Enterprise Risk

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The official magazine of the Institute of Risk Management

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The power of simplicity: Dr Sarah Gordon of the IRM's Innovation SIG on keeping it simple

Enterprise Risk

Spring 2018

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IRM is the leading professional body for enterprise risk management. We are an independent, not-for-profit organisation that champions excellence in managing risk to improve organisational performance.

We do this by providing internationally recognised qualifications and training, publishing research and guidance and setting professional standards across the world. Our members work in all industries, in all risk disciplines and across the public, private and not-for-profit sectors.

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Editorial

Defining innovation

One of the overriding themes to emerge out of the IRM's Risk Agenda 2025 research project was the ubiquity of innovation in the everyday life of the professional risk manager. This can be detected most clearly in anxieties about technologies. How will we cope with the gradual introduction of new programs containing artificial intelligence, for example? Or, will we be able to stay ahead of increasingly sophisticated hackers in the cyber war?

In this issue, Jo Powell tackles the important topic of what artificial intelligence is likely to mean for risk managers – and how they should start adopting it in their work (pages 16-19).

Dr Sarah Gordon, a long-standing member of the IRM's Innovation Special Interest Group, reminds us not to overlook other aspects of innovation that are going on alongside these technological developments. In my interview with her on pages 10-14, she explains how improvements to the very way risk managers approach their work are equally – if not more – important than the technical processes novel technologies provide.

> **Perhaps our fascination with novelties makes us believe that only they will be able to alter what is established**

Gordon warns against forcing risk jargon and methods on those people who are already using a different set of techniques to do the same job. They will only resist, and the result is likely to be confusion. Instead, she urges risk professionals to be flexible in the approaches they take to enterprise risk management in order to get the information on risk they need throughout the business. Risk managers should be saying, "tell us about your world and leave us to do the stitching together", she says.

That idea inspired me to look in the Oxford English Dictionary, which defines innovation in two ways: "the introduction of novelties; the alteration of what is established."

Perhaps our fascination with novelties makes us believe that only they will be able to alter what is established. But Gordon seems to be saying that while those devices play a role, breaking a long-standing approach to risk management needn't involve technology at all. It can entail thinking differently about what we already do. Technology may play either no role, or a large role, depending on the circumstances.

If that sounds like your thing, why not visit the IRM website and join the group?

Arthur Piper
Editor

CDS

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Will your next move put your company at risk?

LexisNexis® Due-Diligence Solutions enhance your ability to:

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Global futures

While recent political events suggest barriers to global co-operation, long-term trends, supercharged by technology, suggest otherwise, says Carolyn Williams

In the developed economies many large organisations have now achieved a relatively mature state of risk management. This has brought significant benefits for organisations, individuals and the economy in general – for example, in the UK there has been an 85 per cent reduction in the number of fatal injuries to employees since 1974, according to government statistics. Risk reduction measures in the health and safety field plus more strategic changes in the nature of work mean that thousands of deaths have been avoided.

Moving beyond risks to life and limb, risk management also offers the opportunity to address other key risk areas, protecting assets of all types, improving organisational performance and achievement of objectives and supporting innovation and growth.

As developing economies around the world build businesses and invest in social provisions like hospitals, universities and transport systems, there is a growing interest in protecting these assets by adopting modern risk management techniques. There is also often a strong cultural commitment to education and personal development. IRM has attracted individual students and members from outside the UK almost since its inception, due to the fact that study is by distance learning and exams can be taken almost anywhere in the world. The growth of the internet, and the widespread adoption of English as the business language, has accelerated this process, and we have grown organically to the position where we now have students or members in over 100 countries around the world, but perhaps only one or two in many of these.

Stronger communities

Our strategy is now to consolidate this position by growing strong member and student communities in the most receptive areas. Where we do not yet have enough members to form a regional group large enough to get noticed, we are experimenting with the appointment of senior local IRM members as regional ambassadors to act as a local point of contact. We were delighted recently to announce our first ambassadors for India and for Vietnam, Cambodia and Laos.

We have also experienced a growing number of approaches to IRM by organisations from areas where we have not previously had much contact. These are corporate or organisational approaches motivated by a desire to build healthy risk cultures by raising the general capability of an organisation to manage its risks. Recently we have responded to requests for advice and co-working from sources as diverse as the energy sector in Russia, the banking sector in Nigeria and the nuclear industry in the UK.

> **Risk reduction measures in the health and safety field plus more strategic changes in the nature of work mean that thousands of deaths have been avoided**

Involvement

One of IRM's strengths is its pairing of practitioner involvement with sound academic foundations. We have responded to interest in educational partnerships from universities worldwide, including East Africa, Belgium, Portugal and China. We hope that these relationships will grow to match the strong foundation of multi-faceted partnerships that we already have with a number of UK universities.

Looking to the future, we intend to remain the dynamic centre of the global risk management community. We will build upon the foundations laid over the past few years and continue to help individuals and organisations around the world build their risk management capability.

Carolyn Williams is IRM's director of corporate relations.

Trending

DATA

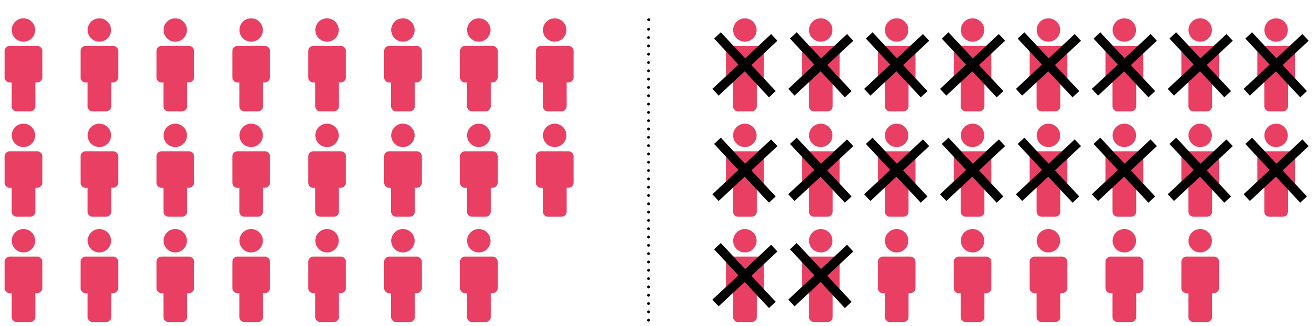
The latest stories and news affecting the wider business environment as interpreted by our infographics team

UK's top three risks

	2017		2018
Cyber incidents	48%	↑	60%
Changes in legislation and regulation	23%	↑	38%
Business interruption	30%	↑	35%

Source: Allianz Risk Barometer 2018, Allianz Global Corporate and Speciality

Artificial Intelligence to be net creator of jobs by 2020



2.3 million

Jobs created by artificial intelligence

1.8 million

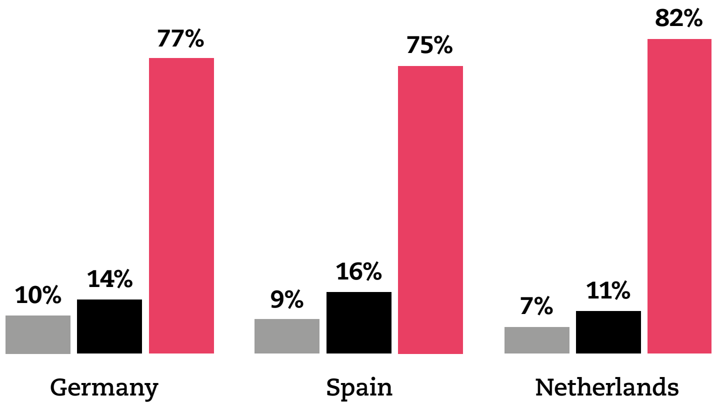
Jobs destroyed by artificial intelligence

Source: Gartner

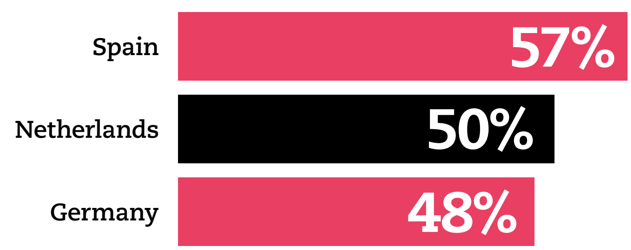
Cyber criminals target poorly defended businesses[1]…

Europe's companies least prepared for cyber attack

Cyber experts
Cyber intermediates
Cyber novices



Europe's companies suffering the most attacks



…and cyber maturity levels are low through lack of training[2]…

51%

of enterprises report low maturity of security training

62%

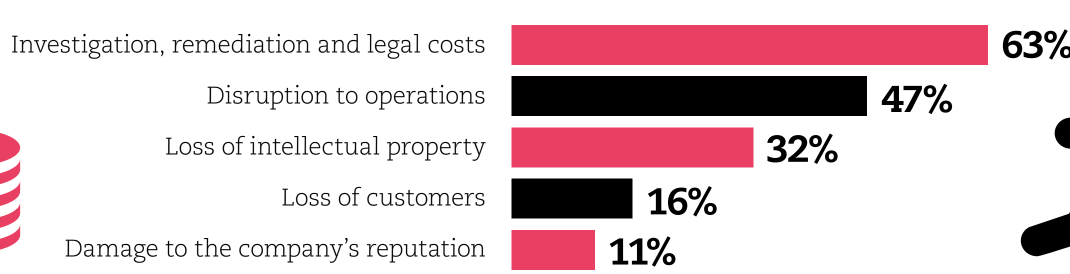
of enterprises without IT GRC solutions report low security readiness, as opposed to only

25%

of those with IT GRC solutions

…while executives put cost over loss of customers[3]

Most important consequences of a breach



Sources: [1] *Hiscox Cyber Readiness Report 2018*
[2] *Moving up the IT risk management maturity curve, MetricStream survey 2018*
[3] *CEO Disconnect is Weakening Cybersecurity 2018, Dow Jones Customer Intelligence/Centrify*

The power of simplicity

If risk managers want to stay relevant in a complex world, they need to learn how to work and communicate effectively with others by keeping it simple, says Dr Sarah Gordon of the IRM's Innovation SIG

BY ARTHUR PIPER

It is perhaps unsurprising that Sarah Gordon, a long-standing member of the IRM's Innovation Special Interest Group (SIG), is advocating for risk managers at all stages of their careers to get interested in innovation. And to do so, not just because the world is changing rapidly, not only because it could be seen as a defensive ploy to stay relevant – but because she believes it opens up a whole world of opportunity for people to progress as individuals and to push professional boundaries.

"If you're not innovative as a business and as a risk manager, you are going to be surprised on a regular basis as the world won't wait for you," Gordon says. "If you are not innovative in the way you manage risk, those people who focus only on risk analysis are going to be out of a job because there is a high chance that aspects of their day-to-day work will be replaced by a computer."

While acknowledging that it is a threat to those who are comfortable in their current roles, she sees it as a massive opportunity to get rid of the "boring bits" of the job and get a machine to perform those tasks. "I really hope in the future that our lives will not revolve around Excel spreadsheets," she adds, laughing.

Supported by machines, she argues, risk managers

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> **The true value of risk management is where you bring together all the different facets of a business across the organisation to enable people at all levels to make decisions**

will have an opportunity to move up the value chain – to manage risk rather than crunch the numbers. Humans will be needed, but not in the same capacity as today.

"You will need humans to deal with the uncertainty around risk because your answer is never going to be 100 per cent right," Gordon says. She adds that it is also difficult to model the full context of an increasingly complex business environment accurately – pointing by analogy to attempts at accurate weather forecasting.

Changing models

But innovation is not just being forced onto risk departments by better, smarter software; it is also coming through developments in the risk management model itself.

"Risk teams and departments in the future will shrink – and they should do," she says. As organisations approach what she calls the "optimised risk management space", their processes and risk culture will be so mature that risk management becomes the natural way of doing things. For small organisations, or less regulated sectors, that means risk just becomes part of the culture of the enterprise – a trend she hopes will spread. This evolution will take time. That is because, at present, in heavily regulated businesses such as banks, there are lots of risk managers to deal with the compliance burden. But, she suggests, this model could begin to melt away as risk appetite statements and other innovations enable the leadership to set the direction on risk in a clearer and less burdensome way.

That, in turn, has implications on the way the profession understands enterprise risk management (ERM). Instead of making it an expensive bolt-on, risk professionals will be better positioned to exploit the way that people are already managing risk across the organisation and stitch that knowledge together, she says.

"The true value of risk management is where you bring together all the different facets of a business across the organisation to enable people at all levels to make decisions," she concludes.

Rocks to risks

Gordon, the co-founder of the Satarla risk management, training and research consultancy, is certainly a glass-half-full person. But I begin to sense as we talk at the IRM's headquarters in London that her optimism comes from an almost systematic search for simplicity in a world of uncertainties – an attempt, perhaps, to geologise risk management, applying her background from a PhD in "rocks" from Imperial College London to the discipline.

"It took me a long time to realise that geologists are risk managers," Gordon explains when I ask how a geologist from the South African mining giant Anglo American ended up working as a risk management consultant. "Geology is all about uncertainty," she says. "Geologists try to understand a four-dimensional puzzle where most of the bits are missing."

By analogy, risk managers are involved in a similar enterprise. Gordon was working at Anglo American in Brazil in 2010 divesting two large operations when for her the parallels between the disciplines hit home. She was the technical and sustainable development co-ordinator, acting as the link between the bankers and lawyers in London, and the site owners in Brazil. The two groups had a conflicting understanding of the aims of the operations and had different ways of looking at information – which led to miscommunication and sometimes puzzlement over requests for data. The London-based group wanted to get the best value for money; the Brazilians wanted to keep the operation going, and emotions were running high because they did not want to be sold.

"We used risk management to bridge the communications gap that had grown between them and diffuse the growing emotional tension," she explains. Using a common risk language, the two groups began to communicate better and, crucially, the London-based team developed much clearer insight into the assets they were trying to sell. The success of this project led to her moving into risk management within Anglo American, eventually becoming head of assurance in Africa for the company's safety and sustainability programme.

Simplicity

Gordon left Anglo American in the summer of 2014 to set up Satarla with two other risk managers from the company – engineer-turned-risk-manager Laura Mallabone and economist and professor of accounting Tankiso Moloi. The business gets its name from the first few letters of each of their first names. It has grown from the three founders to a global network of thirty-five associates in under four years. But why give up the safety of working at one of the mining sector's market leaders to launch a risky start-up?

"We believed we'd found a way of doing risk management that really works, but in 2014 the mining sector had gone into a slump," she explains. "We decided to set up the company to see if simple, accessible, practical risk management actually works."

> **It took me a long time to realise that geologists are risk managers**

There is a principle in science called Occam's razor that always looks for the simplest solution to every problem and seems to sit behind Gordon's approach. Applied to risk management, Gordon's key assumption is that people tend to be good risk managers in everyday life – in evidence, for example, when and how people cross a road. Fundamentally, tapping into this natural ability creates the glue that makes ERM feasible.

Gordon says that while the technical aspects of risk are still important and need to be carried out by a much smaller group of people, to get widespread acceptance throughout an organisation the basics have to be simple, even when dealing with other risk professionals.

"Given that there are generally other departments and professions dealing and talking about risk in every large organisation, why not latch onto what they are doing rather than imposing another model from the outside?" she asks. "ERM needs to utilise the risk management taking place in every single silo, and since there will always be a group of people who refuse to speak your language, just give in. Use their language – and get rid of the barriers to communication."

Gordon likens it to explaining the results of her PhD to non-geologists, or to what Silicon Valley entrepreneurs have schmaltzily called "the Mom Test". Can you explain expert-level ideas to non-experts? She sees this as an essential skill for risk managers to nurture, especially when communicating with the board,

who need to make big decisions without being drowned in data.

Horizon scanning

As well as being honorary visiting lecturer in Earth Sciences and Engineering at Imperial, lecturing in risk and sustainability management at Imperial and conducting industry research through Satarla while running the business, Gordon finds time for the IRM's Innovation SIG. The group does not just look at risk management tools and techniques for risk analysis; it also explores methods by which risk managers can better communicate their work, do better horizon scanning and ensure that action is actually taken on the ground.

Recent events have reflected this eclecticism. In 2017, the group held a symposium on reputation and has more recently explored current trends in horizon-scanning technologies and techniques – the work the group is doing on horizon scanning will be published as guidance by the IRM in the summer.

She sees a forward-looking, proactive approach to emerging risk as especially important today given the rapidly changing technological, social and political contexts. While one approach over Brexit, for example, could be to wait to see what happens because of the inherent uncertainties in the political process, Gordon does not believe this to be a feasible option for risk managers.

"It's our duty to model different scenarios," she says. That is partly because during times of rapid change, time horizons for managers and the board shorten. People are too busy dealing with today to worry about tomorrow. But she says that risk managers cannot afford to simply focus on the immediate issues their organisations face.

"We're not just here to look at what's in front of our noses, but to look at what is five, fifteen and fifty years into the future as well."

She says that the potential scale of human impact on the earth is a good example of how myopia can prevent companies from making the right decisions. "If we don't do something about the plastics we are putting into the oceans soon, that is going to create a massive problem in twenty or thirty years' time. It is a huge risk that we need to be dealing with now and, as risk managers, it is part of our role to be reminding people of these obligations rather than just talking about the short-term time horizons."

The group has also been working with colleagues in another IRM SIG – ERM in Banking and Financial Services – about what block chain means to sectors outside of finance. While media attention has tended to focus on cryptocurrencies, the technology that block chain is based on has much wider implications for the way businesses operate – from contracts to financial transactions across their supply chains. This initiative chimes well with Gordon's belief that risk managers can use the good work that has been done in one profession, company department or industry sector and seek to share that knowledge using practical, basic language across disciplinary boundaries.

The SIG does not have a set agenda. Gordon strongly supports efforts by Mark Turner, who heads the group, to get new voices involved in the SIG and urges members to get in touch via the IRM's website. "It doesn't matter what your background is; you can be a fantastic risk manager by bringing what you have to the table. That is why our SIG is open to absolutely anyone."

> **"We're not just here to look at what's in front of our noses, but to look at what is five, fifteen and fifty years into the future as well**

All together now

The IRM's key risk predictions for 2018 show how increasingly interconnected world events are becoming

A key theme in UK politics is one of shared risk and opportunity, with politicians across the spectrum using phrases such as "for the many not the few", "building a country that works for everyone" and "we're all in this together".

According to several IRM experts, this may not be far wrong, with many of the risks identified for 2018 being shared by companies across the globe in terms of both nature and potential impact – including political risk, regulation and cybercrime.

Helen Hunter-Jones, head of group risk at Network Rail and an IRM director, says, "the interconnectivity of risks is more and more complex. We need to enhance our ability to understand the connections between risks in order to provide the right mitigations and be more resilient to business disruption".

> **We need to enhance our ability to understand the connections between risks**

Politics and regulation

According to Nicola Crawford CFIRM, IRM chair, 2018 is the year when political risk on a global scale will be one to watch: "The City of London and the wider stage are braced for a hard Brexit along with uncertainty and political unrest globally."

Crawford adds that data breaches and the way companies manage the incoming General Data Protection Regulation (GDPR) are among the top risks – an issue also highlighted by Alyson Pepperill, chair of the IRM Charities Special Interest Group.

"There will be continued scrutiny of the sector by regulators," says Pepperill. "The GDPR has been a key focus of many charities' efforts to be compliant ahead of the May deadline. This focus will continue up to and beyond the deadline for most."

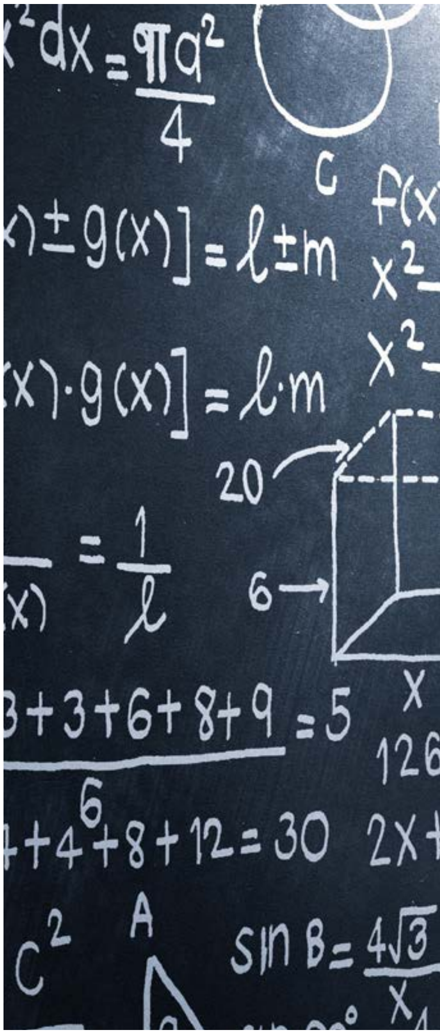
Regional issues with a big impact

Across the world, regional issues can take on global significance. For example, the uncertainty of political leadership in South Africa has come under scrutiny in recent years. According to Zanele Makhubo, director of enterprise risk management and business continuity in the public sector, and South Africa IRM regional group chair, the country saw serious threats in 2017 to the rule of law and governance structures being undermined, resulting in the status of the economy being downgraded by key rating agencies.

Sonjai Kumar, CMIRM, vice president (business risk) at Aviva India Life Insurance and IRM ambassador for India, says the country's key risk areas include the economic environment and the impact of the developed market: "To a certain extent, the performance of the stock market in India during 2018 may depend on foreign inflow of money. This depends on tightening US monetary policy that may hurt portfolio inflows into India."

Rahat Latif, head of enterprise risk management, Qatargas, and an IRM director, names geopolitics and oil and gas prices as key themes in the Middle East, with significant competitive threats including new suppliers emerging over the next decade. "Expect to see more legislation placed on critical industries in the future, and for them to have formal business continuity and ERM processes in place," says Latif.

For the full range of expert predictions, see the IRM website.



Programming for intelligence

IRM's latest research says artificial intelligence will be the next big thing. But what does it really mean for risk management?

BY JO POWELL

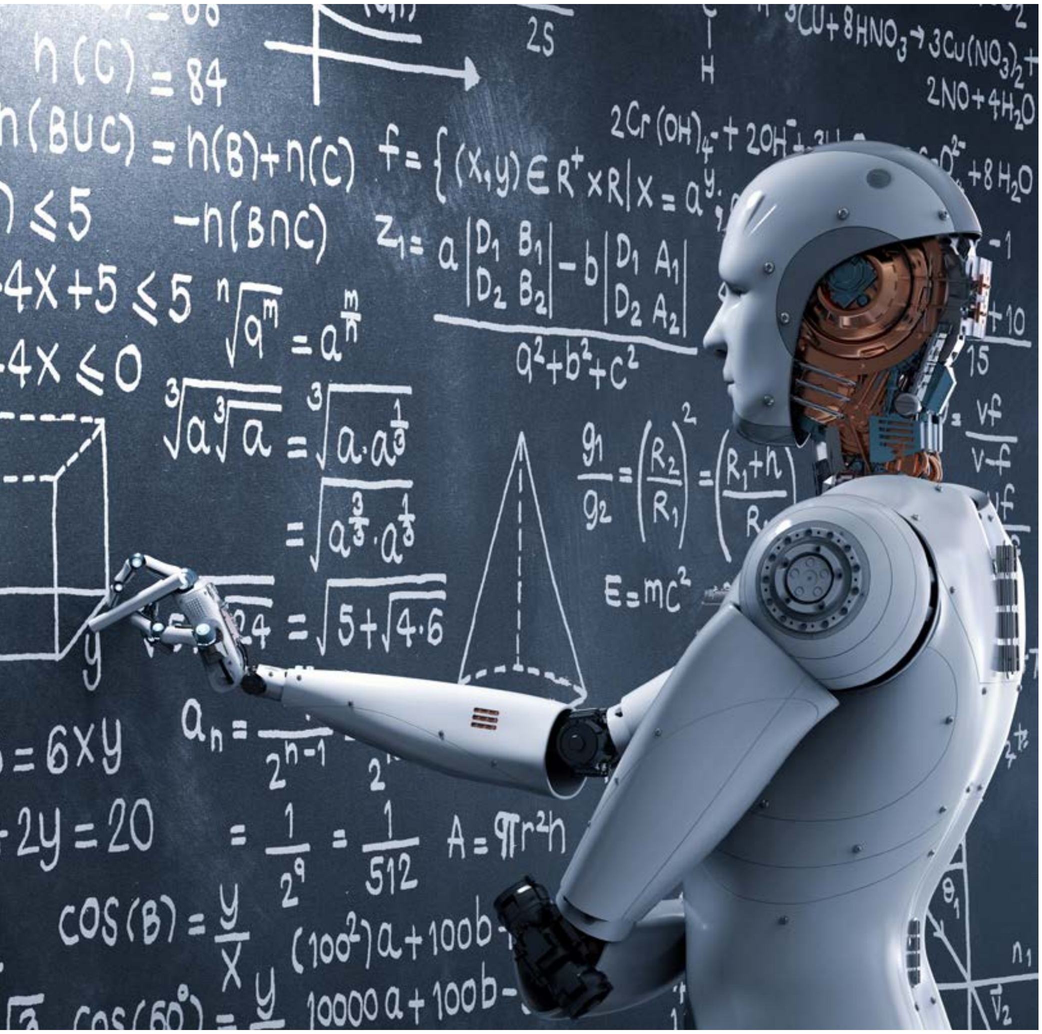
Artificial intelligence (AI) is fast moving up the agenda for risk managers according to the IRM *Risk agenda 2025* survey – rising from the fifth highest technological development having the greatest impact on an organisation today to top of those expected to have the greatest impact by 2025.

AI can be hard to define as it has so many applications – and many may be wary of it for that reason – but at a basic level for risk managers it could be considered as software that's capable of learning to interrogate data and find the risks and opportunities hidden within it.

> **AI will not replace humans; it's just about using it to enhance the work we do**

Karlene Agard, owner of risk and value management company ARAVUN and member of the *Risk agenda 2025* project team, explains that while there may be some lack of understanding around what AI is and its potential, the survey reflects an acceptance of its relevance to risk managers. "We are getting to the point where we recognise that computers are able to process data much more effectively than humans. AI is a tool, not something to be feared – it is something that we as professionals should embrace and seek to take advantage of in the future."

In the survey, respondents were asked about the main risk management techniques practitioners expect to be using in 2025. Scenario planning and social media monitoring were shown to be two of the top methods



Below: Karlene Agard

for managing risk, alongside horizon scanning and real-time risk management monitoring.

"AI will help us do these things so much more effectively in the future," says Agard, "but the human element will never go away; AI will not be able to replace humans entirely. People can't be modelled wholesale, and there is the emotional side of things which computers don't 100 per cent 'get'. It is just about working out how we can use AI to enhance the work we do."

Competitive advantage

The first job for risk managers is to look at how they can collaborate with AI and use it to supplement the work they are already doing, says Mark Turner, VP Risk Management, Airborne & Space Systems Division, Leonardo MW Ltd, and chair of the IRM's innovation special interest group.

"Risk managers should start to think about the questions they want AI to answer, and how the answers will add advantage to their organisation. In many respects the answers are already available; the problem is that risk managers are not currently asking the right questions," he says.

Through using pattern recognition, and accessing significantly interconnected data, it is possible to create algorithms which can detect the early indicators of risks which may not be noticeable to humans at that time. Through machine learning, it is possible to optimise the algorithms to improve their performance. Turner adds that, while it is unlikely an all-encompassing risk management algorithm will be developed in the very near future, commercial advantage can be gained from even small improvements in

> **AI is a tool, not something to be feared**

> AI will break a lot of confirmation bias in risk management, as we will be able to validate or invalidate some of our closely held assumpions

Image credit: sitthiphong / Shutterstock.com

Above: Netflix uses AI to suggest what movies you should watch

the ability to identify patterns within large volumes of connected data.

Advances in processing power, machine learning algorithms and interconnectivity of technology and data mean that the capability to utilise AI has advanced. While the technology of AI is considered by many to be science fiction, in reality it is already in daily use. For example, Amazon suggested buys and Netflix suggested movies are all being run by AI.

"AI has already demonstrated a capability to discover hidden details within large volumes of data in such areas as e-discovery in the legal arena," says Turner. "However, until proven otherwise, there will be a trust issue with management accepting the analysis of an AI, particularly if it contradicts the human intuition of a situation.

"The more that these tools become available to risk teams, the more that they should be using them to give insights into the data so that they can make their own interpretations. The real skill is taking information and being able to utilise it in order to exploit opportunities, avoid threats and convince others to achieve a commercial advantage. Just presenting data does not achieve this."

Accessibility is key

In January 2018, Ventiv Technology staked a claim as the first provider in its sector of the risk technology market to integrate AI in the form of IBM Watson Analytics as its advanced analytics and smart data-discovery solution. While this particular development is an Insurtech software solution – developed specifically for the insurance industry – its very introduction into the commercial market demonstrates the advances that are making AI accessible to businesses of all types and sizes.

Angus Rhodes, global product manager at Ventiv Tech, says: "What we're doing is bringing very technical data analytic knowledge embedded in IBM Watson Analytics and integrating it in a manner that people can just use. The trend is to lower the technical expertise needed to use such tools – making AI more accessible to risk managers."

Rhodes says the software helps in identifying trends and outliers, suggesting things and recommending potential questions to ask after analysing the data. It has a natural language interface. This means managers can ask, for example, "what are the trends for this particular risk?" and the program will provide a response. "In essence, it is automated predictive analytics," he adds.

"Areas where risk managers can really apply AI are in combining business data and external data to identify trends and emerging problems," says Rhodes. "Also,

Below: Angus Rhodes

when you start to monitor risk, generally you start to look at interacting with perhaps larger amounts of data, and I think that's where the tools can be applied."

Speaking about some of the barriers to utilising AI – for example the costs of employing both data scientists and the computer processing power needed, Rhodes explains that these can be overcome.

Big data and AI

Big data (the plethora of traditional and digital online data now available for interrogation) polled in the IRM risk agenda survey as the number two technological development risk that needs to be managed both now and in 2025. The world is swamped with data – Twitter, Facebook, YouTube, Instagram and all the other social media platforms can all prove useful sources, but buyer beware – even AI can be fooled by fake news or doctored data.

Understanding data and its limitations is key to the successful use of AI, says Éireann Leverett, cyber risk security expert and CEO of Concinnity Risks: "Having people in your team who can interact with AI and use it to answer complicated questions will be a powerful force for risk management."

He explains that the key will be having people who can look at a dataset and look at an AI working on the data in some sense and know what the limits are. For example, knowing that it will be very good for answering one type of question, but it will come up with a terrible answer for another kind of question.

AI also has a role to play in looking at received wisdom and letting people know if they have been led astray. "AI will break a lot of confirmation bias in risk management, as we will be able to validate or invalidate some of our closely held assumptions about what the greatest risks to our business are," says Leverett. "Sometimes we will find out that our risks live in a different corner of our portfolio than we expect and that's probably a good thing." Using AI to explore the data risk managers already have might be a useful thing to do – without necessarily seeking to decide on how to do the management of the risk, he adds.

Risks and opportunities

AI brings its own risks. And regulatory issues around storing a lot of data about people or places will bring with them a whole host of other potential liabilities that will also need to be risk managed. "If you're going to do AI you'd better do cyber risk too because you're going to inherit cyber risks just in the process of doing work with AI," he says. "A revolutionary shift in the work culture will probably produce revolutionary new problems for your business at the same time."

It is clear that AI brings with it opportunities for assessing risks and taking advantage of the opportunities offered to stay ahead of your competitors – and staying ahead of the game in AI is crucial to taking that commercial advantage. "People have a tendency to think mainly about how they would use AI, and not as much about how their competitors or even criminals might use AI, so a little bit of discussion around how others could use AI to ruin your business – just a short stress test – is a useful exercise for most people," says Leverett.

The biggest risk?

Risk managers can use AI to help their companies manage emerging risks and opportunities – and those not yet considering it should perhaps ponder on the risks of not adopting AI or falling behind their competitors in its use. The *Risk agenda 2025* focus group participants looked at ways in which risk managers can manage the expected transformation to the risk landscape, and their thoughts included both cultural change to support the use of technological advancements and investing in people as well as technology – because decisions are still made by people.

AI is unlikely to replace all risk management jobs – not quite yet, anyway. But inaction is not an option. Risk professionals need to understand AI and what it can bring to their organisations. Having a stronger AI algorithm than your competitors to gain a commercial advantage would be a bonus.

Jo Powell is assistant editor at Enterprise Risk.

Above: Éireann Leverett

A revolutionary shift in the work culture will probably produce revolutionary new problems for your business at the same time

Thrill-based risk management

Following a serious accident at a key attraction, Merlin Entertainments thoroughly overhauled its risk management processes across the business creating a positive legacy from the incident

BY OWEN YORATH, DOMINIC WIGLEY, JONATHAN ELLIS AND MARK BOULT

In the aftermath of the Alton Towers theme park accident on The Smiler roller coaster in 2015, Merlin Entertainments took a deep and careful look at how it managed ride safety risk. Consequently, it is now implementing more advanced risk approaches taking on board best-practice learning from other high-hazard industries. Changes are being embraced by its workforce, who are delivering change in ride designs and operations, and Merlin is taking a leading role to innovate and improve the overall management of ride safety risk throughout the theme park industry.

Merlin is a global experienced-based entertainments group that operates 14 theme parks, including LEGOLAND Resorts, SEA LIFE aquariums, Madame Tussauds, The London Dungeon and the London Eye and two Australian ski resorts. Many of the experiences provided are thrill based such as roller coasters, rapids rides and drop towers.

Roller coasters and amusement rides in general have evolved considerably since the first one in modern form opened in Paris in 1817. As typified by The Smiler ride, they are today complex machines operating multiple cars at speeds of up to 50mph. The cars themselves are unpowered and operate without brakes. The cars move solely under gravity, having been elevated to a height at the start of the ride. Separation between the cars is achieved by dividing the track into separate sections, the entry to each being controlled by a friction or magnetic

THE SMILER

The Smiler is a steel roller coaster which has been open since May 31, 2013. The ride has 14 inversions (loops) meaning that it holds the world record for the most inversions on a roller coaster. The ride was designed and manufactured by Gerstlauer Amusement Rides, which is an internationally renowned designer and manufacturer of premium roller coasters. The ride cost £18 million and is 1170 metres long. The ride is designed to operate with up to 5 cars at any one time, and each car can carry a total of 16 passengers.

Image credit: photocritical / Shutterstock.com

> Alton Towers had not experienced such an event in its previous 35-year history

brake installed on the track. A Programmable Logic Controller (PLC) computer system is used to monitor the cars and ensure that no two are in the same section of track.

Collision

On the June 2, 2015, two cars on The Smiler roller coaster collided resulting in severe injuries to some of those on the ride, including the loss of limbs for two of the passengers. Shortly before, a fault had occurred that was rectified by engineers. An empty car was then sent round the track as a check of restored operation but failed to clear the "Cobra Loop" (most likely due to strong headwinds slowing the unpowered car so that it could not complete the loop). It rolled back and settled in a valley element of the track. When a subsequent car with passengers was sent round the track, it was automatically stopped by the PLC at the entry of the section with the stationary car in it. But the block stop was overridden in the belief that it related to the earlier rectified fault. The passenger car proceeded and collided with the empty car.

Alton Towers had not experienced such an event in its previous 35-year history. Over this period, it has welcomed more than 85 million visitors, who have taken more than 1 billion rides.

Independent review

Separate to the accident investigation, Merlin's board commissioned an independent review from DNV GL of their ride safety risk management system and safety culture across their organisation globally. This considered the full life cycle of a ride from concept development to construction, operation and decommissioning.

The review entailed a series of analyses through the vertical structures of the organisation to understand how risk was managed at each level of the business from the board to front-line staff. The review assessed the ride risk management through interviews with a cross section of employees at a selection of attractions around the world, reviews of records and documentation, and a safety culture survey of staff at all sites visited.

In parallel, DNV GL undertook a series of analyses across the horizontal structures of the organisation and supply chain involved with the ride life cycle with visits to project offices, ride designers and manufacturers and ride inspection companies. This included observations of ride projects in progress, testing of new rides and Merlin's inspection and maintenance activities.

The review team reported back to Merlin's board making a number of recommendations to enhance the governance and management of risk. A primary finding was that the interface between the manufacturer and the operator needed strengthening. Manufacturers understood the design and construction and the technical and engineering risks involved while operators understood the operations and the operational risks involved. To strengthen the interface and provide an overall management of the risk – both design and construction, and operation – operational issues needed to be brought more proactively into the design process (see *Primary recommendations*).

Implementation

Merlin committed to implement all the recommendations. It recognised that this meant a changed way of working with even greater focus on managing ride safety risks in a connected and systematic manner. To successfully deliver the changes, it used a range of different tactics.

Merlin changed its approaches to risk assessment and assurance

PRIMARY RECOMMENDATIONS

1. **"Golden thread" of assessing and assuring risk (or anything that could pose a risk) throughout life cycle** – from the beginning of the life of a ride to the runs and through to the end of the process' life. This needed to go beyond considering equipment failures to considering operations and human factors. This has led to a holistic and proactive risk assessment of ride design and operations.

2. **Considering human factors from the outset.** This includes considering not only operators, inspection and maintenance personnel but also guest behaviour.

3. **Introducing "critical friend" safety risk experts** to advise and challenge the board regarding ride safety, as well as safety more broadly, as they oversee all operations in Merlin.

4. **Protecting and formalising "handover" from projects to operations** so that new rides are handed over formally to attraction personnel who can be trained in safe operations and working procedures. This builds their experience in running, inspecting and maintaining the rides before opening to guests.

5. **Harmonising standards.** Globally standards were found to vary between geographical jurisdictions with varying practices being applied. A common standard was to be applied across Merlin to deliver rides that meet international standards and best practice as well as meeting any specific standards for the jurisdiction in which the ride is located.

> A primary finding was that the interface between the manufacturer and the operator needed strengthening

by ensuring that harmonised standards were designed in collaboration and consultation with the people and organisations who would have to deliver them, and with the support of risk experts.

In addition, it clarified risk management for rides. To support people in understanding the new way of working, a simple diagram (process drawing) was developed and used to clearly explain the "golden thread" of risk assessment and risk assurance activities throughout a ride's life cycle. This successfully unlocked people's understanding of the new ways of working and the benefit they would bring. Additionally, it provided clarity on the roles and responsibilities of those involved.

To support the move to harmonised standards, a mapping document was produced that compared the technical and risk requirements across multiple jurisdictions to ensure that the changes that were made were clear. This reduced the barriers to the adoption of a new standard which manufacturers and inspection bodies were unfamiliar with by making the connections to standards that they were familiar with. They were then more engaged with the new process.

Merlin's risk management sought and won senior leader commitment for the changes with the chief executive by stating "this is what we will do". This commitment stemmed from an acknowledgement that the new approach would improve ride safety. Additionally, it was anticipated they would reduce cost as operational issues for new rides would be dealt with in design rather than through post-construction remedial work.

Where the ways of working were changed, they were informally piloted for existing rides with a selection of those who would apply them. Then they were formally piloted on a real project or ride, with modification and refinements being made based on learning and feedback, before being fully launched.

For new rides the new ways of working were built into the projects from the outset. For existing rides operating at attractions, the golden thread of risk was rolled out as a part of the attraction annual risk programme. This minimised disruption by incorporating the change into the normal cycle of risk management in the business. The whole programme was designed to allow time for individuals to experience the new way of working and take an ownership going forward as they realised the benefits.

Impacts and benefits

This approach of identifying risks early and working collaboratively to manage them proved effective in both the pilots and the implementation. By aligning the risk management process to how people worked allowed its ready adoption, and shortly benefits were being realised. These were expressed variously, from statements such as "we should do this for everything" to the fact that projects completed ahead of schedule with fewer issues in the handover to operations.

Risk is getting greater board time and greater weighting in business decisions. Not because there is a greater focus on risk management generally but rather that the benefits of improved risk management are being felt in terms of safety, cash flow and reputation. This has led to an approach that was designed for high-consequence thrill rides and large projects being widely applied across the business, from hotel management and catering to building large-scale LEGO models.

Because the concepts behind this are as well understood as the process, Merlin has been able to apply the new approach in a proportionate manner to these nominally lower-risk activities but still achieve the benefits. While the safety risk may be lower in these different projects and for these different assets, other risks are not, and the effective management and mitigation of these is understood to yield benefits.

Merlin Entertainments' future plans for the management and governance of risk are simple: to "embed – extend – expand". The new approach is embedded fully into the organisation's way of working; the Smiler accident now forms an important part of the company's corporate memory, and the new working methods are a means of learning from this. The new working methods are to be extended into new and existing rides, continuing to embed the golden thread of assessing risk throughout the ride life cycle. The new approach will be expanded to all areas of Merlin's business.

Dominic Wigley is group health, safety and security director at Merlin Entertainments. Mark Boult is a director at DNV GL. Owen Yorath is RTP & MMM health, safety and security director at Merlin Entertainments. Jonathan Ellis is principal consultant at DNV GL.

KEY LEARNING POINTS

For risk management:

Need to *engage early* in life cycle (of assets, products, services) and then continue the *"golden thread"* of risk assessment and assurance through the life of your asset/service.

Need to *educate suppliers and collaborators* in your risks as an operator and have them understand their role in reducing, eliminating or mitigating your risks through the design and approval process. This includes *human factor* based risks.

Need for a *formal and robust handover* from projects to operations including the *handover of operational risks and their mitigations*.

For implementing improved risk management:

Collaborate in designing, *piloting* and implementing changes/ improvements in risk management with those involved: employees, partners and your supply chain.

Have a simple means to *clearly communicate* the (enhanced) risk processes.

Top-level *commitment* and involvement.

Stage rollout in steps and from the start of projects and as part of natural business cycles.

Empower people to take ownership and extend the application of new improved risk management ways.

> "The Smiler accident now forms an important part of the company's corporate memory, and the new working methods are a means of learning from it

Above: Dominic Wigley "protecting the magic" in his role as group health, safety and security director at Merlin Entertainments.

Above: The Smiler was designed and manufactured by Gerstlauer Amusement Rides and opened in May 2013.

The lost art of experiential training

Experiential training could provide risk managers with deeper and more meaningful knowledge than more passive, traditional methods of learning

BY SIMONA FIONDA

Learning and skills acquisition is a continuous process, frequently achieved through personal experience and involvement. Children learn vital skills through play and interaction with the world that surrounds them. In education, such hands-on learning is widely accepted as a beneficial pedagogical method, yet the act of reflection and "doing upon reflection" remains undervalued by many training providers.

Research into education, development and learning has led to consensus among the academic community that the benefits of learning through experience outweigh those of more traditional instructor-centred methods. Even though in education the benefits of a learner-centred methodology are widely recognised, learning through experience remains much under-utilised in professional training, in particular in-house training.

> Managing risk adequately requires an appropriate level of situational awareness, experience, and rational and emotional capabilities

Experiential learning

Although learning through experience is an ancient concept and deeply rooted in all beings, it is a four-stage model proposed by American psychologist and educator David A. Kolb, in his 1984 book *Experiential*

learning: experience as the source of learning and development, that has become central to late-20th and 21st century educational theories. Kolb's model illustrates the essential steps involved in effective learning.

Such learning begins with doing a task, the experience of which forms the basis for observation and reflection as the learner considers what worked well and what did not. This is then followed by a consideration of what needs to be done to improve the next attempt at performing the activity (plan); finally, active experimentation (do) completes the cycle as it forms a new experience.

In the context of professional training, Kolb's model translates into a programme designed with experience and involvement in mind. Such training contrasts with a traditional transfer of skills or knowledge in which text-based materials impart information to the learner and knowledge is tested through some form of assessment, such as multiple-choice questionnaires. Such traditional methods fail to address learner diversity and frequently lead to poor results as the learner plays a passive role in the training context. Experiential training, on the other hand, makes the trainee an active participant in the learning process. However, such training requires both a cultural and organisational shift away from traditional modes of training – often based primarily on procedures and templates, and likely to result in employees solely seeking compliance with rules – to develop an environment in which trainees are encouraged to experiment and reflect on their experiences. In such experiential training programmes, trainees are more likely to achieve – with careful guidance – their full

> **Experiential training engages participants on a level that is deeper and more meaningful than would occur in traditional methods**

potential and meet the required programme learning outcomes.

Risk management is both a rational and instinctive process of identifying risks, assessing them (in terms of likelihood and impact) and deciding on a course of action (a response that is influenced by our perception of the risk and our tolerance for taking that risk). The skills for assessing and managing risks, in its simplest form, are inherent in all beings, as survival depends on the three stages identified above: identify, assess and respond. However, definite rules to apply at each stage are difficult to formulate. Managing risk adequately requires more than just knowledge and instinct; it requires an appropriate level of situational awareness, experience, and rational and emotional capabilities – attributes that can be nurtured through experiential training.

Drawing on Kolb's model, experiential training begins with an exercise or activity in which the trainee takes an active role. Such training environments provide trainees with practical hands-on experience. In particular, scenarios (ie situation-based training that encourages participants to interact and emotionally connect with a task) and gamification (ie the application of game design and principles to non-game contexts) have proven successful in creating immersive training environments. Such experiential training engages participants on a level that is deeper and more meaningful than would occur in traditional methods that focus solely on transfer of knowledge.

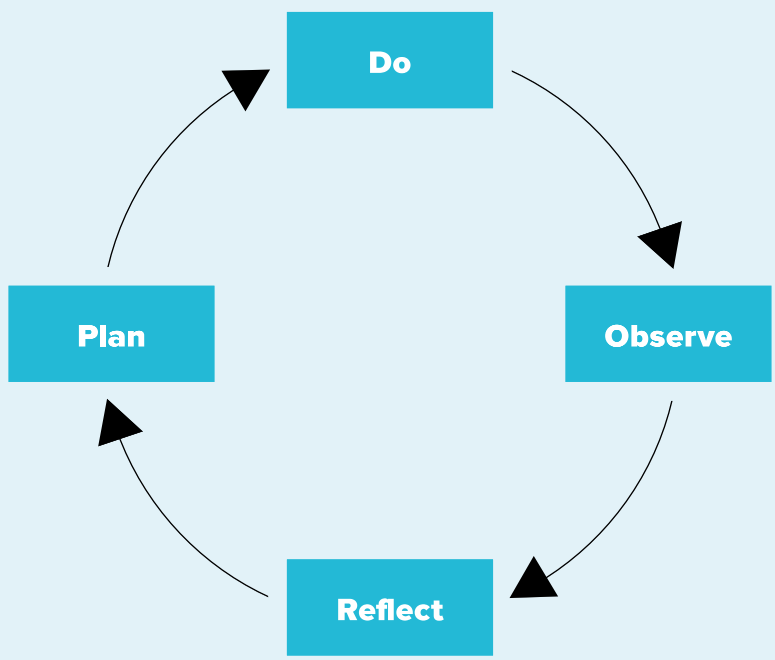
Practical application and challenges

Scenarios are frequently used in business continuity and crisis management training (or resilience, as it is now more commonly referred to). Such training might include simulated exercises involving the identification, evaluation and mitigation of risks, as well as incident response. It is also used to understand how people would respond to the unfolding scenarios presented to them, capturing both the rational and the emotional elements of responses. In order to activate the reflective element of the cycle, it is important to set time for a debrief if the scenario is run in a group setting. A group discussion to share personal reflections would enhance not only the individual but also the collective learning experiences. This has also proven an effective method of assessing the risk culture of an organisation.

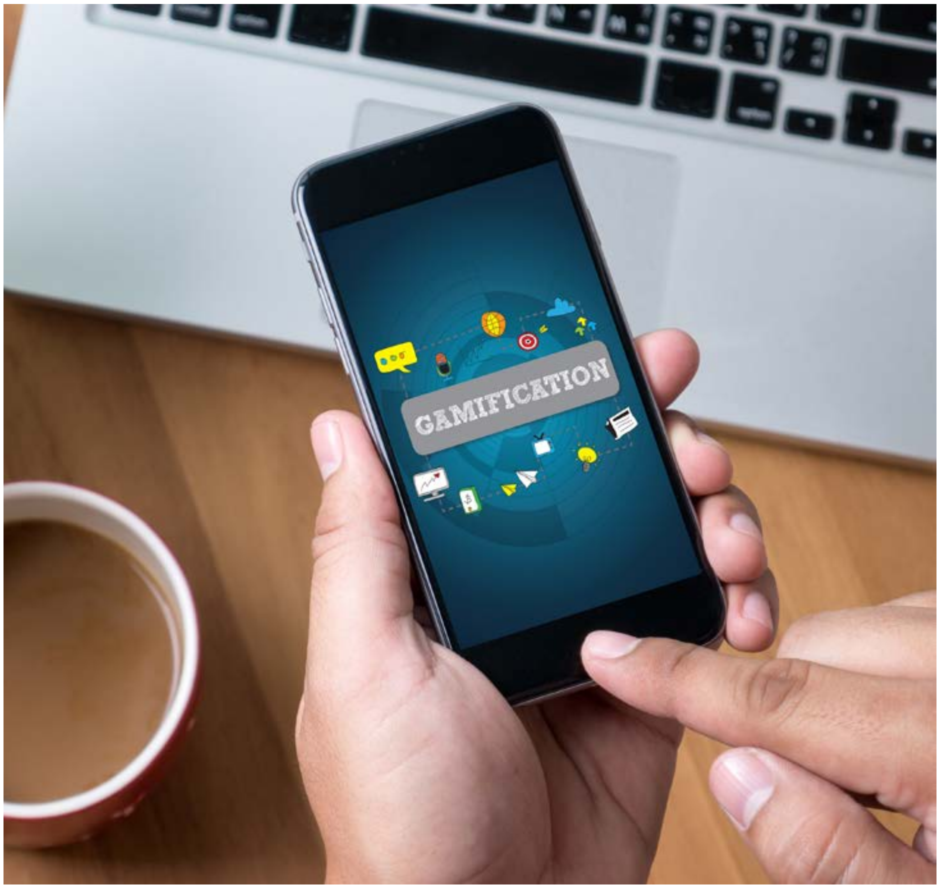
In the context of risk management, a scenario may be developed in which a trainee navigates a setting to complete a series of tasks which ask the participant to identify, assess and respond to perceived risks. Such scenarios, which should be realistic to the organisation the trainee works in, must be engaging, and this can be facilitated through the introduction of game-based elements, such as points and levels. In a game-based scenario, participants may – for example – be required to respond to a perceived risk at one level in order to progress to the next, in which the consequences of their proposed actions are revealed.

Although such training does not

KOLB'S MODEL



> **The aim of risk management training is to develop confidence in managing a wide range of risk scenarios**



> Experiential training is versatile and has the potential to address learner diversity

have to be computer based, current technologies afford implementation of a wider range of gaming solutions that allow sharing and collaboration. Furthermore, it can provide training environments with flexible access in terms of time and location, which is particularly suited to global organisations. If such scenarios are well conceived and structured, a trainee is encouraged to learn about concepts through practical application, observation, reflection and experimentation – in accordance with Kolb's four-stage model.

A recurring feature in gamification is the introduction of rewards; however, rewards can drive wrong behaviours as intrinsic motivation to learn is replaced by extrinsic stimuli driven by virtual incentives. When a trainee fails to recognise value in the reward, its intended stimulus can be negatively impacted and the learner may disengage. Recognition, on the other hand, has the potential to acknowledge and strengthen intrinsic motivation, and it can therefore be more effective in engaging the learner. There is also the possibility that gamification, when poorly applied, has unintended consequences, which may not have been apparent at the beginning of a training programme. Therefore, learner engagement must be closely monitored to ensure effectiveness of a game-based scenario so that it meets learning needs, in particular where group activities may result in weaker or more reserved participants being excluded from the learning experience.

Confidence

The aim of risk management training is to develop confidence in managing a wide range of risk scenarios. Such an outcome can be achieved by drawing on a pedagogical framework based on methods of learning instilled in trainees from an early age: learning through experience. Traditional training methods frequently fail to adequately engage learners; despite educational theory having recognised the positive impact of learning through experience, such methodology is only infrequently adopted in professional training. If, on the other hand, training is designed with reflection and experimentation in mind, in accordance with Kolb's four-stage model, trainees can be better engaged. Such training models have the potential to facilitate self-directed and instructor-modelled learning in face-to-face and online environments. Furthermore, game-based scenarios afford effective consolidation as a trainee progresses through levels, with each reinforcing prior learning. This could be further enhanced through the introduction of constructive peer competition, which provides opportunities for sharing experiences and collaborative reflection. Such training models are versatile and have the potential to address learner diversity, thus increasing the rate of success in meeting learning outcomes.

Simona Fionda IRMCert, is head of risk at the Financial Compensation Scheme and a member if the IRM's Education and Standards Committee

Creating an effective alliance

When London Waterloo station decided to boost peak-time capacity, five organisations had to learn how to work effectively together

BY MARYNA LOSIEVA

London Waterloo is currently Britain's busiest station and links the country's most used railways. The Wessex Capacity Programme (WCP) is aimed to deliver a 30% boost in peak-time capacity to and from Waterloo station. A number of works are being or have been carried out to achieve this, including rebuilding the former Waterloo International Terminal (WIT) and bringing Platforms 20-24 back into use with modern facilities, new track and signalling, and a layout that meets the needs of thousands of passengers. Platforms 1-4 were extended to allow longer carriage trains (10 carriages as opposed to 8) further increasing capacity. This had to be accommodated by works to Platforms 1-8 and associated track and signalling alterations. The intention behind creating two additional staircases (entrances to London Underground) on Platforms 1-4 is to relieve congestion on the platforms during peak times. Vauxhall Station will also be upgraded as part of the works.

This £602 million investment programme, involving 380 people daily and over 1000 people during peak construction, will be delivered by December 2018.

The Waterloo Capacity Alliance (WCA) is a body that was procured in January 2015 by the client, Network Rail. The Alliance is made up of the client, designer

> **Only a fully collaborative approach between the client organisation, designers and contractors would allow the project to be delivered successfully**

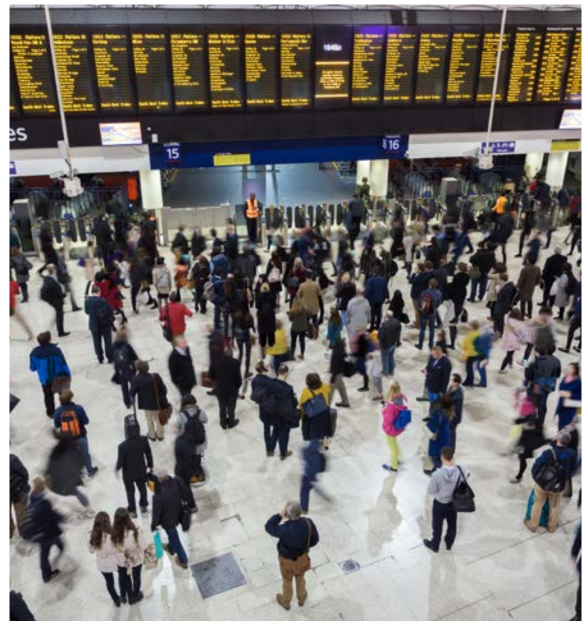


Image credit: Hatchapong Palurtchaivong / Shutterstock.com

consultants (Mott MacDonald and AECOM), building contractor (Skanska) and track and rail systems/ signalling contractor (Colas Rail).

Why deliver as an alliance?

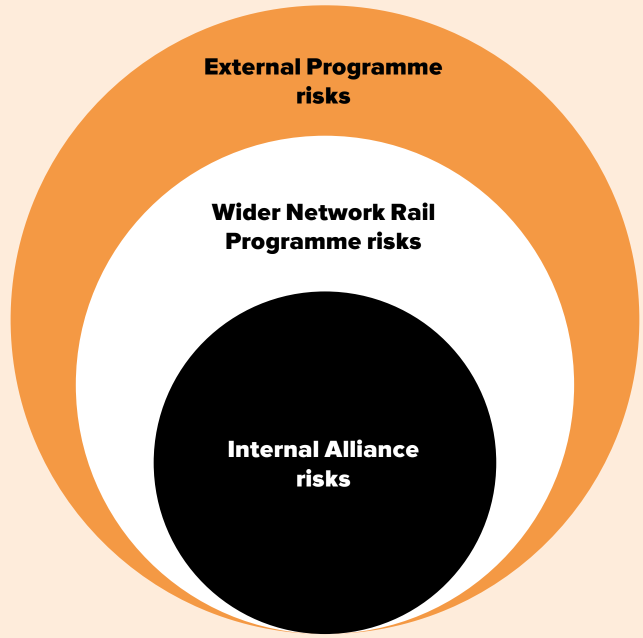
The works required to be undertaken were very technically challenging and complex on a fast-track schedule. The programme includes multiple interfaces for overlapping design and construction phases between numerous interlinked disciplines such as civils, railway track, Mechanical, Electrical and Public Health (MEP), railway systems and power upgrades. There are also many stakeholders involved, eg train operators, passengers and Network Rail maintenance teams, whose requirements need to be satisfied. There were two key stakeholder requirements to deliver the programme: keep the station operational and minimise disruption to services.

As the station could not be fully closed during construction, the only way to deliver the required works was by partial closures of the railway track, known as possessions. The most significant possession, estimated to be a 24-day long one (main possession), had to be booked 2 years in advance. This was a closure of Platforms 1-10 to enable Platforms 1-4 to be extended and modifications on Platforms 5-10. Major negotiations with the train company operators and other stakeholders were required and involved an extensive advertising campaign to make passengers aware of the disruption. Closing 10 out of the station's 19 platforms was not acceptable as it would cause more than half reduction to services, hence extra platforms had to be provided to maintain minimum station operational requirements. Consequently, the old WIT platforms were demolished and reconstructed (5 in total) to be operational before the start of the Platform 1-10 main possession. If WIT was not ready before the main possession, then it would have had to have been cancelled, which would have resulted in significant reputational impact on the client and Alliance participants and extended the programme by a full 12 months. In addition, smaller possessions were also required to carry out track renewals, civils enabling works and signalling upgrades.

To deliver the required work within two years (up to August 2017) was described by WCA Commercial lead Tim Ryall as being double that of a typical railway project over the same time frame. Therefore, to manage all

> Five different companies with possibly differing cultures and approaches to risk management do not participate collaboratively and transparently straight away even though it is a contractual requirement

HIGH-LEVEL REPRESENTATION OF RISKS



the above constraints and risks, only a fully collaborative approach between the client organisation, designers and contractors would allow the project to be delivered successfully.

Alliance way of working

All the Alliance partners signed a contract "Integrated Programme Alliance Agreement" (IPAA) which outlined key behaviours expected from each individual within the Alliance. It asserted that all participants win or all participants lose, based on achieved project outcomes. Risks and responsibilities are shared and managed collectively by the Alliance participants, rather than allocated to individual companies. A shared spirit of co-operation and openness is a must. Communication is to be open, transparent and honest to enable informed decision making. In addition, the agreement highlighted that the members are to act at all times in a manner that is consistent with a "Best for Project" approach.

However, you do not get five different companies with possibly differing cultures and approaches to risk management to participate collaboratively and transparently straight away even though it is a contractual requirement! To build a genuine alliance environment, an understanding of each of their risk cultures "by their natural standing in the construction industry" is vital. Traditionally contractors were perceived to be very clandestine, trying to transfer as many risks as possible to the client or be paid handsomely to take on the liability. In contrast, consultancies usually worked as part of the client team and aimed to minimise the client's expenditure as these were the services they had been employed for. Designers were deemed to be risk averse and to quite often design a very expensive but safe and proven solution. On the other hand, contractors were prone to taking a more cost-effective approach to delivering a project but without compromising safety. These attitudes have become outdated but are still prevalent within some organisations.

Working as an alliance means forgetting about your parent company attitude towards risk and to start acting as one entity with a "Best for Project" approach which ultimately, if followed, will bring the best reward for everyone. This is due to all identified risks being managed proactively and not assuming or relying on other parties to manage project risks which are outside of their contract (in normal contractual arrangements). The reality is that it does not matter how many risks you transfer to other parties; they are still project risks and, if we want the project to succeed, everyone needs to take responsibility for mitigating them.

Dedicated risk management team

To build a strong alliance takes a long time, continuous education and lots of effort by everyone in the team. Having a dedicated risk management team who will be working closely alongside the other project team members, firstly educating and then embedding alliance principles (all risks are shared), is crucial.

By adhering to Alliance risk values, the WCA risk team was able to identify and assess effectively not only the Alliance risks but also the client risks which could affect the programme of works. Consequently, the WCA risk team was given the responsibility of managing the client risks associated with the project as well. This gave the project team an effective way of escalating risks which are outside of their control but still needed to be managed. Regular risks reviews/workshops were held where the project team would highlight a risk which was outside of their control to deal with and discuss this with the client to find the best solution to mitigate the risk.

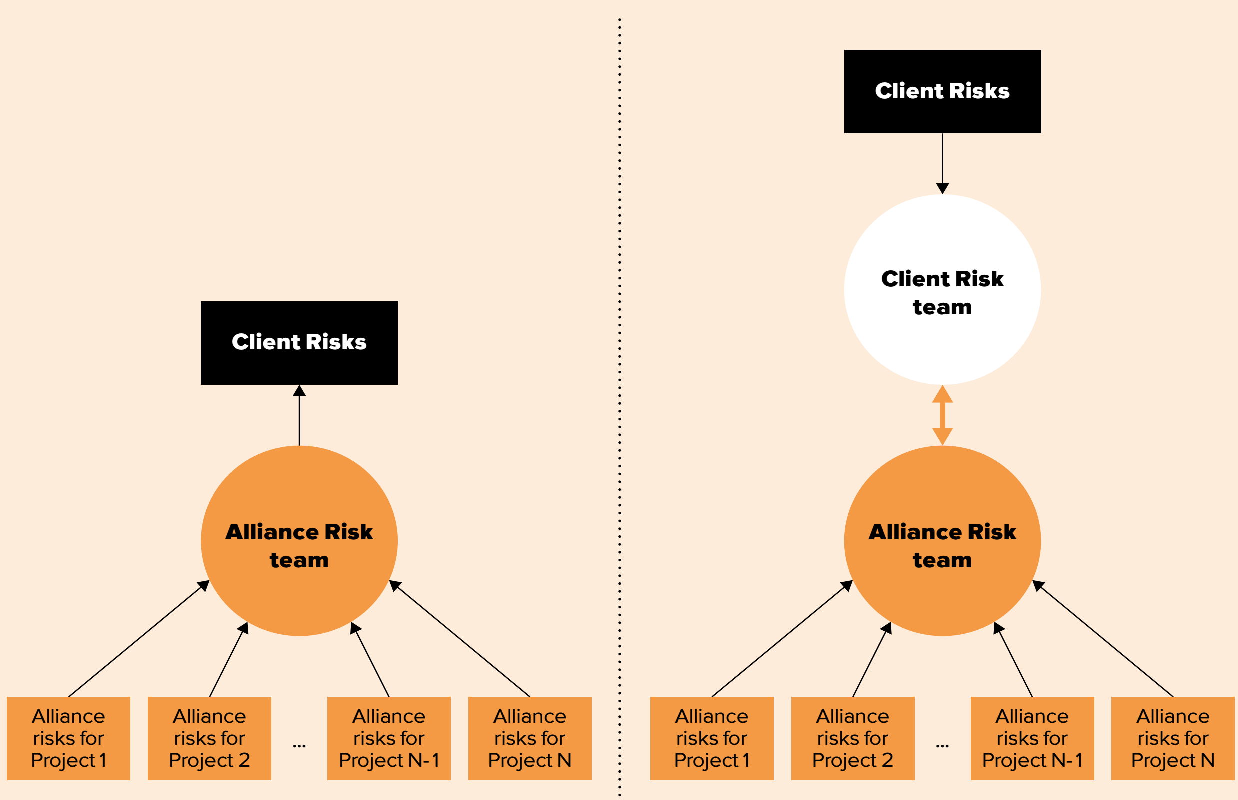
Key risks were managed collaboratively by the client and the Alliance members. Firstly, there were access-related risks (cancellation or not approving required access). The majority of rail-related jobs are dependent on the possibility of track line closures in order to deliver scheduled works. This is usually considered to be a key risk for rail projects. WCA had requested an extension of the 24-day main possession working area quite late due to results from the detailed design outcome. Late access requirement for Platform 10 was approved. Key members from throughout the rail industry (Network Rail, train operators, station management and others) came together to mitigate the risk of cancellation of the main possession.

There was also the risk or re-prioritisation for key plant, eg KIROW cranes and tampers. Nationally there is a limited number of certain plant's availability which is based on how critical the project is. The required plant was secured for all planned works.

Several other key risks were also faced. These included the risk of working with existing old infrastructure, which could introduce substantial additional scope. WCA work scope had interfaces with very old buffer stops (which potentially needed to be replaced), Victorian

> Interdisciplinary collaboration is essential to an effective alliance

CURRENT RISK MANAGEMENT SET-UP VERSUS TRADITIONAL RISK MANAGEMENT SET-UP



(Note: Highlights that the process is much leaner and reduces additional layers of communication) arches (which may not be able to take the weights of trains and a KIROW crane and could potentially require strengthening) and old bridges. There was also the interface risk with Network Rail maintenance during the whole project life cycle (eg design issues which could lead to additional cost and programme delays). Finally, there were risks related to external stakeholder interfaces and managing their requirements especially during the main possession (ie station operations, train operating companies, crowd management with London Underground, British Transport Police). These risks were all managed through collaboration.

Having one dedicated risk management team dealing with both the Alliance's and the client risks sitting outside the WCA remit ensures that all risks are managed appropriately by eliminating the threat that when transferring a risk it may not be mitigated by the receiving party.

Integrating risk management

Interdisciplinary collaboration is also essential to an effective alliance. Instilling alliance principles throughout the project team's disciplines (eg planning, cost control and change) ensures pro-active risk management. For example, better-quality and more realistic plans are provided through interrogation of the logic and suitability of the plans by the risk team, and quantitative schedule risk assessment (QSRA) is carried out earlier, not waiting until the plan is fully developed. Ensuring realistic and robust cost estimates, setting the right level of target price and having a deeper understanding of the cost position helps the team to decide whether to take on risk liabilities within the contract with "open eyes". Also, there is more effective change management as risk drawdown is managed proactively and monitored by risk managers. If it is not carried out in a timely manner, this may affect cost deliverability of the project as management may not be fully aware of potential cost pressures. Finally, contract reviews highlight inconsistencies which could lead to disputes if not addressed.

Risk management should not be a stand-alone discipline but interact and embed itself into the project team among the other functions and be actively involved with the decision-making process at all levels.

Risk dashboards and culture

Effective risk dashboards bring a lot of value to the project team and senior management and therefore breed an environment where the members of the alliance take ownership for the management of risks. Instead of only reporting on the top five risks, WCA risk dashboards present a full detailed picture to the project team about their project. They also report on current risk exposure versus target price risk exposure and previous period risk exposure. Cost deliverability is indicated by this metric. Cost risk uncertainty over time outlines when to expect risk uncertainty to reduce. They show categorisation of the risks by common causes, either by work breakdown structure or action owner. They also list the top five current four-week period risks and the top five schedule risks, and provide a summary of the changes during the four-week period and key information.

Elena Stebbings, the project manager of the works associated with the main possession, stated that risk dashboards have given her "a space to be heard" and the ability to "inject a sense of urgency" for both the senior management and the project team.

After successfully delivering the main possession, a detailed and comprehensive lessons-learnt exercise was undertaken (see *Top 5 lessons for a partner-based project*). This enabled all staff involved within the delivery of the main possession to reflect on the successes and potential improvements to be made and how alliancing behaviours helped to achieve the December 2017 milestone. This has identified the power of collaboration and everyone working for one aim.

Maryna Losieva, WCA risk lead. Senior risk manager at Mott MacDonald

TOP 5 LESSONS FOR A PARTNER-BASED PROJECT

1. Assess the risk cultures of each company before creating an alliance outlining potential difficulties which may slow down becoming an effective alliance
2. Co-location is a must. Moving everyone into one office (designers, construction managers, engineers, project controllers, etc.) made integration more efficient as staff are surrounded by other alliance members and therefore more willing to adopt alliance behaviours
3. Regular and effective communication is essential to make people feel as one team and behave as an alliance rather than an employee from one of the separate companies
4. One IT system is vital as this reduces the time spent developing good communication
5. Well-defined client and parent company governance processes which must be followed should be outlined in the contract before the alliance is put in place.

> Risk management should not be a stand-alone discipline but interact and embed itself into the project team among the other functions

Model industry

IRM's Internal Model Industry Forum (IMIF) is helping spread best practice throughout the insurance industry, says Phil Whittingham

Drives to improve risk management by insurers, alongside increased regulatory scrutiny, has driven significant human and technological investment in the development of internal risk models. Broadly speaking, the "internal model" refers to the processes, systems and calculations that together quantify and prioritise the risks that the insurance business faces. An insurer's internal risk model is at the heart of its risk and capital evaluation and will therefore be a key input to a wide range of business and strategic decisions. It is essential that this internal risk model is fully integrated into all parts of the business.

> **Models are an essential tool to help insurers manage uncertainty, but users need to be aware of whether they are appropriate for the decisions they are supporting**

Back in 2014, IRM established the IMIF to address the key challenges that insurers face with the use and validation of these internal risk models. The Forum aims to work in a collaborative way to develop good practice. This is not only to satisfy regulators but also to add value to organisations by improving their modelling and risk management capabilities. The Forum's mailing list now includes over 400 insurance risk practitioners, consultants, modelling specialists and actuaries, and it holds regular meetings to discuss hot topics.

In February 2018 the IMIF published the eighth in its series of guidance documents that cover the various challenges faced by firms. The journey from model validation to model risk management outlines a maturity progression from piecemeal validation to an integrated and risk-based approach which looks at all models used by the firm, not only those for regulatory purposes, and which is tailored specifically to the individual firm's risks and culture. This has the benefit of improving decision-making, allowing the most efficient allocation of resources and adding significant value. This project has been supported by a team from the advisory firm Risk Dynamics, part of McKinsey & Company.

The work of the IMIF continues with a new workstream looking at how the risk-mitigating effects of insurance purchase decisions can be recognised in internal models and hence capital assessments. This work is supported by Marsh, and it is expected that the group's report will be launched at the end of April.

As in many fields of risk management, models are an essential tool to help insurers manage uncertainty, but users need to be aware of whether they are appropriate for the decisions they are supporting. Our aim is to develop and share good practice to help practitioners, and the industry as a whole, build capability in this area. We're always pleased to hear from new people who want to get involved with or hear about the work of the IMIF and would also like to hear from those working in similar fields outside insurance where cross-over benefits of knowledge sharing might be valuable.

Phil Whittingham CFIRM, is chair of the IMIF and head of model validation at XL Catlin. All IMIF guidance and details of meetings can be found at www.theirm.org/imif

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Droning onwards and upwards

With autonomous vehicles becoming more commonplace, businesses will need to get up to scratch with new safety standards

In February this year, the British Standards Institution (BSI) announced it would be launching new quality and safety requirements this spring for the burgeoning market in drones. The initiative is timely. A couple of years ago, the investment house Goldman Sachs estimated the drone industry would be worth about $110 billion by 2020. Now those figures look like an underestimate.

That is not because the proliferation of autonomous insect-like airborne craft has suddenly exploded. It is because the definition of a drone has shifted to include a much wider range of autonomous vehicles.

"Such projections were based upon available data at that time, which predominantly focused on the air industry," Robert Garbett, chairman of the BSI Committee on Drone Standards, said at an event to announce the initiative at the House of Lords. "We define the entire drone industry as covering surface, underwater, air and space. If you look at the entire picture the figures are much larger and growing faster than anyone expected. If you then forecast the impact of integrating drone technologies across these environments, the figures will take on an ever more exciting dimension."

Shifting definitions

This change in definition is yet another example of how the fast-moving world of gadgets refuses easy categorisation. Only last year, ISACA's excellent paper *Rise of the drones: is your enterprise prepared?* looked like the definitive last word on this emerging subject. But it only dealt with flying drones.

> The risk assessment for the business is likely to be complex because the regulatory environment is moving slower than the technology is developing

Some of the issues for risk managers, though, are likely to be similar. Unlike autonomous cars or helicopters, drones are easy to set up and get running from a technological point of view. Anyone in any organisation can pop down to their local electronics store and buy a flying drone, then start using it for work-related tasks. But risk controls must be rigid because, if things go wrong, the consequences can be fatal in worst-case scenarios.

Most companies are used to having both feet firmly on the ground in the non-metaphorical sense. Airborne drones, on the other hand, require organisations to create their own internal aviation department from scratch with expertise within the risk function to match. Outside of a few sectors, this represents a radical change in both thinking and operating. Regulatory requirements for air, land and sea are likely to be radically different and, in some cases, complex. Amazon's planned drone-based customer delivery service has had to jump through multiple hoops with the UK's Civil Aviation Authority just to get to trial stage – see *Enterprise Risk*, Spring 2017.

Complexity

Not only that, but the risk assessment for the business is likely to be complex because the regulatory environment is moving slower than the technology is developing. That is not to mention privacy laws, and the interaction between the data drones can collect and Europe's General Data Protection Regulation, which comes into force in May.

But perhaps the biggest challenge will come from Garbett's use of the word "exciting" to describe these developments. Businesses are rightly enthusiastic about the potential for drones in their operations, and risk managers could have their work cut out in curbing that enthusiasm until the risk assessments have been properly done.