

Cold Case Solutions

Leveraging the power of IBM's Watson
to reopen cold cases, find criminals,
and save lives

What is a Cold Case?

MISSING

From Indiana University



Lauren Spierer (age 20) was last seen in Bloomington, Indiana at 4:15am on Friday, June 3, 2011 walking south on College Avenue from 11th Street on her way back to her apartment for a quick party in Eastwood Plaza. She was barefoot and wearing a white tank top and a loose, light colored button shirt and black stretch pants. Lauren has blue eyes, long, blond hair, stands 5'11" tall and weighs 90 pounds. "MEDICAL ALERT" Lauren has a heart condition requiring daily medication and must be taken to a hospital immediately when found. Call 911 if you find her to request an ambulance.

LAUREN SPIERER

Call Bloomington Police or 911

1.812.339.4477

[facebook.com/find.lauren](https://www.facebook.com/find.lauren)

Embracing the Constraints

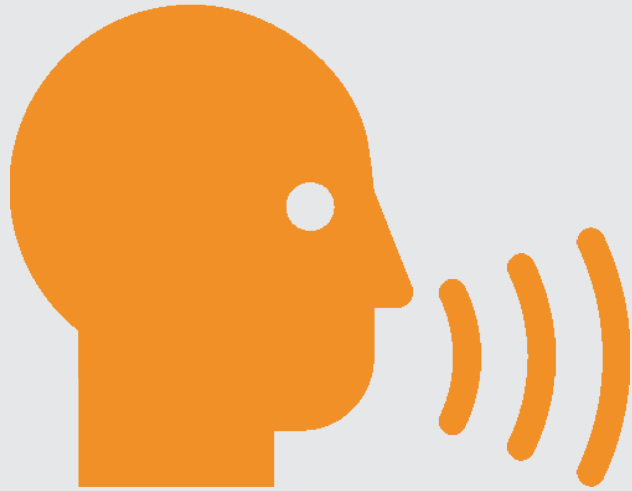
Embracing the Constraints



Using Watson Takes Time

Cold cases have no deadlines,
any solution is better than no solution.

Embracing the Constraints



Natural Language Plain Text

Cold cases have finite document (evidence) sets, and can be transcribed into plain text files.

Embracing the Constraints



Critical Questions

Solving cold cases can save lives
or lead to arrests.

Embracing the Constraints



Fact-based Answers

Investigation of criminal cases relies heavily on factual inquiries.

Interaction Scenario

Meet Lieutenant Potts



Uploading Documents



Upload Case Assets



Watson Case Learning



Watson Case Q&A

Lieutenant Potts ?

Step 1: Define and Upload Case Assets i

* Case name:

* Upload path: Browse...

Description:

Case officer: **Lieutenant Potts - Indiana State Police (Cold Case Investigation Unit)**

Created on: **Thur, Nov 21, 2013 13:07:44 AM**



Folder A



Folder B



Folder C



Folder D



Folder E



Folder F



Folder G



Folder H



Folder I



Folder J

Uploading

Uploaded



Case File 12/15/2012.txt

00:04



80%



Case File 12/15/2012.txt

00:50



05%



Case File 12/15/2012.txt

00:10



50%



Case File 12/15/2012.txt

00:01



90%



Case File 12/15/2012.txt

00:30



20%



Case File 12/15/2012.txt

00:04



100%

Drag and drop here to upload assets



Watson is waiting for new assets.

Watson's learning progress: 0%



IBM WATSON

Evidence Processing



Upload Case Assets



Watson Case Learning



Watson Case Q&A

Lieutenant Potts



Step 2: Answer Watson's Questions about the Case



"Lieutenant Potts, your uploaded assets are being processed. I may have some questions for you when I finish. It should take about ..."

00:05:22
Days Hours Minutes

"You will receive a notification when processing is completed."

Watson is processing case assets.

Watson's learning progress: 0%



IBM WATSON

Teaching Watson the Evidence



Upload Case Assets



Watson Case Learning



Watson Case Q&A

Lieutenant Potts ▾ ? ▾

Step 2: Answer Watson's Questions about the Case ⓘ



"Lieutenant Potts, are the people highlighted below the same?"

...A **young man** was seen walking westward on 15th street at 12:13 am. Witnesses report **he** is wearing a green hooded sweatshirt and seems inebriated. Can any officers respond?

Recording of Police Dispatcher

...I asked **him** if **he** had been drinking and **he** told me **he** hadn't been. I wasn't entirely convinced, but **he** seemed like **he** was capable of getting home--**he** said **he** was walking home from a party and that **he** lived only a few blocks away on 15th street. I offered a ride but **he** said I was making **him** uncomfortable by doing so...

Police report filed by James Wilson

Suspect name: **Jonathan Waterson**
Context: Seen on the night of the crime, walking westward on 15th street at 12:13 am wearing a green hooded sweatshirt. Was approached by deputy James Wilson and asked if he had been drinking. Suspect denied having had anything to drink and asked that deputy Wilson allow him to walk home. Suspect's whereabouts after his meeting with deputy Wilson are unknown.

Suspect Profile of Jonathan Waterson

Yes

No

I don't know

Watson is learning case assets.

Watson's learning progress: 50%



IBM WATSON

Asking Questions of Watson



Upload Case Assets



Watson Case Learning



Watson Case Q&A

Lieutenant Potts ▾ ? ▾

Step 3: Ask Watson Any Questions about the Case ⓘ



"Lieutenant Potts, please enter your question below."

You have asked

07

questions

Where was Jonathan Waterson on the night of June 3rd, 2011?

Ask Watson

Review



"Here are my answers to 'Where was Jonathan Waterson on the night of June 3rd, 2011?'."

Answers

Confidence

15th street



96%

The home of Jonathan Waterson



34%

Bloomington Hardware Store



02%

Watson is ready to answer your questions.

Watson's learning progress: 100%



IBM WATSON

Additional Interactions

IBM Watson and Active Cases

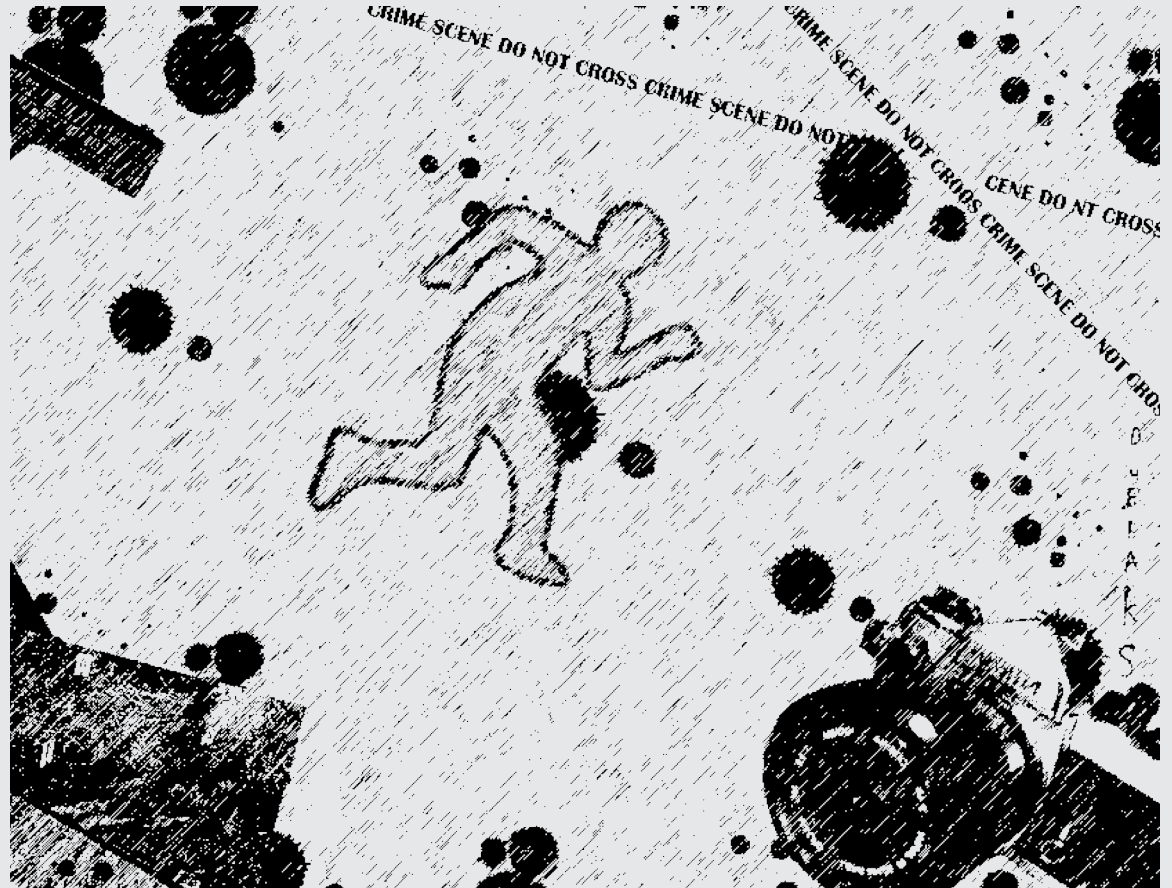
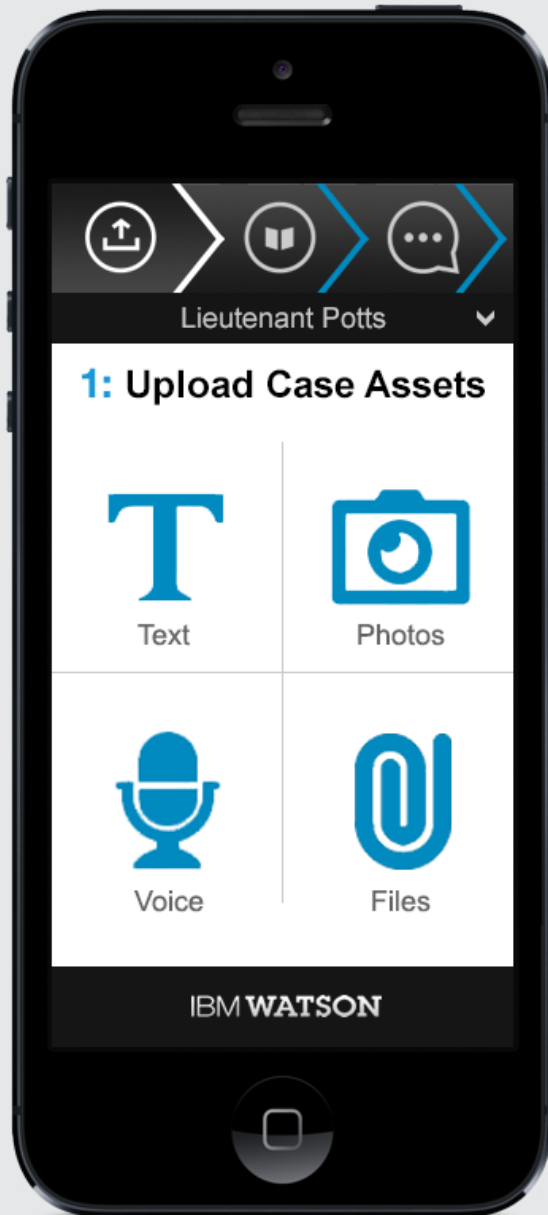


New evidence
anywhere, at any time.

Faster is better



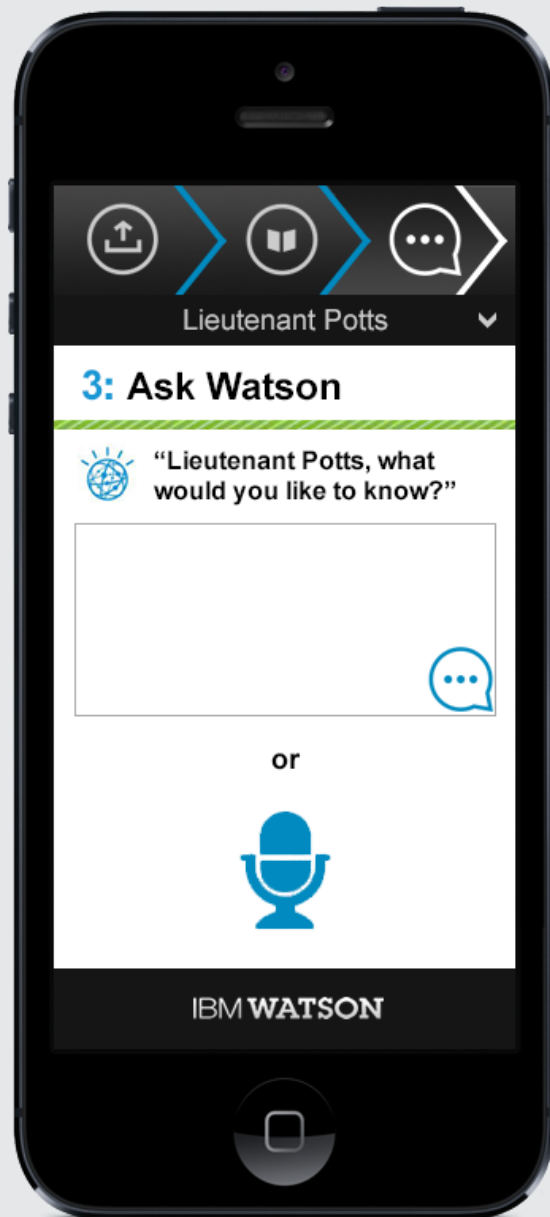
Uploading Mobile Assets



Answering Watson's Questions



Asking Questions on the Go

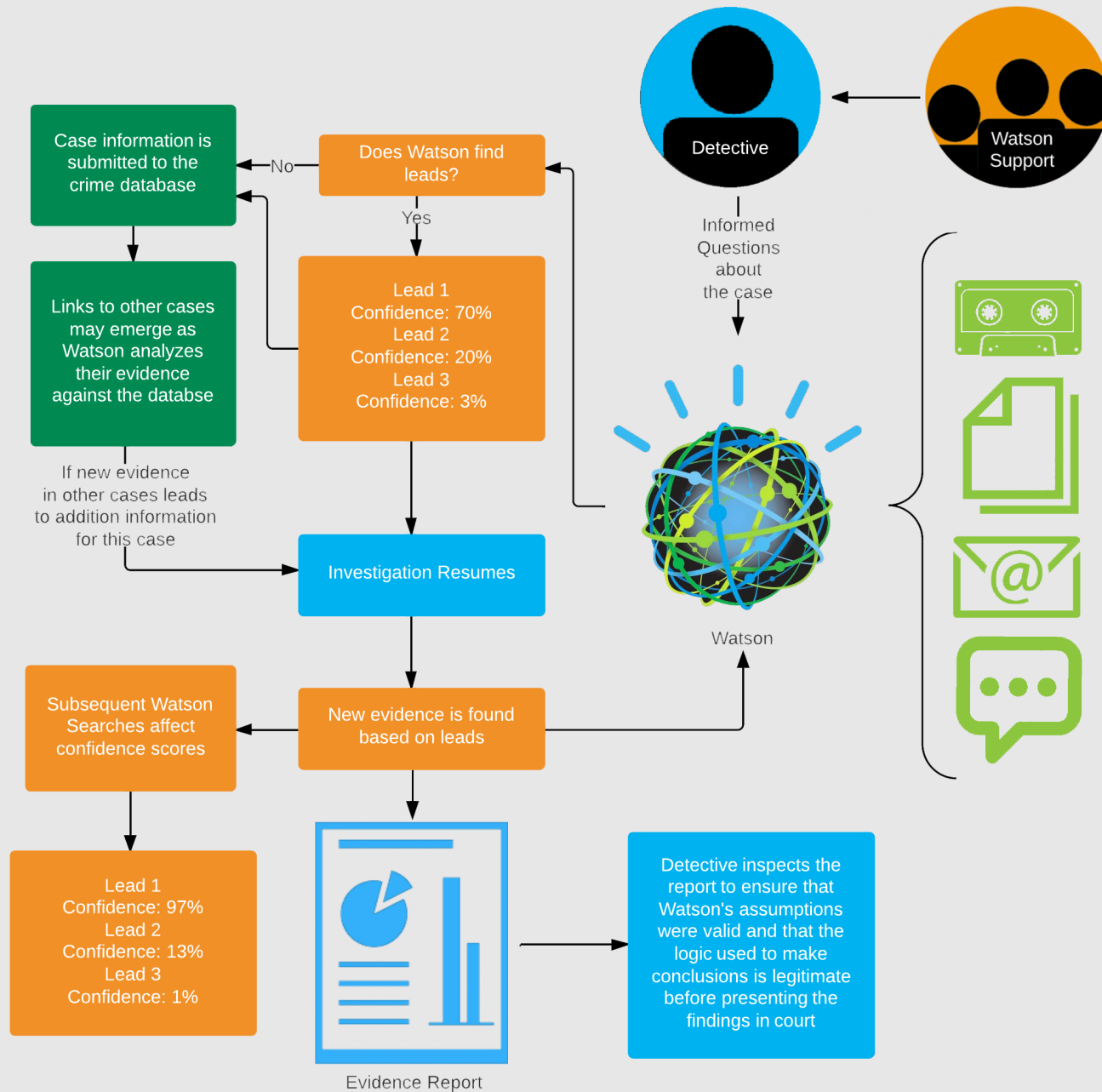


Cold Case Solutions and the Semantic Web



Thank You
Tarun Gangwani
Brandon Le
Mark Marrara
Maria Elavumkal
IBM Watson Design Team

Cold Case Solutions System Map



Research

Videos about Watson on Jeopardy

IBM's Watson website

Documentaries about cold case detectives

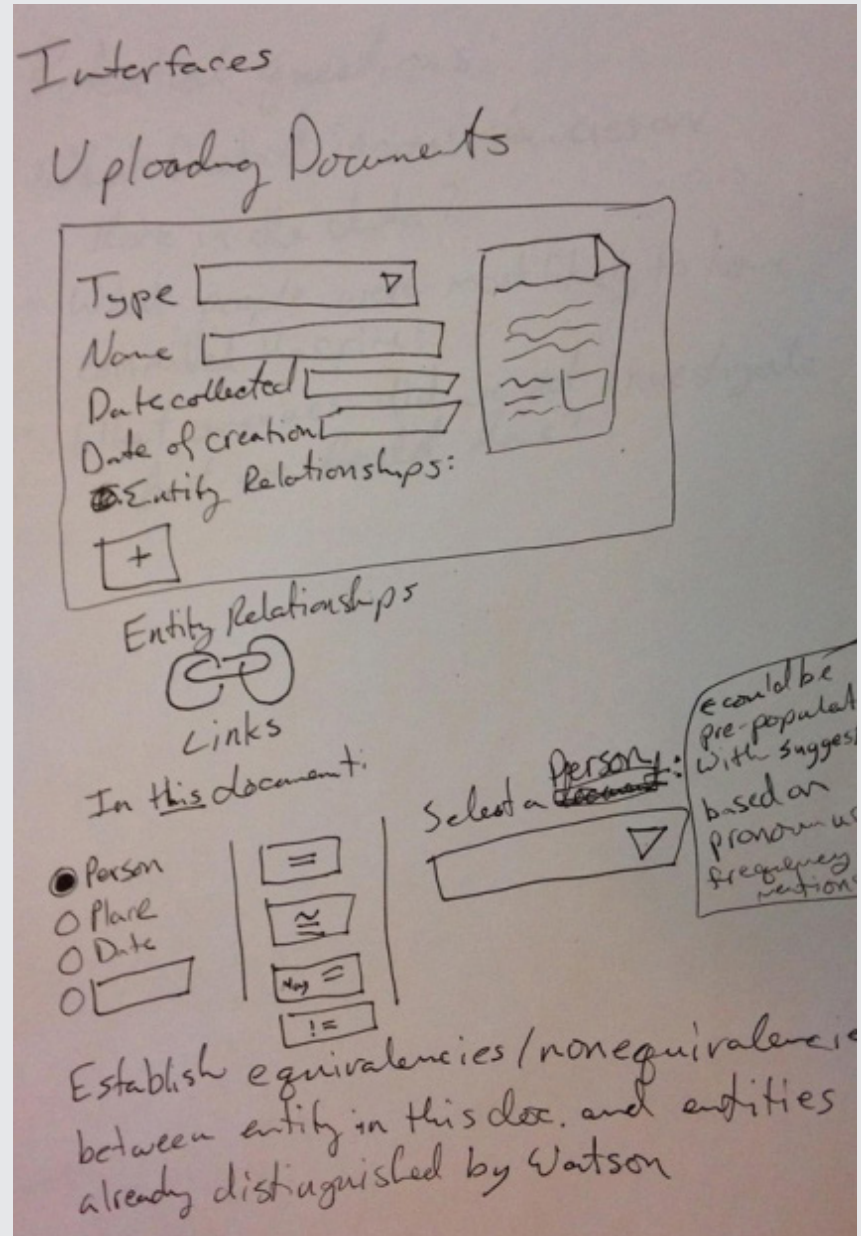
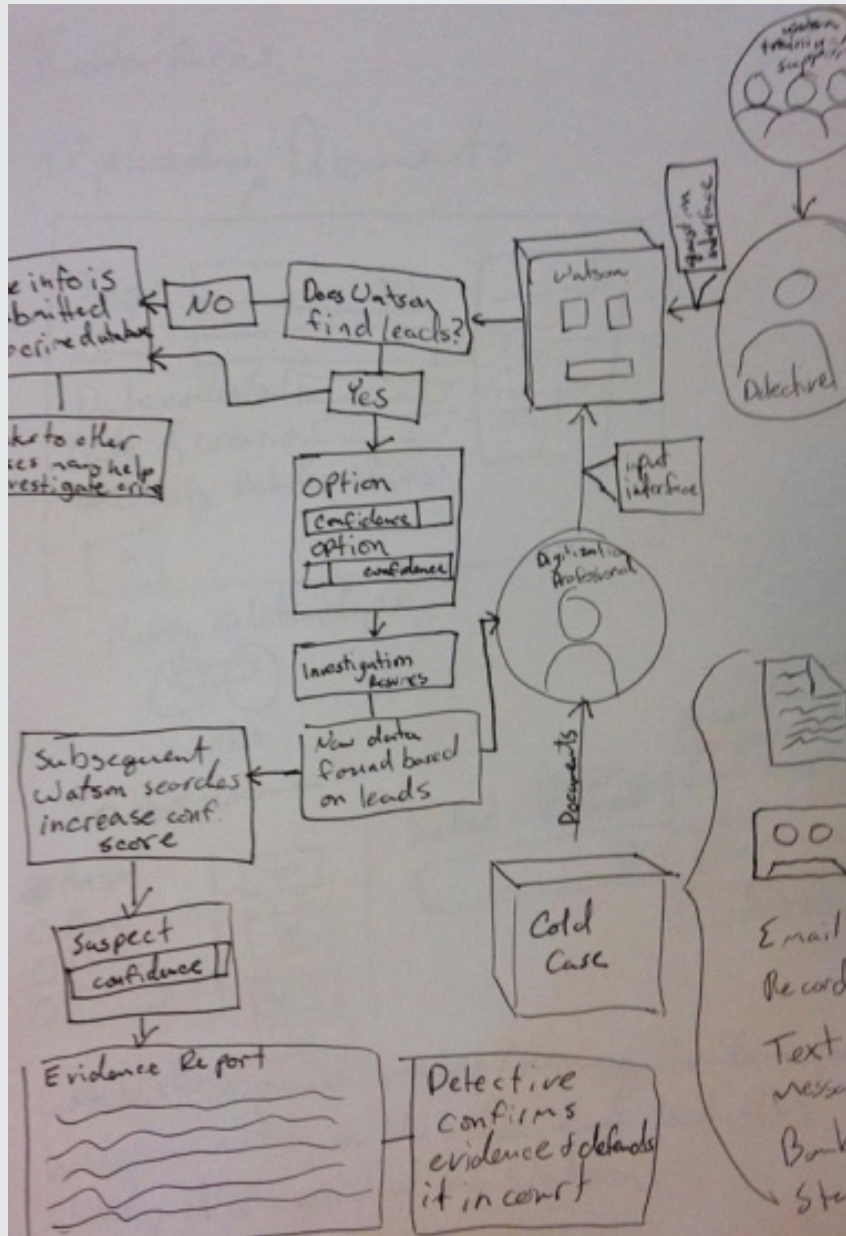
How Watson answers questions

Watson in different use cases (healthcare, law, education, etc.)

Process



Process



Process

Agenda
4:10 ~ 5:10

Problem Space
Focus
Concept

SAM Shahmi

Business
Public Questions & Answers
Cost
Value

Answers
direct
possibilities

Energy
Weather
Health
Traffic
Finance
Telecom

1. Big Data
2. Valuable Fact-based results
3. Critical requests
4. Generate solid knowledge
5. Make research more efficient
6. Figure out the right questions to ask

→ ... is the killer? → Sematic connections big data sources