Actuaries in Data Science with DS:

Interview Transcript

Julia Lessing: Hi, everyone. Today we're talking to Daniel Stone. Daniel is a qualified actuary and a data scientist with 20 years' experience across a range of fields, including life insurance, reinsurance, consulting, and expert level model building.

He's worked in Australia, South Africa, the UK and Southeast Asia. And his recent experience is in applying big data and cloud technologies, data engineering automation, and the application of statistical and data science techniques in life insurance and actuarial pricing. In his spare time, Daniel enjoys spending time at the beach with his family and making a deep run-in poker tournament. Daniel, thank you so much for joining us.

Daniel Stone: Thanks very much. That was a bit of a mouthful. Great to be here.

JL: So, Daniel, lots of people know you as one of the first life insurance actuaries to bring data science into their role. Can you tell us a little bit about how that came to be and how you got to that point?

DS: Yeah, well, I've always been, I guess, a coder or a modeler, as you'd say. Even in university, when I did my final thesis, I picked trying to pick the stock market with a statistical model. And I thought I was going to be this this millionaire. But it turns out it wasn't statistically significant. And I had to continue with my actual exams and continue with that. But from there, I continued to really be more down the programming, coding, technical actuary. I was self-taught in the Prophet software and even spent some time in the UK during that Solvency 2 boom period. And funny thing, around 2010, one of my best friends from uni was easily the most intelligent person I thought I knew; he suddenly did a master's in machine learning.

And I thought, what's he doing computer science? Turns out that was the more accurate term for AI. And that really got me curious that a person who was seemingly very successful in as an actuary, now became a data scientist, really. And when I went to Singapore, I was working with EY, and they were focusing a lot on applying data analytics in banking. And during that time, I started developing some thoughts and some offerings around doing data analytics in the life insurance space. Because really, when I returned back to South Africa, I met up with a startup company who were developing some AI tools for telematics. And I joined as an interim CEO to represent them.

And this company was doing true AI. I'm talking about Marvin Minsky kind of AI stuff, and I had caught the bug. And luckily, later that year, I found the perfect role for me here in Australia, with TAL, where I was asked to incubate the data analytics function for the group insurance team. And credit to Darren Wickham for his vision in realizing the opportunity for analytics to improve the offering of TAL and of the insurers to the superfunds.

JL: Quite a visionary, Darren is.

DS: He's a brilliant man, for sure. But quite a few years went by, and I was tackling various problems around improving the pricing process, replacing some of the traditional actuarial methods that were in Excel and other tools. Also going down the operational route, how can we be more efficient in the way we deliver underwriting decisions, and that was through an improved underwriting rules engine, using natural language processing, deep learning models, really trying to find what's inside the underwriter's head when they make those decisions outside of the engine. But it was during the time I really believe that I had an opportunity to bring my data science knowledge I'd learnt tackling some of these other problems back into the actuarial space. And I started focusing, and that's what I've been doing recently, is in pricing automation, converting some of the traditional methods in Excel and some of the traditional actuarial methods into more statistical methods, like survival methods for termination analysis, or being able to visualise things at a much more granular level than we previously were able to do.

JL: So interesting, Daniel. So, it sounds like you already had an interest in coding right from the get go, and the actuarial degree was something that you still needed to pursue in your studies and your work there because you still needed to pay the rent and keep doing that.

But then some opportunities arose where you were able to bring your interests and some of those other opportunities that we might not think of as traditional actuaries and get some experience doing some different things and applying some different techniques in different areas, and more broader business type challenges as well beyond what we think of in terms of just pricing a new product or valuing a product, which often as life insurance actuaries, that's where we spend most of our time.

And so those opportunities arose, and it all kind of culminated, you were ready to take those opportunities on when they came to you, and then you were able to transfer that back into a life insurance and actuarial context. It's really interesting.

DS: Thank you. I think, you know, back in 2014-15, there wasn't many actuaries using true data science techniques. You know, we had some GLM models and things like that. And I had to almost go away to find out what really was available to then return back into the sector. And I think the market's ready to utilise these techniques. And most insurers are aggressively pursuing that right now.

JL: Well, it's a great way to stay competitive, if you can bring those new techniques in and derive some new insights. Sort of feels like life insurance was maybe a little bit slower off the mark in terms of using some of those techniques, perhaps compared with our GI actuarial colleagues, who have probably been doing that for a little bit longer.

DS: That's right.

JL: Yeah. So, you know, I'm probably one of those older, you know, I don't do a lot of life insurance anymore, but I did start my actuarial career in life insurance. And I remember at

the time, we just did a lot of things in Excel, we didn't sort of, and I'm sure that's changed since the days that I was practising as a life insurance actuary. But I know a lot of people kind of our generation who are a little bit older, and maybe didn't learn how to code at uni, and maybe don't know very much in the way of, you know, programming or machine learning. What advice would you have for older actuaries like us who might be wondering whether it's too late to learn data science and apply that at work? Have we missed the boat?

DS: No, I think the answer is in your question. It is never too late. And I mean, it is never too late. The best example I can give you is Francis Burgess. He's an actuary with 30 plus years of experience. And, in my opinion, he's the best group pricing actuary in the country right now. He is certainly, a genius for sure. But a few years back, he came to me and said he had been learning R and SQL on the holiday, and he had taught himself from scratch. And he's never really looked back since then. And now he's applying advanced statistical methods to these traditional group pricing problems. And he's taken on that ethos of continuous learning. And he's truly the example of it's never too late to pick it up, pick anything up.

JL: He just taught himself on holidays.

DS: Yeah, there's a few tools that are amazing out there these days. You've got things like DataCamp and other methods of learning that people can use.

JL: Fantastic. Well, I might ask you some more about that at the end. And we can put some links in the show notes as well about what actuaries can do to learn some of those skills. I want to talk for a little bit about leadership. So fellow actuary Andrew Yin nominated you for this discussion on the podcast. I understand Andrew's worked for you before and I came across Andrew when he was stepping into that first people management role and he identified you as a great leader, and someone he admired. So, I wondered if you can talk us through, you know, clearly, you've got a reputation for being a leader who looks after their team. So, I wondered, Daniel, if you could tell us a little bit about your thoughts and views on what makes a great actuarial leader.

DS: Very happy to hear Andrew's progressing so well. He's a really talented, young actuary and he's got a promising future. I guess the key word is to lead and not to manage. And to lead by example and lead by vision rather than kind of by force and by authority. Secondly, you know, empower your team really, give them opportunity to give it a go and make it well known that you encourage that. Generally, we have very talented actuaries out there and they generally do succeed at finding some sort of solution even when thrown somewhat in the dark. For me, I've never liked to be micromanaged and that's the way I approach it.

Each person has their own approach, they have their own flair and most of the time they can come up with a very similar solution that you might need to mentor or, or show some sort of guidance and what you're looking for, but allow them to have their personal flair and that will really allow them to feel like they are in charge of their own destiny. The last thing I was thinking was really provide the space and time, you know, for learning is, we often talk

about, as I said, continuous learning, but if we don't give people a. the space and b. the time to do it, it will never happen. And BAU will just continuously come around.

So, earmark time in your workday where you've given people that opportunity to learn something new or try something different, or even take an existing business problem and attack it from a different angle.

JL: And that can be really hard to achieve in our busy calendars. How do you practically carve out time for that? How do you do it personally?

DS: For me, I guess I have certain learning objectives that I have set myself every six months or so. And a lot of those have, you know, other courses or targets that are well embedded within those. But generally, I'm doing it after hours in my own time. As you know, with young kids and family, it is difficult, but once you get a bit of momentum, it really kicks over. So, it's getting over that first hurdle. But in terms of the team, typically, it's giving them the freedom to find that time rather than dictating the time because something always comes up.

JL: So how do you empower your team members to find time to do those things? You said you don't sort of enforce it, but how do you empower them to find the time and make the time? Is it through role modelling? Or have you got some practical tips on how to do that for team members?

DS: I think people have to somewhat own their own journey, to be honest. You give them the tools, but it's up to them. And most people, if they don't want to do something, they will find work to do during that time. If you give them the opportunity, and people have that right intent, they will take it. So, I also don't believe in forcing people to do anything they're not willing to do.

JL: Yep. Excellent advice. So, what I'm hearing, Daniel, is that the kind of leader you are, is one who is self-disciplined and self-driven, you've got your own goals, and you make your own time to continuously develop. But you also don't micromanage your team, you understand that they're very capable, and you set the vision and you lead the direction of the team, but you give them some room and autonomy to work out how to do that for themselves and to set their own goals as well and to do that.

So, I'm really curious then because often as managers, and I know I'm going to use the word interchangeably, and I know that leadership can be quite different to management, but sometimes when we step into that first people management role, and we're managing a team, and we think, oh my gosh, I've now got so much to do, I'm managing the team, I've got new objectives, I've got new senior people I need to report to, there's so much to do.

How do you balance the responsibilities of being a team leader, and getting things done with the need to not micromanage your team to give them enough room to work things out for themselves and maybe make mistakes, and maybe manage their own challenges that

they have going on? How do you balance that need to deliver without overloading your team members and without micromanaging them?

DS: Certainly, I like to lead by example. So, you know, during those busy times, you don't just bark out an order and walk out the door at 6pm and say, can I have it in the morning, which I did experience a little bit while I was in Singapore, it was quite that hierarchical structure. It's really to show that you are there with them, that you are willing to get down and dirty with them and show that your commitment to this goal is there.

But then on the back of that, you really need to live that peak and trough theory, you know, a lot of people talk about peaks and troughs, peaks and troughs. And what often happens that you have peak and normal, peak and normal rather than peak and trough, is during those troughs truly provide, again, space and time for people to recover and recuperate from those peak periods. So not trying to discount that peak will or won't happen in the future, but recognize when it's when it's not, to not just re overload them with something else just to get them back to normal status. I know in the consulting space, that's really challenging because you've got clients and targets and deadlines. But there's a real problem with burnouts in the consulting space in my opinion.

JL: So, you recognize those troughs and you go, you know what, we don't have as much to do now. So, let's just take advantage of that. Use that time to do some other things or refocus or rebalance or recharge.

DS: So yeah, yeah, yeah, take the time, truly give the time off and often give them that opportunity to do the self-learning or, or just rest. People need that, certainly.

JL: And so underrated, so underrated rest, isn't it?

DS: That's right. With the work from home opportunities we've had, I think people are finding more recently, that balance is starting to materialize more where people can take off time at 2pm because they want to go for a walk now rather than at the end of the day, it's too late. And allowing your time to have to have the flexibility to recharge when you feel your recharge is most appropriate. And some people are morning, and some people are afternoon kind of work or evening workers. So live, use that opportunity for flexible working rather than sticking to the exact timeframes that people have been traditionally working to.

JL: Yeah, yeah, yeah. Great advice. And I can see how that that would trickle down. And I can see now why Andrew has even just in this short discussion, I can see why he's nominated you as a great actuarial leader who not only develops their team, but also, you're looking after people as well. And you're still getting things done. And you're making sure that things are happening, but there's enough time for rest as well.

DS: Yeah, the other thing to do is someone to identify the important things to do versus the perfect solution. And we often talk about that. But as actuaries, we love perfection. We love the detail. We love that micro accuracy level.

JL: True. So true.

DS: You can get to 99 or 95% accuracy very, very quickly, actually. It's that last 5% where theoretically, it is true to do your exposure by day rather than by month and things like that. But if you round it down to the final result, it could be 0.02%. It's deciding when is enough enough, because you can always get more accurate than what you've got right now. So, identify what I call the battlegrounds for where the materiality is, and focus your energy on the what I call the battlegrounds.

Where in the group insurance spaces, where are the areas where the big decisions are going to be made, where you need the additional analysis, and where the areas where it's relatively standard, apply it and move on and focus and deep dive into the areas where if you focus on everything, you're not going to be able to identify those true trends. But at the end of the day, you know, I put my team's well-being first over deadlines. And that's what's important to me.

JL: Well, unless we have well-being, not a lot is achieved. So it's important for us to look after each other. But that will also have a knock-on effect to good productivity and good business outcomes as well. So absolutely agree that well-being is fundamental. And I can see that you you live that in the way that you lead your teams. So. So, speaking of teams, and you've done a lot of hiring over the years, can you tell us a bit about the skills that you look for when you're hiring people to join your teams?

DS: The first thing I look for is willingness to learn, as you can see, as part of my ethos, anybody that arrives and thinks that they know everything is generally inflexible to learn new new tools and new methods and look for that energy that that's strive for knowledge. Second thing is self-driven. And that's both as I said, for studying and other advancement for knowledge. That's also within their career is you want somebody who is not gonna look for you to guide them in terms of where their career must go not look for you to tell them exactly what to do. It's I do need people who have that ability to self-drive their solutions and their own work balance.

And on top of that, as you know, I want somebody to give it a go mentality that you know, there's a lot of problems where there's a lot of problems where we don't know the answer because we tackling methods from a new angle in most of my my functional areas. And if they come up with a potential idea or solution, build a prototype, show it to me, give me give me an example of what you think. But ultimately, you know, there's an aptitude towards coding that is somewhat needed in my team, I don't need you to know every programming language off by heart. Because ultimately, you know, our Python SQL, Spark, whatever, is a bunch of if and then statements for or while loops and some joining.

JL: What a what a great quote. So, you've distilled all different languages down into, you know, the same sort of logic, right? And if you if you know one, you can sort of pick up another one. It's just

DS: Google's my best friend, you say how to do this in (insert programming language).

JL: Yes, yes, yes. And so much information at your fingertips to work through those things. So, so you're saying you don't need people to come in and know everything and be able to code or without having to look anything up. But knowing how to find things out knowing having that logic, having that sound basis, and coding ability. And also, a willingness to learn and a willingness to have a go and a curiosity and some self-driven goals and, and to be wanting to continue to develop themselves as well, not just be spoon fed.

DS: Yeah, I think the areas where you're developing new new techniques, you do need somewhat of a person who has that mentality of doing something different to what's currently there. And some of those skills that I talked about are precursors to that kind of mindset.

JL: And I can see that mindset come through not just in the way that you do your work and solve problems at work now, but it's also how you apply that to your career as well. You've sort of taken that approach of building skills and looking for opportunities and having a go and trying new things and seeing what's happening rather than just staying kind of within the tracks of
you know, where you're where you've been.

DS: I often quote Field of Dreams with Kevin Costner. If you build it, they will come. And 100% believe in building very strong foundations, whether it's data, whether it's skills, whether it's the tools or, as I say, time and space to get things done. Because once you build it, it will come.

JL: So true. So true. And certainly, that was my experience moving into health and human services. And sometimes actuaries say to me, oh, what do you do in health and human services? Are you pricing? Are you reserving? And I said, I'm not I'm doing neither. I'm just using some of the skills and techniques and problem-solving skills that I picked up along the way to apply that to a different industry. It's not about just doing insurance type things outside insurance.

So yeah, if you build it, they'll come and if you try something new, and you've got some skills in your toolbox, you can be quite successful. Yeah. So, let's talk for a minute then about, you know, this age-old debate, or it feels like a common debate at the moment, actuaries, data scientists, data analytics professionals. I mean, you span different you wear different hats or different labels, if you want to, you know, give them labels. But where do you see that sort of competitive landscape between actuaries versus data scientists versus other people kind of doing similar type things or coding?

DS: Yeah, well, actuaries are excellent generalists, we may have specialised mostly in insurance, but we are generalists across economics, statistics, finance, data analytics, actuarial, and it's all encompassed under this professional banner. And then within the data analytics space, actuaries or data engineers, sometimes data analysts, they are statisticians or data scientists or ML engineers. And certainly, actuaries may not be as skilled at any one of those skills relative to those individuals. But actuaries have that broad skill set, and they

bring it all together. And if I had to hire one person, and one person only, I'll pick an actuary of any one of those other individuals every day.

JL: Would you? Why is that?

DS: It is that ability to both span the deep technical knowledge of and understanding of systems and data and information, but be able to distil that into decisions and management information and communicate that and visualise it and, and bring it all together into a yes, a financial picture really is what actuaries can do, relative to specifically data scientists who can mathematically solve things very well. But my experience hasn't been around how do you apply or what does it mean? Or what do we do with it? How do we adjust it?

JL: So, so you're saying that actuaries have kind of broader, generalist type skills, and maybe thinking about problems in a broader way, not just kind of solving the problem that's right in front of you, but maybe some broader applications of those techniques.

DS: Yes, because a lot of the others individual focus on their tool, their software, their problem, and then actuaries understand the full end to end solution or end to end process. And that whole actual control cycle that we studied back in the 90s and 2000s. Yeah, it truly does manifest and the data scientists have actually somewhat coined it now with the data science process.

JL: Is that right? Oh, wow. Yeah, yeah. Well, it's an important part, isn't it? It's important part to keep checking our assumptions. And when we are making assumptions to keep revisiting those and making sure they still hold. Yeah, very interesting. All right. So, Daniel, you've shared a bit about how you ended up being one of the first life insurance actuaries in Australia to bring data science into your role and how you've gone about that really interesting pathway of having an initial interest in coding, but then having some opportunities to do some different work and to see some different things and experience some true AI. And then to be able to bring those skills back into life insurance and pricing and to be able to help, you know, gain some sort of edge, perhaps over some of the other players who weren't including those or incorporating those techniques.

You've talked about how it's never too late for older actuaries who think maybe they've missed the boat on learning those data science techniques, but there's lots of things that we can do to pick those skills up. And you've given some examples and Francis being one of those examples of someone who's done that a little bit later in their career. You've talked about what it means to be a leader and not just telling people what to do, but really empowering people to come up with creative solutions and also looking after their wellbeing and the importance of tapping into those troughs and taking rest when we have the time to do so, so that we can be recharged and ready to work and to add value and be at our best. And I think that's definitely an underrated aspect of today's business world, but very, very important that we take enough rest to recharge.

You've talked about the skills that you look for when you're hiring, that people need to be able to code, but you're not sort of testing them on knowing how to do everything, but

knowing how to find out what they need or to be able to transfer their skills and apply their logic, but also, and maybe more importantly, that willingness to learn and to be self-driven and to take a chance and try something to test and learn and to evolve and contribute in that way. And you've talked a bit about how if you had a choice about who you'd hire, and it was down to an actuary and a data scientist, it would be an actuary for those general and broader skills. So, some fascinating, fascinating insights there, Daniel.

I want to finish with a question, which is this, if you were speaking to an actuary who wanted to improve their skills in data science, what top tip would you give them to build their skills?

DS: Well, as I said, continuous learning can revitalise your interest and your career. So, if I think about things, there's a mountain of knowledge out there, you could, you know, do more higher, higher-level learning around things like Coursera or similar platforms where you can, you know, learn the topic at a higher level, and then get a feel for where you want to specialise. Things like DataCamp is where you can learn coding in R and Python and SQL, and it's kind of a copy and paste and learn as you go tool. You could do data science specialist courses, or even a master's in data science, if you really find your aptitude in that space.

And then we've got the cloud area, you know, Microsoft, AWS, Google, they all got somewhat of a fundamentals or AI fundamentals type of course, where you can learn what the opportunity what the capability of the cloud is for both computing, data engineering, but also, some of our data science, and actuarial mathematics coming through. But ultimately, it's either it's Google or YouTube, YouTube, YouTube.

JL: So much out there for us to learn. And we'll include some links to some of those places that actuaries can go and learn more information and learn learn their coding skills and improve their data science skills so that they can bring that to work. We'll link those in the show notes.

Daniel, thank you so much for your time today. Thank you so much for sharing your insights and reflections in your own experience. I know that that's going to be very inspiring for for a lot of actuaries right across the career continuum. Thank you for the chat.

DS: Thanks so much. We'll chat soon.

JL: Thanks, Daniel.