

Placard

THE DISCUSSION PAPER OF THE ASSOCIATION OF CONSULTING ACTUARIES LIMITED

JANUARY 2017 / ISSUE 35

Following on from the publication of the International Actuarial Association's recent report on the evolving nature and role of the global actuarial profession and our February 2016 edition of Placard, we consider two of the specific areas where actuaries are increasingly in demand.

ACTUARIES ABROAD – EXPLORING THE WIDER WORLDS OF BIG DATA AND RISK



By Tiziana Perrella,
Acting Editor

In November 2016, the International Actuarial Association (IAA) published its initial report on its State of the Profession Study, looking at trends and observations for the actuarial profession across the globe. Two key findings were that changes in the regulatory and economic environment were leading to an increased demand for actuarial skills and that the number of fully qualified actuaries worldwide had increased by about 30% over the past 5 years.

Whilst the core areas of actuarial employment remain in pensions, life assurance and general insurance, an increasing proportion of actuaries now work in other areas. The IAA survey also identified data analytics/business intelligence, enterprise risk management (ERM) and capital risk management as specific areas where actuaries or

actuarial skills were increasingly in demand. In this edition of Placard, we look at two of these areas in more detail. Chris Paterson and Jonathan Green (Senior Manager and Director; KMPG) talk about their work within a multidisciplinary team providing HR data analytics services to a range of clients. The second article by Neil Cantle (Principal; Milliman) considers how his actuarial and other business skills is valued in the world of ERM.

Why use a consulting actuary?

It is clear from these articles that the core actuarial skills of quantitative ability, attention to detail and problem solving (backed up by technical training in economics, finance, demographics and statistics) that have been acquired in traditional business areas are easily transferable to other fields and can create value for their employers and/or clients in

Continued over

ACTUARIES ABROAD – EXPLORING THE WIDER WORLDS OF BIG DATA AND RISK (CONTINUED)

these new environments. However, both articles also emphasise how it is the additional abilities of being able to work closely with other disciplines and to clearly communicate their models and the related results or conclusions to non-actuaries that really brings the consulting actuary to the fore in these wider fields.

The worldwide nature of the profession and the growing involvement of actuaries in non-traditional roles, in response to evolving business needs and complexity, is also leading to changes at a UK level through the professional training and qualifications offered by the Institute and Faculty of Actuaries. Only last month, the IFoA announced a joint

initiative with the Society of Actuaries in the United States to oversee, deliver and promote the Certified Actuarial Analyst as a global qualification. This is intended to provide a more generalist qualification that is based on the acquisition of relevant technical and analytical skills that can serve as the bedrock for those working alongside or in support of fully qualified actuaries (at Associate or Fellowship levels), both now and into the future.

Based on these developments, it seems clear that UK-qualified actuaries (and consulting actuaries in particular) will continue to be well equipped to explore and make the most of the opportunities that can be found in these wider areas ■

TEN IMPOSSIBLE THINGS TO DO EVERY WEEK



As a profession, actuaries have been analysing data and drawing conclusions, including using some relatively rich sources of data such as pension schemes and insurance books, for many years. However as data analytics has grown as a field in its own right, and (small) data has expanded into Big Data, very few actuaries are currently at the forefront of this.

As a profession, we have arguably been left behind by new disciplines such as data scientists, who have pushed ahead in these new areas. Our own experience, however, is that actuaries have an increasingly valuable contribution to make in the field of Big Data and data analytics, and for those actuaries with curiosity and willingness to learn, the opportunities are already here.

What we do

We work in a multidisciplinary team providing HR analytics services to clients. As well as actuaries, in the team we have developers, project managers, data scientists, visualisation experts, UI / UX designers, salespeople, HR experts, and

By Chris Paterson
and Jonathan Green



management consultants. Providing HR analytics services might mean helping clients to look at their data in new and interesting ways to get insights into their employees, or test their long-held hypotheses about why people are behaving in certain ways. It might instead mean solving a problem for which conventional solutions just have not worked, such as: "Can we predict when our best people will leave and how can we stop it?", or "What are the circumstances, situational differences or behaviours that are associated with high performers". The issues we tackle usually involve analysing large amounts of data using technology we have developed, or bought in, and producing output which meets what the client is looking for.

Where being an actuary fits in

Within all of this we as actuaries have a central role, or in reality a range of roles depending on the actuary and his or her strengths and preferences. We have actuaries in senior roles leading the strategic direction of our team, our sales efforts and client relationships. We also have actuaries who manage the analysis and development of tools to carry out the analysis, or lead the analysis itself.

The team was built with a group of founding actuaries, and more have been recruited over time into a variety of roles.

The reason actuaries, and in particular consulting actuaries, work well in these roles is a set of combined abilities which allow us to span the gap between the more technical and analytical work, and the commercial side where communication with clients and understanding their needs and businesses are vital. In common with all actuarial work, we utilise our understanding of the capability of the analysis as well as the risks and limitations. Combine that with an ability to communicate that to clients and you can see why we are right at the heart of the team.

Challenges for an actuary in a new environment

Learning to work in a new field and how to apply our actuarial skills has been challenging of course. Part of that challenge is fairly generic, focussed on learning the language and jargon of the field, and gaining the confidence to use it. In our case we have had to learn how to speak "HR" – for example to be comfortable talking about talent management, organisational design, and workforce planning.

Then there is the technology we use. Being able to talk about it is the first step – databases, analytical software, programming languages and visualisation tools make up most of it. Once au fait with the language, then learning what the different parts can do is the next challenge. You know you are getting advanced when you are able to put these parts together in different ways to tackle a particular problem, even more so when the room looks at you and acknowledges that we've found a new solution that hadn't been contemplated before. Chris: "One of my biggest challenges was when I had to attend a meeting with a large German client to demonstrate and discuss a brand new analytical technology we had developed which I had not yet used. A colleague who knew the technology well had to pull out of the meeting as he couldn't get a visa to travel. This left me with the task of learning the detail of the technology and how to demonstrate it whilst talking through it, all in a relatively short space of time. Fortunately we had all the expertise we needed on hand including a systems architect and the technology design team to take me through it, and an expert in the field from our German team who came along to the meeting. I got the support I needed in time for a successful meeting!"

Understanding and being able to talk about the statistical techniques we use can also be stretching. Some of these are familiar from actuarial work and exams but we have also had to learn new areas and how to combine them. Having a published statistical academic as a colleague is a great help here! It's not just one way though - one of the areas where actuarial training has also been able to contribute in is our knowledge of modelling and projecting populations which is something we have used when looking at large workforces.

Jonathan: "Working with some very talented colleagues (including some PhDs and Professors!) has taught me that there is a lot I don't know. But my actuarial background and experience provided

"The issues we tackle usually involve analysing large amounts of data using technology and producing output which meets what the client is looking for."



TEN IMPOSSIBLE THINGS TO DO EVERY WEEK (CONTINUED)

enough of a base to be able to join in the conversation, challenge the assumptions being made, and shape the overall solution to the client's problem. This helped us to deliver a ground-breaking actionable outcome to my client, which ultimately I was responsible for communicating".

The last of the big challenges is one that a lot of industries are currently facing – keeping up with changes in technology. Tools we developed 12 months ago now look tired and outdated and hard to use with a client without looking potentially behind the curve. Fortunately we have an agile and hardworking team of developers who keep abreast of the next big things and let us know when we need to move on. We've also learned to think to the future when making any development decisions. We don't make any decisions about our roadmap now without challenging how futureproof it will be.

How did you end up doing this?

To some extent we were both in the right place at the right time but we also did things to put ourselves there. Our particular consulting firm does an enormous variety of work for clients and proposition development and is open to people moving around to do new things as long as there is the desire, individual talent and potential, and business case for the job opportunity.

Chris: "I am excited by data visualisation and it is this part of the job which drew me to apply to join the team. I was working on a client with a colleague in the team and at a post-meeting pub visit we got chatting about this mutual interest and I realised there was opportunity within the firm. The opportunities I've had since taking on the role have far exceeded my expectations. I have worked with our alliance partners including McLaren Applied Technologies, and Imperial College London, and now lead the training of colleagues in HR analytics."

What we like about our jobs

Chris: "One of my stock answers when people ask me about my job is that I get 10 impossible things to do every week, and sometimes I get one of them done and that seems to keep people happy. Of course that is tongue-in-cheek but there is some truth in it. Most of the things we are trying to do have not been done before, or at least not in the way we are trying to do them. This makes it difficult to know where to start and it can be frustrating, but it is also one of the best things about the job. Even what might seem like a small amount of progress, like creating a new data dashboard for a client, can be seen by others as a big step forward helping the client to see a problem in a different and more

helpful way. I also love that data visualisation is part of my job, and my "hobby" now contributes to my professional life."

How the field will develop in future

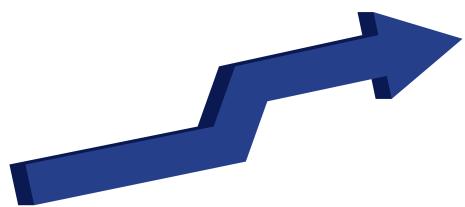
Jonathan: "The future for our work is exciting. HR as a discipline as a whole is at the start of a move to a more evidence-based approach, and bit by bit we are helping it to move in that direction. We are doing projects now which we wouldn't have conceived of approaching when we started four years ago, thanks to being able to leverage some of the data and analytics investments being made within our organisation and alliance partners, and we are actively working on propositions that leverage the "Internet of Things" Big Data and the latest visualisation technologies.

Advice for those interested in a change

We often get asked by actuaries working in more conventional fields about the transition into new fields and analytics in particular. Our best ideas on how to do this are:

- Find a place in your current company which does the work you want to. Introduce yourself to the people that do it and tell them that you are interested
- Find the steps which take you from your current career to your desired career. For example Chris worked in pensions, but also had lots of people management experience and had worked a lot with HR teams. HR analytics therefore was close enough to what he did to make the switch easier
- Find out which companies do what you want to do. Are there any which also do what you currently do? Do they encourage / allow people to move between teams?
- Read up on what skills and knowledge are needed in the new area. Consider whether you could gain some of these in your current role or even in your spare time
- Apply for a job in the field you want to work in – even if unsuccessful you will have learned more about how you need to develop

The opportunities are out there, both for individual actuaries and the profession as a whole ■



ACTUARIES IN RISK



By Neil Cantle

Risk – for such a small word it seems to pick up a large number of, sometimes conflicting, meanings. To most non-mathematicians risk simply refers to something that “could” or “might” happen in the future which will have undesirable consequences for someone. It is the uncertainty which makes thinking about risk difficult. If we knew exactly what was going to happen, we could plan perfectly to deal with it (assuming we also had infinite resources!). But this is practically never the case.

So, in this world, risk management is all about the anticipation of an uncertain future and using insights about it to guide the decisions you make today. It is an ongoing process of thinking about what might happen, assessing the potential consequences and working out how any actions taken now might influence it, all with the intention of minimising your chances of underachieving your goals by an unacceptable distance.

Actuaries have been carrying out some types of risk management activities in insurance businesses for centuries. Actuarial science began through the identification of particular risks which appeared, in aggregate, to be somewhat predictable, and using probabilities and statistics to model them. This enabled insurers to accept risks in return for a payment that they were confident would cover all but the most extreme possibilities. It is very common for actuaries to be involved in pricing,



ACTUARIES IN RISK (CONTINUED)

reserving and, more recently, risk capital, but these would not historically be thought of as "managing risk" per se as they are just part of what insurance companies do.

This article focuses more on the "enterprise risk management" world to illustrate that many of those actuarial skills are equally applicable to other types of risk. In this world, there are other risks whose drivers are less predictable, and possibly dynamic – for these, probabilities are only part of the story, and other actuarial skills in dealing with complex systems come into play. As a profession trained in dealing with an uncertain, if sometimes fairly predictable, future we ought to be well-positioned to assist with this wider risk management world.

Risk management contains many different activities and each of them can benefit from the skills actuaries have. Some of these are discussed below.

Risk Appetite

At the very core of risk management is a statement about how much risk you are prepared to take around the delivery of your objectives and the types of risk which you find acceptable or unacceptable. This then sets the tone for how the company does business. Many, if not most, people find it quite challenging to think in a structured way about uncertainty so this is an area where actuaries can definitely help. They appreciate the nature of probability and statistics and are quite comfortable thinking about ranges of potential outcomes which each have some chance of happening. Although many enterprise risks do not behave nicely according to probability distributions the underlying principles can be generalised and the thought processes are rather similar. Many actuaries also have to explain this type of "range of possible outcomes" to others in their business on a regular basis to help them make important decisions. So, actuaries can play a key role in the risk appetite process by helping business experts to express themselves in a consistent way when talking about future uncertainty.

Risk Identification

A lot of risk management work is about trying to determine what could happen in the future. Dreaming up things that might happen doesn't sound particularly difficult, but it turns out that humans do not have particularly consistent skills in this area, often getting misled by their inherent events, but also assess them to work out what the consequences might be and how likely such events are. Without this analysis we have limited ability to prioritise. Again, people are not inherently very good at assessing these things directly.

So how do you identify a risk? Essentially it must start with an understanding of the mechanisms operating to produce the outcomes you are trying to achieve. If one or more elements in this mechanism do not behave as anticipated, or they interact in a novel way, then the outcomes emerging will not be what you expected. Risks are the subset of these situations where the outcome is less desirable than the expected one. An understanding of the mechanism is best derived by combining what is known, or suspected, by your experts with insights identified from observation.

Actuaries are excellent analysts and are often asked to explain complex situations, so there is a definite role for actuaries in the identification process. As actuaries increasingly move into advanced analytics there is a role in helping to reveal trends and patterns that business people can recognise more quickly than they otherwise would have. As the world becomes increasingly interconnected, skill in developing and analysing networks is particularly helpful. Actuaries have the analytical skills to help, but it is their ability to communicate it clearly and persuasively that matters here – there is no good in identifying a risk but failing to get anyone to listen! This combination of skills can be particularly helpful for emerging risks which it can be hard to get buy-in for early on.

"Actuaries have the analytical skills to help, but it is their ability to communicate it clearly and persuasively that matters"

Risk Assessment

Once the existence of a risk is identified, the next challenge is to assess it and find out its consequences, likelihood and features. This involves a second wave of analysis, where actuaries can play an important role. Most risks involve several moving parts, so the ability to describe and analyse multi-variate dynamics is very helpful. In order to communicate the effects being uncovered, skills in creating and describing meaningful scenarios and sensitivities are really useful. One of the tasks of risk management is to help companies prioritise – even if they were able to identify all of their risks, they seldom have the resources to neutralise all of the ones they wish not to accept, and so choices must be made. Actuaries can therefore help to develop common evaluations of risk (e.g. in terms of variation in target outcomes) so that they can be compared and management can rank them. It is

increasingly important to be able to judge the aggregate risk position, to ensure that the interactions between risks are captured. This means that classic heat maps plotting out individual risks are perhaps less useful ways to judge the significance of individual risks – actuaries can help to present a more “authentic” representation of the combined view and the contribution each risk is making to the whole. Areas like operational risk are ones where actuaries can add value – particularly by building models which offer real insights into how the risks behave not just ranking possible outcomes.

“It is increasingly important to be able to judge the aggregate risk position, to ensure that the interactions between risks are captured”

Risk Management

The management of risk nearly always involves some kind of trade-off. Only very rarely can risk be reduced without expending some form of effort. So, those responsible for making the choices will require information about the options, to help them decide how they should allocate their finite resources to best effect. The problem they are trying to solve will have multiple targets, that they are trying to optimise, and multiple constraints. And, because we are dealing with uncertain future events, much of the information will necessarily be a range, or distribution, of possibilities. Actuaries can be helpful here in evaluating the different options and producing information on a comparable basis. This work crucially helps the decision-makers to make well-informed decisions on a consistent basis.

Risk Monitoring

Risk monitoring activity involves a number of tasks:

- Looking for signals that a “known” risk may be getting more, or less, likely;
- Looking for signs that the nature of its impact is changing; and,
- Detecting the signs that something “unknown” is happening and triggering the organisation to learn more and prepare itself.

These activities require multi-variate analytics – helping people spot the consequences of simultaneous movements in a wide range of potentially connected factors. Actuaries are increasingly involved in this type of analysis and, again, this is an area where a lot of value can

be added by helping people “see the wood for the trees”. Seeing a risk trend early can make the difference between still having an option to respond positively or not – potentially saving the organisation a lot of effort and resources, and even preventing corporate failure.

Conclusions

Risk management is all about anticipating the future in various ways and prioritising to focus on the key things you should be doing to make sure your chances of success are in line with your risk appetite. Actuaries have a significant history of helping people to model, understand and communicate about uncertainty, making, at least some of, the future a bit easier to grasp. Whether the individual role is analytical, modelling, scenario development, reporting or even Chief Risk Officer, actuarial skills are highly applicable to the general risk management landscape. This brings the possibility of applying actuarial skills in a wide range of industries outside of financial services.

Risk is everywhere ■



Placard is the periodic discussion paper of the Association of Consulting Actuaries Limited. The views expressed in this publication are those of individual authors and are not necessarily the views of their employers or the Association.

Placard is intended to provide general information and guidance only. Its content does not constitute legal or business advice and should not be relied upon as such. Responding to or acting upon information or guidance in this paper does not constitute or imply any client/advisor relationship between the Association of Consulting Actuaries Limited and any party, nor does the Association accept any liability to any person or organisation relating to the use of such information or guidance.

Acting Editor: Tiziana Perrella
