The Future is Connected

Apps & More

Medical Diagnostics & Devices Workshop, University of Cambridge

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INTRODUCTION
DEVELOPING BREAKTHROUGH TECHNOLOGIES FOR MULTIPLE SECTORS
DIGITAL HEALTH

- eHealth
- Connected Health
- Telemedicine

QUANTIFIED SELF

- Digital Health
- Telehealth

Health & Wellness

- mHealth
- Health 2.0
Key factors are fuelling the interest and growth in Digital Health
An ecosystem made possible via digital tools & data analysis has the potential for improving outcomes and expanding market share
The technology components include connected medical products, off-the-shelf mobile platforms and back end infrastructure.
DEVELOPING CONNECTED HEALTH SOLUTIONS
CONNECTED SYSTEM DESIGN – STEP 1

**MARKET**
- Who is our target audience?
- What do they need?
- Who are our competitors?
- How can we differentiate?

**MONEY**
- Who will pay?
- What is the best business model for us?
- Will/ how our device/solution be reimbursed?
- Can I provide a service?

**TECHNOLOGY**
- What technology is the best choice for our device?
- Should we go wireless?
- Should we develop an app?

**REGULATIONS**
- Will the FDA regulate our device/app?
- Will regulations affect our technology or feature choices?
CONNECTED SYSTEM DESIGN – STEP 2

Consider all stakeholders
Think end to end - consider your opportunities

- **DEVICE**
  - COTS
  - Bespoke

- **SERVICE**
  - Novel
  - Me Too
  - None

Think end to end - consider your opportunities
Design the end-to-end user experience

Here is your current glucose reading and your last injection times

120 mmol / mol

Insulin Alert!
Due to extensive exercise 2 hours ago, recommended insulin dosage is 123u
Develop

or

[Image of a Lego structure]

[Image of a molecular structure]
**Iterate**

- Biz & Tech Operations
- Insight & Discovery
- Agile
- Secure
- Scalable
- Design & Prototype
- Production & Launch
- Beta & Pilot

CONNECTED SYSTEM DESIGN – STEP 5
SOME IMPORTANT ASPECTS
Defining a System Architecture to meet all your goals is a tricky balance.

Demanding applications can result in conflicting design requirements.
A different strategy is required to keep up with fast moving consumer electronics
Is your App a Medical Device?

Mobile Medical Applications

Guidance for Industry and Food and Drug Administration Staff

Document issued on: September 25, 2013
The draft of this guidance was issued on July 21, 2011.

For questions regarding this document, contact Balal Patel at 301-796-5528 or by electronic mail at Balal_Patel@fda.hhs.gov. For questions regarding this document concerning devices regulated by CBER, contact the Office of Communication, Outreach and Development (OCO) by calling 1-800-835-4709 or 301-827-1800.

U.S. Department of Health and Human Services
Food and Drug Administration

Center for Devices and Radiological Health
Center for Biologies Evaluation and Research

Diagnose
Detect
Interpret
Analyse
Calculate
Convert
Control
IT'S NOT MAGIC....

THINK SYSTEM
UNDERSTAND THE NEEDS
PLAN TO ADAPT
THANK YOU

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SOME INTERESTING PROJECTS
Labless Diagnostics Smartphone App

- Using the smartphone’s processing power and camera for optically-read diagnostic technologies such as lateral flow assays, opens the door to a range of diagnostic opportunities previously limited to laboratory equipment.

- Applying the correct image processing algorithms can give high quality analysis in remote locations such as patient’s home, hard to reach communities, or developing regions.

- A guided user interface experience provided by a well-designed app can put this diagnostic ability in the hands of a patient without the need for a clinician.
Skin care with real time personalized feedback

- Wearables are becoming invisible; fashion items with a purpose
- UV sensor and weather data fused to calculate exposure levels
- Measured data fused with information on skin type (determined via camera) results in the ability to deliver personalized advice
  - Opens opportunity for a new business model – selling skin care rather than sun screen products
Closed loop therapy

- Wireless implant + wearable sensor enables continuous monitoring and modification of neurostimulation therapy
- Wearable sensor monitors tremors, sends data to physician.
- Bluetooth Smart enabled implant can be controlled via doctor’s tablet to change therapy in response to tremor data