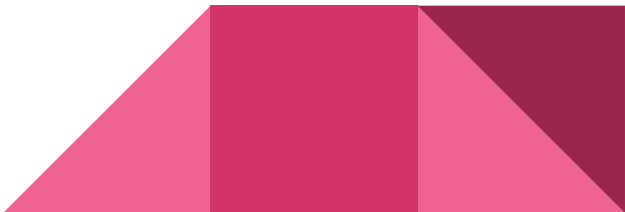# Observed Things MVP

Civil Target Handoff System

A Whitepaper by Farhan Yusuf Nugroho

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Overview

Observed Things is a mobile app designed exclusively for geotagging purpose, enabling *civilian* users to *Find*, *Fix* and *Target* their subject of observation with **precision** in an **easy** and **affordable** way.

It aims to solve the following problems in the industry:

- Accessibility
- Process Efficiency
- Data Stovepiping and Siloing
- Interoperability
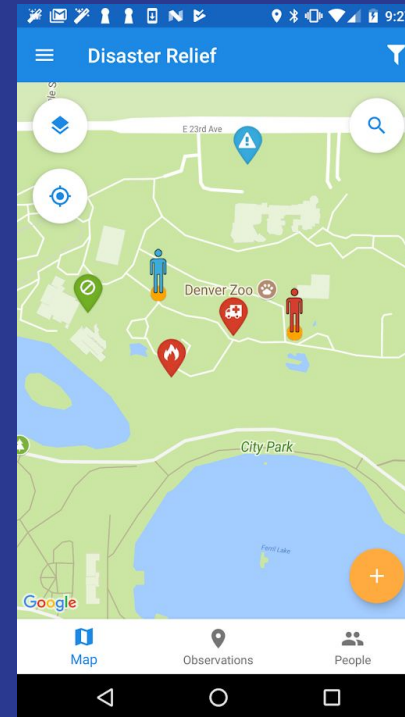
Industry Problems

Process efficiency:

- User might need to manually calibrate through map-terrain association to refine their actual position on map if using GNSS data then do another map-terrain association to pinpoint their target of observation on map with no aid indicating OT azimuth and distance. This may lead to imprecise geotagged target data due to human error especially at longer distance.

- Geotagging is built on top of collaborative GIS, increasing overhead.

Accessibility, Data Stovepiping and Siloing:

- Requires connection to MAGE server to use the app.

- Target data is stovepiped into MAGE server and meant to be used for collaborative purpose within the same platform, cannot be exported easily into other platforms.

What if user is outside the group, only need to geotag and share the target without using the collaborative GIS feature of the app?

Industry Problems

Process efficiency:

- Observer terrain-map association to refine GNSS position on map given inaccuracy and further adjusting the map to match known OT azimuth and distance for dropping marker on target location.

- Target geotagging is built as a feature on top of extensive Real-Time Situational Awareness GIS for tactical purpose which **significantly** increase overhead.

Interoperability and Accessibility:

- Each app with similar offering is developed independently from each other and locked into a specific device platform.

- CivTak cannot be deployed and used in Apple devices and SITREP cannot be deployed and used in Android devices.

Data Stovepiping and Siloing:

- Target data is stovepiped into respective TAK/SITREP Team server, not designed to be exported into other platforms.

- Due to device platform lock, data generated by either of these apps are siloed into each app in the respective device platform and cannot be interchanged with each other, despite both apps offering similar features.

What if user have incompatible device platform?

Case: CivTak and SITREP
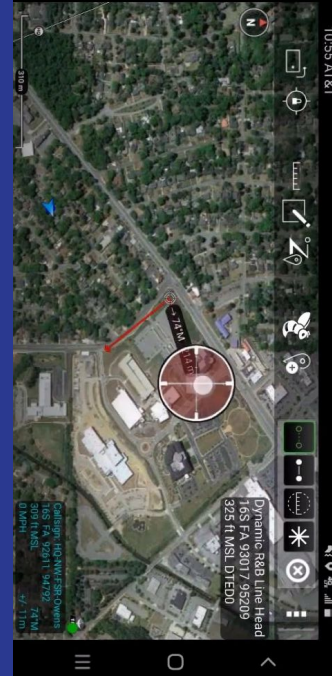
CivTak for Android

SITREP for iOS

Industry Problems

Accessibility

- Target geotagging feature locked to a specific additional device (Sig Sauer KILO5K) at considerable cost and subject to ITAR.
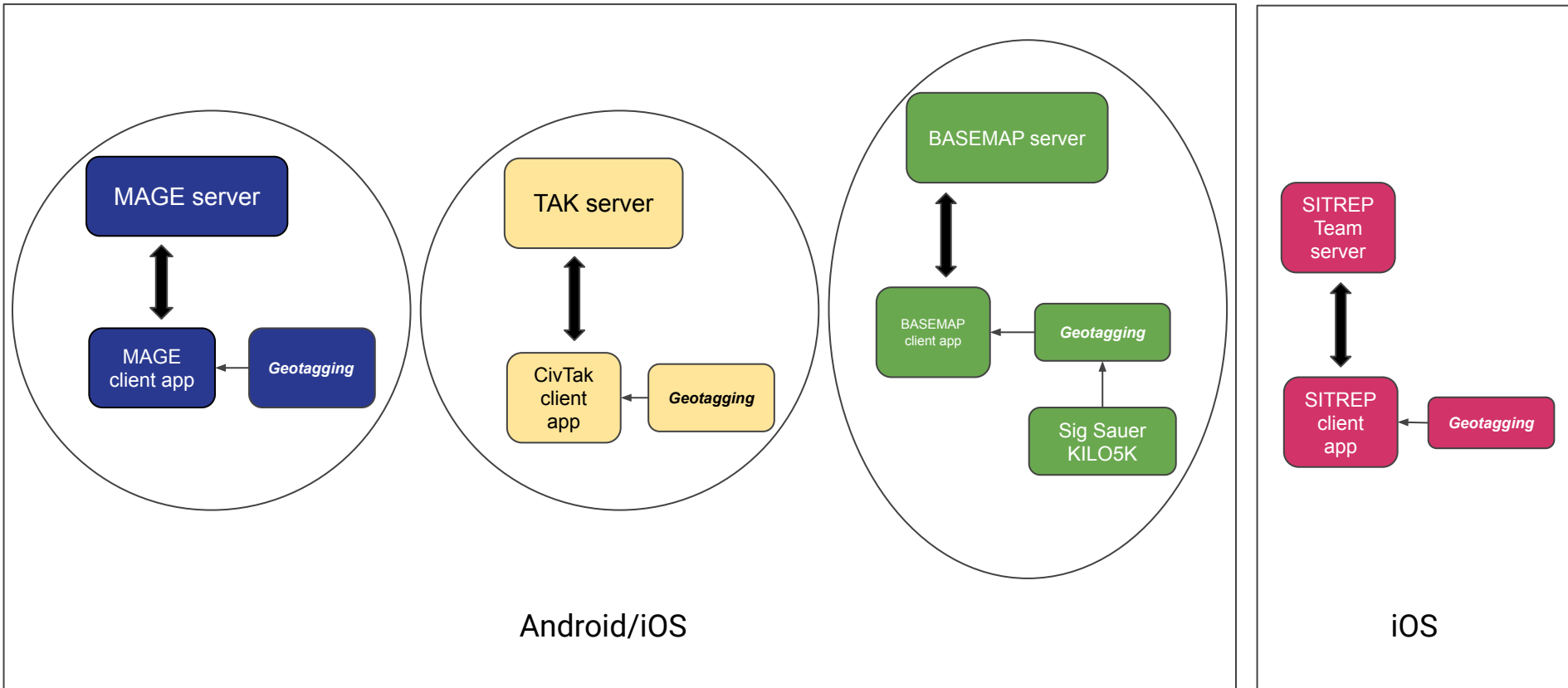
Data Stovepiping and Siloing:

- Target data is stovepiped into BASEMAP server, cannot be readily exported to other platforms.

- Target data sharing through LiveLink feature is siloed to BASEMAP server so that only user of same platform can get access.

What if user cannot acquire the additional device?
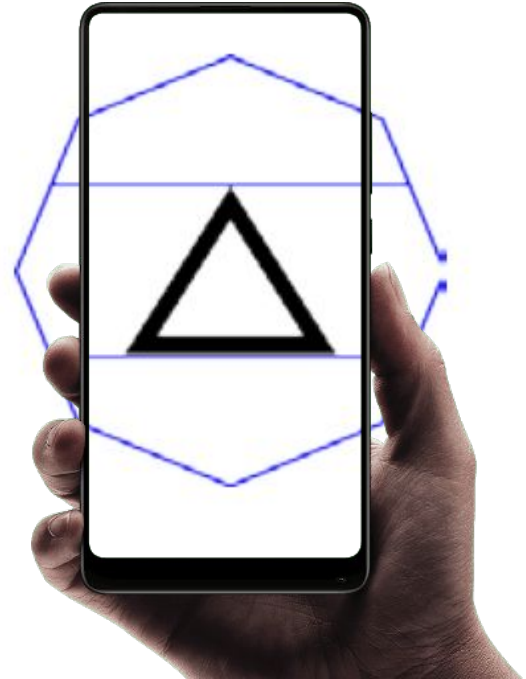
Current Industry Picture: Data Stovepipes and Siloing

What if *precise* target geotagging can be done using only these two devices?

A smartphone of any OS platform

Any rangefinder
model (e.g. golf)
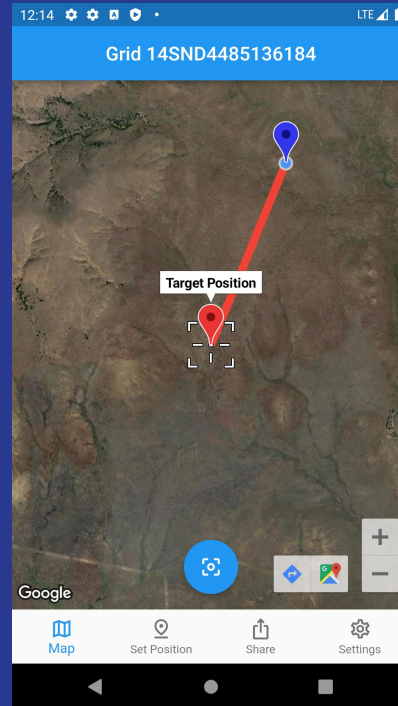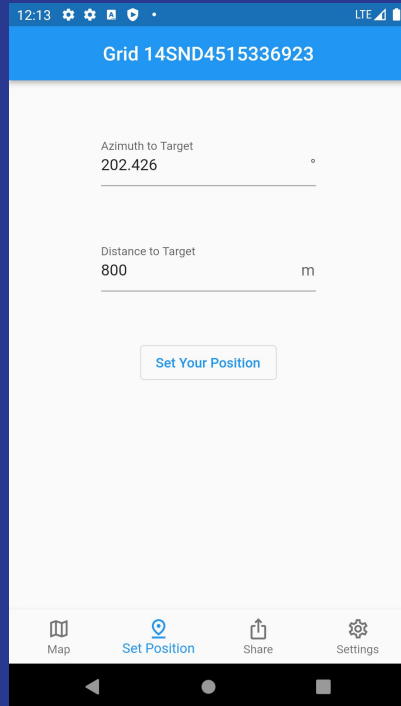
MVP provides 3 steps solution
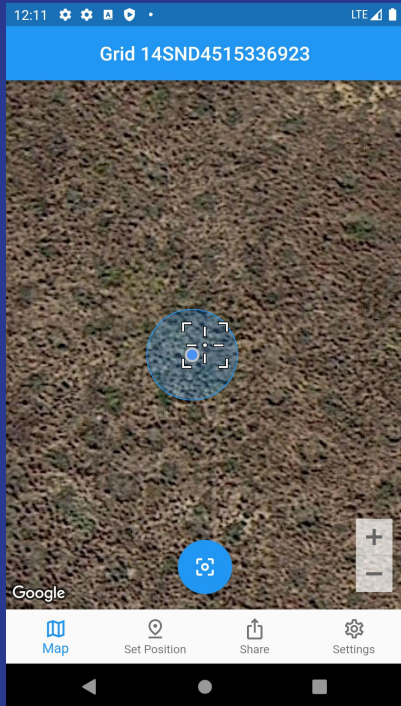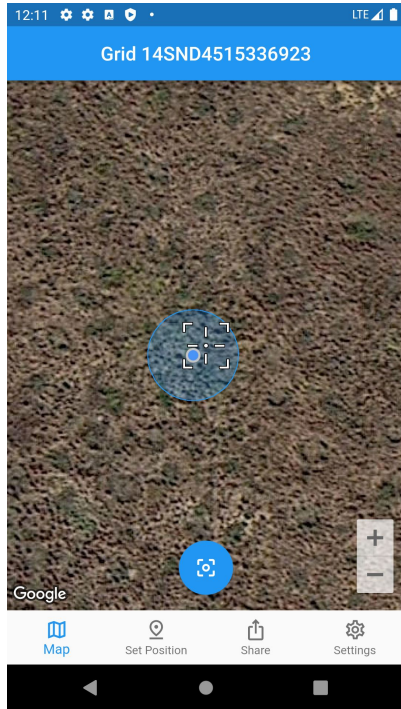
1   ->   2   ->   3
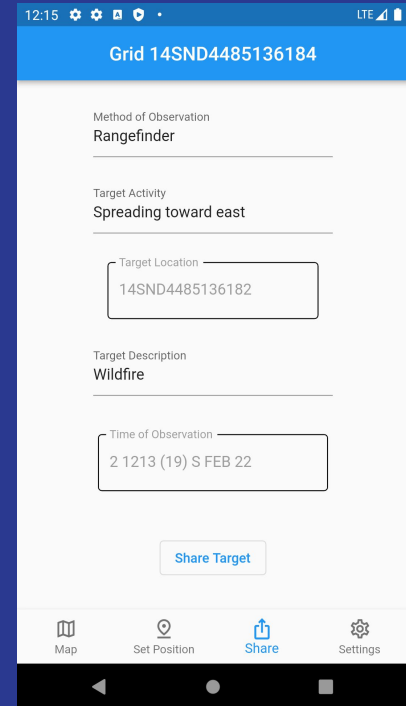
Step 1: *Find*

Given that the user have observed their subject at a distance, user then adjust their own position in "Map" page either through GPS service or manually.

If GPS service is not an option, user can set their precise position on map manually by dragging the map and adjusting the crosshair while referring to the grid coordinates on the app bar.

If GPS service is an option, user can press "Center Location" button and the crosshair will be centered to their GPS location.

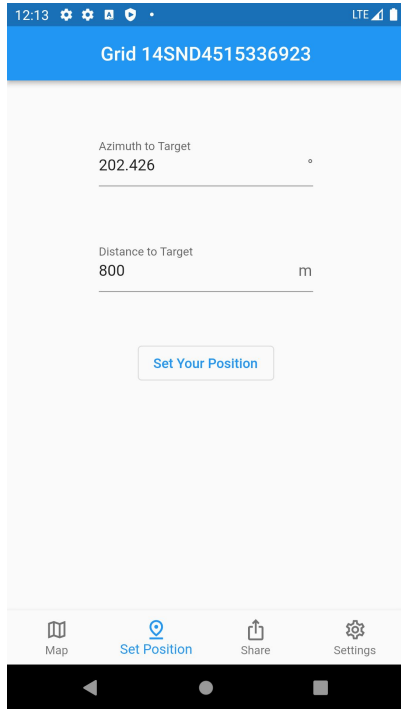Since smartphones GPS service in average yields ~11m radius of accuracy as depicted by the opaque blue circle overlapping GPS point, user may need to do map-terrain association only **once** to correct their precise position on map by adjusting the crosshair.

App bar displaying dynamic coordinates of a point in MGRS

Grid 14SND4515336923
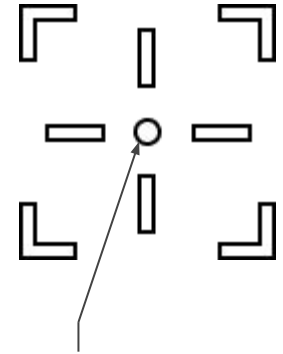
Coordinates of a point displayed in app bar is relative to the dot in crosshair

Step 2: *Fix*

User enter known OT azimuth and distance to locate target position in map.

At the current state of MVP, OT azimuth is limited to arc degree unit and must be inputted manually. Not all devices has embedded IMU sensor to enable automatic population of OT azimuth field by simply pointing the phone toward direction of target. User may need to use additional lensatic compass if their device does not have embedded IMU sensor.

OT distance can be inputted with observer's reading from any method of observation, whether unaided, binocular or preferrably using laser rangefinder. No horizontal component distance calculation is included at the current state of MVP.

After both fields have been populated, user can press "Set Position" button and be redirected to "Map" page with the crosshair now centered on the located target position.
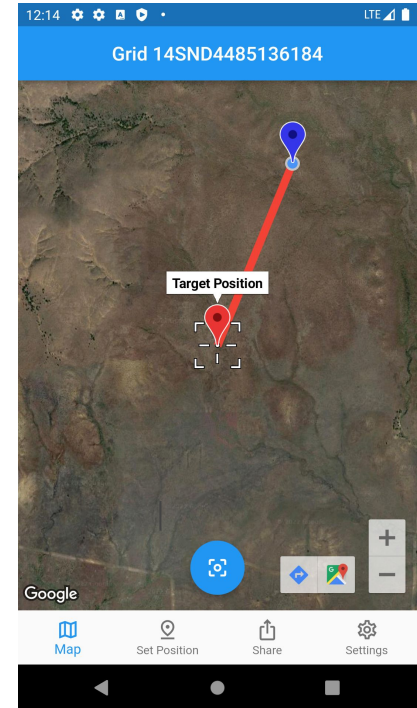
Map page with crosshair on target and app bar now showing target grid coordinates

Step 3: *Target*

User fill a SPOTREP form, modified and adapted from STP 21-1-SMCT, 171-COM-4080.

Target Location field is locked to the last acquired target location from the previous "*Fix*" step and location coordinates formatting is compliant to MIL-STD-2401.

Time of Observation field is locked to the device local time when the target location is acquired from the previous "*Fix*" step and DTG formatting is compliant to MIL-STD-2525D.

Sharing format

Rangefinder//
Spreading toward east//
14SND4485136182//
Wildfire//
2 1213 (19) S FEB 22//

https://maps.google.com/maps?
z=18&t=h&q=loc:34.6666200724691
15+-98.51046020332791

Powered by Observed Things
#OSINT #GEOINT

Figure 1.

When "Share Target" button is pressed from the previous *Target* step, device platform native system that provides several standard sharing services will pop up.

The report will be generated in plaintext format following figure 1, adapted and modified from INTREP formatting in FM 34-45, as shown in figure C-2.

User can then choose via device platform native sharing services whether to copy this plaintext to clipboard and save it into a note-taking app for later use, share as open source GEOINT into social media, send privately to encrypted messaging app or to other supporting system endpoint directly for secure post-processing with user authentication.
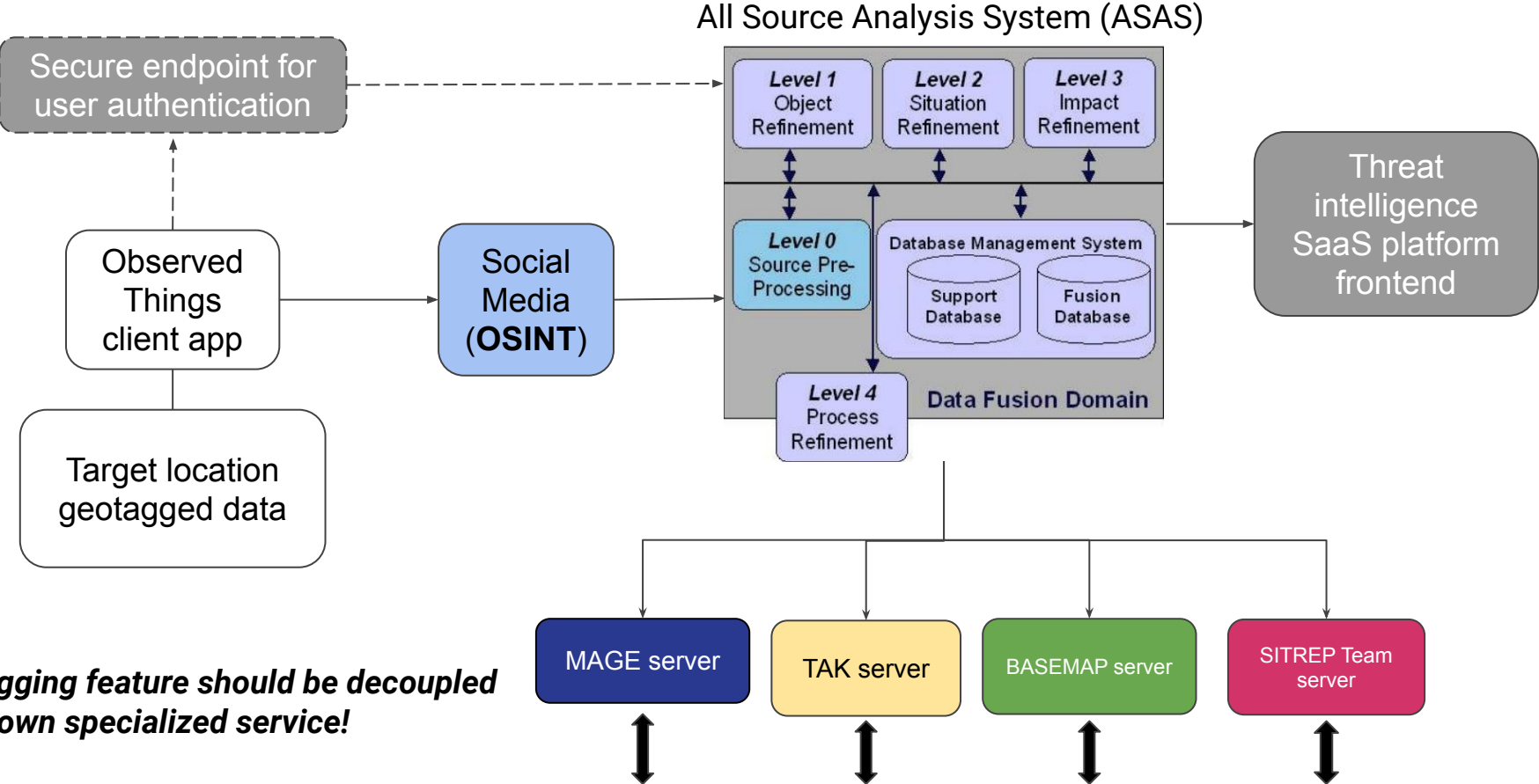
It is possible for user to manually modify the generated plaintext report before it is sent to the following channel.

INTREP formatting FM 34-35


```
                        FORMAT

LINE 1:    CLASSIFICATION
LINE 2:    SET FIELD NAME/EXERCISE NAME//
LINE 3:    SET FIELD NAME/MESSAGE TITLE/ORIGINATOR/DATE-TIME//
LINE 4:    SET FIELD NAME/HEADING INFORMATION//
LINE 5:    SET FIELD NAME/TYPE OF SOURCE OF INTELLIGENCE INFORMATION/
           ACTIVITY DATE-TIME/EVALUATION OF INFORMATION//
LINE 6:    SET FIELD NAME
LINE 7:    /DATE ELEMENT/TARGET TYPE/EQUIPMENT NAME/EQUIPMENT
           MODEL/QUANTITY
LINE 8:    AMPLIFYING DETAILS
LINE 9:    AMPLIFYING DETAILS//
LINE 10:   AMPLIFYING DETAILS//

                        EXAMPLE

EXER/BRAVE SHIELD 95//
MSGID/INTREP/1STBN/2DMAR/0622019//
HEADING/INFORMATION//
SOURCE/PATROL/220735Z/A1//
1BL
/DE TGTTYP EQPT                              EQMOD   QTY
01 MDMTK   T-62                                -      10
02 LTWHL   2.5 TON TRKS                        -      12//
```

Figure C-2. Intelligence report.

Industry Picture with Observed Things:

All Source Analysis System (ASAS)

Secure endpoint for user authentication

Observed Things client app

Target location geotagged data

Social Media (**OSINT**)

Level 1 Object Refinement

Level 2 Situation Refinement

Level 3 Impact Refinement

Level 0 Source Pre-Processing

Database Management System

Support Database

Fusion Database

Level 4 Process Refinement

Data Fusion Domain

Threat intelligence SaaS platform frontend

MAGE server

TAK server

BASEMAP server

SITREP Team server

Geotagging feature should be decoupled as its own specialized service!

Interoperability

The app is built upon development framework that enables mobile (iOS, Android), web, desktop (Windows, macOS, and Linux), and embedded apps on any screen to be built from a single codebase with minimal changes, maximizing *code reusability* and *portability* to create a truly *interoperable* and *cross-platform* solution.

At the current state of MVP, it is only built for Android devices.
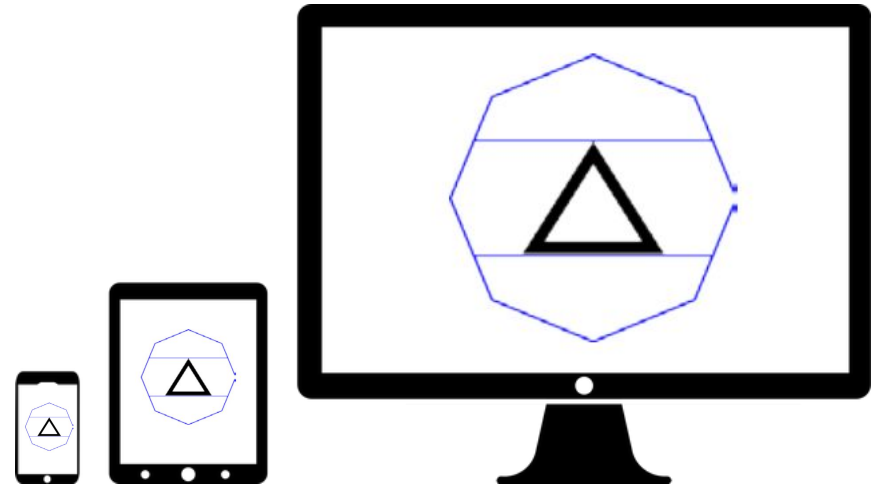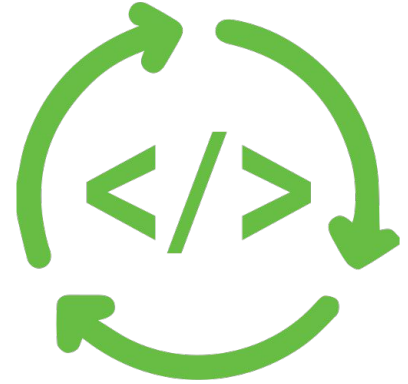
Conclusion

So far, Observed Things have solved the problems in the industry by:

- *Improving Accessibility*
- *Streamlining Process*
- *Eliminating Data Stovepiping and Siloing*
- *Maximizing Interoperability*

You can download the MVP for Android in Google Play Store with the following link below:

https://play.google.com/store/apps/details?id=com.fynugroho.observed_things

Moving onward…

There are many more features I have in mind to be implemented and elevate the app away from MVP.

Interested to hear more?

Contact me at LinkedIn:
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