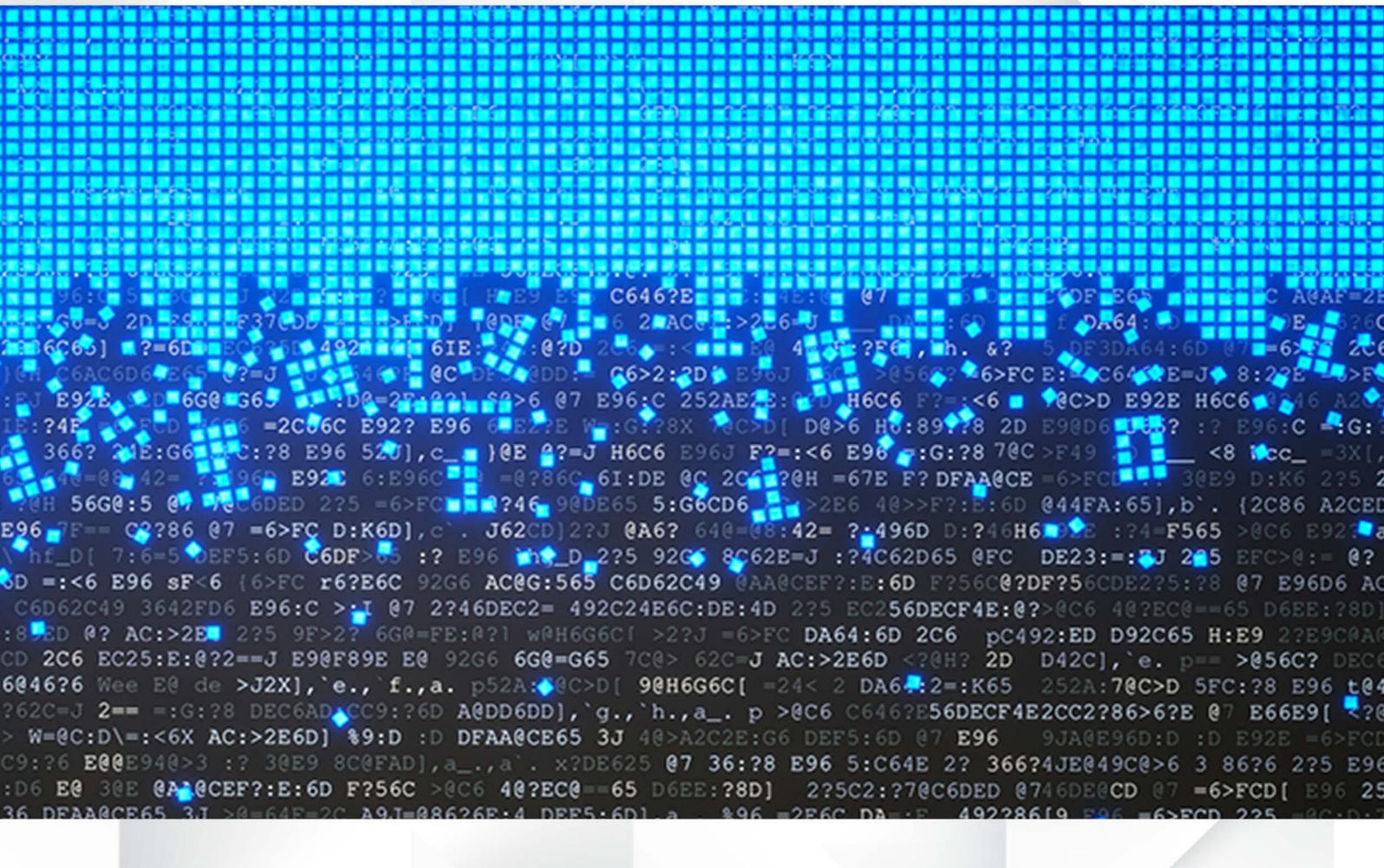


# Actuaries



**COLUMN**  
The Critical Line: Volume 8

**EVENT REPORT**  
The NDIS: Today and Tomorrow

**REPORT**  
Blockchain in Insurance

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## IMPORTANT INFORMATION FOR CONTRIBUTORS

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Published by the Actuaries Institute  
© The Institute of Actuaries of Australia  
ISSN 2203-2215

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## The Critical Line: Volume 8

By Dan Mayoh

December is upon us, and with that Dan Mayoh has brought us an instalment of the Critical Line that has nothing in particular to do with Christmas. Christmas is for friends and family, but puzzles are for everyone year-round!

Before we get to the challenge, I would like to share two other interesting puzzles I have come across in books recently.

### The Two Envelopes Problem

This has some elements in common to the well known Monty Hall Problem. In the Two Envelopes Problem, you are presented with two sealed envelopes, and you know that one contains twice the money of the other (but you do not know which has the larger amount). You are allowed to pick an envelope and open it to see how much money it contains. You are then given a choice to keep that envelope, or swap it with the other envelope and keep its contents instead, with the objective of maximising your return.

At this point, a quick analysis might suggest that if not changing gives you  $\$X$ , then changing would give you  $50\% * (\frac{X}{2}) + 50\% * (2X) = \$X * (\frac{5}{4})$ , and you would choose to change. However this same line of thinking seems to apply again once you have the second envelope in your hand (before you open it), or indeed if you had chosen the second envelope to begin with. This looks like a paradox.

The 'problem' in the title is not to decide if you should switch. The task of the Two Envelope Problem is to explain the paradox! I'm not going to get into it here, but give it some thought if it takes your interest and then read some of the not-insignificantly-small portion of the internet devoted to discussing this problem...

### The Pancake Problem

This is a problem that I am informed was first posed in 1975 under the pseudonym Harry Dweighter (harried waiter). Essentially, it asks:

A chef prepares a stack of circular pancakes that come out all with different radii, stacked one on top of another. I like to rearrange them into an ordered stack with the smallest at the top down to the largest at the bottom. I can only do this by grabbing several from the top of the whole stack, flipping over the stack I grabbed, and placing them back on top of any ungrabbed pancakes.

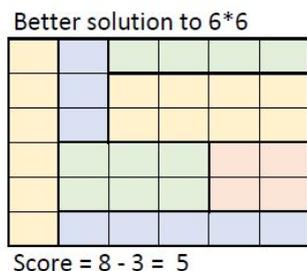
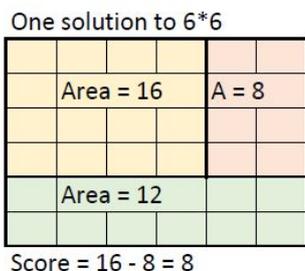
If there are  $n$  pancakes, what is the maximum number of flips (as a function of  $n$ ) that I will ever have to use to rearrange them? Call this number the Pancake Number  $P_n$ .

For example, if  $n = 3$  the worst-case starting arrangement (which would be a stack ordered from top to bottom as radii 1-3-2) will require 3 flips to order. So  $P_3 = 3$ . The problem is to find a way to express  $P_n$  as a function of  $n$ . I am informed that this is unsolved, and that many serious mathematical papers have been published on the topic, including one in 1979 co-authored by William H. Gates of Microsoft fame proving an upper bound of  $P_n$  to be  $\frac{(5n+5)}{3}$ .

### The Critical Line challenge

Now for the actual problem to be solved. First, let's discuss a small example to illustrate the problem. You are given a  $6*6$  square, and subdivide the entire square into rectangles with integer side lengths. You can divide the square into rectangles (including smaller squares) any way you like, subject to one condition: You cannot use two rectangles of the same dimensions. This includes rotations, so you cannot use both a  $2*1$  and a  $1*2$  rectangle. Your 'score' from your subdivision is equal to the area of the largest rectangle used minus the area of the smallest rectangle used. Your task is to perform the subdivision in a way that minimises the score.

For a  $6*6$  square, the smallest possible score is 5 as far as I know. This involves dividing the square into 7 rectangles, the largest of which has an area of 8 and the smallest an area of 3.



Your challenge is to find a sub-division for a 17 \* 17 square with a lower score than anybody else.

For your chance to win \$50, send your solution to the puzzle to ActuariesMag@actuaries.asn.au

## The Critical Line volume 7 solution

By Oliver Chambers (ochambers@deloitte.com.au)

There were no winners to this month's puzzle. Honourable mention to Paul Swinhoe who submitted the correct answer without proof.

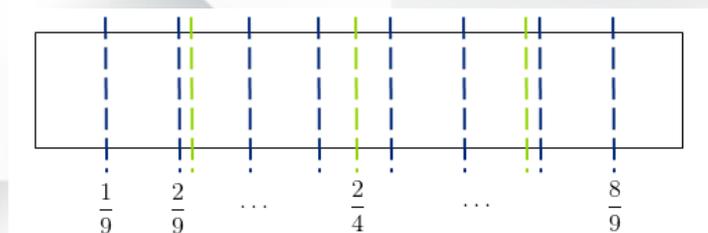
### An Efficient Birthday

An actuary is hosting a birthday party and he has invited all of his friends and family. He knows that either  $p$  or  $q$  people will attend the party, where  $p$  and  $q$  are two relatively prime integers (i.e. they share no common divisor). He also strives for efficiency in all aspects of his life and decides to pre-cut the birthday cake. He would like to cut the cake into several pieces such that the cake could be divided into either  $p$  or  $q$  groups of equal quantity (without further division). What is the minimum number of pieces that the actuary should divide the cake into to meet this requirement?

#### Solution

The minimum number of pieces that the actuary should cut his cake into is  $p + q - 1$ .

First we show that this is attainable. Consider a rectangular cake, and make cuts at  $\frac{1}{p}, \frac{2}{p}, \dots, \frac{p-1}{p}$  and  $\frac{1}{q}, \frac{2}{q}, \dots, \frac{q-1}{q}$ . This will divide the cake into  $p + q - 1$  pieces (no cuts will coincide because  $p$  and  $q$  are relatively prime). It can also clearly be grouped into equal quantities of cake for  $p$  or  $q$  guests. (Note that if the cake isn't rectangular you just need to cut the cake into pieces with those volumes of cake). Below is an illustration for  $(p, q) = (4, 9)$



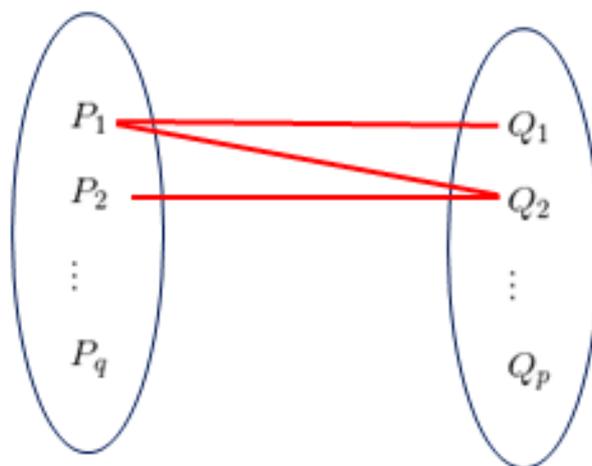
Next we need to demonstrate that you cannot do better than  $p + q - 1$ . To do so we will utilise some [graph theory](#). There are three steps:

1. Define a graph with  $p + q$  vertices such that each partition of the cake represents a vertex and each piece of cake is mapped to an edge of the graph.

2. Show the graph is connected
3. Show that every connected graph on  $n$  vertices has at least  $n - 1$  edges, and therefore at least  $p + q - 1$  pieces of cake.

Assume we have a partition of cake into  $k$  pieces with volumes  $\omega_1, \omega_2, \dots, \omega_k$ , such that  $\sum_j \omega_j = pq$ . Further assume we have a desired partition these pieces into disjoint subsets  $P_1 \cup P_2 \cup \dots \cup P_q$  and  $Q_1 \cup Q_2 \cup \dots \cup Q_p$  where the pieces in group  $P_i = \{\omega_{i_1}, \dots, \omega_{i_n}\}$  sum to  $p$  and those in  $Q_j$  sum to  $q$ .

Define a graph with a vertex for each set  $P_i$  and  $Q_j$  and draw an edge between each pair  $P_i$  and  $Q_j$  if they both contain the same piece  $\omega_\ell$  that is  $P_i \cap Q_j \neq \emptyset$ . Then we draw at most as many edges as there are distinct pieces  $\omega_\ell$ . This is illustrated in the diagram below.



We will show that this graph is connected. That is, any two vertices are connected by a series of edges (a path). To do so, consider any connected component of this graph. This is a subgroup of connected vertices such that no additional vertices outside the subgroup are connected to vertices inside the subgroup by an edge. Suppose this component has  $s + t$  vertices  $\{P_{i_1}, P_{i_2}, \dots, P_{i_s}, Q_{j_1}, Q_{j_2}, \dots, Q_{j_t}\}$ .

Notice that the sum of all the volume of cake in all  $P$ -groups is  $p \cdot s$  and the sum of the cake volume in all  $Q$ -groups is  $q \cdot t$ . Further, these two quantities are equal because, by definition of the connected component, each quantity  $\omega$  appears in exactly one  $P_i$  and one  $Q_j$ . Therefore  $ps = qt$ . However, because  $p$  and  $q$  are relatively prime, this means that  $q$  divides  $s$  and  $p$  divides  $t$ . Therefore  $s + t \geq p + q$  so our component is actually the entire graph, which must be connected.

Finally we demonstrate that any connected graph,  $G$ , on  $n$  vertices has at least  $n - 1$  edges. Prove this by induction: any graph with  $n$  vertices and  $e$  edges has at least  $n - e$  connected components. When  $e = 0$  the claim is trivial. If  $e > 0$  then remove one edge,  $uv$ , from the graph. This increases the number of components by at most 1 (i.e. if  $u$  and  $v$  are no longer in the same component). So by the inductive hypothesis there are at least  $n - (e - 1) - 1 = n - e$  connected components.

Because there are at most as many edges as there are pieces of cake there must be at least  $p + q - 1$  pieces of cake

[square?]

If we extend this argument slightly then you can also prove the more general statement for any  $p$  and  $q$ : that you need

$p + q - \gcd(p, q)$  pieces of cake.



# GIS2016 Wrap up

By Actuaries Institute

GIS2016 was a truly thought provoking and relevant seminar for those in the general insurance industry who are constantly faced with challenges, especially around big data and cyber risk. This article wraps up the two day seminar that was held this month.

The 2016 General Insurance Seminar was held 13-15 of November at the Grand Hyatt in Melbourne. President of the Actuaries Institute, Lindsay Smartt, opened the Seminar welcoming 230 delegates to one of the most important general insurance events on the Institute’s calendar.

“We, as a profession...must prepare ourselves and our businesses to adapt to imminent change and disruption,” said Lindsay, acknowledging key conference themes of big data and cyber risk. Michael Pascoe once again facilitated the seminar with his unique flair built over four decades of public commentary, on economic, business and finance issues.

The seminar brought together an impressive line up of speakers across four plenary and nine concurrent sessions covering a comprehensive list of topics relevant to the GI industry. Some of the concurrent topics presented were insurance fraud, the NDIS, cyber risk, rick clture digital disruption and even natural disasters.



Facilitator Michael Pascoe, President Lindsay Smartt and CEO David Bell

## Challenges of Today – Part One

In the first plenary session, Win Li Toh, Principal of Taylor Fry summarised key findings of the latest JP Morgan Taylor Fry General Insurance Barometer, while Kate Mackenzie, Investment & Governance Manager at the Climate Institute, spoke to the risks and challenges faced by actuaries and insurers due to the impact of climate change.

Noting the challenging times for insurers and that disruptors such as over-capacity in the market, competition, impact of climate change, big data and cyber risk, were all perfect conditions for change.

Win-Li commented that “our key challenges while riding the perfect storm is to never lose sight of why we’re here and what we’re doing.”

Katie Spearritt, CEO and founder of Diversity Partners, rounded up the session by discussing the importance of diversity in the actuarial and wider insurance industry and how improvements can be achieved. After carrying out an exercise exploring the scope of diversity in the room, Katie concluded that ‘as individuals the key question is to ask how biased am I, and for organisations it’s how can we leverage diversity?’”



*Win-Li Toh, Kate Mackenzie and Katie Spearritt*

**Challenges of Today – Part Two**

Carrying on with the 'challenges of today', the second part of this plenary session raised points about the role of the Appointed Actuary. A range of perspectives were provided by Stuart Bingham, General Manager in the Diversified Institutions Division of APRA, Estelle Pearson, Principal with Finity Consulting and Mark Valena CEO with GMHBA. At the heart of the discussion was whether actuaries fill a compliance role, a strategic role, or both, within their organisations.



*Stuart Bingham, Estelle Pearson and Mark Valena*



A key question raised by Mark Valena, CEO GMHBA included "how can we appoint the role of the AA as a role of trust?"

**Solutions for Tomorrow**

Plenary 2 explored emerging risks of the insurance industry as well as how the industry should be preparing for the future insurance environment.

Fergus Brooks, National Practice Leader, Cyber Risk at Aon Risk Solutions, shared his knowledge of information security and experience with client solutions in this space, while Graeme Adams, leader of Finity's Management Consulting Practice offered insight into business strategy design and the execution needed to meet tomorrow's challenges.

Donna Walker, Executive General Manager of Broker Business at Insurance Australia Group spoke about the future customers of insurers commenting that "the insurance industry is looking to experiment and do it fast...the risk solutions for tomorrow will look different to what we have today,"

Nick Sordon, Senior Casualty Treaty Underwriter with Swiss Re discussed his experience in non-traditional structured reinsurance solutions in the context of emerging risks that can affect the insurance and reinsurance industry. Game-changing emerging risks included, Drones, 3D printing, Io(e)T, Nanotechnology and Driverless Cars. Noting that "In just over a decade - we've come so globally, economically and socially dependant on the Internet," Nick concluded that "insurers have always been dealing with the unknown and that the key is to stay on the cutting edge of technology."



**Your Role in Data Analytics.**

As we moved into day two, we began with this pertinent topic, especially given the launch of the Institute's new Green Paper on ['The Impact of Big Data on the Future of Insurance'](#) at GIS.

Plenary speakers were Alan Greenfield, Principle at Taylor Fry, Paul McCarney, co-founder and CEO of Data Republic, Craig Price, Executive Manager, Data Science at Suncorp, and Simon Reid, Group Executive – Technology at Quantum.

Data analytics has been a huge focus throughout the year, how this will affect the insurance industry and how actuaries are able

to use this information. This Plenary asked, as actuaries, what expertise do we bring to the table? What skills do we need to acquire?

Issues covered included:

- Social policy: balancing insight gained against privacy considerations.
- Challenges and practicalities of implementing big data technology.
- Using analytics to improve/tailor customer service.
- Cross-organisation data sharing issues.
- How actuaries can progress the capabilities within their organisations.



Alan Greenfield, Paul McCarney, Craig Price and Simon Reid



"75% of welfare costs in NZ are derived from people aged 18-19 starting on welfare benefits," said Alan, "...because of analytics, we can now measure the impact of policy changes."

**Innovation**

Plenary 4 speakers Tracy Green (IAG), Guy Russell (Accenture), Samantha Cockfield (TAC) and Vicki Mullen (ICA) emphasised that insurers need to continue to not only meet customers' expectations, but also be responsive and "wow" them.

This session explored the big changes that are happening around the industry and how actuaries can prepare for the future customer.

"If you aren't disrupting your business or industry, someone else is," said Guy.

Incumbents and challengers alike are approaching many aspects of the traditional insurance value chain in new and innovative ways.

From product design, to claims management, to gamification of customer engagement and even "connected" assets – the way insurers operate in a day-to-day sense is changing rapidly.



"I'd love to see the industry ask 'what do people really want?'" said Vicki.

"With natural disasters, insurers are on the ground almost as soon as emergency services and, to me, that's innovation."

GIS2016 supported the *Alannah & Madeline Foundation* with just over \$1,200 raised at the seminar. CEO Lesley Podesta spoke of passionately of the plight of Australian children who live with violence and described how the Foundation was set up in memory of Alannah and Madeline Mikac, aged six and three, who were tragically killed with their mother and 32 others at Port Arthur, Tasmania, on 28 April 1996. Launched in 1997, the Foundation cares for children who have experienced or witnessed serious violence, and runs evidence-based programs that prevent violence and advocate for children's safety and wellbeing.

Since GIS2016 the Alannah & Madeline Foundation have launched their Christmas Appeal, you can find out more and donate to this very worthy cause [here](#).



President Lindsay Smartt and Lesley Podesta from the Alannah & Madeline Foundation



## Alannah & Madeline Foundation

The Institute would like to thank the GIS2016 Organising Committee:

David Gifford (TAC), Danielle Ling (Taylor Fry), Ash Ahluwalia (Finity), Andrew Thomson (Quantium), Shikha Bajpai (PwC), Niki Appleton (Actuarial Edge), Yulia Lai (IAG), Kitty Ho (Munich Re) and from the Actuaries Institute Sarah Gibson and Donna Viengkham.



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# An update on the Massive Open Online Course (MOOC) 'Introduction to Actuarial Science'

By Adam Butt

Adam Butt, Senior Lecturer at ANU, returns to Actuaries Digital to give us an update on the MOOC Introduction to Actuarial Science that has attracted thousands of students from over 180 countries.

Just over a year ago I wrote an Actuaries Digital article about "Introduction to Actuarial Science". You can probably find that article in the "Related Articles" section to the right of this text, or [click here](#) instead! That article was published around two months before the course went live and now is a good time to write again and let you all know how this [Massive Open Online Course](#) is going.

Whilst I'd encourage you to read the previous article if you want a more detailed background on the course, by way of brief introduction the purpose of the course is to provide those considering an actuarial career with a free and interactive experience that will give them an idea of what an actuary is and does. The course is free to enrol in and can be found [here](#).

The course commenced on 17 October 2015 and ran in a synchronous format until 14 December 2015 (i.e. course material was released in weekly fashion to a cohort of students taking the course at the same time). Following on from this the course was opened in a self-paced format from 22 December 2015 onwards (i.e. all course material is immediately available upon enrolment in the course) and is currently running in this format.

The course is made up of a number of short videos, interspersed with questions related to the video material. Students engage with the instructor (myself) and each other through discussion forums. For a one minute "highlights package" of the videos of the course see below:

View the video here:  
<https://youtu.be/yLKUXSMJsRI>

An example of a question asked to students in a latter portion of the course can be seen below (this is a screenshot from the interface of the course):

Assessment Question 6.8  
 1.0 point possible (graded)

The whole of life policy described in this Lesson is updated to have a fixed term of 30 years, where the \$400,000 claim is paid upon the end of the year of death, or if death does not occur in the next 30 years, then the \$400,000 is paid in exactly 30 years and the policy ceases immediately. This is known as an endowment policy.

Update the demonstration file for the simulations to take into account the revised policy design, keeping all other values (interest rates, mortality rates, number of policies sold, etc.) the same. Calculate the premium (to the nearest whole dollar) to be charged to give a 90% probability of being sufficient to cover the claims cash flows.

Submit You have used 0 of 3 attempts

Save Show Answer

We've been very pleased with student numbers and response to the course, with students from over 180 countries having enrolled in the course. Details of student numbers as at 18 November 2016 can be found in the table below.

Course version	Synchronous	Self-paced
Total enrolments	11,490	17,176
Attempted first question of first Lesson	1,793	3,072
Attempted first question of second Lesson	1,059	1,344
Attempted final question of Final Exam	236	212
Passed the course	472	350

In order to pass the course students must obtain a mark of at least 40%. The drop off numbers in the table above are consistent with the experience of other MOOCs, noting that the vast majority of “enrolments” are people who just want to have a quick look at the course and have no intention of actually taking it. (The marketing people love the “total enrolment” numbers – the critics love the completion rates – the truth is somewhere in between).

The course currently has a 4.5/5 rating from 14 reviews on edX, with a number of very positive comments. It is heartening to read comments like:

*“For anyone thinking of the US exams, I think this is a better first step toward becoming an actuary than focusing on statistics & probability for the first exam since this gives a better impression of what the professional environment and processes might be like.”*

Information from surveys of students we undertook during the course paints an interesting picture as well. The following summary statistics come from the synchronous version of the course:

- Around 60% of students who completed the opening course survey (1,624 responses) were considering or already doing actuarial degrees/exams, with 38% just generally interested in the profession and 2% already actuaries.
- Around 46% of students who completed the closing course survey (147 responses) were intending to start an actuarial degree/exams in future, with 15% already doing an actuarial degree/exams and intending to continue doing so.
- Of those intending on starting or continuing an actuarial degree/exams, 21% had not intended on doing this before taking Introduction to Actuarial Science.

There is lots more I could say about the course but let’s keep this (relatively) brief! For those who are interested I will be presenting on the course and MOOCs in general in much more detail at the Actuaries Summit next year. In the meantime if you would like to know more please feel free to post in the comments below or to [send me an email](#) and please continue to spread the word about the course!



## My top tip for those new in their careers, volunteer!

By Julia Lessing

When Julia Lessing, Director at Guardian Actuarial, was asked 'what would be the best advice for young professionals' she thought volunteering. In this article, Julia illustrates the value of volunteering and how it contributes to our careers.

### Many of the skills I regularly utilise at work were not learned at university or in the workplace.

I was recently invited to share some career tips at a Young Actuaries Program session. In preparation for the session, the convenor sent me a number of questions to guide my discussion. Most were fairly standard questions, but the last one was this:

"In only one sentence what would be the best advice you would give to a young person just starting their career?"

I was stumped! As an actuary and consultant I am comfortable giving professional advice to clients. But as an experienced counsellor, I usually avoid giving advice to people about their own careers and lives, instead preferring to share information and ideas, listen and help them work out what's right for them. But how do you do this for an audience of people?

I thought further. What has really helped me in my career? Certainly the technical skills are important, but alone they were not enough to help me find interesting projects and opportunities at work. It was the soft skills I learned through volunteering that have helped me to build an interesting career.

### Volunteering helps us to build our careers

We often think of volunteering as something where we "give" our time to others. However, in my experience, volunteering has given a lot of things back to me. There are lots of reasons why volunteering is a good thing to do, but why is it good for our careers?

Volunteering:

1. Helps us broaden our networks
2. Allows us to learn new skills
3. Helps raise our profiles in our workplaces, professions and industries

### Volunteering helps us broaden our networks

"Build your network" is a commonly offered piece of advice to those new in their careers. This often happens naturally through our day-to-day work with our colleagues. We can enhance this by attending networking events. However, one of the best ways I've found to build my network is to work closely with others for a specific project or purpose.

Volunteering gives you the opportunity to meet and work with people you may not otherwise have crossed paths with. Often, it can give you an opportunity to meet people who are more senior or experienced than you would ordinarily work with in your paid work.

### Volunteering allows us to learn new skills

Many of the soft skills we need to get ahead in our careers are not taught through formal training or on the job. Volunteering allows us the opportunity to learn and practise many new skills that can be valuable in the workplace. Sometimes, volunteering gives us access to the opportunities earlier in our careers than our paid roles might. Examples of this include:

- Chairing or participating in a working group or committee for your professional body gives you the opportunity to learn how to communicate and effectively execute actions within a team.
- Volunteering outside work in an area you are interested in (e.g. training to be a counsellor on the Lifeline phones) lets

you learn valuable skills in your interest areas that are transferable to the workplace.

## Volunteering helps raise our profiles

Early in your career, there are lots of demands on your time – you are learning your profession, often still undertaking formal study and getting used to working in an office every day. On top of this, you are trying to build your career and make a name for yourself.

Limiting your involvement in your profession to paid activities often limits the opportunity you have to raise your profile. By being prepared to volunteer your time, you get more opportunities to build your personal brand. Examples of this include:

- Volunteering for a project or initiative at work that is outside your core responsibilities can help you meet colleagues outside your usual team.
- Getting involved in a working group about something you're interested in with your industry can help you meet other people with shared professional interests.

## Conclusion

While it may feel impossible to find the time, volunteering can be a valuable way to broaden our network, learn new skills and raise our profiles, which ultimately helps us to build our careers. Reflecting on my own career to date highlights how valuable my own volunteering experiences have been in preparing me for interesting roles and opportunities.

*Where will you find your next volunteering adventure?*

See the original article [here](#)



## President's Column - Diversity

By Lindsay Smartt

*In his Presidential Column, Lindsay Smartt focuses on diversity and asks whether we are doing enough in this important area.*

I recently had the opportunity of presenting at the IAA Regional Development Seminar in Gurgaon, India on the eve of the 20<sup>th</sup> Asian Actuarial Congress (AAC).

Despite struggling to keep delegates' attention during the session - the opposition I faced was that my timeslot coincided with the US presidential election results coming through - there was still considerable interest in [my talk](#) and it was received well.

From the outset, I announced I would be calling for updates on the presidential election race from the floor, to be shared with the group, as they came to light. By the end of my talk, it was clear that Trump had won. As I was discussing the result at the AAC, a colleague who is in tune with US politics commented that Clinton lost because she is female.

I also had opportunity at this meeting to see who was on the judging panel for a recent eminent Insurance Awards event. I was staggered to find that the panel consisted of 23 men. Only one female judge was present amongst seven international judges. Having only one female out of a total 30 judges on the panel was to me, a sad reflection on the state of gender diversity in the industry in the region.

Of course, diversity has a much broader scope than gender diversity.

In my time as President, I have tried to focus on diversity. I spoke of it in my [Presidential Message](#). Typically, this has been in areas like looking at the makeup of proposed memberships of committees, working groups and the like. I also try to take opportunities to challenge whether we have a diverse outcome as circumstances arise.

What else is the Institute doing to promote diversity? Is it enough, or should we do more?

My predecessor, Estelle Pearson, made some great progress to further promote gender diversity through establishing some new events.

Members also write on the topic. A really interesting and practical [article by Jan Swinhoe](#) on diverse teams was recently published in *Actuaries Digital* and I suggest you have a read if you haven't done so already.

### Diversity in the global profession

One thing the role of President has given me is greater visibility and contact with other actuarial bodies.

The two largest groups: the Institute and Faculty of Actuaries (IFoA) and Society of Actuaries (SOA), have both taken specific steps to further diversity. The SOA formed a Diversity and Inclusion Committee earlier this year.

The IFoA articulated its Diversity Strategy at the start of this year, which includes the following aims:

- to create and support an inclusive environment;
- to embrace the value of diverse perspectives; and
- to build awareness and understanding of diversity within the profession for the benefit of our members, the public and profession as a whole.

The IFoA has also articulated over 30 specific actions against these strategies. When I read them, there are some that we are doing but others that leave me questioning whether we should be doing more.

*"I am a firm believer that diversity and inclusion lead to better outcomes whatever the situation."*

In most business and society forums, diversity is a current topical issue. In my work outside the Actuaries Institute, it is an ever-present focus. I am a firm believer that diversity and inclusion lead to better outcomes whatever the situation. Apart from the evidence from research and the currency of the topic, I support an Institute focus on diversity, firstly to help us achieve best outcomes, and secondly because I see people as equals. To the extent that business and society has in the past been biased, and delivered concentration and exclusion rather than diversity and inclusion, I believe we must all do what we can to redress this.

I would be most interested to hear your views on this topic. Please drop me a line or post a comment below this article.

It is pleasing to see that gender diversity in the role of President of the Actuaries Institute is present. As your first President to serve both immediately following and preceding female Presidents, I certainly hope it is not too long before this is repeated.

Council will be reviewing its Strategy in early 2017 and I will be asking Council to consider whether it needs to specifically articulate strategies and plans for diversity.

## Latest Happenings in our Actuarial Community

My [previous column](#) was on the important single topic of the Appointed Actuary review, so I pick up now on happenings in our actuarial community over that last few months.

Travel has taken me to New Zealand (member dinners, presentation to NZSOA, visits to RBNZ, Commission for Financial Capability and Victoria University), China (annual meeting of the China Actuarial Association), Indonesia (meeting with the Indonesia Society of Actuaries President and member event), Singapore (40<sup>th</sup> anniversary celebration) and India (IAA seminar and 20<sup>th</sup> AAC). Each occasion gave ample opportunities for furthering our important relations with other actuarial bodies.



*President Lindsay Smartt and IFoA CEO, Derek Cribb at the 17th China Actuarial Annual Conference.*

I've attended many and varied Australian member activities (from major seminars on Health, Banking and Data to smaller gatherings) and appreciate very much the opportunity to meet with members and hear your perspectives on our great profession. Let me highlight just a few:

- Professionalism courses – having attended the very first course we offered in 1984, I value engaging with our future actuaries in what is always a lively environment.
- Member dinner in Tasmania – the President hasn't previously included Tasmania in the various state dinners. I was pleased to change this and to host a very enjoyable dinner and hear of the interesting things happening in this very engaged group.
- Past Presidents – our past presidents are still actively considering the state of the profession and future opportunities. It was a pleasure dining with them.

I recently met with David and Delyce Orford, following [the announcement](#) in the AFR, of their generous donation in support of the profession.

The launch of the CAA Global joint venture between the IFoA and the SOA is an interesting very recent development, following the launch of the CAA designation by the IFoA a couple of years ago. I held preliminary discussions with my counterparts from both the IFoA and SOA in India last week. Council will be considering this matter at its next meeting in December.

Speaking of Council, I trust you find my [post-meeting](#) report informative.

I will finish with a reminder to all those members eligible to [please vote in the Council Elections and have your say](#) if you haven't done so already.

I welcome your feedback on this column or any matter.

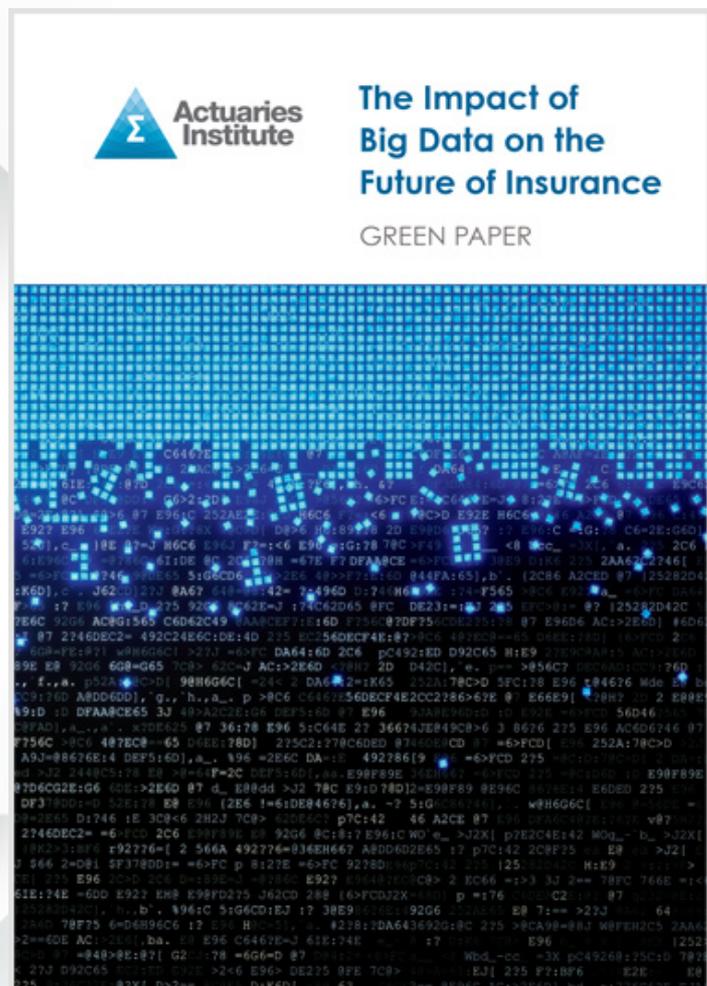


# Big Data set to transform Australia's insurance industry

By Actuaries Institute

The Actuaries Institute launched a Green Paper on Monday (14 November) on how Big Data is transforming the insurance industry.

Impact of Big Data on the Future of Insurance considers some of the public policy issues that will face society as insurers price policies on a more individualised risk basis.



"Improved data will produce winners and losers amongst insurance customers," the report said.

This is the first of the Institute's thought-leadership publications to focus on Insurance and 'big data' and follows on from the Institute's previous publications:

- [Unlocking Housing Wealth – options to meet retirement needs;](#)
- [For Richer, For Poorer – Retirement Incomes;](#)
- [Who will fund our Health? and](#)
- [Australia's Longevity Tsunami - What Should We Do?](#)

The Paper release coincides with the Productivity Commission releasing their [Data Availability and Use draft report](#) earlier this month, that recommended a major overhaul of Australia's data policy framework, including the introduction of a Comprehensive Right to give people more control over their data.

Elayne Grace, Deputy CEO and Head of Public Policy at the Actuaries Institute said the Paper was an important document to help insurers and policy makers consider increasing amounts of information.

"What will be the impact of genomics on life insurance, what will be the impact of 'fit bits' on health insurance?" asked Elayne.

View the video here: <https://youtu.be/jjvibusXYMM>

Actuary and Partner at Deloitte, Paul Swinhoe, co-authored the report, said privacy questions around who owns the data and how it can be used must be examined.

"Insurers need to maintain confidence in data and the trust of their consumers" Paul said.

Commissioned by the Institute, prepared by Deloitte Australia, and with significant contributions from Institute practice committees and working groups, the [Green Paper](#) entitled *The*

**View the video here:**

<https://youtu.be/U4hf-QgBwy8>

Kaise Stephan, actuary and partner at Deloitte who co-authored the paper, said it examines issues such as how increased data analysis could potentially marginalise individuals considered higher risk, even though they may not be able to control the risk they seek to insure.

“Is [the risk] because of their driving habits, which they can change, or are these risk factors largely outside their control? A flood rated zone that a person lives in for example; night shift workers who drive during the riskier night hours; or perhaps a genetic makeup of a person?” Kaise said.

**View the video here:**

<https://youtu.be/jjhYesAY5JM>

The knowledge that insurers gain from extra data should lead to a potential new role for them: that of risk signalling and helping consumers to reduce their risks.

Manager at Deloitte and co-author of the paper, Marc Mer was positive about the benefits of this new proactive role for insurers.

**View the video here:**

<https://youtu.be/AwUFDMMsrVQ>



## Renaissance of the Effective Professional

By Tim Gorst

*Tim Gorst, Senior Manager at the NAB, tells us about the increasing focus on risk culture in financial services and how the effective professional contributes to a strong risk culture.*

The 2015 introduction of CPS220 (Risk Management Prudential Standard) into APRA regulated entities has seen a much stronger focus by Boards on risk culture. Yet an October 2016 APRA update on the topic commented that most institutions still seem to be grappling with how to get risk culture embedded into the actions and behaviours of the people who work in these businesses. I believe that where effective professionals thrive, risk culture will be strong. So what do these people look like?

1. They Know Their Business – They take time to look back and understand the events that have shaped where their business is at today, what can go wrong and what can be learnt. They look forward and think about how different scenarios might impact the business plan and purpose. They know their customers, and understand how risk, return and capital all need to hang together to deliver in the long term.
2. They Collaborate – They have learnt that they will get better outcomes when they work with others around a common purpose, than when they work alone. They welcome review and challenge, and respect those whose role it is to provide this.
3. They Take Accountability – They know how their role fits in, where their responsibility starts and ends, and when to defer to others. They are bold, but also know when to pull back and show restraint.
4. They Lead With Integrity – They influence by being an example and are disciplined to stick to the process particularly in times of stress. They know that work and life must be in balance to sustain their personal effectiveness. They understand that community trust is the foundation of the effective working of the financial services industry, and do their job with integrity.

What the financial services industry needs, and the community demands, is a renaissance of the effective professional. So what can Boards and executives do? They can train their staff to be more effective professionals, ensure incentives reward and promote the effective professional, provide leadership (tone from the top) role modelling the effective professional, ensure only effective professionals are recruited (and “ineffective

unprofessionals” managed out) and establish a purpose and plan that is both customer and people focussed.

In my work in financial services, I meet so many effective professionals every day. Right now the industry just needs more of them, and in positions of leadership. So let’s bring on this renaissance of the effective professional, and the bright future of an industry where risk culture, community trust and confidence is strong.



## I am an Actuary

By Martin Mulcare

Following the Professionalism Course, Martin Mulcare presents the most recent instalment of the 'I am an Actuary' series. Read on to find out more about six young and ambitious actuaries.

### Brendan Fehon



Standing on top of the spire of Centreport Tower in Sydney is a long way from the Professionalism Course. However, my career has managed to take me from the top of a tower to being able to call myself an actuary. I was a latecomer to the actuarial profession. While finishing my Engineering and Commerce degrees, I thought a management consulting job was where I wanted to be. I stumbled upon Trowbridge Deloitte and Actuarial consulting. It was a great role, solving business problems with rigorous logic behind it. I knew I had a bit of study to do, but how hard could it be...

So my actuarial career started at Trowbridge, where I enjoyed working on a variety of challenging projects across the financial services industry, including what were then non-traditional areas like customer analytics. After my 8th year of study post school, and no end in sight, I decided to take a break. I made the big

decision to go back to work as a structural engineer. I was able to work on iconic projects including modelling Centreport Tower as part of its redevelopment, BridgeClimb and a 1000m high building.

However, the actuary in me was still there, and so after 6 years working as a structural engineer I made my way back. Deloitte again offered me a role where I could utilise the skills and expertise I gained in engineering within an actuarial team. Late in 2015 I made the move to a corporate role at TAL. It is here that I have been able to see the value that actuaries make to peoples lives on a daily basis.

So 12 years after I sat my first 100 series exam, I found myself sitting in the Professionalism Course so that I now can call myself an 'Actuary'.

## Francesca Hetherington-Kirby



Signing up for actuarial studies at the end of my school career, it's fair to say that I had no idea what I was getting myself in to. Someone had told me that it was a good option if you liked maths but didn't want to end up an academic. I had some sort of inkling about lots of very hard exams, and some further study after uni. But as someone who never shied away from tough academic situations, this didn't put me off.

Little did I know that it would be eight years and a lot of blood, sweat and tears before I would finally be on the cusp of becoming a qualified actuary. I took a couple of years off to travel along the way, and started my graduate position at Finity Consulting in 2015.

Going from spending a year in hostels where the toughest challenge was trying (unsuccessfully) to not get robbed, starting work was hard. My brain was rusty and the learning curve steep. After floundering a little, I eventually rose to the challenge.

I now spend most of my time valuing Christchurch earthquake liabilities (yes, they still exist). I also dabble a little in pricing, and various other projects.

I've found the consulting life to be pretty much as advertised – yes, there is the opportunity to get involved in a lot of different things. Yes, you do learn a huge amount. And yes, the hours are long! Let's just say I'm looking forward to my upcoming holiday... but in truth, I love the job and have found it to be a great starting point for my career.

## Chung-Yu Liu



During Year 12, my high school economics teacher mentioned I should look into something called “actuarial studies” as a possible career option. A couple of Google searches painted me a career path which promised a lot of problem-solving in a business context using probability and statistics. The prospect of getting financially rewarded for doing something I enjoyed was quite difficult to say 'no' to, so I promptly put down actuarial studies at UNSW as my first preference. Five years later, I came out with a double degree (with a maths major purely out of interest) and no regrets.

My actuarial career started in IAG as a motor pricing analyst, where my main role was to provide statistical analysis of the expected technical cost and customer elasticity on the motor portfolio, all of which are factored into devising pricing strategies. One of the most valuable lessons I have learnt in the last 3.5 years has been how to communicate technical analysis to a non-technical audience. This is crucial in transforming solid insights and knowledge from data into actions which deliver real value for both customers and the insurance company.

Given the recent popularity in “big data” and “machine learning”, I have had opportunities to try out newer data science techniques in order to glean deeper insights into our customers' behaviour. I think the growing popularity of data science provides actuaries with new opportunities not only as practitioners of these methodologies but also by being the bridge which connects data science to better decision making within the company.

## Nicole McKinnel



The first time I heard of the actuarial profession was from one of my sixth form teachers in the UK, who mentioned to me in passing that it was a great career for mathematically minded people. I had already decided I was going to be a doctor so ignored the advice. Yet when I moved to New Zealand my love of mathematics won over and I decided to study it at university instead of medicine.

Throughout my degree, I always had an actuarial career in the back of my mind so I jumped at the opportunity to start work as a GI Pricing Analyst straight after I graduated. This provided me with a massive variety of work, from generalised linear modelling for technical rate reviews to algorithm system design, migration and testing, to using GIS software for mapping earthquake claims.

More recently I have moved into Portfolio Management. I am now focused on profitability and premium growth at portfolio and brand levels, as well as recommending solutions for declining books. This gives me the opportunity to engage with stakeholders across the business. I love that in my job as no two days are ever the same.

The profession is much smaller in New Zealand than in Australia, with only three of us studying in Christchurch. The Professionalism Course held in Sydney recently was a great chance to meet people and it struck me how diverse the profession is. I was inspired to take control of my own career and make the most of my opportunities.

## Jesse Treharne



I'm not your typical actuary. I'm outgoing, definitely not risk averse, actively seek change, and I don't have a good eye for detail.

Originally I planned to use the skills I got from actuarial studies for get-rich-quick algorithmic trading. Wrong! Then, whilst at UNSW, I interned in superannuation at Mercer, but in classic Gen Y style I needed to find myself, so deferred a semester to become a ski instructor in Canada. Besides, doing Part II at uni meant deferring wouldn't even delay my graduation. Awesome!

I strongly considered a career as a ski instructor but returned to Sydney, taking an offer at a non-bank mortgage lender creating forecast models for non-conforming RMBS. Upon graduating, I moved to their subsidiary (a securitisation-focused credit fund manager), created models/processes which allowed them to grow five times in three years without hiring more staff, and became a portfolio manager along the way.

One Valentine's Day, I delivered roses for fun as a courier. Using a route optimisation app, I finished hours before all other couriers, so I started exploring optimisation algorithms in R. Then, I taught myself Python and started a route optimisation SaaS business ([tarotrouting.com](http://tarotrouting.com)) in my spare time. We're now onboarding our first few users, and I've cut back to part time at the investments business.

Actuaries: Don't ever think you're locked into a career path and don't hesitate to change specialisations or jobs. You can always go back to your old career (or equivalent) if you realise you don't like the new one. And if you know anyone who needs route optimisation...

## Aaron Tse

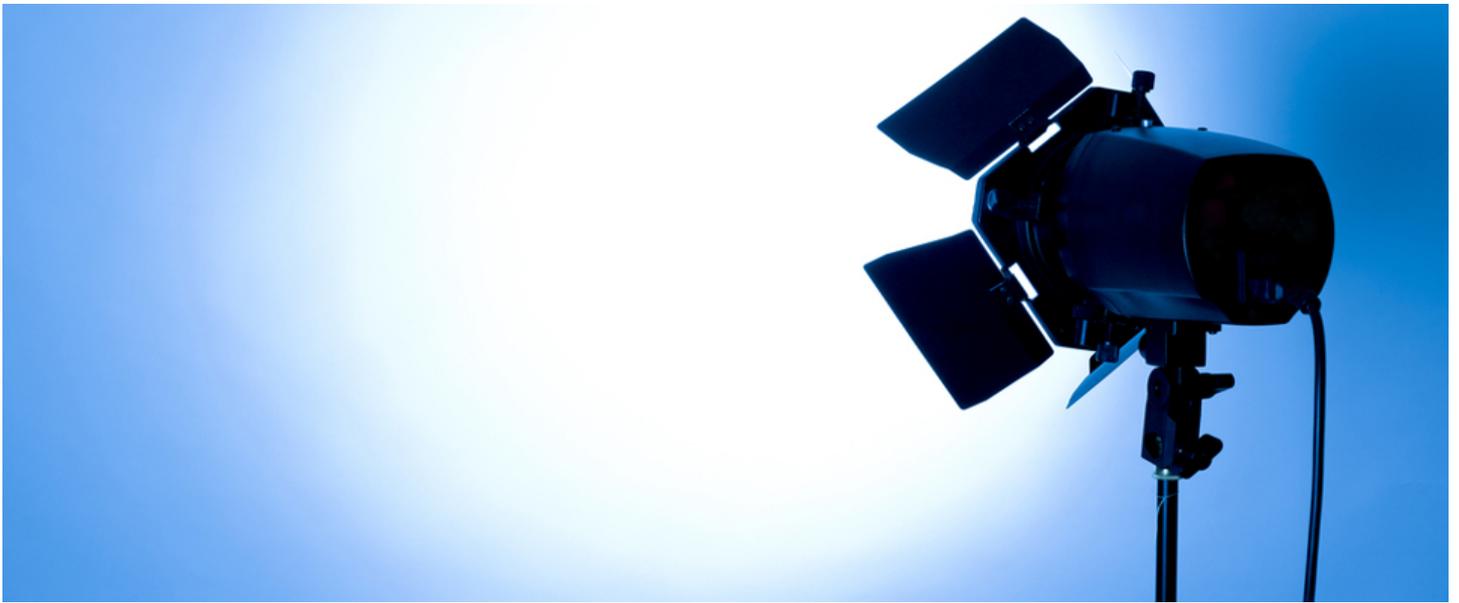


Finishing high school and having studied unit 4 maths and music/music extension I was faced with two paths. To embark on a music career or take the safe option of doing a course like commerce, law or engineering. After speaking to many people including accountants and actuaries alike I chose to take the safer commerce path at the University of New South Wales. It was only in my second semester of my first year that I chose to take the actuarial path, a difficult one but one that I have not regretted to this day.

I began part time work in the last year of my degree at Wesfarmers Insurance whilst completing my triple major in Actuarial, Finance and Financial Economics. During my time at Wesfarmers, I enjoyed an array of projects including pricing, reinsurance, natural perils modelling and economic capital modelling. As a smaller general insurance company, this gave me exposure to all aspects of building an Actuarial Control Cycle from scratch.

After the IAG and Wesfarmers merger in 2014, I worked extensively with the CGU pricing team in Melbourne after eventually settling in a more business facing role in a portfolio and pricing role in the Commercial Insurance underwriting division. From there, I moved into a technical pricing role in Workers Compensation. I eventually settled into an Actuary role in the IAG analytics team where my duties could range from big data to detailed technical pricing or machine learning.

Outside of work I enjoy snowboarding, skiing and playing the guitar. One day I wish to work overseas and be a snowboarding instructor - as well as a fully-fledged Actuary!



## [VIDEO] Under the Spotlight: Kirsten Flynn

By Kirsten Flynn

Kirsten Flynn has just touched down in Alabama, USA to start a new secondment with her employer's (TAL) sister company. This outgoing, country music-loving Project Actuary lets us in on some of her hopes, dreams and pet peeves.

View the video here:

<https://youtu.be/X2QGejIAgns>

**"I have not matched the level of exuberation I felt [when I qualified]"**

**What do you like doing when you're not working?**

I really like boxing. I actually box with some of my work colleagues which is really good fun. There's nothing more satisfying sometimes than hitting your boss...

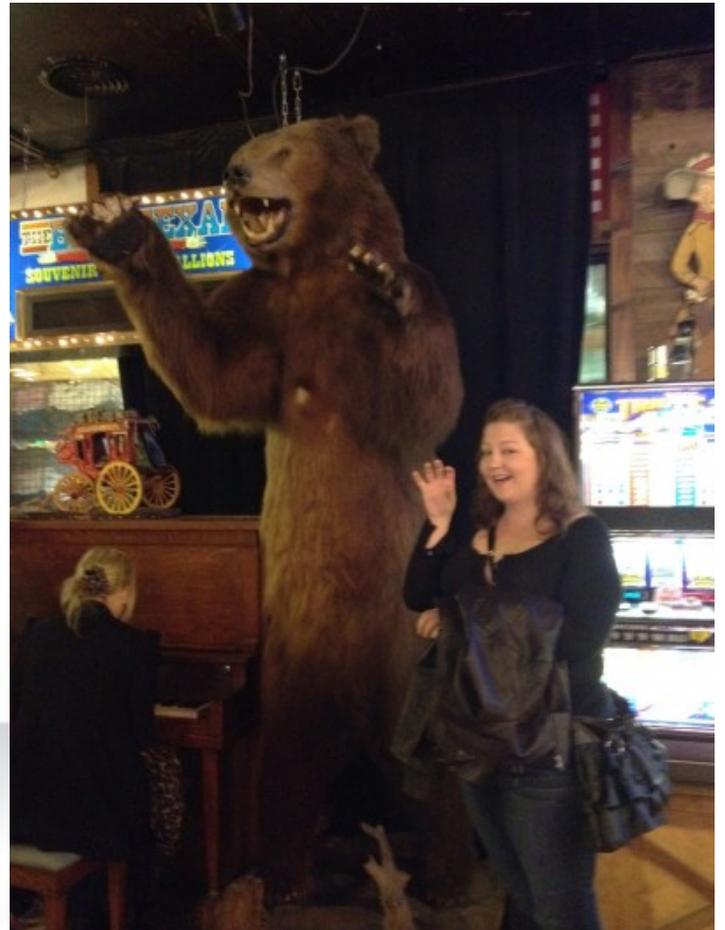
**What gets your goat?**

People who don't sit in their assigned seats (e.g. in cinemas)! You either have to ask them to move (and then they think you're being neurotic) or sit in another seat (and then worry that someone else is going to ask you to move). I just end up stressed out!

**How has being an actuary affected your life?**

Getting through your actuarial exams is hard but not impossible and someone once described it to me as survival of the fittest. Those people who become actuaries are not necessarily the smartest people, they're the people who fail an exam, and get back up and do it again. Being an actuary has made me very resilient and that definitely extends to my personal life. And now it's allowed me to move to the US and pursue my passion for country music and travelling around a lot more.

*"I spend a lot of time trying to convince people that*



I'm not a nerd...people make this assumption that I love science fiction... I'm like, I haaate science fiction"

**You recently did 'cultural training' for your secondment, how was that?**

TAL brought in a cultural coach to help prepare me for working in a different culture. I was surprised at just how different the work culture in the USA is to Australia! I'm going to have to watch my words a little, a word in Australia can mean something very different in the USA (e.g. thongs).

**What are you looking forward to about working as an actuary in Alabama?**

Professionally, I'm looking forward to the opportunity to try something different (I'll be working in a product development role instead of my current financial reporting role) and see just how transferrable actuarial skills are! Personally, I'm looking forward to wearing my cowboy boots more often and trying waffles with fried chicken and maple syrup (an Alabama delicacy I'm told).



“The ‘aha’ moment when you solve a challenging problem, it could be something small like understanding why your model hasn’t run, when you solve that problem, that ‘aha’ moment is just fantastic”

Also by Kirsten Flynn:

[9 things I learned after becoming an actuary](#)

[Looking for love?](#)

Kirsten regularly contributes to Actuaries Digital, see all of her popular articles [here](#).

**What was the last book you read?**

A trashy teenage novel! I've had to downsize my book collection considerably in preparation for my move and had a few book series from my teenage years I never finished reading. I wanted to read these before I left (I'm about 75% there, the rest are coming with me).

**What's been your proudest moment as an actuary so far?**

Inspiring others to become actuaries! I'm lucky enough to get speak at high schools and universities and I feel so proud when students come up to me afterwards to say that I've made them interested in becoming an actuary.

**If you won the lottery what would you do with the money?**

That depends on how much I won! Assuming I hit the jackpot, first would be a nice long holiday to the USA (to finish visiting all 50 states) and Europe (to visit my brother who lives in London). After that I'd try to do something financially responsible, like finish paying off my student loan, contributing to super and buying a house in Sydney (winning the lottery is the only way I'm going to be able to afford that)!

**In an alternative universe, what career would you be in...**

An Actuary. I actually can't imagine being anything other than an Actuary (but I'll definitely start thinking about this now....)



## Actuaries star at 2016 Insurance Industry Awards

By Actuaries Institute

The Australian and New Zealand Institute of Insurance and Finance (ANZIIF) has announced the winners of the 2016 New Zealand Insurance Industry Awards.

The winners were honoured at the 5th annual ceremony in Auckland last Thursday (10 November).

For their outstanding policies, strategies and programs aimed at developing potential, AA Insurance was awarded both the inaugural Youth Development Employer of the Year and Women’s Employer of the Year.



The coveted Innovation of the Year Award was awarded to NZI for their NZI Safe Driving Rewards Program which uses telemetric data to establish behavioural benchmarks and assess insurance risk for heavy motor vehicles.

Also recognised at the Awards were three industry individuals who have shown outstanding achievement. Willis Towers Watson’s Eugene Sabitov was awarded Young Insurance Professional of the Year, David Crick of

Runacres & Associates was named Broking Professional of the Year and Jim Harris was the deserving recipient of the ANZIIF Lifetime Achievement Award for his long-standing service to the industry.

Prue Willsford (pictured above), CEO of ANZIIF, said that “Despite the challenges the industry has faced over the last year in New Zealand, the individuals and businesses honoured tonight have exhibited outstanding creativity and adaptability.”

“Submissions this year to the Awards were of both a high number and quality, and these winners represent the best the industry has to offer. Their evolution and contribution does great service to the New Zealand insurance industry and its customers.”

Finity Consulting was recognised as Professional Services Firm of the Year.



(L to R): Scott Collings (based in Sydney), Nic Warren, Sam Cosgriff, Kristee Hardacre, Simon Young, John Smeed (all based in NZ).

“We’re delighted to be named 2016 Professional Services Firm of the Year and be recognised for our commitment to the New Zealand insurance industry,” said Scott Collings, Finity Managing Director.

"Finity was also the proud recipient of the 2015 Professional Services Firm of the Year in Australia and is now the only actuarial firm to have won this accolade in both Australia and New Zealand."



*John Smeed from Finity's NZ team accepts the 2016 ANZIIF Professional Services Firm of the year Award*

First time winners Frank Risk Management were awarded Small-Medium Broking Company of the year, with Rothbury Insurance Brokers taking out the Large Broking Company of the Year category for the third year in a row.

Direct General Insurance Company of the year was won by FMG and Intermediated Insurance Company of the Year was taken out once more by twice-previous winner Vero. Life Insurance Company of the Year went to AMP Financial Services NZ.

Service Provider to the Insurance Industry was awarded to JB Hi-Fi following their success in the category in the Australian Insurance Industry Awards earlier in the year.

## The full list of winners is:

### Small-Medium Broking Company of the Year

Frank Risk Management

### Large Broking Company of the Year

Rothbury insurance Brokers

### Direct General Insurance Company of the Year

FMG

### Intermediated Insurance Company of the Year

Vero Insurance

### Life Insurance Company of the Year

AMP Financial Services NZ

### Innovation of the Year

NZI

### Service Provider to the Insurance Industry

JB Hi-Fi

### Professional Services Firm of the Year

Finity Consulting

### Youth Development Employer of the Year

AA Insurance

### Women's Employer of the Year

AA Insurance

### Young Insurance Professional of the Year

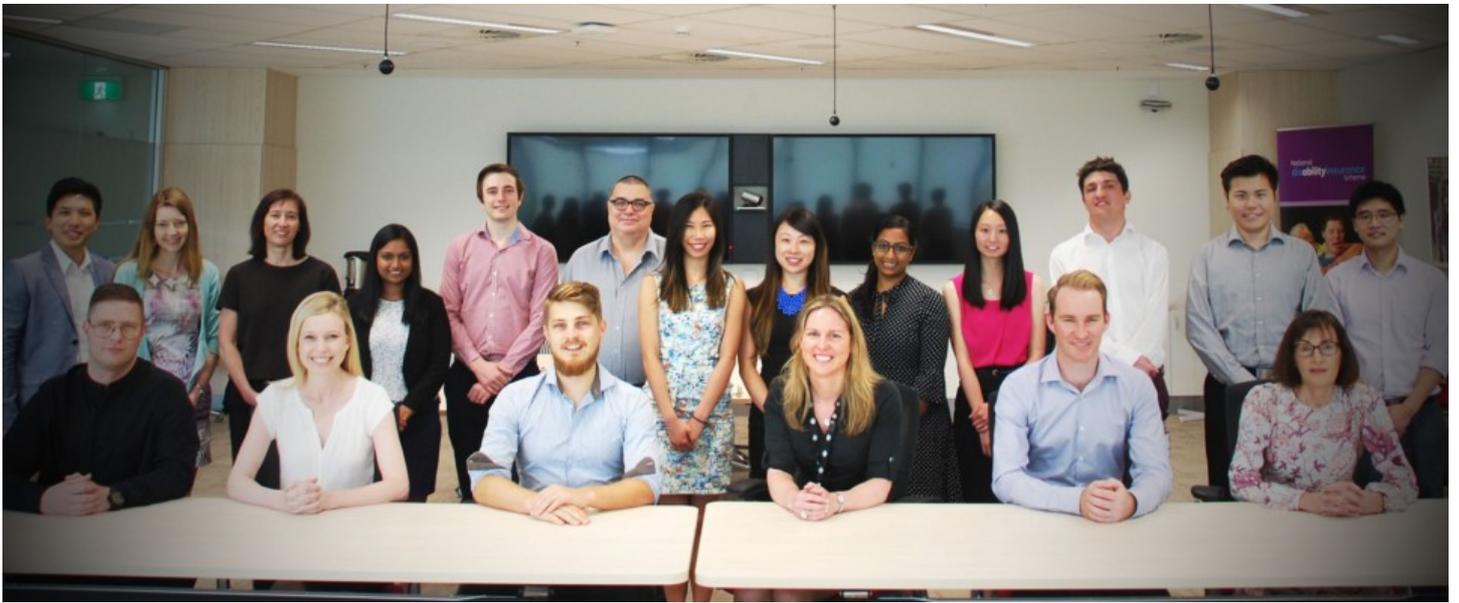
Eugene Sabitov, Willis Towers Watson

### Broking Professional of the Year

David Crick, Runacres & Associates Ltd

### ANZIIF Lifetime Achievement Award

Jim Harris



## The NDIS: Today and Tomorrow

By Jessica Twigg

Actuary and Director of the National Disability Insurance Agency (NDIA), Jessica Twigg, reports on the current state of the NDIS and some important lessons gleaned from the trial period of the scheme.

1 July 2016 marked the completion of three years of trial for the National Disability Insurance Scheme (NDIS) and the beginning of a new chapter in Australia's history; the rollout of the scheme across the country.

At its core, the NDIS represents a significant shift in funding and support for people with disability.

The Productivity Commission labelled the previous disability system as "underfunded, unfair, fragmented, and inefficient". The NDIS offers a nationally consistent scheme, where supports are tailored to a participant's individual needs.

The concept of "choice and control" underpins the NDIS, allowing participants to shape their goals, the types of supports they require and the providers who will deliver those supports.

Sarah Johnson, NDIS Scheme Actuary and the 2016 Actuary of the Year, will present a [concurrent session](#) on the NDIS at the [2016 General Insurance Seminar](#) in Melbourne on Monday 14 November.

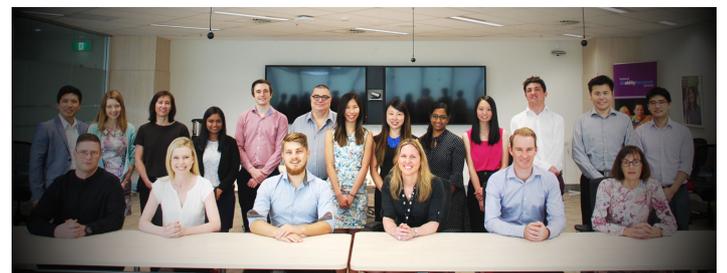
### The actuarial team

We now have the opportunity to apply the lessons learned in trial to a new period of change for the scheme.

By the end of trial, the NDIS was operating in nine locations around Australia, funding over 30,000 participants at 30 June 2016. Sarah has helped to guide the scheme through its first three years, building an actuarial and data team of over 40 people.

Tasked with monitoring and ensuring the financial sustainability of the scheme, the team has developed comprehensive reporting on the participants who have entered the scheme during trial, their characteristics and their costs.

This monitoring identified some pressures, including higher than expected numbers of children entering the scheme. The collection of comprehensive data has enabled the development of management responses to address these issues, including the introduction of the Early Childhood Early Intervention (ECEI) approach which provides a gateway to the scheme for children aged 0-6 years.



*The actuarial team for the NDIS.*

### A robust framework

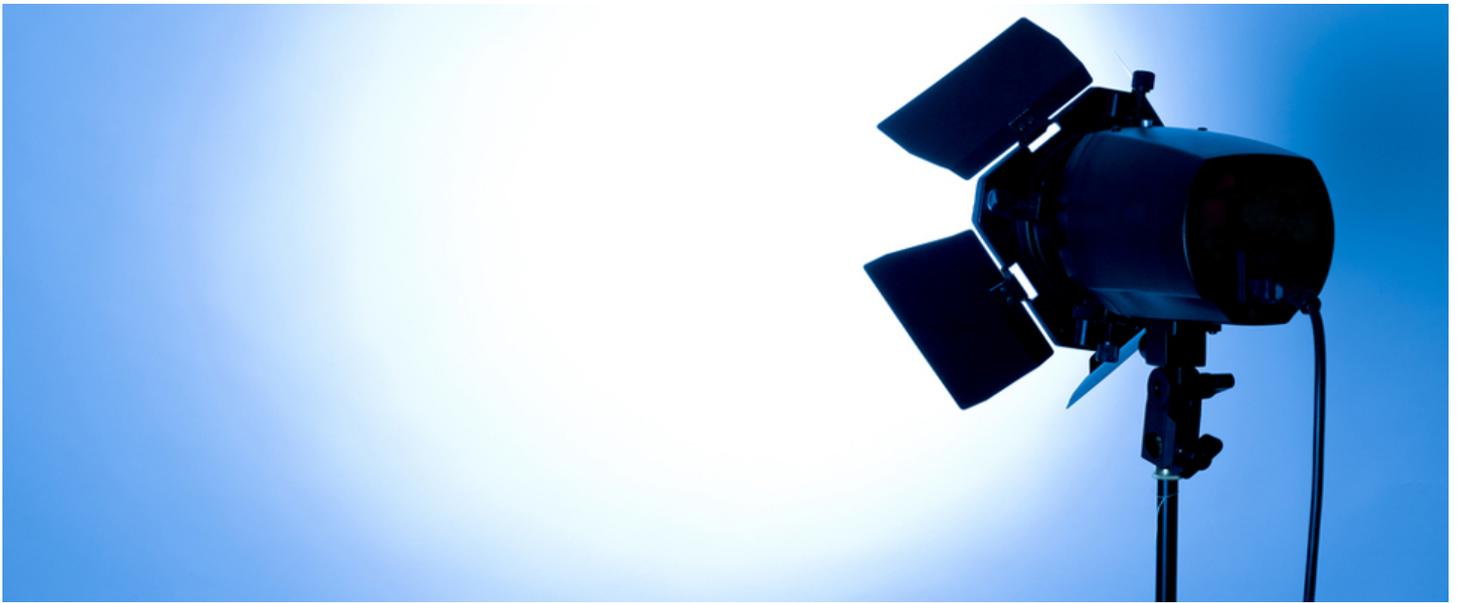
Over the next three years, the NDIS will grow to support more than 460,000 people with disabilities. This period of rapid growth requires a robust monitoring framework and the development of a suite of supporting tools and reports. Tools such as the Outcomes Framework and Reference Packages are essential in monitoring the scheme's progress.

The introduction of a new, more efficient planning process and a fit-for-purpose IT system will also assist the transition to full scheme. This framework will allow the continued monitoring of scheme cost pressures while ensuring people with disability are able to access the scheme, and the certainty of funding it provides, as quickly as possible.

At full scheme, the NDIS will represent one of the largest sources of data on people with disability, their supports and their outcomes, in the world. This wealth of knowledge will help the scheme fulfil its promise to allow people with disability to live an

'ordinary life', maximising opportunities for independence, and social and economic participation.

The significance of the scheme and its potential benefit cannot be understated - not only for people with a disability and their carers, but for all Australians.



## [VIDEO] Under the Spotlight: Avanti Patki

By Avanti Patki

*AMP actuarial graduate Avanti Patki wanted to be an actuary from a young age. She shares her thoughts on study, starting work in the traditional field, and why she is excited for the future unknown of her career.*

**View the video here:**

<https://youtu.be/416k31PCdL8>

**What was the last book you read?**

Memoirs of a Geisha (I'm a sucker for historical novels!)

**What do you do when you're not working?**

I love baking and trying out unfamiliar recipes. I also enjoy sketching, painting and modular origami. A couple of my experimental works are [below/above/to the right/to the left]. Boxing, crossfit and swimming help me destress while relaxing with a good book also helps to keep the balance (personal favourites include 'Gone with the Wind' and 'The Secret History').



Examples of Avanti's artworks



**If I hadn't become an actuary, I would be...**

This is a tough one as I've wanted to be an actuary since middle school but if I had to choose, I'd be a food critic in keeping with my passion for finding the best dishes among the world's cuisines.

**What gets your goat...**

Those who have a "victim" mentality. The following quote sums it up perfectly:

*"Whether you think you can, or you think you can't--you're right."*

- Henry Ford

**If you won the lottery what would you do with it?**

Being a finance professional, reinvestment is a must! Apart from that, I'd share the winnings with family and support a good cause (including non-profits working to eradicate human trafficking). Lastly, I'd likely spend a decent-sized portion of it on traveling to places like Kakslauttanan in Finland, which is one of my dream holiday destinations.

**What has been the most rewarding experience in your career so far?**

The most rewarding experience has been rotating across a number of diverse and fast-paced teams, including Insurance Strategy and Asset-Liability Management, this early in my career. It has meant that I've learnt to live on the edge of my comfort zone at work and fortified my stamina for rapid on-the-go learning.

**Not many people know this but I...**

...was lucky enough to travel to 12 different countries by the time I was eight years old

**Where do you see the actuarial profession in 50 years' time?**

I couldn't tell you even if I had a crystal ball because the profession could take as many paths as there are actuaries in Australia today. The future identity of the Actuary comes down to how far each of the young actuarial professionals of today choose to push the boundaries of the profession. Personally, I would like to see actuaries (and myself) actively becoming part of the solution for some of the more pressing global issues such as climate change, human trafficking, world hunger, biodiversity depletion, terrorism etc.



# Optimising Your Career

By Jas Singh

More than 40 enthusiastic members, including a high number of students, attended Jas Singh's recent career-themed presentation to the Perth Actuarial community. Here, Jas outlines his key takeaways.

With the focus of the discussion being on the 'optimisation of your career', key items discussed at my session included:

- Career Planning
- How to transition from pure technical roles
- Disruption in the workplace and opportunities for actuaries

## Career Planning



In my mind it is quite simple. If you don't have a career plan then this equates to getting into a car and while you sort of know your destination, you don't really have a navigation plan. This is likely to lead to erratic and knee jerk decisions which will potentially result in an unfulfilled life and career. Having a plan on the other hand will ensure you focus on the right things and optimise the returns from your efforts and hard work. It will also help you better evaluate internal directions or opportunities which you find yourself in at work, or as suggested by your managers. This will help you to take calculated risks and

evaluate different options objectively and clearly. Having a plan means you have thought about what you are trying to achieve. It does not mean you are focussed on only one way of achieving it, but in fact you are better placed to really assess your options and know when it is important to take a risk and move out of your comfort zone.

I am often asked about what time period in the future a plan should cover. There is no right or wrong answer to that but in my view you should look at least five years into the future and constantly review and evaluate the plan. Applying a simple control cycle approach (highlighted below) ensures you have a process for regular review, as the key thing is to constantly monitor your environment and to evaluate your career plans.



## Transitioning from Pure Technical Roles

Many actuaries want to move out of purely technical roles into either general management, a business focused role, a sales/relationship management role or a combination of these. To make a move of this nature requires careful planning, networking, awareness of the role requirements & opportunities. A focus on demonstrating a high level of EQ combined with your actuarial training can absolutely help you get there. It is fair to say that you will most likely need to take a calculated risk and move into a role which challenges you and develops different skills in you. This might be achieved by a move overseas or a move into a very different kind of job as a stepping stone to reach your final goal. My advice would be to do your homework, be aware of what you

are getting yourself into, develop a trusted network of advisers and be bold to take the necessary risks to achieve your goals. You only live once.

## **The future workplace - disruptions and opportunities for actuaries**

The World Economic Forum released a report in January 2016 based on an extensive global survey of major organisations on the future of work. The report heralded the Fourth Industrial Revolution and noted that in the future the most in-demand occupations or specialties did not exist 10 or even five years ago. The pace of change is set to accelerate and that 65% of children entering primary school today will ultimately end up working in completely new job types that don't yet exist. When considering the future workplace and roles which will be in most demand, two job types stand out:

- Data analysts, and
- Specialised sales representatives (who can explain new and developing technology to customers)

I conclude that mathematical and analytical skills will be in high demand and when combined with strong communication skills even more valuable.

Actuaries who are prepared to move into new and developing areas are well placed to bring a strong skill base from which they can develop their career. To benefit, I recommend being open to new ideas, to be aware of what is happening externally in the market and prepared to take calculated risks.



## Blockchain in Insurance

By Dimitri Semenovich

*Dimitri Semenovich outlines some of the foundational concepts of blockchain technology, ahead of his upcoming presentation on the subject at the 2016 GI Seminar.*

Many popular accounts of the original Bitcoin blockchain and its newer derivatives leave out the essential concepts required to understand these systems from first principles.

White papers talk about “automated audit”, “unprecedented financial services innovation”, “disruption” and the like, claims that without sufficient details will leave a jaded practitioner at best skeptical. In this respect, we have a situation not dissimilar to the still recent flurry of “big data” projects, albeit one where the subject matter is better amenable to concrete definitions.

In my General Insurance Seminar paper I have tried to explore some of the foundational concepts of blockchain technology, hoping to highlight those aspects that indeed might promise unprecedented opportunities for innovation.

First thing to note is that the original Bitcoin protocol combined together several (in themselves quite complex) ideas to create the complete system.

- Direct application of public key cryptography and related ideas to the facilitation of financial transaction (rather than their transmission, storage etc).
- A significant innovation in distributed consensus algorithms
- Smart contracts

It is thus generally a mistake to think about the “blockchain” as a single concept. Different applications may require only some of the above (in particular, smart contracts and cryptography are often of independent value from distributed consensus).

As all of these building blocks are likely to be novel to the readers with a background in financial services, in my paper I’ve tried to focus on them individually before describing their interaction.

Several blockchain native applications have emerged to date that are particularly relevant to insurance: distributed lotteries and prediction markets. These schemes offer a fascinating glimpse into what a truly decentralised organisation might look like and the ideas can be built up to even more complex arrangements.

While it appears quite unlikely that any such “from the ground up” designs will be able to replace traditional insurance products, there is considerable scope for new products that better fit the technology.

Block chain technology also encourages one to rethink many of the processes taken for granted in financial services.

One such example is audit – it is possible, for example, for a Bitcoin exchange to create public proof of the funds it controls without engaging an external party to validate its accounts.

Another example is “smart contracts” - traditionally, core IT systems in insurance and banking are very inflexible and require long and complex projects even for minute changes. Smart contracts invert that pattern – all of “business logic” is included in the transaction itself. A new generation of flexible core systems that focus only on executing smart contracts can dramatically reduce complexity associated with IT change management and allow for a much greater degree of customisation, automated settlement etc.

Dimitri will present his presentation and paper: [Blockchains, Smart Contracts and Possible Insurance Applications](#) at the [2016 GI Seminar](#) in Melbourne on 14-15 November. [Registrations](#) are still open.

For more on Bitcoins, why they work, and challenges for the system, read actuary Milton Lim’s comprehensive article: [‘Bitcoins, Banking and the Blockchain’](#).



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