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Munich Re: How Data and AI Reduce Risk from Global Calamities

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Technology is at its most impactful when it is applied to addressing big problems. Perhaps there are no bigger problems than the occurrence of calamities, whether in the form of natural disasters, epidemics, or other catastrophic events. It is in response to seismic events, that fast actions can ameliorate acute conditions and mitigate potentially greater disaster. Such was the case in the wake of the recent super Hurricane Florence which had a massive regional impact when it struck the continental U.S. and devastated the Carolinas with severe flooding and widespread damage.

It was in the wake Hurricane Florence that Munich Reinsurance Company, commonly known as Munich Re, stepped into the aftermath to help devastated homeowners and business owners get back on their feet, as it has in response to past calamities. The reinsurance business may seem like a mystery to those not familiar with the role that reinsurance firms play. Munich Re was founded in 1880 and is headquartered in Munich, Germany. Warren Buffett was the single largest shareholder of Munich Re for many years, and remains a significant shareholder today. As one of the largest reinsurance firms in the world, Munich Re provides insurance products and services to insurance

companies to help mitigate the risk of high impact crises. These crises generate severe capital demands on insurers to cover payouts and property losses in a timely and responsive manner. By helping assure part of the risk, reinsurers like Munich Re can help primary insurers in times of crisis.

Munich Re Chief Data Officer Wolfgang Hauner expresses it aptly — “For the average person, you only value insurance when you have a loss”. And, it is in the event of the biggest of losses where Munich Re rises to the occasion. It is then that technology and data innovation come to the forefront. Munich Re has been hard at work developing and enhancing its data engineering and data analytics capabilities in anticipation of calamitous events. These efforts have included the application of image classification algorithms which rely on Artificial Intelligence (AI) to assess the severity of damage, produce immediate and automated damage estimates, and accelerate badly needed damage payouts. Munich Re employs remote sensing devices to capture high resolution images of property damage that are fed into an AI engine which is supported by advanced Machine Learning algorithms. Munich Re is then able to help customers through calamities with a rapid response to damage assessment that transforms

what had been a 100% manual process into an automated process that reduces costs, increases productivity and efficiency, and results in enhanced customer satisfaction and loyalty.

It should not come as a surprise that Munich Re has embarked on initiatives such as image classification using AI. Munich Re CDO Hauner describes the journey that Munich Re has undertaken to leverage data and analytics to enable business innovation. He describes this journey as an evolutionary process that has been formally underway for several years now. In 2015, Munich Re launched an Advanced Analytics team to create a central hub of data and analytics skills and capabilities. In early 2016, a Chief Data Officer function was established under the leadership of Hauner. Today, the CDO office has primary responsibility for three principal activities:

- 1. Data Engineering**, including management of the data lake, data governance, and ownership for the global data and analytics platform
- 2. Analytics**, which is primarily focused on the development of sophisticated analytics, many of which are employed for one-time use, while others lead to analytical software products
- 3. Artificial Intelligence**, which is where leading edge technologies are

applied to problems of unstructured data such as image classification and text analytics.

Hauner describes a fourth area which is being developed to focus on Analytics Operations, which will be the process by which models are maintained through their life cycle. The role and responsibility of Analytics Operations will be to run and maintain these models in a highly operational fashion based out of Munich.

Being a global business, Munich Re recognizes the necessity of decentralization. To avoid business bottlenecks, Munich Re is undertaking efforts to provide greater regional proximity to its clients. As an example, Munich Re is engaging in parallel recruiting efforts for data science and analytics talent in regional markets, recognizing that it is easier to compete and hire scarce analytic talent on a decentralized basis, rather than hire many people within a single market.

Reinsurance is a complex and highly impactful business. Hauner describes the characteristics of Munich Re clients, and levels of servicing that are required to meet their needs. High-value, high-frequency customers benefit from Munich Re's AI image classification

initiative because the need is great, the timeframe is immediate, and the magnitude is widespread. The result is that the recovery process for property owners shrinks from months to days. Munich Re also seeks to bring these same high-end AI capabilities to enable smaller insurers to realize the same positive customer impact without having to fund and develop these sophisticated data and AI technology capabilities on their own. Munich Re provides this functionality to insurers in a services model. Lastly, Munich Re supports low-value, high-frequency initiatives such as identifying and compensating customers for flight delays, through the detection of weather patterns that correlate to the risk and probability of flight delay. An example is the flight delay insurance developed by Munich Re and offered by a client of Munich Re in China, which is helping to insure almost 50 million air travels — out of around 500 million air travels annually in China at an average premium of 20 Yuan (less than \$3) per policy. As climate change accelerates, AI predictability of weather patterns and their risk impact will become increasingly critical.

Munich Re is proceeding on its data and innovation journey, but recognizes

that further progress is required. As Hauner notes, “We are so far perhaps 40% of the way there.” To manage the data lake, Munich Re has created a data ecosystem supported by software tools such as those provided by Alation. The Alation tools enable Munich Re to navigate their data lake so that analysts and data scientists can work collaboratively with their data. The tools provide a central place to search for and access data. Hauner observes, “This helps us break down organizational silos. We are able to think differently. Data sources provide value across the organization. We are able to understand who is using data, in addition to our own units.”

Thinking differently! Indeed, it is not hard to appreciate how Munich Re is relying on data and AI to meet the needs of a changing world while also assuming the risks. Hauner sums up, “Catastrophic events tend to be cyclical. We and our customers are encountering more frequent and evolving risks. These risks require great solutions. We look to leverage great technologies, while we focus on what we do best — the management of risk taking and providing policy solutions.”