

New strategies to engage more of the world with scientific app development and content deployment.

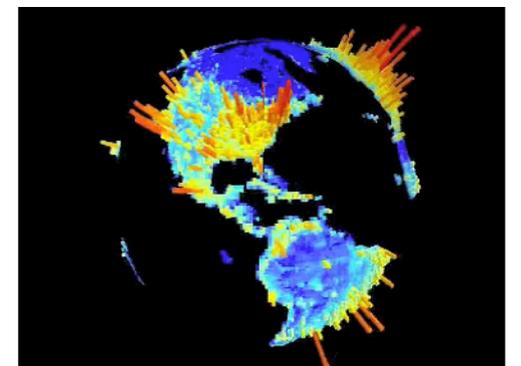
Dr. Steven Muskal

Chief Executive Officer

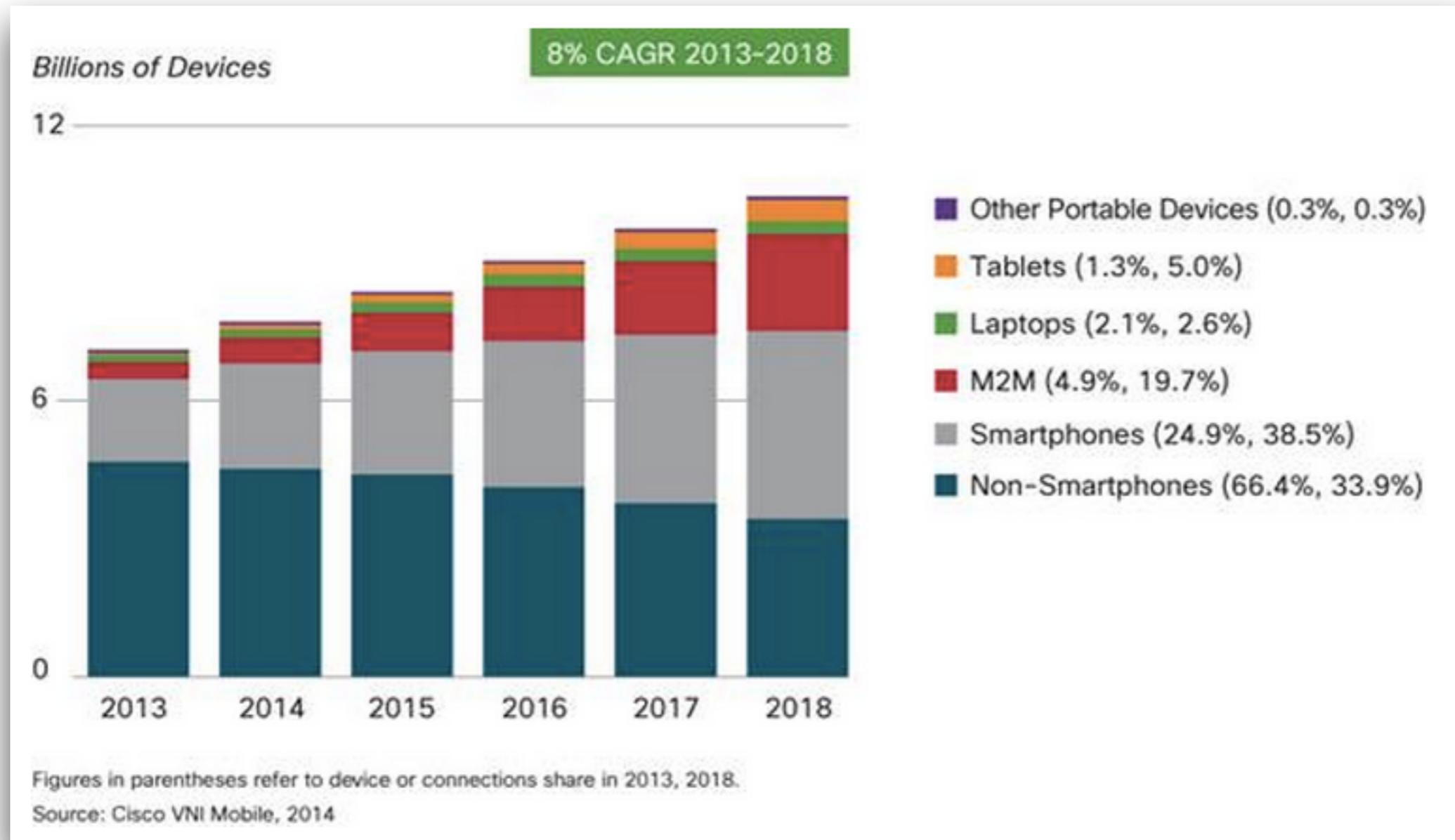
Eidogen-Sertanty, Inc

smuskal@eidogen-sertanty.com

7 Billion people depend on fewer than **500,000** people to discover and develop new medicines.

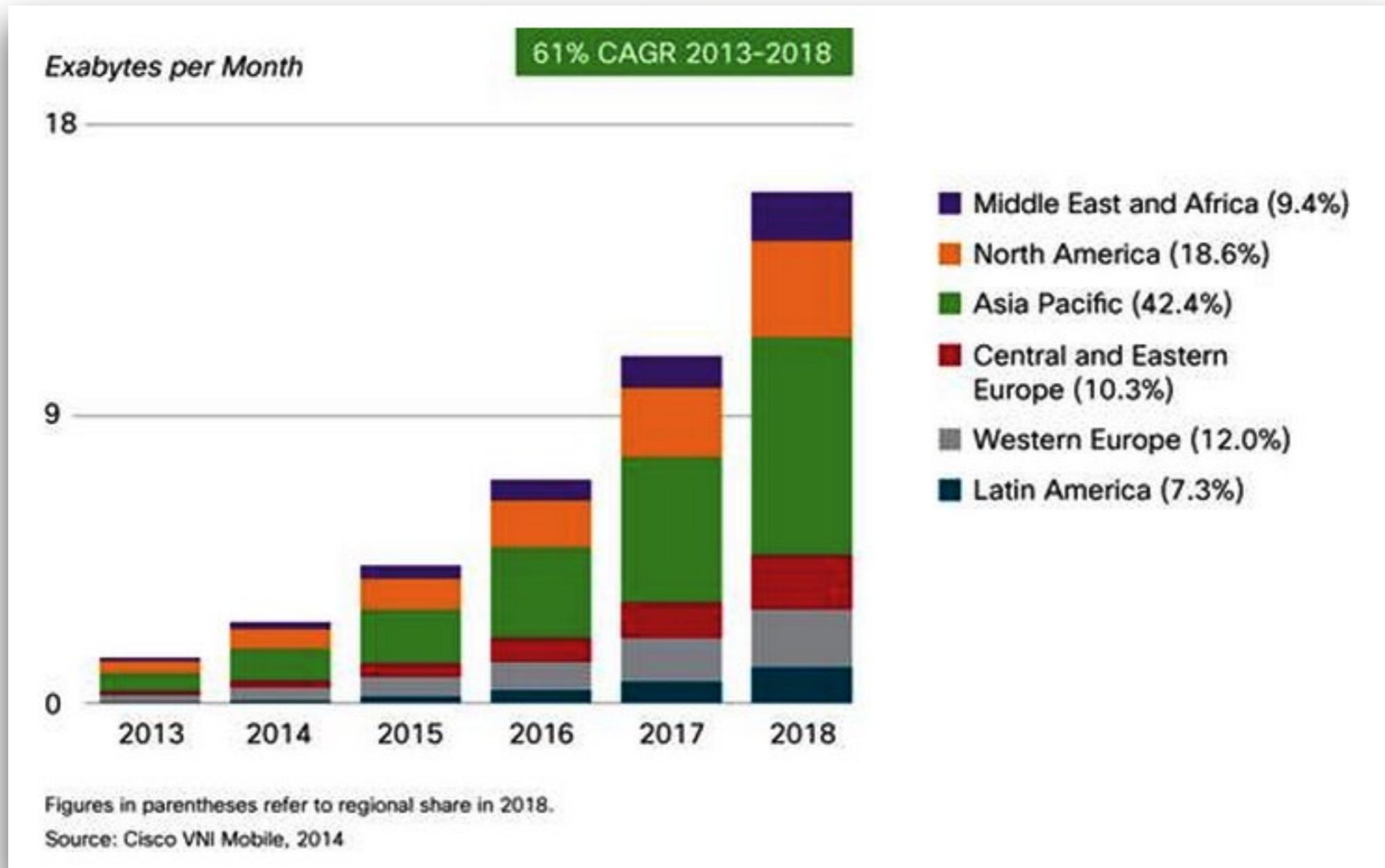


70% of World's Population Uses Mobile Devices

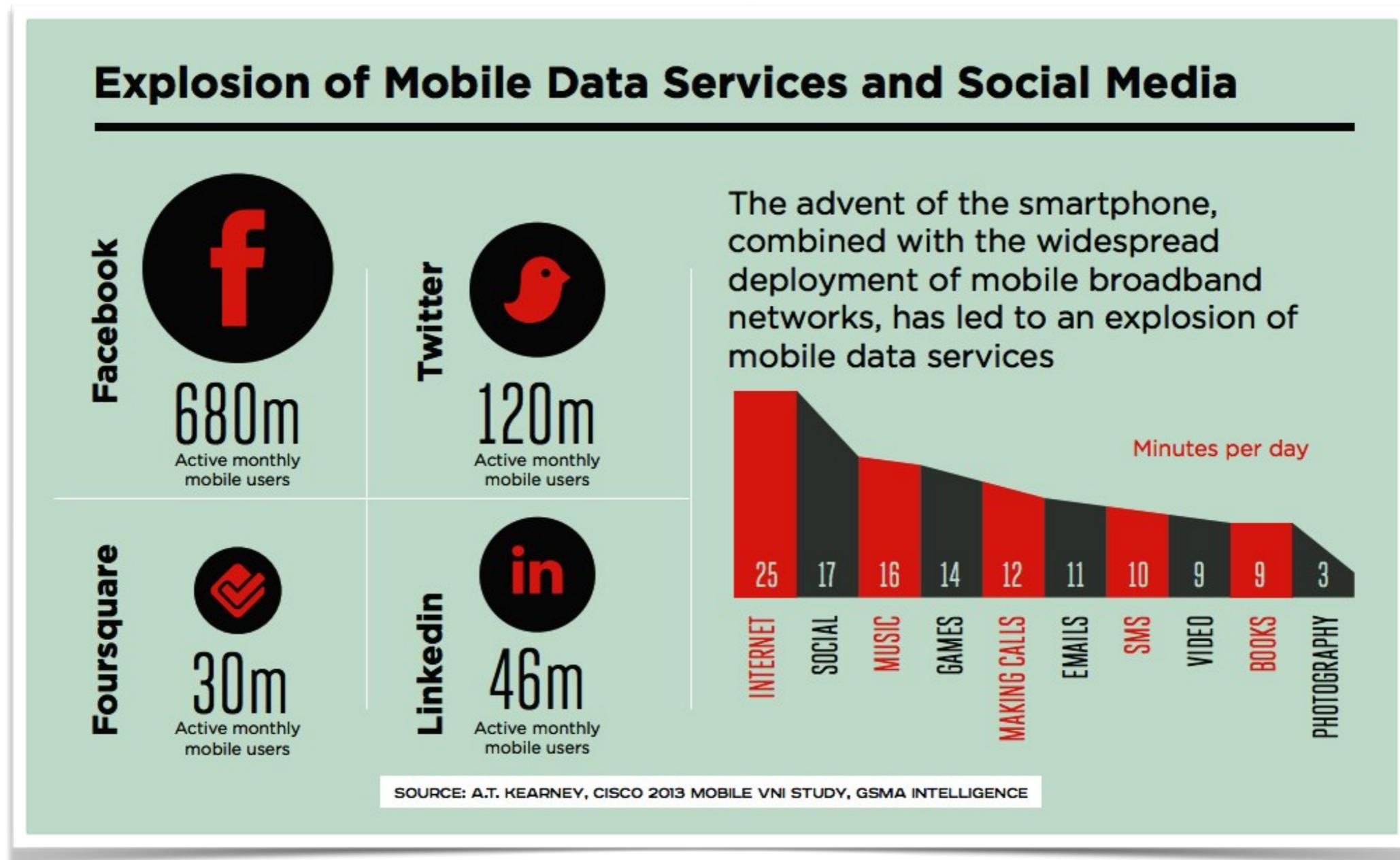


Over half a billion mobile devices and connections were added in 2013

Growing World Demand for Connectivity



Mobile Social Networking

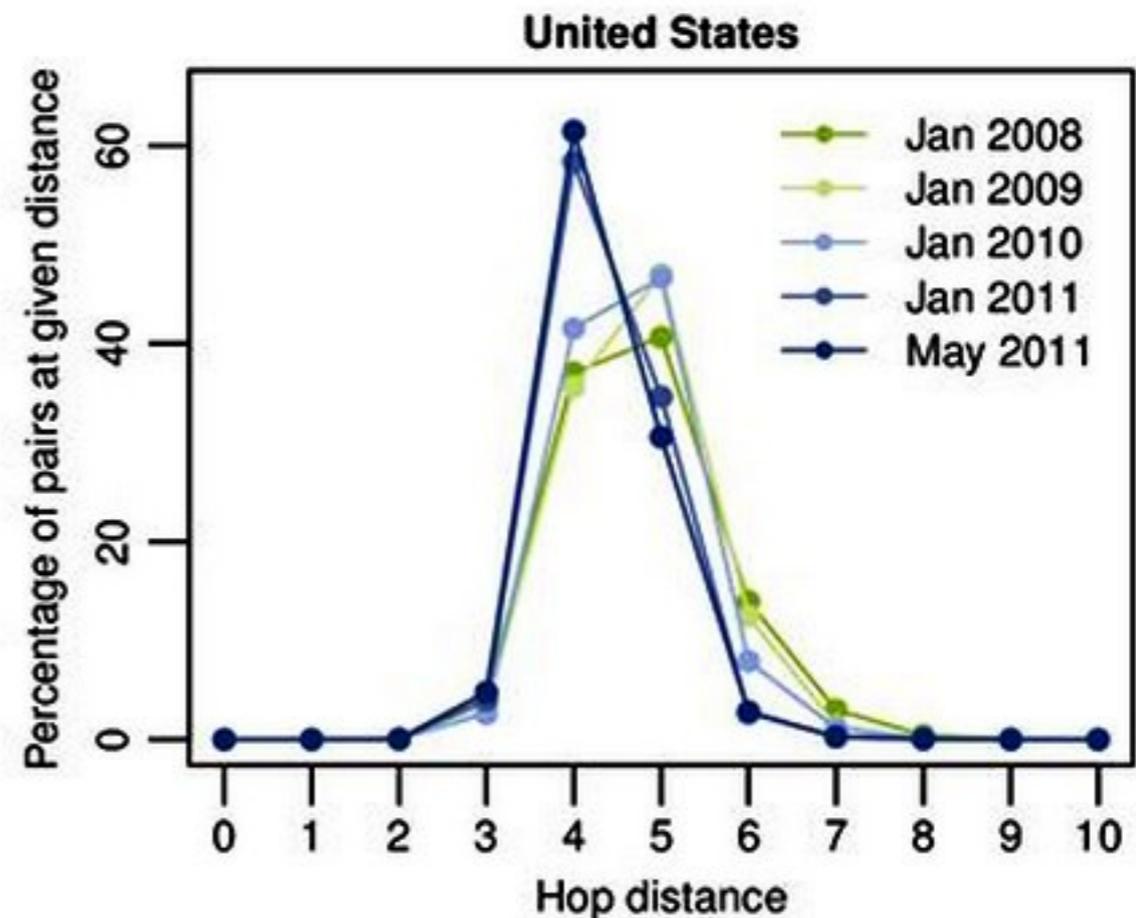
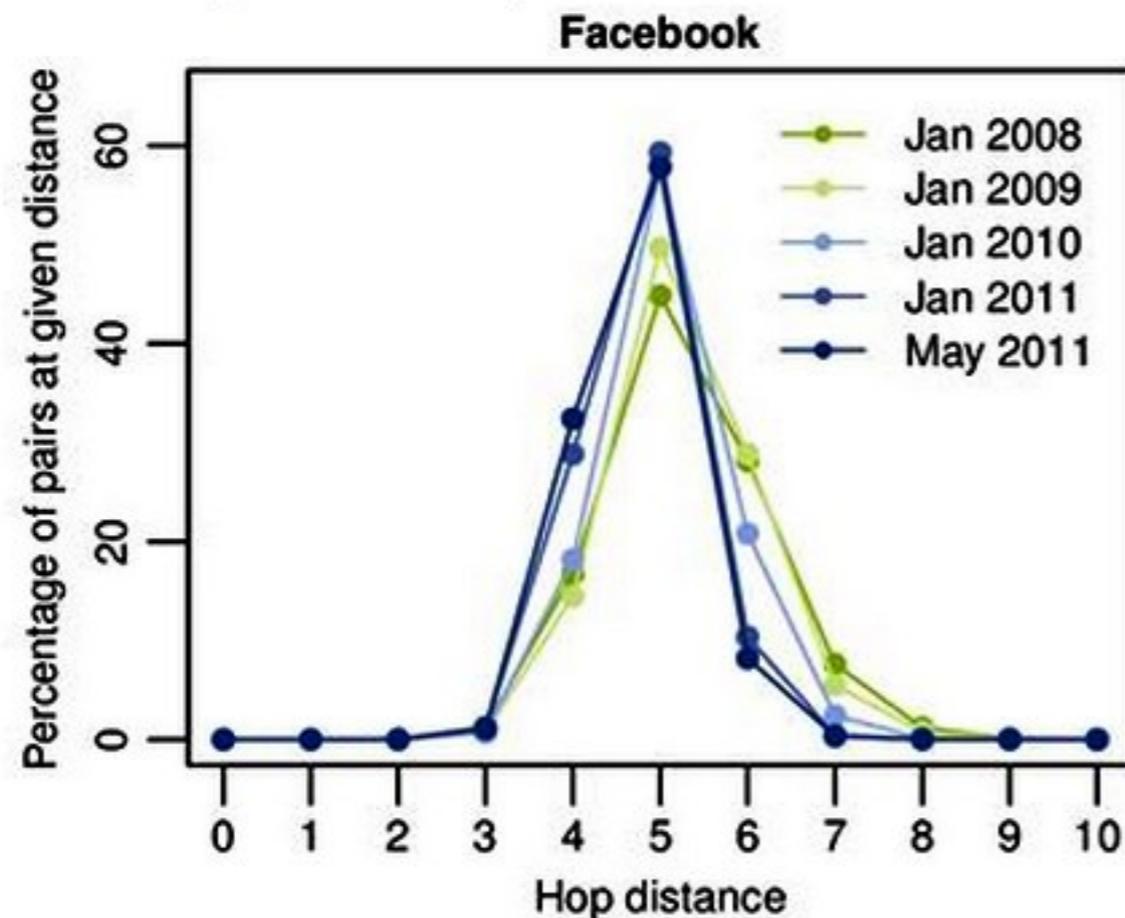


August 2014:

- Facebook: **1.3 Billion Monthly Active Mobile Users**
- Twitter: **~700 tweets/second** (average: 58 million tweets/day)

Less Than Four Degrees of Separation

Four degrees of separation.

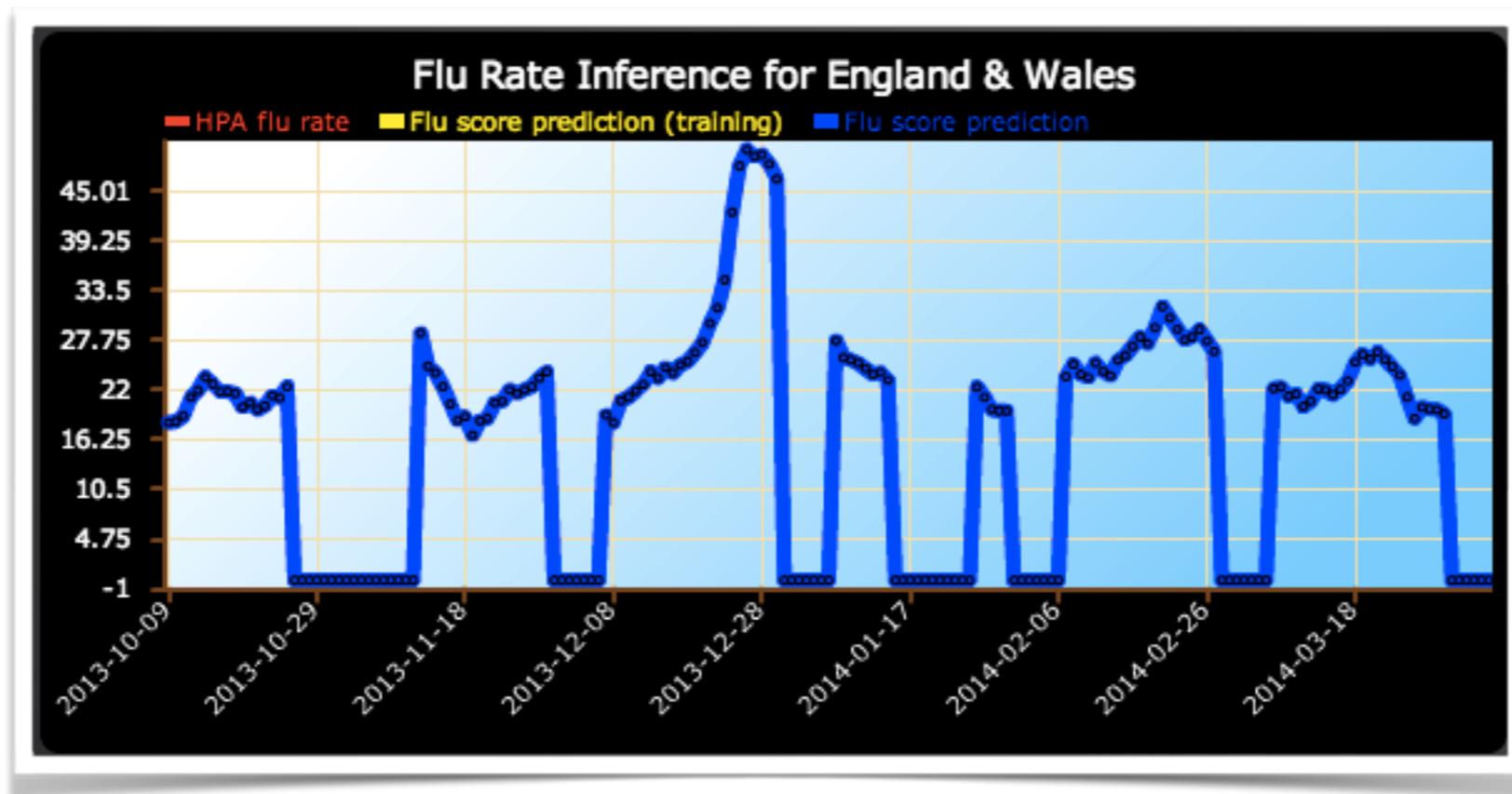


Anatomy of Facebook

By Lars Backstrom on Monday, November 21, 2011 at 5:04pm

Tracking Epidemics and Other Public Health Issues

Flu Detector - Tracking Epidemics on Twitter



Machine Learning and Knowledge Discovery in Databases Lecture Notes in Computer Science Volume 6323, 2010, pp 599-602 Lampos, V. and Cristianini, N.

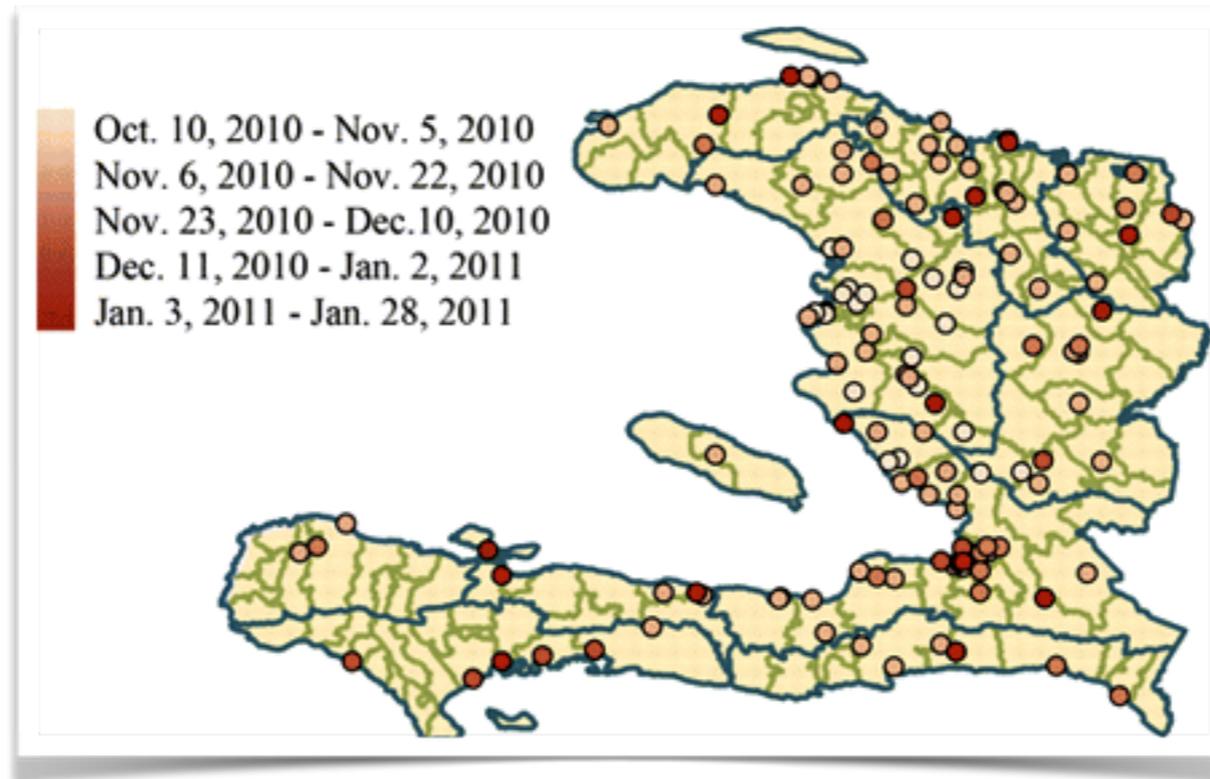
Tweet: “**Poor little crumb’s got fever and red spots. I feel so sorry.**”

Tweet: “**Coughed the whole night. I got it bad. Flu.**”

> 95% correlation with Health Protection Agency Data

Tracking Epidemics and Other Public Health Issues

Social and News Media Enable Estimation of Epidemiological Patterns Early in the 2010 Haitian Cholera Outbreak



HealthMap alerts for the first one hundred days of the Haiti cholera outbreak.

- Cholera-related HealthMap news media reports, Twitter postings, and government cholera cases reported strongly correlated with official case data.
- Data from Informal sources were available up to **2 weeks earlier!**

Many Apps, Huge Download Numbers

- Total Apps Seen in iTunes App Store: 1,367,788
 - Total Active Apps (currently available for download): **1,139,599**
 - Total Inactive Apps (no longer available for download): 228,189
- Number of Active Publishers in the iTunes App Store: **285,489**

August 4, 2014: <http://148apps.biz/app-store-metrics>

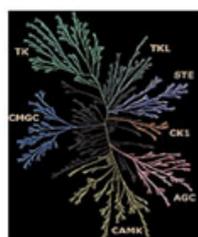
> 100 Billion Downloads!

Mobile App Store Downloads, Worldwide, 2010-2016 (Millions of Downloads)

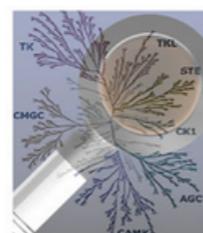
	2012	2013	2014	2015	2016	2017
Free Downloads	57,331	92,876	127,704	167,054	211,313	253,914
Paid-for Downloads	6,654	9,186	11,105	12,574	13,488	14,778
Total Downloads	63,985	102,062	138,809	179,628	224,801	268,692
<i>Free Downloads %</i>	89.6	91.0	92.0	93.0	94.0	94.5

Source: Gartner (September 2013)

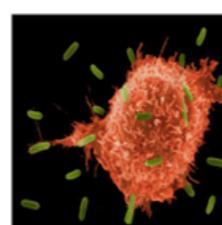
Eidogen's Apps: More than 50K Downloads



iKinase



iKinasePro



iOncology



iProtein



Mobile Reagents



In partnership with Intel



Reaction101



Yield101



SPRESImobile



ScienceCloud Tasks



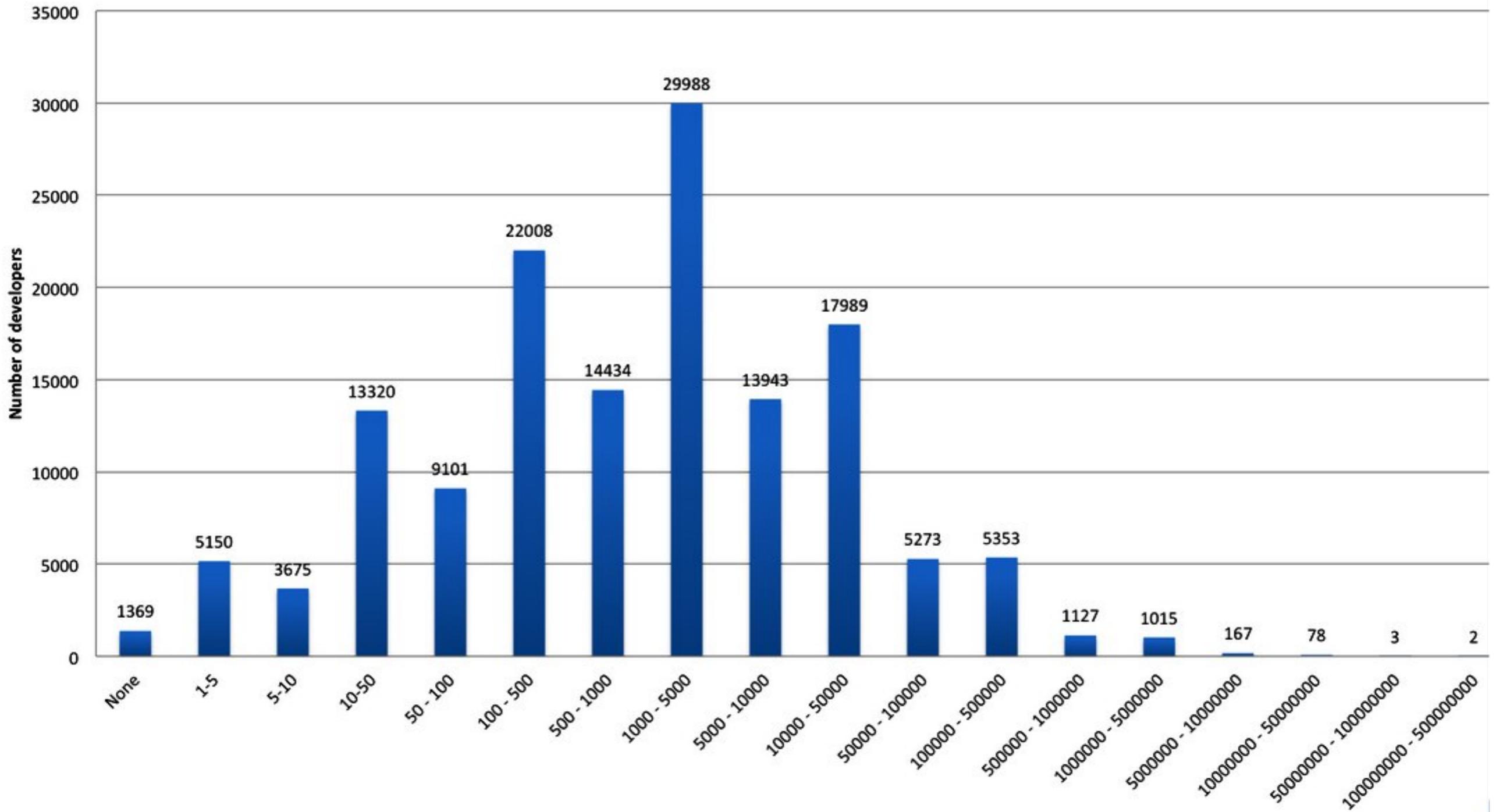
In partnership with Molecular Materials Informatics,

with InfoChem

In partnership with Accelrys

However, Market Awareness Is Challenging...

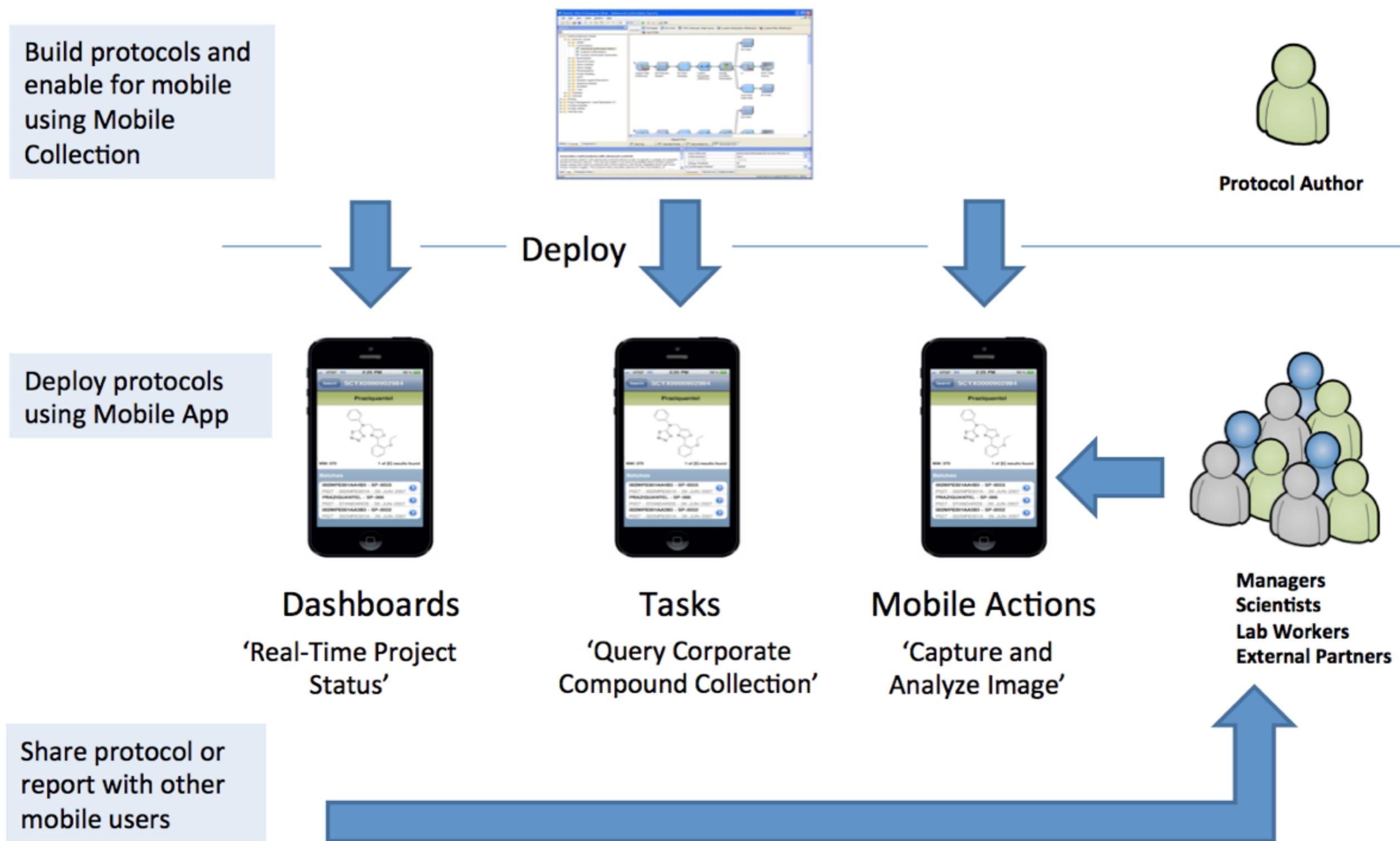
Android: Developers vs. Installs



Science-Cloud Tasks (Eidogen/Accelrys-BIOVIA)

- What is it?
 - ▶ An iOS application for iPod/iPhone/iPad (Android planned)
 - ▶ A new Pipeline Pilot component collection - “Mobile Collection”
- What does it do?
 - ▶ Allow any Pipeline Pilot PDF and HTML report to be easily deployed to mobile devices
 - ▶ Allow authoring of new Pipeline Pilot protocols to deploy dashboards and mobile-centered tasks and actions on mobile devices
- Free App from Apple AppStore (search ‘Accelrys’)

New Mobile Possibilities...



ScienceCloud Tasks / Mobile Collection

Pipeline Pilot Protocols are Easily 'Mobilized'

Components

- Mobile
 - Inputs
 - Audio Input (Mobile)
 - Barcode Input (Mobile)
 - Camera Input (Mobile)
 - Location Input (Mobile)
 - Molecule Input (Mobile)
 - Outputs
 - Audio Output (Mobile)
 - Text to Audio Output (Mobile)
 - Reporting
 - Charts
 - Text
 - HTML Output (Mobile)
 - Utilities
 - Prototypes
 - Barcodes
 - Filters
 - Location
 - Multistep Tasks
 - Reporting
 - ScienceCloud
 - Utilities
 - Web Applications
 - Accelrys
 - Dependent List Boxes_TM mod

Pipeline Pilot Professional Client - [Where On Earth Am I]

File Edit View Tools Window Help

Search protocol database

Protocols

- Examples
- Mobile
 - Admin
 - Demo
 - Audio and Video
 - Chemistry
 - Fun
 - Analyzing Beers with Different Chart Types
 - City Temperature Gauges
 - Find Best Beers for your Buck
 - GeoChart Side-by-Side with Photo
 - Lookup Barcode Info
 - Manipulate My Picture Many Ways
 - Table with Inline Molecules
 - Where On Earth Am I
 - Location and Maps
 - Search
 - Developer
 - Prototypes
 - Test
- Mobile Demo
- Mobile Protocols
- Mobile Services
- Mobile Services-tests
- Portlets
- Stylesheets

1

Location Input (Mobile) → Geo Chart (Mobile) → HTML Output (Mobile)

We read a location from the user, then load it into a GeoChart. Simple!

Elapsed Time:

Jobs

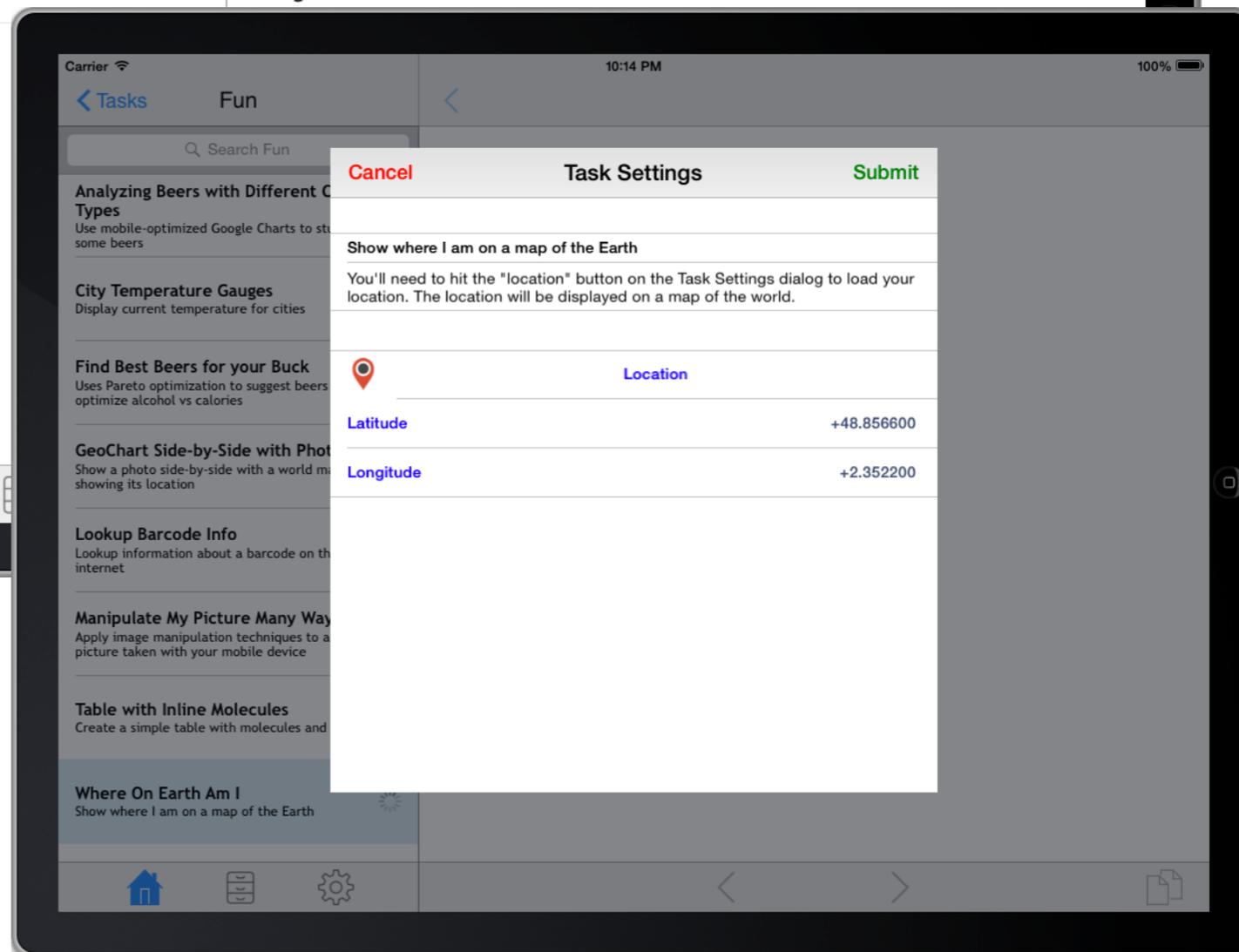
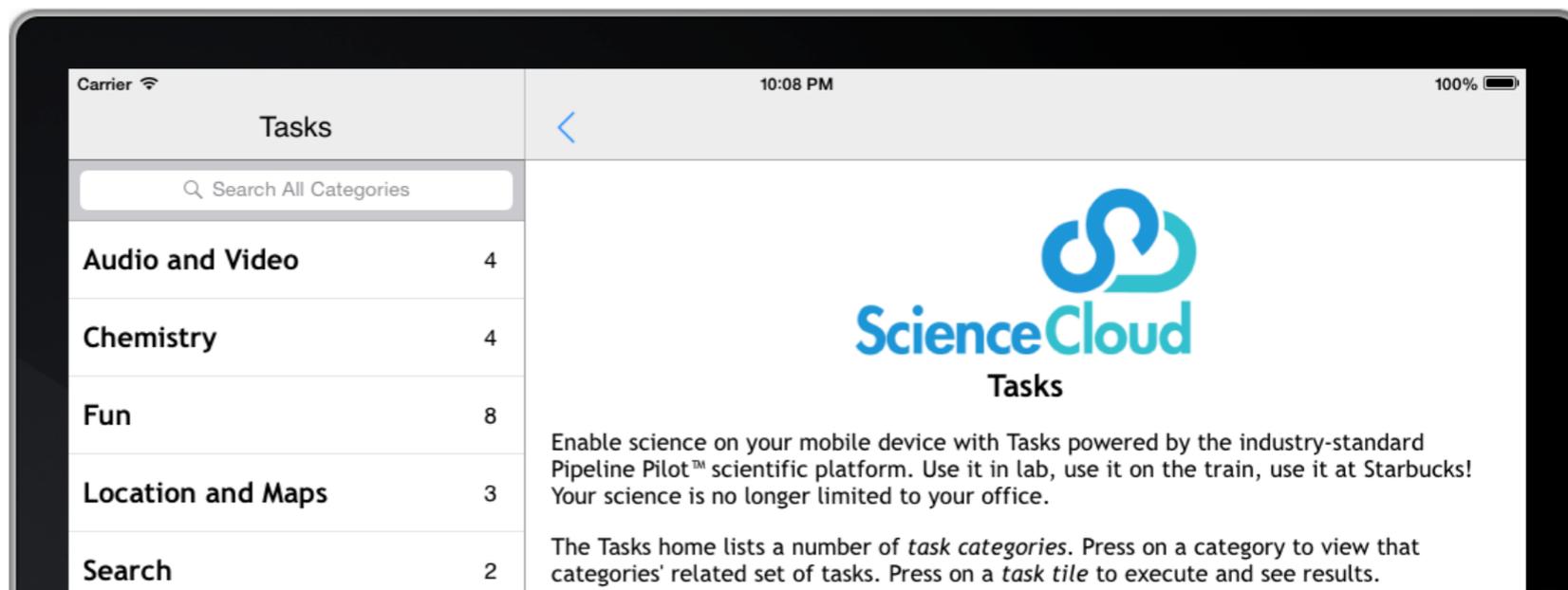
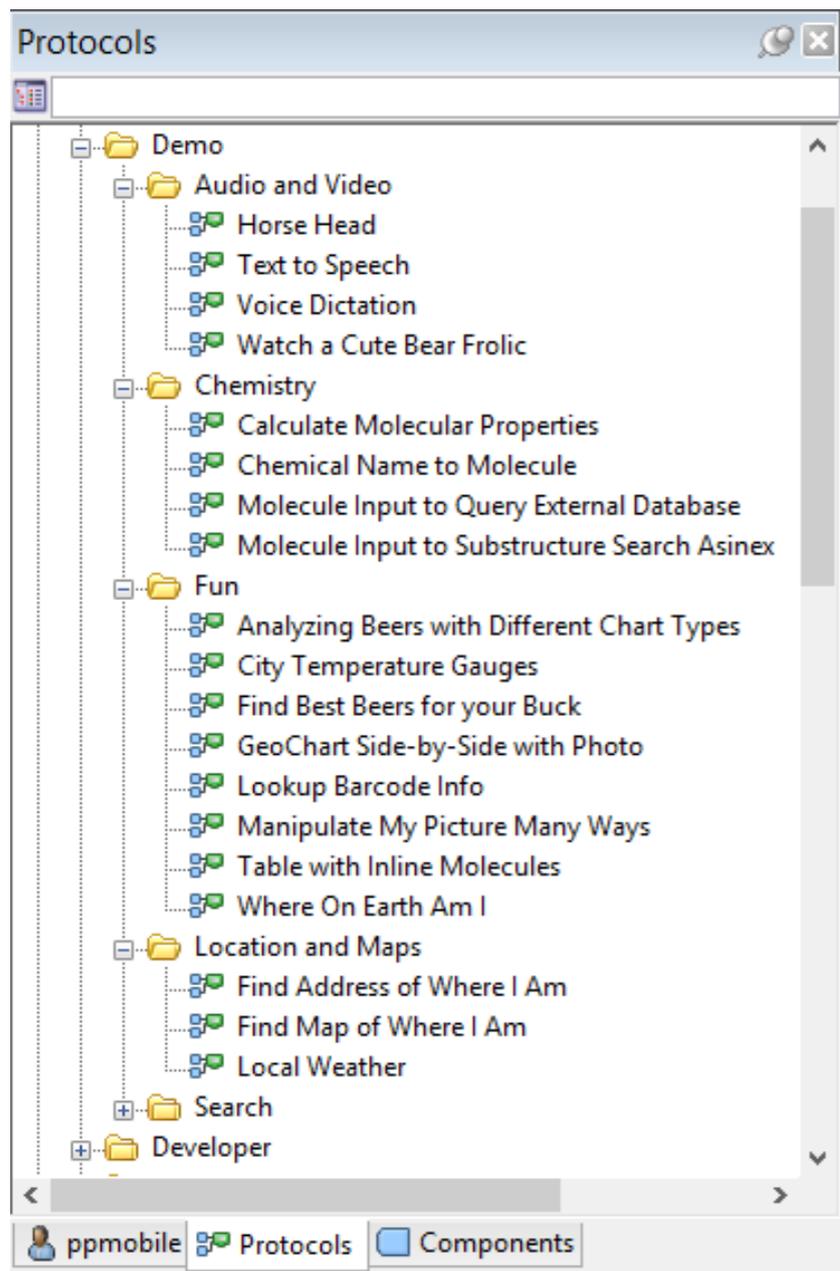
Protocol Name	Status	Start Date
Horse Head	Finished	Tue Feb 18 17:21...
Manipulate My Picture Many Ways	Finished	Thu Mar 13 05:2...
New Protocol1	Finished	Thu Mar 06 07:2...
Where On Earth Am I	Not Started	

Parameters

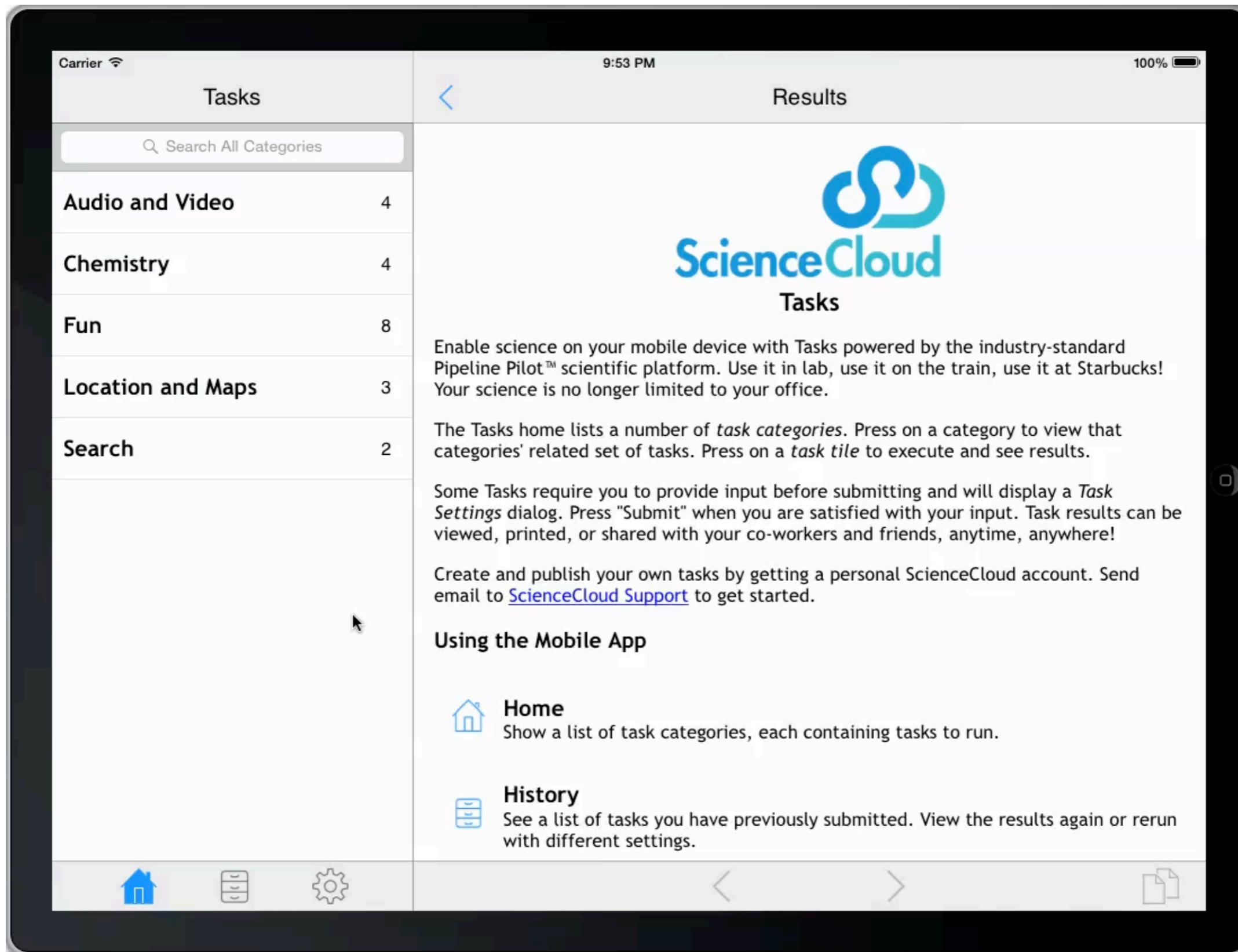
- Location
 - Latitude
 - Longitude

Parameters Implementation Inf

Protocol Folders Appear in the Tasks App



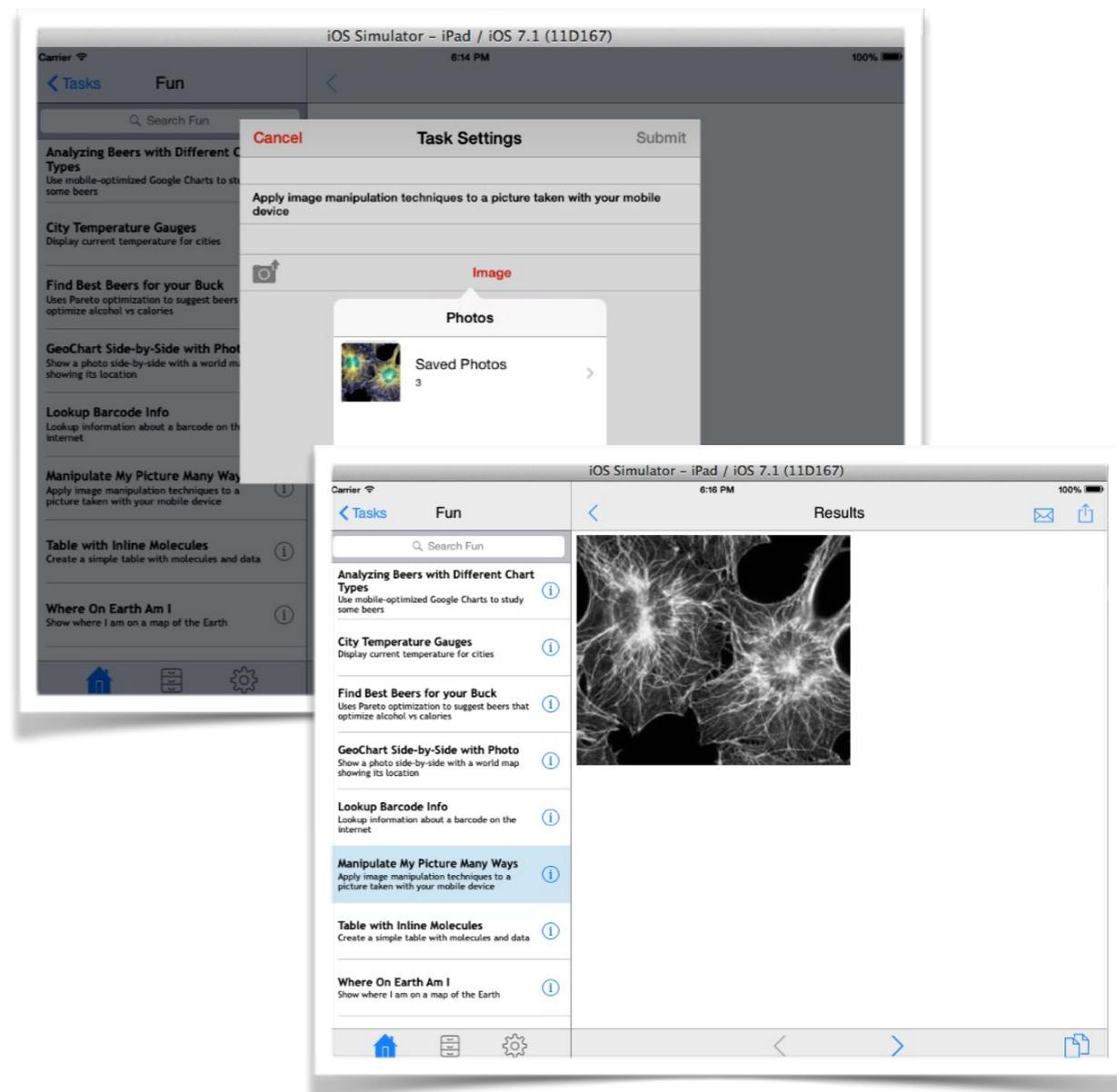
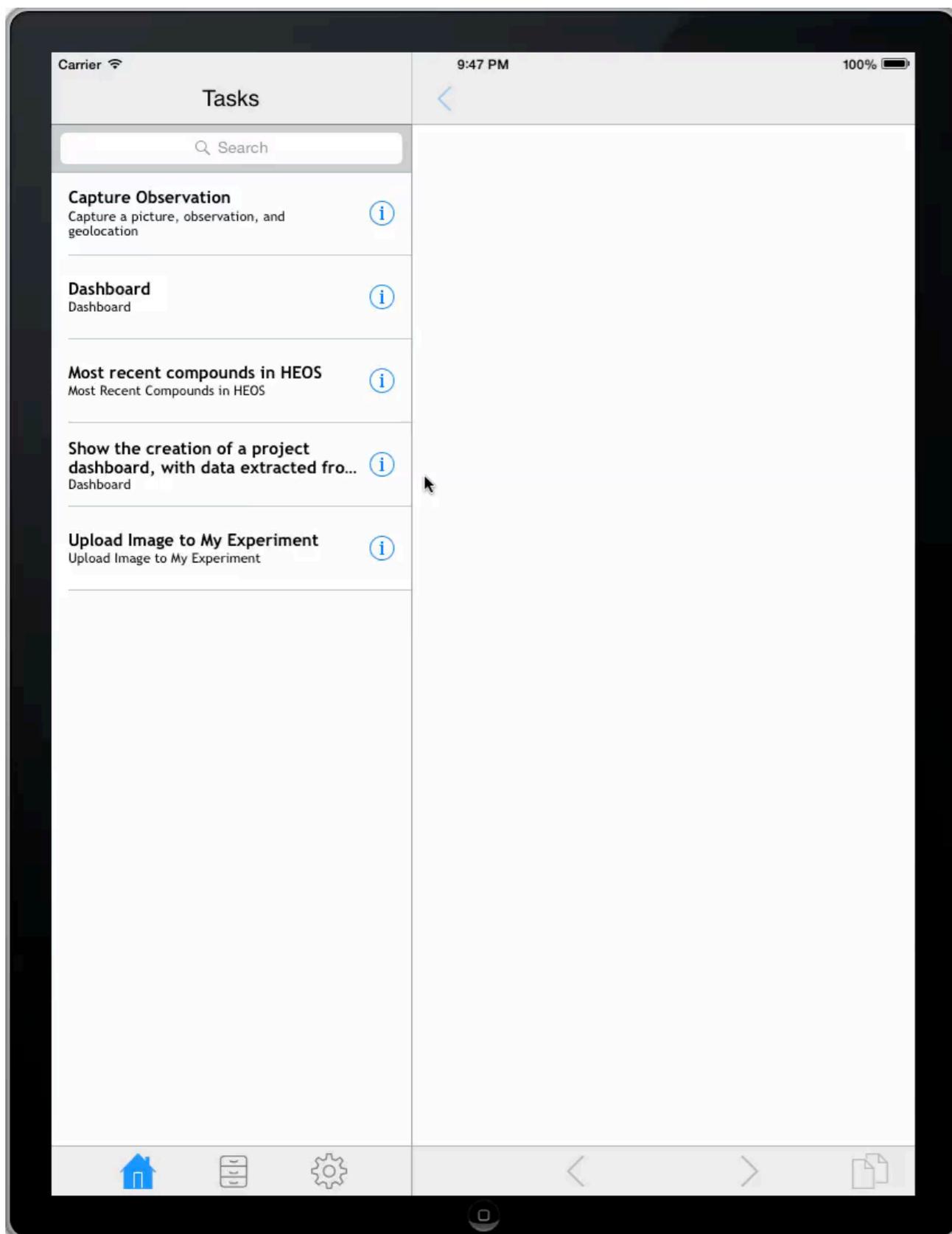
Location (Demo)



Observation Capture (Demo)

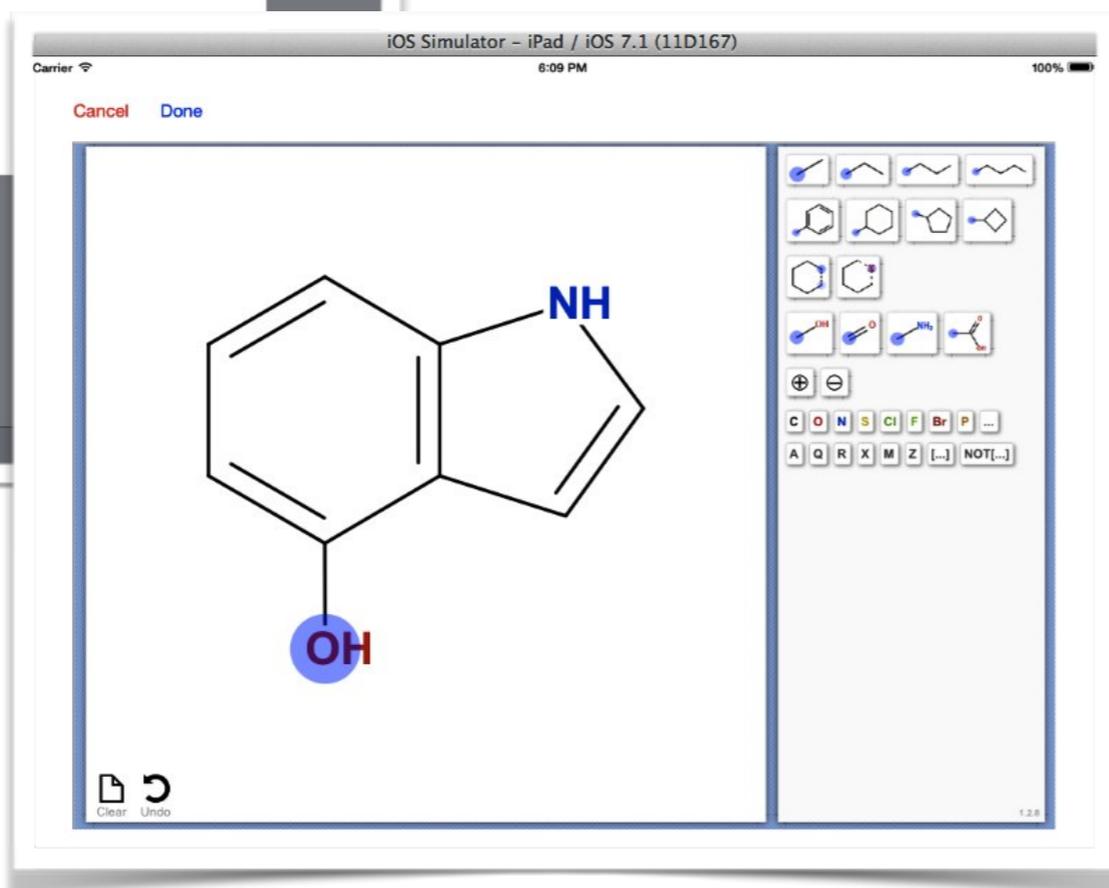
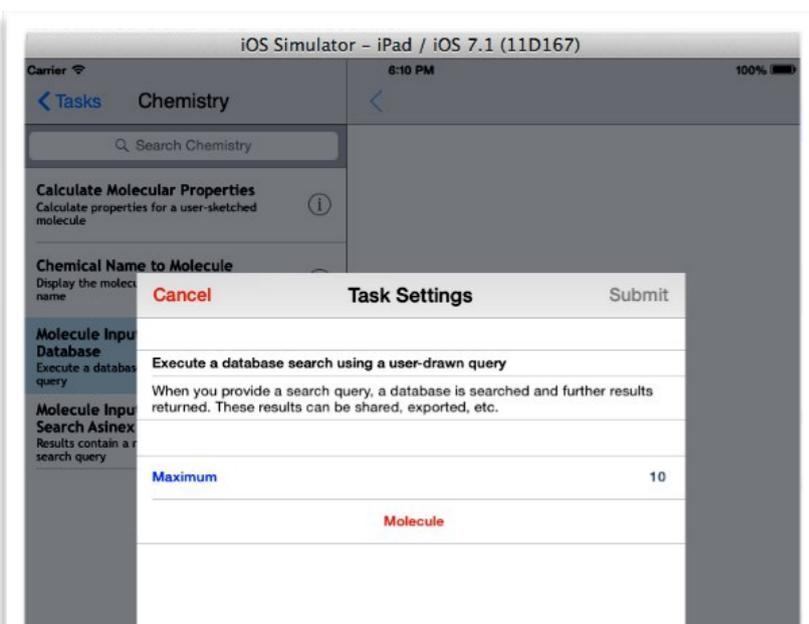
Leverage Mobile Device Capabilities

- Camera, Audio, GPS, etc.

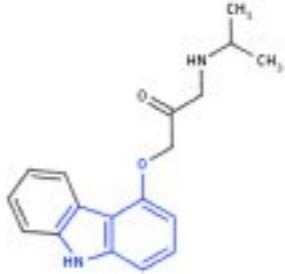
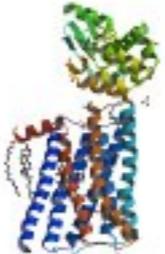
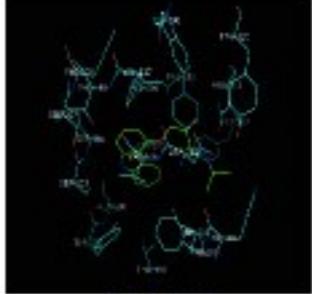
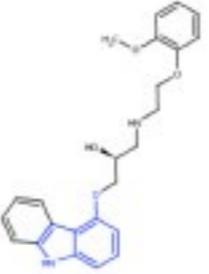
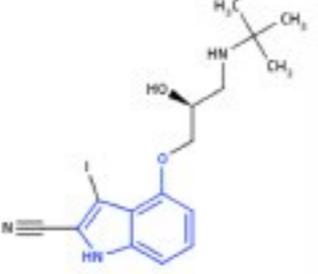
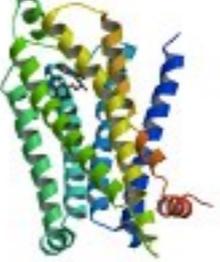
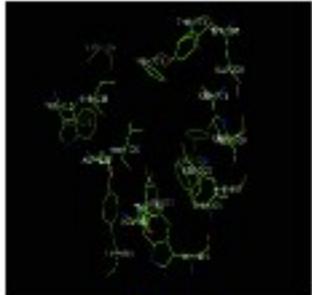


Embed and Deploy

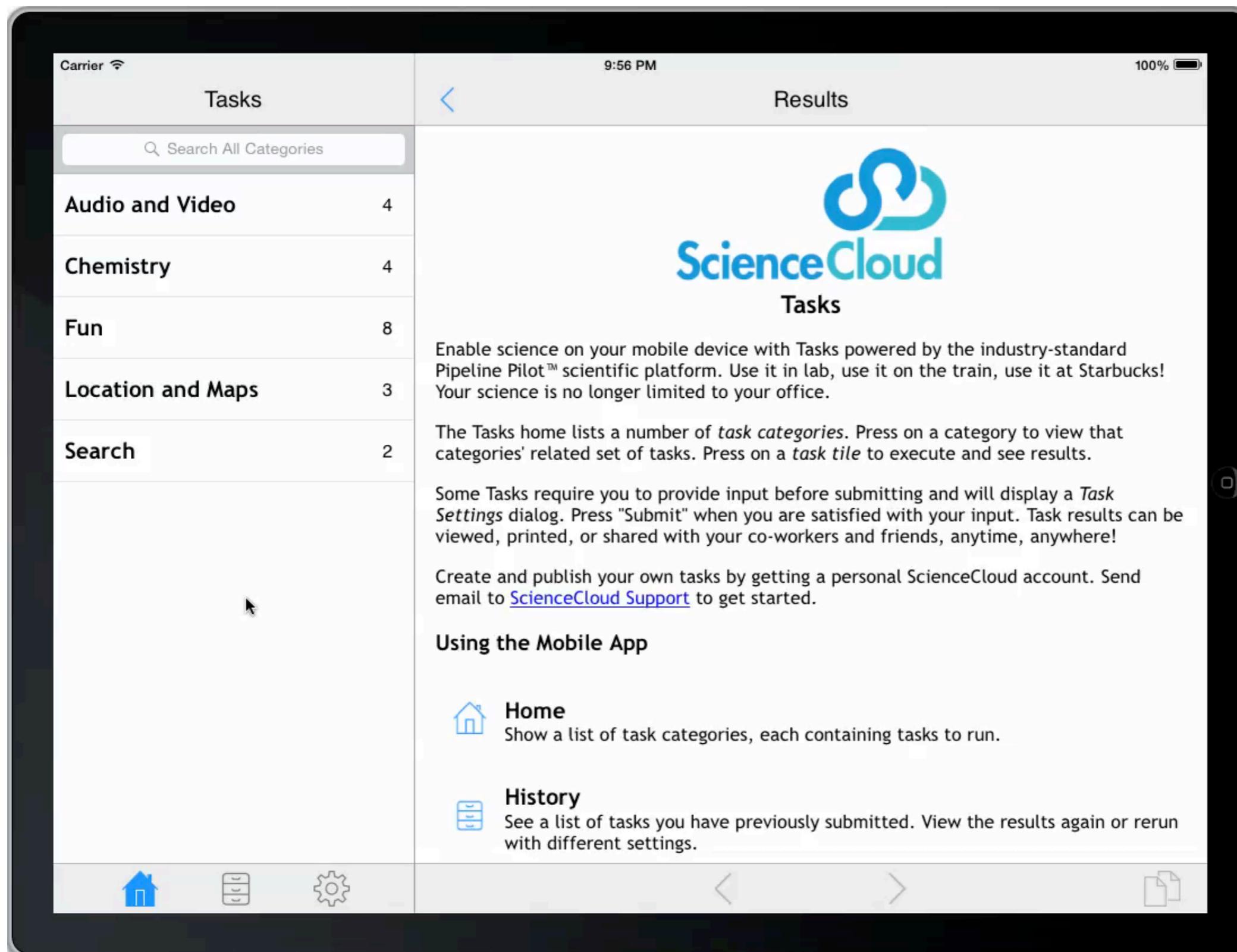
Embed full applications within Pipeline Pilot protocols and deploy to mobile users



This screenshot shows the 'Results' screen of the chemistry application. It displays a table of ligand hits with columns for 'Ligand Hit', 'PDB', and 'Site'. The table contains three rows of data, each with a chemical structure, a PDB ID, and a site ID.

Ligand Hit	PDB	Site
 CAU	 2rhl	 1276810
 CVD	 4amj	 2004620
 I32	 2ycz	 1857801

Ligand Co-Complex Search (Demo)



Summary

- Billions of people routinely use and connect with mobile devices.
- Massive worldwide connectivity is unprecedented.
- Well deployed social media frameworks are in-place and easy to access.
 - e.g. Facebook, Twitter, and their APIs.
- Science apps have been largely insular, vertical, and point solutions. We need to recruit more of the world!
- Cloud-based pipelining-tools, social media frameworks, and mobile devices together open many new possibilities.

Acknowledgements

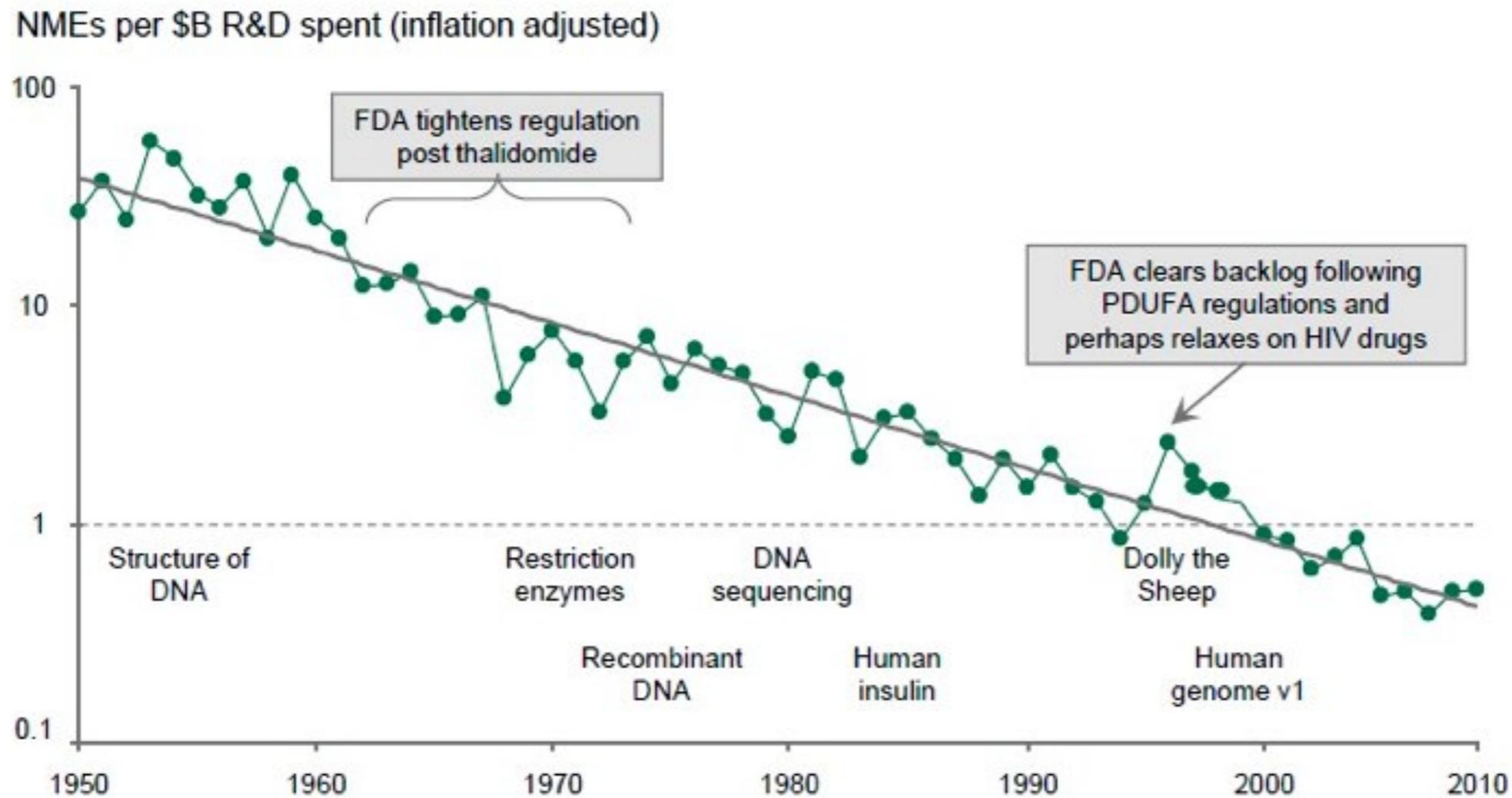
Accelrys

- Matt Hahn
- Dave Rogers
- Jung Ku
- Mike Peeler
- Ton van Daelen

- Maurizio Bronzetti
- Stephan Schurer
- Alex Clark



R&D Productivity Has Been On The Decline



Note: R&D costs are estimated from PhRMA annual survey 2009; NMEs are the total number of small molecule and biologic approvals by the FDA

Source: Bernstein Research "The Long View - R&D Productivity" (September 30, 2010)

Life sciences R&D: Changing the innovation equation in India

THE BOSTON CONSULTING GROUP

About Eidogen-Sertanty, Inc.

• Knowledge-Driven Solutions Provider

- Sertanty established in 2003, acquired Libraria assets
- Sertanty acquired Eidogen/Bionomix in 2005 → Eidogen-Sertanty
- \$20M invested: Libraria (\$6M), Eidogen/Bionomix (\$12M), Sertanty/ES (\$2M)
- 15 distributed FTE's (5 US and 10 India)
- Worldwide (bio)pharmaceutical customer base
- Cash-positive since 2006

• Databases & Software – Annual Subscriptions

- *TIP*TM - Protein Structural Informatics Platform
- *KKB*TM - Kinase SAR and Chemistry Knowledgebase
- *CHIP*TM - Chemical Intelligence Platform

• DirectDesignTM Fee-For-Service

- In Silico Target Screening (“Target Fishing” and Repurposing)
- Target and compound prioritization services
- Fast Follower Design: Novel, Patentable Leads