Connecting up to Chemical Health & Safety

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Why?

- Health and Safety Data is crucial for scientific research
- H&S Information is not well shared & easily accessible
- Need new interaction methods
- Capturing incident occurrences

What we built

Data Sources

- Sigma Aldrich safety data and Biovia Chemical Safety Library

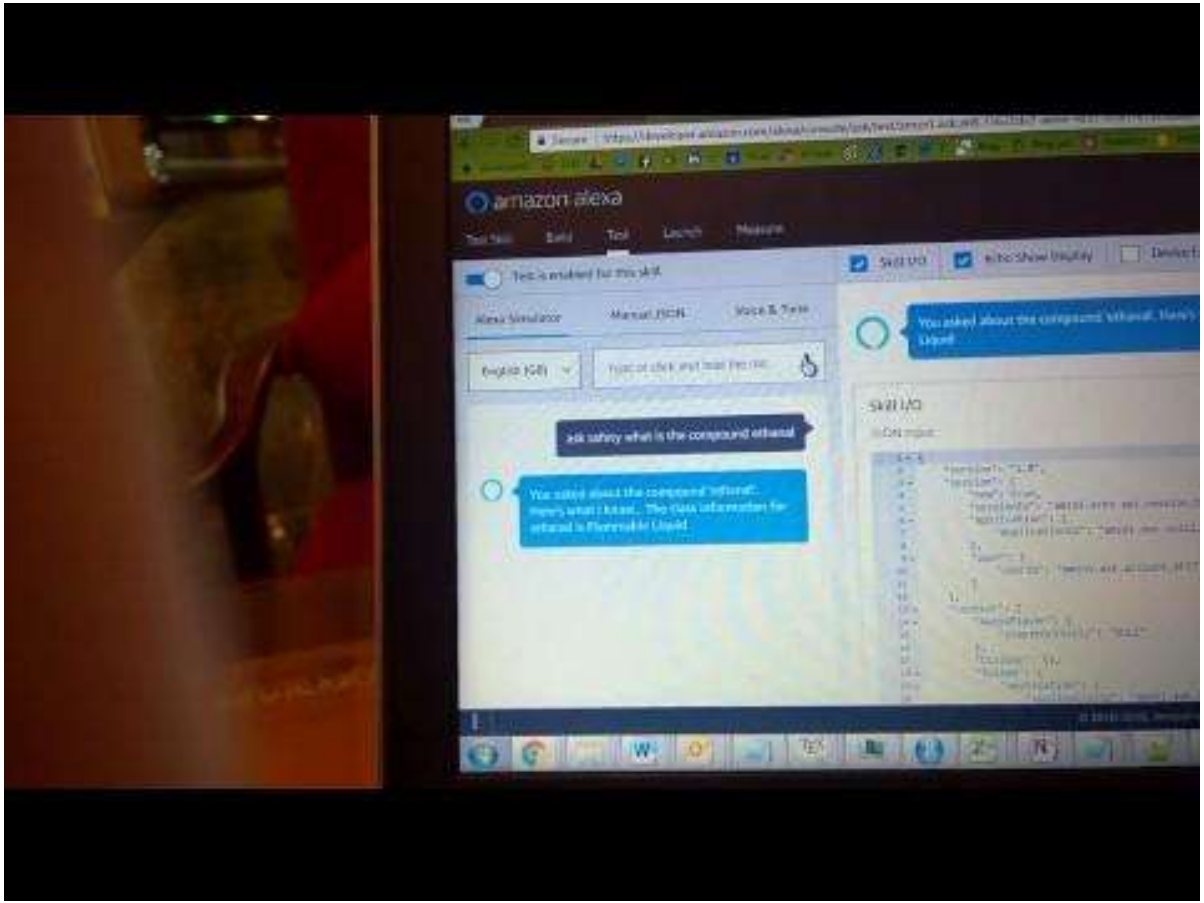
Data Retrieval

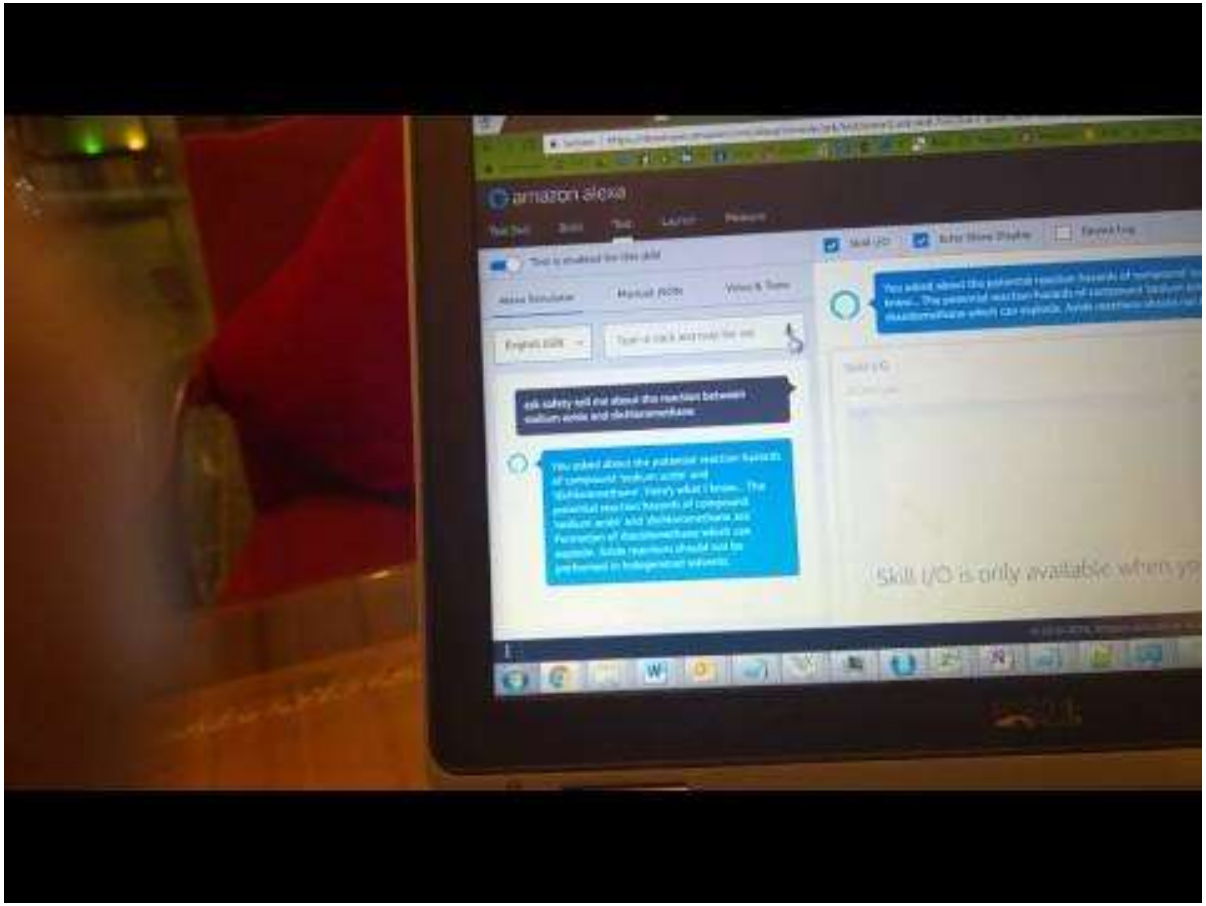
- Interaction via Amazon Echo and Web interface.
- Compound hazards, PPE, compound classes and Reaction Hazards

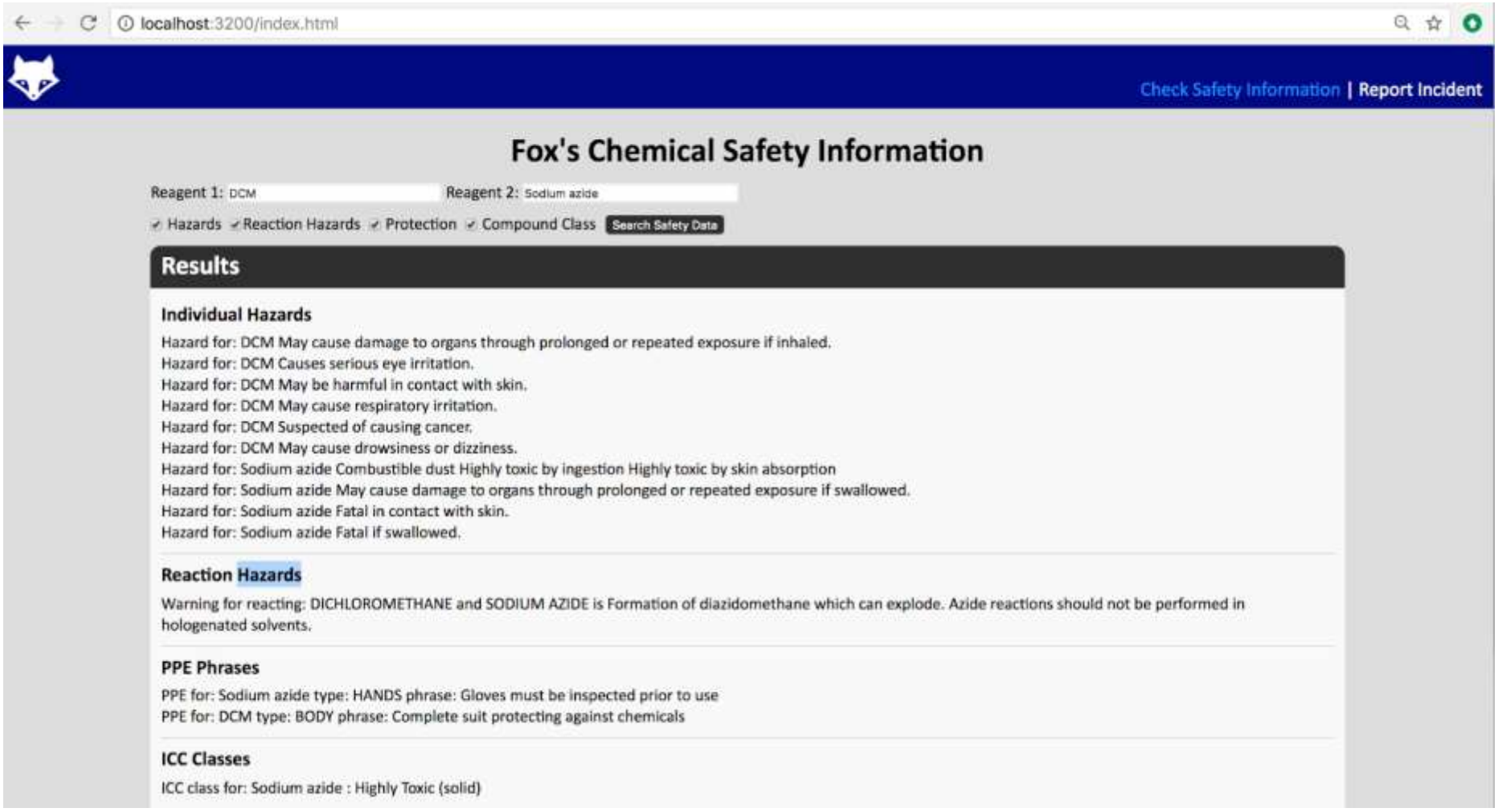
Incident Logging

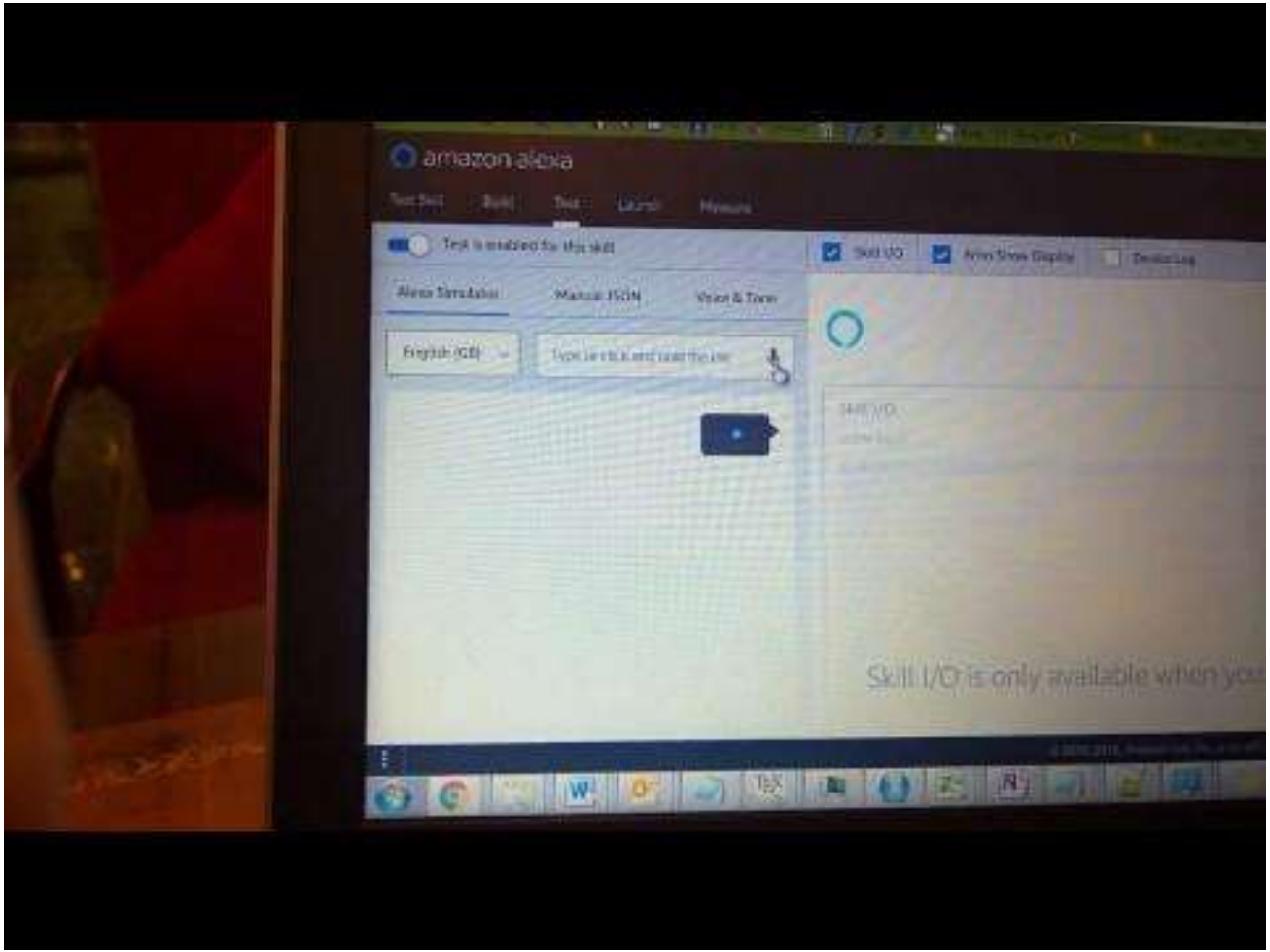
- IoT button - log severity of incident
- Alexa interface - voice logging of an incident
- Incident reporting form linking up to incident log

Demo


amazon alexa
ask safety what is the compound ethanol


amazon alexa
Skill I/O is only available when yo

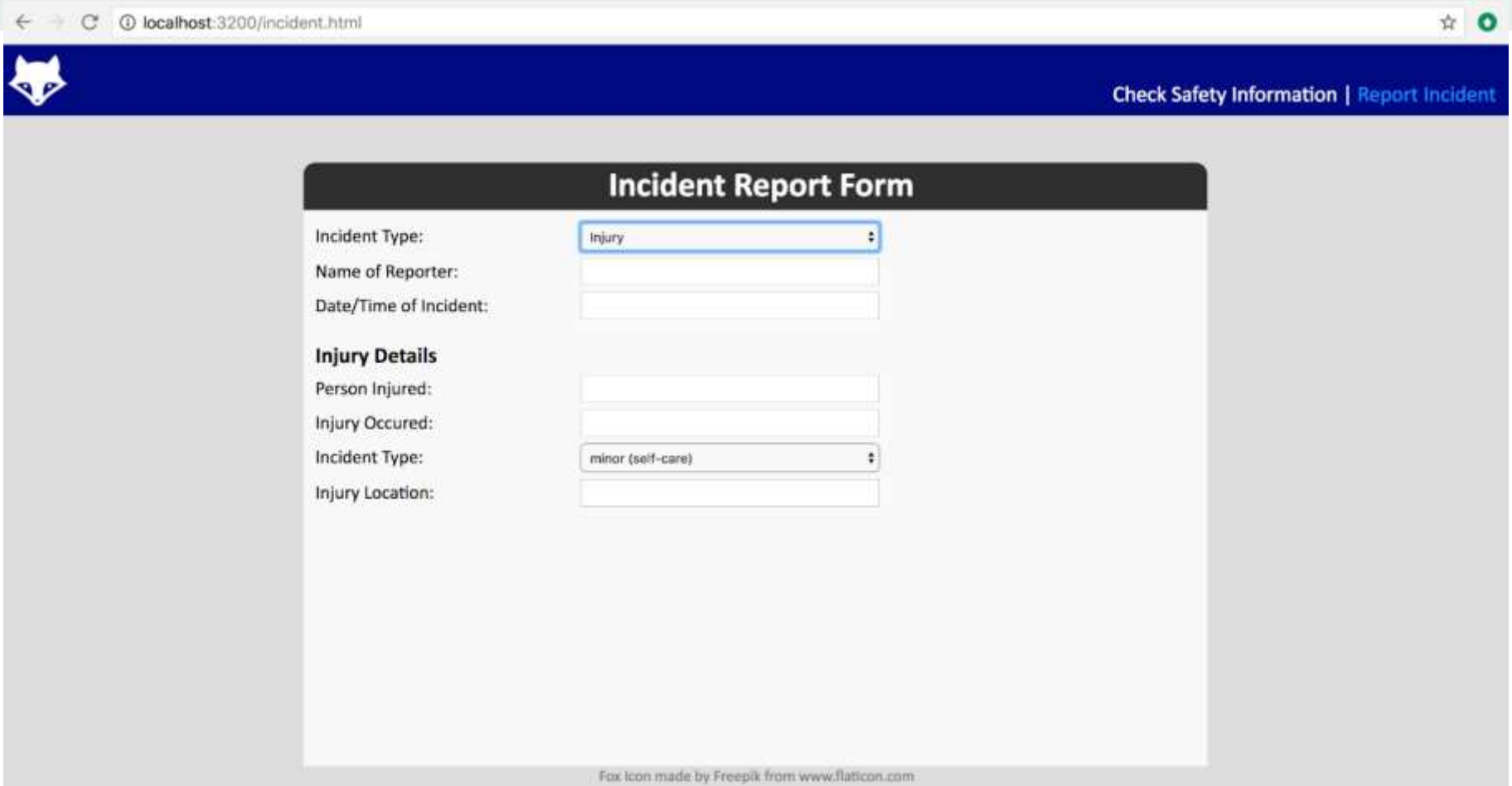

localhost:3200/index.html
Check Safety Information | Report Incident
Fox's Chemical Safety Information
Reagent 1: DCM
Reagent 2: Sodium azide
Hazards Reaction Hazards Protection Compound Class
Search Safety Data
Results
Individual Hazards
Hazard for: DCM May cause damage to organs through prolonged or repeated exposure if inhaled.
Hazard for: DCM Causes serious eye irritation.
Hazard for: DCM May be harmful in contact with skin.
Hazard for: DCM May cause respiratory irritation.
Hazard for: DCM Suspected of causing cancer.
Hazard for: DCM May cause drowsiness or dizziness.
Hazard for: Sodium azide Combustible dust Highly toxic by ingestion Highly toxic by skin absorption
Hazard for: Sodium azide May cause damage to organs through prolonged or repeated exposure if swallowed.
Hazard for: Sodium azide Fatal in contact with skin.
Hazard for: Sodium azide Fatal if swallowed.
Reaction Hazards
Warning for reacting: DICHLOROMETHANE and SODIUM AZIDE is Formation of diazidomethane which can explode. Azide reactions should not be performed in hologenated solvents.
PPE Phrases
PPE for: Sodium azide type: HANDS phrase: Gloves must be inspected prior to use
PPE for: DCM type: BODY phrase: Complete suit protecting against chemicals
ICC Classes
ICC class for: Sodium azide : Highly Toxic (solid)

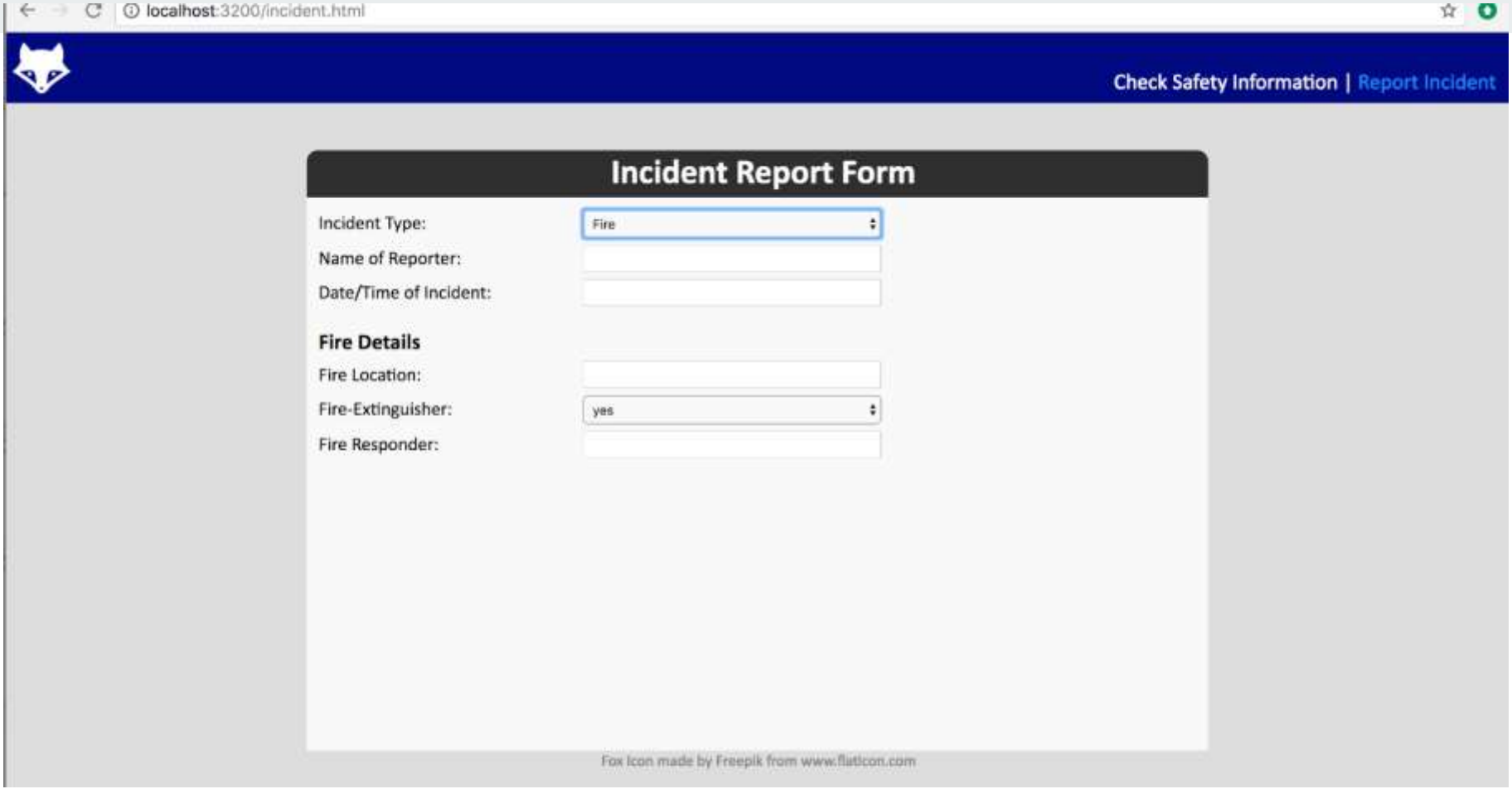

amazon alexa
Alexa Simulator
Manual JSON
Voice & Tone
Skill I/O
Skill I/O is only available when

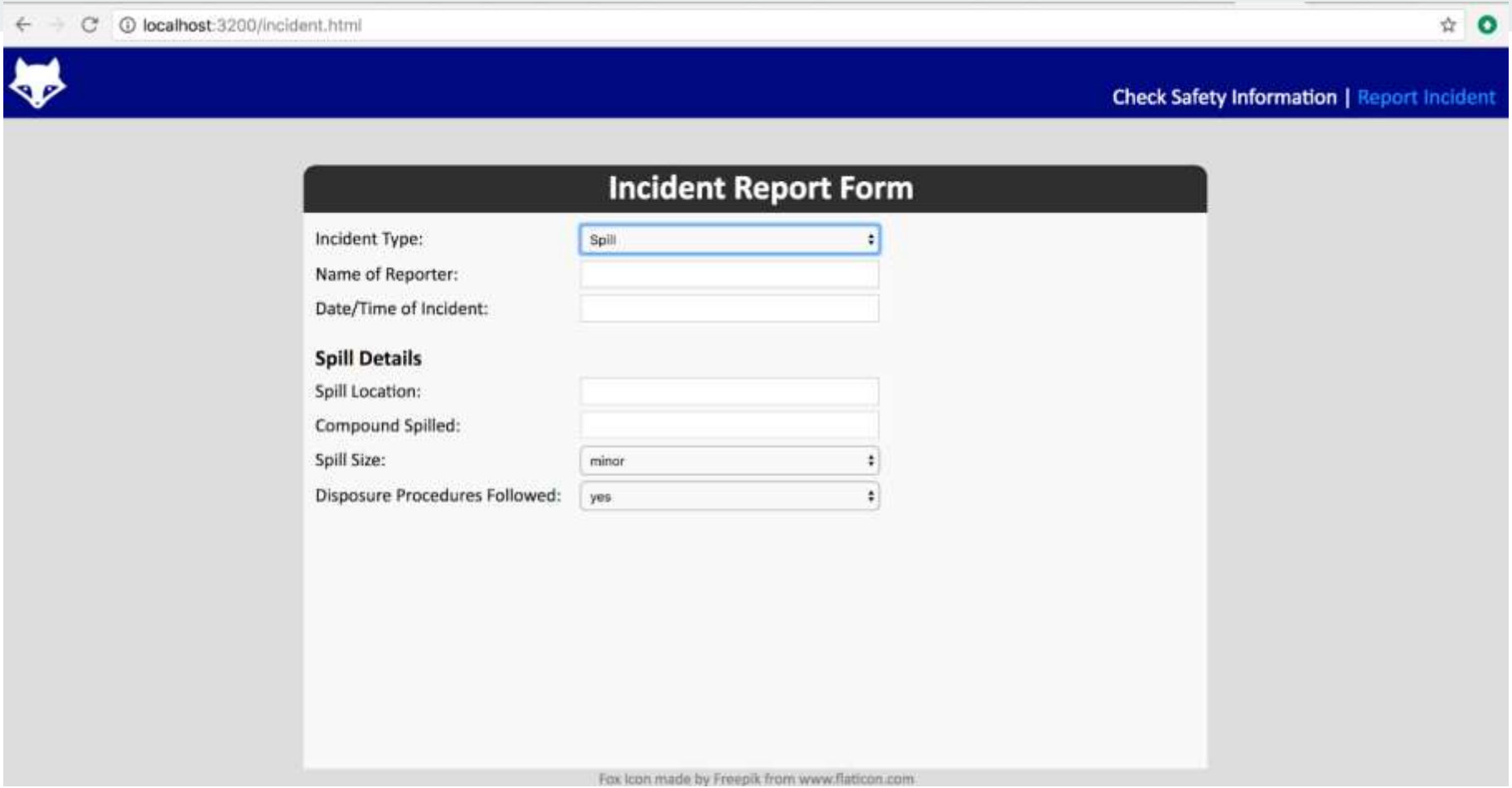
Incident log from button and reports via Alexa

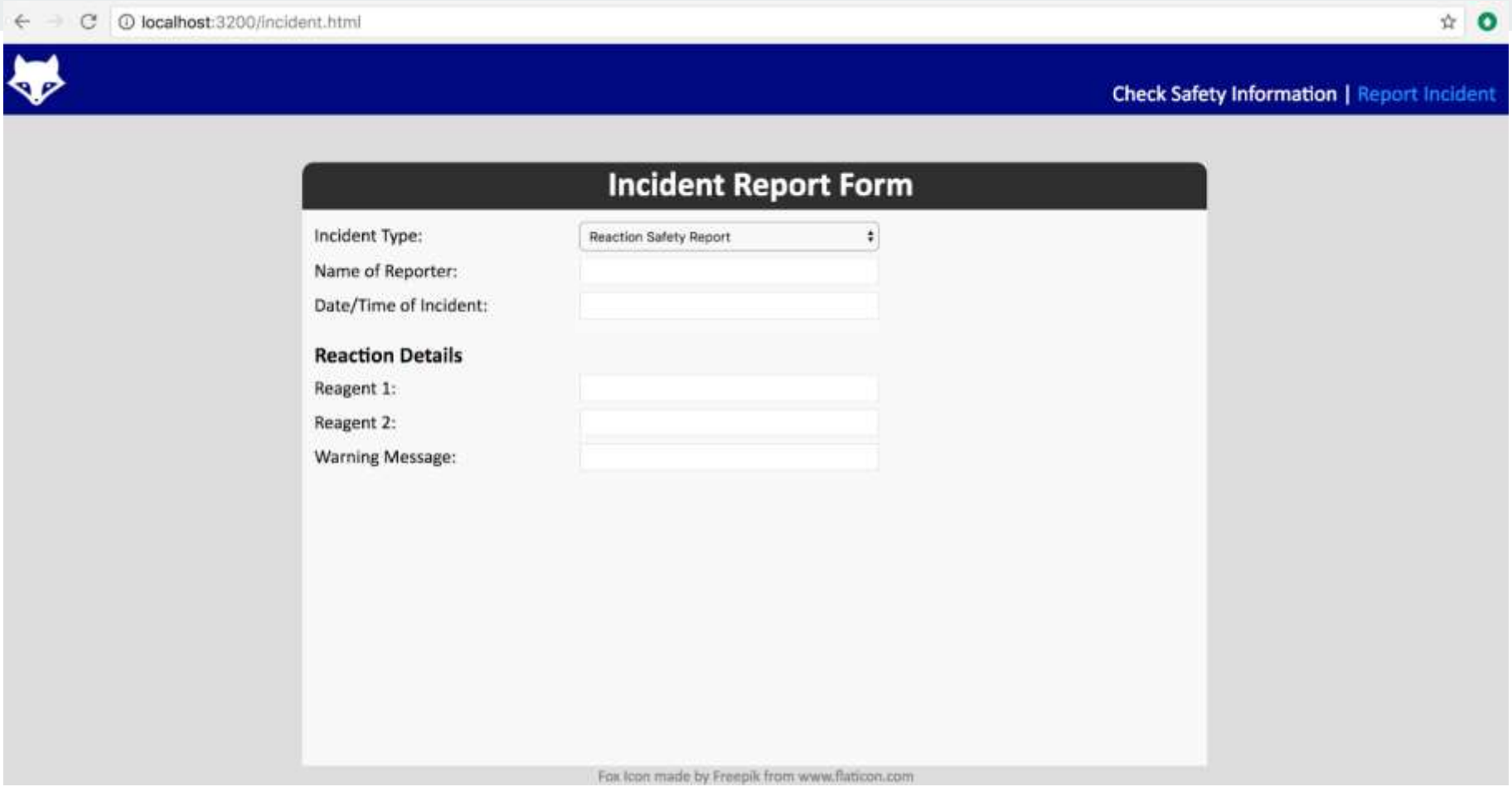
Incident Log

Source	Button ID	Time	Class	Status
button	G030PT026187U8M1	March 13th 2018, 11:51:21 am	Minor	Completed
button	G030PT026187U8M1	March 13th 2018, 2:17:32 pm	Minor	Incomplete
button	G030PT026187U8M1	March 13th 2018, 2:18:12 pm	Moderate	Incomplete
button	G030PT026187U8M1	March 13th 2018, 2:18:30 pm	Severe	Incomplete
Alexa		March 13th 2018, 2:40:15 pm		Incomplete
Alexa		March 13th 2018, 2:40:54 pm		Incomplete
Alexa		March 13th 2018, 2:41:36 pm		Incomplete


localhost:3200/incident.html
Check Safety Information | Report Incident
Incident Report Form
Incident Type:
Injury
Name of Reporter:
Date/Time of Incident:
Injury Details
Person Injured:
Injury Occured:
Incident Type:
minor (self-care)
Injury Location:
Fox Icon made by Freepik from www.flaticon.com


localhost:3200/incident.html
Check Safety Information | Report Incident
Incident Report Form
Incident Type:
Fire
Name of Reporter:
Date/Time of Incident:
Fire Details
Fire Location:
Fire-Extinguisher:
yes
Fire Responder:
Fox Icon made by Freepik from www.flaticon.com


localhost:3200/incident.html
Check Safety Information | Report Incident
Incident Report Form
Incident Type:
Spill
Name of Reporter:
Date/Time of Incident:
Spill Details
Spill Location:
Compound Spilled:
Spill Size:
minor
Disposure Procedures Followed:
yes
Fox Icon made by Freepik from www.flaticon.com


localhost:3200/incident.html
Check Safety Information | Report Incident
Incident Report Form
Incident Type:
Reaction Safety Report
Name of Reporter:
Date/Time of Incident:
Reaction Details
Reagent 1:
Reagent 2:
Warning Message:
Fox Icon made by Freepik from www.flaticon.com

Future Developments

- Expand system to pull in data from additional safety sources
- Use information displays - Echo Show to display textual feedback & current hazards.
- Use incident data to track incidents in laboratories
- Link reported incident data back to expand reaction safety libraries

Any Questions?