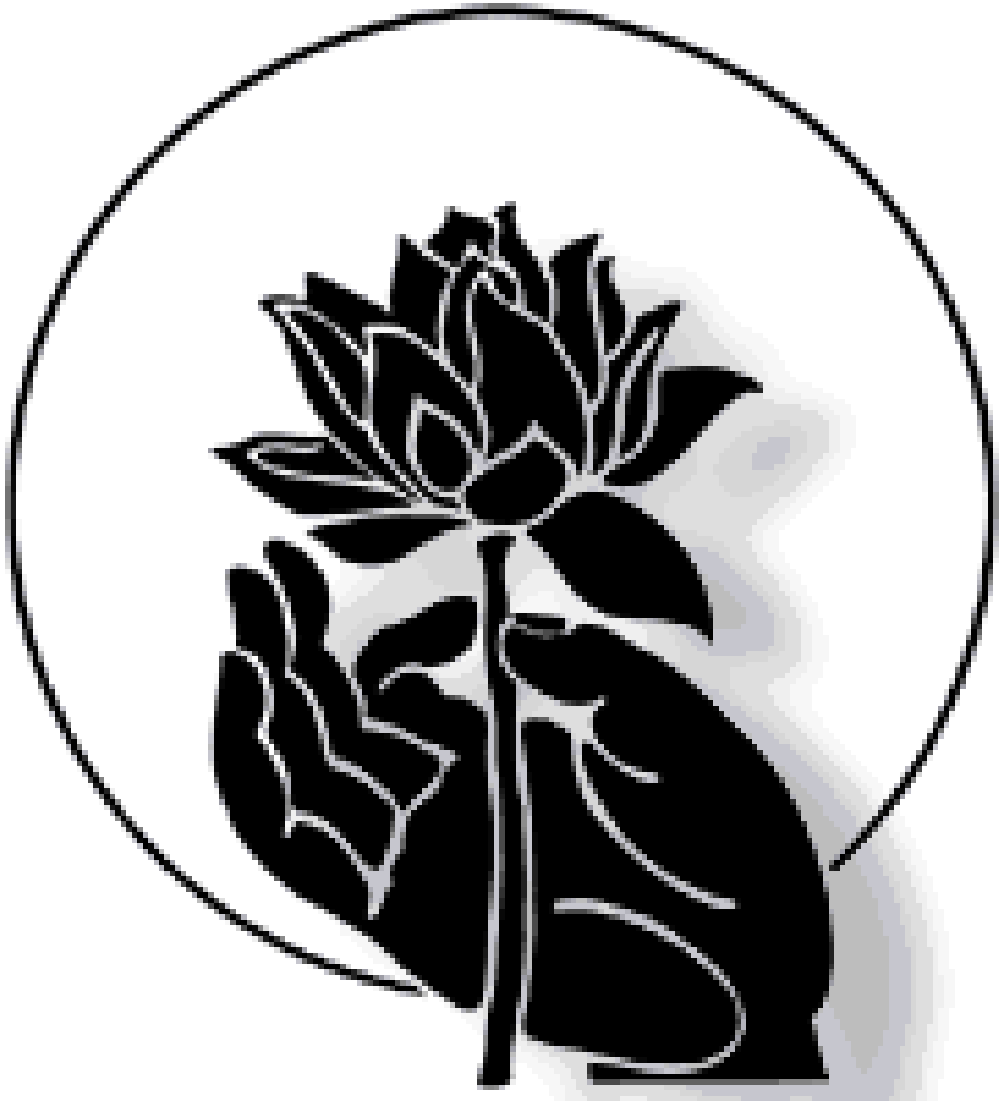
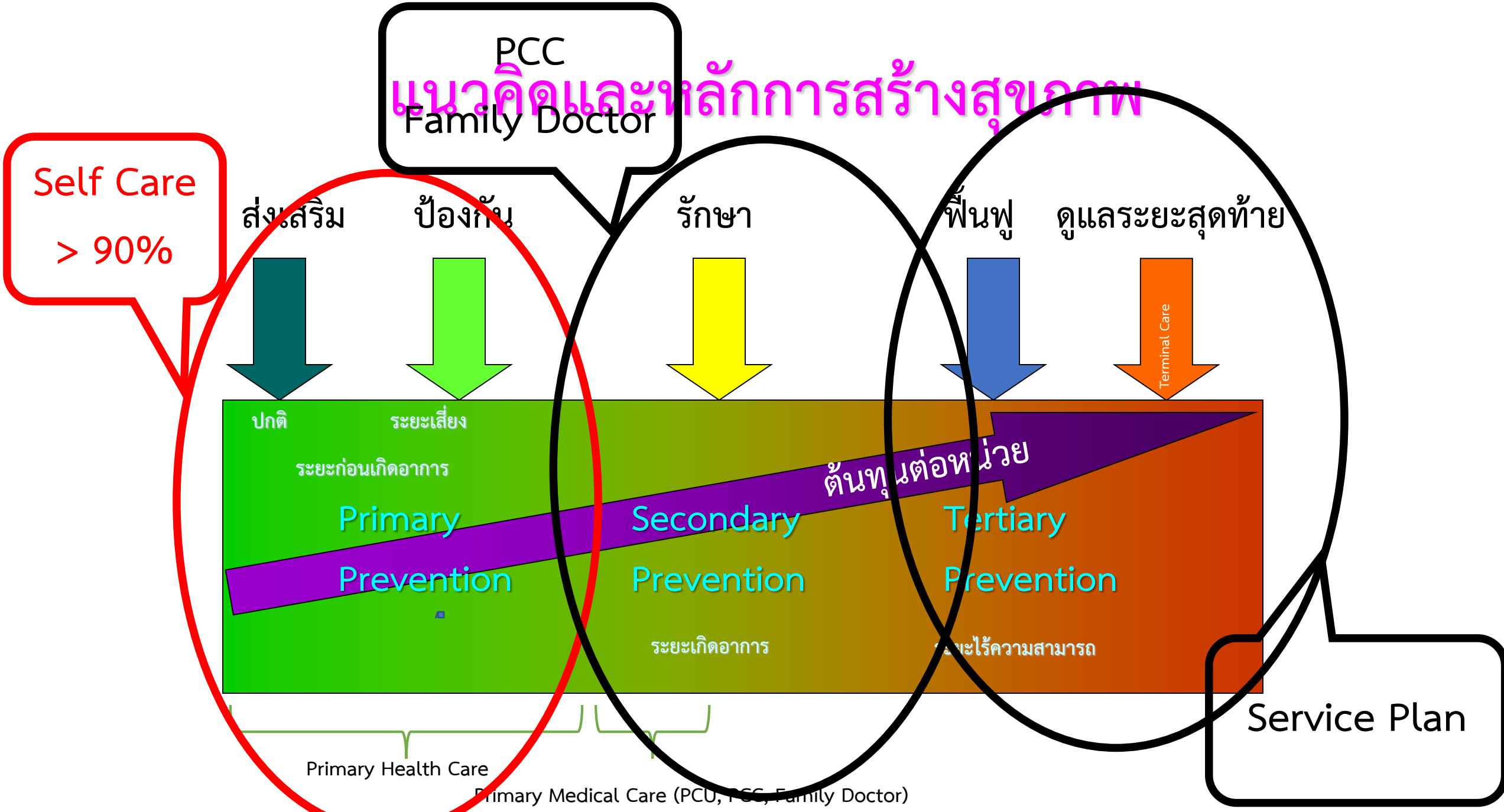
การจัดการความรุนแรงต่อเด็กและสตรี เขตสุขภาพที่ 8

นพ.ชาญวิทย์ ทระเทพ

กระทรวงสาธารณสุข

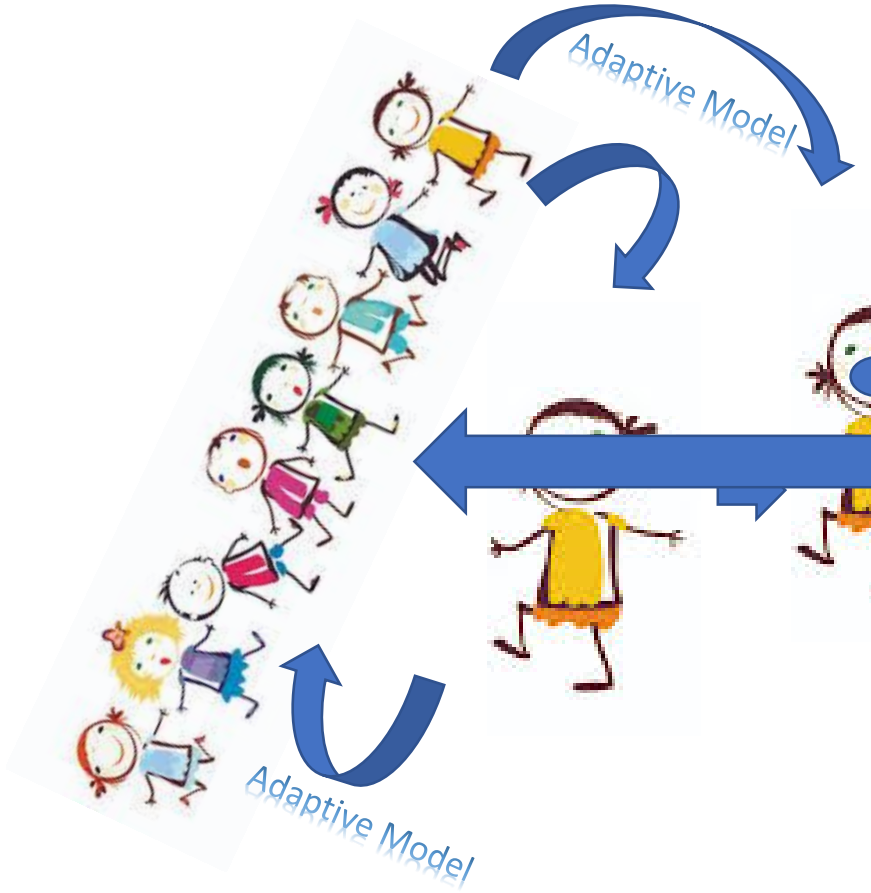


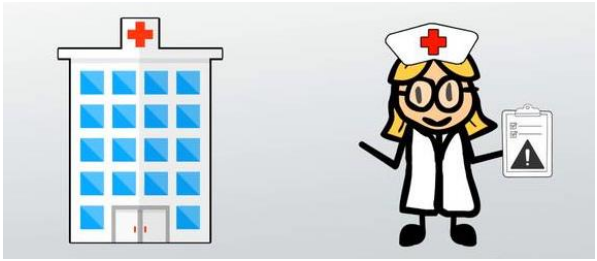
แนวคิดและหลักการสร้างสุขภาพ



Target Population

New Business model for People focus: Patient Journey





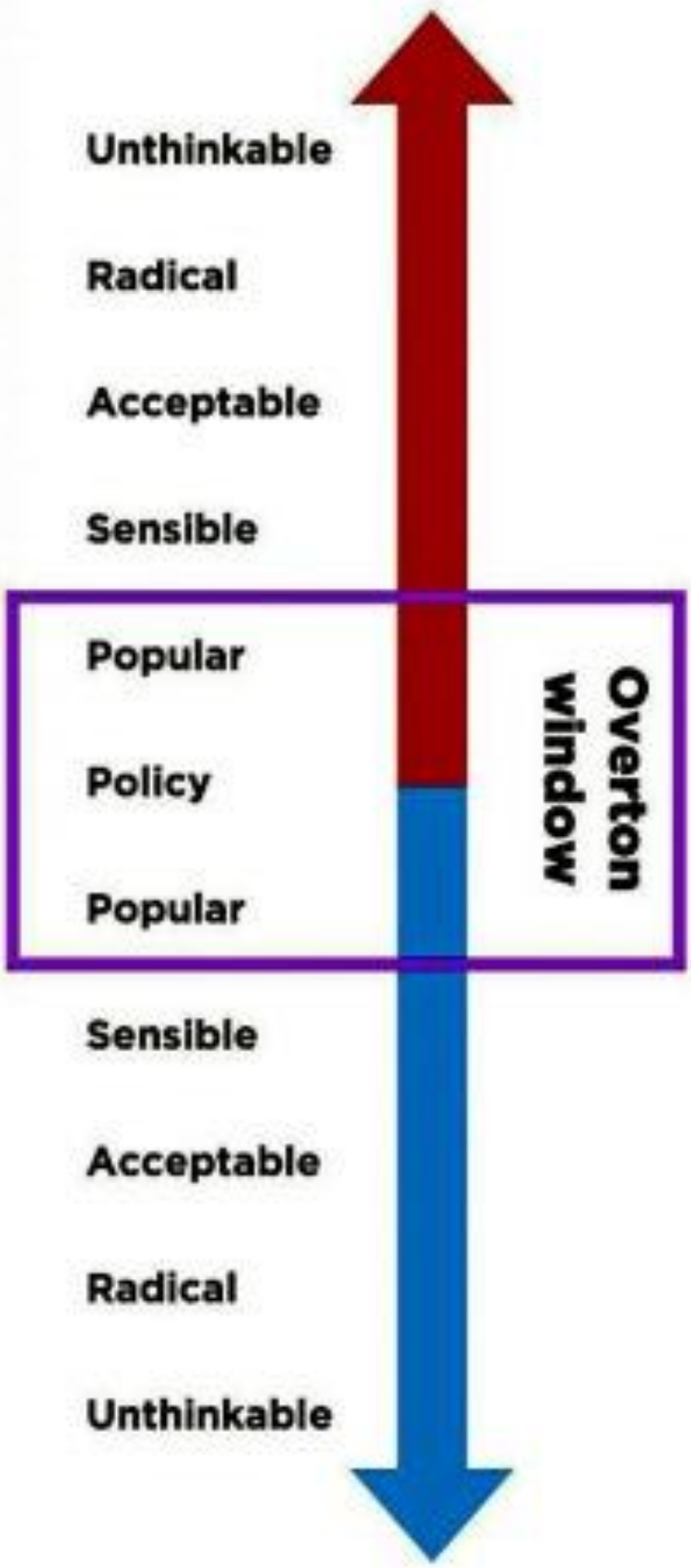
Surviellance
Big data, AI (Deep learning)

Risk

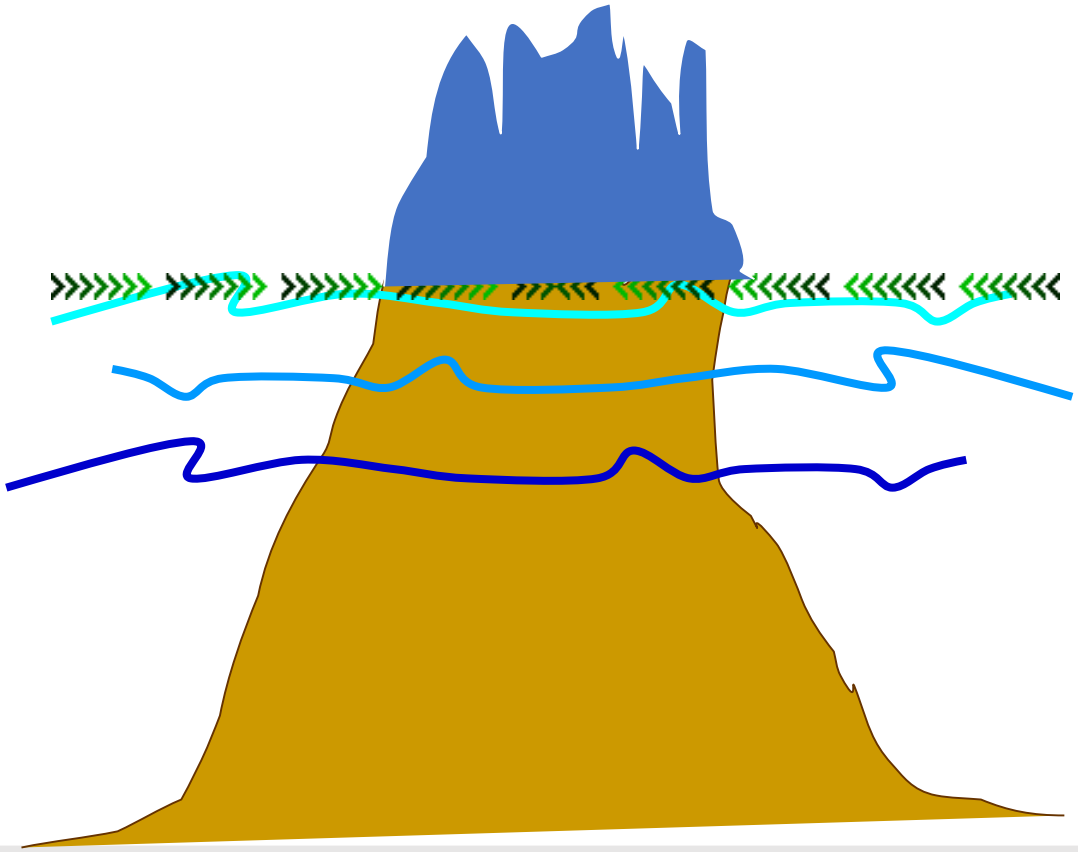
Sick

Healing

High Cost
Poor Outcome, LTC

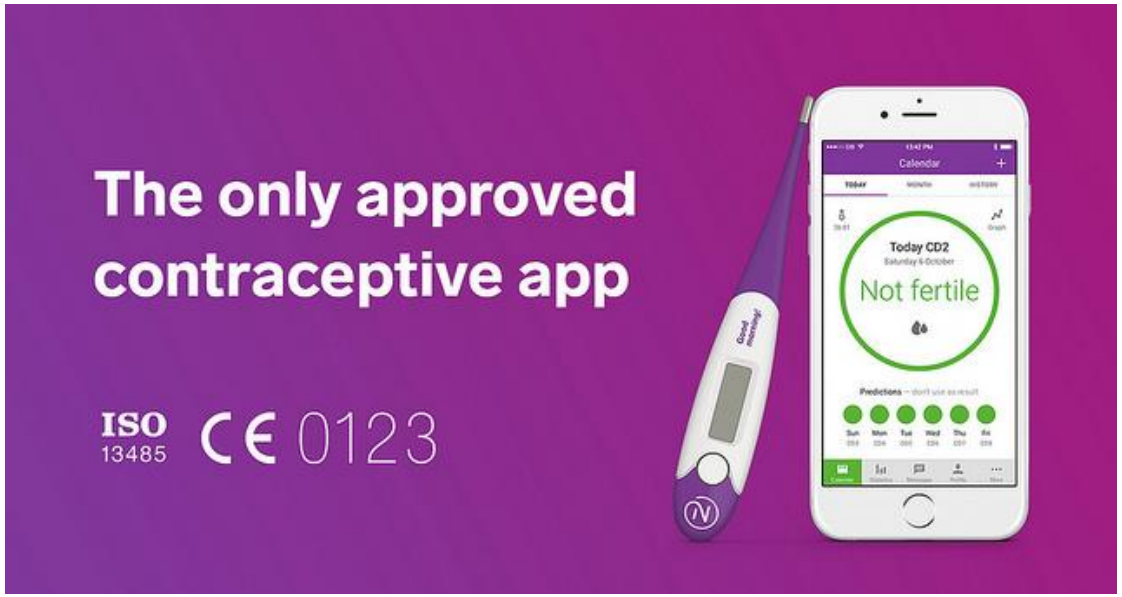

Unthinkable
Radical
Acceptable
Sensible
Popular
Policy
Popular
Sensible
Acceptable
Radical
Unthinkable
Overton window

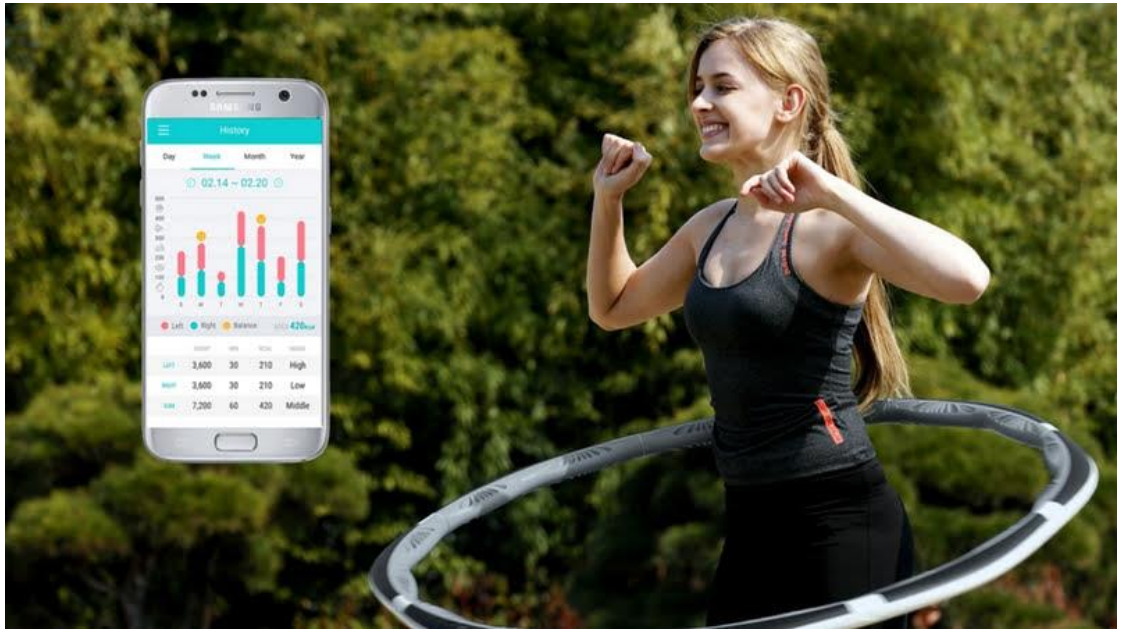
Confirmation Bias



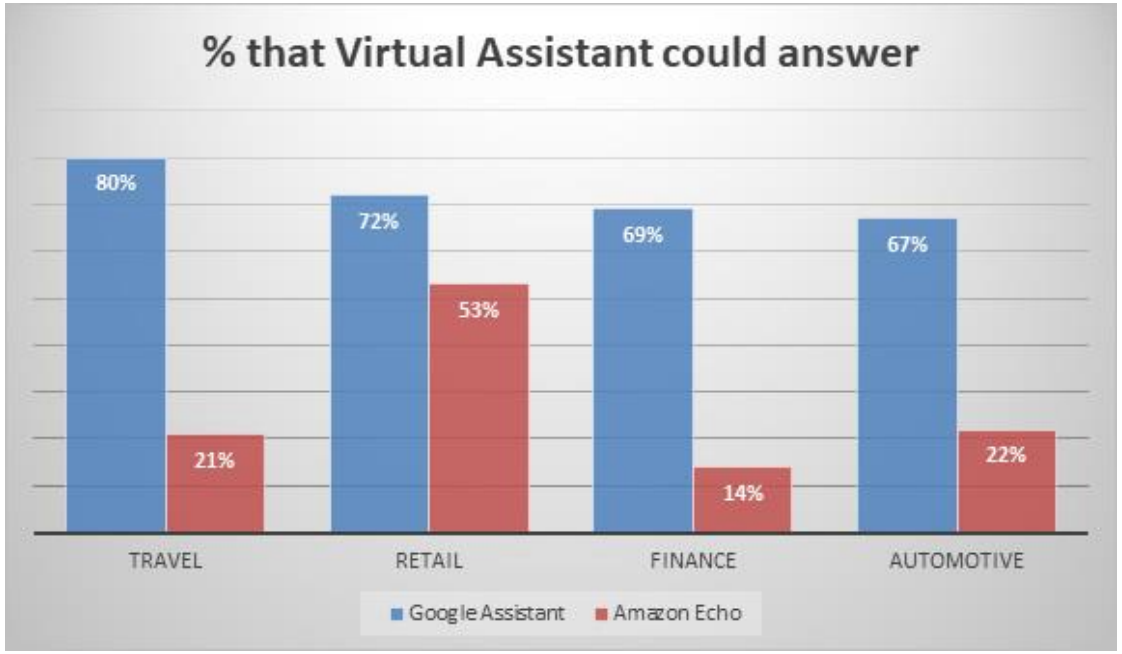
อุบัติการณ์ความรุนแรงที่เรารับรู้เปรียบเสมือน
ยอดภูเขาน้ำแข็งที่โผล่พ้นน้ำในมหาสมุทร

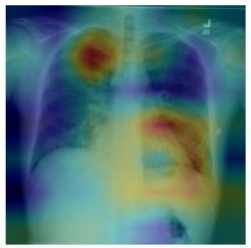
New Ecosystem



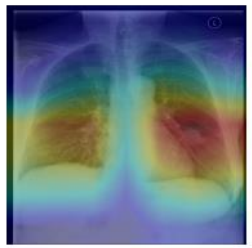


New Ecosystem

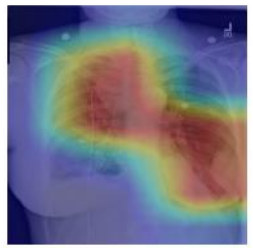




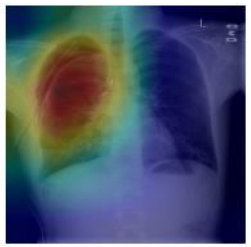
(a) Patient with multifocal community acquired pneumonia. The model correctly detects the airspace disease in the left lower and right upper lobes to arrive at the pneumonia diagnosis.



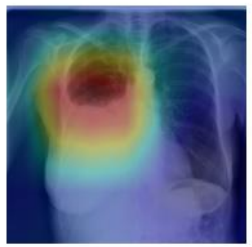
(b) Patient with a left lung nodule. The model identifies the left lower lobe lung nodule and correctly classifies the pathology.



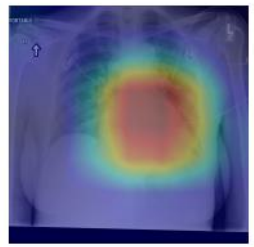
(c) Patient with primary lung malignancy and two large masses, one in the left lower lobe and one in the right upper lobe adjacent to the mediastinum. The model correctly identifies both masses in the X-ray.



(d) Patient with a right-sided pneumothroax and chest tube. The model detects the abnormal lung to correctly predict the presence of pneumothorax (collapsed lung).



(e) Patient with a large right pleural effusion (fluid in the pleural space). The model correctly labels the effusion and focuses on the right lower chest.



(f) Patient with congestive heart failure and cardiomegaly (enlarged heart). The model correctly identifies the enlarged cardiac silhouette.

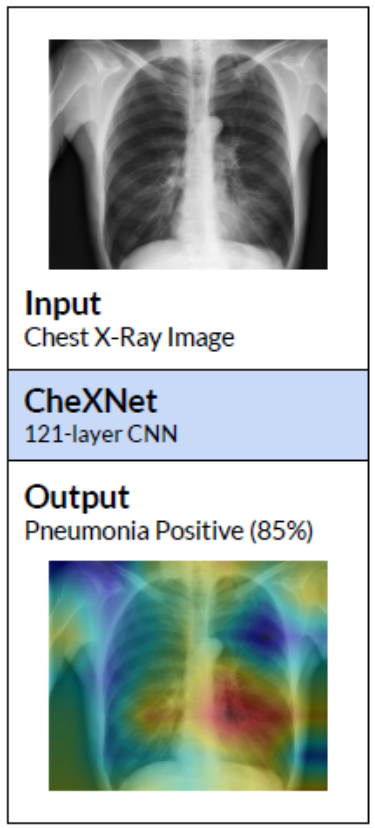
Figure 3. ChexNet localizes pathologies it identifies using Class Activation Maps, which highlight the areas of the X-ray that are most important for making a particular pathology classification.

CheXNet: Radiologist-Level Pneumonia Detection on Chest X-Rays with Deep Learning

Pranav Rajpurkar [*1] **Jeremy Irvin** [*1] **Kaylie Zhu** [1] **Brandon Yang** [1] **Hershel Mehta** [1]
Tony Duan [1] **Daisy Ding** [1] **Aarti Bagul** [1] **Robyn L. Ball** [2] **Curtis Langlotz** [3] **Katie Shpanskaya** [3]
Matthew P. Lungren [3] **Andrew Y. Ng** [1]

Abstract

We develop an algorithm that can detect pneumonia from chest X-rays at a level exceeding practicing radiologists. Our algorithm, CheXNet, is a 121-layer convolutional neural network trained on ChestX-ray14, currently the largest publicly available chest X-ray dataset, containing over 100,000 frontal-view X-ray images with 14 diseases. Four practicing academic radiologists annotate a test set, on which we compare the performance of CheXNet to that of radiologists. We find that CheXNet exceeds average radiologist performance on the F1 metric. We extend CheXNet to detect all 14 diseases in ChestX-ray14 and achieve state of the art results on all 14 diseases.



1. Introduction

More than 1 million adults are hospitalized with pneumonia and around 50,000 die from the disease every year in the US alone (CDC, 2017). Chest X-rays

FDA News Release

FDA permits marketing of artificial intelligence-based device to detect certain diabetes-related eye problems

For Immediate Release

April 11, 2018

THE VERGE

SCIENCE TECH HEALTH

AI software that helps doctors diagnose like specialists is approved by FDA

"It makes the clinical decision on its own"

By Angela Chen | @chengela | Apr 11, 2018, 1:25pm EDT

For the first time, the US Food and Drug Administration has approved an artificial intelligence diagnostic device that doesn't need a specialized doctor to interpret the results. The software program, called IDx-DR, can detect a form of eye disease by looking at photos of the retina.

Scalable and accurate deep learning with electronic health records

Alvin Rajkomar[1,2], Eyal Oren[1], Kai Chen[1], Andrew M. Dai[1], Nissan Hajaj[1], Michaela Hardt[1], Peter J. Liu[1], Xiaobing Liu[1], Jake Marcus[1], Mimi Sun[1], Patrik Sundberg[1], Hector Yee[1], Kun Zhang[1], Yi Zhang[1], Gerardo Flores[1], Gavin E. Duggan[1], Jamie Irvine[1], Quoc Le[1], Kurt Litsch[1], Alexander Mossin[1], Justin Tansuwan[1], De Wang[1], James Wexler[1], Jimbo Wilson[1], Dana Ludwig[2], Samuel L. Volchenboum[3], Katherine Chou[1], Michael Pearson[1], Srinivasan Madabushi[1], Nigam H. Shah[4], Atul J. Butte[2], Michael D. Howell[1], Claire Cui[1], Greg S. Corrado[1] and Jeffrey Dean[1]

Predictive modeling with electronic health record (EHR) data is anticipated to drive personalized medicine and improve healthcare quality. Constructing predictive statistical models typically requires extraction of curated predictor variables from normalized EHR data, a labor-intensive process that discards the vast majority of information in each patient's record. We propose a representation of patients' entire raw EHR records based on the Fast Healthcare Interoperability Resources (FHIR) format. We demonstrate that deep learning methods using this representation are capable of accurately predicting multiple medical events from multiple centers without site-specific data harmonization. We validated our approach using de-identified EHR data from two US academic medical centers with 216,221 adult patients hospitalized for at least 24 h. In the sequential format we propose, this volume of EHR data unrolled into a total of 46,864,534,945 data points, including clinical notes. Deep learning models achieved high accuracy for tasks such as predicting: in-hospital mortality (area under the receiver operator curve [AUROC] across sites 0.93–0.94), 30-day unplanned readmission (AUROC 0.75–0.76), prolonged length of stay (AUROC 0.85–0.86), and all of a patient's final discharge diagnoses (frequency-weighted AUROC 0.90). These models outperformed traditional, clinically-used predictive models in all cases. We believe that this approach can be used to create accurate and scalable predictions for a variety of clinical scenarios. In a case study of a particular prediction, we demonstrate that neural networks can be used to identify relevant information from the patient's chart.

npj Digital Medicine (2018)1:18 ; doi:10.1038/s41746-018-0029-1

The doctor is online: Singaporeans prefer virtual physician check-ups over face-to-face consultations

3 in 4 said they would prefer self-directed healthcare.

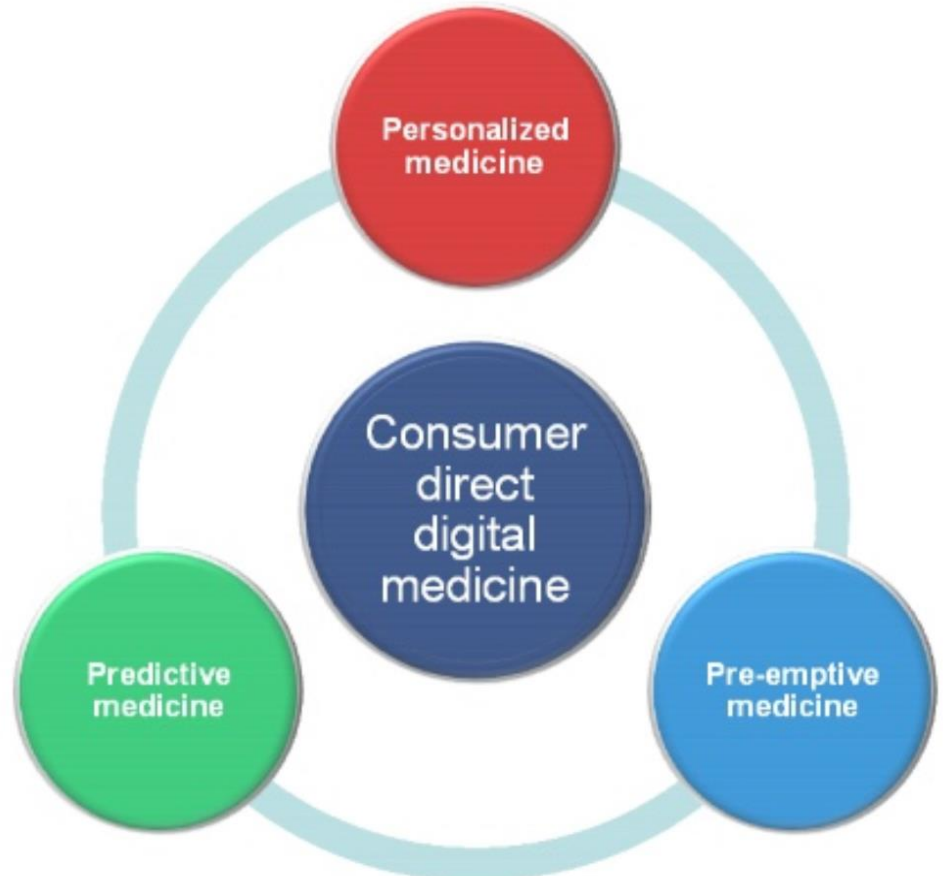
Source: BMI

Paradigm Shift in Healthcare

Medicine of the past

Medicine of the future

Healthcare industry for the next decade



SMART HOME

Smart home devices are being used in domestic abuse, report finds

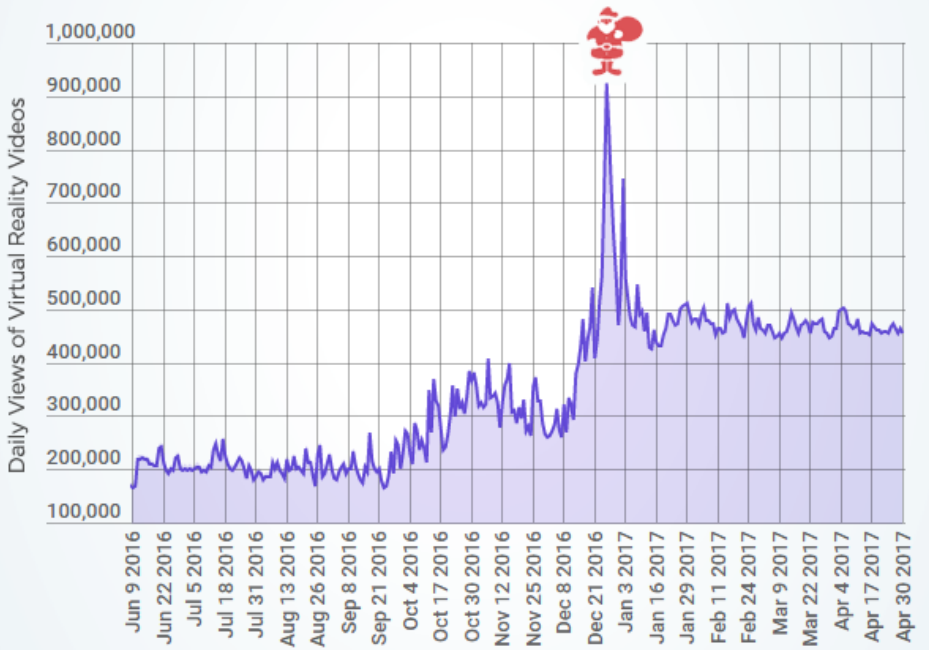
SHARE

Rather than simplifying their lives, some smart home device owners are finding that their connected gadgets and appliances are making their lives a living hell. The New York Times recently reported a disturbing new trend that leverages smart devices as tools of abuse, with some ill-intentioned users (not even hackers), using their smartphones in order to remotely control locks, speakers, thermostats, lights, and the like, and wreak emotional havoc on those within the home. More alarming still is

Pornhub

Virtual Reality Video Views

June 2016 to April 2017

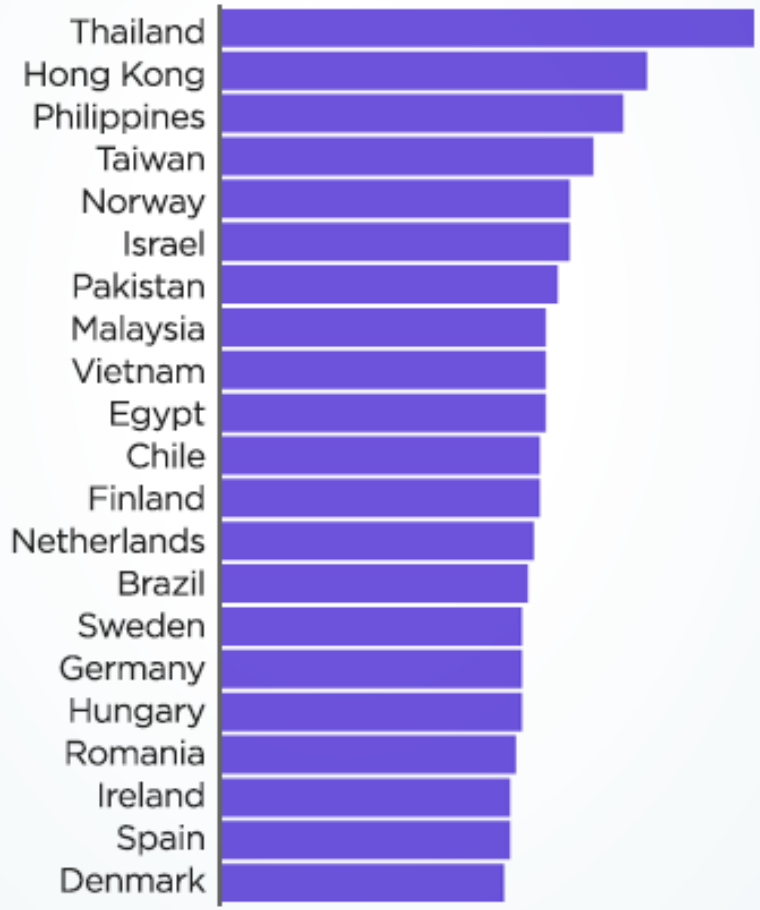


pornhub.com/insights

Pornhub

Countries Where VR is Most Popular

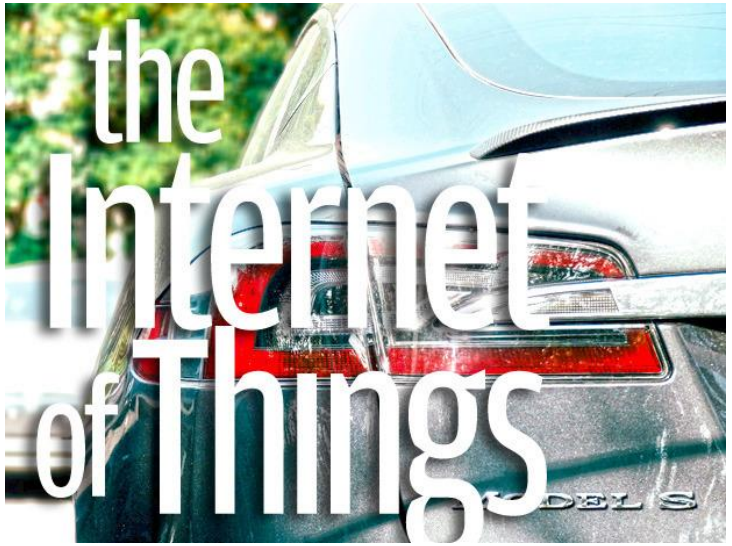
Relative popularity when compared to all other countries



pornhub.com/insights


Wearables


Robotics


the
Internet
of Things

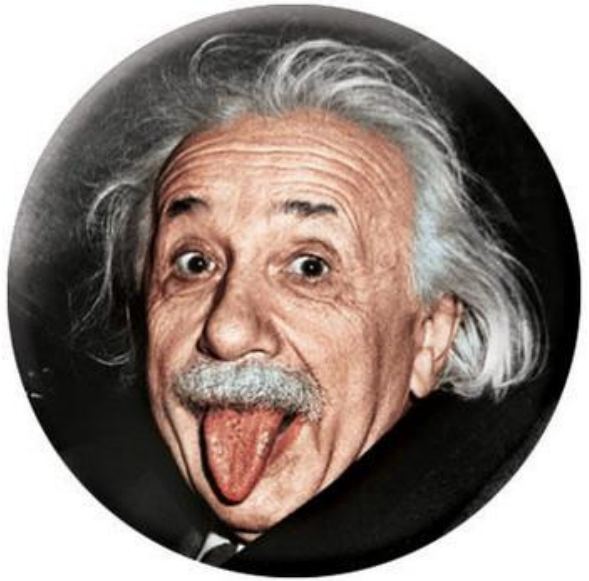

OUTLOOK 2017
THE PREDICTIONS
Augmented reality
By 2020, 100 million consumers
will shop in augmented reality.
SOURCE: GARTNER


Cloud


Analytics

We cannot solve our problems with the same thinking we used when we created them.

Albert Einstein

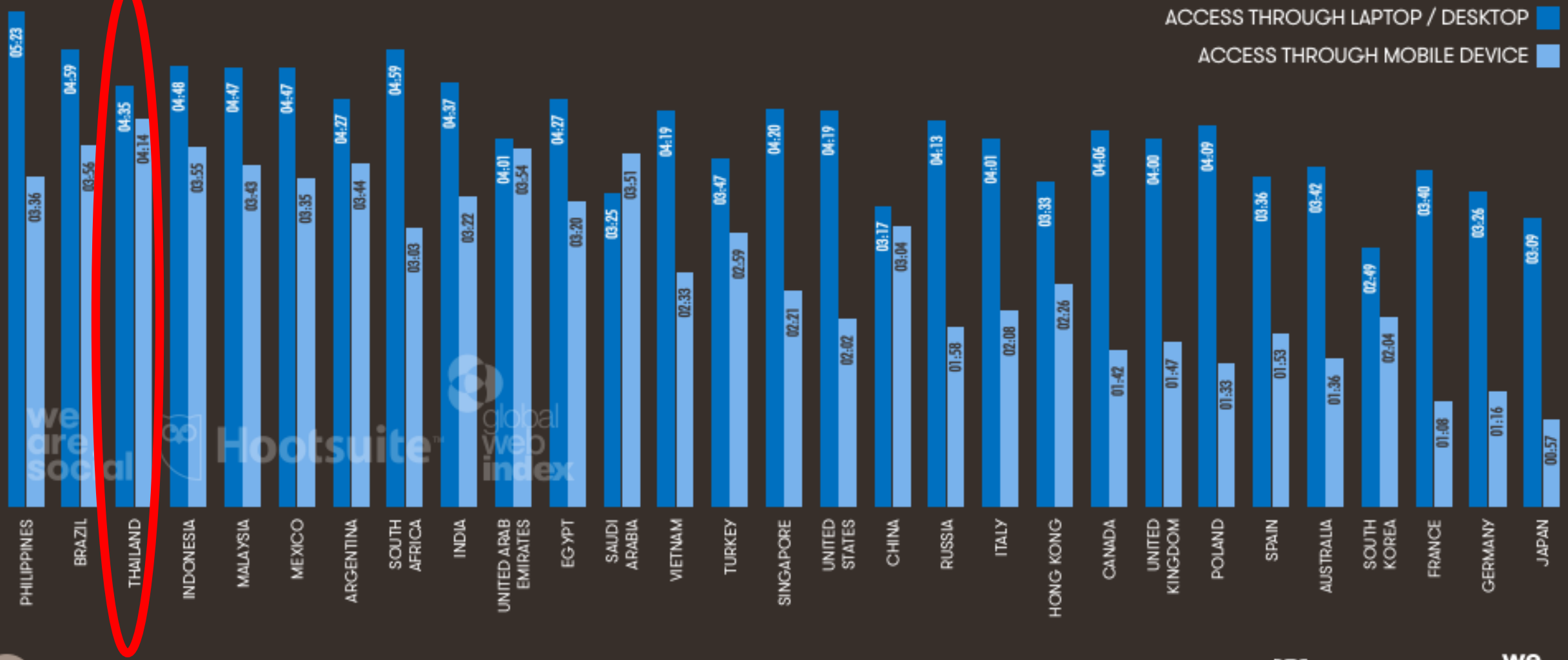


JAN 2017

TIME SPENT ON THE INTERNET

AVERAGE NUMBER OF HOURS SPENT USING THE INTERNET PER DAY, SPLIT BY COMPUTER USE AND MOBILE PHONE USE [SURVEY BASED]

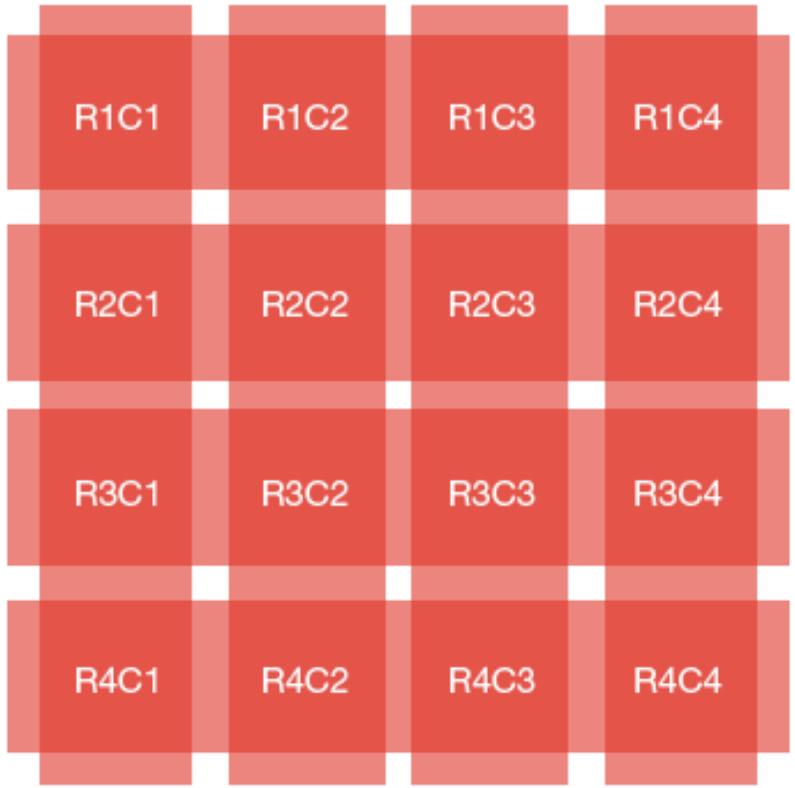
NOTE THAT TIMES CAN BE ADDED TOGETHER TO FIND TOTAL INTERNET TIME BY COUNTRY; RANKINGS ARE IN ORDER OF TOTAL TIME SPENT USING THE INTERNET EACH DAY



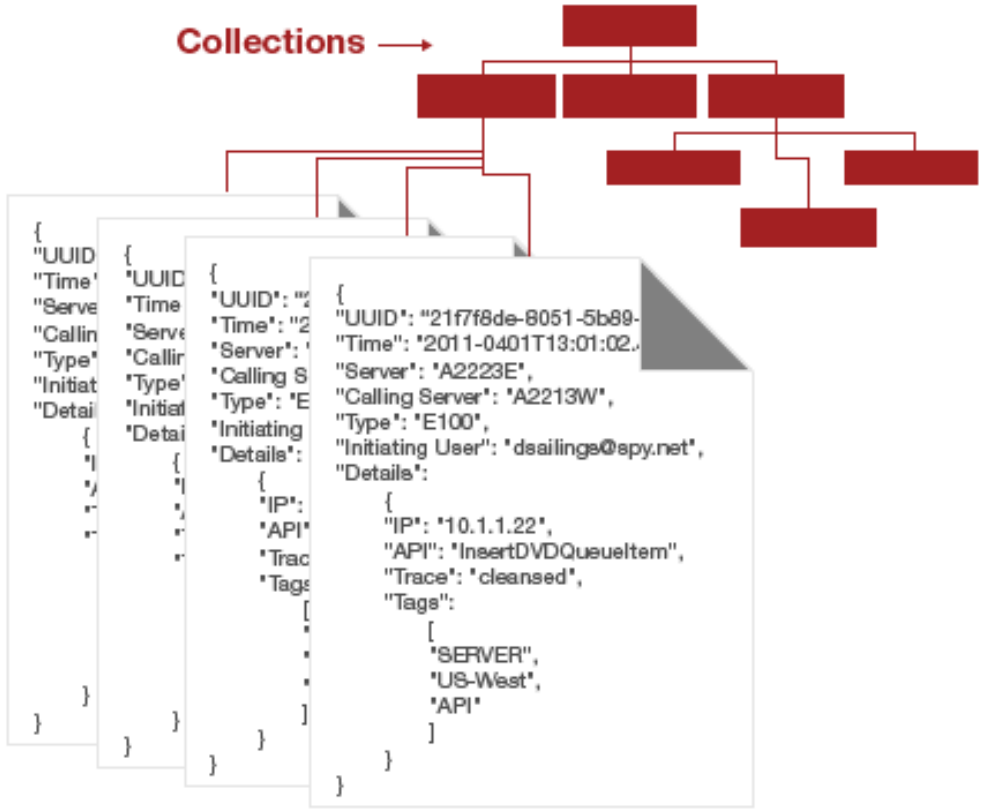
SOURCES: GLOBALWEBINDEX, Q3 & Q4 2016. BASED ON A SURVEY OF INTERNET USERS AGED 16-64.

How relational databases and document stores handle four records

Relational data model
Highly structured table organization with rigidly defined data formats and record structure



Document data model
Collections of complex documents with arbitrary, nested data formats and varying “record” format



This sample of JSON side by side with its XML equivalent shows the name-value pairs

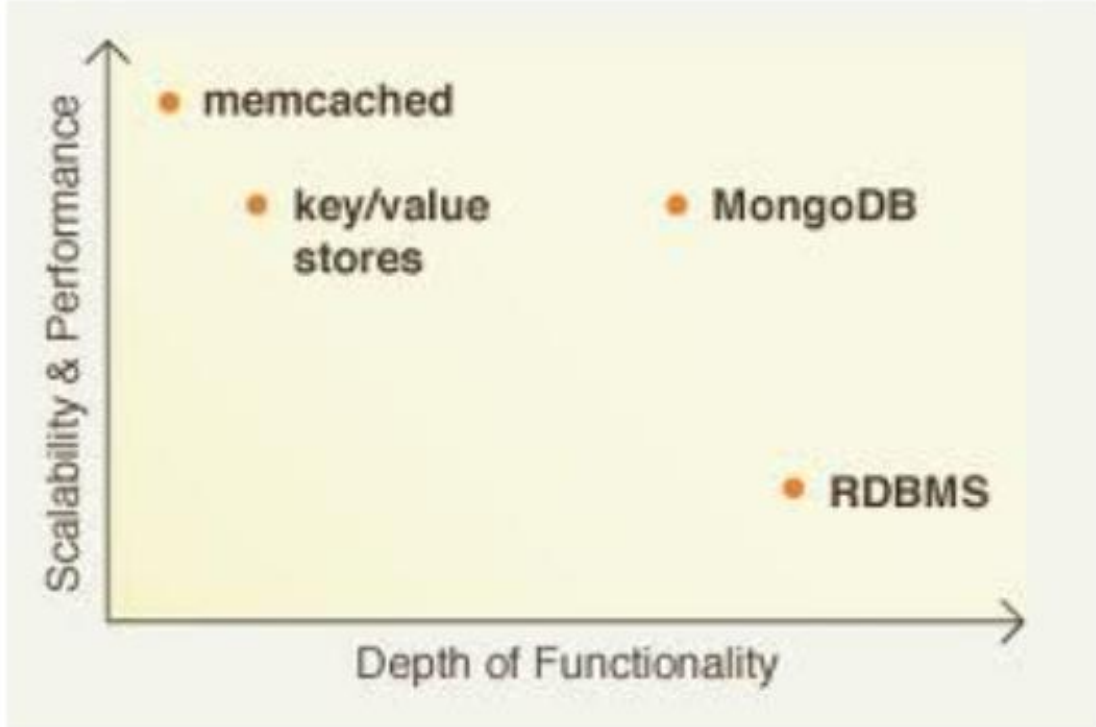
JSON

```json
{
  "firstName": "John",
  "lastName": "Smith",
  "age": 25,
  "address": {
    "streetAddress": "21 2nd Street",
    "city": "New York",
    "state": "NY",
    "postalCode": "10021-3100"
  },
  "phoneNumbers": [
    {
      "type": "home",
      "number": "212 555-1234"
    },
    {
      "type": "office",
      "number": "646 555-4567"
    }
  ],
}
```

XML

```xml
<person>
  <firstName>John</firstName>
  <lastName>Smith</lastName>
  <age>25</age>
  <address>
    <streetAddress>21 2nd Street</streetAddress>
    <city>New York</city>
    <state>NY</state>
    <postalCode>10021</postalCode>
  </address>
  <phoneNumbers>
    <phoneNumber>
      <type>home</type>
      <number>212 555-1234</number>
    </phoneNumber>
    <phoneNumber>
      <type>fax</type>
      <number>646 555-4567</number>
    </phoneNumber>
  </phoneNumbers>
</person>
```

Why Mongo Over RDBMS?



- ✓ For Applications requiring high performance and scalability without compromising on functionality

Digital Laggards

Do not have a digital plan; limited initiatives and investments in place

15%

of total respondents

Digital Followers

Very few digital investments; tentatively planning for the future

32%

of total respondents

Digital Evaluators

Gradually embracing digital transformation and planning for the future

34%

of total respondents

Digital Adopters

Have a mature digital plan, investments and innovations in place

14%

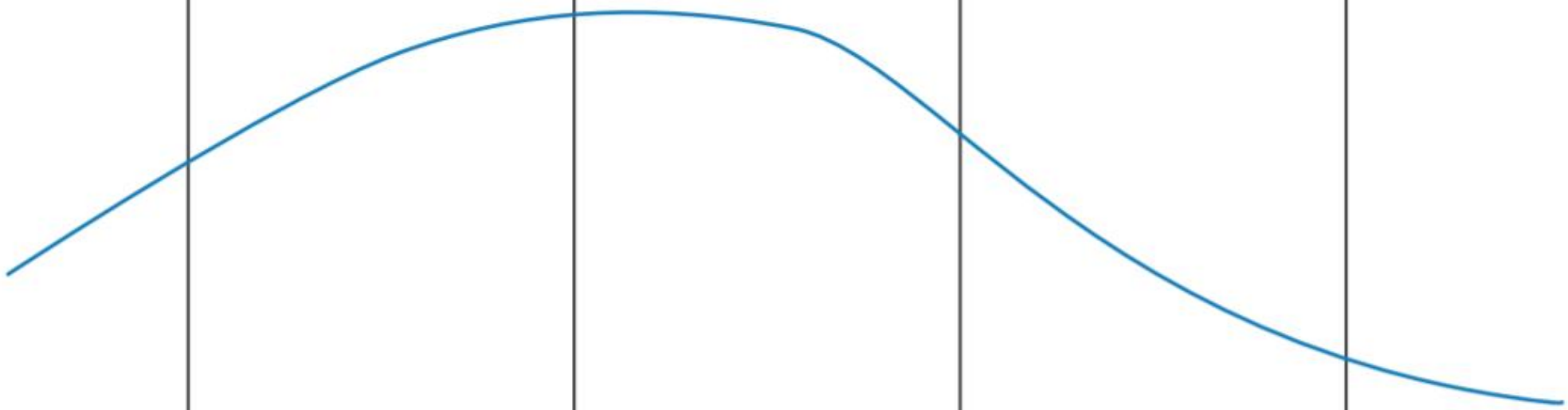
of total respondents

Digital Leaders

Digital transformation is ingrained in the DNA of the business

5%

of total respondents



WHAT IS THE CLOUD EXACTLY?

A **NETWORK**
of servers that holds your digital data from documents to music

Information is stored on an external network of servers and **ACCESSED VIA THE WEB**

HOW DO I USE IT?

An application that runs in the cloud is called a **Web App**. Unlike desktop apps like Microsoft Word, web apps don't need to be installed.

More than **180 Million** people use cloud storage devices

All you need is a browser and reliable internet connection.

Simply log in to your account and start using it.

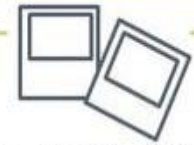
Username

Password

When you...

Check your emails through **Gmail**

OR



Share pictures in **DropBox**

OR

Video chat on **Skype**

... you are already using a cloud based service.

YOU'RE ALREADY USING THE CLOUD

Use any of these services?

YouTube

2,000,000,000 videos viewed DAILY

24 hours of content uploaded every minute

You're already cloud computing.

skype

560,000,000 user accounts in 29 languages

500,000,000 users

the internet's #1 page 2 years in a row

200,000,000 accounts

100,000,000 pages

90,000,000 profiles

Windows Live Hotmail 360,000,000 accounts

275,000,000 webmail accounts

150,000,000 Gmail addresses

photobucket & flickr 50,000,000 users EACH

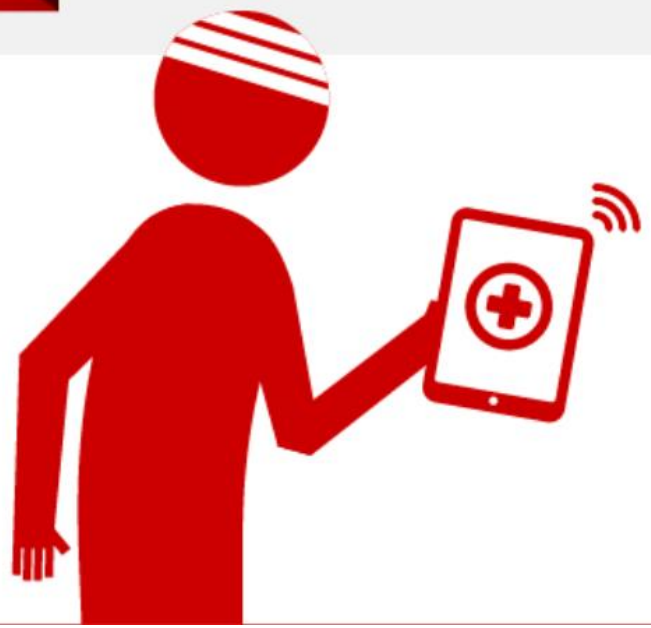
500,000 accounts

Is Mobile Healthcare
THE FUTURE?

What is mHealth?

mHealth or *mobile health* is a term used for the practice of medicine and public health, supported by mobile devices.

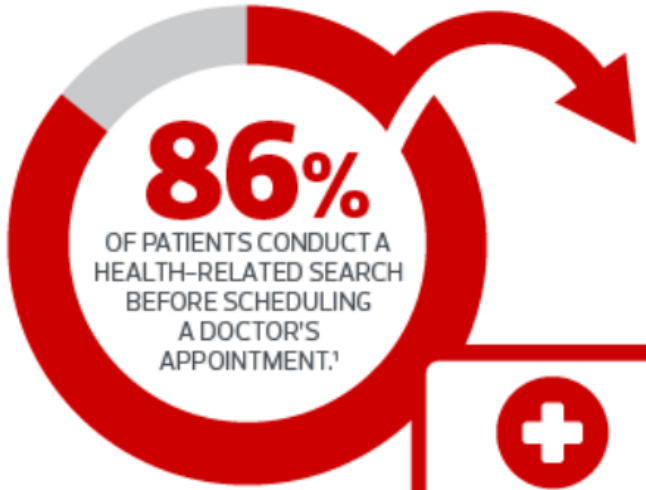
TODAY'S DIGITAL PATIENT



From pre-screening potential doctors to viewing their treatment information and keeping tabs on their exercise regimes –
modern patients are online AND IN TOUCH.

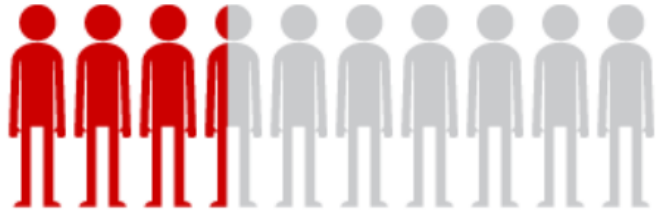
The digital patient is...

EDUCATED AND INFORMED BEFORE SEEING A DOCTOR



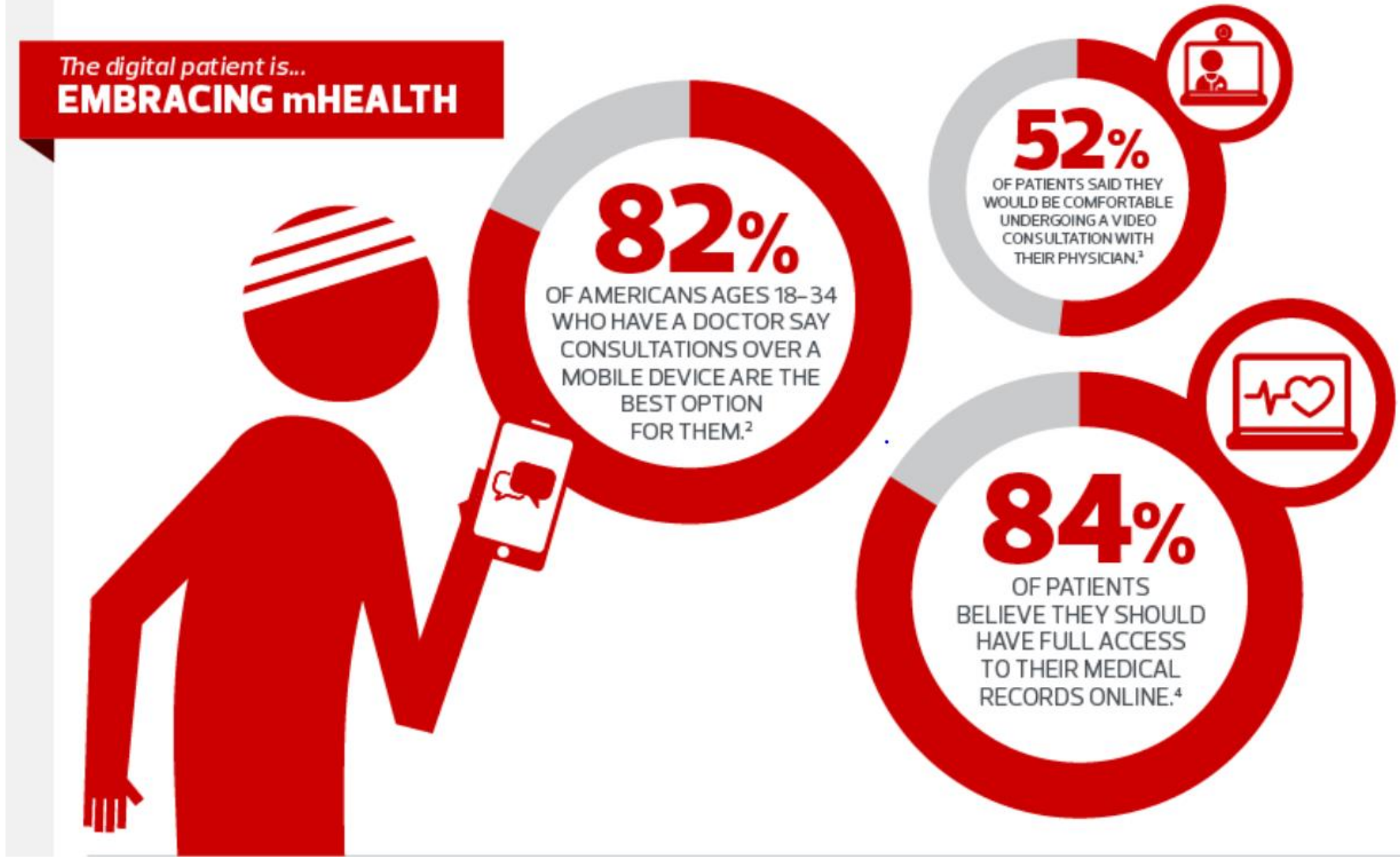
HALF OF ALL PATIENTS

WHO USE THE INTERNET TO SELF-DIAGNOSE ULTIMATELY SCHEDULE A DOCTOR'S APPOINTMENT.[1]



MORE THAN **33%** OF AMERICANS USE SOCIAL MEDIA TO RESEARCH HEALTH CONDITIONS.[1]

41% SAY SOCIAL MEDIA IMPACTS THEIR CHOICE OF HEALTHCARE PROVIDERS.[1]


The digital patient is...
EMBRACING mHEALTH
82%
OF AMERICANS AGES 18–34 WHO HAVE A DOCTOR SAY CONSULTATIONS OVER A MOBILE DEVICE ARE THE BEST OPTION FOR THEM.[2]
52%
OF PATIENTS SAID THEY WOULD BE COMFORTABLE UNDERGOING A VIDEO CONSULTATION WITH THEIR PHYSICIAN.[3]
84%
OF PATIENTS BELIEVE THEY SHOULD HAVE FULL ACCESS TO THEIR MEDICAL RECORDS ONLINE.[4]

The digital patient is...
EMPOWERED

mHEALTH TECHNOLOGY IS POSITIVELY INFLUENCING PEOPLE TO TAKE CHARGE OF THEIR OWN WELL-BEING:[7]

THE NUMBER OF ADULTS USING SMARTPHONES TO MONITOR THEIR HEALTH GREW TO **75 MILLION** IN 2012. IT'S PROJECTED TO INCREASE MORE THAN THREEFOLD BY THE END OF 2014.

70% OF THE TOP-SELLING WEARABLE DEVICES ARE DEDICATED TO FITNESS.

CONSUMERS WILL SPORT ALMOST **112 MILLION WEARABLES** BY 2018.

247 MILLION AMERICANS HAVE DOWNLOADED A HEALTHCARE APP FOR THEIR PERSONAL USE.[3]

SECURE CONNECTIONS WITH DIGITAL PATIENTS ARE THE KEY TO mHEALTH SUCCESS

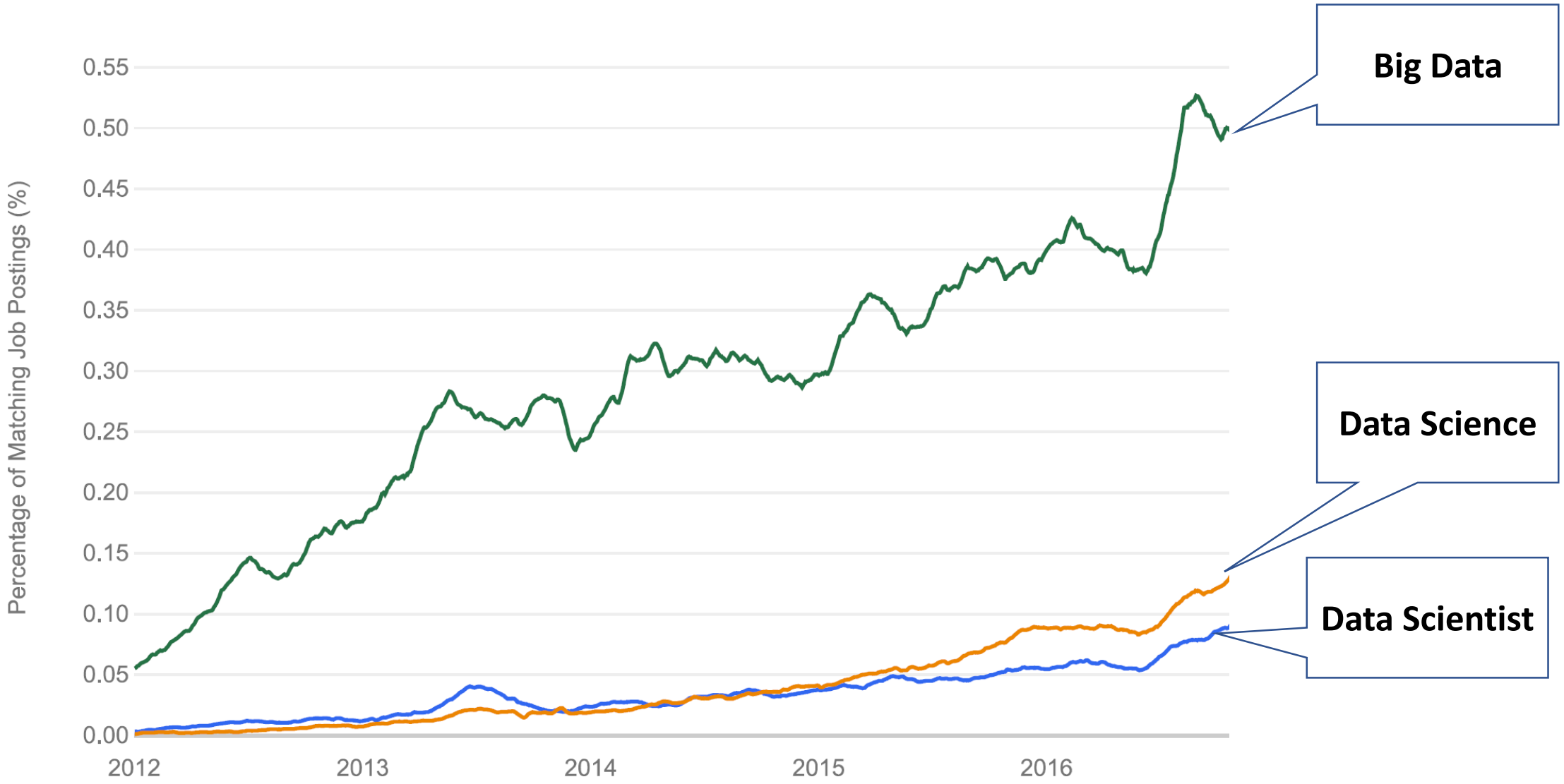
39% OF FREE AND 30% OF PAID HEALTH/FITNESS APPS SENT INFORMATION TO SOMEONE NOT DISCLOSED BY THE DEVELOPER.[8]

SECURITY WAS THE #1 CONCERN AMONG INDIVIDUALS SURVEYED ON THE FLOOR AT HIMSS14.[9]

THE USE OF PERSONAL MOBILE DEVICES IN HEALTHCARE SETTINGS IS PROVIDERS' **SECOND BIGGEST CONCERN** WITH DATA SECURITY.[10]

THE RISK OF A DATA BREACH WORRIED 45% OF RESPONDENTS, WHILE MANY QUESTIONED THE ABILITY OF mHEALTH TO MEET PATIENT PRIVACY STANDARDS INHERENT IN HIPAA.[9]

Data Scientist, Data Science, Big Data



Source : Job trend from https://www.indeed.com

ระเบียบกระทรวงสาธารณสุข
เรื่อง การคุ้มครองและจัดการข้อมูลด้านสุขภาพของบุคคล พ.ศ. ๒๕๖๑

General Data Protection Regulation

GDPR

Welcome to gdpr-info.eu. Here you can find the official PDF of the Regulation (EU) 2016/679 (General Data Protection Regulation) in the current version of the OJ L 119, 04.05.2016; cor. OJ L 127, 23.5.2018 as a neatly arranged website. All Articles of the GDPR are linked with suitable recitals. The European Data Protection Regulation is applicable as of May 25th, 2018 in all member states to harmonize data privacy laws across Europe. If you find the page useful, feel free to support us by sharing the project.

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