

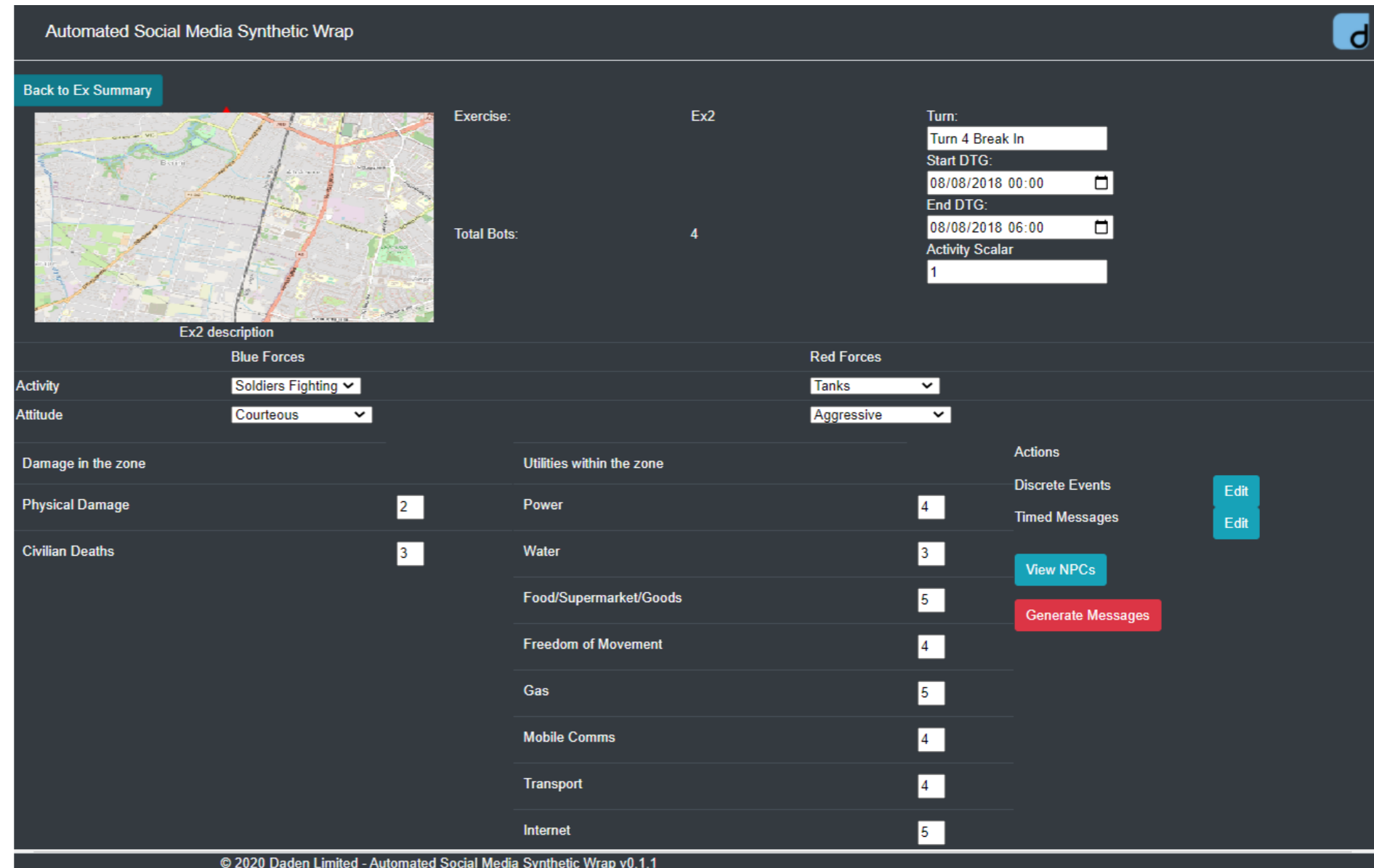
Information Injects

- Information Injects are often pre-scripted and introduced through a Master Events List (MEL) or Master Injects List (MIL).
- Take time and effort (and hence budget) to produce.
- Can be hard to adapt if player actions start to diverge from “the script”
- Tends to focus on the “golden thread”, little time to produce the “noise”
- As a result G2/G9/Influence cells often not well exercised
- Is it possible to generate the same/similar content without high levels (or any) human intervention?



Automated Social Media Synthetic Wrap (ASMSW)

- Developed to support the UK's Land Warfare Centre's Ex Urban Lion series of CPX wargames in 2020/2021
- Turn Based – with key parameters for Blue, Red, White/Brown and the Environments being manually set to define activities and impacts
- Agent-based modelling of CivPop, including Sentiment, Mood, Chattiness and Retweet values



Automated Social Media Synthetic Wrap

Back to Ex Summary

Exercise: Ex2

Total Bots: 4

Turn: Turn 4 Break In

Start DTG: 08/08/2018 00:00

End DTG: 08/08/2018 06:00

Activity Scalar: 1

Ex2 description

Blue Forces		Red Forces	
Activity	Soldiers Fighting	Tanks	
Attitude	Courteous	Aggressive	

Damage in the zone		Utilities within the zone		Actions
Physical Damage	2	Power	4	Discrete Events Edit
Civilian Deaths	3	Water	3	Timed Messages Edit
		Food/Supermarket/Goods	5	View NPCs
		Freedom of Movement	4	Generate Messages
		Gas	5	
		Mobile Comms	4	
		Transport	4	
		Internet	5	

© 2020 Daden Limited - Automated Social Media Synthetic Wrap v0.1.1

ASMSW Example Output



Automated Social Media Synthetic Wrap

Exercise:

Turn: All

Npc: All

From: dd/mm/yyyy --:--

To: dd/mm/yyyy --:--

Current Turn

All To Date

Back To Exercise

@Terenti M - 08/08/2018 02:46:03
Lol why are we boarding up windows its not like itll help when the drop the bomb on us

@Terenti M - 08/08/2018 02:49:00
My ham radio mate still getting messages out via G7DXS in the UK

@Darja Kukkk - 08/08/2018 02:52:46
Smoke drifting across the street - grenades?

@Jeremias Waara - 08/08/2018 03:01:49
as in resistor planted the bomb, detonated it & got back safely to Latvia Shit

@Terenti M - 08/08/2018 03:03:05
Demo forming at Heleny - keep the troops out!

@Eleonoora Couri - 08/08/2018 03:05:48
Landline gone totally - no dial tone or broadband for hours now - just 3G

@Terenti M - 08/08/2018 03:17:52
Trying to sleep but convoy just keeps trucking past my house

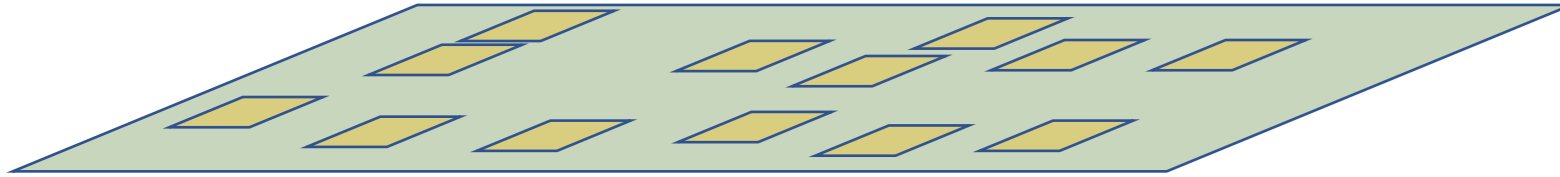
@Darja Kukkk - 08/08/2018 03:25:05
Bunch of Bothnians busy studying a manhole on Vietsiloudontie

@Jeremias Waara - 08/08/2018 03:30:24
Syalyow is a total empty. All the bars are shut. I feel for the people it must be soul destroying.

@Terenti M - 08/08/2018 03:33:56

© 2020 Daden Limited - Automated Social Media Synthetic Wrap v0.1.1

ASMSW – Tiered Approach

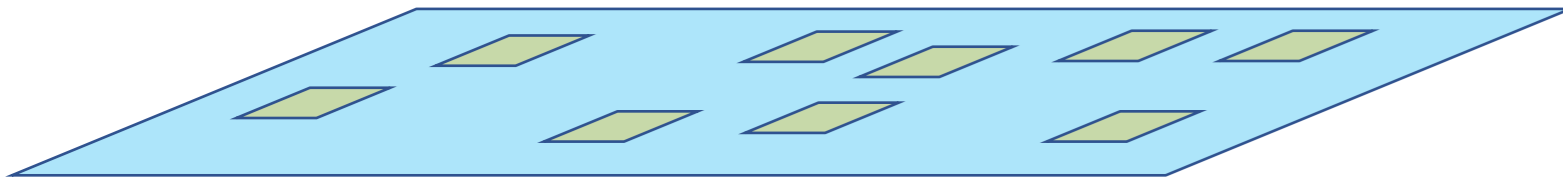


What the user sees

- Timed/Ad-Hoc Messages
- Timed or written as required
 - Fully manually

- Discrete Events
- Semi-Automated
 - Events queued as required

- Background Messaging
- Fully automated



ASMSW – Template & Synonym Approach

- All messages authored as templates, which include multiple synonyms (e.g. for tank) and variables (e.g. home street)
- Templates indexed by allegiance and conditions

TEMPLATES

A [bignumber] protest has gathered at the [roadblock,crossroads,barriers] in front of the path up to [~key_location].

[~opposition] forces using heavy artillery in direction of [~city] region.

1 [bunch] of [soldiers] chatting just [outside]
2 [icansee] [soldiers] [shooting] [onthestreet]
3 [couple] of [tanks] [moving] [down] [thastreet]
4 [exclam]! [huge] [bang]. [tankgun] [firing] just [outside].
5 [~they] are [bombing] [us], [explosions] [everywhere]

SYNONYMS

exclam	Christ, Wow, omfg, omg, F***, holy crap
Icansee	I can see, We can see, Just seen
Bunch	Bunch, Group, Crowd

“Good idea, gives G2 an idea of what is going on”

“Really good.. real-time effect”

“the constant [rolling] feeds were easy to read and a good way of displaying the information, providing a presence/reminder of the Syalyow population.”

“Adds a real sense of realism / depth / immersion that can be hard to get, especially on short exercises.”

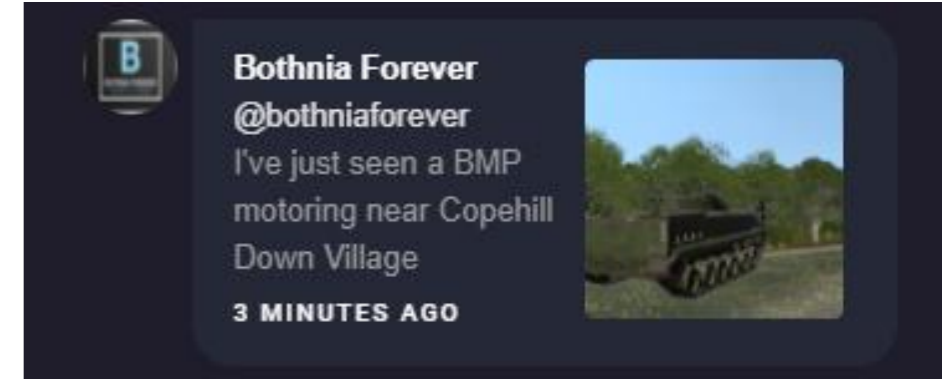
“Can provide intel or events to react to.”

“gives a wider sense of ‘live’ activity to back up OSINF summary and target RFIs.”

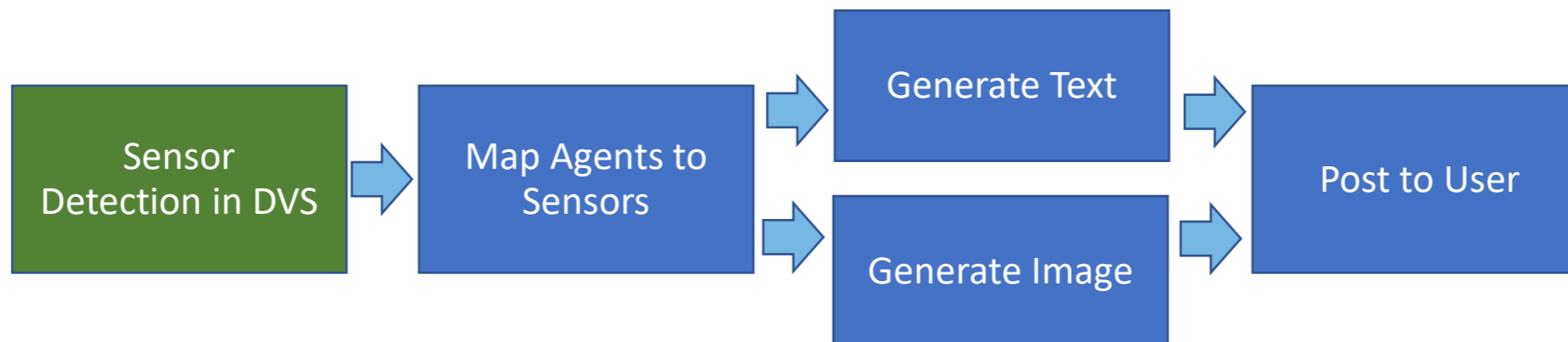
- Developed as part of Serapis Mastering Architectures and Artificial Intelligence for Training and Education Efficiency (MAAITEE) WP4 during 2021
- Project and design led by Daden Limited, software development by Vindico Limited
- Aim was to:
 - Design and Demonstrate a proof-of-concept system able to automatically generate injects from underlying simulation data (e.g. entity location):
 - Intelligence Reports
 - Social Media Posts
 - News Posts
- Defence Virtual Simulation (provided through GFX) used as the target simulation system, but:
 - Source simulation independent and loosely coupled - so can use with systems other than DVS
 - Minimal load into DVS, and all intelligence in the application not DVS – to simplify deployment and maintenance

Process Overview

- Use existing sensors in DVS to write detections out in a standard format to an external file
- “Agents” (social, news, military) are used to generate the messages
- A templating/synonym approach to message generation (as used in ASMSW) provides message variety
- Images are generated by combining a vehicle image library with a locations image library

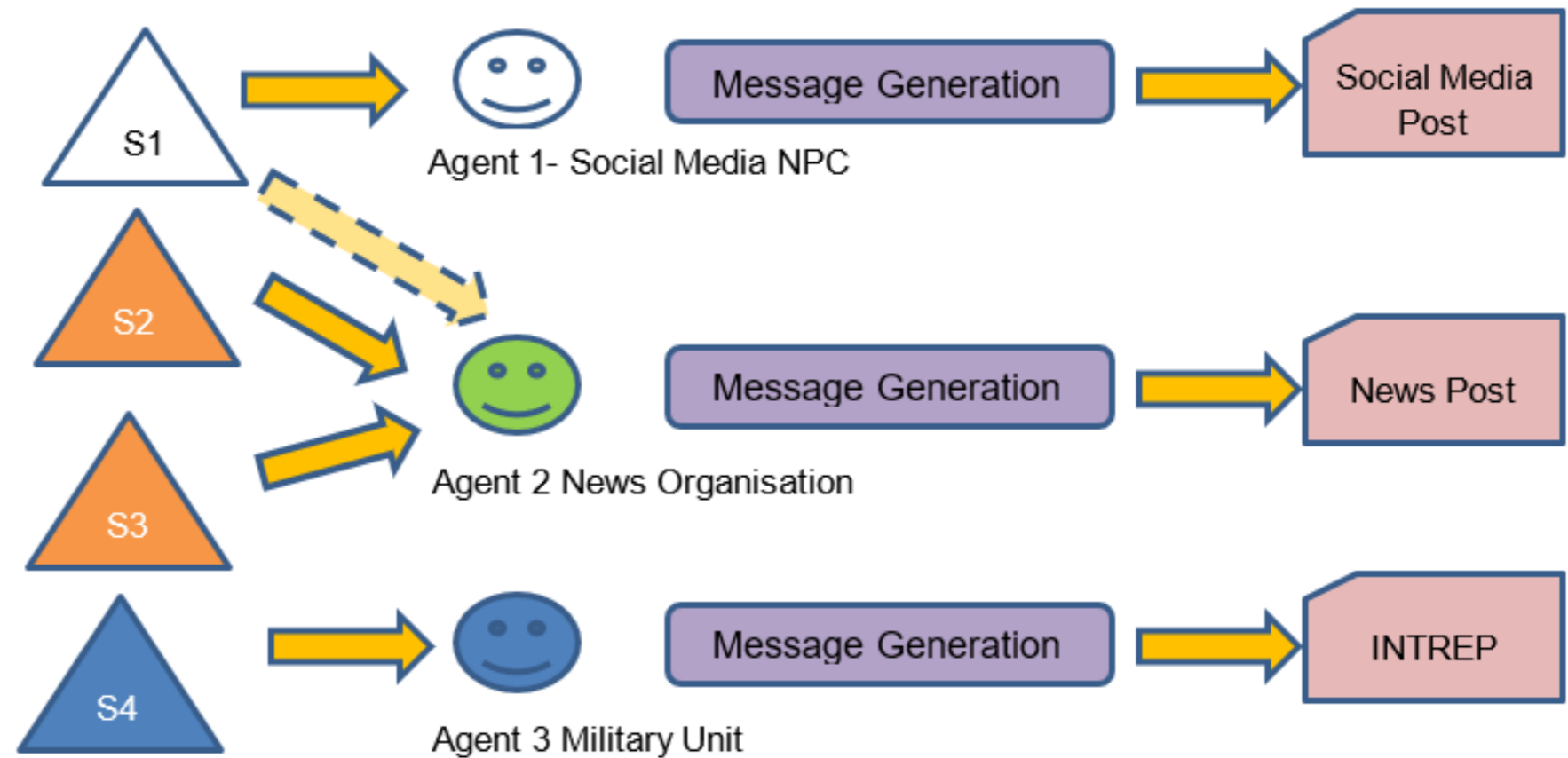


```
TASK FORCE ZULU MX REPORT. FROM B20. TO: 0A. ICOD: 151210ROCT21. SOURCE GRADING 1. WHAT: SA-19 moving West through Copehill Down Village . WHERE: NGR SU 02789 45508, 700m North North East of my location. WHAT ARE YOU DOING ABOUT IT? Observing
```

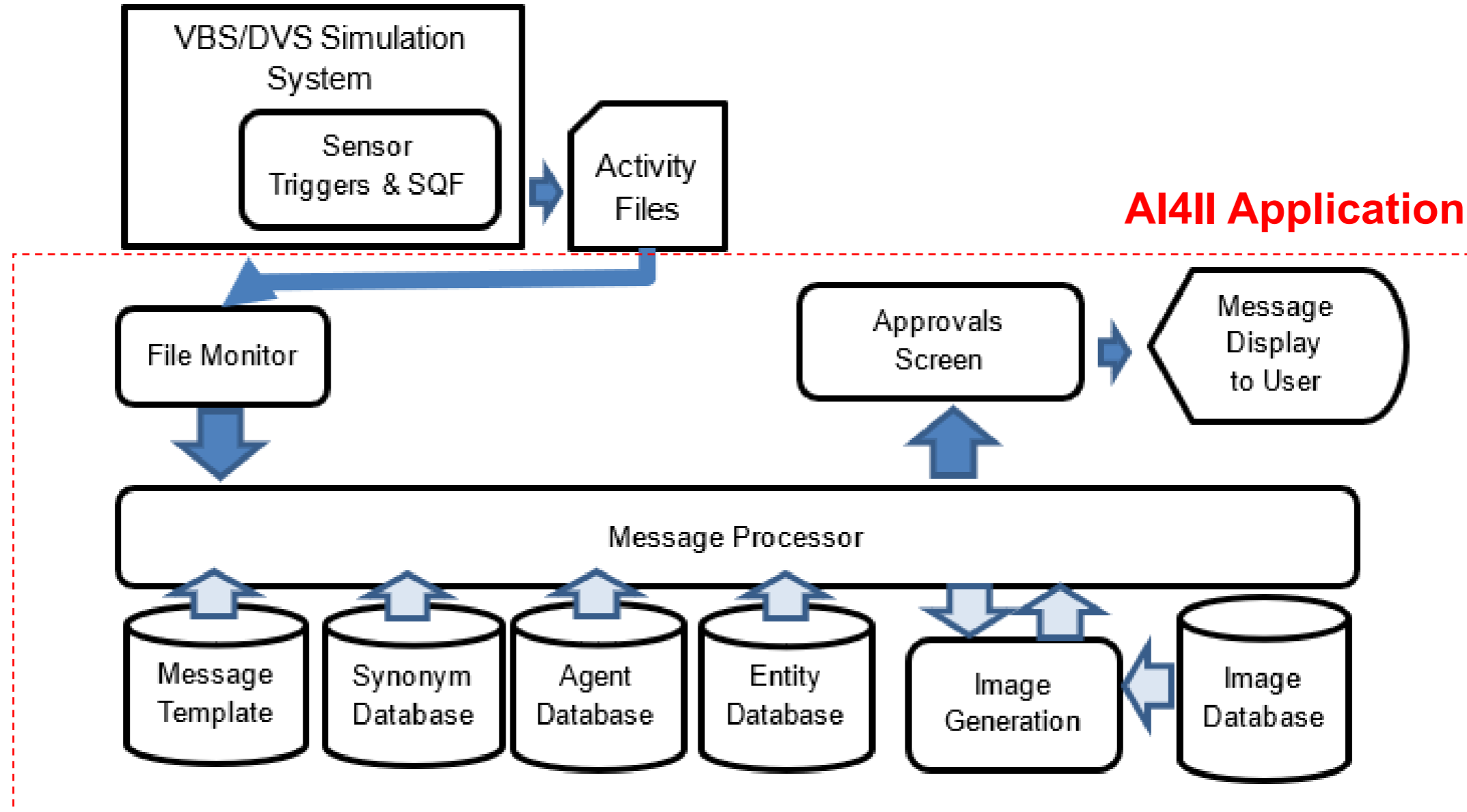


Agents & Sensor Mapping

- **Agents generate Messages from Sensor Triggers**
- Each Agent has:
 - Chattiness rating
 - Entity Importance Threshold
 - Following list
 - Avatar

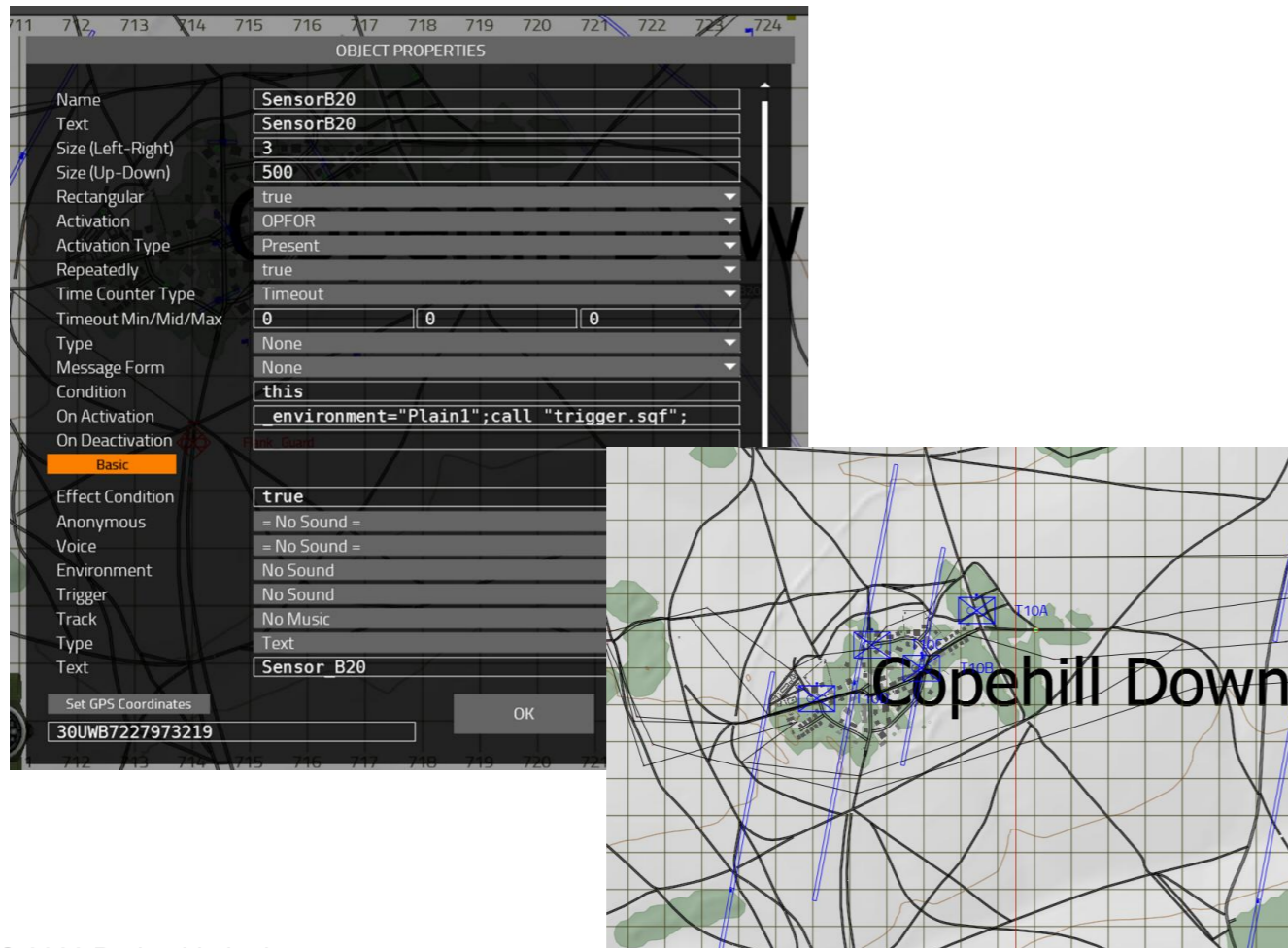


Overall Architecture



The DVS Interface

- A generic script is placed in a DVS, only needing sensor ID and location/location type entered for each instance



```

{"sensor":
{"name":"Sensor0A",
"position":[35506.3482,32880.65496,0],
"gps":["51.20829335289 N","1.98207435654 W"],
"nearestLocation":"Copehill Down Village",
"distanceToLocation":"395.873226177764",
"environment":"Plain1",
"dayTime":"12.0003757476807",
"date":"[2021,10,15,12,0]"},
},
"trigger":{
"name":"T90",
"description:"",
"type":"vbs_ru_army_t90a_grn_x",
"position":[35526.027,32920.177, -0.120],
"direction":"134.377517700195",
"speed":"28.9148750305176",
"gps":["51.2086 N","1.9817 W"],
"distanceToSensor":"44.175186666634",
"gridRef":["SU 01272 45551",""]
}
}

```

- Randomly selected for each message
- Formats:
 - {...} = synonym
 - [...] = variable

Social Media Templates

```
"I just saw a [target] driving through [location]";
"{ijustsaw} a {size} [target] {moving} [heading] through [location]";
"{ijustsaw} a {size} [target] [distance] away from {meus} in [location]";
"I just saw a [target]";
"{ijustsaw} a {size} [target] {moving} [heading]";
"{ijustsaw} a {size} [target] [bearing] of {meus}";
"{ijustsaw} a {size} [target] [distance] away from {meus}";
```

Intelligence Report Templates

```
"A.When: [time]. B.Where: [location] [distance] [bearing] of my location at approx NGR [ngr]. C. What is it? [target]. D. What is it doing? Moving [heading]. E. What you are doing about it? Observing";
```

News Templates

```
"%"[location] {newsorg}: Thu 8 May: About [oclock] o'clock {residents} in [location] {reportedseeing} a [target] {movingthrough} the {town}.";
"[location] {newsorg}: Thu 8 May: Signs of {increasingtension} in [location] as {residents} {reportedseeing} {several} [target] {in} the {town}.";
```

- Any thing in the simulation which may be of interest for a message is an “entity”
- **Entities** have:
 - Importance value
 - Image links
 - Name list of decreasing detail
 - Confusion list of similar vehicles

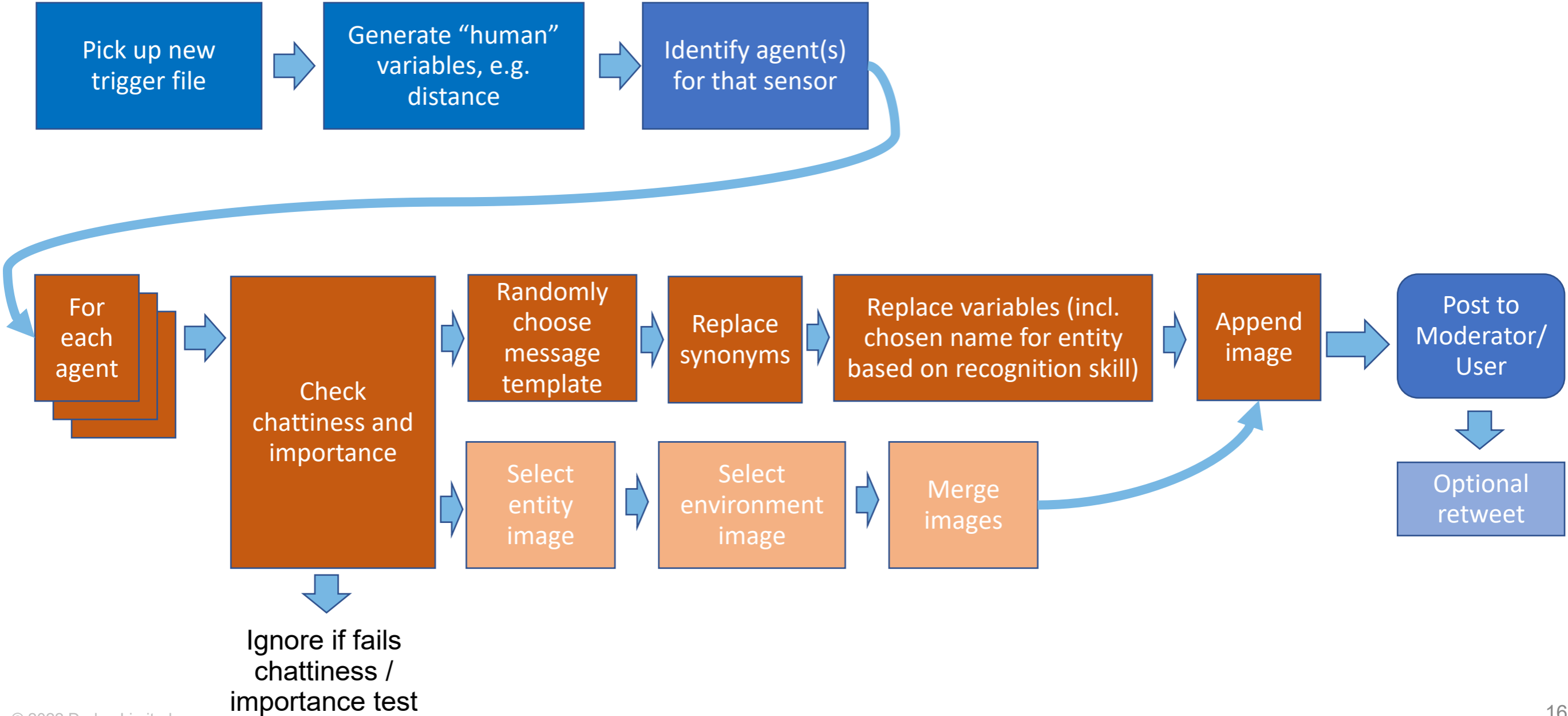
ID	sensorSimId	side	image Path	recognition	importance	confusedWith
ENTITY:16277..	VBS2_OPFOR_Army_T80U_W_X	Red	T80	T80,T80,T80,big tank,tank	2	T80B,T80U,T80UK,T64B,T90,T90M,MBT,big tank,tank
ENTITY:16278..	vbs_op_army_t72_grn_x	Red	T72	T72,T72,T72,big tank,tank	2	T64A,T64B,T80,T90,T90M,MBT,big tank,tank
ENTITY:16276..	vbs_dvs_op_army_sa13_grn_x	Red	SA13	SA-13,Gopher,SAM,rocket launcher,funny tank,tank	1	SA19,SA15,Gauntlet,SAM17,big tank,tank
ENTITY:16275..	vbs_ru_army_bmp3_grn_x	Red	BMP3	BMP3,BMP,APC,small tank,tank	3	BMP2,BMP1,BMP1,MTLB,APC,small tank,tank

Image Generation

- Library of entity and environment images from multiple perspectives
- All images from DVS for internal and exercise consistency
- Images merged to give final result



Message Generation and Filtering



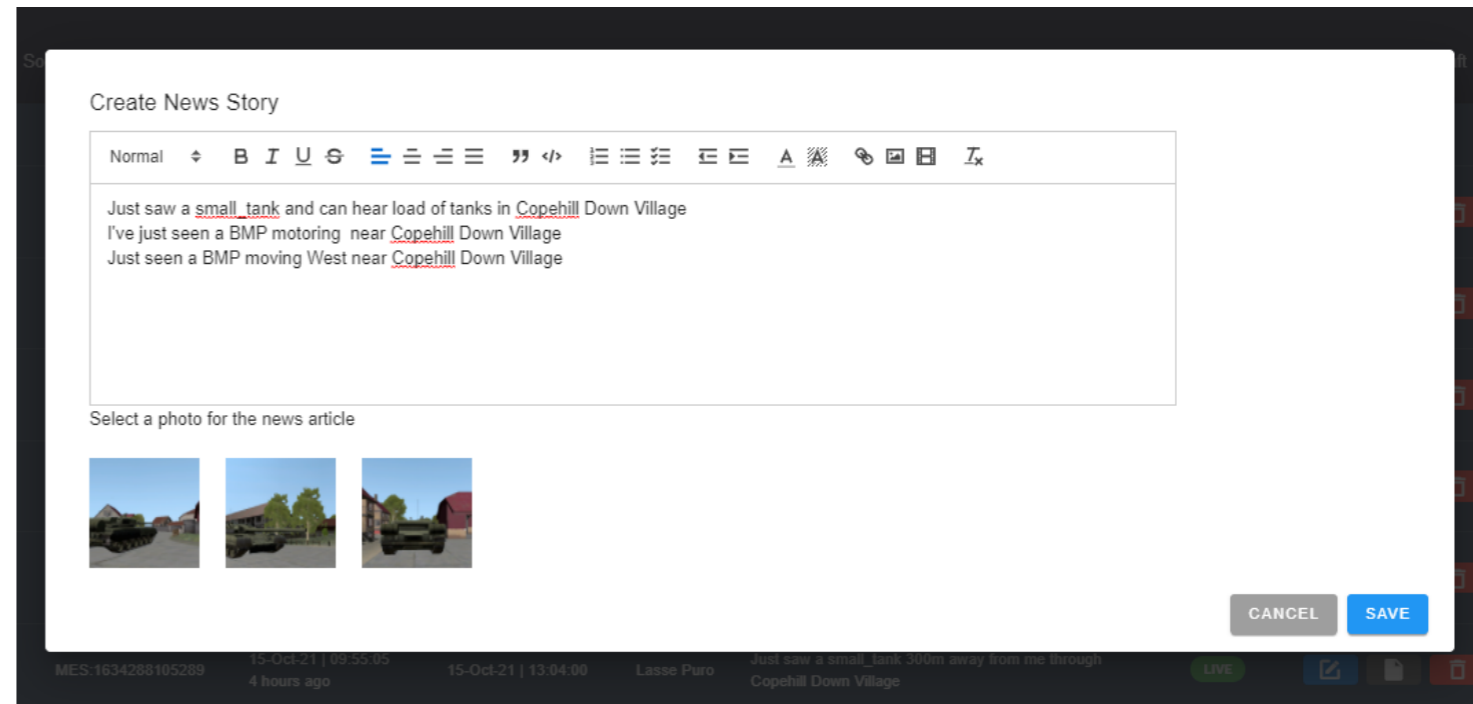
Secondary and Aggregated Messages

Secondary Messages

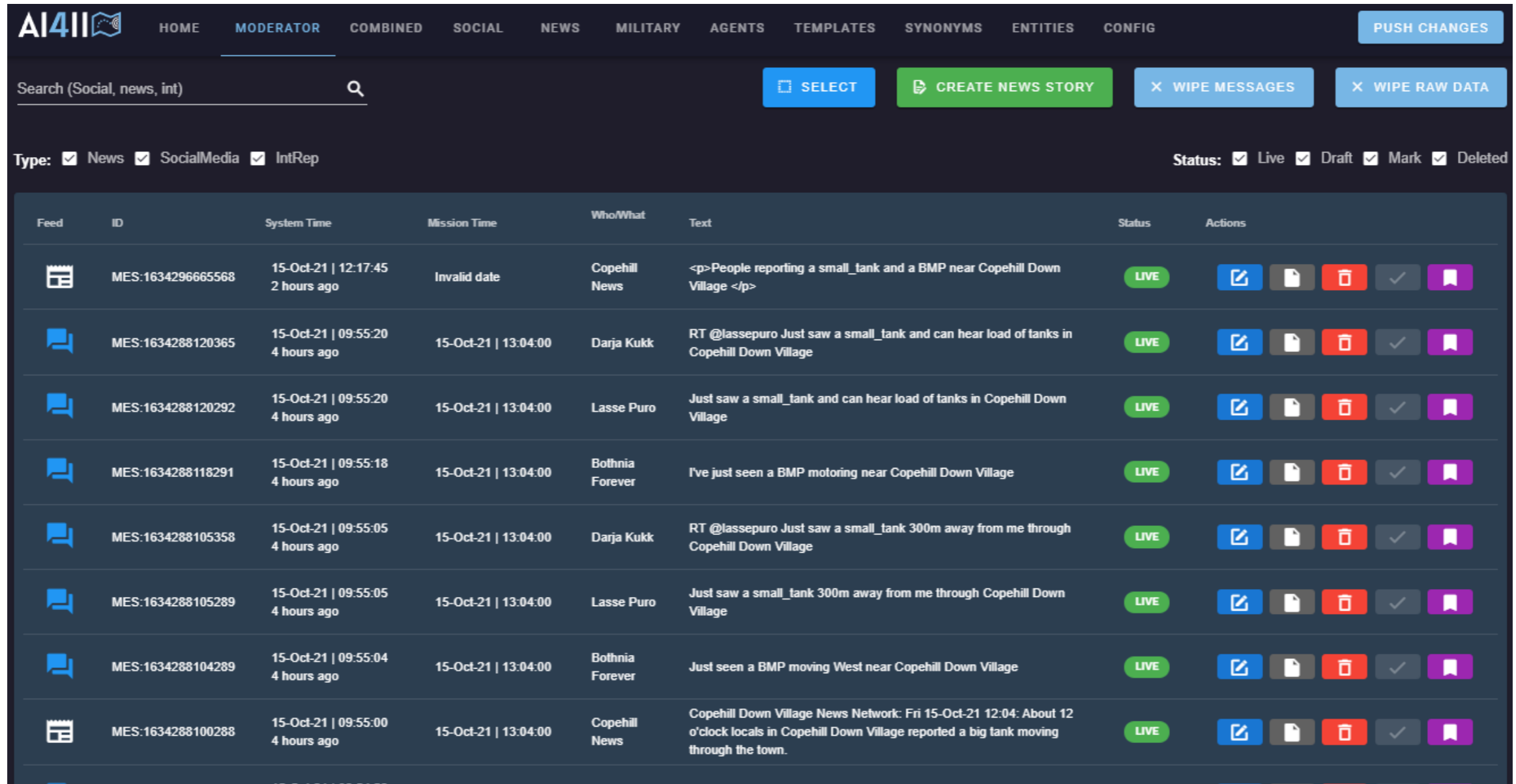
- Those that result from an analysis of multiple sensor triggers (or their absence)
- Possible uses include:
 - “It's busy here” – more than 5 triggers in 10 minutes
 - “It's quiet here” – no triggers in 30 minutes
 - “There's a convoy coming through” – more than 10 triggers in 3 minutes

Aggregated Messages









































- Manual pick, merge and edit of multiple messages
- Usually used to convert multiple social media/reporter posts to a single news story



Application UI – Moderator Screen



The screenshot shows the AI4I Moderator Screen. At the top, there is a navigation bar with the AI4I logo and menu items: HOME, MODERATOR (selected), COMBINED, SOCIAL, NEWS, MILITARY, AGENTS, TEMPLATES, SYNONYMS, ENTITIES, and CONFIG. A 'PUSH CHANGES' button is on the right. Below the navigation bar is a search bar with the text 'Search (Social, news, int)' and a magnifying glass icon. To the right of the search bar are four buttons: 'SELECT', 'CREATE NEWS STORY', 'WIPE MESSAGES', and 'WIPE RAW DATA'. Below the search bar are filter options: 'Type: News SocialMedia IntRep' and 'Status: Live Draft Mark Deleted'. The main content is a table with columns: Feed, ID, System Time, Mission Time, Who/What, Text, Status, and Actions. The table contains several rows of news items, each with a 'LIVE' status and a set of action icons (edit, delete, verify, bookmark).

Feed	ID	System Time	Mission Time	Who/What	Text	Status	Actions
	MES:1634296665568	15-Oct-21 12:17:45 2 hours ago	Invalid date	Copehill News	<p>People reporting a small_tank and a BMP near Copehill Down Village </p>	LIVE	   
	MES:1634288120365	15-Oct-21 09:55:20 4 hours ago	15-Oct-21 13:04:00	Darja Kukk	RT @lassepuro Just saw a small_tank and can hear load of tanks in Copehill Down Village	LIVE	   
	MES:1634288120292	15-Oct-21 09:55:20 4 hours ago	15-Oct-21 13:04:00	Lasse Puro	Just saw a small_tank and can hear load of tanks in Copehill Down Village	LIVE	   
	MES:1634288118291	15-Oct-21 09:55:18 4 hours ago	15-Oct-21 13:04:00	Bothnia Forever	I've just seen a BMP motoring near Copehill Down Village	LIVE	   
	MES:1634288105358	15-Oct-21 09:55:05 4 hours ago	15-Oct-21 13:04:00	Darja Kukk	RT @lassepuro Just saw a small_tank 300m away from me through Copehill Down Village	LIVE	   
	MES:1634288105289	15-Oct-21 09:55:05 4 hours ago	15-Oct-21 13:04:00	Lasse Puro	Just saw a small_tank 300m away from me through Copehill Down Village	LIVE	   
	MES:1634288104289	15-Oct-21 09:55:04 4 hours ago	15-Oct-21 13:04:00	Bothnia Forever	Just seen a BMP moving West near Copehill Down Village	LIVE	   
	MES:1634288100288	15-Oct-21 09:55:00 4 hours ago	15-Oct-21 13:04:00	Copehill News	Copehill Down Village News Network: Fri 15-Oct-21 12:04: About 12 o'clock locals in Copehill Down Village reported a big tank moving through the town.	LIVE	   

Application UI – Message Display Screens

AI4II HOME MODERATOR COMBINED SOCIAL NEWS MILITARY AGENTS TEMPLATES SYNONYMS ENTITIES CONFIG PUSH CHANGES

Social Media

Darja Kukk @darjakukk
RT @lassepuro Just saw a small_tank and can hear load of tanks in Copehill Down Village
3 MINUTES AGO

Lasse Puro @lassepuro
Just saw a small_tank and can hear load of tanks in Copehill Down Village
3 MINUTES AGO

Bothnia Forever @bothniaforever
I've just seen a BMP motoring near Copehill Down Village
3 MINUTES AGO

Darja Kukk @darjakukk
RT @lassepuro Just saw a small_tank 300m away from me through Copehill Down Village
3 MINUTES AGO

Lasse Puro @lassepuro
Just saw a small_tank 300m away from me through Copehill Down Village
3 MINUTES AGO

LATEST HEADLINES

NEWS NETWORK
Copehill Down Village News Network: Fri 15-Oct-21 12:04: About 12 o'clock locals in Copehill Down Village reported a big tank moving through the town.
COPEHILL NEWS - 3 MINUTES AGO

TimesNews
Copehill Down Village Times: Fri 15-Oct-21 12:04: Signs of military force in Copehill Down Village as our reporter saw a small_tank inside the area.
COPEHILL NEWS - 4 MINUTES AGO

THE COURIER
Copehill Down Village Courier: Fri 15-Oct-21 12:03: About 12 o'clock our reporter in Copehill Down Village spotted a small_tank patrolling in the area.
COPEHILL NEWS - 4 MINUTES AGO

Village NEWS
Copehill Down Village News: Fri 15-Oct-21 12:02: About 12 o'clock residents in Copehill Down Village sighted a big_tank moving through the village.
COPEHILL NEWS - 5 MINUTES AGO

Daily Post
Copehill Down Village Post: Fri 15-Oct-21 12:01: About 12 o'clock townfolk in Copehill Down Village reported seeing a small_tank racing through the village.
COPEHILL NEWS - 6 MINUTES AGO

TimesNews
Copehill Down Village Times: Fri 15-Oct-21 12:01: About 12 o'clock observers in Copehill Down Village reported a tank driving in the streets.

MILITARY REPORTS

TASK FORCE ZULU MX REPORT. FROM B20. TO: 0A. ICOD: 151210ROCT21. SOURCE GRADING 1. WHAT: SA-19 moving West through Copehill Down Village . WHERE: NGR SU 02789 45508, 700m North North East of my location. WHAT ARE YOU DOING ABOUT IT? Observing

TASK FORCE ZULU MX REPORT. FROM B20. TO: 0A. ICOD: 151210ROCT21. SOURCE GRADING 1. WHAT: BMP moving West near Copehill Down Village . WHERE: NGR SU 02788 45481, 700m North North East of my location. WHAT ARE YOU DOING ABOUT IT? Observing

TASK FORCE ZULU MX REPORT. FROM B20. TO: 0A. ICOD: 151210ROCT21. SOURCE GRADING 1. WHAT: BMP moving West by Copehill Down Village . WHERE: NGR SU 02799 45539, 800m North North East of my location. WHAT ARE YOU DOING ABOUT IT? Observing

TASK FORCE ZULU MX REPORT. FROM B20. TO: 0A. ICOD: 151210ROCT21. SOURCE GRADING 1. WHAT: BMP moving West close to Copehill Down Village . WHERE: NGR SU 02790 45516, 800m North North East of my location. WHAT ARE YOU DOING ABOUT IT? Observing

TASK FORCE ZULU MX REPORT. FROM B20. TO: 0A. ICOD: 151210ROCT21. SOURCE GRADING 1. WHAT: BMP moving West in Copehill Down Village . WHERE: NGR SU 02797 45551, 800m North North East of my location. WHAT ARE YOU DOING ABOUT IT? Observing

TASK FORCE ZULU MX REPORT. FROM B20. TO: 0A. ICOD: 151210ROCT21. SOURCE GRADING 1. WHAT: T80 moving West by Copehill Down Village . WHERE: NGR SU 02793 45507, 700m North North East of my location. WHAT ARE YOU DOING ABOUT IT? Observing

Typical Live Configuration

The screenshot displays a live configuration environment with three main components:

- Map Application (VBS3 20.1.9.33 "VBS3_64.exe" -window):** Shows a topographic map with a grid. A large black text overlay reads "Copehill Down". The map includes contour lines and elevation data. The system time is 13:37:10 on 10/15/2021 at 12:00:00. Coordinates are [37002.681,33257.514,13] 30UWB7260373858.
- Web Interface (ai4ii-frontend-app):** A browser window showing the "AI4II" moderator interface. The URL is localhost:3000/#/admin/moderator. The interface includes a search bar, navigation tabs (HOME, MODERATOR, COMBINED, SOCIAL, NEWS, MILITARY, AGENTS, TEMPLATES, SYNONYMS), and a list of news items. The news items table is as follows:

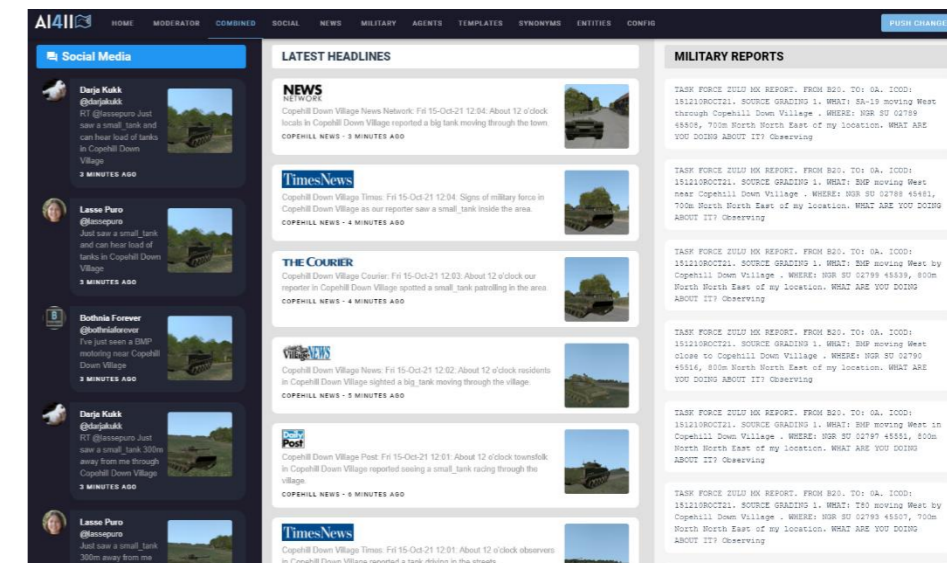
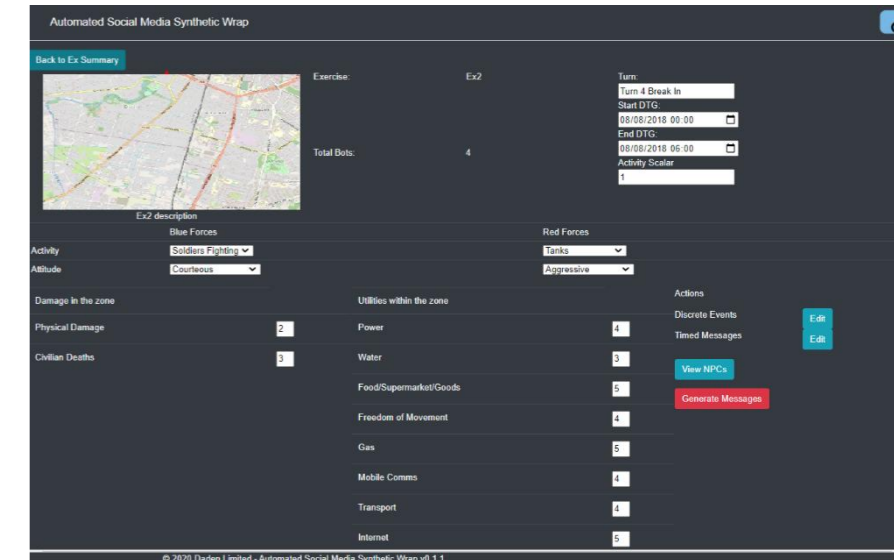
Feed	ID	System Time	Mission Time	Who/What	Text	Status	Actions
	MES:163429665568	15-Oct-21 12:17:45 an hour ago	Invalid date	Copehill News	<p>People reporting a small_tank and a BMP near Copehill Down Village </p>	LIVE	[Edit] [Share] [Delete]
	MES:1634288120365	15-Oct-21 09:55:20 4 hours ago	15-Oct-21 13:04:00	Darja Kukkk	RT @lassepuro Just saw a small_tank and can hear load of tanks in Copehill Down Village	LIVE	[Edit] [Share] [Delete]
	MES:1634288120292	15-Oct-21 09:55:20 4 hours ago	15-Oct-21 13:04:00	Lasse Puro	Just saw a small_tank and can hear load of tanks in Copehill Down Village	LIVE	[Edit] [Share] [Delete]
	MES:1634288118291	15-Oct-21 09:55:18	15-Oct-21 13:04:00	Bothnia	I've just seen a BMP motoring	LIVE	[Edit] [Share] [Delete]
- Command Prompt (docker-compose up):** Shows the output of a Docker container restart. The output includes Redis logs for background saving and database saving, and an error message from AI4II: "Error: ENOENT: no such file or directory, stat '/DATA/images/img/Front.043805f2.png'".

- VBS3 setup, sensor and AI behaviour
- Use of Docker with split code/data applications and file monitoring
- Environment at a Distance
 - Environment taken from sensor ID, but may sense a target in a different environment (e.g. edge of wood from sensor in a town)
- Mobile Sensors
 - Problems getting a sensor to follow a moving entity even if attached
 - Similar problem of environment detection as above, but now sensor also moving and changing own environment
- Detection of changing entity states, e.g.: stop/start, firing, debus/enbus
- Detect closest approach before messaging
- UAVs (detection of and detection from)

- Reduce the time taken to craft injects for simulation-led exercises – or focus that time on more “golden-thread” type injects and better hide those within the automated injects (even 5-10 min simulations generating 50+ messages)
- Enable generation of information injects without the need for additional or specialist staff – e.g. use within unit, sub-unit and even Fight Club style exercises
- Deploy useful OPs without having to crew them in the simulation (especially if extended to UAVs etc)
- Increase the awareness of human/social/ethical consequences of actions within the simulation, and sense of media oversight
- Enable better exercising of G2/6/9 and Influence staff on simulation-led exercises

Opportunities & Exploitation

- Productionise for general use
- Expand scope and sophistication, e.g. UAVs, allegiance
- Develop API to connect to media analysis tools
- Interface to other simulation systems
- Merge with ASMSW and AI4II to give a dynamic blend of manual, semi-manual and automated injects for turn-based and real-time wargames/simulations





Web: www.daden.co.uk
Email: david.burden@daden.co.uk
Twitter: [@dadenlimited](https://twitter.com/dadenlimited)