

# Update on ABM and Advanced Analytics

## IMS UCM 18.2

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- **Intro**
- **Capabilities**
- **Usage**
- **Recent developments**
- **ABM WS7 summary**
- **EMAT prototype**
- **Webservices available**

Automated Behaviour Monitoring (ABM) algorithms provide Integrated Maritime Services' (IMS) **users with services related to the detection of specific or anomalous ships' behaviours.**

The ABMs proved to be very **useful for the maritime safety as they provide a better maritime situational awareness.**

In the context of **VTMIS** they may produce an **early warning on potentially dangerous situations affecting safety or security of navigation.**

The **VTMIS reporting obligations can be also verified** with the usage of specific ABM algorithms.

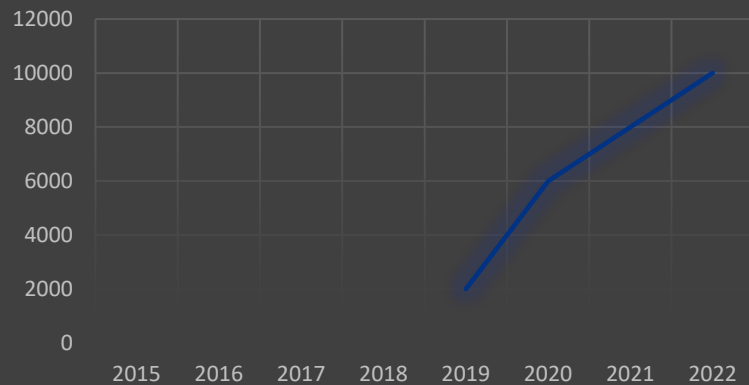
They may also **reduce maritime surveillance operators' workload by automatic analysis of ships' positions and the related alerting.**

## The ABM implementation provides two types of capabilities:

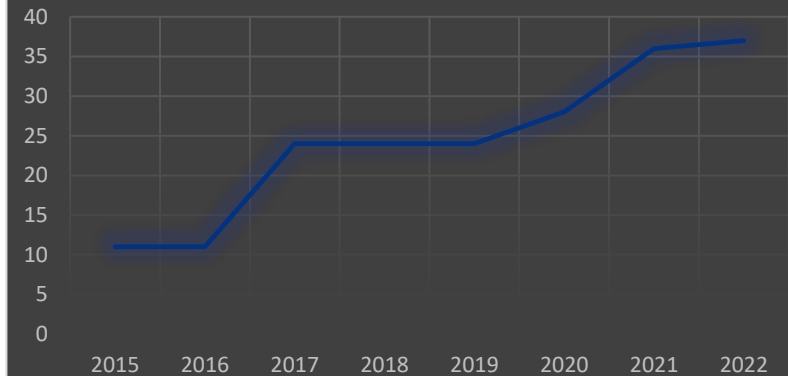
1. **‘Near real-time’ algorithms (NRT- ABMs)**, detecting specific or anomalous behaviours and alerting users within around fifteen minutes.
2. **‘Historical’ ABMs (H-ABMs)**, where algorithms use archived position reports or form a database of specific, detected situations and events (e.g. detecting port calls globally). Not time-critical.

# ABM usage and evolution

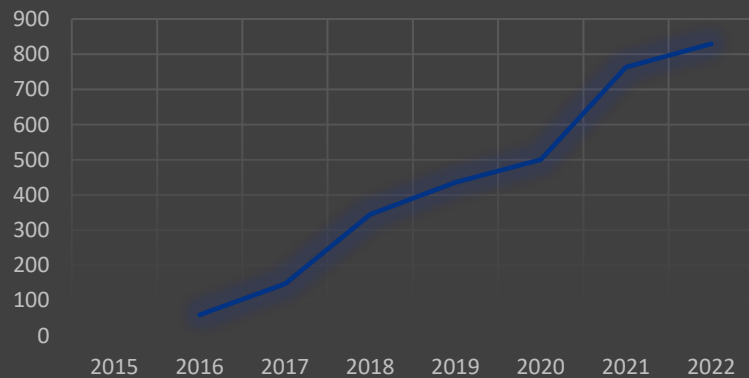
## Number of Alerts daily average



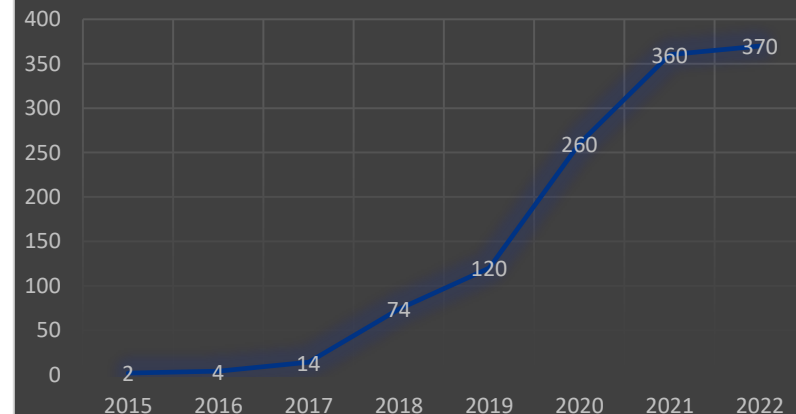
## Number of ABM algorithms



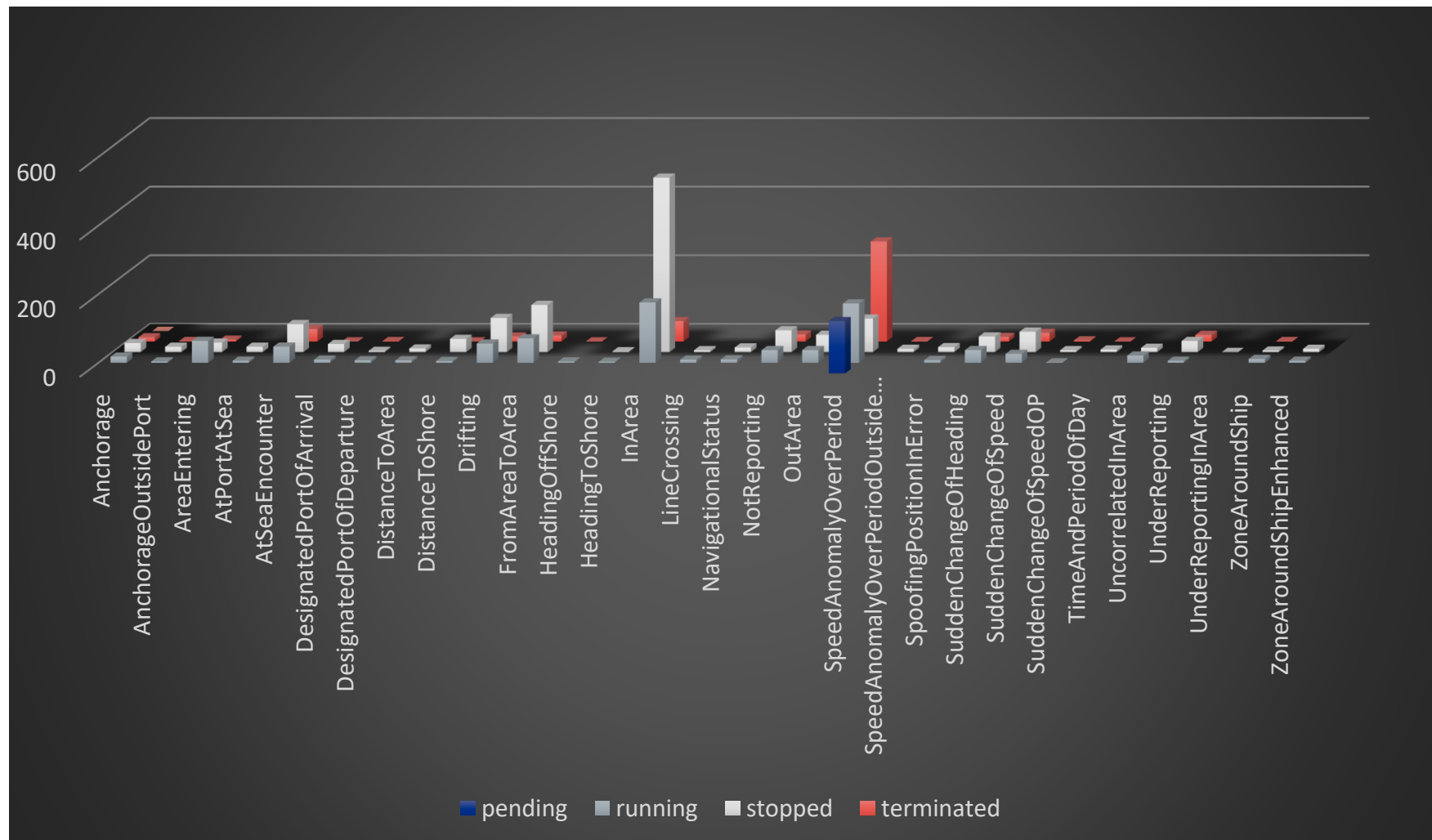
## Running ABMs



## Number of ABM Admins

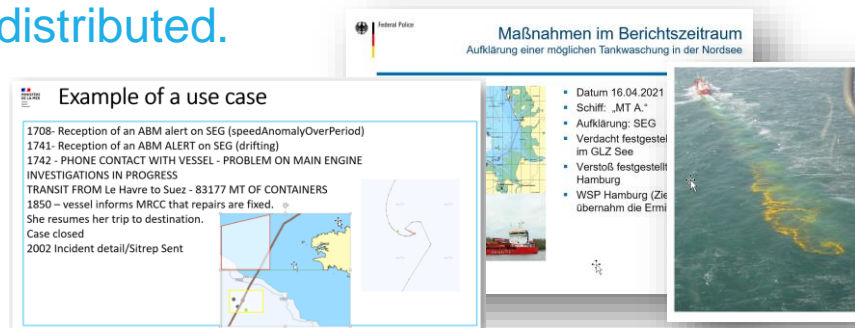


# The most popular algorithms (NRT ABM)



- **SSN Enrichment as filter for vessels of interest** (e.g. to select alerting for vessels with 'active' HAZMAT report). Later the first **new combinations of NRT ABMs**.
- **A new algorithm** for the detection of a lack of position report messages ('**Gap in Reporting**') should be also implemented.
- **The Historical (H) ABMs capabilities** will be implemented in **SEG** at the end of **2022**.
- **New H-ABMs** are also expected and services ensuring **continuous record of 7 situations on a global level, outside ports**.
- The next **IMS/SEG/ABM training** is planned for **June 2022**. Member States can also request **an ad-hoc, on-line information or awareness sessions**.
- **ABM user guide** have been **recently updated**.

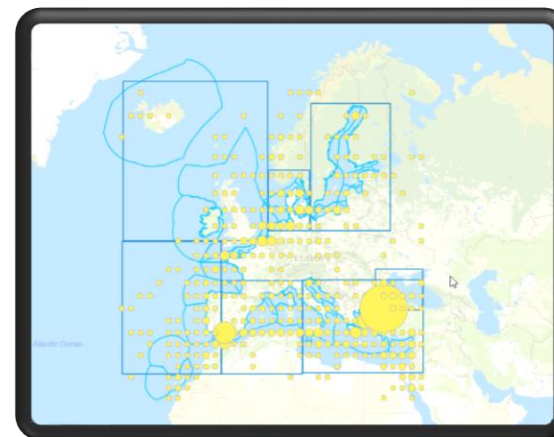
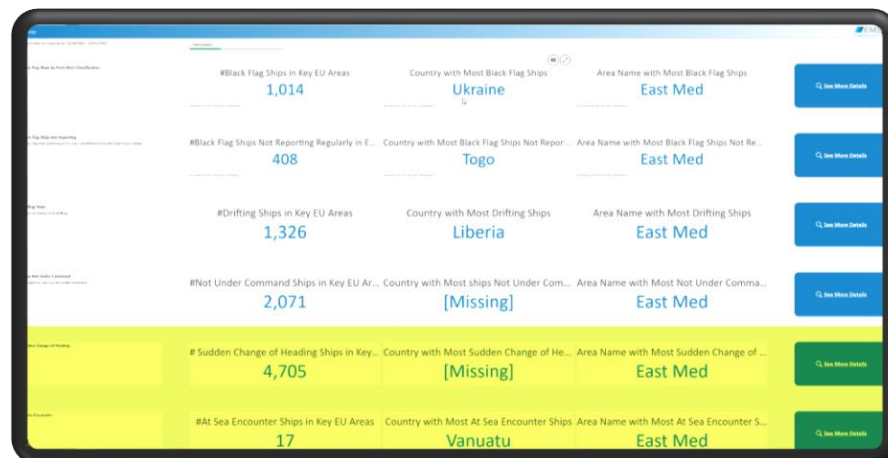
- MS and EU Bodies feedback on ABM operational usage in the context of maritime safety, law-enforcement, traffic monitoring, pollution prevention, fisheries control, border control and cross-border crime.
- Usage of the 'Cloud' and 'Big Data' new, technological solutions.
- Previously identified Artificial Intelligence (AI) and Machine Learning (ML) business scenarios were discussed in the context of their VTMISS
- The EMAT – EMSA Maritime Analytics Tool prototype status was presented, focusing on recently developed new dashboards
- ABM related training activities were also discussed and a new version of the ABM User's Guide was distributed.











*Details under agenda point 18.9*

- Some of the ABM active users were granted with access to the software.
- New licences have been provided to the interested IMS/ ABM users.
- Additional two dashboards ('at sea encounters' and 'sudden change of heading' outside ports) were added to the tool.



**EMSA is planning to expand the tool in collaboration with MS, and consequently encourages IMS users to further elaborate potential new use cases or dashboards based on the combination of various data sources.**

| Functionality | Configuration of the ABM algorithms  | ABM related alerts   | Configuration of the ABM alerts distribution   |
|---------------|--|--|--|
| Interface     | <p><b>S2S</b> </p> <p><i>Separate APIs for NRT ABMs and H-ABMs</i></p> <p><b>SEG*</b></p> <p><i>* for the NRT ABMs. The H-ABM implementation in SEG is pending</i></p>  | <p><b>S2S</b> </p> <p><i>Separate APIs for NRT ABMs and H-ABMs</i></p> <p><b>SEG</b></p> <p><b>IMS Mobile App</b> for the NRT ABMs only.</p> <p><b>E-Mail</b> for the NRT ABMs only).</p>   | <p>EMSA Maritime Applications Portal (MAP) for the NRT ABMs only.</p>  |

|   | <u>Use case</u>  | <u>Comments</u>  | <u>Documentation</u>                                   |
|---|--|--|--|
| 1 | <b>Get the last 40 port calls for the vessel of interest (e.g. cargo ship)</b>   | Selection of a ship of interest  | HISTORICAL ABMS AND PORT OF CALLS DETECTION webservice |
| 2 | <b>Get the last two months port calls for the group of vessels of interest (e.g. recreational crafts arriving from 3rd countries)</b>              | Selection of a group of ships of interest  | HISTORICAL ABMS AND PORT OF CALLS DETECTION webservice |
| 3 | <b>Configure own ABM algorithm in an area of interest (e.g. to detect vessels drifting)</b>  | National interface may interface/connect and provide the configuration to the user in the national application | STAR ABM ICD   |
| 4 | <b>Get Near Real Time (NRT) ABM alerts generated for specific vessel behaviours</b>  | For the ABMs created by the user   | STAR ABM ICD   |
| 5 | <b>Get all Near Real Time (NRT) alerts for a given vessel.</b>   | For the ABMs created by the user   | STAR ABM ICD   |
| 6 | <b>Configure own Historical ABM - H-ABM - algorithm in an area of interest (e.g. to get the list of vessels drifting in the area in Jan 2018 )</b> | -  | HISTORICAL ABMS AND PORT OF CALLS DETECTION webservice |
| 7 | <b>Get the H-ABM alerts – all detected situations in the area of interest (e.g. the list of vessels drifting in the area in Jan 2018 )</b>         | For the ABMs created by the user   | HISTORICAL ABMS AND PORT OF CALLS DETECTION webservice |

- **Take note of the current ABM status**
- **Take note of the ABM WS8 date December 2022**
- **Analyse operational needs + communicate them to EMSA (ABM WS 8 or at the next UCM)**



**Volunteers are always needed**

Further validation of the new ABMs algorithms EMAT and the related implementations in the front and back-ends.



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