SAFETY

Q1’25 Council Meeting

April 8, 2025

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This call will be recorded.

Agenda

- News
- ChatSafetyAI Usage Dashboard
- 2025 Data Updates
- ChatSafetyAI Next Steps

SafetyAI, Inc.

- Took time, but necessary to allow growth, and speed up research and development.
- Bottleneck is not ideas and vision, but small team!
- We are considering partnerships… More soon.
- Transitioning to safetyai.io email addresses and website (under construction). Nothing else changes for now.

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New Council Members

- AtkinsRéalis
- Dominion Energy
- EllisDon

Have already started piloting ChatSafetyAI in-house or via SaaS (or will soon).

Will join the council if pilots are successful.

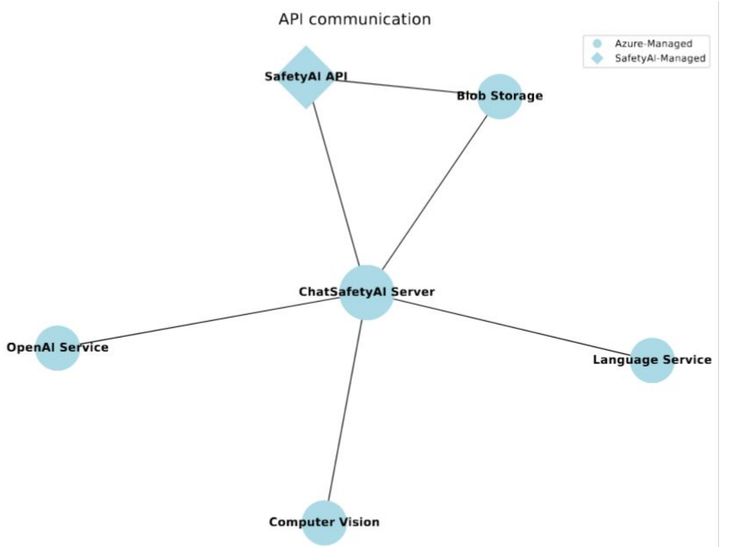
Also interested in the Safer Together initiative (pooling accident datasets to improve the predictive models).

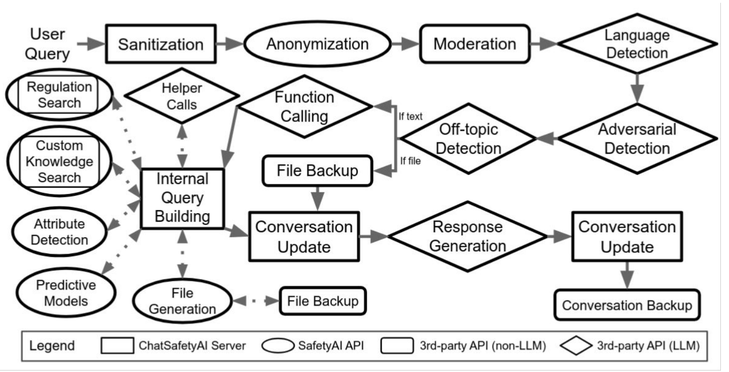
In-House Deployment

- To eliminate data security and privacy issues.
- Proof of concept validated on MS Azure.
- Also possible in AWS.
- Anyone interested should contact me. Takes 6-8 weeks and requires coordination with your IT team.

In-House Deployment

Service	Default	Amazon	Azure
Text Anonymization	Google Sensitive Data Protection	Comprehend	Language Service
Image Anonymization	Google Vision Logo and Face Detection	Rekognition	Computer Vision
Text Moderation	OpenAI Moderation	Bedrock Guardrails	OpenAI Service or Content Safety
Image Moderation	Google SafeSearch	Rekognition	Computer Vision or Content Safety
File and Conversation Backup	Dropbox	S3	Blob Storage + Front Door
LLMs	OpenAI Chat Completion	Bedrock Converse	OpenAI Service
Search APIs	OpenAI Embeddings	Bedrock Embeddings	OpenAI Service
SafetyAI APIs	EC2	Elastic Container Registry + Beanstalk or App Runner	Container Registry + App Service
ChatSafetyAI Web App Hosting	Shinyapps.io	Elastic Container Registry + Beanstalk or App Runner	Container Registry + App Service
User Management	Shinyapps.io	Amazon Cognito	MS Entra ID

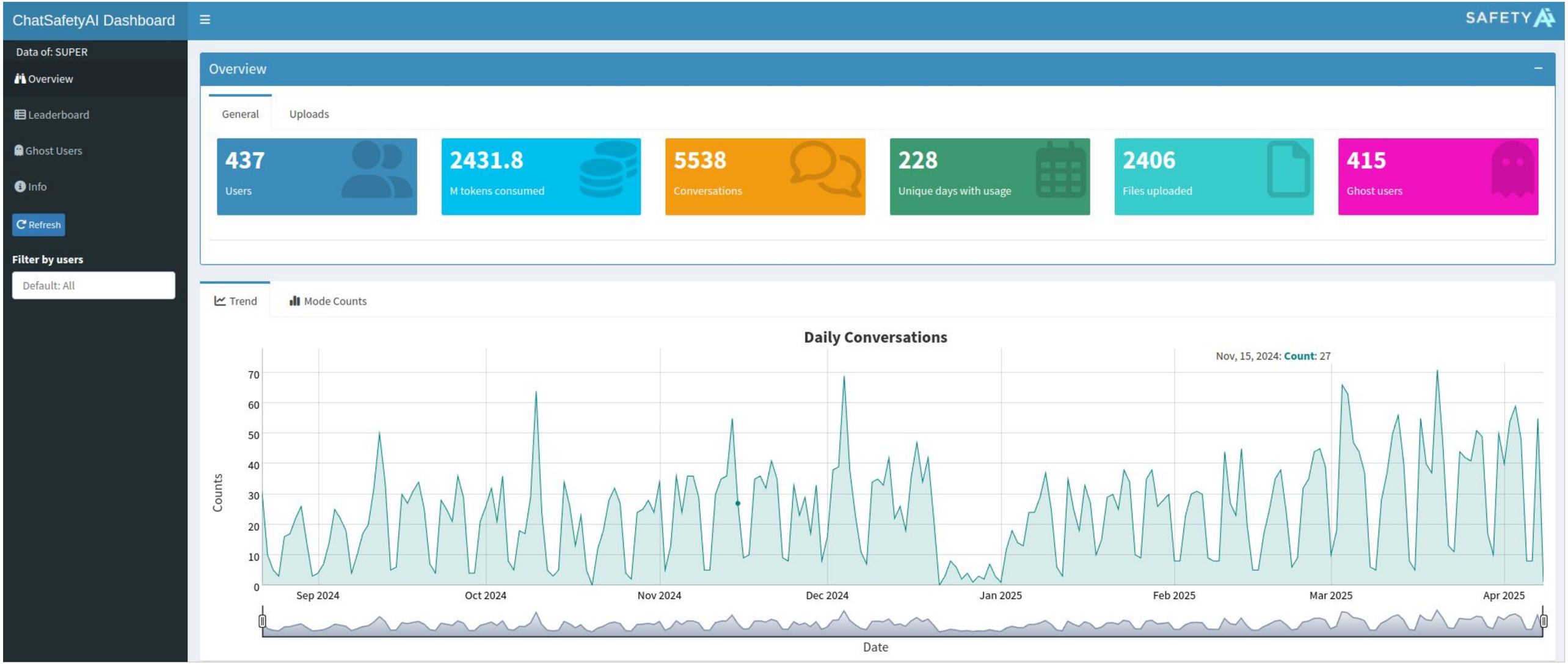




ChatSafetyAI Dashboard

- Lives at: https://safetyapp.shinyapps.io/chatsafetyai_dashboard_new/
- See how ChatSafetyAI is used within your org.
- Does not access user content (conversations or uploaded files), only high-level stats.
- Can be deployed in-house.
- Contact me to get access!

ChatSafetyAI Dashboard



ChatSafetyAI Dashboard

SAFETY AI

ChatSafetyAI Dashboard

Data of: SUPER

Overview

Leaderboard

Ghost Users

Info

Refresh

Filter by users

Default: All

SAFETY AI

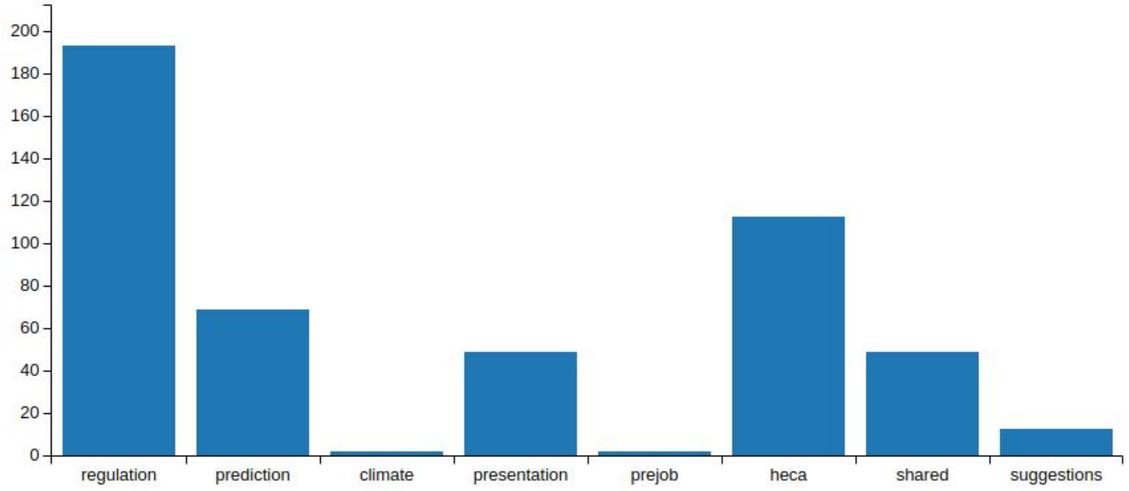
Overview

General | Uploads

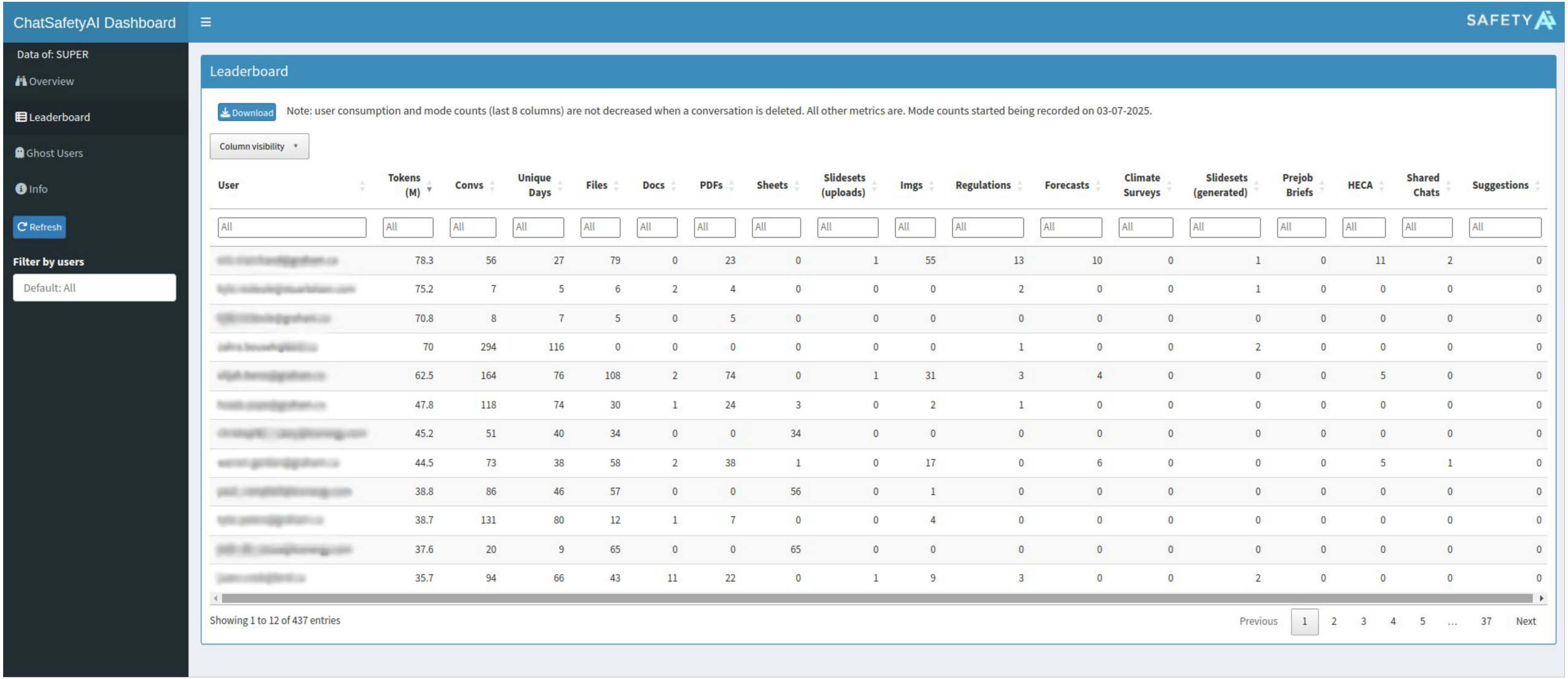
86	1031	253	36	1000
Docs	PDFs	Sheets	Presentations	Images

Trend | Mode Counts

Mode Counts (data starts 03-07-2025)



ChatSafetyAI Dashboard



Data Updates

- Graham: up to Dec 2024 (just received)
- BMWC: up to June 2024
- Bird: up to April 2024
- Ameren, Fortis, TCE, TVA, WolfCreek: up to 2023
- Enbridge: up to 2022
- Entergy, T-FMC: up to 2021
- CRC, Kiewit: up to 2016/2015

Model training still ongoing, not too late to send me a data update. Also, some new datasets will arrive soon.

Pooled Dataset

- 1M data points (observations + near misses + injuries):

T-FMC	TCE	Entergy	Enbridge	Graham	Ameren
244811	214175	188658	163674	106675	27108

TVA	Bird	Fortis	Kiewit	CRC	BMWC	WolfCreek
26873	21739	13494	6972	2861	2224	1016

- 90k incidents:

fa	report	lwt	medical	recordable	fatality
56908	14055	9756	8118	1664	155

Pooled Dataset

- Normalized safety outcomes kept for prediction:

```
    "severity"
       fa     report        lwt    medical recordable
    56908      14055       9911       8118       1664

    "body_part"
 hand  head   arm   leg trunk  foot
21110 14404  9778  9688  8345  6276

    "injury_type"
         cut        strain     contusion           fob      fracture          burn    bite_sting
       18245         18017         10671          4318          2301          2037          1306
electrocution     pain    irritation          heat        unwell  hearing_loss
         262     1223          1143           866           658           357

    "accident_type"
      slip_trip_fall             exposure struck_by_or_against        caught_pinch        overexertion
                8105                 6133                 5408                4010                2005

    "energy_source"
     motion     gravity    chemical  biological     thermal  mechanical    pressure electricity   radiation
      54763       24074        3694        3639        2483         916         547         292         248
```

Pooled Dataset

- Predictor variables: 92 attributes extracted from the narratives with our NLP tool.

"adverse low temps"	"bolt"	"breaker"
"cable"	"cable tray"	"chipping"
"cleaning"	"clearance"	"concrete"
"concrete liquid"	"conduit"	"confined work space"
"congested work space"	"crane"	"door"
"drill"	"dunnage"	"electricity"
"exiting"	"fan"	"fatigued dizzy"
"forklift"	"formwork"	"fuses"
"grinding"	"grout"	"guardrail/handrail"
"hammer"	"hand size pieces"	"hazardous substance"
"heat source/high temps"	"heater"	"heavy material/tool"
"heavy vehicle"	"hose"	"improper body position"
"improper procedure/inattention"	"improper security of materials"	"improper security of tools"
"insect/animal"	"job trailer"	"ladder"
"lifting/pulling/manipulating"	"light vehicle"	"LOTO/labeling"
"lumber"	"machinery"	"manlift"
"mud"	"nail"	"no/improper PPE"
"object at height"	"object on the floor"	"piping"
"pole"	"pontoon"	"poor housekeeping"
"poor visibility"	"powered tool"	"rebar"
"relay"	"repetitive motion"	"scaffold"
"screw"	"sharp edge"	"slag"
"slippery surface"	"small particle"	"soffit"
"spark"	"splinter/sliver"	"spool"
"stairs"	"steel/steel sections"	"stripping"
"stud"	"switch/switching"	"tank"
"transformer"	"uneven surface"	"unpowered tool"
"unpowered transporter"	"unstable support/surface"	"valve"
"vault"	"welding"	"wind"
"wire"	"working at height"	"working below elev wksp/mat"
"working overhead"	"wrench"	

Weather Pooled Dataset

- Kept only cases with: date + time + location.
  And only if location could be accurately geocoded by the Google Maps API, as verified by GPT4.
- From 90k to 17.5k data points.
- Predictor variables: 92 attributes + 50 weather variables.
  https://open-meteo.com/en/docs/historical-weather-api

Weather Pooled Dataset

SAFETY AI

Hourly Weather Variables

- [x] Temperature (2 m)
- [ ] Relative Humidity (2 m)
- [ ] Dewpoint (2 m)
- [ ] Apparent Temperature
- [ ] Precipitation (rain + snow)
- [ ] Rain
- [ ] Snowfall
- [ ] Snow depth
- [ ] Weather code
- [ ] Sealevel Pressure
- [ ] Surface Pressure
- [ ] Cloud cover Total
- [ ] Cloud cover Low
- [ ] Cloud cover Mid
- [ ] Cloud cover High
- [ ] Reference Evapotranspiration (ET_0)
- [ ] Vapour Pressure Deficit
- [ ] Wind Speed (10 m)
- [ ] Wind Speed (100 m)
- [ ] Wind Direction (10 m)
- [ ] Wind Direction (100 m)
- [ ] Wind Gusts (10 m)
- [ ] Soil Temperature (0-7 cm)
- [ ] Soil Temperature (7-28 cm)
- [ ] Soil Temperature (28-100 cm)
- [ ] Soil Temperature (100-255 cm)
- [ ] Soil Moisture (0-7 cm)
- [ ] Soil Moisture (7-28 cm)
- [ ] Soil Moisture (28-100 cm)
- [ ] Soil Moisture (100-255 cm)

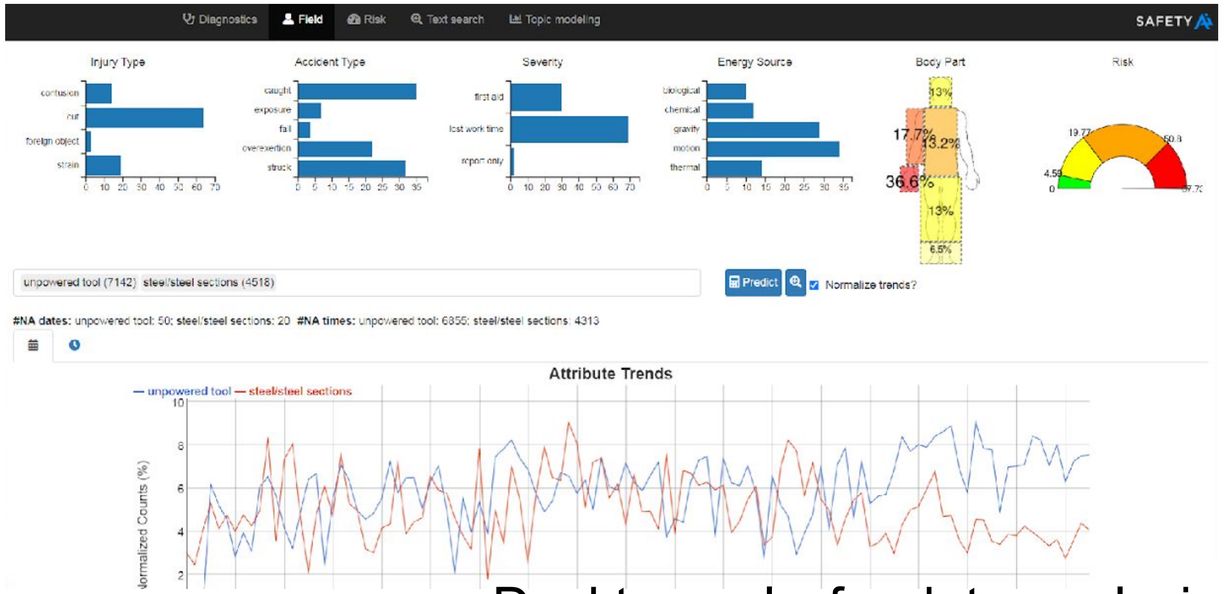
Daily Weather Variables

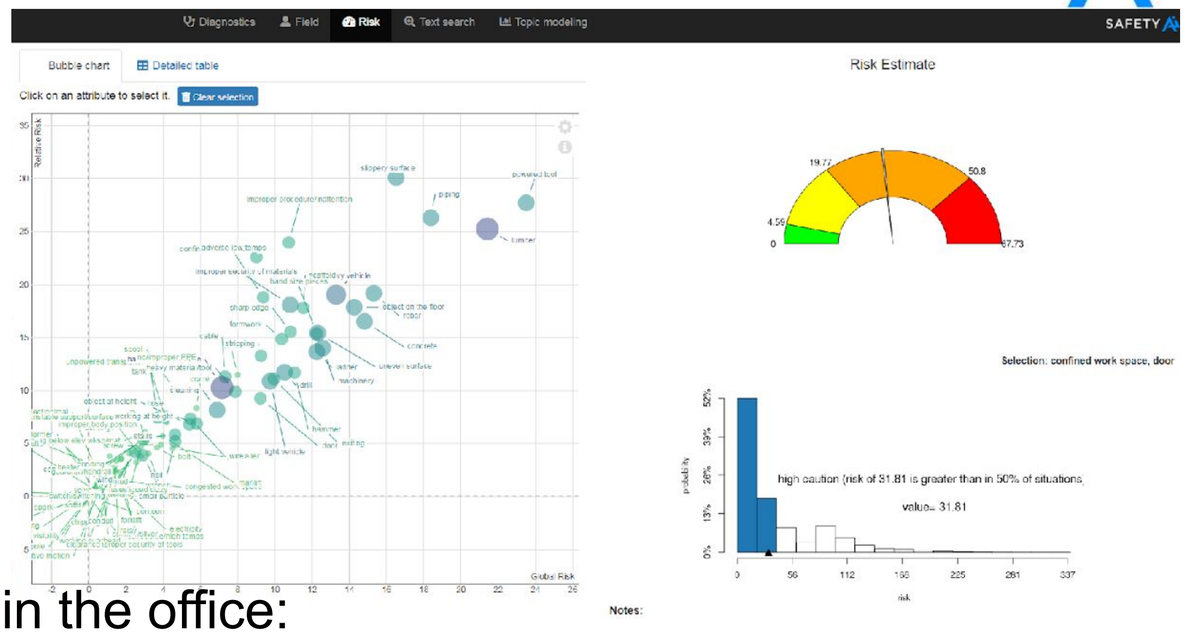
- [ ] Weather code
- [ ] Mean Temperature (2 m)
- [ ] Maximum Temperature (2 m)
- [ ] Minimum Temperature (2 m)
- [ ] Mean Apparent Temperature (2 m)
- [ ] Maximum Apparent Temperature (2 …
- [ ] Minimum Apparent Temperature (2 m)
- [ ] Sunrise
- [ ] Sunset
- [ ] Daylight Duration
- [ ] Sunshine Duration
- [ ] Precipitation Sum
- [ ] Rain Sum
- [ ] Snowfall Sum
- [ ] Precipitation Hours
- [ ] Maximum Wind Speed (10 m)
- [ ] Maximum Wind Gusts (10 m)
- [ ] Dominant Wind Direction (10 m)
- [ ] Shortwave Radiation Sum
- [ ] Reference Evapotranspiration (ET_0)

Experiments (ongoing)

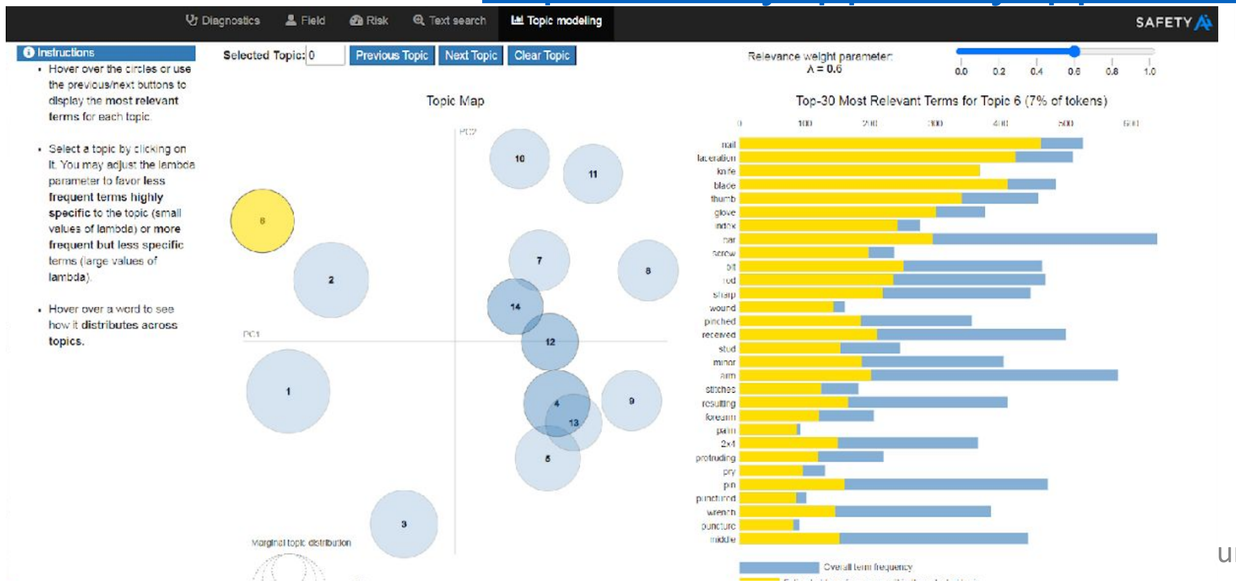
- On the pooled dataset:
  - Custom models for each company.
  - Super models.
  - Super models vs custom models.
  - Current versions vs previous versions.
- On the weather pooled dataset:
  - One model:
    - With attributes only.
    - With attributes and weather variables.
    - With weather variables only.

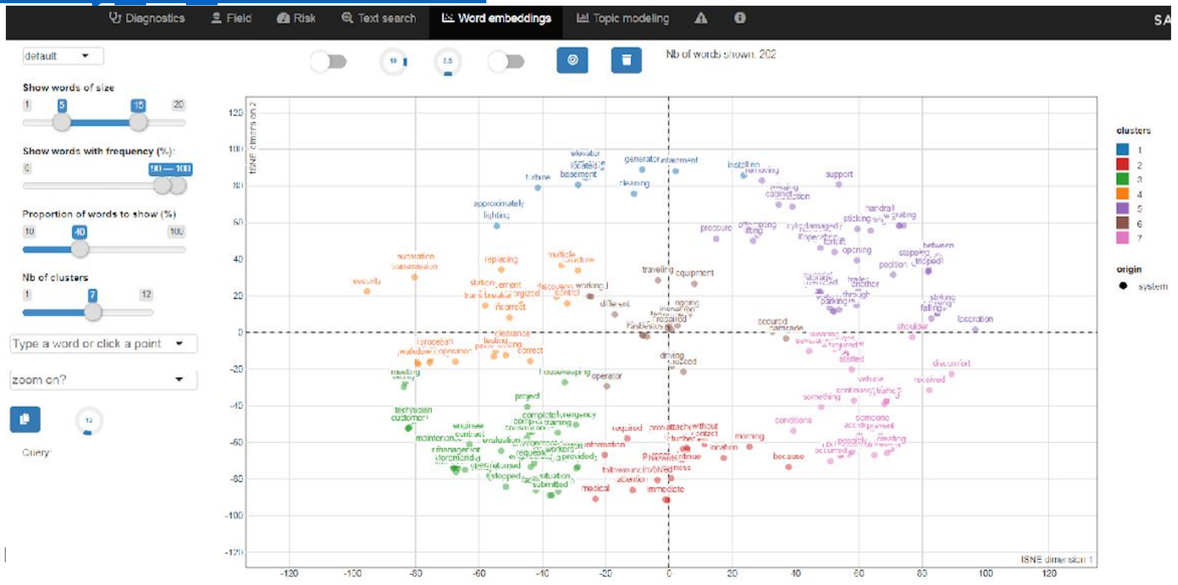
Dashboard Updates (ongoing)





Desktop only, for data analysis in the office:
https://safetyapp.shinyapps.io/safety_ai_dashboard/

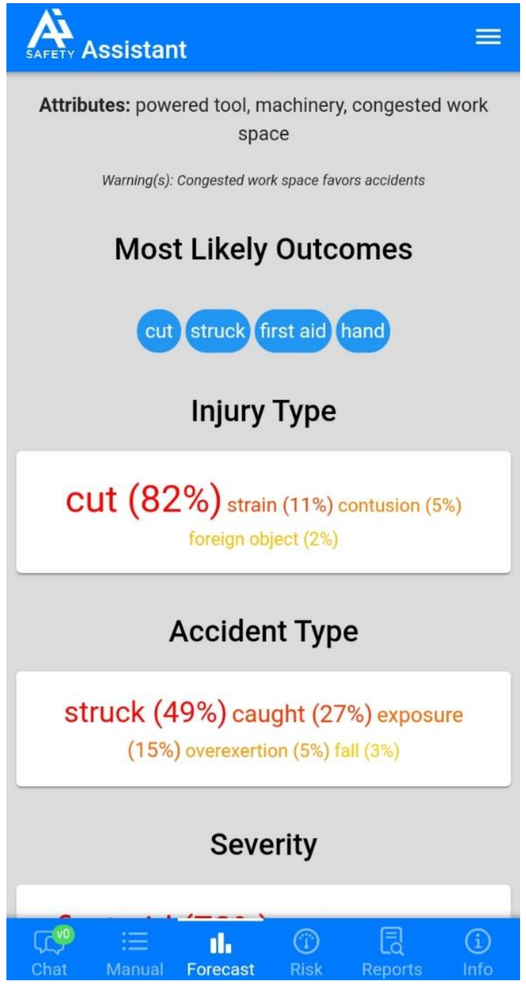


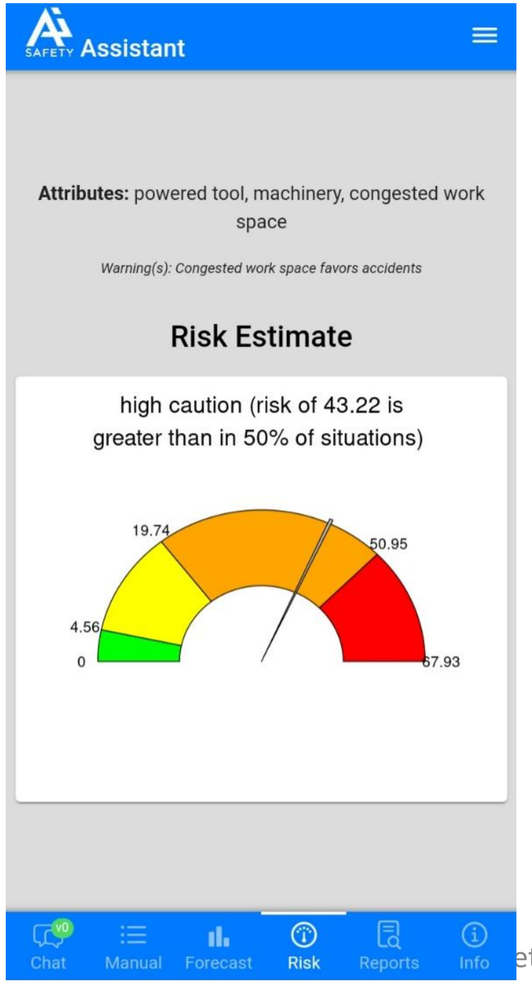


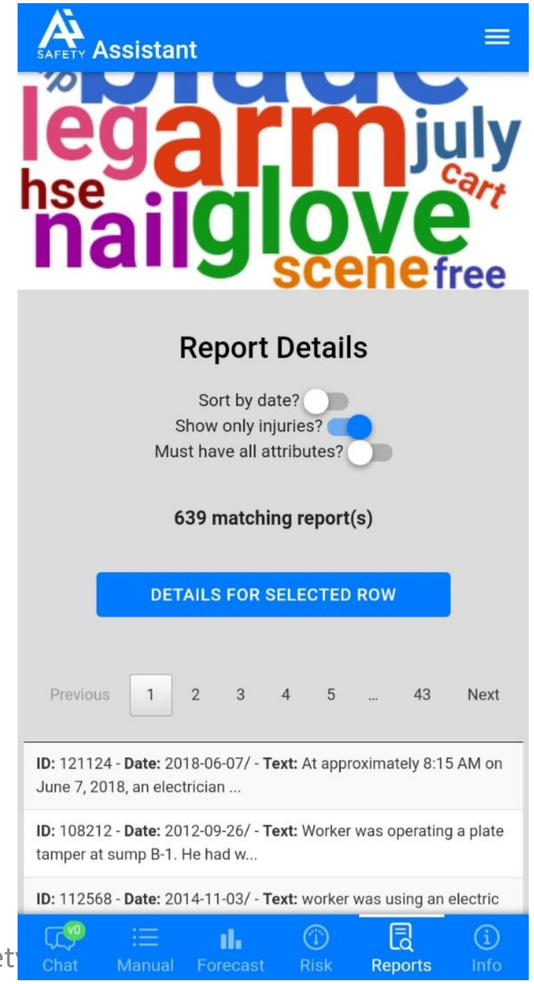
Assistant Updates (ongoing)

Assistant (mobile-first, for field use, e.g., pre-job meetings):

https://safetyapp.shinyapps.io/safety_ai_assistant/







Output:

- Injury characteristics forecast.
- Risk estimate.
- Historical reports.

Demo:
https://vimeo.com/443507785

ChatSafetyAI Next Steps

- Multi-file/photo uploads.
- Voice input on mobile.
- Support for Google's Gemini (2M-token context to upload bigger or more files).
- Improved vision that **pinpoint hazards in images**.
- Better predictions with the 2025 models (more data, weather variables).
- Memories/customization…

ChatSafetyAI Next Steps

- Chat renaming functionality + search engine, folders…
- Data visualization: charts, plots, diagrams…
- Integration with external databases / internal documentation: contact me. Already ongoing for some companies (+ using custom PPT template, prefilling custom forms)...
- API for live video processing. Angle and zooming level critical. Future: additional sound and thermal inputs ?
- Master JHA.
- Formal testing of ChatSafetyAI's hazard recognition capabilities via annotated datasets / comparison with other tools.

ChatSafetyAI Next Steps

From offline discussions.

Combining existing functionalities into new modes to serve specific use cases (UI/API):

- HECA + predictions + PDF generation: from a set of photos, generate a self-contained handout with everything needed for a tailgate meeting, in an easy-to-consume / visual way. HECA, barplot of likeliest incident characteristics, bodymap...
- Object detection + regulations: point what is not compliant in a photo. Google's Gemini will be used for object detection (bounding boxes).

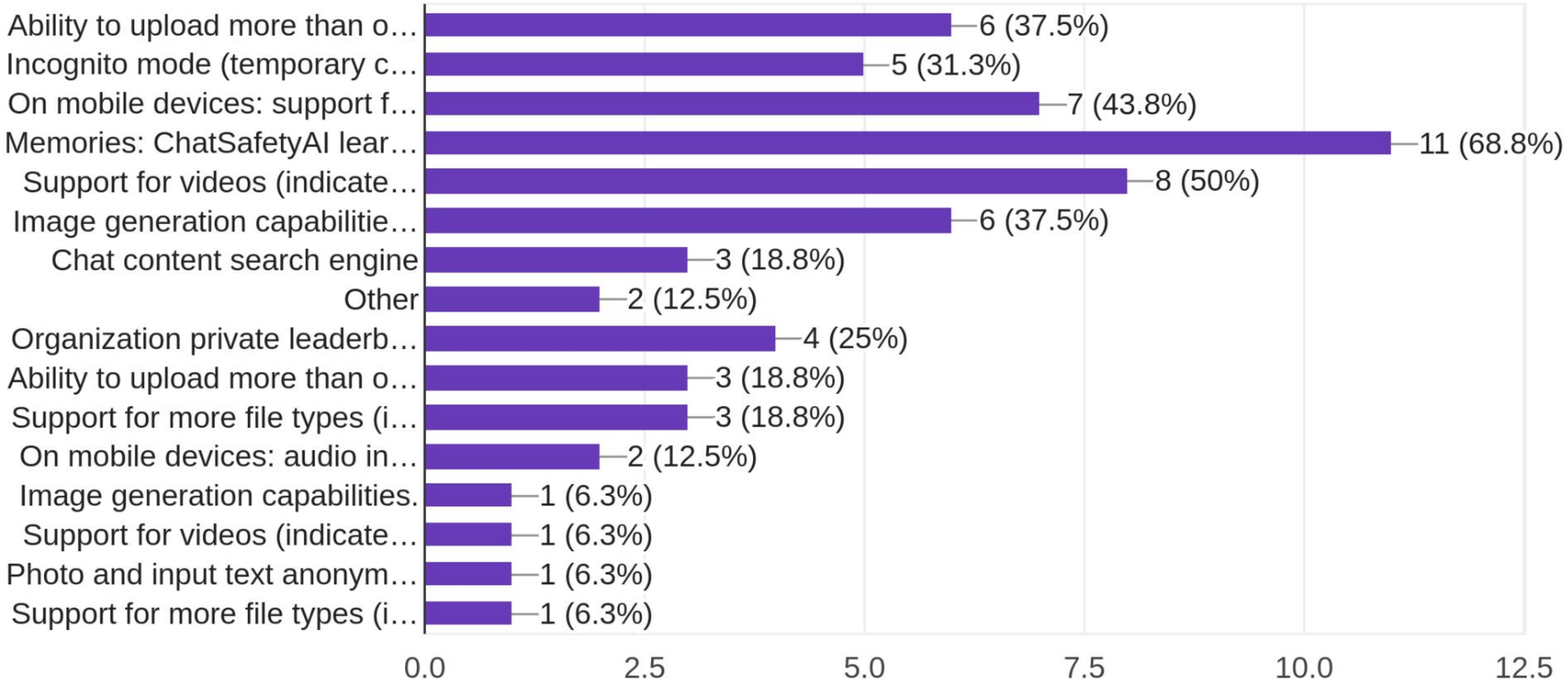
Also:

- Greater context size, to analyze bigger files w/o truncation. Gemini will be explored, as it offers a 2M-token context window!
- Anthropic's Claude 3.5 is already being used for images due to frequent false alarms with GPT-4o's guardrails

=> ChatSafetyAI starts capitalizing on the respective advantages of major LLMs !

ChatSafetyAI Next Steps

Survey open at: https://forms.gle/RkBNn3bhGXMNXQwd7



Thank you!

Visit our webpage at: https://www.safetyfunction.com/safetyai-details

New website (under construction):
https://safetyai.io/

Useful links:

ChatSafetyAI: https://safetyapp.shinyapps.io/chatsafetyai/

ChatSafetyAI Dashboard: https://safetyapp.shinyapps.io/chatsafetyai_dashboard_new/

SafetyAI Dashboard: https://safetyapp.shinyapps.io/safety_ai_dashboard/

SafetyAI Assistant: https://safetyapp.shinyapps.io/safety_ai_assistant/

Email me at antoine.tixier@safetyai.io for access.