HYUNDAI SODAS


# BRYAN HOLLAND
# PRODUCT PRINCIPAL

VISION + LEADERSHIP + DESIGN

HYUNDAI SODAS

# Safety Office Data Analytics System

BRYAN HOLLAND

## PRODUCT PRINCIPAL

**VISION + LEADERSHIP + DESIGN**

Oct 2021- April 2022

THE PROJECT

## CREATE NEW PREDICTIVE AI-BASED ALERT SYSTEM

SODAS system will predict when to recall a vehicle and what system or part is responsible.
Using **Predictive AI/ML (ChatGTP3) & RLHF, create a global web-based system to predict from 14 million claims and incidents,** with speed and high accuracy, what to recall (part, system, vehicle, model line) and then initiate recall.

Hyundai Motor Group- Exec- Seattle/Korea
AutoEver- HMG Tech arm, Seattle
Hyundai Mobis- Vehicle Parts Manufacturer, Korea
Hyundai Data Safety Analysts- Irvine, CA
WongDoody + InfoSys- Global

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ChatGTP + BigData + RLHF

# TREND DETECTION ALERT SYSTEM

## RFP TO CLICKABLE PROTOTYPE

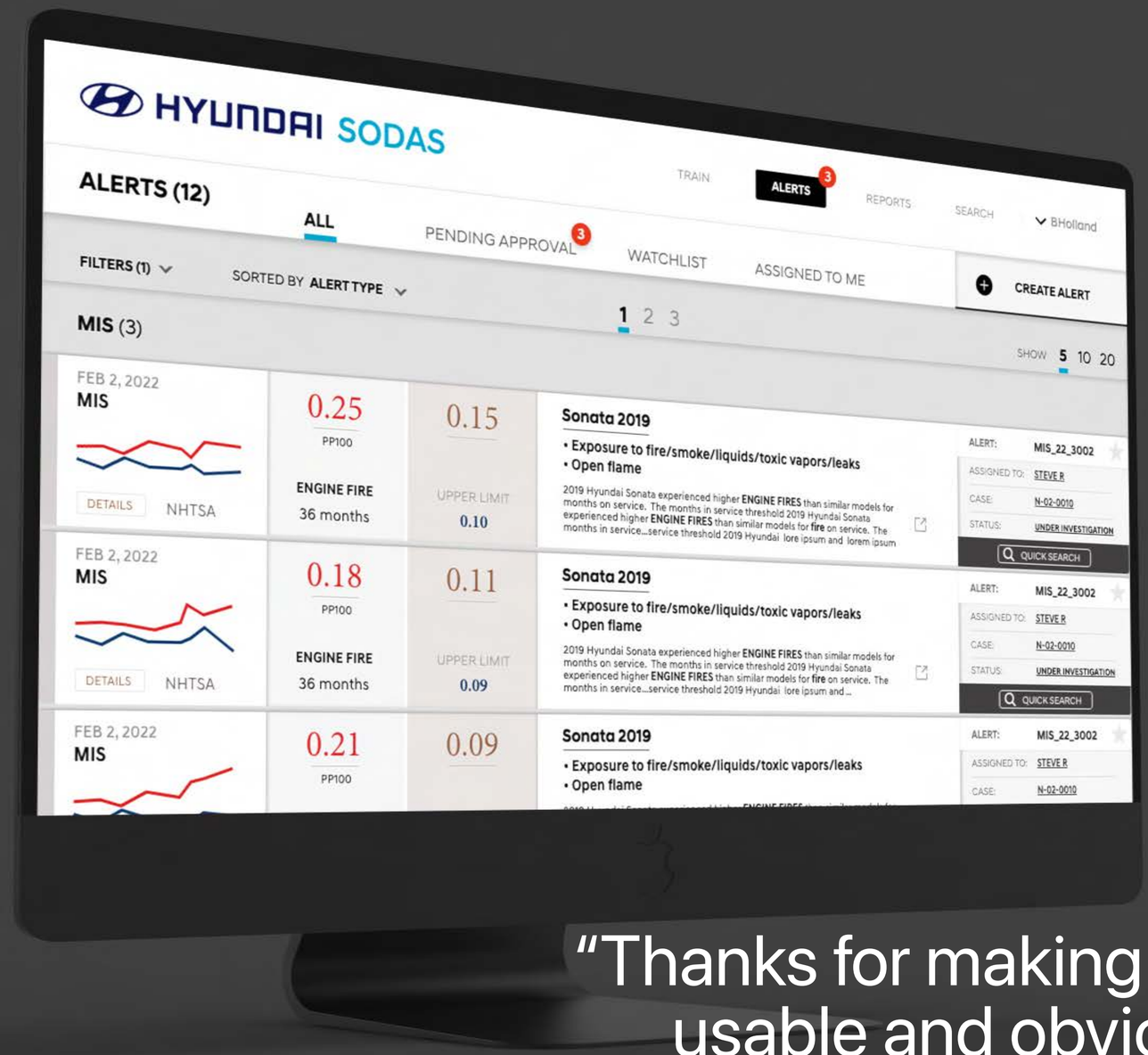
**Responding to a direct mandate from NHTSA,**
the **SODAS** (Safety Office Data Analytics System) will predict when to **recall a vehicle** and what system or part is responsible based on examining existing records collected by 40 different sources at Hyundai Motors et al.

Using **Predictive AI/ML** (ChatGTP) and training with **RLHF**, create a global web-based system to throw alerts to data Team in Irvine, CA from **14 million claims and incidents in Phase 1**, with speed and high accuracy, detailing what to recall (part, system, vehicle, model line) and then easily initiate a recall.

***"As part of this commitment, HMA Safety Office needs to integrate machine learning and predictive analytics into existing processes to identify and investigate potential defect trends."***

**REQUIREMENT**
**US-Based Product Designer**
with US Automotive experience, to wrangle consensus and set a North Star vision for a complex product.

**So, InfoSys/WongDoody called me.**




"Thanks for making it so usable and obvious."

**Stephanie-**Hyundai Data Analyst

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# UX

## LOTS TO DO

## MY TASKS

- **Synthesize a lot of information**
- **Manage team (UX & UI)**
- **Identitfy users and their needs**
- **Ideate solutions**
- **Vet daily with stakeholders and users by presenting visuals to large global groups (2-80 people)**
- **Process flows**
- **Build a case builder tool**
- **Recall path workflow**
- **Peer review workflow**

### UX

1. **Discovery**- Read RFP, all docs, met all leaders and stakeholders
2. **Users-** interviews, design workshops, prototypes to learn
3. **Workflow**- process flows, pipeline mapping, user journeys
4. **Leadership**- Present new designs, meeting facilitation, team management, product evangelizing,
5. **Stakeholders-** interviews and expectation management
6. **Pivots (3)**
7. **Design**- Iterate flows, mockups and prototypes following Hyundai Branding.

### CHALLENGES

1. **NHSTA** applying pressure against timeline and features to **HMG (Hyundai, Kia, Genesis, Mobi)**
2. **Lack of vision**, no north star, no **consensus at any level**
3. **COVID**- staffing issues, **huge churn** in teams, chip shortage
4. **Data Team disagrees with SOW**
5. **Global** remote team- **80** team members
6. **No product team**.

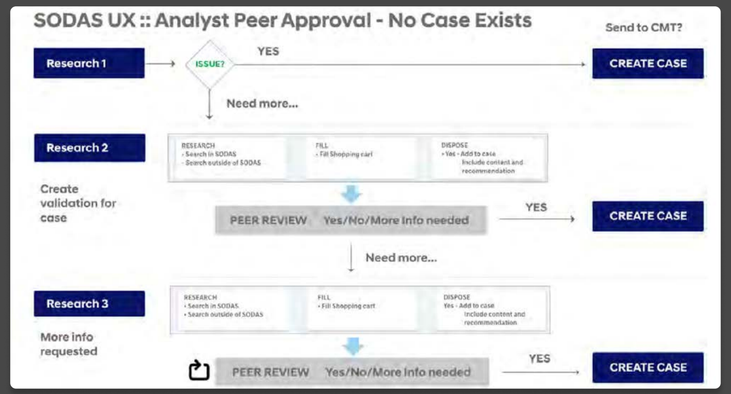
### FAILURES

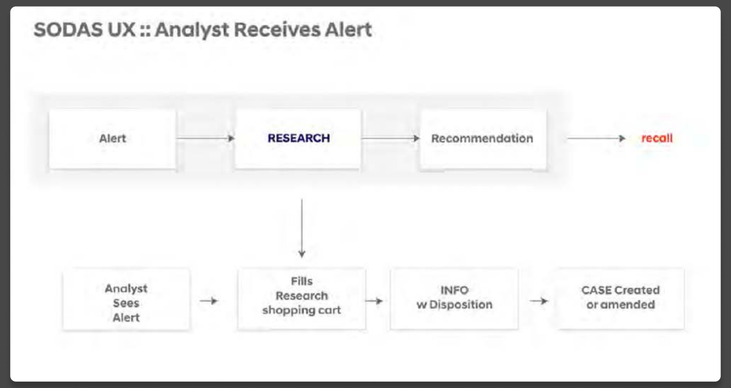
1. **Dashboard** with dials and charts is wrong approach.
2. **ChatGTP** detected no trends in initial 14 million records
3. **Alerts** alone are not enough to initiate recall.
4. **Entire workflow** must be added to tool.
5. **Existing processes** will not fit new tool.
6. **My initial designs were all wrong.**

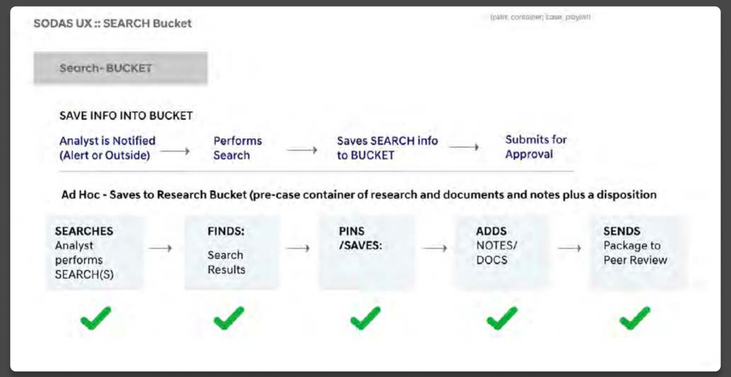
### TRIUMPHS

1. Accurately **mapped workflow** and pipeline to screens.
2. **Gained consensus** across all groups
3. **Designed**, with Hyundai branding, all necessary screens to make valuable toolset for Data team.
4. **Data team thanked me** for steering the project away from another useless tool they felt they were being forced into, to a leveraged, valuable tool with true “lift”.
5. **Infosys thanked me** for making Hyundai team happy with design process.

## SOME ARTIFACTS



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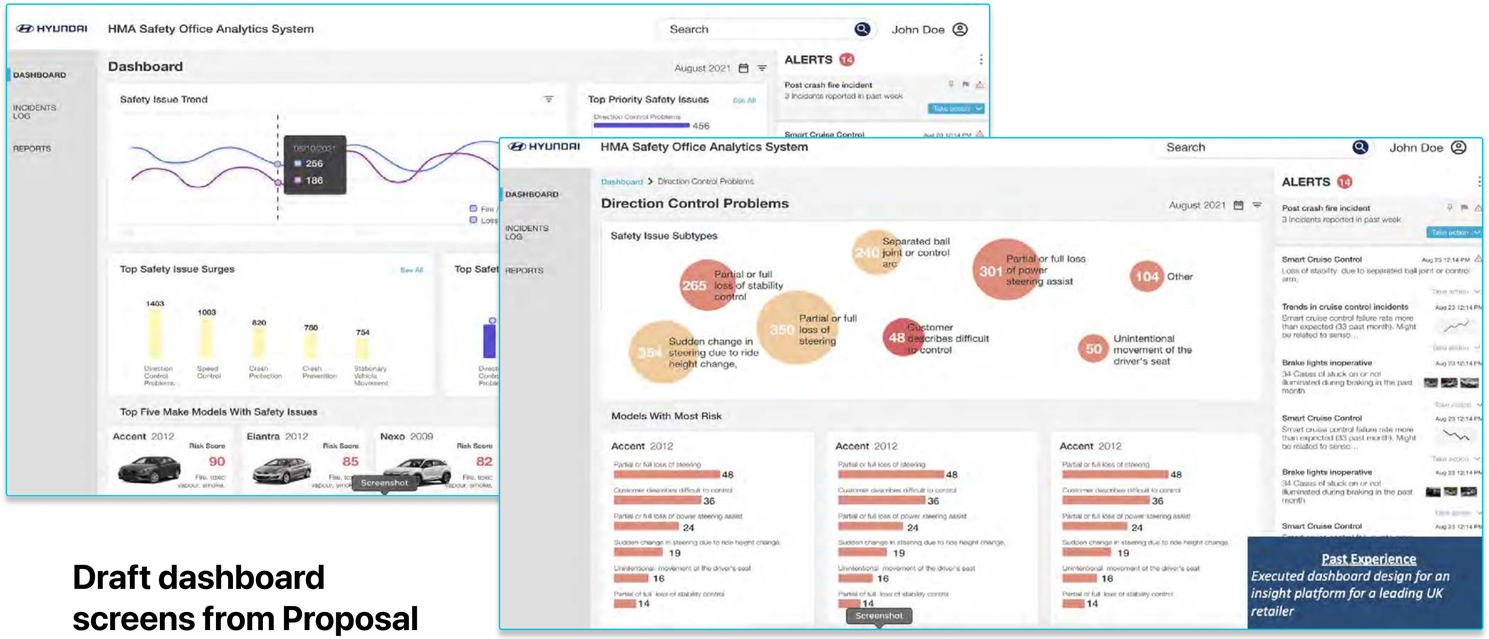
# BEGINNING

## DASHBOARD




**Draft dashboard screens from Proposal**

## ASSUMPTIONS

**AI is better and faster than humans:**

1. **ChatGTP3 can digest and synthesize 14 million records** to detect trends and predict what to recall.
2. **Scope of Work (SOW)** accurately represents needs of Data Team (Users).
3. **A chart and dial dashboard is the best method** to inform Data Team.

## USERS

**Data Team in Irvine, CA**

1. **Userbase** = **40** Whip-smart, driven, Data Analysts
2. **Motivation** = love to be known for being an authority
3. **Tools in Use** = separate terminal access **various data stores**, **Excel** spreadsheets ,and **sneaker net.**
4. **Device** = **27' monitor + same browser**
5. **Growth** = Team would expand to 80-100 over next few years

## GOALS

**Generate Lift and Leverage with AI:**

1. **Create Alert dashboard** and report system to escalate recalls of vehicles/parts and/or systems more quickly than existing system.
2. **Leverage AI/ML** to generate actionable alerts that allow Data Safety Officers to know when to create a case and then easily create a case in the existing CMT (Case Management Tool).
3. **Ingest** existing **data sources (40 sources)** to inform **Chat GTP** in order to predict what is actionable and what groupings create the most leverage.

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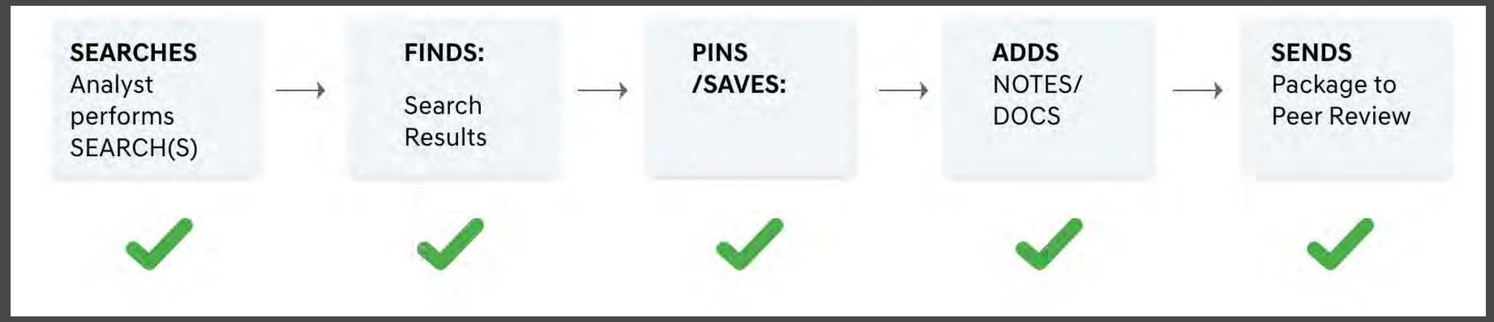
# DISCOVERY WITH DATA TEAM

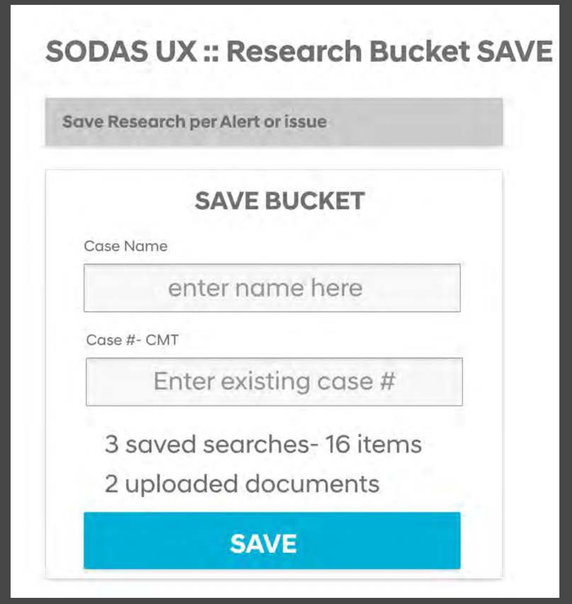
## 3 WEEK DESIGN SPRINT

### What I Discovered:

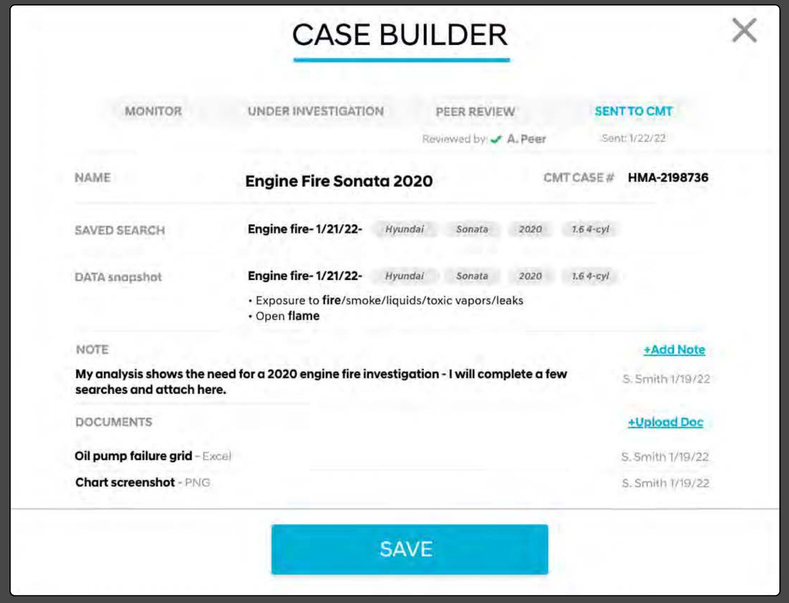
1- Data team had no faith that tool would provide lift or make their lives easier.
2- They needed a way to collect research and bind to something everygreen to persist through pipeline and into the future.
3- They need to be able to do very complex searches- they needed Search ToolKit.
4- Alerts could become the center of the universe- even through they had not been invented yet.
5- Peer review was an unnecessary step.

## DATA TEAM WORKFLOW & PIPELINE




**Version 1- Save Your Search into a bucket**




**Version 2-Case Builder**

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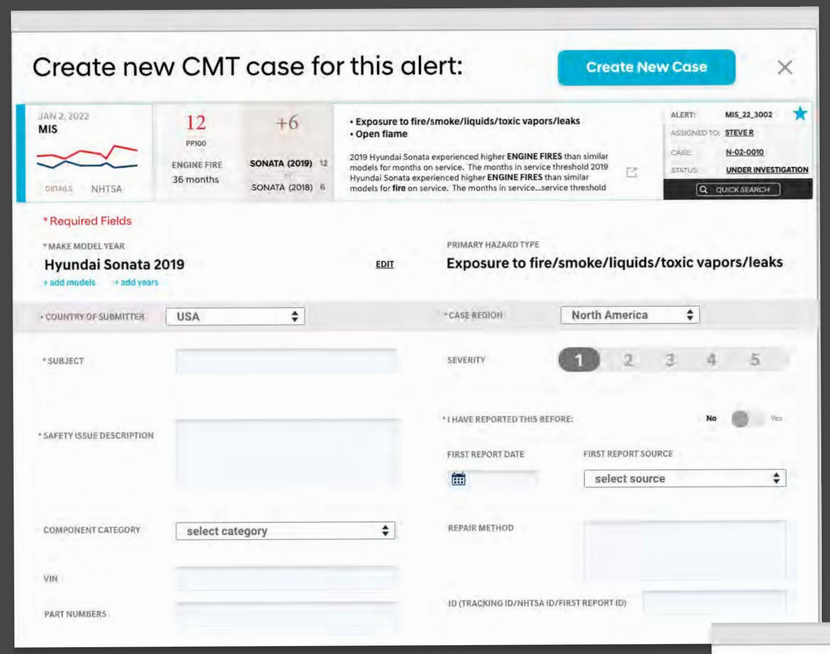
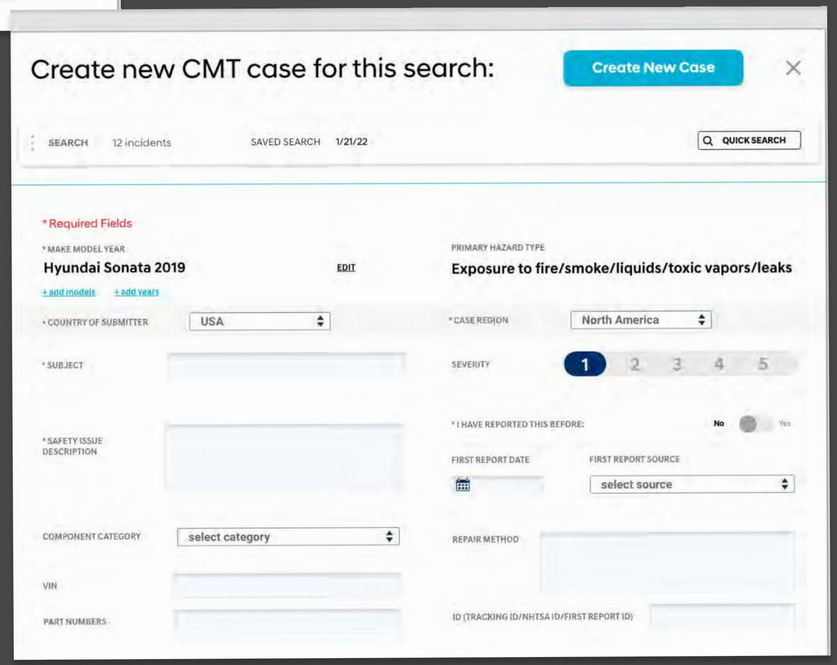
# PIVOT:
# CMT VIA API INTEGRATION

## DISCOVERY #6

**We need to gather and bind all this information into a single bucket & associate to a case inside the existing CMT or create a new case.**




CREATE A CASE > FROM ANY SEARCH

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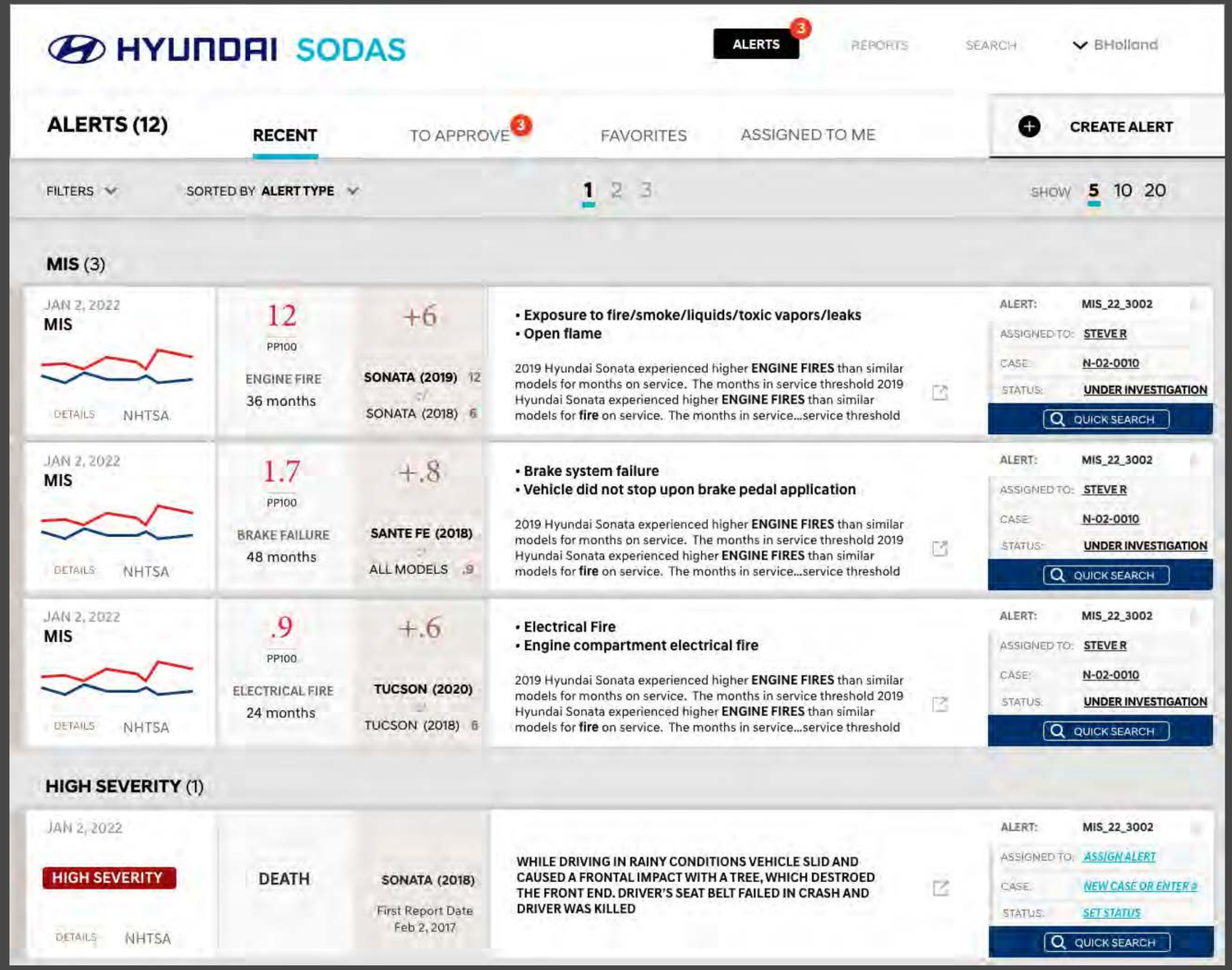
# DASHBOARD = ALERT FEED

## DISCOVERY #7

### Dashboard becomes a feed for alerts, and other notifications

- What/Who throws an alert?
- Data Team should be able to create their own alerts
- Attach data to an alert that is persistent throughout its lifecycle?
- Alerts come in 12 types
- Alert expanded- what details help the Data Team make a decision? Make it interactive.
- How do Alerts get assigned?
- Make a workflow and screens for assigning, claiming and rejecting assignment. All with feedback to mgmt



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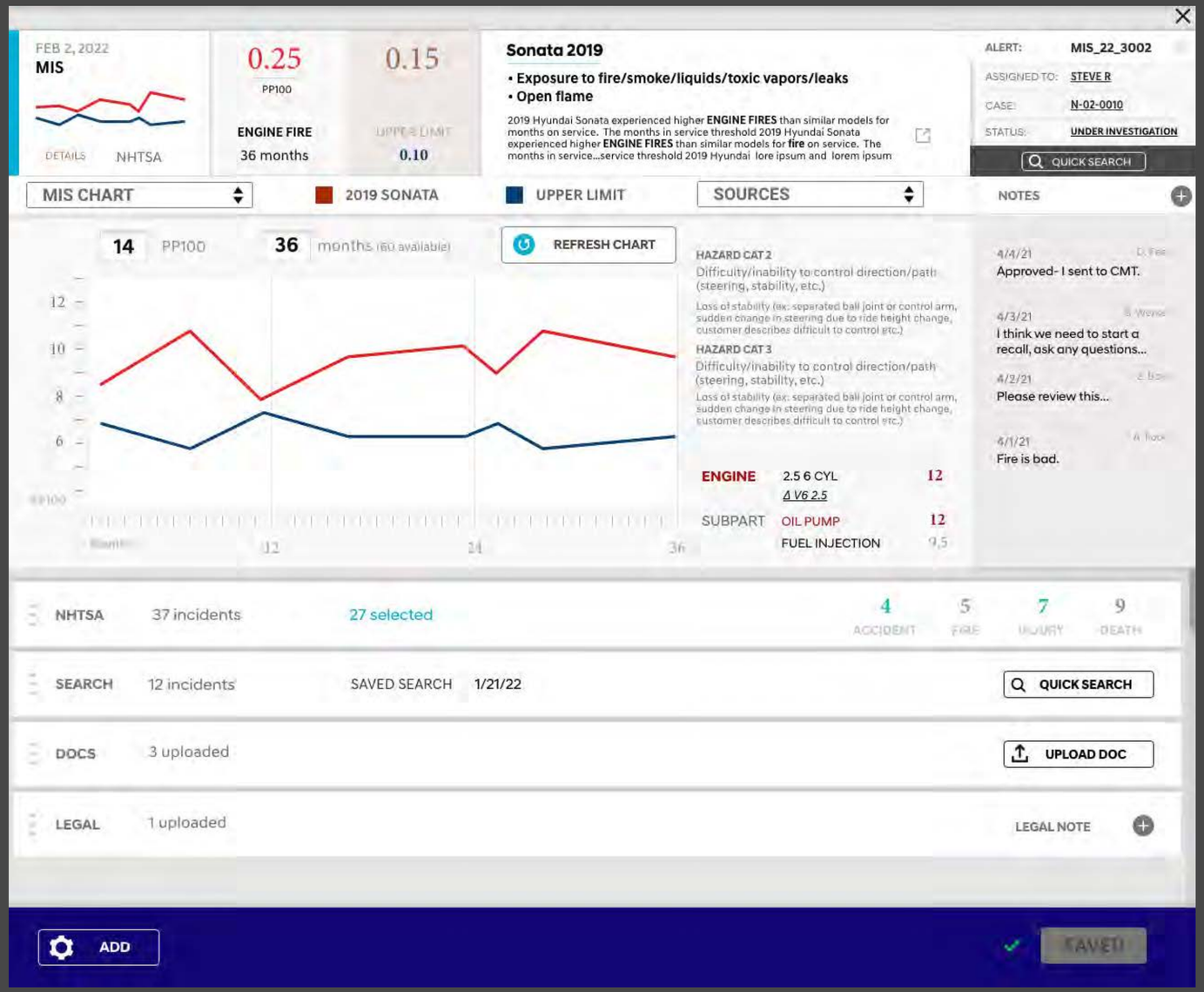
# EXPANDED ALERT

## DISCOVERY #8

### Alert expands to expose toolset

- select which chart to view
- control the 2 axis
- attach claims and incidents
- select which claims and incidents applied to this alert
- attach docs
- attach legal filings
- attach search
- add a note
- assign alert to a team member
- select a Source for the data shown
- tie to CMT via Case #



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# DATA

**40 DATA SOURCES**

## PHASE 1
## Two (2) data sources

- **Incidents -** service bay writups/notes
- **Claims** department writeups

**INITIATE** ingestion into **ChatGPT**

**FORMAT** web display of **incidents** and **claims**

**BIND** to **Hazard Categories**

NHTSA Vehicle Owner Questionnaire (VOQ)
Transport Canada Vehicle Owner Questionnaire (VOQ)
Warranty
Warranty Repair Nature-Cause Code
Vehicle Master
Units in Operation
Warranty Repair Service (Labor) Op Master
Field Service Engineer Report (FSE)
Customer Assistance (CA)
Techline
Team Connect/ NetDocuments
HPDS Warranty Claims
TSB
VCRM
Customer Pay Repair
Repair Order Operation
Re
HTSS
PDI
MPI
Global Safety Issues
Global Speak Up for Safety
Engineering Changes / QIR, QIS and QIRF
Global Quality Management System (GQMS)
En
En
Gl stem (GWMS)
Global Service Way (GSW)
Hyundai Dealer Backorder

OpenAI ChatGPT

**DETECT TRENDS**

**SEND ALERT TO DATA TEAM**

**ALERT**

Incident

| | | | |
|---|---|---|---|
| UNIQUE COMPLAINT ID (CMPLID) | 1237279 | DATE OF INCIDENT | 8/17/19 |
| NHTSA INTERNAL REF NO. | 10789977 | SOURCE | (VOQ) NHTSA WEBSITE |
| VIN | 5NPEC4AC4BH | Hazard Category 1 | Warning light/message/alert from vehicle |
| Brand | Hyundai | Sub-Hazard 1 | Other |
| Model Year | 2011 | Hazard Category 2 | Loss of Propulsion |
| Model Name | Sonata | Sub-Hazard 2 | Reduced propulsion (including limp home mode) |
| WAS VEHICLE INVOLVED IN A FIRE "Y" OR "N" | N | Hazard Category 3 | - |
| NUMBER OF PERSONS INJURED | - | Sub-Hazard 3 | - |
| NUMBER OF FATALITIES | - | | |
| Full Component Description | SERVICE BRAKES | Complaint Description | |
| CONSUMER'S CITY | WEXFORD | | |
| CONSUMER'S STATE CODE | PA | | |
| DATE ADDED TO FILE (YYYYMMDD) | 20151112 | | |
| DATE COMPLAINT RECEIVED BY NHTSA (YYYYMMDD) | 20151112 | | |
| VEHICLE MILEAGE AT FAILURE | 54250 | | |
| NUMBER OF OCCURRENCES | 1 | | |

THE FRONT BRAKES ON OUR HYUNDAI SONATA FAILED 8/17/15 FORCING MY DAUGHTER OFF THE ROAD USING THE EMERGENCY BRAKE. THIS IS A RESULT OF ON-GOING BRAKE PROBLEMS DATING BACK TO WHEN WE PURCHASED THIS CERTIFIED PRE-OWNED CAR 11/25/13. HYUNDAI REFUSED TO COVER THE REPAIR, SO WE PAID TO HAVE BRAKE PADS, ROTORS AND CALIPERS REPLACED. THIS IS THE 3RD SET OF BRAKES WE'VE PAID TO REPLACE IN LESS THAN 12,000 MILES. AFTER NUMEROUS CALLS AND CORRESPONDENCE WITH HYUNDAI CONSUMER AFFAIRS, EXPLAINING THIS IS A LIFE THREATENING PROBLEM CAUSED BY DEFECTIVE BRAKE SYSTEM, THEY DID PAY FOR THE CALIPERS BUT REFUSED TO PAY FOR THE OTHER COMPONENTS. THE FRONT BRAKES HAD GRINDING NOISE SINCE WE BOUGHT THE CAR AND ONLY LASTED 2,743 MILES (DEALER TOLD US THIS CPO CAR HAD BRAND NEW BRAKES), THE SECOND SET ONLY LASTED 9,856 MILES, SINCE THE CALIPER WAS REPLACED 8/21/15, THERE IS NO MORE GRINDING. IT SEEMS CLEAR THAT THE DEFECTIVE CALIPER CAUSED THE PAD AND ROTOR FAILURE, BUT HYUNDAI DENIES THIS. WHEN SPEAKING WITH HYUNDAI CONSUMER AFFAIRS, THEY SAID 1) THEY HAD NO RECORD OF US OWNING THE CAR, 2) HAD NO RECALLS FOR THIS PROBLEM, AND 3) WE DID NOT PURCHASE AN EXTENDED WARRANTY (WE DID). 1 SUBSEQUENTLY FOUND ON THE HYTSB WEBSITE THAT THERE IS A RECALL FOR THE 2011 HYUNDAI SONATA BRAKES (ATTACHED) INVOLVING THE BRAKE CALIPERS, HYUNDAI HAS BEEN DISHONEST AND DECEITFUL DURING THIS ORDEAL. I WOULD TO FILE AN OFFICIAL NHTSB COMPLAINT AGAINST HYUNDAI TO 1) PREVENT OTHER CATASTROPHIC BRAKE FAILURES AND POTENTIAL FATALITIES, 2) OBTAIN REIMBURSEMENT FROM HYUNDAI FOR THE COST OF REPAIRS ($1,065.68, RECEIPTS ATTACHED) + INCONVENIENCE/TIME/PUNITIVE DAMAGES. ATTACHED ARE COPIES OF CORRESPONDENCE, REPAIR ORDERS, NHTSB RECALL, ETC. THANK YOU FOR ANY HELP YOU CAN PROVIDE. [XXX] INFORMATION REDACTED PURSUANT TO THE FREEDOM OF INFORMATION ACT (FOIA), 5 U.S.C. 552(B)(6). *TR

Re-Formatted Incident

Claim

| | | | |
|---|---|---|---|
| CLAIM NUMBER | 69899A | CLAIM RECEIVED DATE | 8/17/19 |
| EVENT TRANSACTION ID | 104328173831 | TAGGED BY | Albert |
| VIN | KM8JUCAC6CU466401 | Hazard Category 1 | Warning light/message/alert from vehicle |
| Brand Code | H | Sub-Hazard 1 | Other |
| Model Year | 2012 | Hazard Category 2 | Loss of Propulsion |
| Model Name | TUCSON | Sub-Hazard 2 | Reduced propulsion (including limp home mode) |
| Causal Part Number | 2102025150 | Hazard Category 3 | - |
| Causal Part Description | BEARING PAIR SET-CRK/SHF CTR | Sub-Hazard 3 | - |
| Cause Code | ZZ3 | | |
| Nature Code | 13A | | |
| Nature Description | WARNING LIGHT ON_LAMP ON | | |
| Customer Complaint Description | CUST STATES CHECK ENGINE LIGHT IS ON AND THE ENGINE SEEMS TO BE RUNNING VERY ROUGH AND VERY SLUGGISH WHEN ACCELERATING | | |
| Cause Description | TIMING CHAIN JUMPED 4 TEETHP0016,P0340 FOUND METAL IN OIL PAN REPLACED ENGINE SHORT BLOCK ASSY. | | |
| Correction Description | TIMING CHAIN JUMPED 4 TEETH P0016, P0340 FOUND METAL IN OIL PAN REPLACED ENGINE SHORT BLOCK ASSY. TIMING CHAIN, OIL PUMP CHAIN, 2 TENSIONERS REPLACED BOTH CVVTS | | |
| Technician Comment | - | | |

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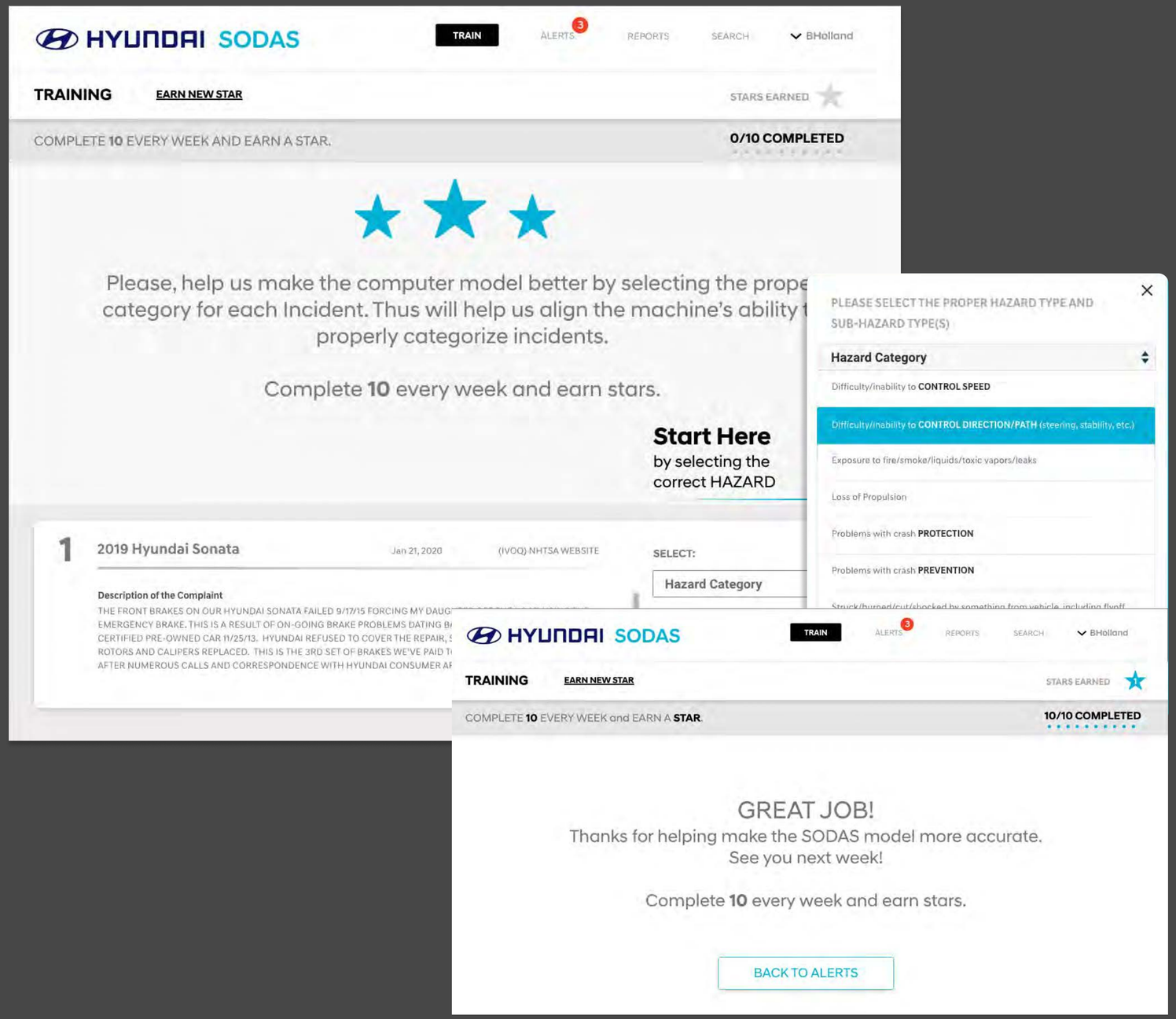
# TRAIN THE MODEL

**REINFORCEMENT LEARNING FROM HUMAN FEEDBACK**

## AI/ML team asked for help matching HAZARD to incident or claim.

After claiming, “We can’t seem to detect any trends,” they asked me if I could design a Train the Model App.

The Data Team were reliant, vetted resources, so let’s keep their data clean (i.e. how to spot cheating, frequency and gamifaction).



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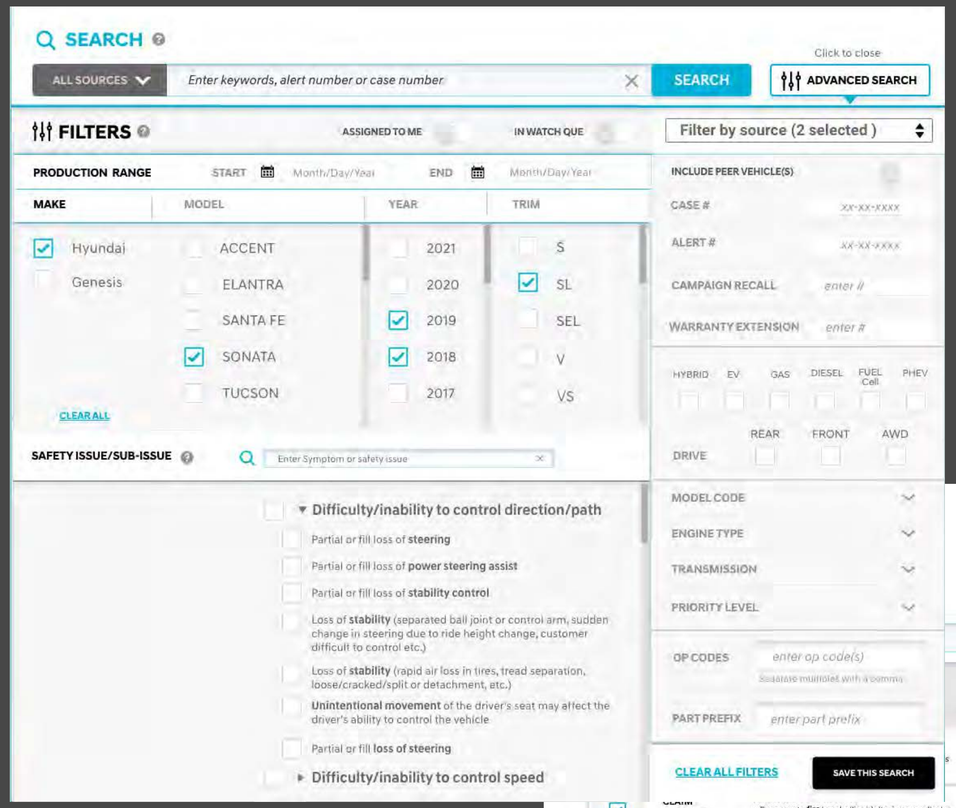
# SEARCH

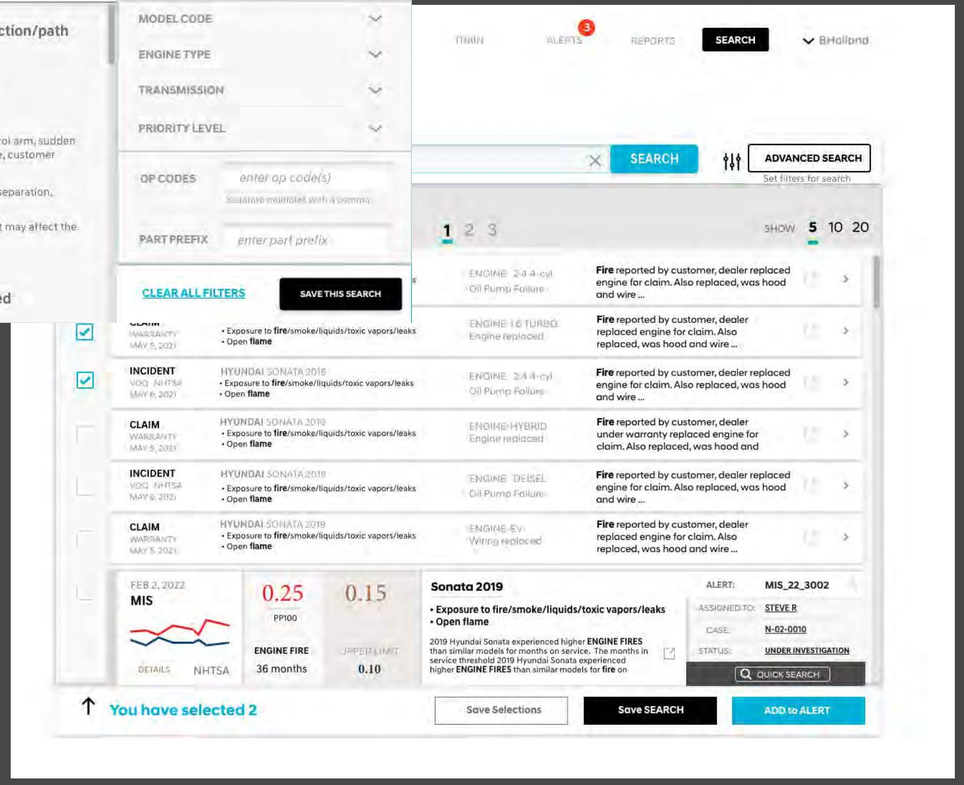
## SEARCH TOOLS

**Search is the main source of research for Data Team so a full set of tools needed to be developed.**

- Advanced Search
- Filter by Data Source
- Select Make/Model/Year to winnow down selectable options
- Facetted Sort & Filter
- What is ASSIGNED TO ME
- Collect results and pin to alert
- Save Search
- Rerun Search

< Advanced Search




Search with Capture Tools >

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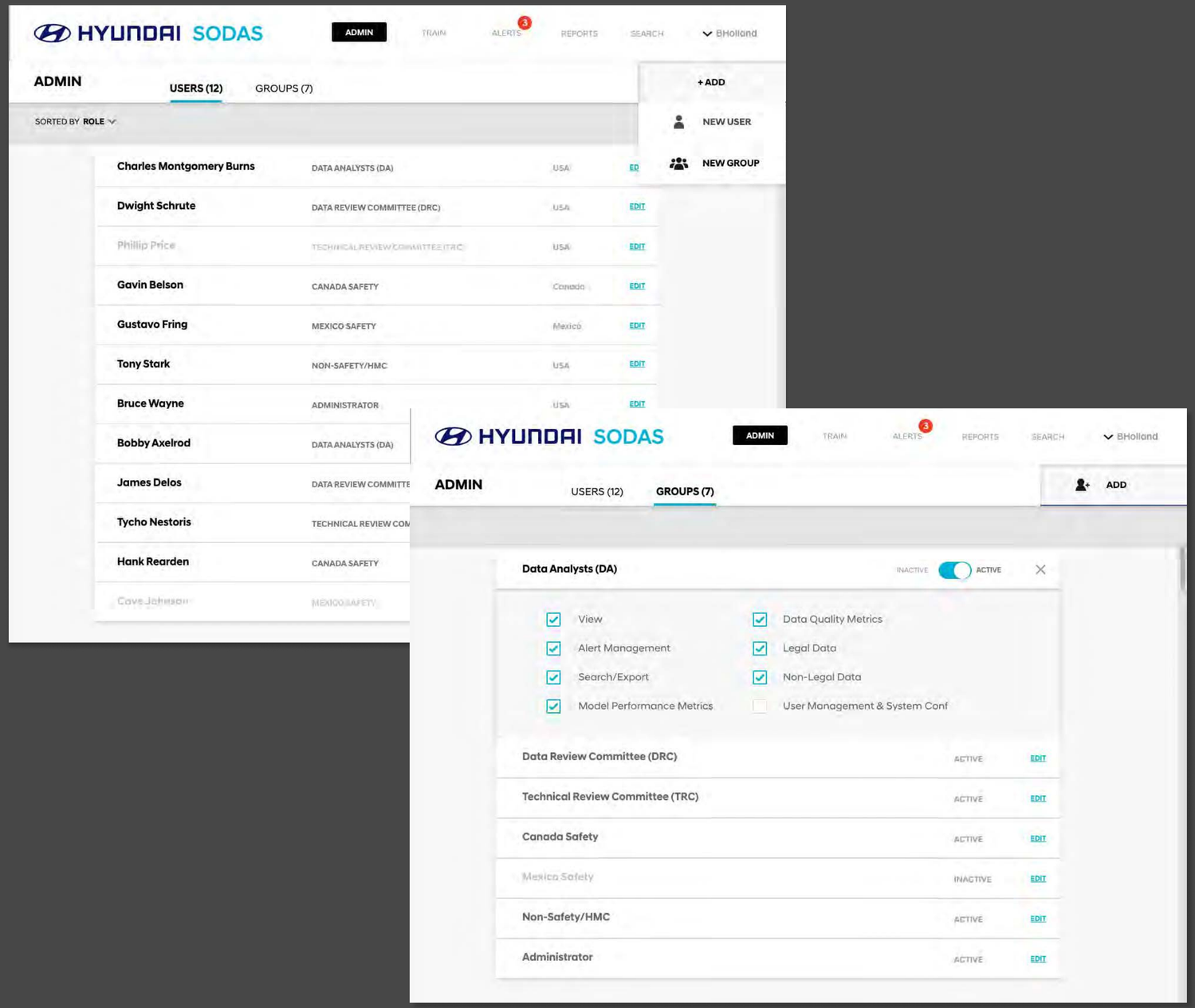
# ADMIN

## MANAGE USERS

- **Users**
- **Region-based permissions**
- **Teams**



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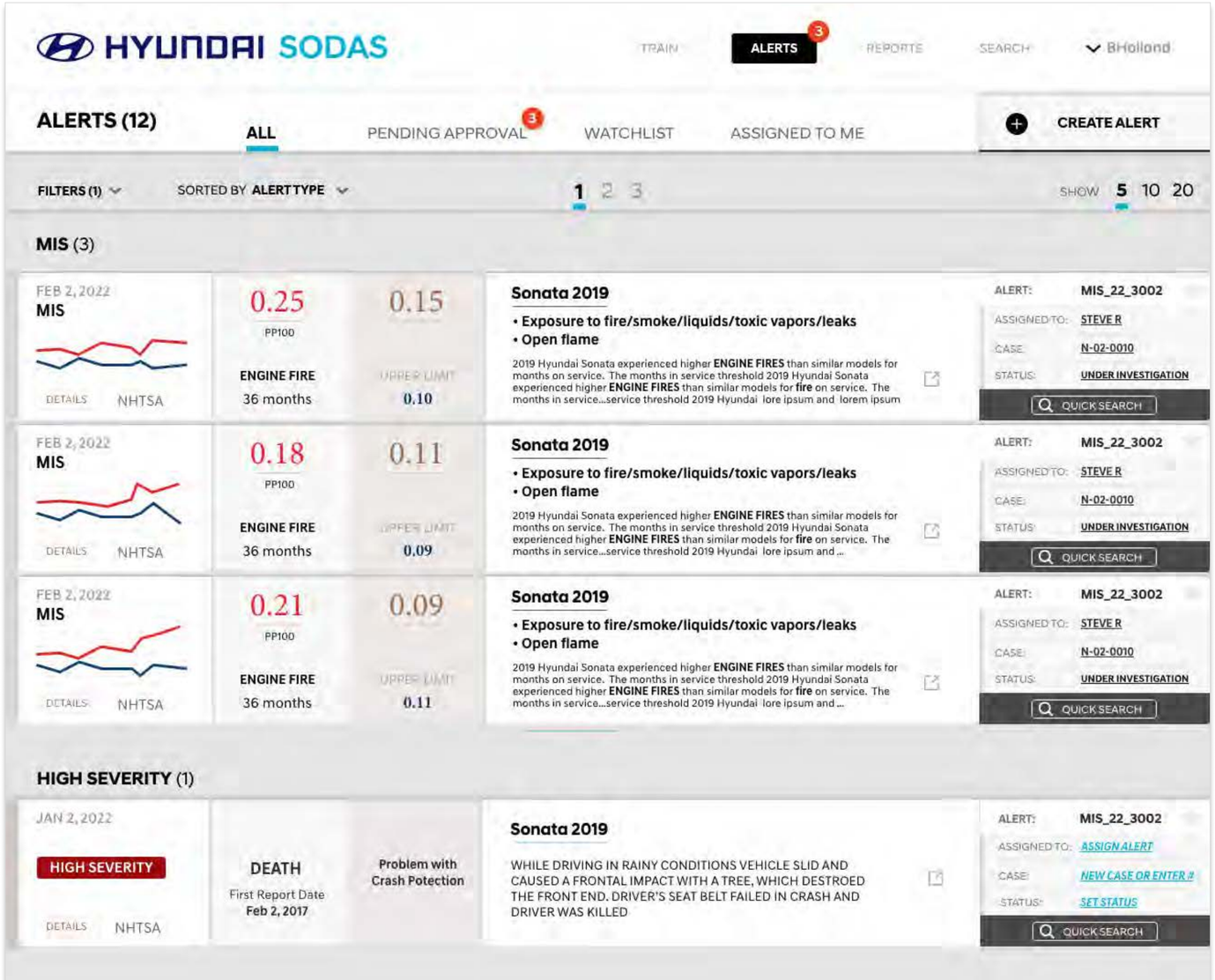
# OUTCOME




# DESIGN & AND CONSENSUS

1. **Feed**- Alerts, messages, approval notifications
2. **Search-** Quick search, advanced search, save search, bind search to alert, auto-fill from Model/Year selection,...
3. **Alerts**- Bind alert to **Hazard Type**, define 12 alert types based on **Hazard Type**, expanded alert with details & interactive chart, parts and systems associated with incident or claim, bind search results to alert, workflow to escalate to CMT.
4. **Admin**- User management, team management
5. **Case Builder** - Collect research - save search results, add notes, add files, peer review, etc.
6. **CMT integration**- Integrate with existing CMT via API.
7. **Teach the Machine**- Using RLHF, extract institutional knowledge from Data Team to teach the model how to recognize and predict, gamify, vet, repeat.

# HAPPY CUSTOMERS

**"Thanks for creating a useful, easy-to-use tool, instead of the direction that was being forced upon us"**
Hyundai Data Team Member (ACTUAL USER)

**"Greatly appreciate your efforts throughout the project. Your work has been appreciated a lot by Hyundai – they loved the entire design experience that you led."**
Program Manager at WongDoody/Infosys