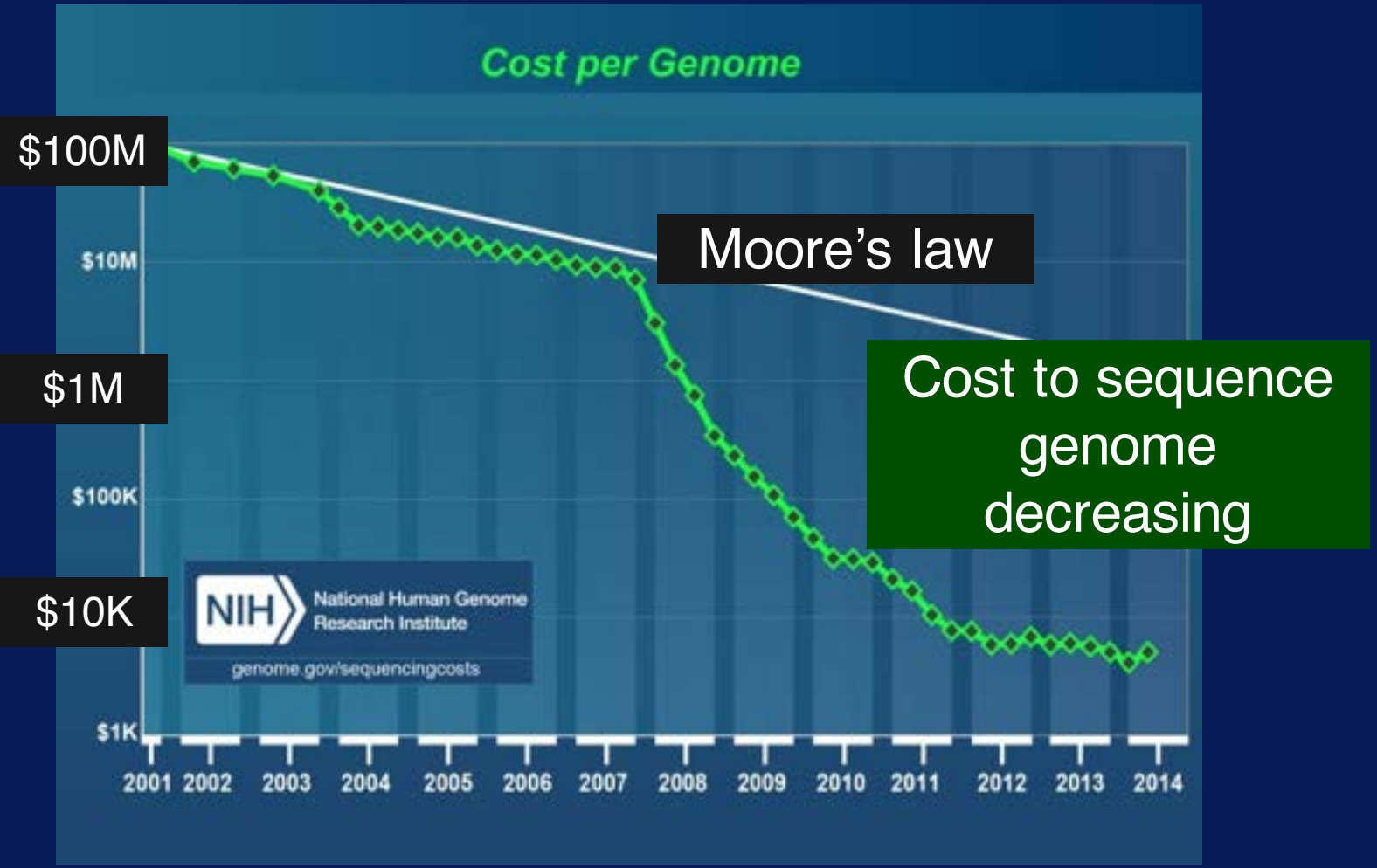
Saving Lives with Big Data: Precision Medicine and Health Informatics

After this video you will be able to..

- Give examples of sensor, organizational, and people-generated data used in precision medicine

- Explain to a friend why the integration of different streams of data is critical to advancing healthcare

Why is this important now?


Cost per Genome
$100M
$10M
$1M
$100K
$10K
$1K
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
NIH
National Human Genome Research Institute
genome.gov/sequencingcosts
Moore's law
Cost to sequence genome decreasing

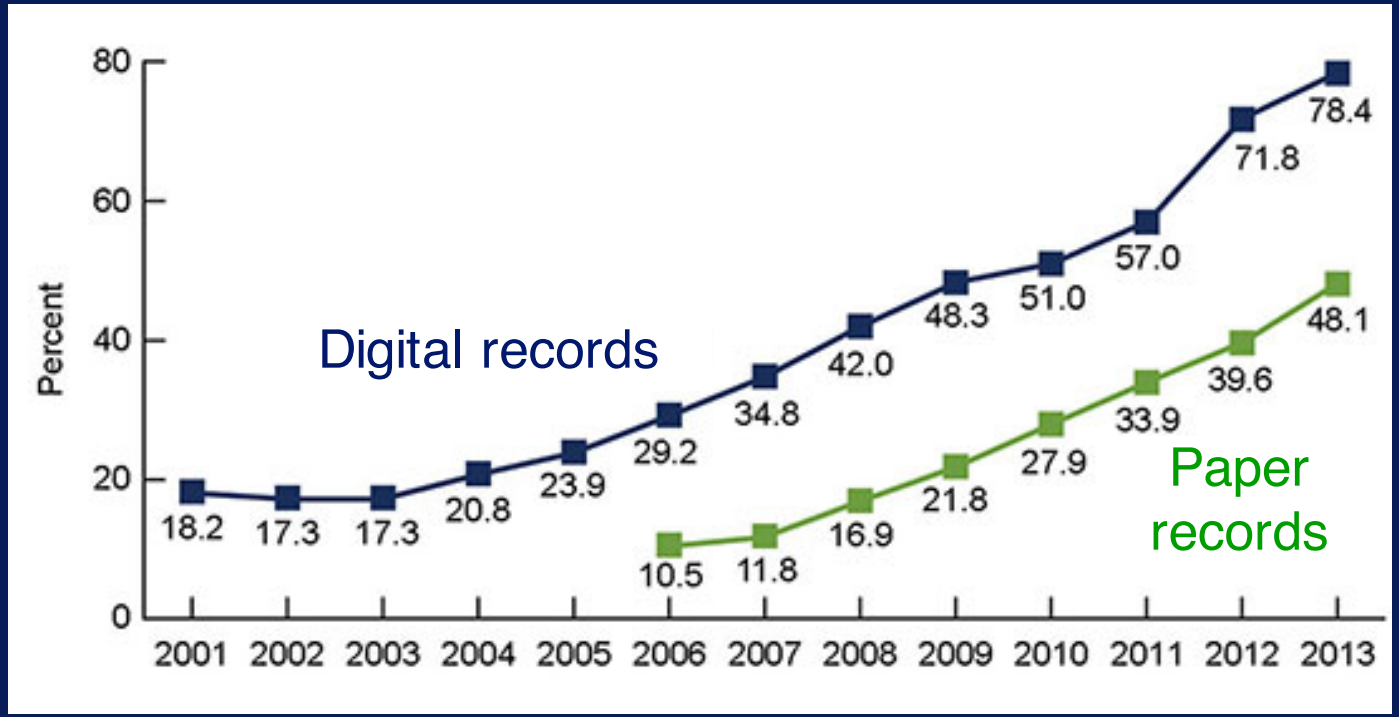
Genome Data Storage

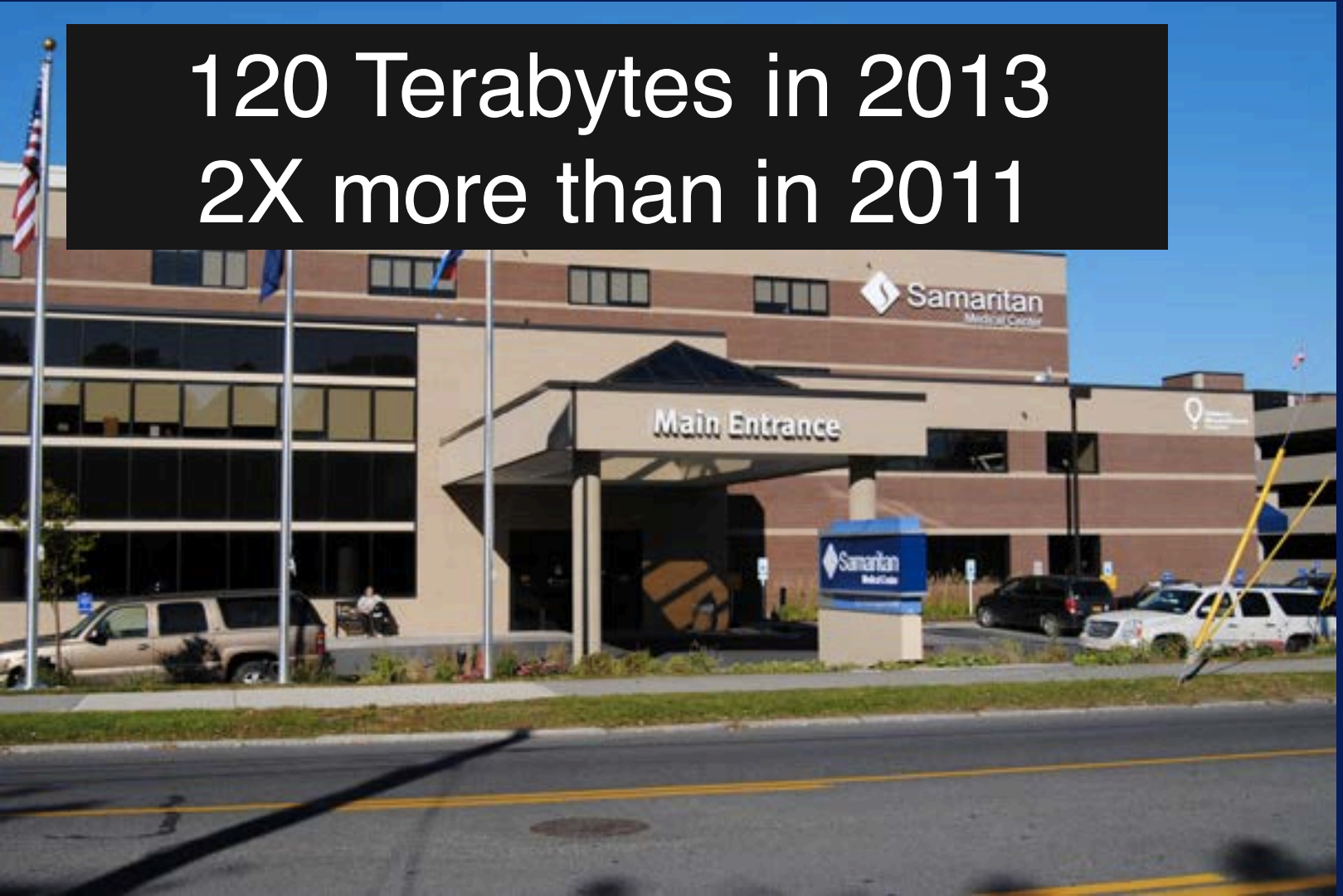
AGTTA → 700MB

→ 200GB

\+ 1 day

Health Records → Digital

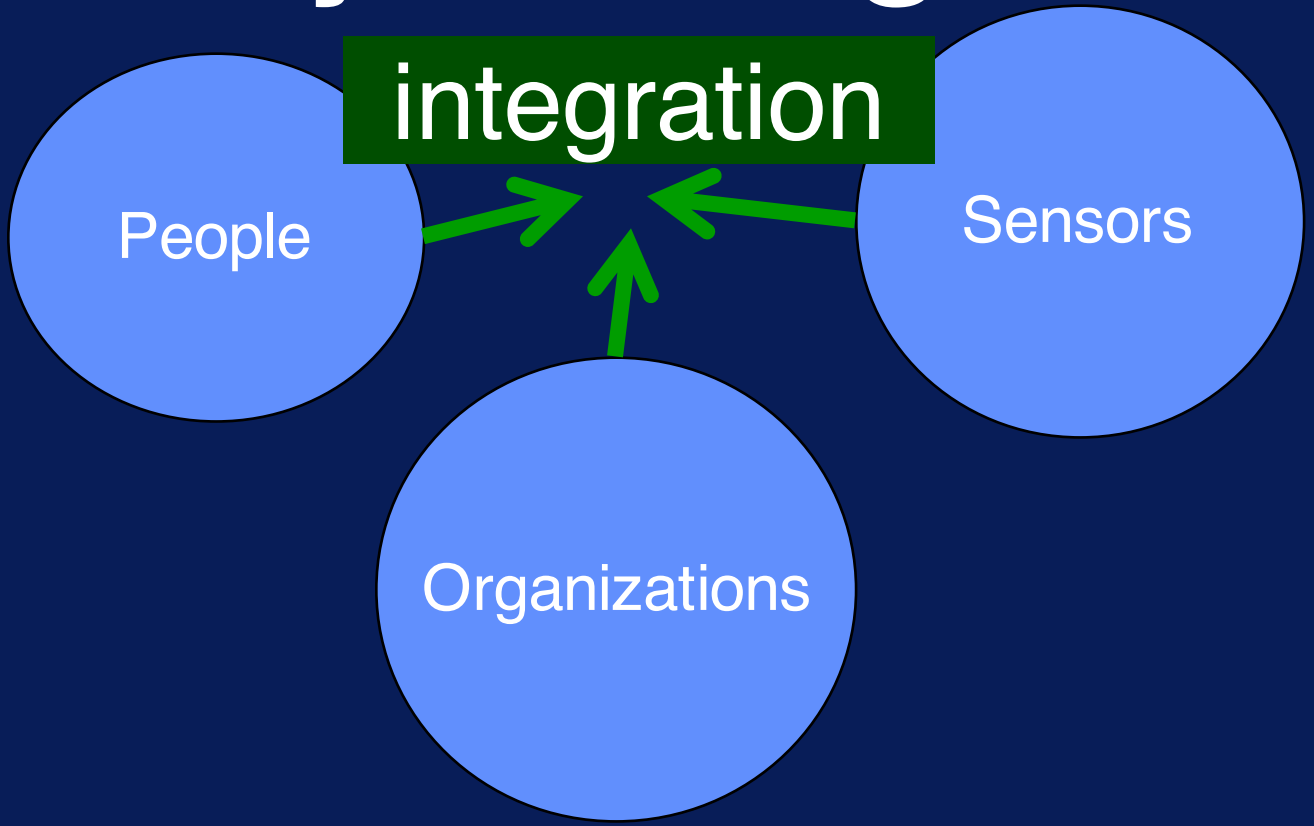



120 Terabytes in 2013
2X more than in 2011
Samaritan
Medical Center
Main Entrance
Samaritan

Recent changes → Big Data for Healthcare

Reduced Cost Analysis
Cheap, Large Data Storage
Digitization of Records

Why can Big Data help?



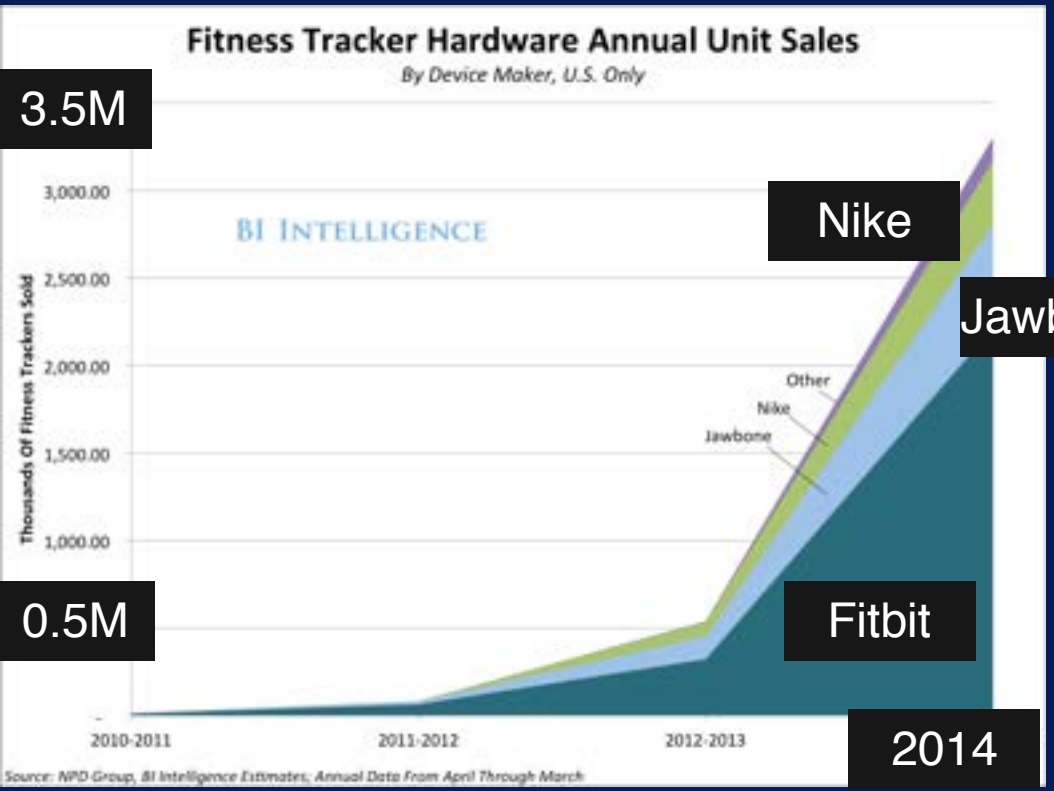
Sensor Data

101100010 →

Sensor Data

More sensors, More places
Data → Storage & Analysis

Fitness Device Industry



3.5M

Nike

Jawbone

0.5M

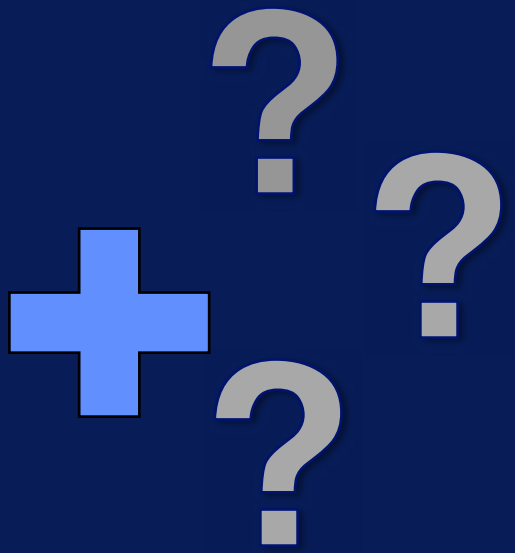
Fitbit

2014

Data Generated?

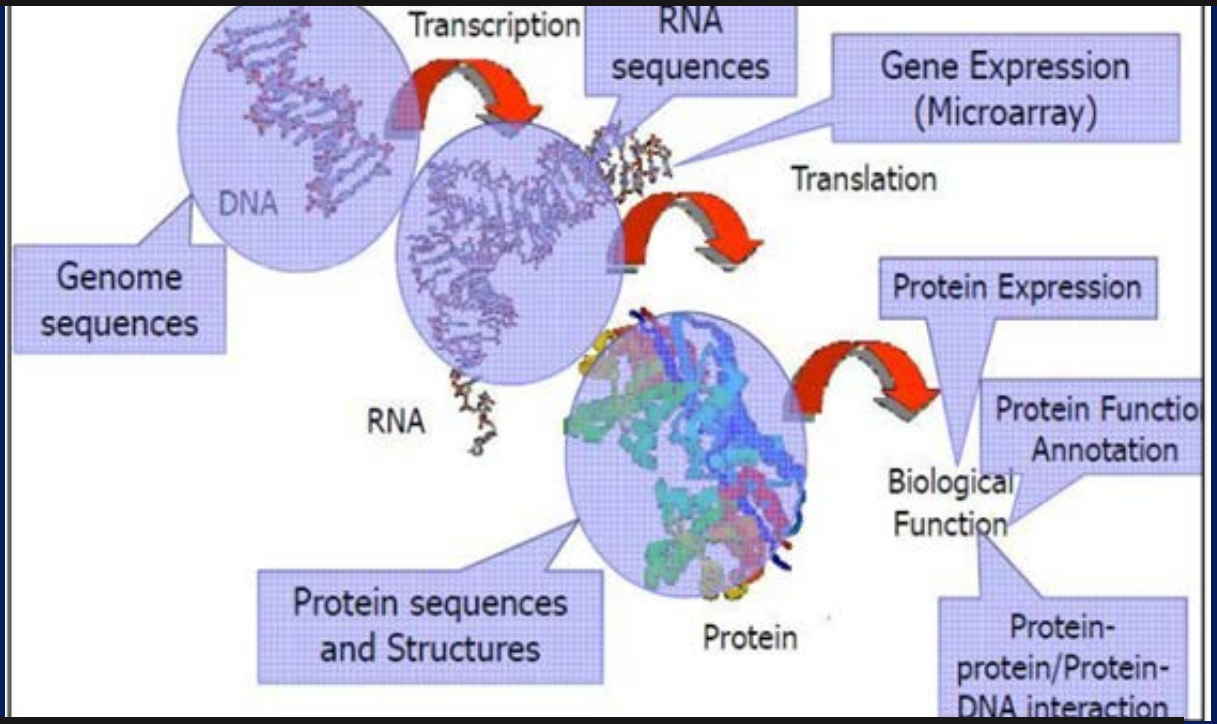
2-5 GB / day

Save health care costs?



Organization Data

Scientific Data and Knowledge-bases



National Center for Biotechnology Information

Experimental Data

+

Computed Data

Scientific Data and Knowledge-bases

People Data

Mobile Health Apps

Webby

• 2015 •
PEOPLE'S VOICE

>100,000 health apps
(iTunes & Google Play)

By 2017 →
$26 billion market?

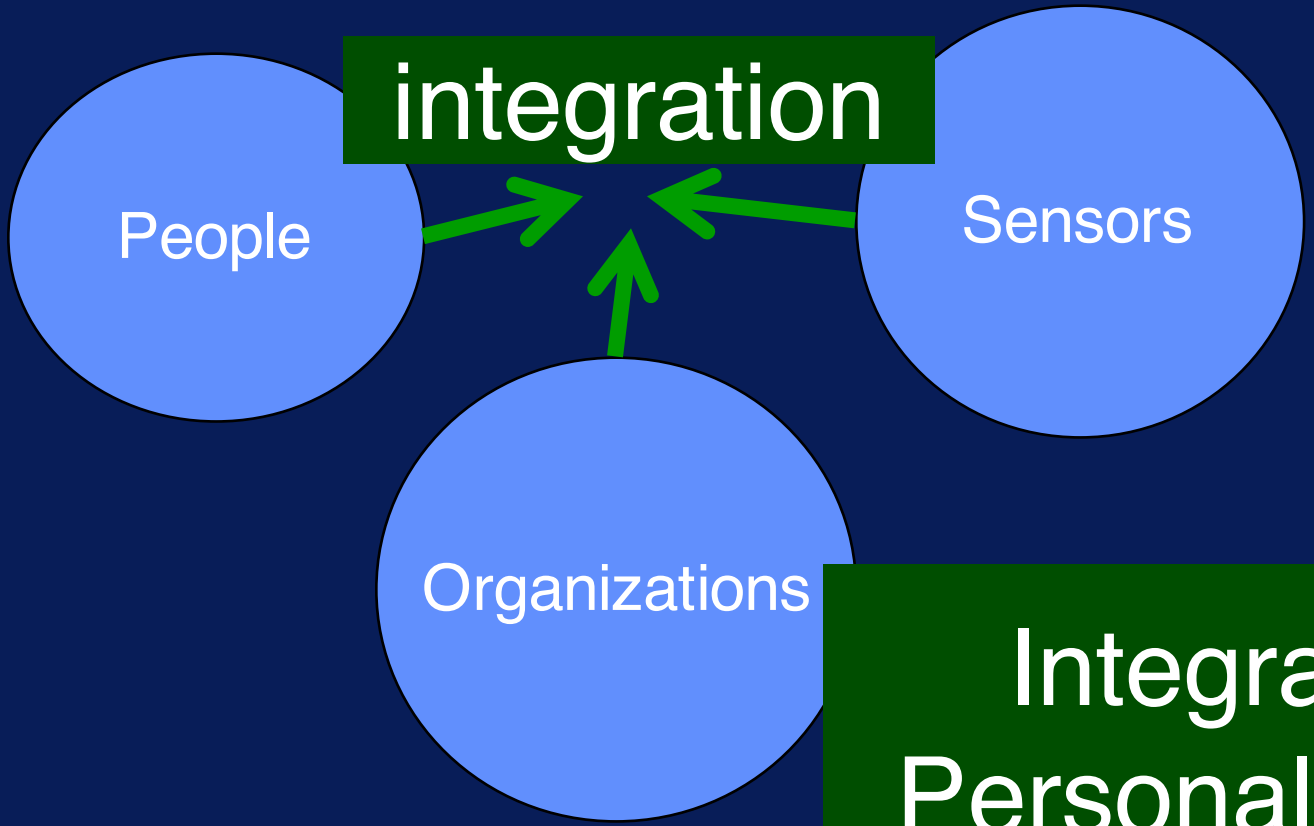
A story:
The impact of novel people-generated data

Have you had any reactions to your medications?

It's been a month… Was that a reaction?

Today → Self-Reported Data
Social Media

Integration →
Personalization →
Precision



Integration →
Personalization →
Precision