Sharing AIS data and linking information equals value for money

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During the last three years, GateHouse has been working with the development and installation of AIS software solutions around the world. GateHouse’s background when entering into this area of business was a comprehensive knowledge within communications in general and radio communications in particular. The AIS software development was initiated from scratch, i.e. it was a completely new development, and based on the best practices known from the IT and telecommunication world.

This approach has lead to a software structure which is firstly, all open, allowing third parties software to easily interface to the AIS SW modules, and secondly and maybe most importantly, the solution is service-oriented, meaning that different services are made available to the outside world. When data and applications are made available as services, the usability of systems increases dramatically and the effort required to interface and integrate decreases substantially.

This service oriented approach, in addition having a huge operational impact, as the integrated data is available to the operator when he needs it, allows the user to minimise unnecessary information. It makes it extremely easy to share AIS data and other data types such as radar tracks when applicable, and it allows for tracks to be enhanced with additional information obtained from other data sources with a minimum amount of effort, which again opens the door to a large number of new operational uses.

A few examples of the operational benefits are described in this article bearing in mind that all solutions are based on a few COTS and low cost software modules combined in different constellations.

What do you gain when sharing AIS and other tracking data?

• The physical area from where you can receive data increases without having the cost of an additional infrastructure to collect the data
• Ports and ship owners will be able to validate that vessels are arriving according to schedule, and more importantly if the vessels are delayed
• Authorities can establish a picture of the vessel traffic, the routes they are using, the density of the traffic and much more, and initiate preventive measures to increase safety
• Authorities, ports, and agencies in general can get warnings in case suspicious vessels are entering a particular zone or area.

Figure 1 shows an example of how much a simple exchange of data can increase the area of coverage, simply by sharing the AIS data (in this case the data is shared between 13 different countries).
Besides allowing ports to see if a vessel is delayed, this enhanced coverage also gives a unique picture of the vessel traffic in general. It is now possible via the internet, within a few minutes, to make an analysis determining e.g. the traffic density or to see vessel tracks for a particular area as shown in Figures 2 and 3.

For the harbour master, different areas of interest apply. The harbour master wants to optimise the use of the berth area and he wants to be absolutely sure to know when a vessel is entering or leaving his harbour.

The Estimated Time of Arrival (ETA) information is normally obtained from the ship agent. This information is either manually or automatically stored in the port management system. Normally, the port will know that a vessel is delayed if a ship does not arrive, or if the vessel contacts the port when it is within VHF coverage. In all cases it is too short a notice for the harbour master to optimise his port operation. Now, when the new port management system is simply integrated to the AIS system, the harbour master will get a warning if a particular vessel is delayed, and receive information about the new calculated ETA. This allows the harbour master to act in due time and inform the service providers at the port.

In addition, an automated invoicing facility makes it possible to send invoices for the Actual Time at Berth without operator involvement, which is also achieved integrating AIS into the other administrative Harbour IT.

What do you gain when linking information sources?

The operational advantages of AIS data and/or other tracks increase significantly when the area of coverage is large, but the amount of tracks (vessel and/or assets) which is presented to the
operators will of course increase as the area of coverage increases. Therefore, the ability to provide a relevant operational picture and assist the operator in retrieving important information is becoming more and more important.

Again, this task is much easier achieved in a service oriented software infrastructure, and AIS information is easily enhanced to include information from external information sources.

Some examples of what can be achieved when information is linked to vessel tracks include:

- AIS data can be compared on the fly with vessel databases (such as Lloyd’s register) and irregularities can be highlighted
- AIS data can be linked to hazmat information sources and vessel with e.g. dangerous cargo can be highlighted
- AIS data can be linked to pilot management tools and again operators will know if a pilot is requested, on board, or not
- The vessel’s previous destinations and violations can be linked on the fly to the vessel track and made available for the operator

This allows getting alerts and acting on theses alerts based on information, not only from AIS, but information linked together as soon as the vessel gets into coverage.

Figure 4 shows how online AIS data is automatically linked to a hazmat information source. The data for the hazmat database is simply integrated with the vessel track, by using the vessel identity to find the hazmat information and by using the GateHouse AIS Integration Module to show it together with the vessel track. The hazmat information is now to be considered as fully integrated and can be used to generate alerts and warnings or merely as additional information.

In other words, depending on the operator’s area of responsibilities, the AIS data is linked on the fly to the relevant information sources and automated alarms will be generated if an operator determined event occurs allowing for immediate action.

Advanced and easy-to-use filters are made available to operators, enabling them to easily achieve the operational picture required, and all detected or user-defined events are stored in a database and can be retrieved for later analysis and action. Such linked features and interest filtering prevent the unfortunate situation of information overload.

Abnormalities can be detected in numerous ways and for numerous types of events when integration between data sources is made easy and is obtained in real-time. This opens the way for new features not previously possible, and holds the potential to enhance border and port security to a new level.

ABOUT THE COMPANY

GateHouse is an independent Danish company founded in 1992, working with technical software and system integration for advanced communication systems. A range of unique products and services are offered horizontally into international niches.

To ensure a high quality and a continuous improvement in software development, GateHouse is working according to CMMI and is ISO 9001:2000 certified.

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The GateHouse AIS solutions are sensor (radar, AIS, transponder etc.) independent and as scalable as needed.

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