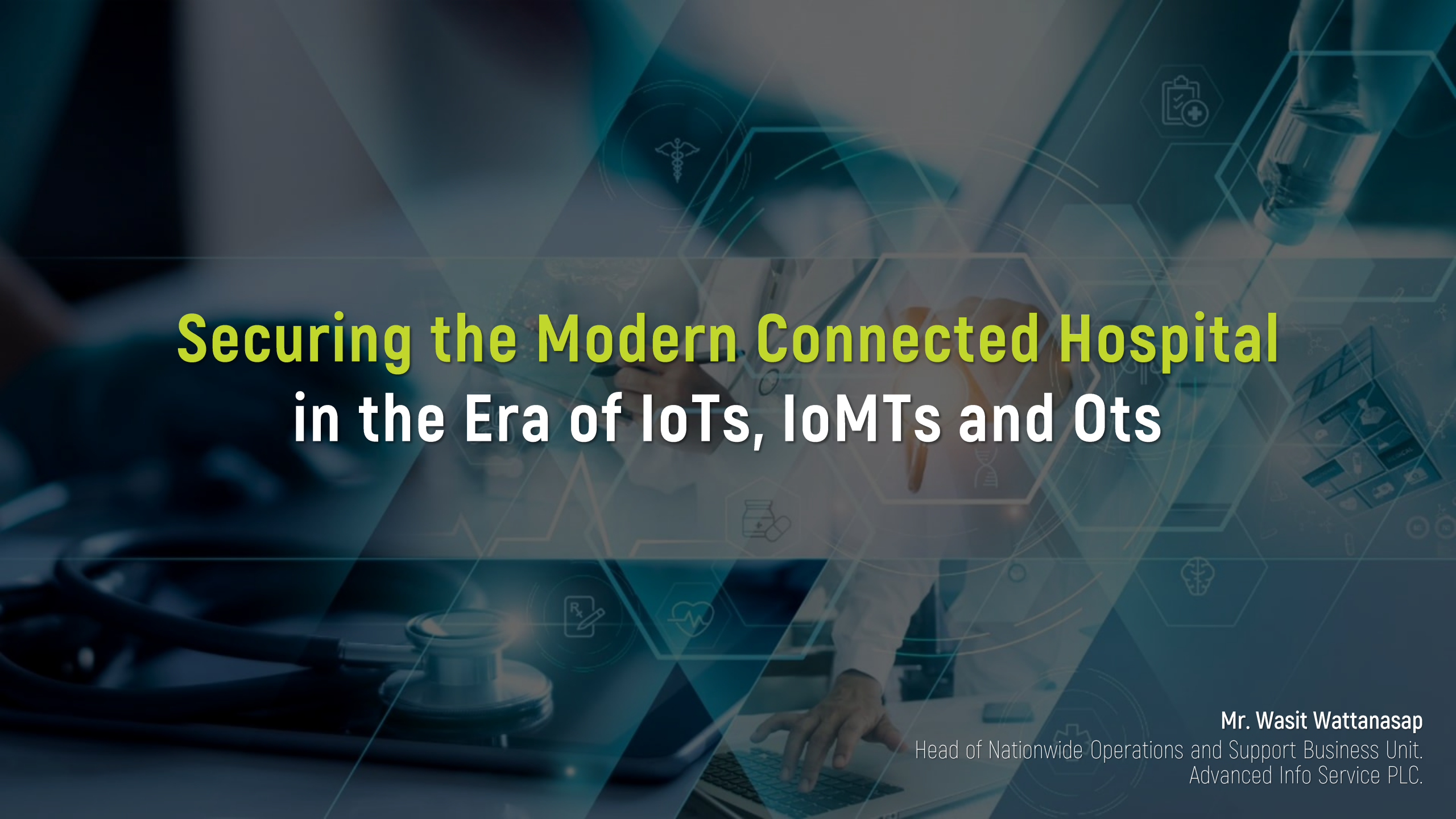


Securing the Modern Connected Hospital in the Era of IoTs, IoMTs and OTs

Mr. Wasit Wattanasap
Head of Nationwide Operations and Support Business Unit.
Advanced Info Service PLC.

There is a growing trend toward seeking medical treatment outside of the hospital

at low-cost , more convenient sites of care

The concept of **“VALUE”** is now being defined and assessed by consumer.

60%

of patients believe
virtual care is more convenient
than in-person care

Medical Industry Trends

Key Factors Driving the Medical Industry

The Trend Towards an Aging Population

New Normal Behavior:

New normal behavior stimulates the awareness of proactive and preventive

More Demand for Customer Experiences:

the high expectations in medical treatment, especially for early diagnosis and efficient treatment.

Growing Self-Awareness about Health :

The collection of heath data for monitoring drives the trend of wearable health devices.

Health system need to start understanding

individuals as people

rather than as patients.

What will make these **ecosystems of care truly 'smart'** is the ability to connect and integrate patient data across care setting – **using AI, the Internet of Things (IoT), and cloud-based digital platforms to turn data into actionable insight at scale**, when and where they are needed.

The Future Hospital

It is expected to see these technologies as major parts of the future hospital, enhancing medical services and empowering the real-time communication between devices in different areas.

The Future Hospital

A Real-time Communication through Cloud Platform

Communicating of device and equipment at the hospital and transferring guideline to staffs in various locations.

Cloud Platform

Collecting and transferring information of the patient from various devices.

The doctors and devices at hospital

Patient Monitoring

5G Ambulance

Streaming of HD video and data of patient to the hospital while the patient is being transported.

The digital ecosystem is empowered by health-tech startups and emerging technologies that disrupt the traditional healthcare ecosystem

Thailand's Health-Tech Ecosystem

Digital Healthcare

Digital Regulators/ Supporters

Regulators

ETDA
สพธอ
www.etda.or.th

Telehealth Regulator

Innovation Supporters

NIA
สถาบันนวัตกรรมแห่งชาติ

DGA

depa

สวทช NSTDA

MHESI

Investment Agency

THAILAND BOARD OF INVESTMENT

Venture Capital

cento

EXPARA

Financial Institutions

Insurances

Thai Life Insurance
Life. Beside You

เมืองไทย

Banks

SCB

Network Providers

AIS

true

nt

System Integrators

gable

GREENLINE SYNERGY

CHANWANICH

InterSystems
Health | Business | Government

Cloud Providers

trueIDC

AIS

INET
Always by your side

NTT Communications
Transform. Transcend.

Health-Tech/ Startups

Service Search

Zeekdoctor

DOCTOR A to Z

MEDICAL DEPARTURES

HealthSmile

Telemedicine

Chiiwii

vitaboost
Your Vitamin Specialist

Pharmacy Management

See

MCS

Personal Health Platform

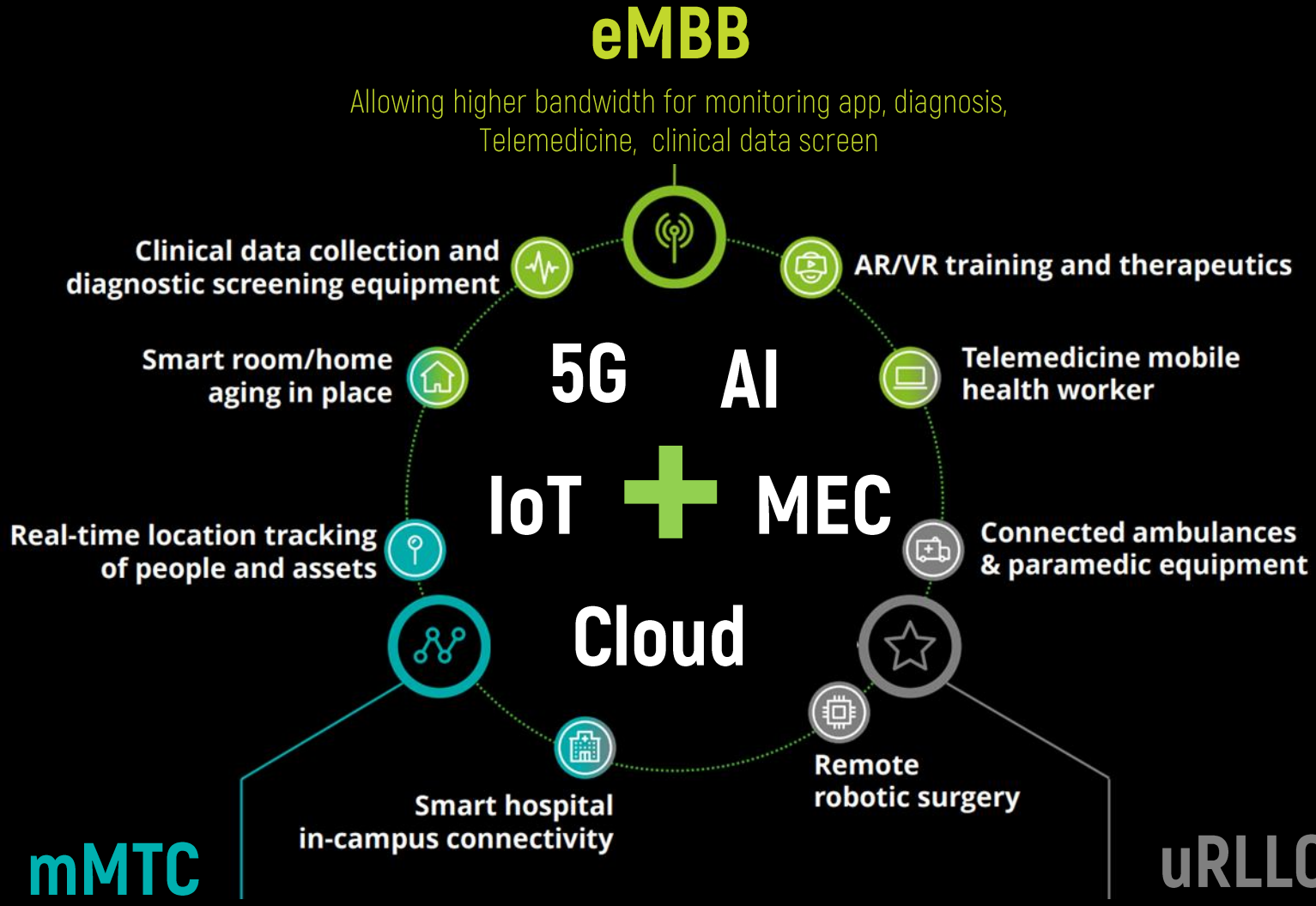
PharmaSafe

MEDCURY

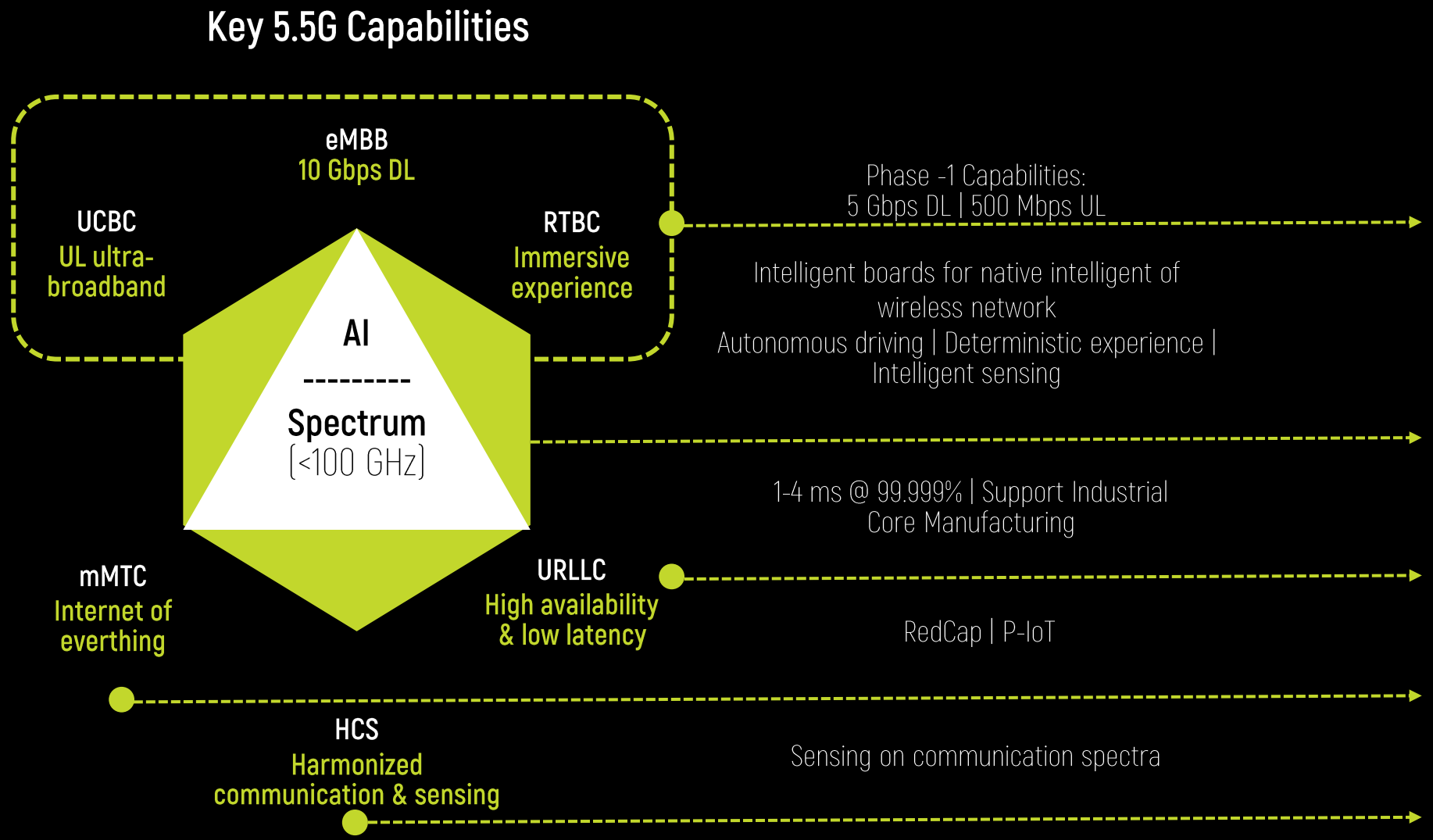
Diamate

ARINCARE

5G in Health Care



From 5G to 5.5G, More use case capability native support



4 Main Types of Digital Health

Telehealth :

the use of telecommunication technology to provide online medical service including remote health monitoring and online medical consultation

mHealth :

the use of smart phones and wearable devices for medical care such as health care application

Health Analytic :

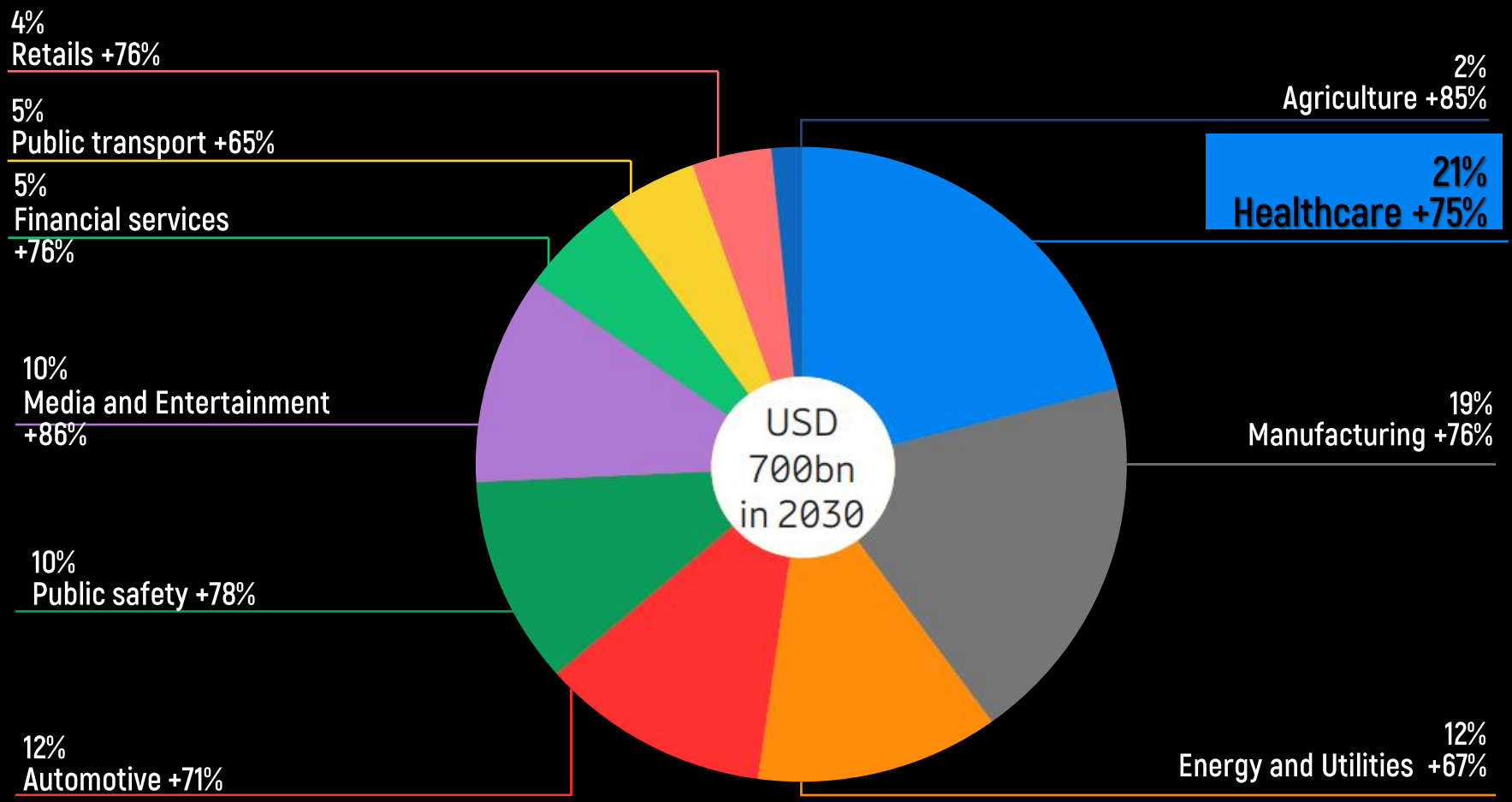
the utilization of big data for the analysis of individual patient behavior such as Personalized Behavioral Predictive Analytic System

Digital Health System :

A system designed to electronical collect health care data such as E-prescribing system and electronic health care record

Source : World Health Organization (WHO), Global medical Trend survey, USC-Keck school of medical, Pew Research Center

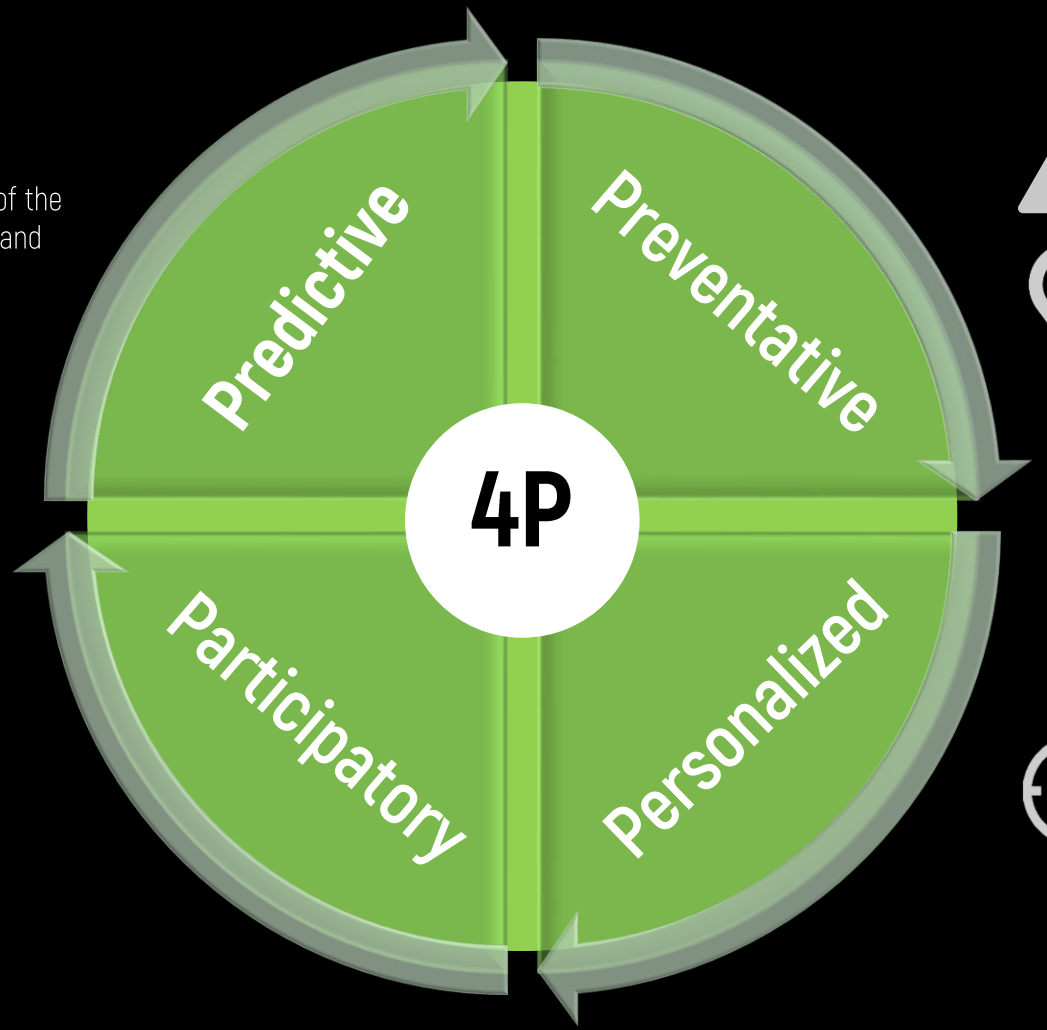
2030 Share and growth rate for global total 5G-enable B2B opportunity for service providers



Source: Ericson and Arthur D.Little

5G bring a New Health Ecosystem

5G will be central to the predictive process itself, it will underpin the ubiquitous connectivity and scale of the ecosystem that collects, analyses and shares the data.



especially relevant in the context of the COVID-19 outbreak - is the ability to track and trace with unprecedented accuracy the location and proximity of vast numbers of people using smartphone apps, Individualized alerts and interventions to stifle the spread of the outbreak can then be initiated.

the 5G-enabled health ecosystem, patients will become less passive consumers of healthcare and more engaged participants in driving their own outcomes.

The combination of constant real-time health monitoring over 5G networks will provide substantial opportunities for personalizing people's healthcare experiences and interventions.

Source: PwC

Healthcare providers gather real-time data from **Internet of Medical Things (IoMT) devices** and other sources. They **employ AI-powered predictive analytics and harness big data** to facilitate instant medical alerts, customize treatments, forecast disease outcomes, predict patient loads, and efficiently identify at-risk patients.

Prevention is better than cure

With the growing adoption of AI, there has been a shift in healthcare providers' approach – a focus **transition from treating conditions to predicting them**.

Whole person care

Modern medical practices have shifted towards a more comprehensive approach known as whole-person care.

Unlike traditional healthcare, whole person care considers a patient's entire life story, including past experiences, current interactions, and the influence of social determinants of health (SDoH).

Whole person care goes beyond treating only physical ailments, emphasizing mental and emotional well-being, social factors, and overall quality of life.

This patient-centered strategy results in **personalized care programs** that can ultimately reduce healthcare costs.

The Internet of Things (IoT) and the Internet of Medical Things (IoMT) are being incorporated into **healthcare systems, enabling real-time data collection and monitoring.** This integration facilitates remote patient monitoring and improves the quality of care through timely interventions.

DIGITAL
HEALTHCARE PLATFORM

ศูนย์ปฏิบัติการ
ด้านการดูแลสุขภาพ

แอปพลิเคชัน
สุขภาพส่วนบุคคล

ชุดเครื่องตรวจและคัดกรอง ความเสี่ยงสุขภาพอัจฉริยะ

DIGITAL HOMECARE

ตรวจ
คัดกรอง

ภาวะ
ซึมเศร้า

ตรวจ
คัดกรอง

ผู้สูงอายุ

ตรวจ
คัดกรอง

ความเสี่ยง
จากสารเคมี
กำจัดศัตรูพืช

1 เครื่อง
สมาร์ทเฮลท์
(Smart Healthcare)

2 เครื่อง
อ่านบัตร
ประชาชน
(ID Card Reader)

3 เครื่องพิมพ์
(Thermal Printer)

4 เครื่องวัด
อุณหภูมิ
ร่างกาย
(Thermometer)

5 เครื่องวัด
ความดันโลหิต
(Blood Pressure)

6 เครื่องวัด
ความอิ่มตัว
ของออกซิเจน
ในเลือด
(Pulse Oximeter)

7 เครื่องวัด
คลื่นไฟฟ้าหัวใจ
แบบ 3 ลีด
(ECG)

8 เครื่องชั่งน้ำหนัก
และวัดองค์ประกอบ
ร่างกาย
(Weight Scale
with Body
Composition)

9 Body tape
วัดสรีระ ขา แขน
สะโพก เอว ศรีษะเด็ก
ขนาดครรภ์

10 เครื่องตรวจ
น้ำตาลในเลือด
โดยไม่ต้อง
เจาะปลายนิ้ว

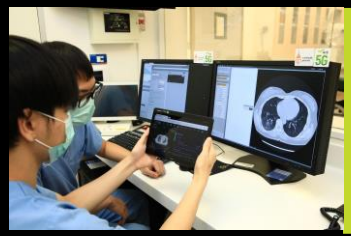
11 เครื่องวัดน้ำตาล
คอเลสเตอรอล
และยูริก
แบบเจาะเลือด
ปลายนิ้ว

12 กระเป๋า

Examples of 5G Use Cases in the Medical Sector

Connected Ambulance

Preventative Care Support/ Follow-up visits



AI for Diagnosis/ Medical Transfer

Wireless Vital Monitors

Remote Ultrasound Scan

Remote Chronic Disease Mgmt.

Hearing Aid

Wearable ECG Monitors

Medical Teleconsultation

Service/ Dispensing Robot

Blood Coagulation Testing

AR/VR in Medical Learning & Training

Remote Operation Monitoring

Spraying/ Disinfestation Robot

Continuous Glucose Monitoring

Management Platform

for Health

Key Challenges of Technology Adoption in the Medical Sector

Highly Concern on Data Security :

- The doctors afraid of the leakage of patients' information during the conversation through communication channels.
- New technology needs to guarantee the security of the data transfer especially during a telemedicine service.

Highly Concern on Patient Safety :

- The hospital will not adopt a new technology that the patients think that it is unsafe to them such as remote-control surgery.
- The investment will be made on the equipment and device that are already certified about safety.

Unclear Regulation :

- Unclear regulations on the use of technology in the medical sector slow a new technology adoption.
- 3 main regulations are Health Facility Act (No.4) B.E. 2559, Medical Device Act (No.2) B.E. 2562, and Medicine Act B.E. 2510

Low Awareness in Utilizing Technology in Healthcare Treatment :

- Elder doctors are resistant to change and they only want to use traditional way in curing the patients.
- Demand of adopting technology is still limited due to
- technological know-how lack off.

High Cost of Investment :

- It is somehow unnecessary to invest in new technology.
- The increase in the level of security and efficiency needs to worth the high investment cost.
- Due to high investment cost, only simple technology such as application is implemented.

Standardization of Medical Device :

- A new medical solution needs to be able to connect to each hospital's existing system.

Immortality-as-a-service

Tech companies increasingly use AI and genetics to develop products and services that promise to extend human lifespan.

While the ultimate goal of immortality may be far-fetched, the potential market for these products is enormous, and age-defying consumers are likely to be a lucrative source of recurring revenue.

The World Health Organization defines health equity as

"..the absence of unfair and avoidable or remediable differences in health among population groups defined socially, economically, demographically or geographically."

Health Equality is all about making healthcare more accessible and affordable for everyone--- **and digital health trends** are the driving forces behind....

AIS
5G