At UCSF Getting a Flu Shot is Cool: iPad App for UCSF Flu Clinics

Project Title
UCSF Medical Center Track-it iPad App

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Summary
In 2012 UCSF Medical Center widely released an innovative iPad application to assist in the delivery of yearly influenza vaccination clinics. This app, Track-it, integrates with the Occupational Health electronic medical record and has improved operational efficiency in the clinics as an intuitive and data rich replacement for paper. Using HTML 5, Track-it is ready to be modified for use in other field data gathering processes. Track-it is integrated with UC and uses unique identifiers for each patient, significantly improving audit reports. Track-it was a collaborative project of UCSF Occupational Health, HRIS and IT Security. Track-it has been a success on many levels, but was summed up succinctly by one clinic patient who, after receiving her flu shot, looked back at the iPad and said, “This is so cool.”

Project Description

Each year, influenza season is a threat and a challenge for medical centers nationwide. In January, 2013 Boston declared the flu outbreak a public health emergency. Medical Centers saw a ten-fold increase in flu cases, prompting some hospitals to open closed wings to address the influx of patients.

How do Medical Centers prepare for flu season? One key to preparation is immunization of staff, affiliates, students and any representative of UCSF who may have contact with patients.

Challenges of Managing Employee Flu Vaccinations

Each year in October, clinicians from UCSF’s Occupational Health Services department travel to 10 UCSF locations and hold 31 immunization clinics. These clinicians administer over 15,000 flu shots. Before the shots are given, clinicians or administrative personnel must gather information about the patient including name, date of birth and relationship to UCSF. The standard approach has been to have patients fill out paper forms with their information and signed consent for vaccination. Once the forms are completed, each patient receives a colored sticker to put on their UCSF ID as proof of immunization.
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It seems like a simple process, but multiple factors create complications. A public health department order requires masking of non-vaccinated employees; Medical Center managers must have flu compliance report to verify employee vaccination status. The Joint Commission issued a standard with precise percentage requirements for employee compliance. The Cal/OSHA Aerosol Transmissible Disease standard included influenza as one of the diseases in mandated exposure control plans. At any time, a regulatory agency could request a compliance report. To reliably produce this data, 15,000 handwritten forms needed to be manually entered into a database. Producing timely reports with accurate data was impossible.

Occupational Health’s leaders knew there had to be a better way. By teaming up with HRIS they began to explore the possibilities.

First Step: Gathering Patient Data Electronically

The first attempts at electronic data gathering involved a laptop and administrative assistant at each clinic. A queue of employees formed at the administrative assistant’s table, identification was confirmed, and they then got in line for a flu shot.

While this worked well technically, it required at least two administrative assistants for most clinics and long lines formed during peak times. With as many as 3 clinics in different locations going on simultaneously, the personnel costs for this were high. Also, the client-server application on the laptop couldn’t replace paper; patients were still required to fill out a paper consent form.

Next Step: Finding the Right Platform

In a planning meeting in March, 2011 Occupational Health and HRIS asked these questions:

- How can we get the laptop into the hands of the clinicians? The clinics were held in conference rooms and lecture halls, far from a clinical setting. Clinicians were already in unfamiliar surroundings. They needed a tool that inspired confidence and increased efficiency.
- How can we get the patient to sign the consent form electronically?

Innovative

The Apple iPad had been out a little less than a year. It was the size and shape of a clipboard. The iPad had a browser that was HTML 5 compatible and could connect to the same Medical Center server the laptop was connecting to. What if clinicians had iPads?

The possibilities were exciting to both HRIS and Occupational Health. Both parties agreed to a pilot in 2011 with 2 iPads.

Operational Efficiency and Usability/Accessibility

HRIS moved forward with development for an October, 2011 pilot. HRIS developed an application that interfaced with the Occupational Health electronic medical record. Throughout the summer and early fall the HRIS developer and Occupational Health clinicians performed usability testing. This testing verified that the clinic workflow with iPads increased efficiency for the clinicians. The user interface had big fonts and touch friendly buttons. The interface included an employee search feature because Track-it on the iPad connects to a server database with employee data.
After clinicians asked patients medical screening questions they showed the Track-it screen to the employees for review, confirmation of identity and electronic consent. This step eliminated the cost in printing and storage of 15,000 forms. If an employee needed proof of vaccination, a secure verification was sent immediately to the employee’s email.

**Shareable**
Under the hood Track-it is written in HTML 5. While it looks like an iPad app, it is useable on any touch-based tablet/laptop. No data resides on the iPad, the app can be implemented elsewhere with a different database backend.

**Interoperable**
The feature clinicians and Occupational Health love the most is the connection to UCSF employee and affiliate data. Clinicians use a search box to lookup patients and populate patient information for the immunization record. HRIS databases hold payroll employee, vendor, student and other affiliate data. Clinicians have immediate access to around 30,000 records. Once a patient’s information is confirmed, the data in the server database can be used to run reports against UCSF’s data warehouse.

**Collaboration**
Occupational Health and HRIS staff worked closely on the development of Track-it, but to move forward with the project IT Security would have to play a guiding role. IT Security consulted with HRIS in setting up VPN connections and adjustments to the disk image used to configure the iPads. The communication from the iPad to the backend server is done using SSL. The iPads are locked-down; on these iPads Track-it is the only application. Theft deterrent UCSF property stickers were added to each iPad.

Initially the login for Track-it used UCSF’s Active Directory. However, some clinicians were temps, hired for the day. IT could not provision AD logins quickly enough to get clinicians working with Track-it in the clinics. With guidance from IT Security, the developer replaced this authentication with a 4 digit pin. The application administrator (an Occupational Health employee) creates a pin for each clinician. Once created the application provides a function for emailing the pin to the clinician.

**Implementation**
With IT Security on the team, in October, 2011 Occupational Health clinicians used 2 iPads to record information about 500 patients (3% of total). Track-it on the iPad was officially launched.

The initial pilot was a success, but adjustments were needed.

Not all locations had working wifi for accessing the Track-it server. An HRIS team visited each clinic site and tested wifi using an iPad, identifying those locations with issues. For the next flu season Occupational Health purchased some iPads with cellular connectivity.

In October 2012, with 10 identically configured iPads, Occupational Health launched its 2012 flu clinics. HRIS staff attended early clinics, but issues were minimal or non-existent.

**Benefits of Track-it**
The cost benefit of iPad Track-it was immediate. Over a 5 year period the cost to run clinics without the iPads was $82k (Printed consent forms in triplicate, administrative supplies, record storage, data entry, laptops). With programming and purchase of iPads the cost is $39k, over 50% less. The iPad application
also reduced the number of administrative assistants needed to help run the clinics by 50% providing a significant reduction in temporary personnel costs.

The iPad enabled hassle free reporting for Occupational Health. With the changes made after the pilot, Occupational Health can now readily report to managers and agencies. An added benefit is that Track-it provides real time reporting. Occupational Health can monitor each clinic minute by minute to assess patient flow and vaccine supplies.

iPad Track-it represents an early iPad app developed at UCSF, and gave IT Security a real-life project for hardening the tablet.

HRIS has since been asked to develop an Android app for Fire Drill feedback and is currently developing a health benefits smartphone app tailored to each employee.

Bei Kong, an Occupational Health clinician used the implementation and use of Track-it as her thesis case study to earn her Clinical Nursing Master’s degree.

The greatest surprise was the reaction of employees and clinicians. Along with all the efficiencies this application provided in the clinics, the use of iPads gave the aura of a Medical Center that is leaning forward with technology, a place that employees can be confident of, and a little boastful about.

Most importantly, this app provides Medical Center patients and leadership with the assurance that, no matter how bad flu season gets, UCSF has verified its employees and affiliates are prepared to provide safe healthcare.

**Technology Used**
iPad 2: HTML 5, jQuery, css
Server: SQLServer 2005

*Update:* Track-it's next update for October, 2013 will be a Single Page Application (SPA), leveraging industry standards and open technologies.

**Timeframe**
Initial discussions: March, 2011
Pilot launched October, 2011
Wide release October, 2012
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Three Track-it Screens

Track-it Name Search Screen

Track-it Medical Questions Screen

Track-it Patient Consent Form

Other screens in the application are:

1. Splash Screen
2. Pin login screen
3. Identity Verification Screen – Clinician verifies information with the employee’s photo id and checks a confirmation box.
4. Vaccine screen – Clinician records the site of injection (left or right deltoid), vaccine manufacturer, lot #, and location of clinic.