Actuaries Institute Podcast
Title: ‘Data Analysis: an Enhanced Toolkit for Actuaries’ explained

Date: 26 November
Interviewer: Basem Morris
Speaker: Maggie Lee
Duration: 18:15

Basem Morris:

Welcome to the Actuaries Institute podcast. My name is Basem Morris and I'm an actuary working in data analytics. I'm a Director in the Business Algorithms Team at Deloitte Australia, and I'm also a member of the Actuaries Institute Data Analytics Practice Committee.

Basem Morris:	**Today I'll be joined by Maggie Lee, who is a Senior Lecturer in the Department of Actuarial Studies and Business Analytics at Macquarie University, and we'll be discussing a new and exciting data analytics subject, which is set to be rolled out by Macquarie Uni in partnership with the Institute in March 2021. The name of the course is *Data Analysis: an Enhanced Toolkit for Actuaries*. We're going to spend some time with Maggie, just to find out a little bit more about this course, who should consider it, and what you can expect from the course. So welcome, Maggie.**
Maggie Lee:	Thanks, Basem. I'm excited to be here today to talk about the course too.
Basem Morris:	**Cool. So, Maggie, before we start, the Department of Actuarial Studies and Business Analytics at Macquarie Uni, for those of us who studied at Macquarie Uni maybe more than a few years ago, the Department of Actuarial Studies will be quite familiar, but maybe not the Business Algorithms Department. Can you tell us a bit more about the department now and specifically the marriage of Actuarial Studies and Business Analytics?**
Maggie Lee:	Yep. Sure, Basem, I'd love to. So, Business Analytics is actually quite a new degree at Macquarie University. It was first introduced at the undergraduate level four years ago, and now at the master's level last year. So, this was really driven by the growing demand in the workplace for students to be equipped with the commercial and analytical skills to handle big data in roles such as data scientists, data visualization analysts, data insights analysts, and so forth. So, it's quite a multidisciplinary degree with a commercial focus, but a lot of the academics come from a variety of

backgrounds including econometrics, statistics, finance, and science.

Maggie Lee: Now, as an actuary, I've found it very beneficial and also exciting to be able to co-teach and also do research with our non-actuarial colleagues in business analytics, because it just gives that additional perspective and collaboration. This is also increasingly required in industry. So, we thought it would be good to mimic that in the courses we provide by having the two programs combined in one department.

Basem Morris:

That's really great. I mean, the team I work in is made up of both actuaries and data scientists and I think it works very well. I think for actuaries to remain relevant, we definitely need to become very familiar with all the modern tools, techniques, and technologies in data science. So I think it's great that you've combined that. So, on this course then, *Data Analysis: an Enhanced Toolkit for Actuaries*, who is this course tailored for? Who should consider doing this course?

Maggie Lee: Yeah. So, we did think a lot about the name. And so, as the name suggests for the course, the course is designed to provide an enhanced toolkit for actuaries who may be well-versed in the traditional actuarial techniques but are wanting to enhance their data analytics skills using the modern techniques. So those wanting to learn about the modern techniques and how they can be applied in the actuarial applications should definitely consider doing this course.

Basem Morris: **Sounds good. Now, what will participants get out of the course in terms of what will they learn? What toolkits will they take away with them?**

Maggie Lee: Yeah. So I think some of the key learnings that participants can certainly look forward to are, first of all, gaining an understanding of the concepts, the tools, and techniques of things like exploratory data analysis and machine learning, including supervised learning and unsupervised learning, and then how these can be applied as alternative approaches to the traditional techniques we use to solve actuarial problems on a day-to-day basis. Another key learning would also be learning how machine learning works, not just the underlying theory as many other online courses do, but also in practice through actuarial case studies. The benefit of this is that participants will then be able to directly apply what they have learnt from the course to their workplace.

Maggie Lee: Another key learning would also be gaining an understanding of the advantages and limitations of these modern machine learning methods and how to then communicate the implications of these

new methods to non-technical business executives. Lastly, I think one more key learning would be an understanding of some of the professional and ethical considerations when using these methods to perform analytical work in a business environment. So, in summary, all of this is really a practical deep dive of how all these modern data analytic methods work in an actuarial background.

Basem Morris: **Sounds like a good mix of both theoretical and practical, and the fact that it's tailored to actuaries as well is a plus. So, will the course be mainly focused on traditional actuarial areas?**

Maggie Lee: So, there will be a focus on the traditional actuarial areas, so case studies on insurance, for example, but we will also be introducing case studies in some of the non-traditional areas.

Basem Morris: **Oh, good. Sounds good. How long will the course run for and what is it the time commitment expected from participants roughly?**

Maggie Lee: Yep. So the course is split into eight weeks of course material, so that's probably about six to seven hours of commitment each week. Then we have two weeks for the assessment period.

Basem Morris: **I take it the course will be run virtually, so there'll be no need to attend to physical lectures.**

Maggie Lee: Yeah. So, there will be mainly the virtual components. So, that will be prerecorded lectures. Well, we also are planning to also have live sessions at the beginning and the end, and also consultations.

Basem Morris: **Great. But I guess the participants don't need to be based in Sydney or anywhere around Macquarie Uni. They can do the course from anywhere in the world, really.**

Maggie Lee: Yes, yeah, yeah.

Basem Morris: **Oh, excellent.**

Maggie Lee: So, it's all online.

Basem Morris: **Cool. Now, what's the breakdown of the assessments for the course, i.e., percentage rating of exams, versus assignments? How does that all work?**

Maggie Lee: Yeah. So, the main assessment will be the final assignment at the end where participants will be asked to complete what we call a capstone project. This is essentially where they get an opportunity to apply the knowledge and the skills in R, in data visualization, data wrangling and manipulation, data organization, and machine

learning, using a data set of their own choice. This assignment will be marked as either a pass or a fail, and you'll get feedback on that. It will be the only assessment that contributes to the grading of the course. There will also be weekly quizzes that help participants assess their own understanding as they progress throughout the course, but these will have zero weighting.

Basem Morris: **I see. So, the course sounds like it's quite hands-on where participants will be expected to get their hands dirty and code in R, but with a focus, obviously, on the practical considerations of using these tools. Is that correct?**

Maggie Lee: So, yeah, that's completely correct. They get to choose their own data set and explore things that they are truly interested in and apply the learnings that they've applied to an actuarial problem.

Basem Morris: **Sounds good. Now, Maggie, there are a lot of analytics courses out there these days, as I'm sure you know, multiple websites offering courses, certifications. What makes this course different to all the others?**

Maggie Lee: Yes. So, it has been specially designed to provide actuaries a one-stop source to learn modern data analytics and how it can be applied in the workplace. So, it's very different to the other data analytics courses because of the actuarial focus and, really, no other universities will be offering this actuarial CPD style course with the Institute.

Maggie Lee: Now, personally, I think this course would have been perfect for me when I started on my own analytics journey as a qualified actuary specializing in general and health insurance some years ago. Now, data analytics was not part of the education curriculum when I studied for the actuarial qualifications. This course is certainly something that would have made my own learning process in this area a lot more straightforward.

Maggie Lee: I think it's quite important for actuaries to develop their skillset in this new important area, so that we ensure familiarity with emerging techniques in a business environment that is rapidly changing. This course does just that. So, for actuaries who are also not currently thinking about applying modern data analytic methods in their work, I still think this course is very relevant. Machine learning approaches to data analysis are becoming increasingly more common in actuarial statistics and computing practice. So, this course will help you stay up-to-date with these new changes and is therefore great CPD.

Basem Morris: **Yeah, look, it definitely sounds like this course is quite unique. I mean, I haven't come across a course that's specifically tailored for actuaries, and it sounds good. So**

apart from actuaries getting CPD points from this course, are there any other credentials that participants will gain from doing this course?

Maggie Lee: Yep, definitely. So, you'll also be provided five credit points that you can use towards further programs at Macquarie University, as well as a digital badge certificate co-branded from Macquarie University and the Actuaries Institute upon successful completion of this course. So, something exciting to put on LinkedIn.

Basem Morris: **Yeah, definitely. I mean, to be honest, I was thinking as you were talking, I mean, this really fills a need because I know that currently the Institute is working on a part two, part three subject on data analytics. So, students will have their needs met when it comes to analytics training. But people who are finished studying who are qualified, who may have been working for a few years, there's really nothing tailored for them. So, this really does hit the mark. So, what does Macquarie University bring to this partnership with the Institute when delivering this course? Can you talk us a bit through that?**

Maggie Lee: Yep, sure. So, Macquarie University has quite a leading position in actuarial studies education, but also in the delivery of online programs for professionals, and a huge commitment to engage with the industry. So, you can see that through our prestigious global MBA program and other Coursera courses on data analytics, which really allows us to stand out as a partner for the Actuaries Institute in providing a data analytics CPD course for Institute members.

Maggie Lee: Now, we understand that those interested in this new CPD course will be experienced actuaries wanting to enhance their data analytics skills using modern techniques. Now, with our long-standing expertise in actuarial science, in data analytics, as well as our deep understanding of the needs of the Institute members, we are quite well-placed to bring the latest research, teachings, and professional insights that participants of this course will be looking for.

Basem Morris: **Sounds great. I mean, I can definitely relate to a lot of what you've said, given I studied at Macquarie. So, can you tell us about who will be teaching the course? What's their background? What's their experience in analytics?**

Maggie Lee: Yeah. So, in terms of the development of the course, Macquarie University has a wealth of experienced academic and industry educators that it can draw upon to successfully deliver this course.

Now, the key facilitators will include myself and Professor Pavel Shevchenko. So, I will be conducting the first four weeks of the course, while Pavel will be conducting the second four weeks of the course, so that forms the eight weeks in total.

Maggie Lee: I'm a senior lecturer in Actuarial Studies at Macquarie University. I'm currently teaching the new associate level actuarial data analytics principal subject. Also, prior to joining Macquarie University two years ago, I worked as a manager in the actuarial practice of Ernst & Young so EY and have eight years of experience in general insurance and health in Australia. So I have strong knowledge in the traditional methods used for pricing and reserving in general insurance, but have also started utilizing modern data analytic methods in my academic research, where currently I'm looking into the potential impact of artificial intelligence on the medical malpractice claim. Ultimately, I'm hoping to be able to share my knowledge on how actuaries can potentially utilize modern data analytic methods for traditional actuarial problems.

Maggie Lee: Now, Pavel is a professor in our department, specifically in business analytics, and also co-director of the Center for Risk Analytics at Macquarie University. For over 20 years, Pavel has been working in the area of risk analytics, analytics, leading research, and commercial projects on modeling of longevity and mortality, retirement products, option pricing and operational and credit risks. He's also delivered four university courses on machine learning and data analytics in finance and insurance for both Macquarie University, Vienna University of Technology, and UNSW, since 2016.

Maggie Lee: He's also currently teaching the new associate level associate data analytics principal subject with me at Macquarie University. So, we both have a passion in drawing insights from data, and I'm really quite excited to share with Institute members how we think data science can enhance the way in which actuaries work.

Basem Morris: **What do you think will be the most challenging aspect of this course?**

Maggie Lee: That's a good question. So, I definitely think one of the more challenging aspects of the course for participants will probably be to keep organised and up-to-date with the program as alongside their work schedule. So, each week is jam packed with quite a few new concepts from the data science world. It's important to keep up-to-date, so that you have the foundation to understand and work on the more complicated concepts as the program progresses.

Maggie Lee: Now, as part of this course, as I mentioned, there will be an opportunity for you to ask questions of us directly and of other course participants during the online discussion forum. Another challenging aspect may be using the R software. So we won't be requiring participants to be familiar with R before starting the course, but those who have not used R previously will need to spend some time getting used to this programming language and software. It's definitely worthwhile investing this time because R is an excellent language that has lots of functionalities in data visualizations, and wrangling, statistics, and machine learning, and a great language to know about in addition to what we typically use at work like SAS.

Basem Morris: **Yeah, I agree around the importance of R. I think if you do know one language or if you've done some sort of programming, it shouldn't be too hard to pick up another one. Cool. So, what's your message to a member who's considering enrolling in this course, but is unsure, maybe on the edge? What would you tell them to push them over the edge?**

Maggie Lee: Yeah. So, I guess this course is pretty much the unique opportunity for actuaries to learn more about modern data analytics. More and more research and actuarial projects involve the use of modern approaches to data analysis, particularly because of the need to draw insights from large quantities of data. Now, this large volume of data that we have today really does create complexity and challenges. This course will give you an opportunity to learn how to apply these methods to draw valuable intuition and insights from such data.

Maggie Lee: Now, the course will be taught by actuarial academics with experience teaching this content, and we'll be using actuarial case studies wherever possible. It represents a great opportunity to enhance your analytics toolkit, accrue some CPD points, 150 points in total, and to take a big step towards applying modern analytic methods to problems of real interest to actuaries.

Basem Morris: **Sounds good. Any final comments from you, Maggie?**

Maggie Lee: Yeah. I guess I just want to finish off by saying that there are so many ways to analyse data these days. And so, it is beneficial to get a better understanding of the popular techniques used by data scientists today. I mean, as actuaries, we should always be undergoing professional development. Learning the new state of the art tools and techniques in the course will most certainly make you an even more well-rounded actuary of today. So, we look forward to seeing you all on the course and to helping you develop your skills in modern approaches to data analysis.

Basem Morris: **Maggie, it was very nice to speak to you today. Thanks for joining us and all the best with the course next year.**

Maggie Lee: It was a pleasure, Basem. Thanks so much for having me.

Basem Morris: **Cool. We hope you found this discussion informative and enjoyable. You can find out more information about the data analytics course by visiting the Actuaries Institute website, where a program brochure will be made available shortly. I'd like to wish you all the best on your data analytics journey.**

Basem Morris: **To listen to more podcasts, visit the podcast section on Actuaries Digital. And as always, please write in with your questions and comments, feedback on the show, as well as any suggestions on ways the Data Analytics Practice Committee can help you on your data analytics journey. We'd love to hear from you. I'm Basem Morris, and bye for now.**