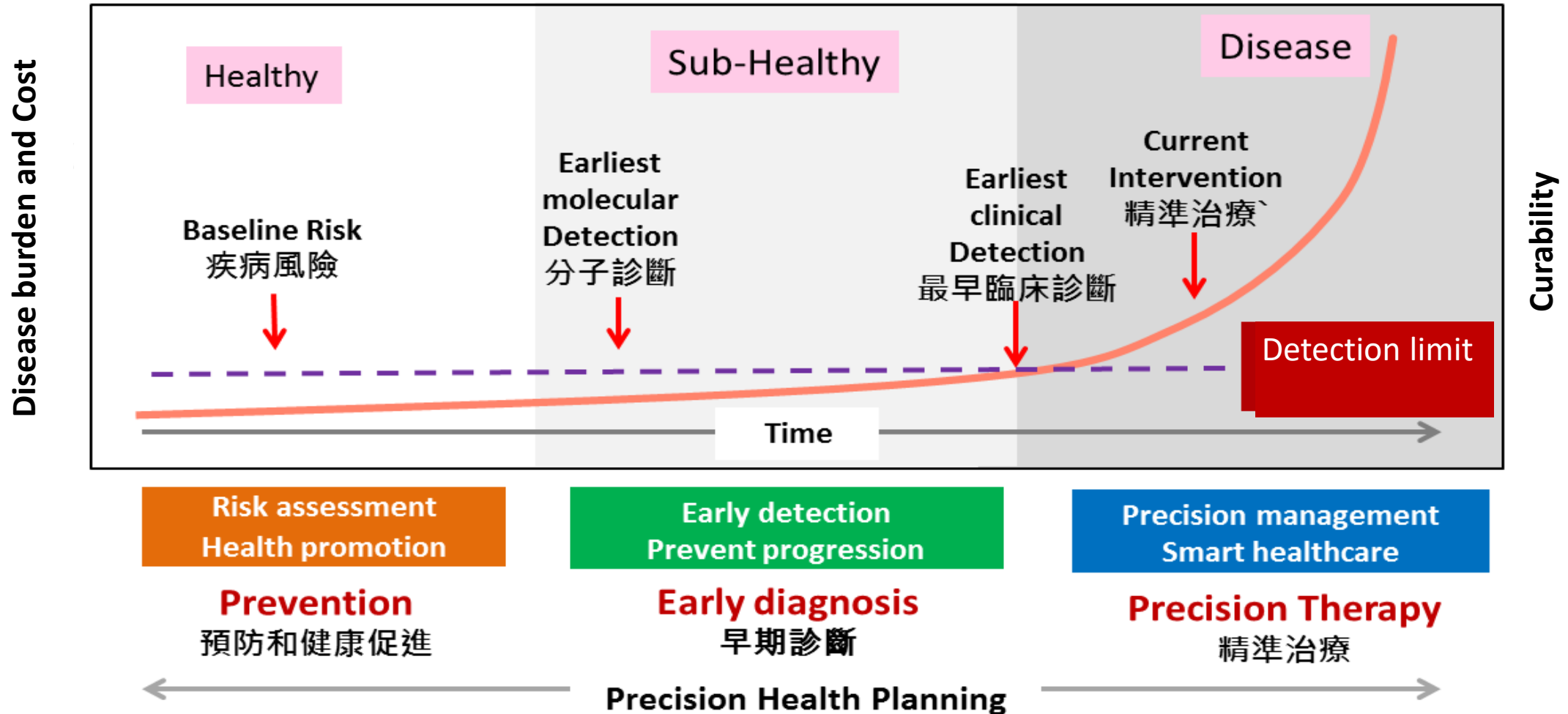
Risk Assessment : Genetic risk, Behavioral Patterns, family history *etc.*

Precision Prevention : Personalized Health Check 、 AI for Early Detection, Home Screening, Tele Health Consulting Services *etc.*

Health Promotion: Lifestyle, Environmental Adjustments, Personalized Diet, Sport and Exercise, Microbiota, Homecare and Wearable Devices, Health Management, *etc.*

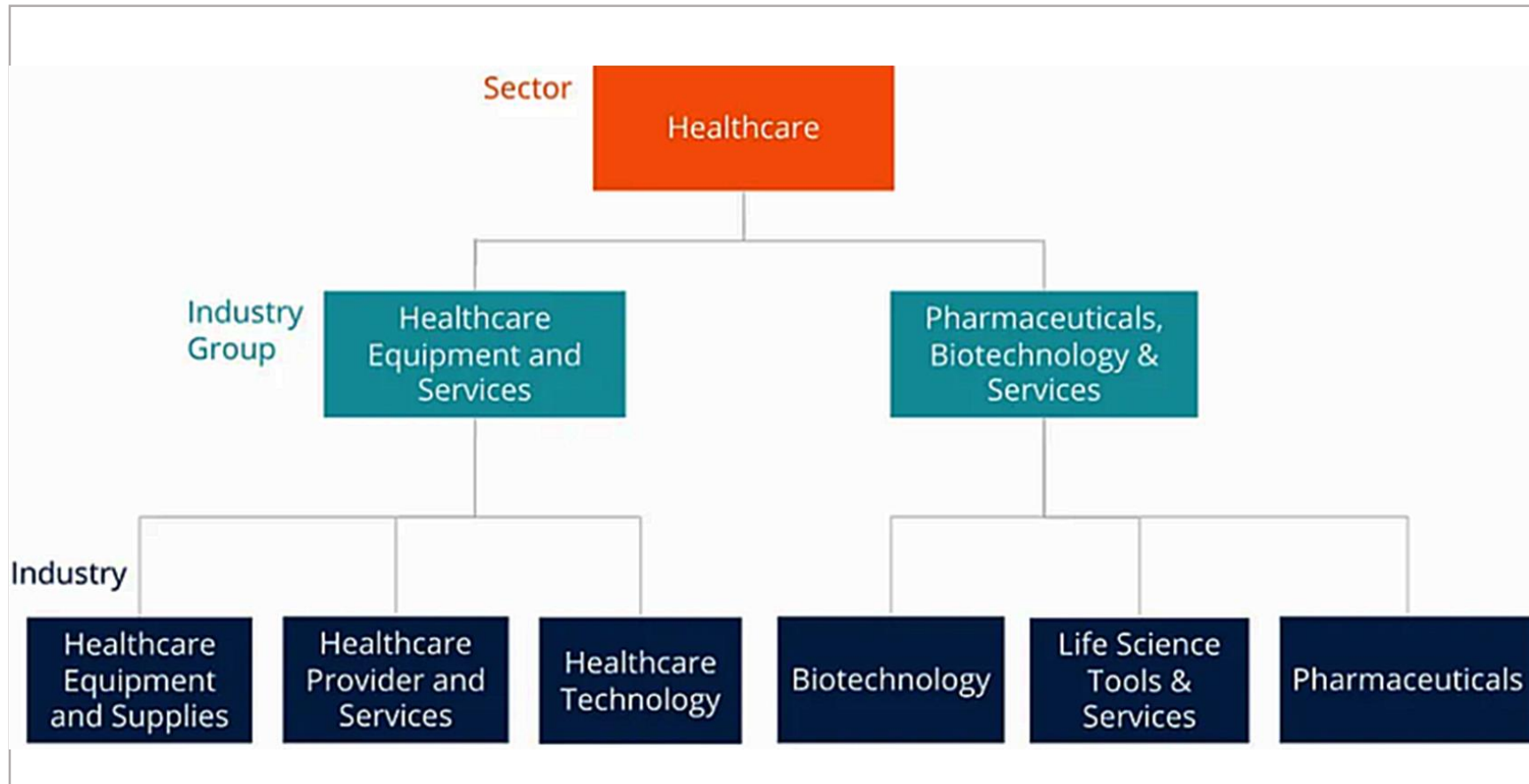
Healthcare from disease treatment to prevention

- Healthcare nowadays provides individuals with products and services ranging from prevention, health promotion, diagnosis to treatment.



Healthcare sector by GICS definition

- ❑ The healthcare sector includes the following subsections, as per Global Industry Classification Standard (GICS)



Global Markets:

- International Healthcare
- Bio-pharmaceutical
- Medical device
- Regenerative medicine
- Smart health
- Precision medicine
- Sports medicine

ABOUT TAIWAN



Population
23.3 million



Area
36,197 km²



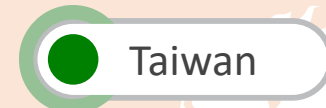
GDP & GDP/capita
761.4 billion & 32,756 (USD)



Life Expectancy & Healthy Life Expectancy
80.9 & 73.3 years

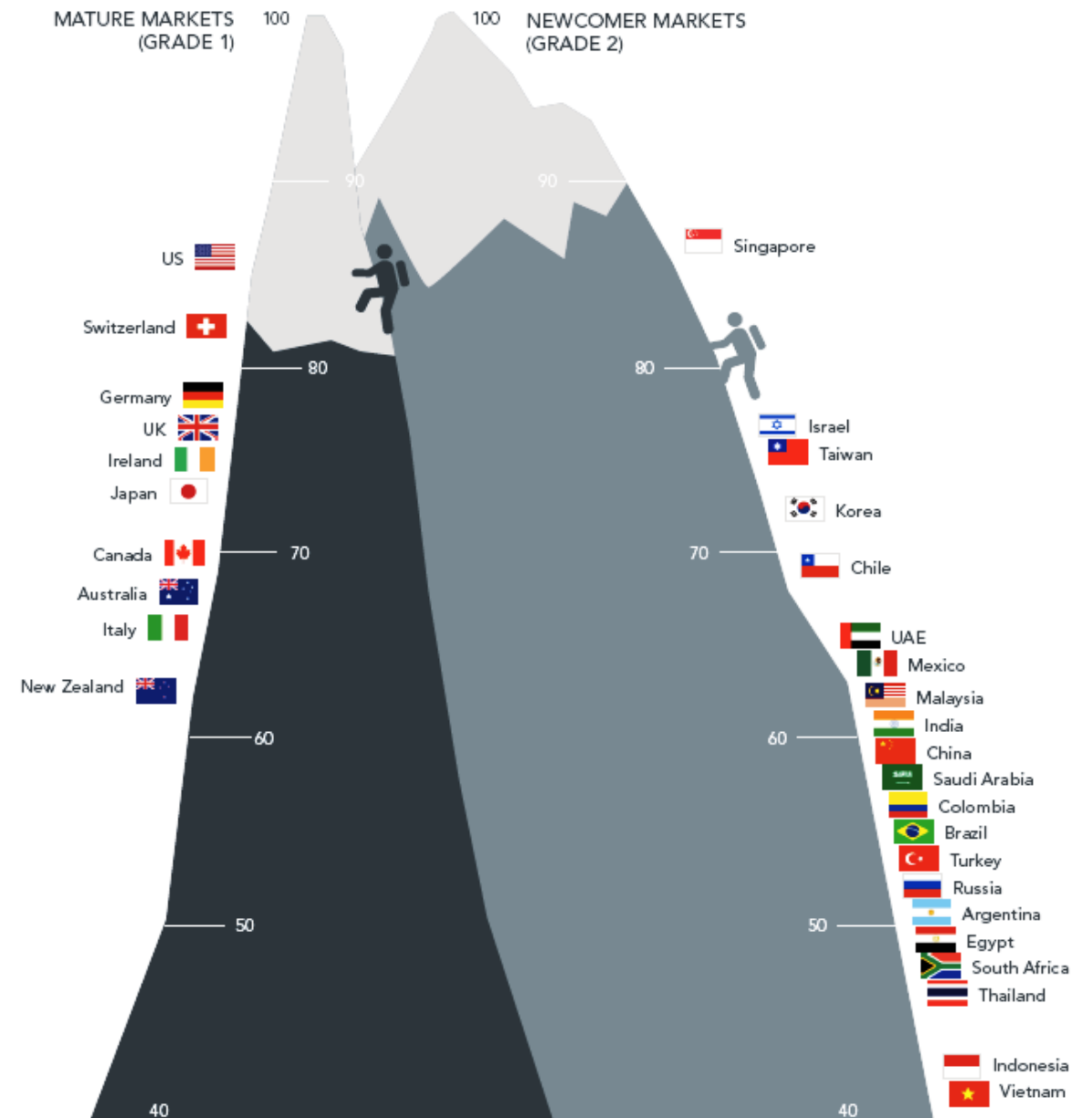


Physicians Ratio
2.23 per 1,000 Population



Taiwan Core Competences

- Taiwan ranks 3rd in the newcomer markets
- World-class quality of medicine and talent
- The best healthcare system and big data
- High quality clinical trials and R&D capacity
- Well-established research infrastructure
- ICT supply chain, talent and manufacturing
- AI and 5G R&D in national level



Source compiled by IBMI, RBMP (2021)

Medical Innovation by cross-industry collaborations



Advanced Medical Care



High Quality R&D and MFG



Strong ICT and Elec. Tech.



Taiwan ICT companies setting foot in healthcare

	Mobile health	Medical equipment	Smart hospital	Gene/cell therapy	Biomedicine	
Companies						
Product pipelines	<ul style="list-style-type: none"> ■ Telehealth ■ IoT solutions ■ Wearables ■ Health management 	<ul style="list-style-type: none"> ■ X ray / ultrasound ■ Micro CT ■ Surgical / service robots ■ Capsule endoscopy ■ Hemodialyzer ■ Molecular pathology ■ Vital sign monitor 	<ul style="list-style-type: none"> ■ Smart ward/operating room ■ Surgical VR ■ AI solution ■ HMS ■ EMR / EHR ■ Medical display 	<ul style="list-style-type: none"> ■ DNA sequencer ■ DNA microarray ■ Protein & genetic testing ■ CTC system ■ Cellular therapy 	<ul style="list-style-type: none"> ■ AI chip ■ Biochip for gene sequencing ■ RF & Wireless chip ■ Biosensor ■ Display component ■ Organic semiconductor 	
Areas of application						

Cross-industry cooperation at a glance



- 1) AI medical platform
- 2) Telemedicine / remote care
- 3) AI-assisted arrhythmia diagnosis
- 4) AIoT device/equipment



- 1) Genome database for Chinese
- 2) Medical wearables
- 3) Epidemic management products
- 4) Proton therapy / 8K medical imaging



- 1) Innovative devices / AI diagnostics
- 2) Health & chronic disease management
- 3) Medical imaging for animals
- 4) Cell therapy / AIoT solutions



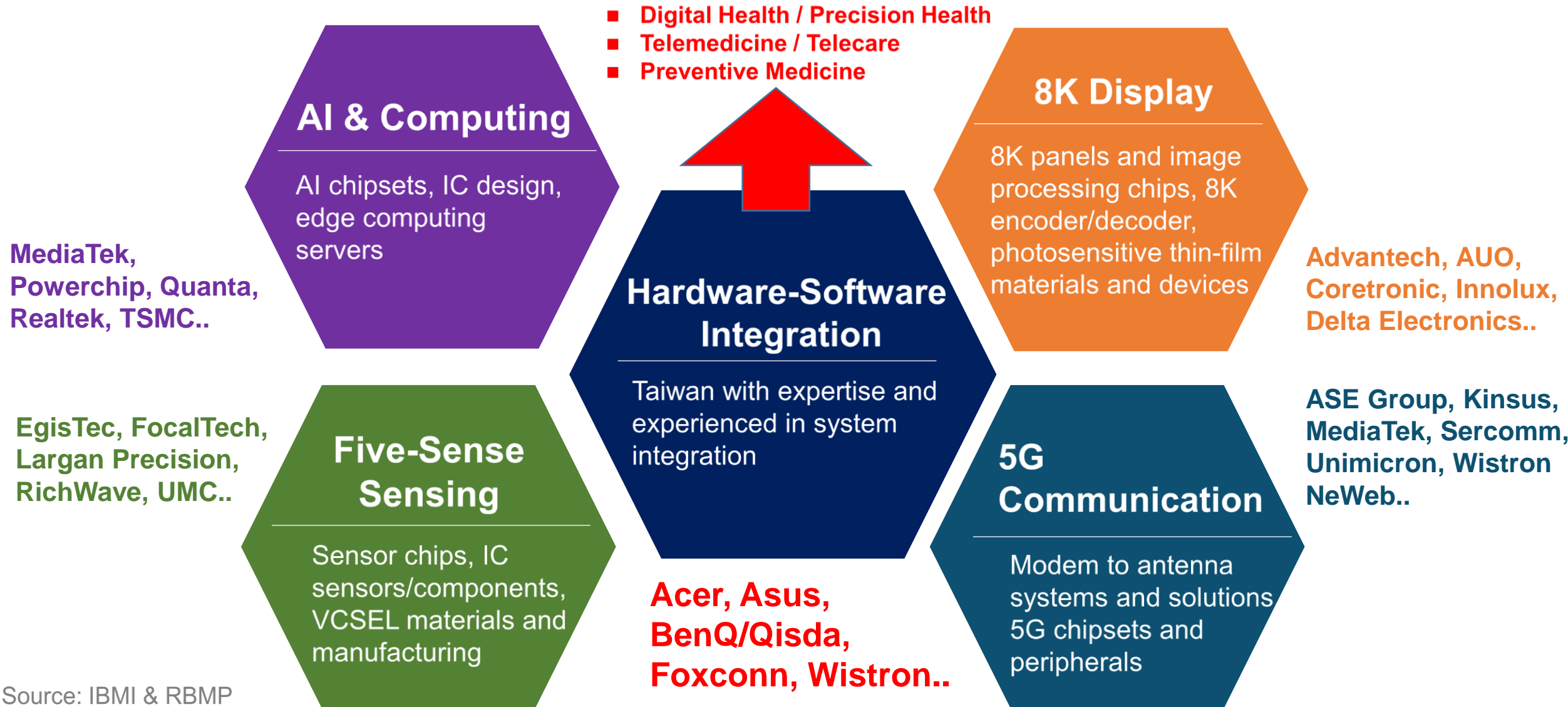
- 1) Miniaturization of medical equipment
- 2) Exoskeleton / assistive devices
- 3) AI dialysis / medical AI imaging
- 4) Digital pathology / health management



- 1) Telehealth / IoT products
- 2) Auto detection of CTC
- 3) Data integration of sports health
- 4) AI-assisted detection of disease

Taiwan Industry Overview

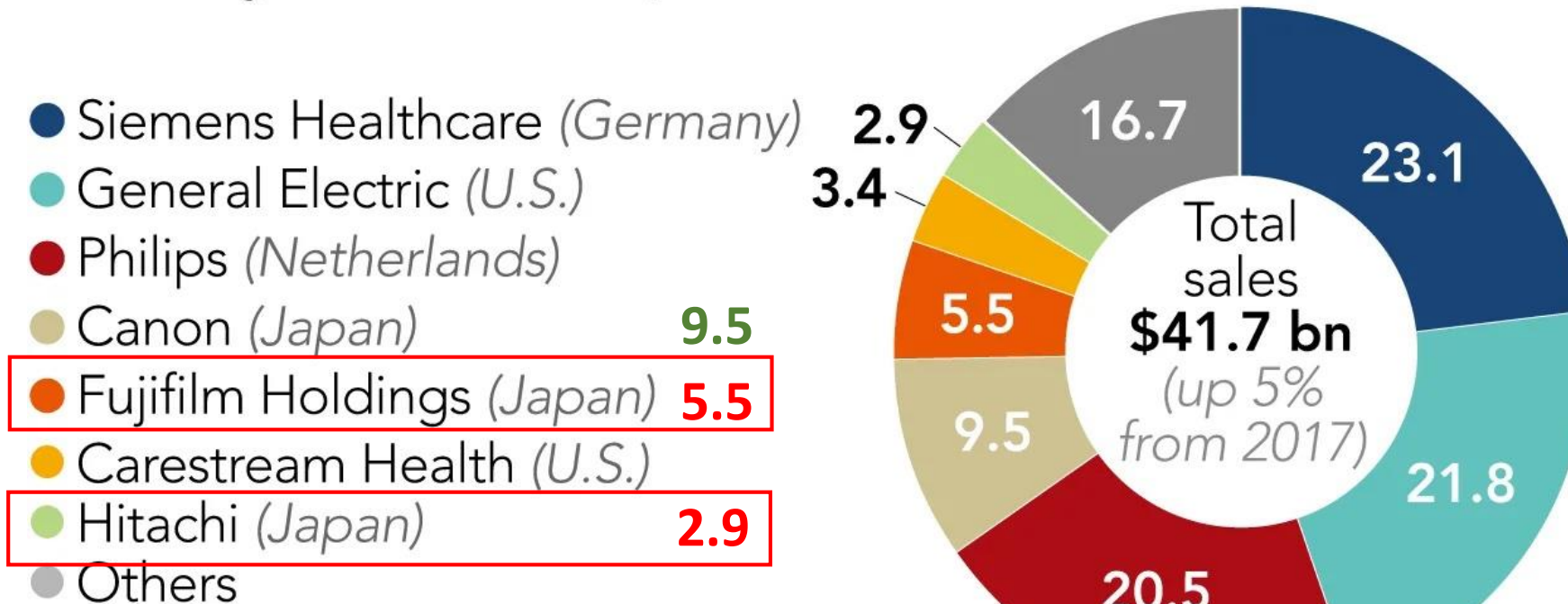
Market Players and Focus Areas



Source: IBMI & RBMP

Fujifilm Healthcare acquires Hitachi Diagnostic Imaging in 2021

Diagnostic imaging equipment global market share by sales (2018, in percent)



Source: Evaluate **8.4 + 9.5 = 17.9 (Japan)**

Fujifilm Healthcare presented a complete and integrated portfolio of diagnostic products and services, including CT, MRI, X-ray, AI, PACS, endoscopy and ultrasound systems.

Fujifilm “One-Stop” solution partner for the Healthcare systems

ONE-STOP Solutions

Fujifilm has a wide range of products including diagnostic X-ray imaging equipment, ultrasound systems, endoscopy, in vitro diagnostics, CT, MRI, and by positioning medical informatics as an open platform, the company can offer a wide variety of solutions to healthcare systems.

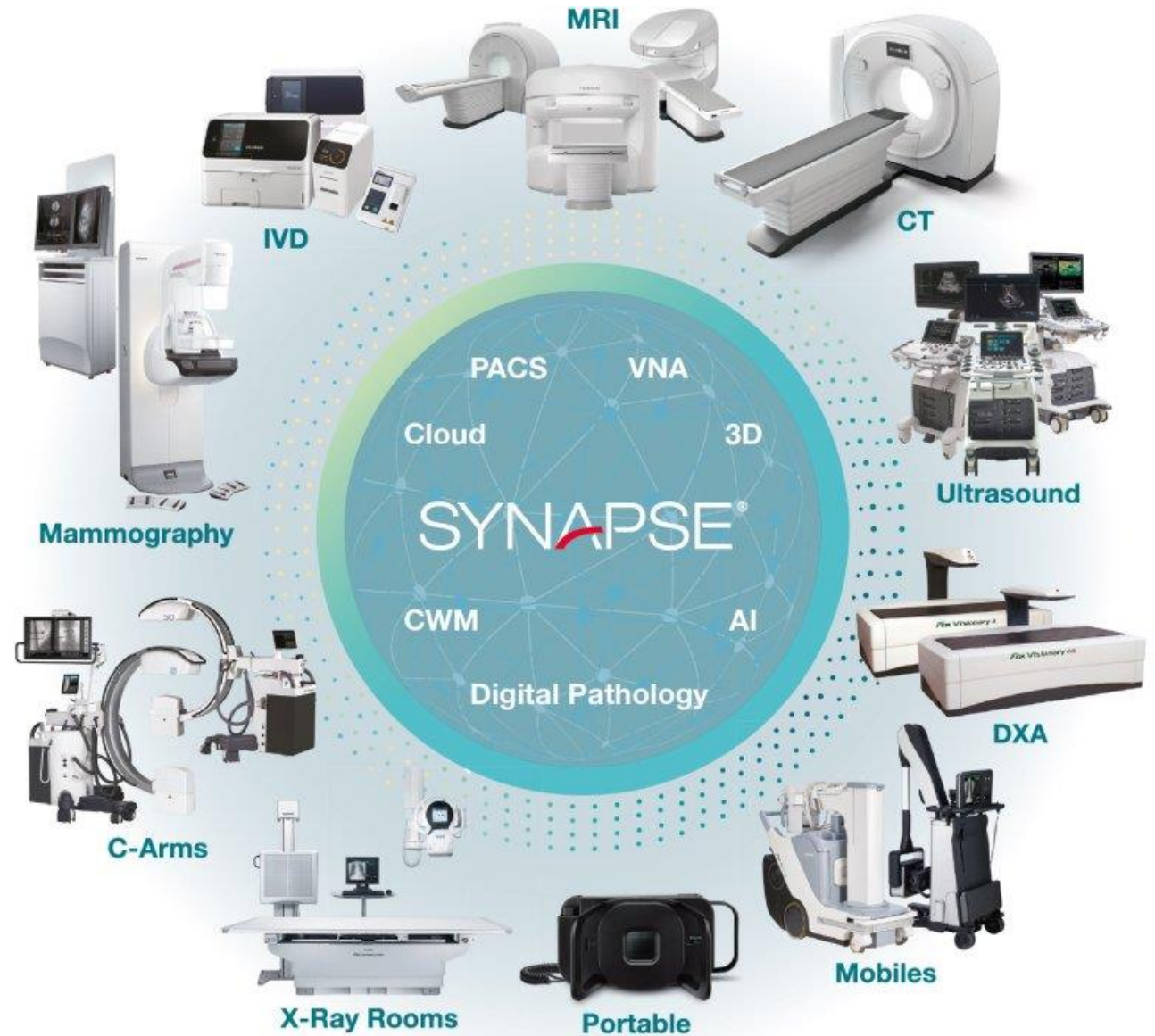
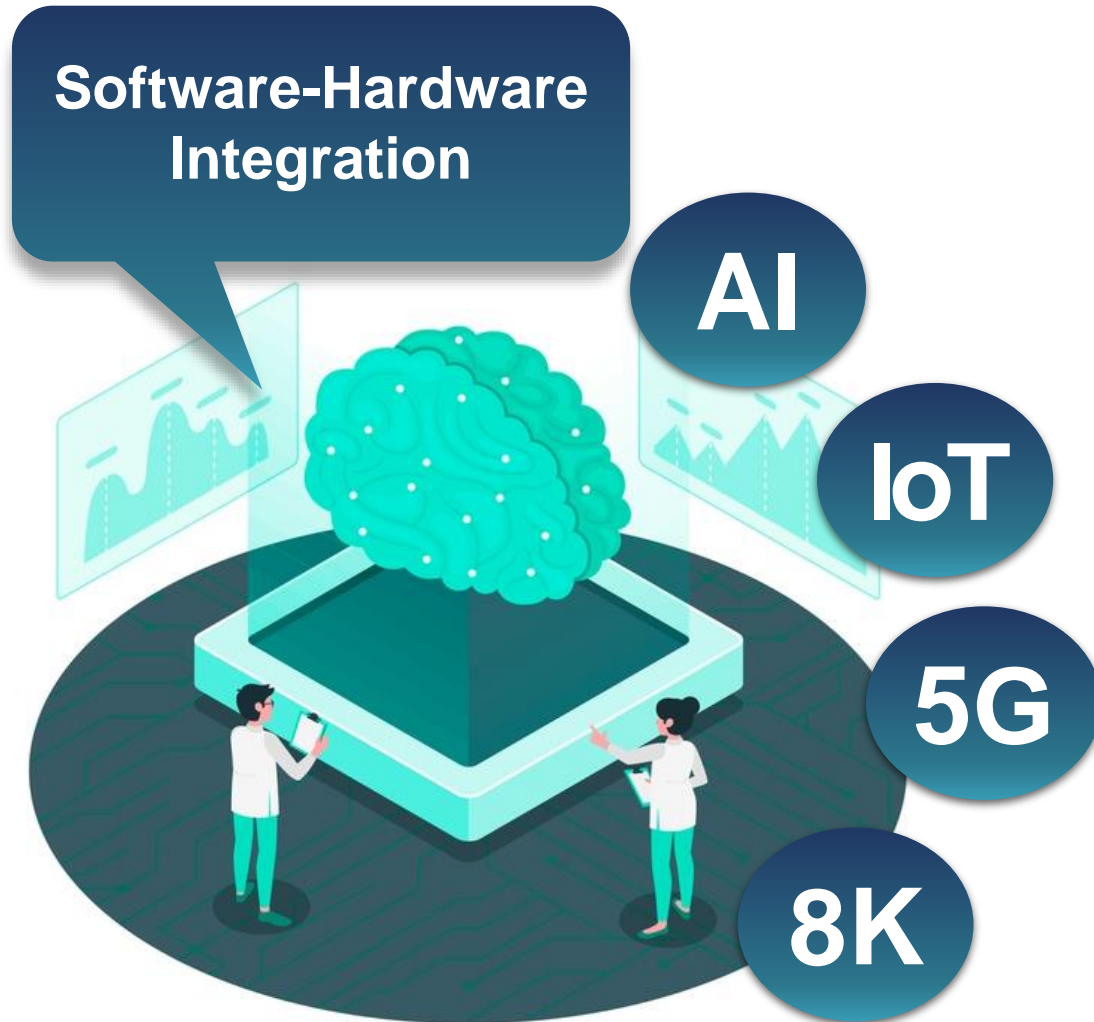


Image source: Fujifilm

Game-Changing Technology in Healthcare



Taiwan houses global players and supply-chain partners in the following areas:

- **Software hardware integration**
- **AI** chip making, AI computing & servers
- **IoT** sensors and components
- **8K** display and 8K image technology
- **5G** telecommunication chips and peripherals

Emerging tech and application after COVID-19

Diagnosis

- Testing kits
- **Mobile diagnostics**
- Temperature monitoring
- Medication
- Vaccine development
- Therapeutics

Prevention

- Antiviral masks
- Disinfectants
- Air filtration
- **Disease surveillance**
- Spit disposal
- Environmental monitoring for disease

Patient care

- **Hospital robots**
- Medical AI algorithms
- PPEs
- Artificial cough device
- 3D-printed ventilator valves

Remote healthcare

- Remote monitoring
- Telehealth
- **Wearable sensors**
- Vital sign monitors
- Digital stethoscope
- Chatbots
- **5G telecom**

Source: Startus Insights · FDA · IBMI

Taiwan Industry Overview

Digital Health R&D

	Prevention & Detection	Monitoring	Diagnostics	Health Tech & Services
Company				
Focus Areas	<ul style="list-style-type: none"> • MRI-based tumour image classification • Breast cancer recurrence risk assessment • Early prediction of dementia • AI-assisted risk assessment of dementia • Analytical services for health risk • Auto-analysis of cardiovascular imaging system 	<ul style="list-style-type: none"> • Chronic disease care platform • AI-assisted vital sign monitoring • AI-assisted dermatological disease monitoring • EKG software • AI in medication and wound care • Cloud-based health platform • Stress EEG assessment • Health promotion • Real-time heart rate monitoring • Mobile health application 	<ul style="list-style-type: none"> • AI-based diagnostics for diabetic retinopathy • Detection software for breast ultrasound • AI-based detection of pneumothorax and Intracerebral hemorrhage • AI-based bone marrow smear differential counting • AI-based diagnostics of osteoporosis • AI-based flow cytometry analysis for leukemia • AI-assisted EEG analysis for mental health 	<ul style="list-style-type: none"> • Decision support for hemodialysis • AI platform for remote critical care • Mental health platform • Sleep telecare • AI-driven radiotherapy • Immersive 3D software for sleep disorders • Digital therapeutics for dementia • AI-based hearing aids • IoT in elderly care

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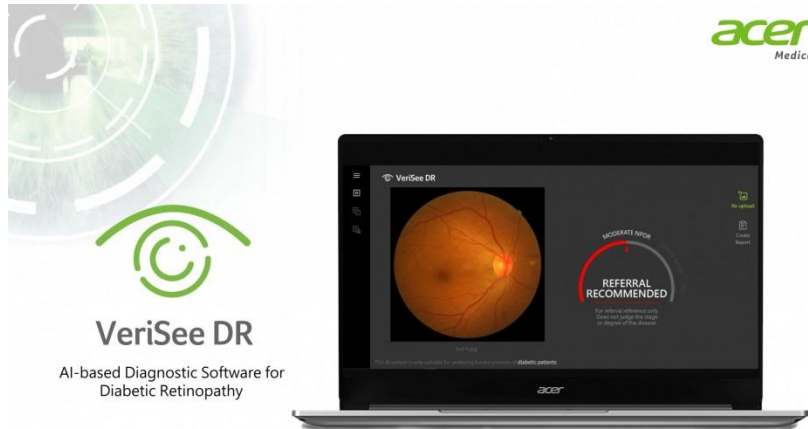


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Taiwan Industry Overview

Successful Solutions

Acer



VeriSee DR

- The AI-powered software is designed to detect diabetic retinopathy (DR) by analysing retinal images.
- Approved in Taiwan, Thailand and Indonesia, VeriSee DR requires no internet connection, can be customised and seamlessly integrated into clinical workflow.

TeleMed for Home Care & Point of Care

- The solution provides a non-contact outpatient service which simulates the workflow in clinical practice for patients and clinicians.
- It is intended to improve efficiency and quality of telecare/remote care/long-term care and enhance the pandemic prevention measures.



Taiwan Industry Overview

Successful Solutions

Asus

全球首創 MRI腫瘤分類及乳癌復發預測系統




- 非侵入式
免除切片 0痛苦
- 節省93%檢驗時程
即早治療
- 精準腫瘤分類
輔助醫生治療規劃
- 乳癌復發風險預測
低風險患者免化療之苦

MRI Tumour Classification and **Breast Cancer** Reoccurrence Prediction System

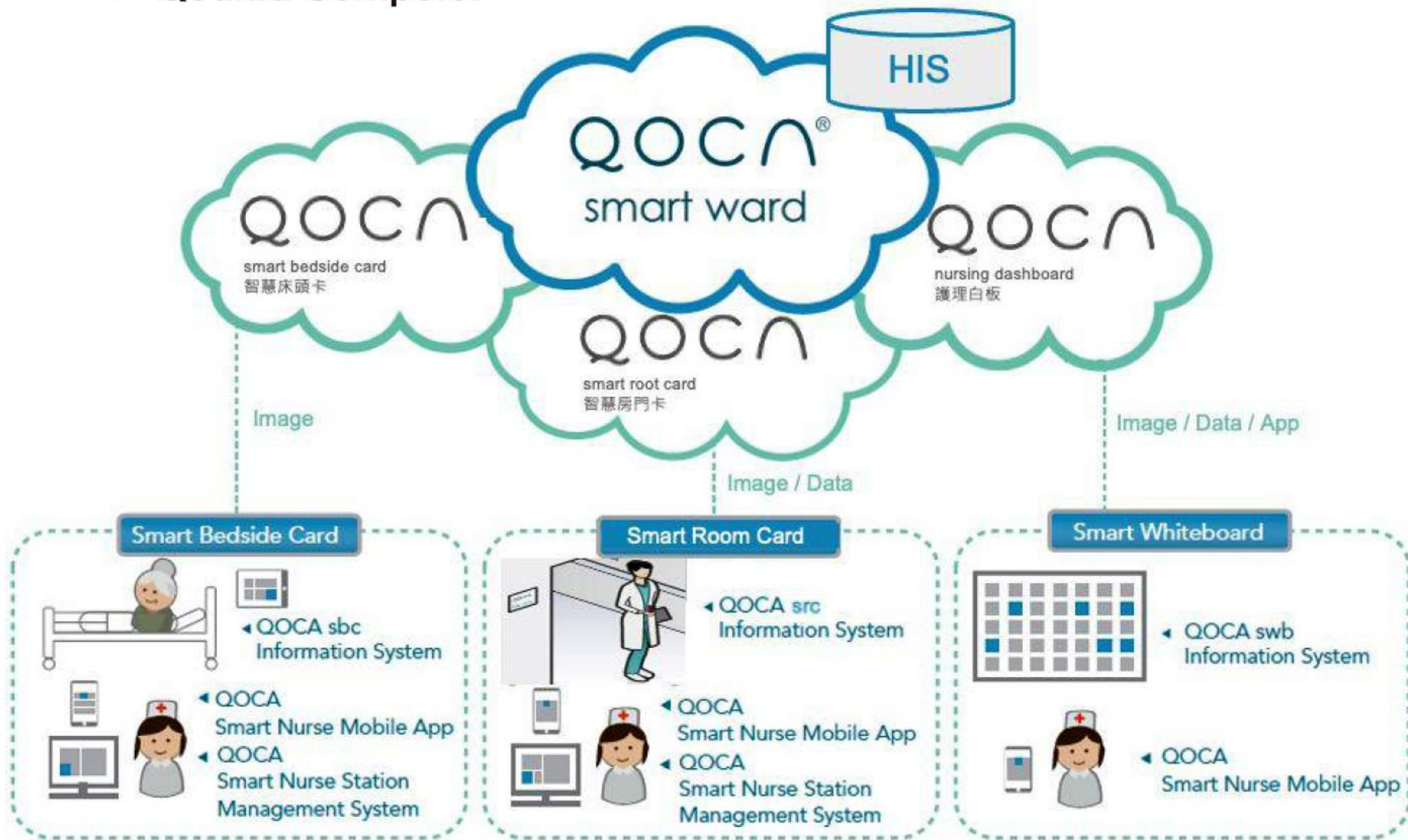
The software analyses 3D images during a screening breast MRI, assisting radiologists recognise the location of tumours, classify them as well as evaluating recurrence risk with PAM50 (Prediction analysis of microarray 50).

EndoAim AI Endoscopy Lesion Detection System

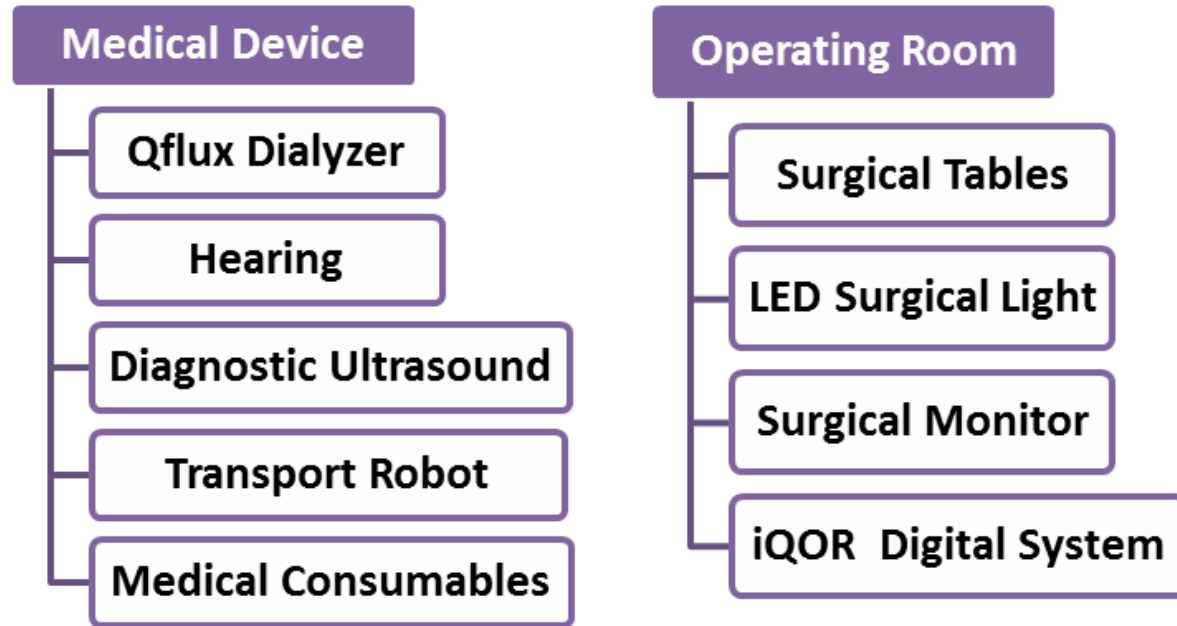
The software is intended to assist clinicians to analyse polyps during a colonoscopy and classify them into non-adenoma or adenoma.



- 即時警示
病灶不遺漏
- 超過90%精準度
降低誤判
- 即時息肉分類
提供診斷參考



Featured Products



Solutions

Smart Operation Room



ODM / OEM of
Medical Device

Other Smart Healthcare Solutions

Fitness System

Smart Wearables

Smart Ward

Health Management System

Long-Term Care Monitoring Solution

Smart Ward: Bedside Infotainment System

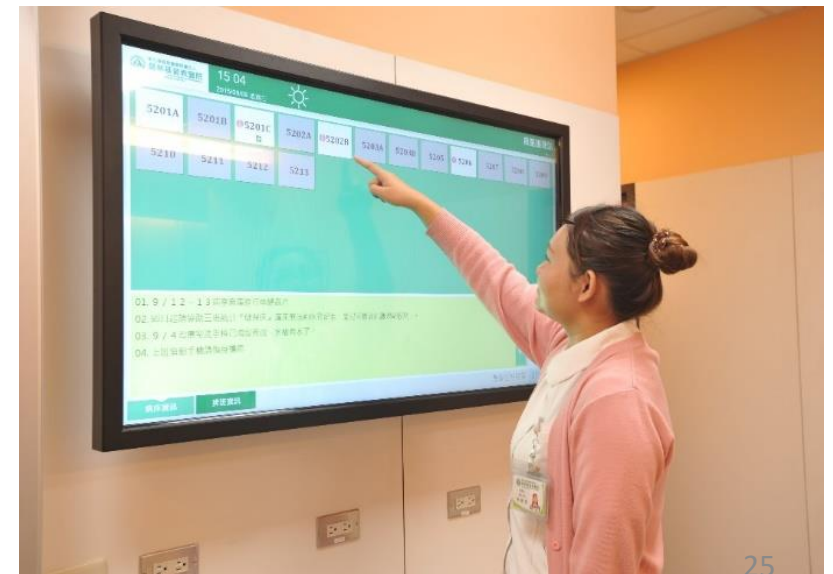
- ◆ Interactive environment
- ◆ Disclosure real-time information
- ◆ Treatment schedule



Smart Nurse Station: Nurse Dashboard

Improvement Nurse Care Quality and Work Flow

- Nurse dash board (No paper works)
- Real time patient information (location, activity, schedule)
- Real time nursing shifting
- Central nurse control panel
- Schedule, Work Flow, and Education



After seeing all these successful solutions...

Taiwan hospitals are expanding their productivity to be the solution providers.



彰化基督教醫院

CHANGHUA CHRISTIAN HOSPITAL



員林基督教醫院

Yuanlin Christian Hospital



**U.S. Green Building Council
LEED Gold Level Certification on
Dec, 2015**



ICT Players launch products and solutions:

- ◆ Smart Nurse Station
- ◆ Smart Ward
- ◆ Smart Clinic
- ◆ Smart Counter
- ◆ Smart Dialysis
- ◆ Smart Operation Room
- ◆ Multimedia interaction
- ◆ Accompany robot
- ◆ Logistics Management

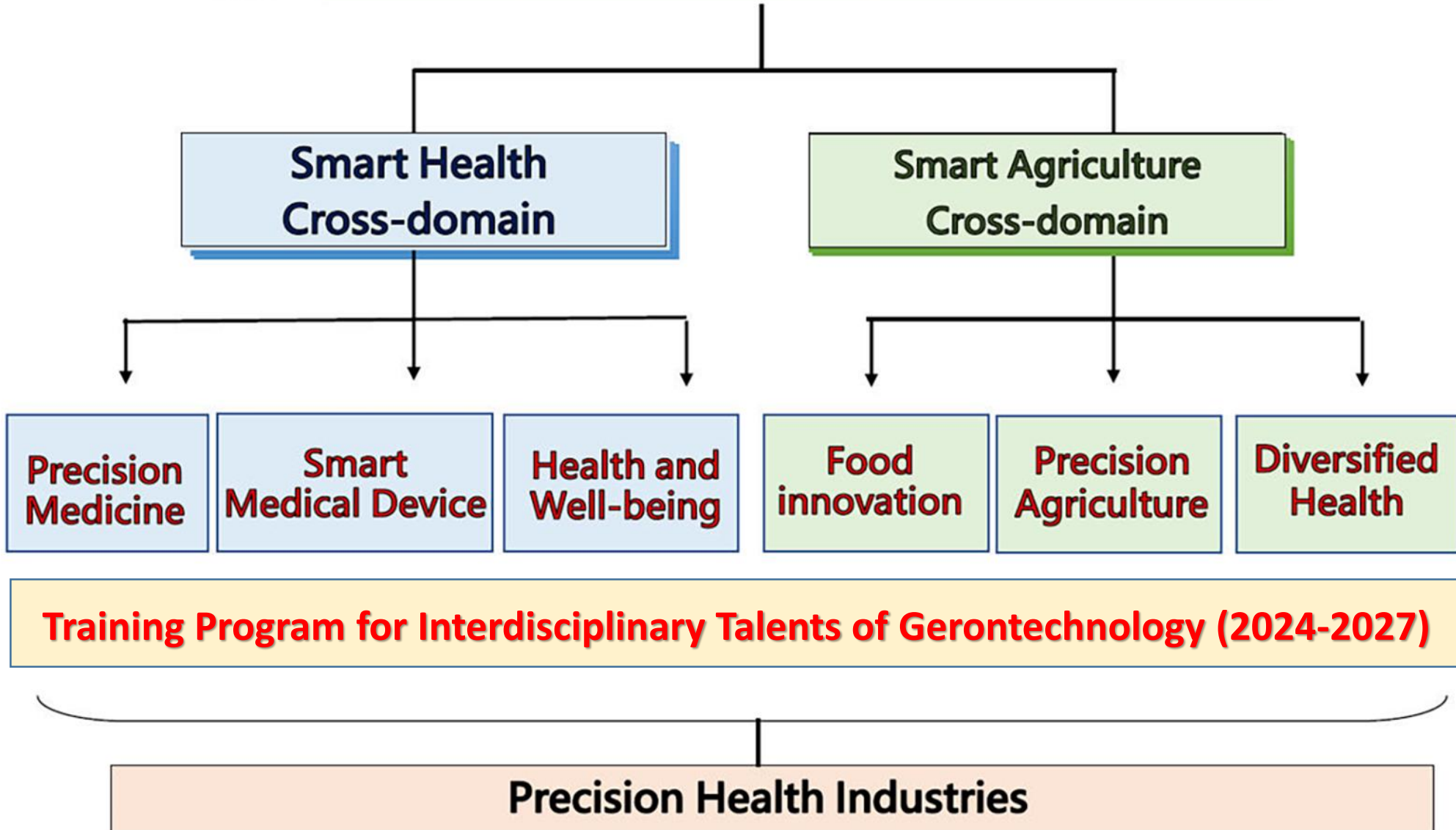
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精準健康產業跨領域人才培育計畫

Training Program for Interdisciplinary Talents of Precision Health

2022-2025



7th Healthcare[®] EXPO · TAIWAN

30 November -3 December 2023, Taipei

Please Book your 2023 calendar



Visitor



Exhibitor



Video



Report

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Institute for Biotechnology and Medicine Industry



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Ministry of Health and Welfare



Ministry of Economic Affairs, R.O.C



NSTC National Science and Technology Council



Council of Agriculture



Taipei City Government

Branding Taiwan



Thank you for your attention