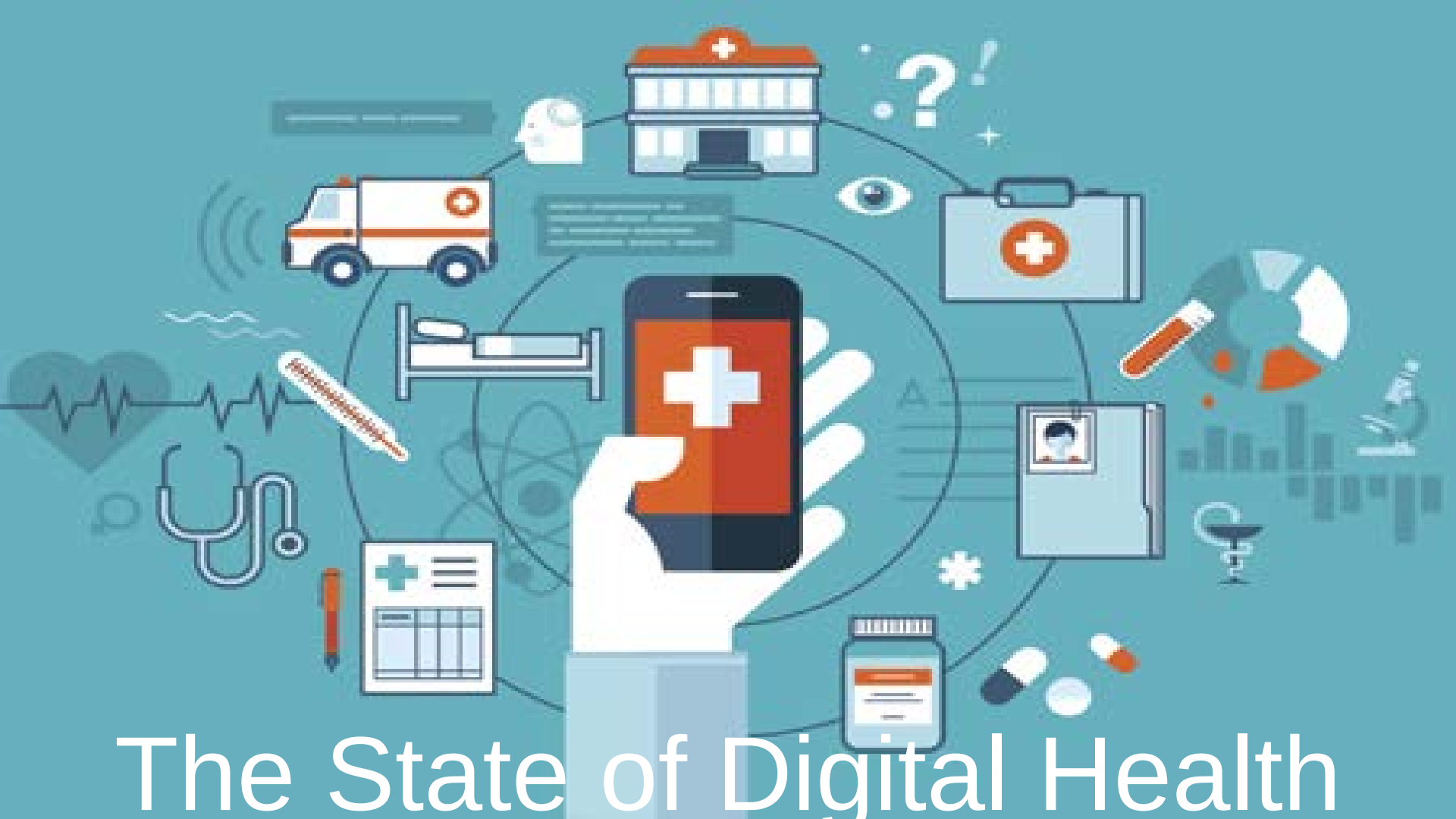


The State of Digital Health

IntraHealth
INTERNATIONAL
Because Health Workers Save Lives.

JSI

Global Digital Health Network
Formerly the mHealth Working Group

fhi360
THE SCIENCE OF IMPROVING LIVES

DAI
Shaping a more livable world.

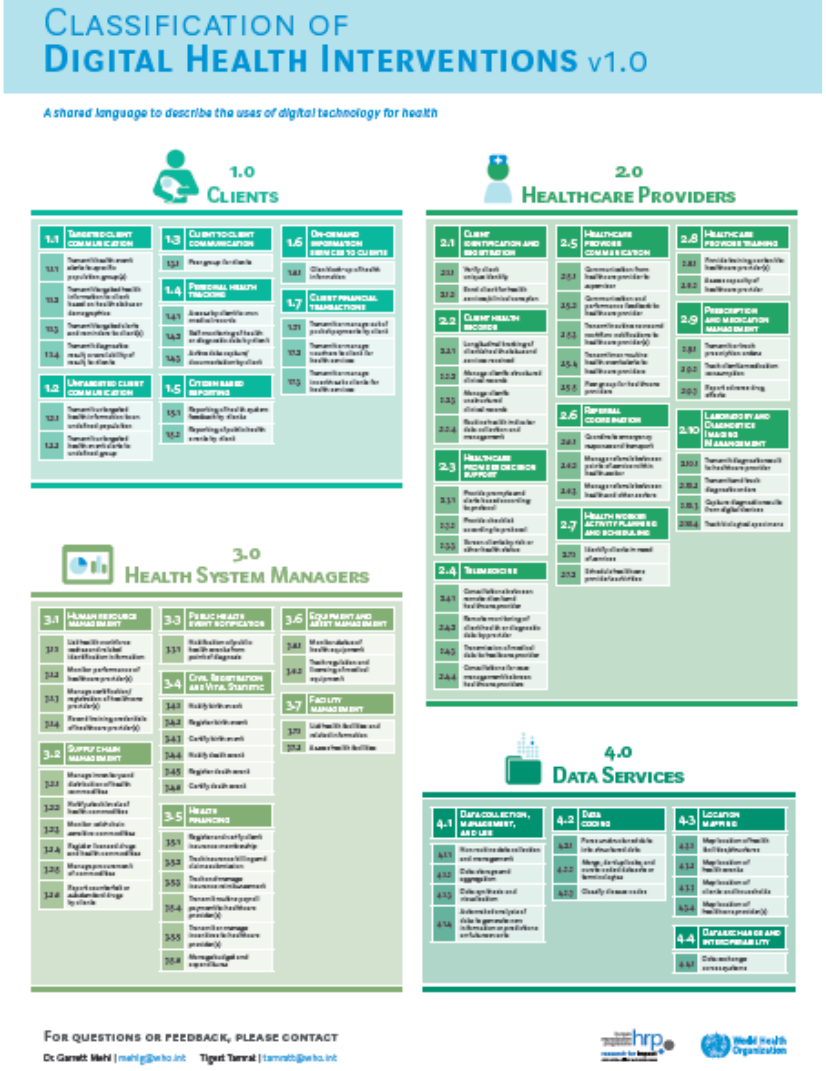
What is Digital Health?

- (Digital Health, eHealth) Umbrella terms to encompass all concepts and activities at the intersection of health and information and communications technologies (ICTs), including mobile health (mHealth), health information technology, electronic health records (EHRs), and telehealth, and encompassing three main functions:
  - the delivery of health information, for health professionals and health consumers, through the Internet and telecommunications media,
  - using ICTs to improve public health services (e.g., through the education and training of health workers), and
  - using health information systems (HIS) to capture, store, manage or transmit information on patient health or health facility activities.

Broadband Commission Working Group on Digital final report "**Digital Health: A call for Government Leadership and Cooperation between ICT and Health“** http://broadbandcommission.org/workinggroups/Pages/digitalhealth.aspx

Common Digital Health Interventions

Labrique AB, Vasudevan L, Kochi E, Fabricant R, Mehl G. mHealth innovations as health system strengthening tools: 12 common applications and a visual framework. Glob Health Sci Pract. 2013;1(2):160-171. http://dx.doi.org/10.9745/GHSP-D-13-00031.



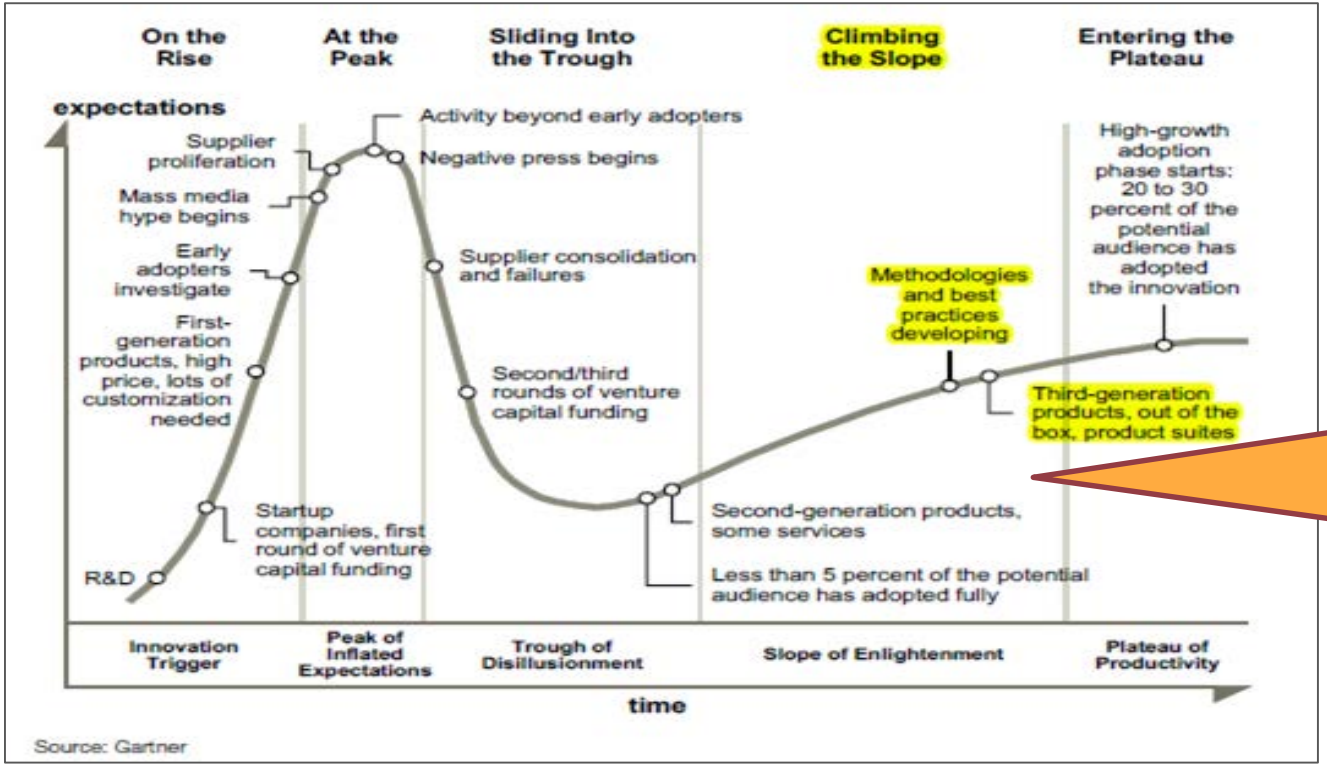
New Taxonomy...

http://www.who.int/reproductivehealth/publications/mhealth/classification-digital-health-interventions/en/

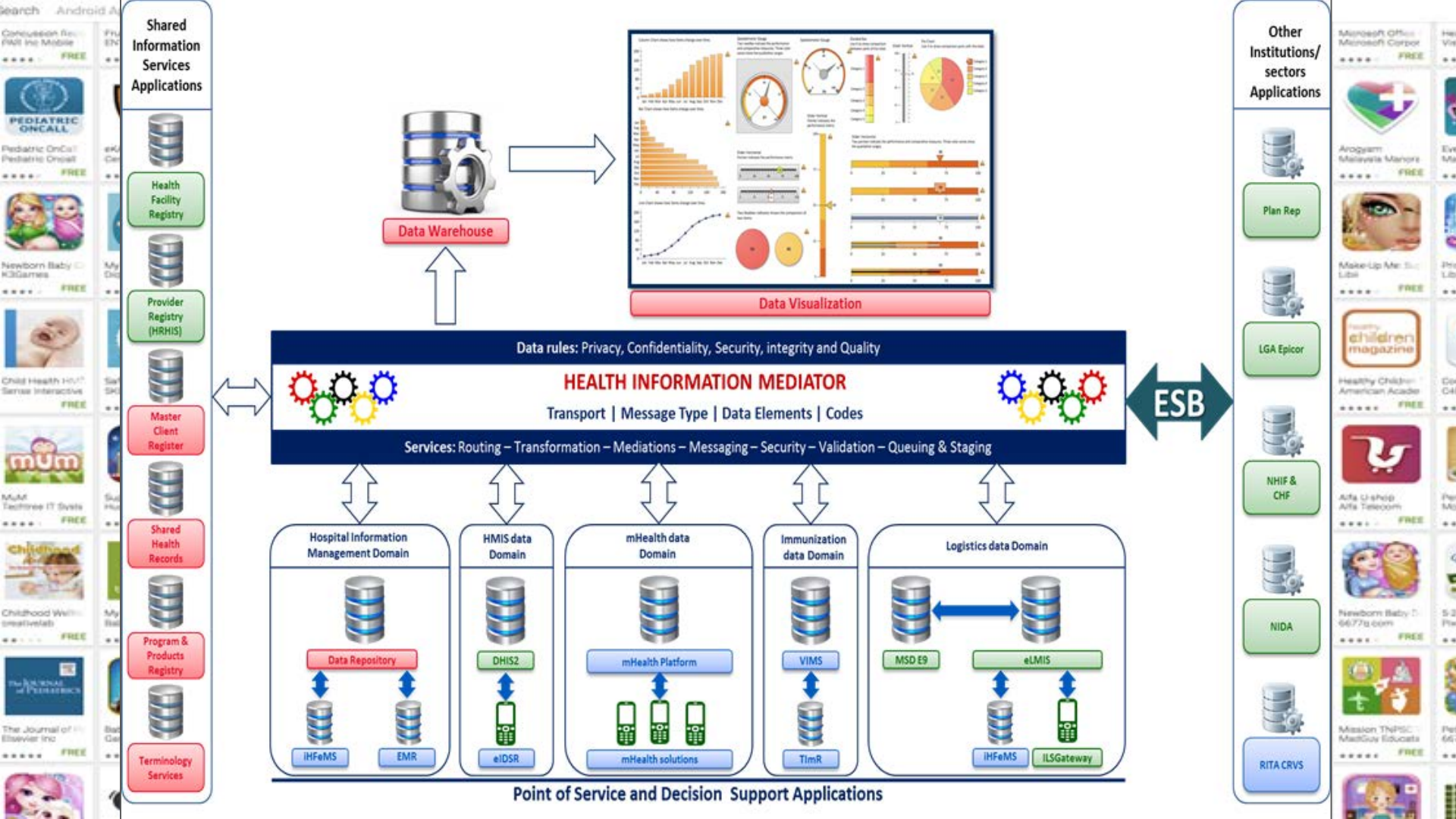
...to address persistent challenges

Trends in Digital Health

- Climbing the slope?



- Toolkits and Frameworks
- Standards and Interoperability
- Collaboration
- Global Goods
- Productization


Shared Information Services Applications
Health Facility Registry
Provider Registry (HRHIS)
Master Client Register
Shared Health Records
Program & Products Registry
Terminology Services
Data Warehouse
Data Visualization
Data rules: Privacy, Confidentiality, Security, integrity and Quality
HEALTH INFORMATION MEDIATOR
Transport | Message Type | Data Elements | Codes
Services: Routing – Transformation – Mediations – Messaging – Security – Validation – Queuing & Staging
ESB
Hospital Information Management Domain
Data Repository
iHFeMS
EMR
HMIS data Domain
DHIS2
eIDSR
mHealth data Domain
mHealth Platform
mHealth solutions
Immunization data Domain
VIMS
TImR
Logistics data Domain
MSD E9
eLMIS
iHFeMS
ILSGateway
Point of Service and Decision Support Applications
Other Institutions/ sectors Applications
Plan Rep
LGA Epicor
NHIF & CHF
NIDA
RITA CRVS

SONY
+27839300900l...
Babies can be hard work! If you need some rest, ask your partner or family for help. They may enjoy playing with your baby while you rest.
Listen to the sounds your baby makes. Talk to him. he needs Vitamin A from the clinic at 9 months, then every 6 months until he turns 5.

DIGITAL INVESTMENT PRINCIPLES

Digital Investment Principles

1. Collaborate

Collaborate to align investments with national digital health strategies.

2. Invest in national plans

Prioritise investments in **national plans that incorporate "digital global goods**" and avoid bespoke systems.

3. Enable sustainable investment

Engage early to **determine and quantify long-term costs** of operating, maintaining, and supporting digital health systems for sustainable country ownership.

4. Track & measure

Track investments, progress, learnings and successes in digital health systems in a transparent manner.

5. Strengthen skills

Strengthen donor technical skills and core capacities, including awareness of the Principles for Digital Development.

6. Creation and evolution

The **creation and evolution** of a country's national digital health strategy, policies and regulatory framework. Strategies include components such as architecture, standards, investment frameworks, privacy protection, and detailed operational and monitoring plans.

7. Maturity continuum

Systems at a level appropriate to the country's progress along the **digital health maturity continuum.**

8. Country capacity

Sustainable country capacity for digital health leadership, governance, implementation, oversight, global good adoption, and donor coordination.

9. Global goods

Scalable, sustainable, accessible, interoperable, and evidence-based **digital health global goods** that meet country priorities.

10. Information and peer-learning

Diverse stakeholder **information-sharing and peer-learning networks** at country and regional levels to foster coordination and alignment of implementation activities.

http://digitalinvestmentprinciples.org/

More resources

- Global Digital Health Network
- Global Digital Health Index
- WHO Digital Health Atlas
- Digital Square - Global Goods
- Open HIE
- Asian eHealth Information Network

digital square

GLOBAL GOODS

Global Utility	**Community Support**	**Software Maturity**
- Country Utilization - Country Strategy - Digital Health Interventions - Source Code Accessibility - Funding and Revenue	- Developer, Contributor and Implementor Community Engagement - Community Governance - Software Roadmap User Documentation	- Multi-Lingual Support - Technical Documentation - Software Productization - Interoperability and Data Accessibility - Security - Scalability

Global Good Maturity

Global Good Maturity

OpenMRS

Global Good Maturity

Principles *for* Digital Development

- Design with the User
- Understand the Existing Ecosystem
- Design For Scale
- Build For Sustainablilty
- Be Data Driven
- Use Open Standards, Open Data, Open Source and Open Innovation
- Reuse and Improve
- Address Privacy and Security
- Be Collaborative

Stewarded by dial Digital Impact Alliance | digitalprinciples.org | #DigitalPrinciples

The State of Digital Health in International Development; New Technologies

Private Sector

•••

Bobby Jefferson,
VP,Chief Technology Officer, DAI
Accredited Investor, Judge, Panelist (6) Social Innovation Funds
Board Member (4) Health Tech Startups, Board Advisor (2) Nonprofit

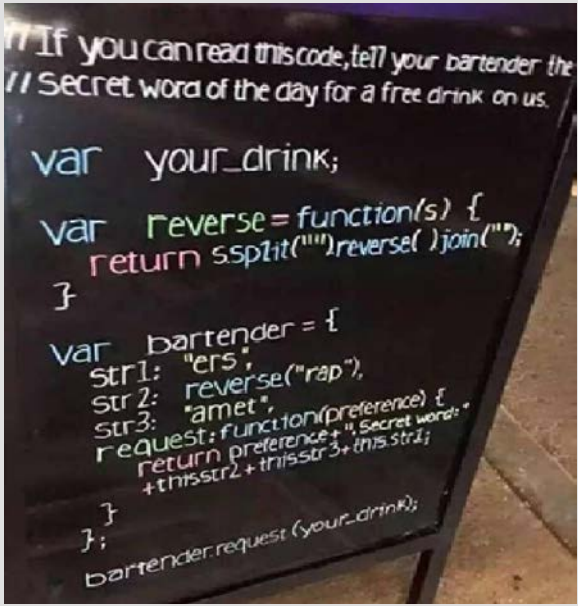
Business Models

Which is a Medical Device ?

Infusion Pump

Blood Glucose Meter

Pulse Oximeter



Software Code

Which is a Medical Device ?

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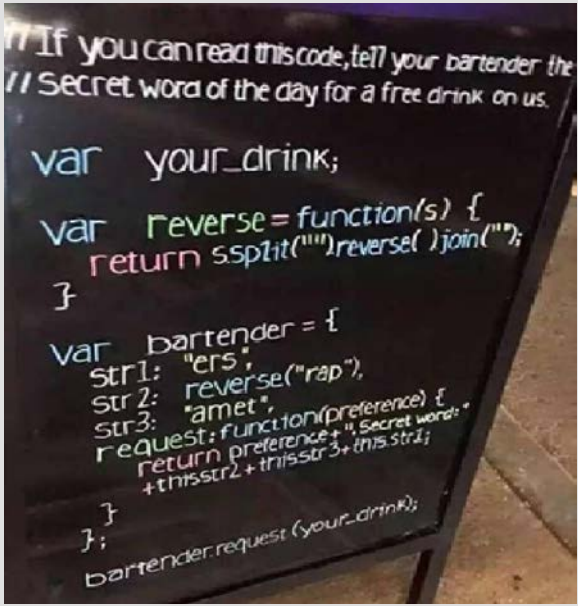
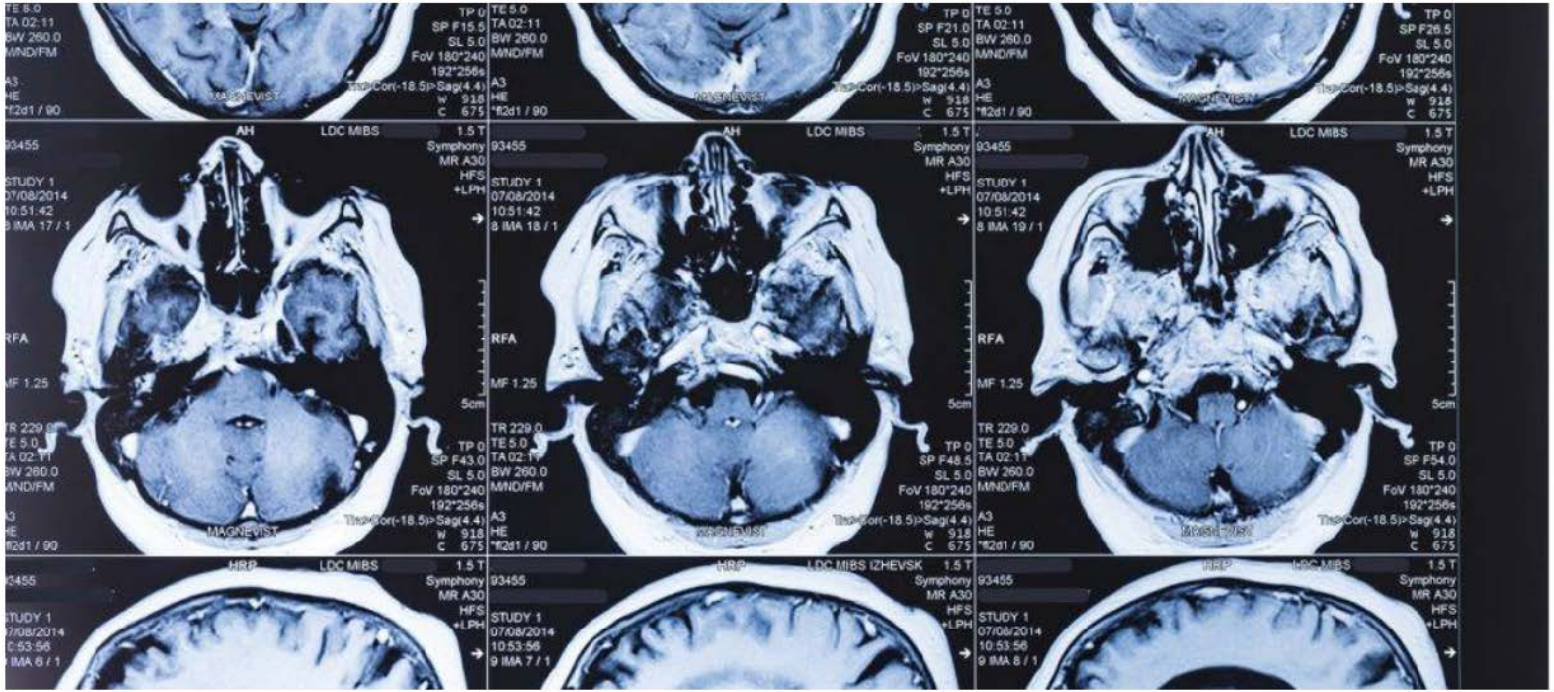


Software as Medical Device (SaMD)

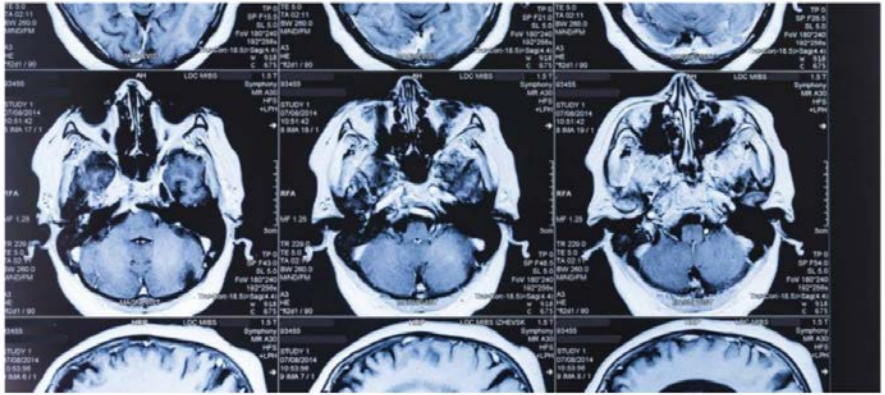
Software as a Medical Device (SaMD) International Medical Device Regulators
https://www.fda.gov/medicaldevices/digitalhealth/softwareasamedicaldevice/default.htm

Rise of AI-as-a-medical-device



The FDA is fast-tracking approvals of artificial intelligence software for clinical imaging & diagnostics.

Rise of AI-as-a-medical-device



The FDA is fast-tracking approvals of artificial intelligence software for clinical imaging & diagnostics.

Startups, Early Stage Companies

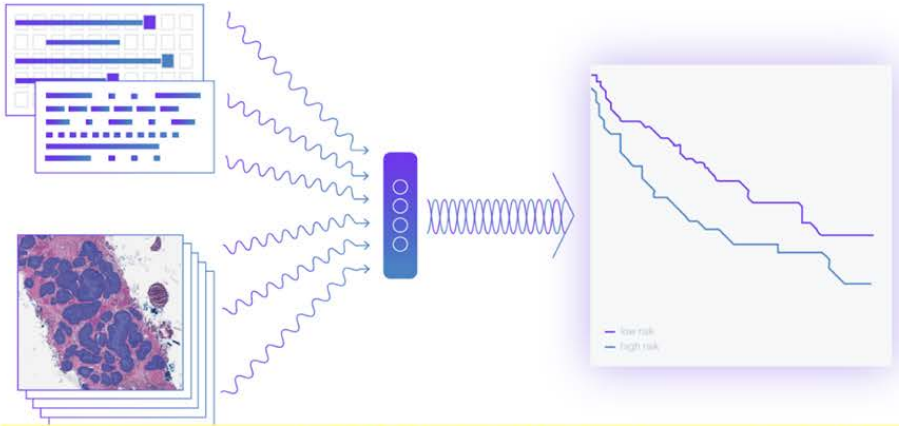
MobileODT®
Mobile Optical Detection Technologies

THINKMD™

ClickMedix
Mobile Healthcare Experts

Paige.AI Created to Transform Cancer Diagnosis and Treatment by Applying Artificial Intelligence to Pathology

Backed by $25 Million Equity Investment and Exclusive Data Licensing Agreement with Memorial Sloan Kettering Cancer Center

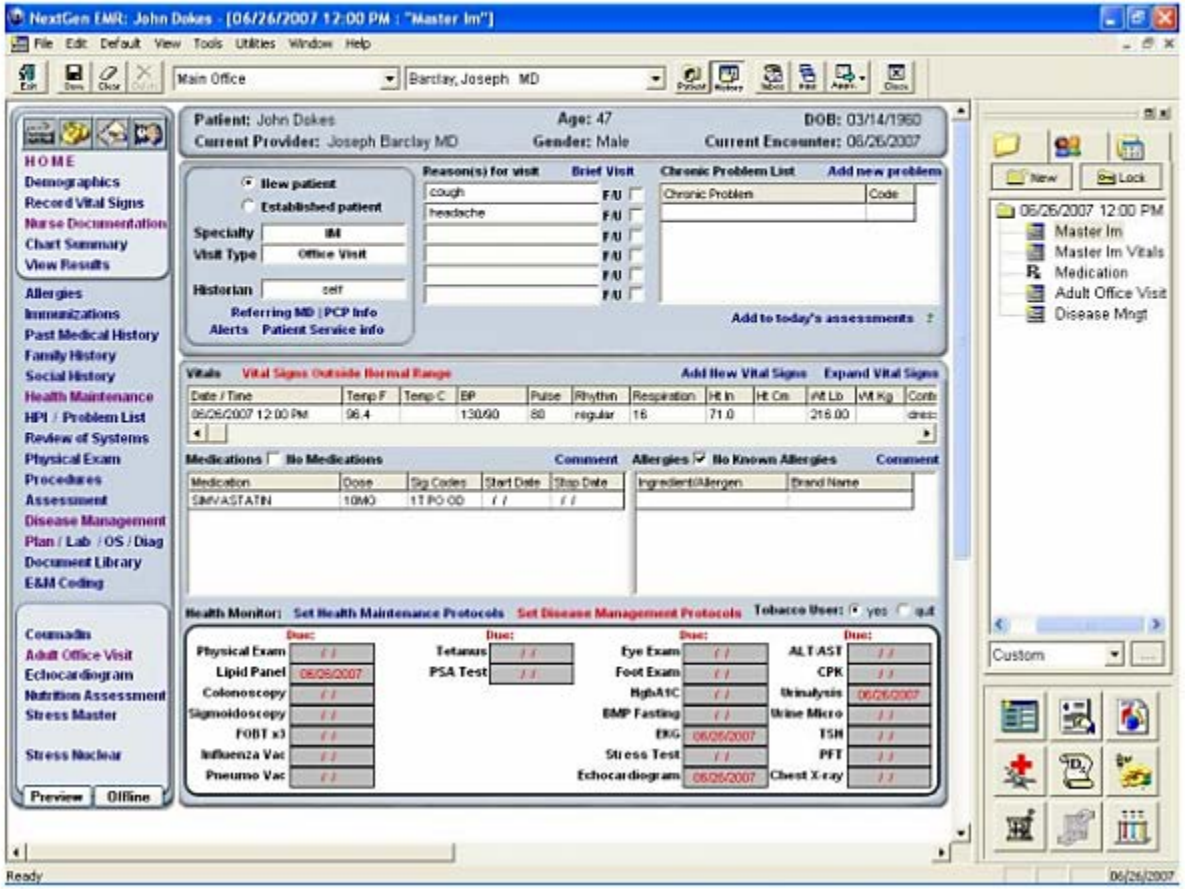


1. **Data at an entirely new scale.**
2. **Unparalleled clinical domain expertise**
3. **An AI Team.**

exclusive access to MSK's intellectual property in the field of computational pathology, as well a
library of 25 million pathology slides. This de-identified data set represents one of the world's lar
archives and will be invaluable to Paige.AI as it builds out a suite of AI applications in pathology.

USER-CENTERED DESIGN

Human Centered Design EMR



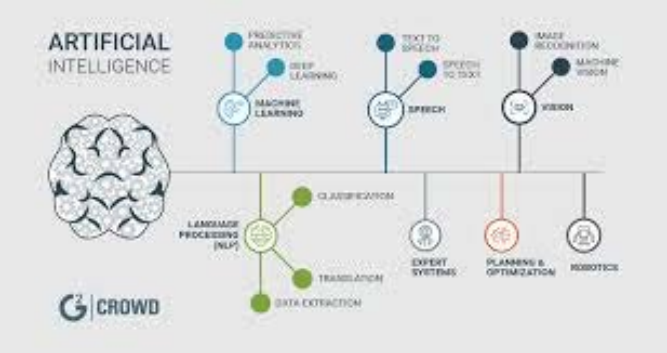
Power BI

tableau

Commercial Software Models, SaaS, DaaS

MINISTRY OF HEALTH

amazon web services™

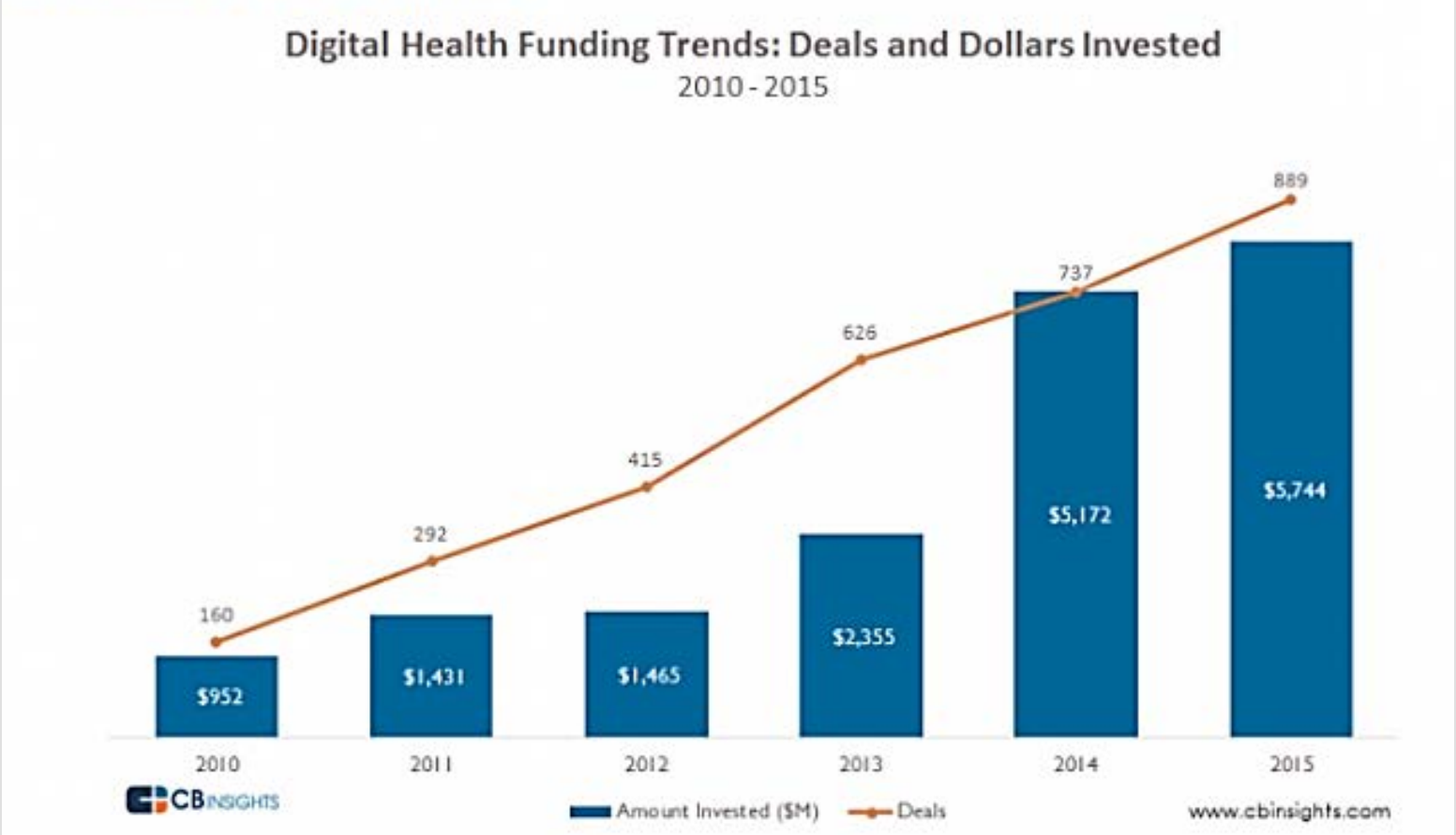


The Health Improvement Network (THIN) database

THIN data electronic medical records of 11.1 million patients (3.7 million active patients) collected from 562 general practices in the UK, covering 6.2% of the UK population. All data are fully anonymised, processed and validated by CSD Medical Research UK.
http://www.ucl.ac.uk/iehc/research/primary-care-and-population-health/research/thin-database/database

DIGITAL HEALTH CONTINUES TO PICK UP STEAM

Digital health as a whole continues to grow, with nearly 900 deals being closed in 2015 as well as more than $5.7B invested



WHO ARE THE TOP DIGITAL HEALTH INVESTORS?

Investors from different parts of the ecosystem are active in the digital health space

Most Active Digital Health Investors of 2015

Rank	Investor	Select Companies
1	Y Combinator	Circle Health, MicroHealth, Akido Labs
2	DreamIt Ventures	Redox, Oncora Medical, CareCierge
2	Rock Health	Sano Intelligence, Amino, Collective Health
4	Qualcomm Ventures	WellTok, goBalto, MediSafe
4	Ben Franklin Technology Partners	Fitly, Grand Rounds, MedStatix
6	Rockstart Accelerator	Med Angel, MOUNT, Cognilab
6	TechStars	Owlet, iDoc24, HealthID
6	Google Ventures	23andMe, One Medical Group, TinyRX
6	True Ventures	Deep Genomics, Lumity, Athos Works
6	Norwest Venture Partners	TigerText, Omada Health, CareCloud
6	Lux Capital	Hometeam, Zipdrug, Pager
6	Merck Global Health Innovation Fund	QueueDr, Ayogo, medCPU
6	GE Ventures	Caremerge, Predixion Software, Aver

CB INSIGHTS

Source: CB Insights

CB INSIGHTS

Challenges to scale and sustainability of digital health innovations

- Interoperability
- Siloed interventions
- Sustainable financial models
- Digital health literacy/capacity among policymakers
- Guidance/coordination
- Evidence v. evolution

Thank You!