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The Suez Canal grounding – a data-driven analysis

This event was hosted by the London FOIL Marine SFT on 13 May 2021 and was led by **Andrew Yeoman,** founding CEO and **James Whitlam**, Data Strategist - Marine at **Concirrus**, a company which harnesses the power of big data and artificial intelligence (AI) to improve the loss ratio in marine insurance.

Andrew Yeoman

Living in an AI powered insurance market

It is impossible for any individual to process and understand the amount of data now available in the market. For example, Concirrus has on its platform around three trillion data points relating to the industry, going back some ten years. This will force the industry, including Lloyds to change. The pandemic has already led to change, marking 2020 as the year in which a line was drawn under practices in commercial insurance that had stretched back for centuries. Before then, the industry was powered by relationships and proximity but from now on, data and technology will be the driving forces (but still powering relationships). It remains a people-based industry but what will be driving the decisions will be data analysis.

Curated 'data and knowledge' will become the differentiators. Historically, different offices within a company and in different parts of

IN BRIEF

In this presentation, the speakers looked at how AI can now analyse huge amounts of data from multiple sources.

The grounding of the *Ever Given* in the Suez Canal was used as a case study on the application of this process to determine what probably happened.

the world might quote a different price for the same risk. Information about a series of claims for a certain type of vessel, in a given type of port could take a considerable time (even years or never) to get from the claims team to other interested departments within the insurer. In the scenario where a vessel began to behave as if it was a claim that had not yet happened, no one knew what to do with that information, i.e., to where within the insurance company it should be directed.

The availability of data means that companies must change the way they do business. It is no longer about one or two items of information that are known but everything that is known. It therefore involves *all* data (policy, claims, sensor, financial, weather and market).

The next level of investment required is not in record keeping but decision making (portfolio strategy; pricing and underwriting; reserving and capital; manual and automated; and tactical and strategic.

The information available is available to all stakeholders: actuaries and underwriters; brokers and agents; investigators and adjusters; asset owners and managers; and experts and non-experts.

The data comes from all perspectives: historical experience; real-time analysis; predictive analysis; insurer specific; and is market wide.

All of this data allows a much more informed decision to be made about the level of risk involved. That should, for example, lead to the different worldwide offices quoting the same premium for the same risk. It should also assist claims handlers to access details of how similar, previous claims settled, potentially speeding up the claims process, reducing the risk of litigation and reducing the cost of claims. There is in essence a new 'expert witness', in the form of data.

These technology innovations affect every insurer. There are three that are unavoidable and *will* happen.

First, massive IOT datasets are being created on the assets being insured. Buried in this data is the 'behaviour' of the risk. New data is constantly being offered to the market.

Secondly, AI is changing the way that risk is priced and analysed. The models created outperform the traditional methods for assessing the market. The technology itself is advancing at an astonishingly fast rate and increases the ability to unlock data.

Thirdly, digital transactions and distribution are driving fundamental changes in the way that insurers will operate. In the future risk will be assessed algorithmically and traded digitally.

Enterprise AI solutions will sit at the heart of Digital Insurance. They will affect every role. For insureds this will include client risk management services; and for brokers and the market, the automation of high volume and follow business. Most importantly, for underwriters, there will be pricing and actuarial data available; automated underwriting services; and accurate portfolio modelling to identify risk transfer needs in relation to reinsurance and claims. The key is that all of these players will be looking at the same data, permitting holistic decisions to be made.

The speaker provided examples of screens showing the automatic triaging and pricing of submissions. Technology can monitor email inboxes; analyse the source and content; feed the information into the system; and rate the risk. AI helps with risk scoring and expected loss and can provide high speed (and real time) information on a global basis. This can include the analysis of an insurer's likely exposure within a very short time after an event.

James Whitlam

Post-Event Diagnostic of the *MV Ever Given* Grounding (March 2021)

The speaker provided an overview of his company's Data Ecosystem, which is the core to its products and models. There are numerous sources for the data collected, including information about where vessels are (via a network of interlinked satellites); ownership information; the value of vessels; and global weather. This information is invaluable both in relation to risk and in investigating incidents. This in turn means that information about causation can be utilised to learn from events. Whilst the *Ever Given* grounding might not have been predictable, the event has now been fed into the database and may inform various types of decision in the future.

The *Ever Given* entered the Suez Canal at 07.13 LT and ran aground at 07.43. The vessel blocked the waterway. It was not re-floated until 29 March. On 1 April, the owner declared a general average; on 13 April the vessel was held under an Egyptian court order; and remains under detention.

Clients wanted to know how their businesses were likely to be affected, including (for reinsurers) the hull sum aggregations for vessels either diverting to use other routes, or waiting to use the canal. Data was available to estimate the hull aggregation in the area (260% of the seasonal average and involving $13.1b value in vessels, excluding cargo); that there were 100 containerships with 1.13m TEU capacity; and 45 crude tankers with 6.56m DWT (roughly 48m barrels of oil) capacity. Given concerns about instability in the region, there was also a more detailed analysis of the types of vessel in the Red Sea anchorage and the hull sum aggregations for each type.

Multiple hypotheses were advanced for the cause of the grounding, including vessel blackout (later discounted); wind conditions; and bank effect and vessel transit speed.

The bank effect occurs when a vessel transits close to a structure, including the bank of a river or canal. As the vessel moves forward, a suction force is created, between it and the bank, which can lead to the bow pushing away from the canal bank, pushing it off course, unless it is corrected. This is a well-known phenomenon but it may be affected by factors such as the proximity to the bank (the size of the gap); and vessel speed. The smaller the gap and the faster the vessel, the more likely the problem will occur.

The course of the vehicle was tracked by satellite and showed a deviation to the left, just before the grounding. This led to an analysis of the typical transit speeds of vessels using the canal, over the last 12 months. The speed limit for the canal is 8.6 knots (with the vast majority of, but not all, vessels at or below that): according to the data, the *Ever Given* was tracked at 13.7 knots.

The results of these investigations have been used for future considerations and behavioural modelling, which can be used to analyse risk and pricing. These take into account such factors as the number of canal transits; speed and deviation from the limits; deviation from the centre line and proximity to the banks; and weather conditions (some vessels elect to use the canal during higher wind conditions when others do not). In a closed loop scenario as this, well defined navigational behaviours can be assessed. The results could also be taken into account when considering how the vessel may be operated in other environments.

Concirrus also undertakes sanction screening, which provides reports on such matters as ship-to-ship transfers; ownership, management and flag-hopping; and abnormal navigation, all built around behavioural insights.

Q&A

The available data can be used for multiple purposes, so that, for example, transit and wind speeds can be modelled to look at various outcomes.

A delegate noted that when a large vessel is transiting a canal, there may well be some use of the engines to assist in correcting the course, which could result in a further increase in speed.

With historical data and an increasing volume of real-time data about cargo, it is now possible to say what loaded cargo was *probably* on board a vessel at the time of an incident (from patterns of trading). With the speed at which new data is being captured, it will soon become possible to say exactly what was on that vessel and what condition the goods were in.

It is likely that within a few years, it will be possible to identify, with greater precision than at present, goods that are dangerous. The miss-declaration of goods is difficult to overcome but whether goods have been coded correctly can be determined by comparing bills of lading with commodity codes. However, it will be possible to track those consistently responsible for miss-declaring goods. Trends are already being followed.

It is not likely in the foreseeable future that this technology will see the human element on board become redundant, because of the risk of machinery failure. Increasingly, however, technology will provide the crew with support. It is more an issue of certainty, than economics.

Insurance law firms need to consider what information they can best gather and share as part of this process.