



RiskNET Summit 2019

Predicting risks more effectively with machine learning and analytics

“Trump is getting nervous: China adopting a dangerous course in its nuclear policy”, “Illegal weapons test: North Korea fires rocket towards Japan”, “Turkish/Kurdish conflict: On the brink of exploding?”, “Conflicts in Hong Kong and Kashmir: The new Asian disorder?” Four headlines from 2019 with a common message: For many editors, geopolitics and geo-economics are among the most important current issues. A look at the global risk map certainly backs this up – with geopolitical distortions and the many unresolved financial

market issues in Europe and across the world. In these unsettled times, there’s only one thing we know for sure: Uncertainty is the new certainty!

“With all these uncertainties, our picture of the future is getting increasingly blurred”, said Frank Romeike, organiser of the RiskNET Summit 2019, in his introductory talk. The words “uncertain” and

“uncertainty” appeared around 90 times in the OECD’s latest economic report. Meanwhile, the expert advisory board’s annual report mentioned the terms 47 times. And the “Economic Policy Uncertainty Index” is at 350 points, the highest figure the academics at Stanford University, the University of Chicago and Northwestern University have ever measured.



RiskNET Summit 2019 at Schloss Hohenkammer. A place full of history. According to legend, in the 8th Century there was a grand stone house at this site on the River Glonn – it was known as chamara. The name was derived from the Latin camera, meaning a room or chamber, which was translated as kamer in Middle-High German. The house was considered “noble” or “high”, resulting in its modern name, meaning “high chamber”.

But the main result of increasing uncertainty is that our picture of the future is increasingly blurred. Uncertainty unsettles people. It gets into their heads and prevents them making decisions. And uncertainty promotes more uncertainty. Romeike said: “Crisis is a productive condition. You just have to get rid of the taste of disaster.” Doing this means that companies need an unbiased view ahead. Even more importantly, top managers have to be able to make the right decisions in a “world of disorder”. They are well advised to implement effective and forward-looking risk management. Frank Romeike referred to the ancient traveller Odysseus: “Risk management has to be put into practice on a day-to-day basis, and Odysseus’s adventures present us with a great example of managing opportunity and risk.”

More than 100 delegates at this year’s RiskNET Summit – a two-day event with the theme “Excellence in Risk Management & Compliance” – were able to find out for themselves what this could look like in reality. So first let’s open up the big risk map for geopolitics and the financial market.

Erosion of the liberal post-war order

Günther Schmid, Emeritus Professor of Geopolitics, former advisor to the Chancellor’s office and an expert in international security policy, began the event by addressing geopolitical and geo-economic risks in a disordered world. Schmid said: “Geopolitics and geo-economics are the key elements in the major powers’ strategies.” He cited a number of examples, including the USA under Donald Trump. According to Schmid, Trump is pursuing a policy of protectionism, rejection of multilateral relationships and the dismantling of America’s hegemonic role. This is referred to as “Leading from behind”. At the same time, the USA is waging an economic war on Europe and China.

Talking of China, they are also prepared to enforce their geopolitical power militarily, in the South China Sea for example. But also geo-economically, as the Chinese Silk Road project illustrates. China is pursuing an aggressive economic policy, aiming to achieve global technological leadership in ten key areas. The basis is a powerful state – externally and internally. The latter aspect is based around monitoring of society, with facial recognition, cameras and a social scoring system.

Schmid went on to explain how international politics is moving into a new era. This is highlighted by an erosion of the stable rules-based liberal post-war order. Schmid called it a “shifting of the axes” with “geopolitical complexity”. He added: “We are experiencing a battle between China and the USA for geo-strategic, technological and political domination in the 21st Century.”

He explained: “This is only the most obvious manifestation of a new bipolar age.” Schmid recently talked about this in an exclusive interview with the RiskNET risk management portal: “The power conflict between the USA, China and Russia will be played out in the form of geopolitical conflicts over influence and control in strategically important areas, such as the South China Sea, Central Asia, the Near and Middle East, the Persian Gulf and the Arctic.” The expert in international security policy underlined and extended these arguments at the RiskNET Summit: “There is a global battle between



More than 100 delegates at the RiskNET Summit 2019 in Schloss Hohenkammer.



Em. Prof. Dr. Günther Schmid: Sees the geopolitical world in a state of disorder.



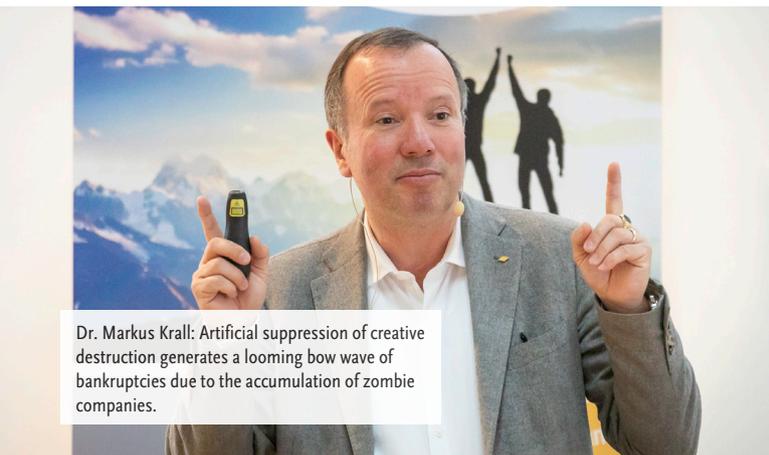
Prof. Jürgen Döllner from the Hasso-Plattner Institute spoke about the dream team of big data, machine learning and analytics.



Dr. Jochen Felsenheimer from XAIA painted a pessimistic picture of systemic risks



Dr. Gerhard Schmid: Data analytics and AI open up new opportunities for managing risks.



Dr. Markus Krall: Artificial suppression of creative destruction generates a looming bow wave of bankruptcies due to the accumulation of zombie companies.



Video production for RiskNET media library.

systems, between freedom and authoritarian systems.” Essentially, Schmid is describing a scenario where countries cooperate closely with partners in certain fields, while simultaneously delineating themselves from them in others. One particularly telling example is the authoritarian state of China and its successful economic policy. Global politics is in a phase of fundamental transition. But where is it all heading? Schmid can see several scenarios, including a bipolar world, “Asianisation” of the world and an increase in regional hegemonomies, such as Brazil or Iran. He concluded with his geopolitical outlook: “It’s an open race.”

Effects, zombie banks and financial crisis

Dr. Jochen Felsenheimer, Chief Executive and Portfolio Manager at XAIA Investment, shifted the focus to “Macro-economic risks”. His introductory question was: What has been the result of the low interest policy of the last ten years? “There have been a few effects”, Felsenheimer explained. He believes that the low interest environment is not really a reason for celebration. According to Felsenheimer, the effects run from excessive risk taking – investors being forced to invest in more risky assets to make a return – to zombie banks. He also cited skewed distribution of wealth and income and a concentration of risk on ETFs. Although ETFs concentrate risks they enjoy huge dominance in the capital market. And, what is more: “ETFs have very systemic movements that can intensify price shifts in the market”, said Felsenheimer.

In Felsenheimer’s opinion, the most fatal effect can be seen in debt. The low interest phase has systematically led to higher absolute debt levels in all sectors of the macro economy. One example is excessive corporate debt. Felsenheimer said: “Many companies have been living beyond their means for years because they knew financing was secure.” But this increases the risk of business failures. He also believes that many companies have an unattractive business model. But Felsenheimer is more worried about zombie banks, as they have a system relevance. “Many of these banks are being kept alive solely by subsidies from the ECB, when they really should be resolved.” According to Felsenheimer, this is extremely inefficient from an economic perspective.

Felsenheimer went on to look more closely at the distribution of wealth he mentioned earlier. This distribution of wealth is skewed and he believes that is not good for an economy. This is particularly because of the kind of radical trends that are widespread here in Germany. This brings a risk of further destabilisation of democratic and macro-social processes. Felsenheimer addressed the possible introduction of a wealth tax, which is currently being widely discussed. He thinks introducing such a tax would be a “smart idea”. On the other hand, an inheritance tax could also be a possible method and a good approach to consider. Whichever options are ultimately taken, new methods are needed to achieve a better distribution of wealth in Germany. Felsenheimer said: “These are the kind of issues we need to address.”

Another is systemic risk. Here, Felsenheimer paints a rather pessimistic picture. In an interview with the RiskNET editorial team, he is sceptical on the question of how systemic risks in the global financial system can be restrained. “I don’t think there is any chance

of this being achieved through long-term risk mitigation alone". His summary is that there is likely to be a financial crisis in the foreseeable future, which will result in natural risk reduction.

Emerging risks: Better risk navigation through early risk identification

What direction is mobility developing in? What cyber risks are lying in wait for companies? Are radical trends contributing to increasing division in society? What risks are caused by increasing protectionism and in respect of the banking and debt crisis? These are just a selection of issues on the risk map and the resulting questions that companies have to deal with these days.

As a result, early identification and management of risks is a major challenge, particularly for companies in the insurance sector. Ultimately, their business is to take a forward-looking view of possible risk events – correct insurance requires precise forecasts and planning. This is definitely the case at Munich RE, the world's largest reinsurer. How Munich Re looks at risks, what systems the companies uses and where new risks can occur (emerging risks) was illustrated by Dr. Gerhard Schmid. One thing is clear. Early identification of potential risks with high potential for uncertainty and taking appropriate action are essential for success.

Systematic risk identification

There is a good reason why Munich Re focuses its analyses on systematic and early identification of emerging risks. Gerhard Schmid defines emerging risks as new or changing risks with high potential for uncertainty in terms of their probability of occurrence and extent of loss. Schmid said: "Emerging risks can have significant impacts on insurance methods and capital investments." In addition, according to the Munich Re manager they are previously unknown or unidentified and affect a large number of people, objects or assets. However, the crux for Schmid is that conventional risk management techniques are difficult to apply to emerging risks. According to Schmid, five areas are responsible for the occurrence of these emerging risks, namely society and politics, the economic environment, the environment and technology.



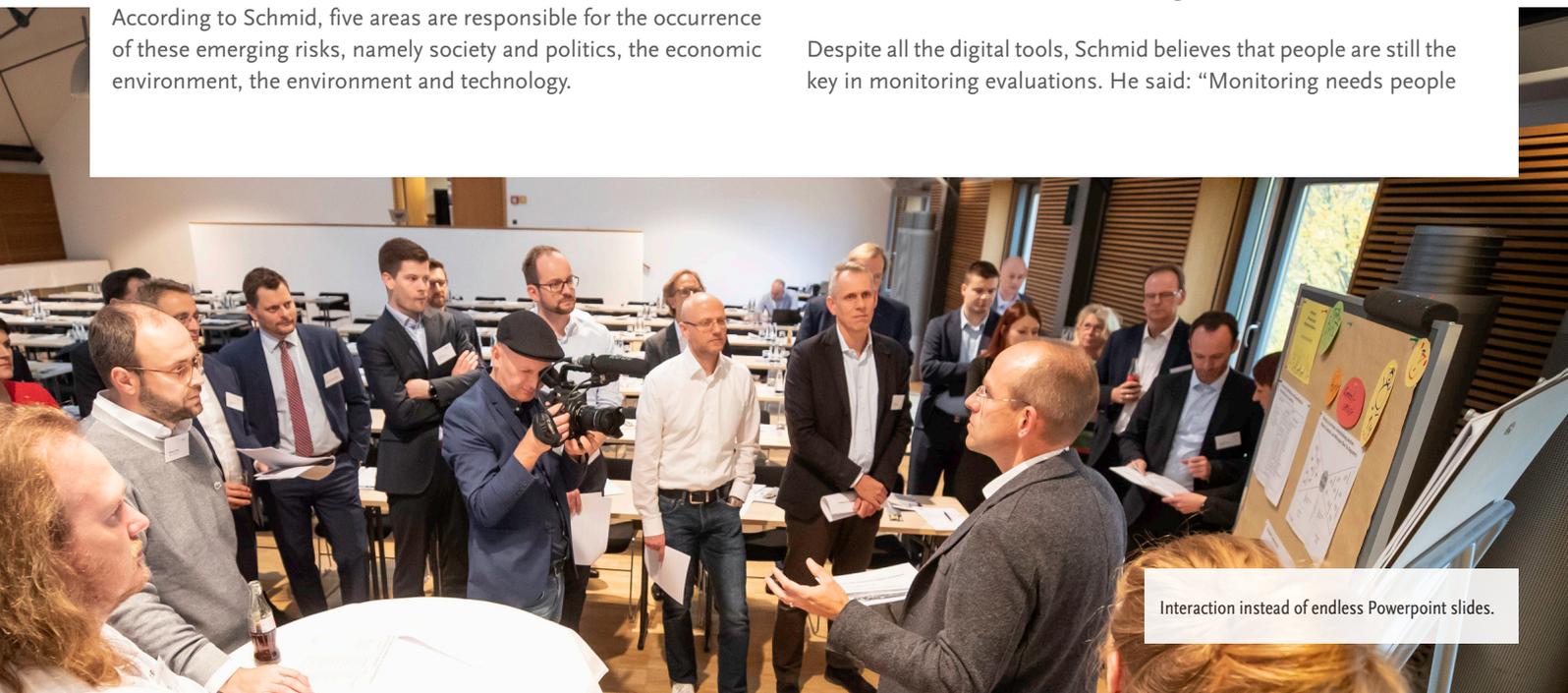
Extreme mountaineer Tamara Lunger performs a balancing act: Opportunity and risk on the world's highest mountains.

AI and data analytics provide new tools

To systematically identify emerging risks, Munich RE uses a mix of manual processes, for example analysis of specialist articles from newspapers and journals and involvement of insurance associations and other insurance-related organisations in the process. They also utilise the expertise of universities, research institutions and industry experts, as well as their own employees and the company network. At the same time, Munich Re takes advantage of sources such as big data, data mining and semantic web analysis. The reinsurer also uses artificial intelligence (AI) and data analytics. In the company's own words: "Data analytics and artificial intelligence open up new opportunities for managing and insuring risks. Data experts from Munich Re [...] also use external, publicly accessible data, for example information relating to geography, buildings, weather or socio-economic data."

Trend radar for better risk navigation

Despite all the digital tools, Schmid believes that people are still the key in monitoring evaluations. He said: "Monitoring needs people



Interaction instead of endless Powerpoint slides.



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with the requisite knowledge.” At Munich Re, the evaluated data is incorporated into an annual “Emerging Risks Trend Radar”. Schmid explains this trend radar using the example of the technology sector, where the fields of energy, transport, industry and IT are analysed. The risk assessment is carried out for three time periods – less than five years, five to ten years, and longer than ten years. Among the top risks for industry and in the IT sector in the next five years, the focus is on supply chain and also autonomous driving. With the trend radar, the reinsurer is deploying a tool that enables fundamentally better advance risk navigation.

Looking ahead at risk

When it comes to the future risk landscape, Munich RE is facing a large number of risks in the individual segments. In the field of technology, they include e-mobility, cyber risks due to digitalisation and autonomous weapons systems. In society, the key trends are the growing income gap and increasing division in society, while for the environment a loss of biodiversity and increased genetic engineering are central. Analysis also focuses on politics, for example geopolitical tension, terrorism and the decline of communities of states. According to Schmid, the same applies in the economic sphere, where new areas of risk could arise due to trade wars, banking and debt. Overall, there are many risks that have a direct or indirect dependency on one another. This is a crucial factor that does not exactly make it easier for risk managers to make predictions. Schmid said: “Global interdependencies, increasing complexity and rapid changes are having a massive impact on the risk landscape.”

Networking in particular – from globalisation of trade and the financial sector to changing communication technologies to increasing mobility of people – calls for a rethink and, above all, faster identification of potential risks. Unforeseen events are on the increase, in a geopolitical world with a rapidly changing risk landscape. And Munich RE is looking for the answers. This is no easy undertaking in a digital and closely networked world – where the emphasis everywhere is on getting faster, higher and further. Schmid sees this is a key challenge for risk management, especially in terms of new risks and possible responses to them.



Moritz Bachmann from Novartis International in conversation with Frank Romeike.



Dr. Holger Klier, Director of Enterprise Risk Management at the Magna Steyr Group, talks about “The Art of Managing Uncertainty”.



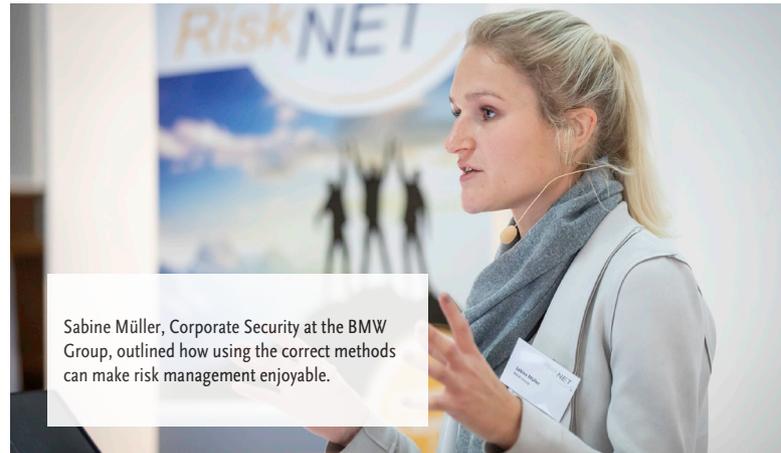
Prof. Michael Huth (University of Fulda) presents the results of the workshop on supply chain risk management.



Prof. Jürgen Döllner in our interview: “I see machine learning as the key as it can do more than people.”



Jochen Derrer, Head of Enterprise Risk Management at the adidas Group, highlights a method of effectively linking risk management to corporate strategy.



Sabine Müller, Corporate Security at the BMW Group, outlined how using the correct methods can make risk management enjoyable.

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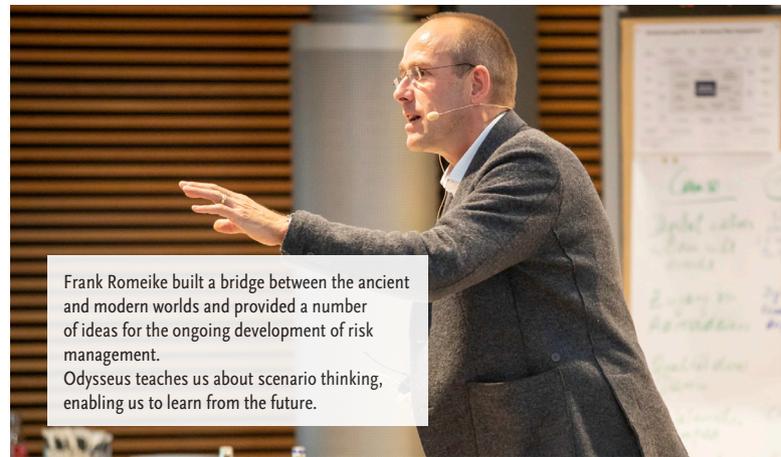
“Is artificial intelligence the biggest threat to humanity?” and “AI can write entire texts – and amazingly good ones at that”. Two reports in recent weeks that highlight the breadth of the discussion of artificial intelligence or AI. From threat scenarios to everyday benefits, facts are getting mixed up with half-truths, speculation and end-time forecasts. The truth is likely to lie somewhere in the middle. In other words, both horror stories and universal praise of AI are exaggerated views. It depends on exactly what is being discussed in the AI environment and what the actual objective of the relevant solution is.

Differences and training data

This is exactly the subject addressed by Jürgen Döllner, Professor at the Hasso-Plattner Institute (HPI) in the Digital Engineering faculty at the University of Potsdam, at the RiskNET Summit 2019. Döllner spoke about “Big data, machine learning and artificial intelligence: Reality, opportunities and misunderstandings”. His introduction was clear: “We are experiencing a paradigm shift.” He believes that this will involve artificial intelligence, AI, fundamentally changing the industry. He concludes: “In the coming years, everything will change.” By this he means the use of AI in business, but also in terms of research and social challenges.

But where are the differences in the field of AI? Döllner began by recalling the history of AI developments, a story that stretches right back to the 1950s. Machine learning was in use from the 1980s, and today we also have deep learning. These are three areas that Döllner believes need to be kept separate. Deep learning is a special form of machine learning. According to the academic, it can trace its origins back to image recognition.

Döllner is focused on the AI areas of machine learning and deep learning. This is linked to the central issue for AI research: How can we convert an input into an output in a way that is non-procedural (not by specifying instructions)? This is the main theme of machine learning and deep learning. Essentially it is about predicting the output without previously specifying the rules used to obtain it.



Frank Romeike built a bridge between the ancient and modern worlds and provided a number of ideas for the ongoing development of risk management. Odysseus teaches us about scenario thinking, enabling us to learn from the future.

Using the example of recognising a dog in a photo, he described how we get from initially classified training data to feature vectors. The final step is to evaluate these vectors to obtain a probability for the category of dog. Throughout the entire process it is crucial that the training data is right. Döllner describes this as the crux of machine learning and artificial intelligence. Döllner said: “It’s all about using the right training data.” It is also important to use the correct amount of training data. Otherwise, a system can actually be over-trained with data.

Big data, machine learning and analytics: The dream team

At the same time, large data volumes have distinct advantages. Without big data, machine learning would not be possible. Döllner said: “Data is the new oil. A resource that has to be processed.” He added: “Machine learning is the refinery.” In other words, data is first refined using machine learning.

Furthermore, these large data volumes are the basic prerequisite for analytics, such as prescriptive analytics and associated location intelligence. “With big data and analytics, we can reorganise many of our business processes”, Döllner said. He is talking here about the dream team of big data, machine learning and analytics. For him, this means for example, predicting risks



Dr. Sebastian Rick, FIRM member, explains the compliance index model, a method of measuring the impact of compliance measures.



Sebastian Koch from EON on the topic: "Measuring – Weighing – Counting" in the compliance environment.

more effectively or predicting scarcity and expectations as early as possible.

At the same time, proposed actions can be generated and patterns identified. These huge data volumes combined with analysis methods need a corresponding amount of computing capacity, i.e. hardware, to obtain valid data and thus meaningful conclusions. The expert believes that specialist hardware working quickly and in parallel is vital for handling the large data volumes. In this context, Döllner also touched on the energy consumption of large server farms. And in other areas too, as Döllner emphasised by discussing the consumption associated with every single Google search.

Software engineering and the key to success

Döllner views the field of "software engineering" as a major success factor. "Software is the key to success", he explains. He believes that every sector is dependent on software in one way or another. One of the risks associated with this is that of software defects. Döllner warns: "Software defects could bring down entire companies." He cites the example of a mobile phone provider. "If a mobile phone provider is unable to start up its servers for just one day, it will suffer huge damage to its reputation." That is to say nothing of the pure financial losses involved. Despite the key function of software, engineering is still a type of craftsmanship. Software is a classic example of working in silos in an organisation. There are a large number of pots of data. And AI can provide valuable services at this interface. AI can be used to bring together the data from the different pots", concludes Döllner.

The key is to model human activities in software engineering and to answer the central questions of: "Who does what? and: How many people are working on a project in a particular period of time? This involves looking at the central element, namely recognising patterns. Döllner thinks that machine learning can make monitoring easier

and faster here. Furthermore, it can help organisations to make more effective use of development resources and to put together optimum teams. Ultimately, Döllner says this will lead to errors being identified earlier and to processes being improved. In this context, Döllner summarises: "I see machine learning as the key as it can do more than people."

Image sources: Stefan Heigl and Frank Romeike / RiskNET GmbH