Project: FHIR Interface to Controlled Substance Database

Team: Pants on FHIR

Members: Ryan Cobb, Fred Galoso, David Mooney

Link to Narrated Presentation: https://youtu.be/M40msnc0P0c

FHIR Interface to Controlled Substance Database

Pants on FHIR

Georgia Tech

UTAH DEPARTMENT OF HEALTH
Office of the Medical Examiner

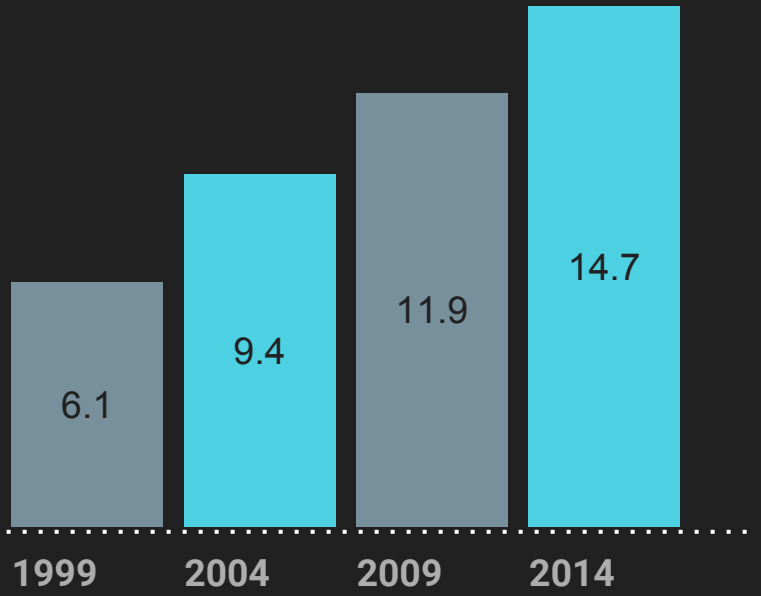
Mission statement: Improve Medical Examiner access to the Controlled Substance Database

The problem

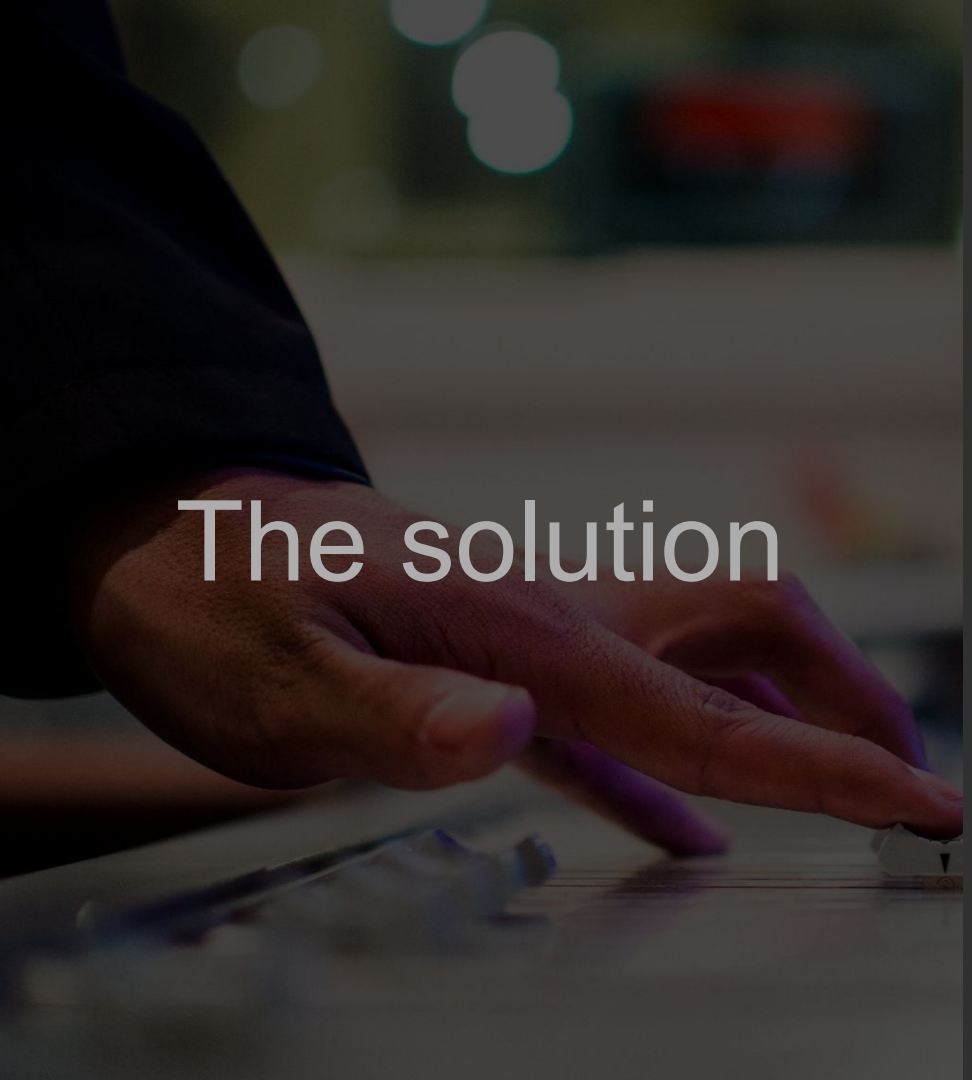
Drug poisoning deaths are now the leading cause of injury related deaths nationwide.

In Utah, drug poisoning deaths have risen from 6.1 per 100,000 population in 1999 to 14.7 in 2014.*

Office of the Medical Examiner pathologists need ready access to relevant clinical information.



** Both Sexes, All Ages, All Races, All Origins, Age-adjusted Rate for state of Utah per 100,000 population*
https://blogs.cdc.gov/nchs-data-visualization/drug-poisoning-mortality/



The solution

We developed a FHIR interface for the Controlled Substances Database that enables users to access prescription history from within the Office of the Medical Examiner's case management system.

How it works

Step 1

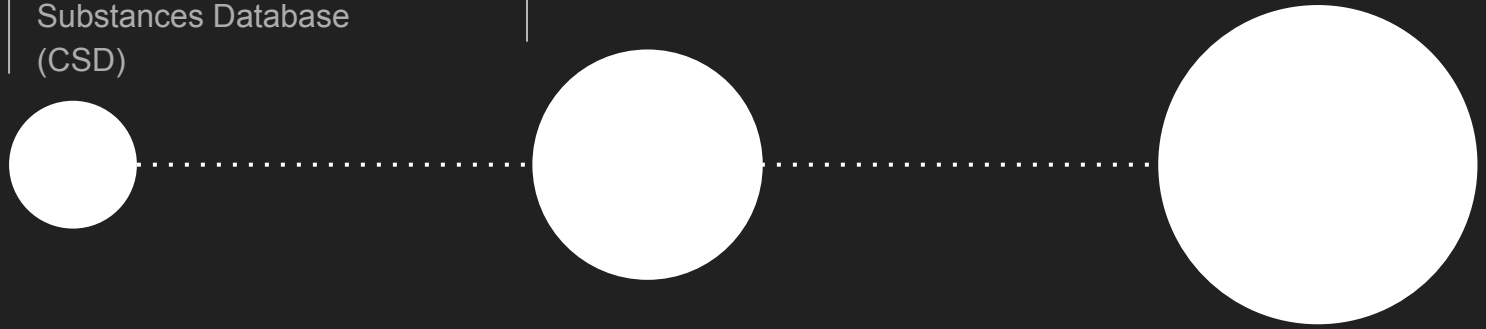
User opens web page to query Controlled Substances Database (CSD)

Step 2

Query generates several FHIR requests sent to FHIR Interface to CSD

Step 3

Responses displayed in interactive web page



Research (Previous)

CSD access and structure

Security requirements

Data sources, generation, and how to handle conflicts

Performance requirements

Future use

Research (Update)

Initializing a Linux Virtual Machine using Amazon AWS EC2

Creating and populating a postgreSQL database

Using Flask for web app development

Using Bootstrap for front-end development

Creating the user interface with React

Establishing appropriate Mirth Connect channels for communicating FHIR resources

Decedent Information | Identification | Decedent Residence | Informant 1 2 | Scene 2 | Death Information | Trauma/Incident | Medical History
Decedent Information 2 | Education | Next of Kin | Scene | Scene 3 | Transport | Trauma/Incident 2 | Narrative

DECEDENT INFORMATION

Release to Eden | Remove from UMED
Lock Record | Unlock Record
Investigator Edit

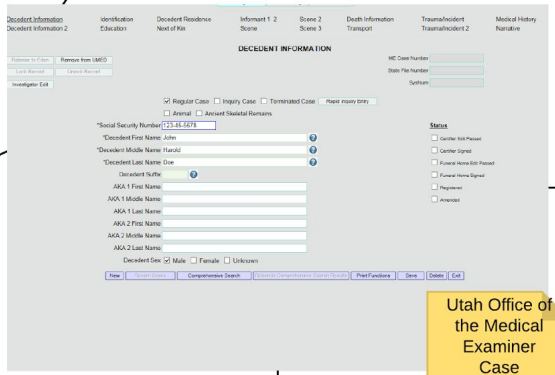
ME Case Number
State File Number
SysNum

☑ Regular Case ☐ Inquiry Case ☐ Terminated Case | Rapid Inquiry Entry | Rx History
☐ Animal ☐ Ancient Skeletal Remains

*Social Security Number: 123-45-5678
*Decedent First Name: John
*Decedent Middle Name: Harold
*Decedent Last Name: Doe
Decedent Suffix:
AKA 1 First Name:
AKA 1 Middle Name:
AKA 1 Last Name:
AKA 2 First Name:
AKA 2 Middle Name:
AKA 2 Last Name:
Decedent Sex: ☑ Male ☐ Female ☐ Unknown

Status
☐ Certifier Edit Passed
☐ Certifier Signed
☐ Funeral Home Edit Passed
☐ Funeral Home Signed
☐ Registered
☐ Amended

New | Recent Cases | Comprehensive Search | Return to Comprehensive Search Results | Print Functions | Save | Delete | Exit



Utah Office of the Medical Examiner Case Management Interface (UMED)

HTTPS

CSD Search and Patient Web Interface
Languages: Python, JavaScript
Framework: Flask

HTTPS

Mirth Connect FHIR Server

AWS EC2 VM Development Environment

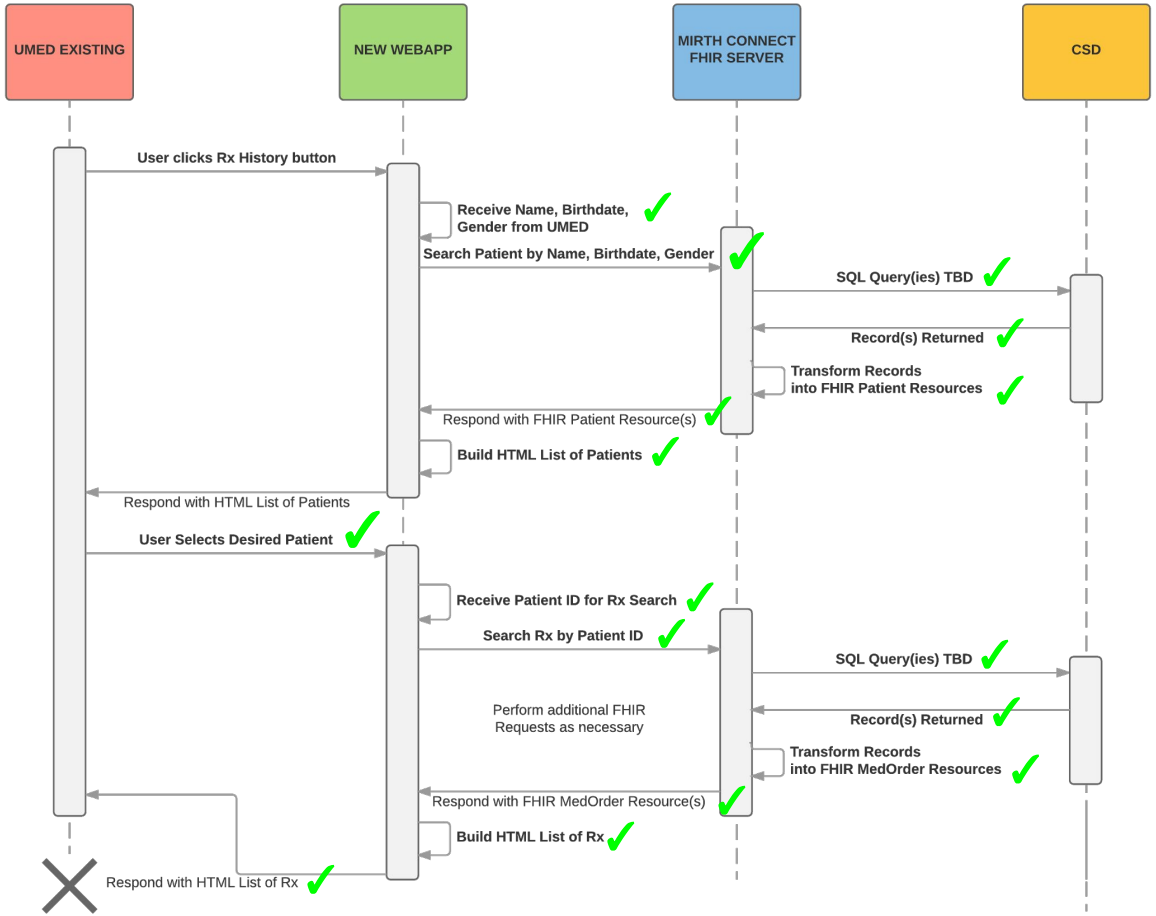
GaTech GitHub Source Code Repository

UMED Database

Utah Department of Health VMware Private Cloud

Controlled Substance Database

BASIC SEQUENCE DIAGRAM



Results (311)

Edmund Hernandez
UT, 84094

Antoinette Rodriguez
UT, 84094

Winfield Hernandez
UT, 84020

Leitha Thompson
UT, 84065

Alvena Brown
UT, 84020

Johnson Jones
UT, 84094

Jessie Taylor
UT, 84094

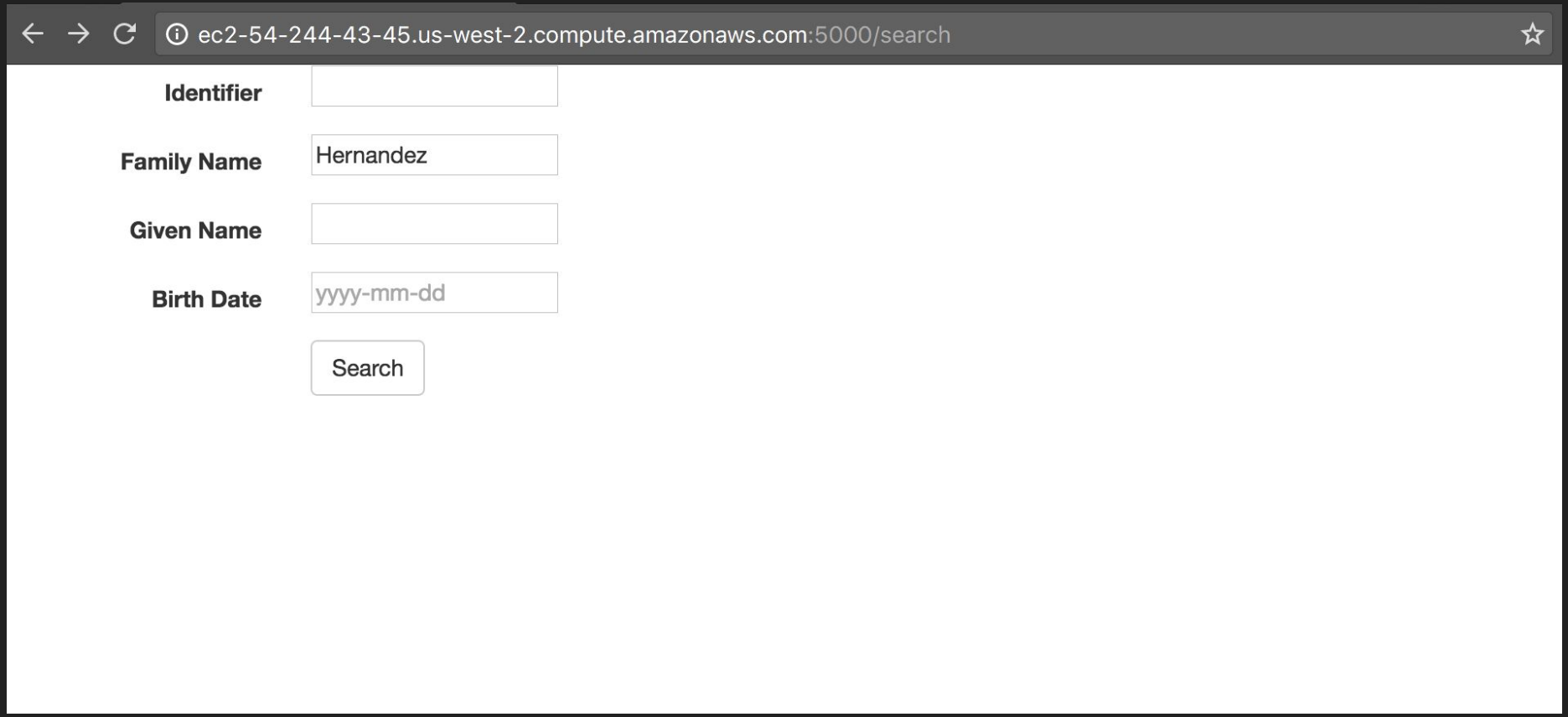
Jessie Taylor
UT, 84094

Edmund Hernandez

Gender: male
Age: 20
Born: 9/30/1996, 7:00:00 PM

UT, 84094

Medication Name	Prescribed	Prescriber	Repeats	Quantity
CONCERTA 54MG ER TABS	1/29/2007, 6:00:00 PM	Pike, Jerry	0	30


ec2-54-244-43-45.us-west-2.compute.amazonaws.com:5000/search
Identifier
Family Name
Hernandez
Given Name
Birth Date
yyyy-mm-dd
Search

Search Criteria: Family Name: Hernandez

Results (10)

- **Edmund Hernandez**
  UT, 84094
- **Winfield Hernandez**
  UT, 84020
- **Nat Hernandez**
  UT, 84106
- **Earl Hernandez**
  UT, 84106
- **Earl Hernandez**
  UT, 84106
- **Lella Hernandez**
  UT, 84109
- **Amalia Hernandez**
  UT, 84027

Edmund Hernandez

Gender: male
Age: 20
Born: 9/30/1996, 7:00:00 PM

UT, 84094

Medication Name	Prescribed	Prescriber	Repeats	Quantity
CONCERTA 54MG ER TABS	1/29/2007, 6:00:00 PM	Pike, Jerry	0	30

Future plans

- Integrate and deploy solution on the Utah Department of Health’s private cloud
- Expand FHIR interface to include additional resources
  - Medication
  - Practitioner
  - Etc.

Activity	Assign	Start	Weeks
Topic Presentation	DM	1	1
Research	Team	1	3
Setup Dev Env	Team	4	3
Database Dev	RC	4	4
Tech Presentation	FG	4	2
FHIR Interface Dev	DM	4	5
FHIR Interface QA	DM/FG	6	5
Query UI Dev	FG	6	4
Query UI QA	RC/FG	6	5
Progress Report	RC	7	1
Integration Dev	DM/FG	8	3
Integration QA	Team	8	3
Final Report	Team	9	2

Georgia Tech

UTAH DEPARTMENT OF HEALTH
Office of the Medical Examiner

Thank You

Contact Us:

Ryan Cobb
rscobb9@gmail.com

Fred Galoso
fredrickgaloso@gmail.com

David Mooney
davidmooney@gatech.edu