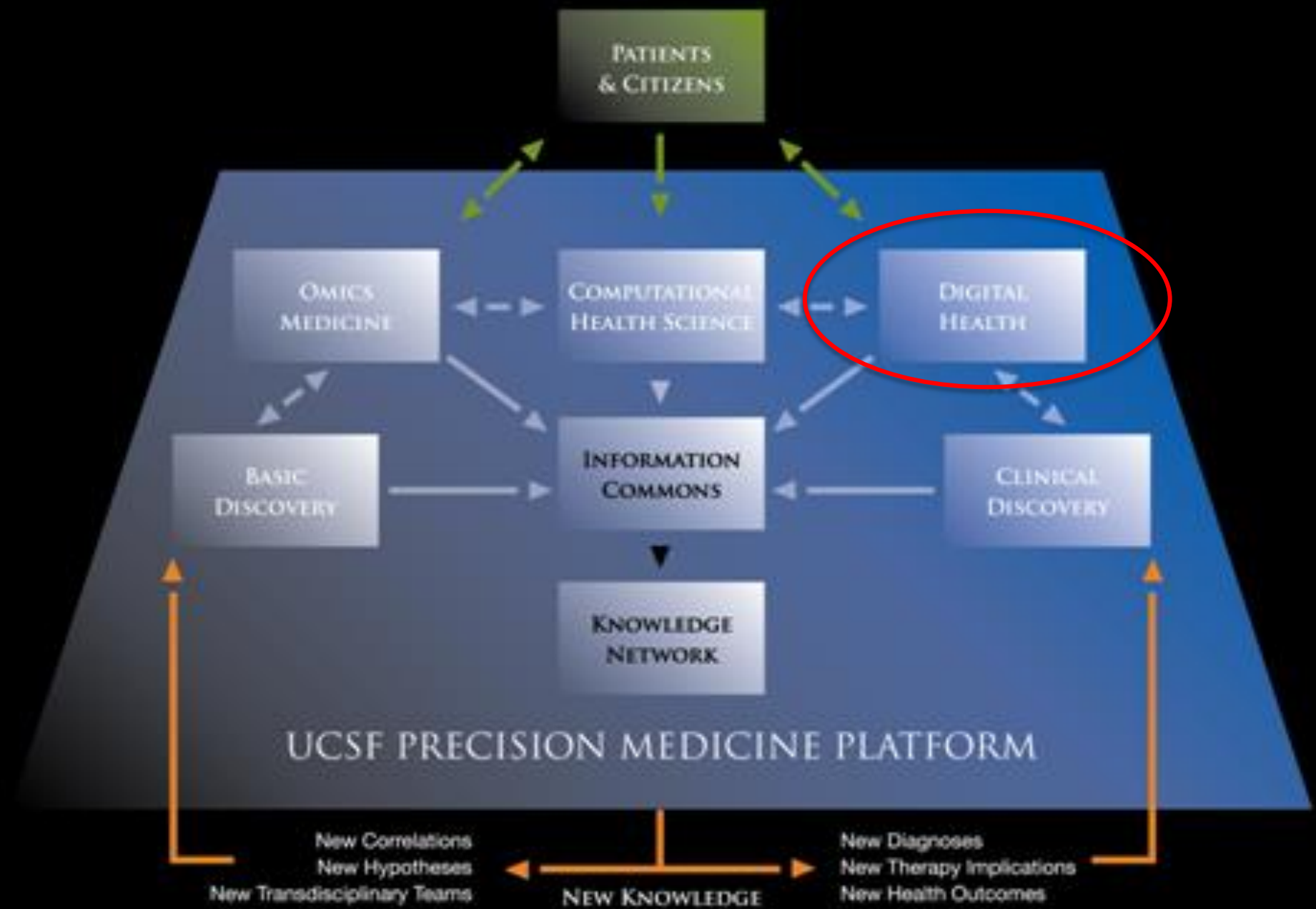# Digital Health and the Evolving Healthcare Landscape

Michael Blum, MD, FACC
Assoc Vice Chancellor for Informatics
Dir, Center for Digital Health Innovation

Commonwealth Fund
Digital Health Briefing
December 8, 2014

Precision Medicine

- Giant leap past *personalized medicine* and reliance upon basic genomics

- Proposes an new ontology that describes diseases based on their molecular mechanisms rather than tissue of origin

- Application of pan-omic analysis and systems biology to analyze the cause of an individual patient's disease at the molecular level

- Using very large data sets
  - makes individualized disease progression and outcome predictions
  - Highly targeted treatments

UCSF PRECISION MEDICINE PLATFORM

Digital technologies, mobility, and Social Media have fundamentally transformed how we communicate

- **121 billion** minutes on social media sites in one month (July 2012)
- **230,060 person-years** spent on-line
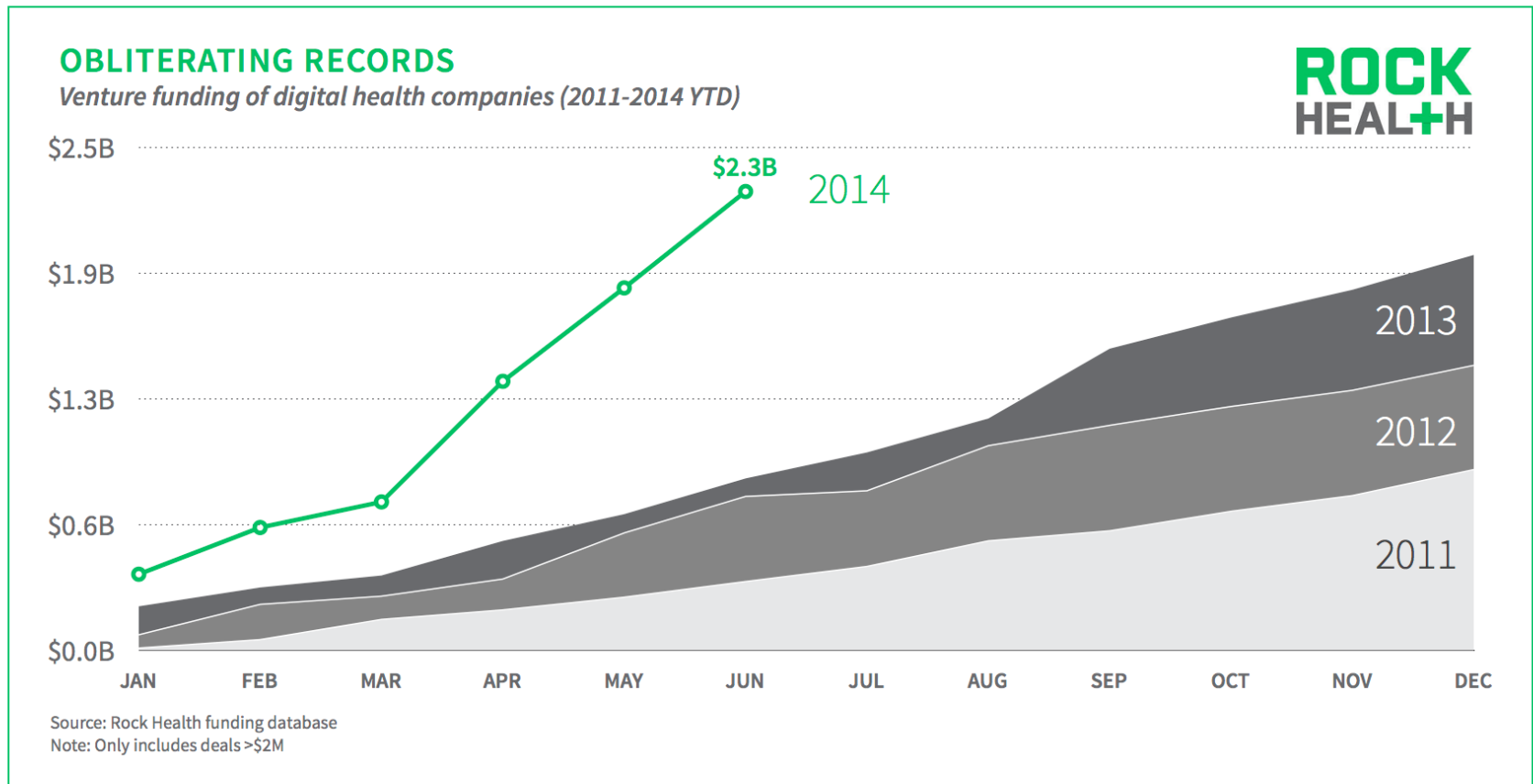- **39 hours on-line per month**

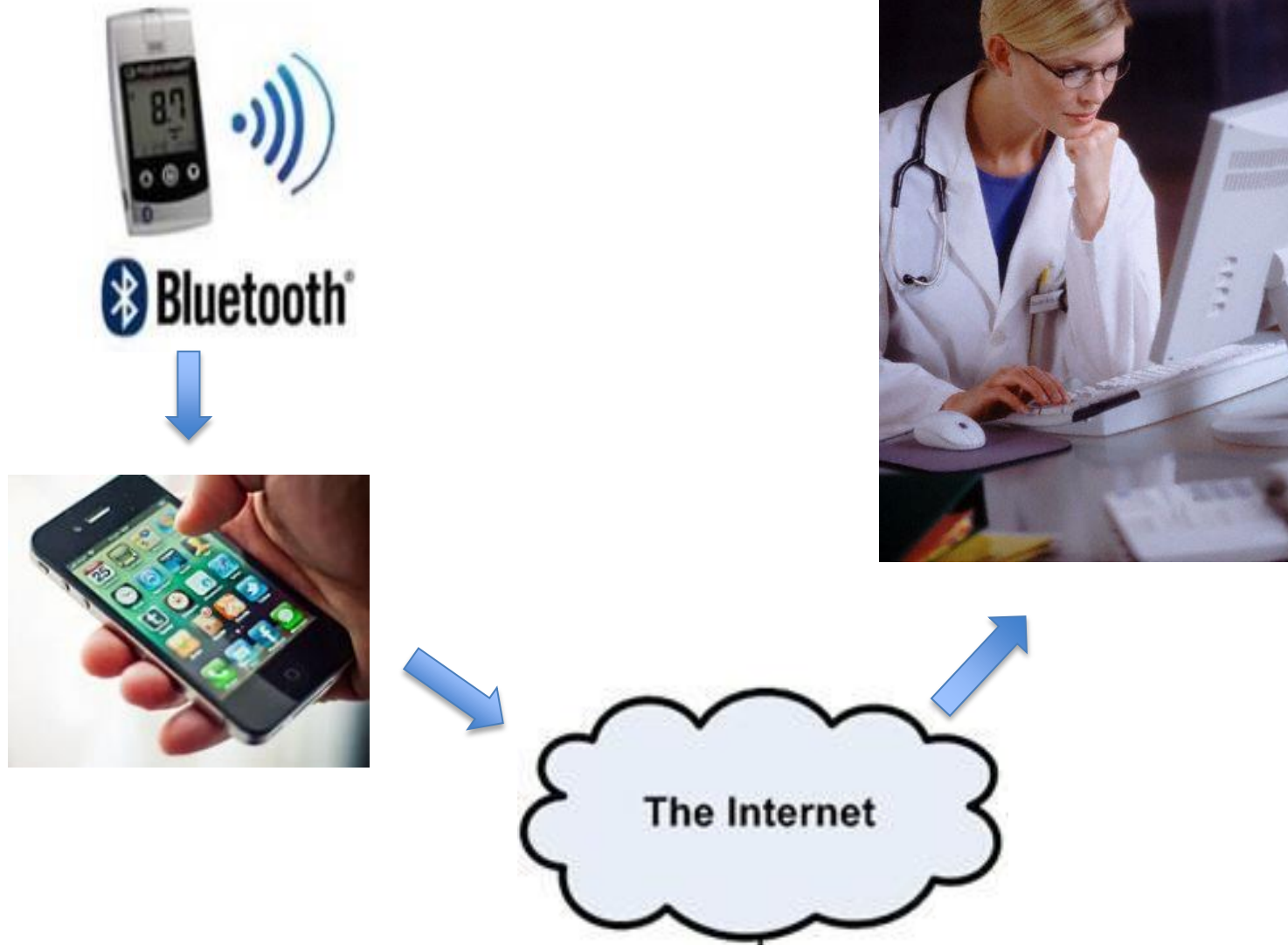**We are social creatures and we expect to be connected and mobile!**

Incredible connected digital health devices

The context: Interest in digital health is growing

OBLITERATING RECORDS
Venture funding of digital health companies (2011-2014 YTD)

ROCK HEAL+H

2014 — $2.3B

2013
2012
2011

Source: Rock Health funding database
Note: Only includes deals >$2M

The Fairy Tale

The Internet

The Reality – the "Last Mile"

UCSF Center for Digital Health Innovation

Focus

Innovate

We provide UCSF faculty, students, and staff with the essential support and resources to create transformative technologies.

Validate

We leverage UCSF's clinical trial resources to test, validate, and iterate on novel technologies.
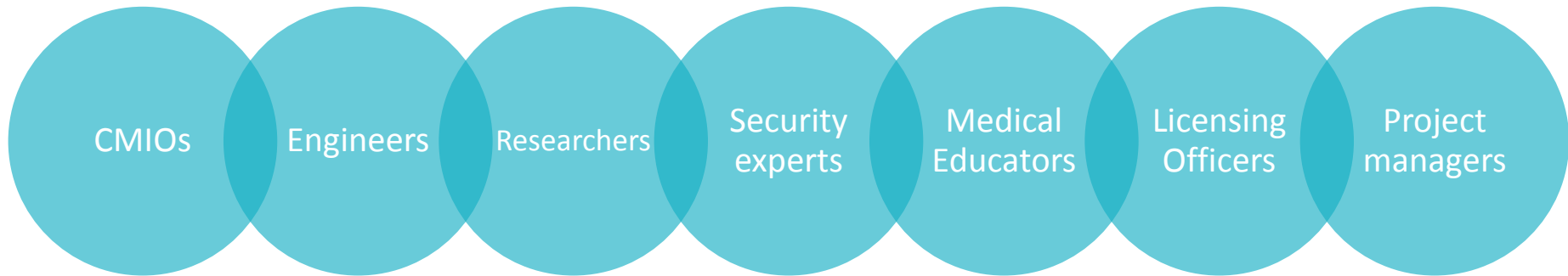
Integrate

We focus on the integration of new technologies in real clinical environments to ensure that technologies can be used by patients and providers.
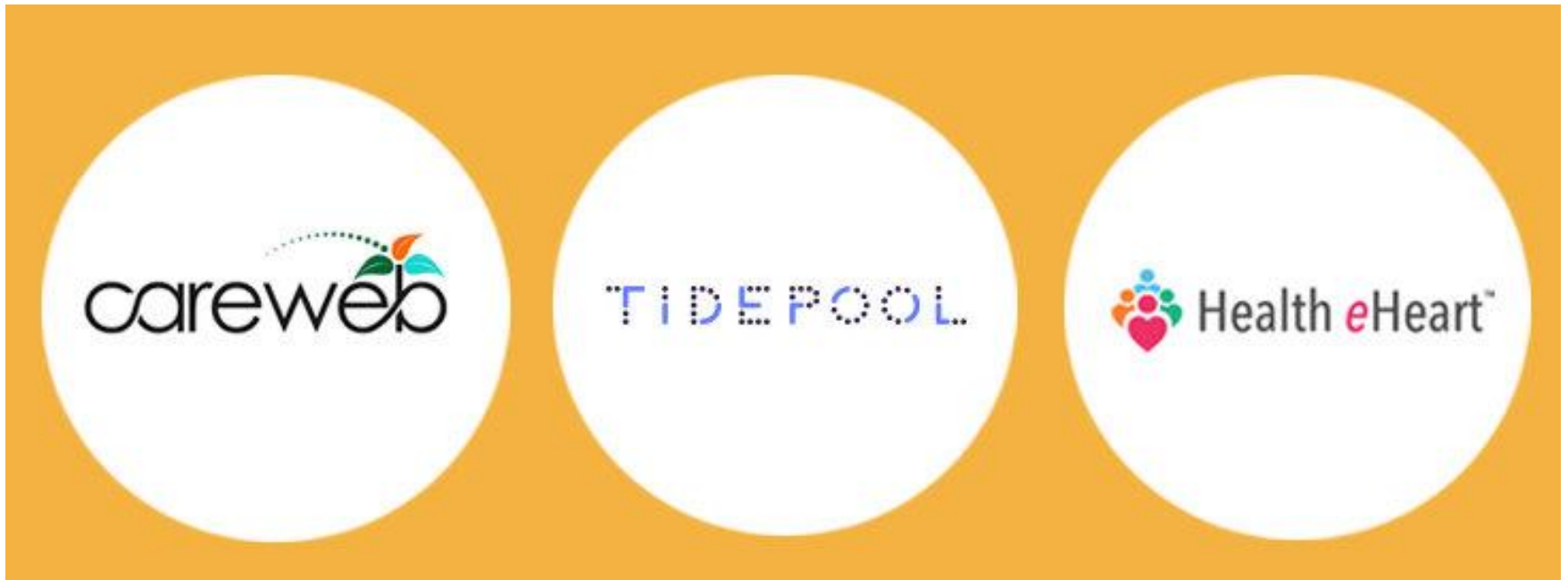
Educate

We design digital health education for the next generation of digital health leaders. We bring together leaders across healthcare and digital health, to create an ecosystem for learning.

Team

CMIOs   Engineers   Researchers   Security experts   Medical Educators   Licensing Officers   Project managers

Innovation: Inaugural Portfolio

- **External collaboration**
  - Demo days
    - 100 start-ups evaluated
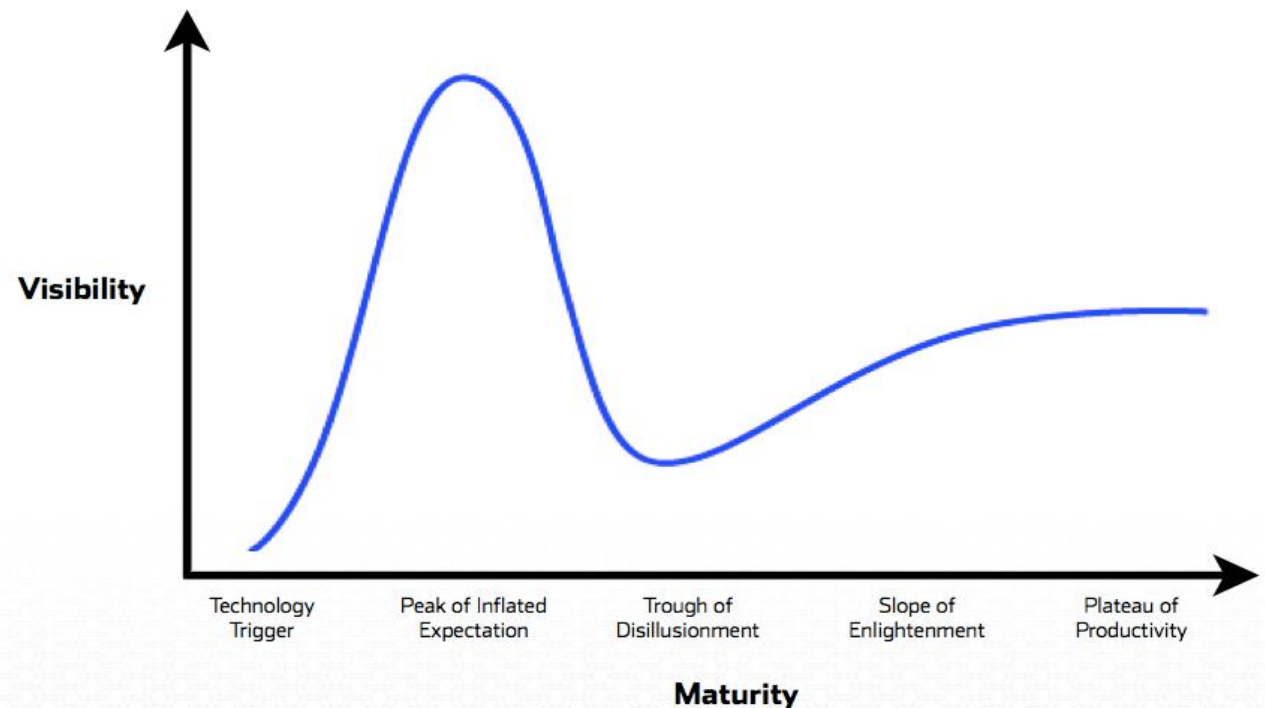   - 3 active projects
  - Partnerships

Accelerate validation and commercialization of an ecosystem of new sensors, algorithms, and digital health technologies for preventive health and chronic disease management solutions
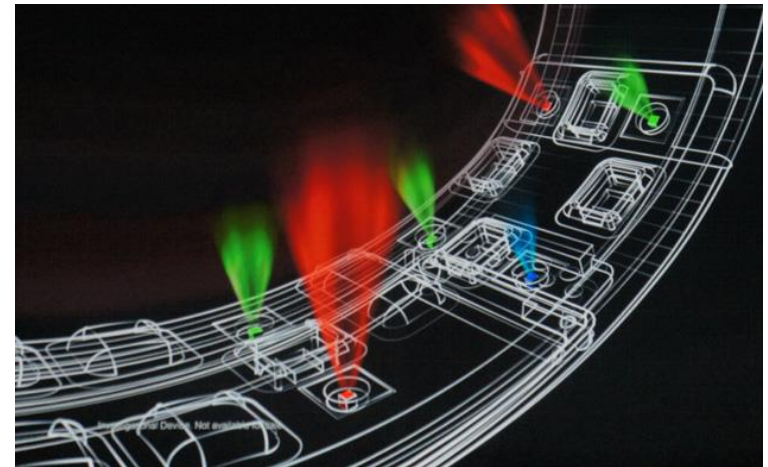
So, what's it all mean?

1. Reality Sets In

- Quantified self fades out
  - Nike Fuel cancelled
  - Fitbit not making money
  - Disconnected devices have t_{50} < 3mos
  - Push for social connected devices, too little too late

- Results are demanded by investors

Visibility

Technology Trigger | Peak of Inflated Expectation | Trough of Disillusionment | Slope of Enlightenment | Plateau of Productivity
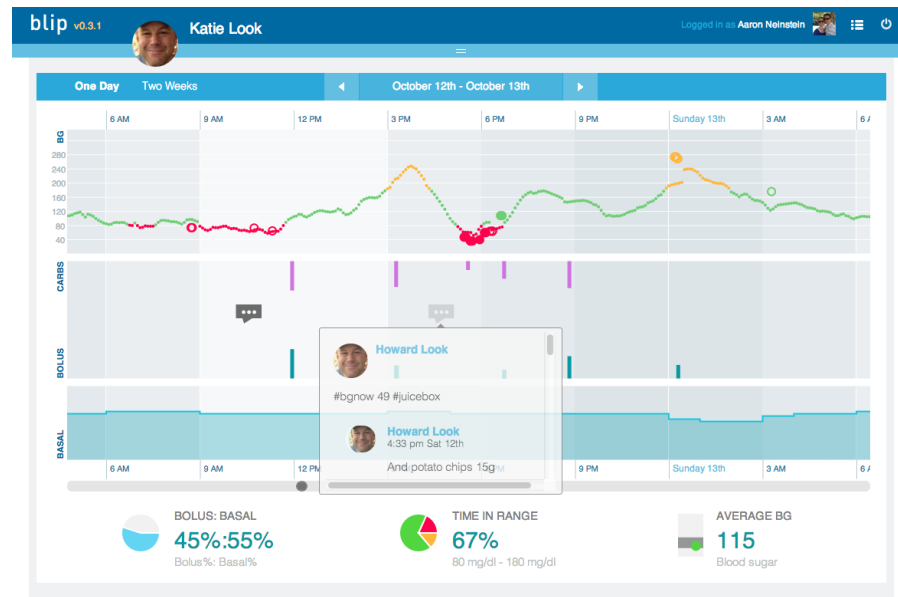
Maturity

2. More Sophisticated Wellness Devices

- Platforms
- EcoSystems
- Multi-parameter sensing
- Advanced analytics
- Payer driven

3. Chronic Disease Management

- HTN
- DM
- Asthma, COPD
- Behavioral health

4. Telehealth Pervasive

- At risk organizations
- CMS broadens opportunities
- Unavoidable to address rural access issues

5. Finally, Integrated Systems

- Integration with EHRs
- Scale at ACO level
- Workflow driven to get data and information to the right person on the care team at the right time
- Data is aggregated at organizations and used for clinical care and research

Discussion