Rapid SMART on FHIR app development

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Overview

- Sapphire is a visual rapid-app development tool
  - Prebuilt UI components coupled with FHIR resources
  - Knowledge-based and other services
- Demonstration of creating an app for acute kidney injury
Sapphire

- Sapphire is a framework to create a modular healthcare apps
  - App = software that provides units of functionality and can be selectively used
- It provides a composable, configurable environment for developers
  - To make it easy to develop apps rapidly
  - Using FHIR-based access to underlying data and operations
  - Collection of components that can be assembled into apps
    - Widgets: user-interface layer components loosely coupled to services
    - Service modules: business logic and data access components
- It provides a deployment environment
  - For running apps
  - Apps are portable
  - Interoperable services-based multi-tier infrastructure
Modular apps
Composing an app

- Assemble
  - Drag and drop components from palette onto canvas
  - Layout on canvas

- Configure
  - Change appearance of component
  - Select/filter data to display

- Tie
  - Connect components via events to create desired behaviors
Deployed in EHR
Demo

Sapphire
Knowledge base

A very large knowledge base of associations amongst clinical concepts

KB is automatically generated by extracting and curating associations from different knowledge sources using proprietary algorithms
Demo video
Thank you

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**Medications**

- **Reason**: Hypercholesterolemia
- **Medication**: Lovastatin 10 mg oral pill

  - **Route**: Oral Route
  - **Dosage Quantity (mg)**: 10
  - **Dispense Quantity**: 30
  - **Start Date**: 2013-05-15 12:00 AM
  - **End Date**: 2013-07-02 12:00 AM
  - **Prescriber**: Dr. Hans Zarkov

**Related meds**

<table>
<thead>
<tr>
<th>Medication</th>
<th>Start Date</th>
<th>End Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simvastatin (Oral Pill) - 10 mg Tab</td>
<td>2013-02-04 07:35 AM</td>
<td>2013-02-02 05:00 AM</td>
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</tbody>
</table>

**Adverse reactions**

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Substance</th>
<th>Reaction Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muscle pain</td>
<td>Lovastatin</td>
<td>2013-07-12T08:30:00</td>
</tr>
<tr>
<td>Persistent cough</td>
<td>Theophylline</td>
<td>2013-10-10T11:15:00</td>
</tr>
<tr>
<td>difficulty breathing, swelling on the face</td>
<td>Hydrocodone</td>
<td>2012-09-17T00:00:00</td>
</tr>
</tbody>
</table>

**Alerts**

- This is sign out not for filter
- Previous adverse reaction documented for Hydrocodone causing difficulty breathing, swelling on the face on 2012-09-17T00:00:00

<table>
<thead>
<tr>
<th>Note</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>Active</td>
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