


The Data Analytics Actuary

IAA President's Forum St. Petersburg
28 May 2016

Outline

- 
- Purpose
 - Data Analytics Actuary
 - Australian Experience
 - Other International Initiatives
 - Where to?
 - Discussion

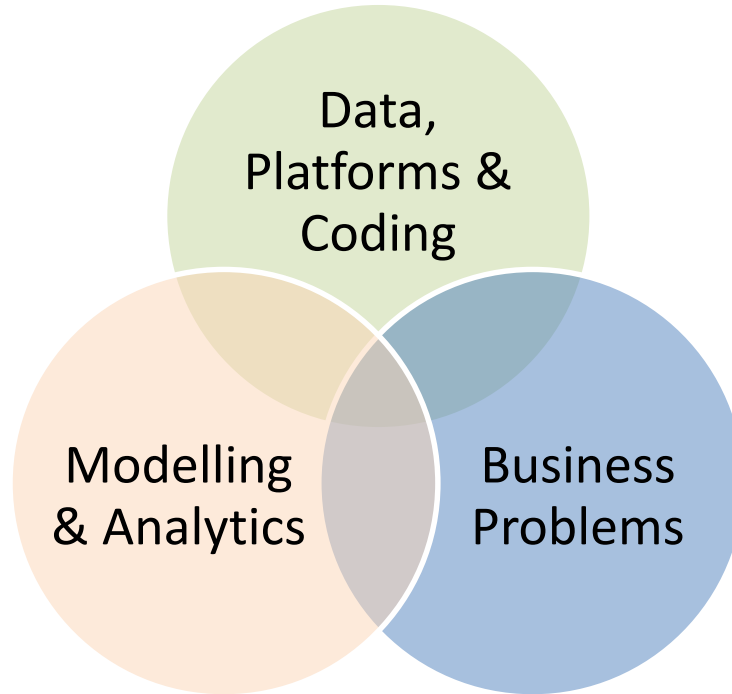
Purpose

- To gain a common view of the skills and capabilities of a Data Analytics Actuary
- This will enable the global profession to better
 - Identify and meet the educational needs of Data Analytics Actuaries
 - Promote data analytics to potential recruits to the profession
 - Promote the Data Analytics Actuary to potential employers

Data Analytics landscape

- Data analytics represents a major opportunity for the actuarial profession – boom in big data and technology and focus on data based decisions
- Actuaries don't have all the requisite skills and brand is less well known outside the insurance and superannuation industry
- Plenty of other people in this space e.g data scientists, statisticians and associations. For example in Australia, Institute of Analytic Professionals of Australia (IAPA) and Association for Data-driven Marketing & Advertising (ADMA)

The Data Analytics Actuary



The competitive advantage of actuaries in data analytics is their training in solving business problems

The Data Analytics Actuary

- Data and Data Platforms
 - Size, velocity and variety = greater complexity than actuaries are trained for
- Modelling
 - Simple modelling of complex data
 - Machine learning and other bottom-up techniques



The Data Analytics Actuary

- Business Problems
 - Not focused on risk or financial outcomes
 - Focus on customer transactional behaviour
 - Goes beyond insurance industry focus
 - Retail, media, telecom, government focused

The Australian Experience

THE AUSTRALIAN BUSINESS REVIEW

Alan Joyce unleashes Qantas's power of numbers

THE AUSTRALIAN | FEBRUARY 27, 2015 12:00AM

THEY are Alan Joyce's new weapon in maintaining the double-digit earnings profile of his booming flyer business.

A 40-strong team of actuaries and mathematicians will descend on the Qantas bunker at Mascot over the coming months after the airline announced yesterday it had taken a controlling stake in Australasian analytics and actuarial consulting business Taylor Fry.

Two actuarial firms, one partly owned by a large retailer and one partly owned by an airline loyalty program business

THE AUSTRALIAN

Quantium shines as retailers seek big data

THE AUSTRALIAN | NOVEMBER 17, 2014 12:00AM



SAVE

THE retail sector's hunger for intimate insights into the spending patterns of its customers, known in the trade as "big data", has more than tripled revenue for analytics company Quantium, enabling it to pay a \$6 million dividend to shareholders including supermarket chain Woolworths.

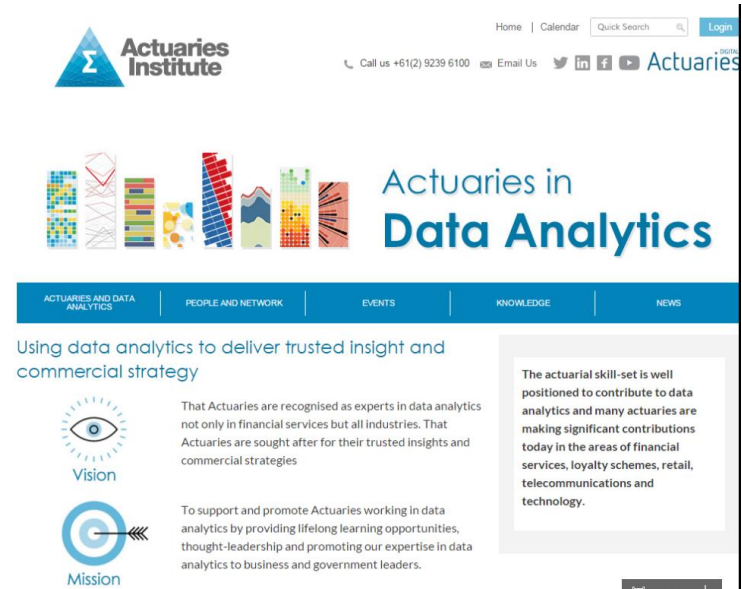
The firm, which offers a range of customer analytical services to clients such as eBay, Telstra, Suncorp, Qantas and increasingly food and grocery manufacturers, has hit a goldmine in Australia's \$250 billion retail landscape.

Retailers are hungry for any data they can glean from shoppers to help refine their offers and gain an edge over competitors.

It is something that Woolworths has also focused on. Last year it paid \$20m for a 50 per cent stake in Quantium to help augment its own customer loyalty programs and put to work the information that flows from millions of spending transactions that pass through its checkouts each week.

The Australian Experience

- 3.5% of members have data analytics as primary practice area and 12% when secondary practice area is included
- Extending the reach of actuaries in data analytics is identified as one of the Actuaries Institute's five strategic goals



The screenshot shows the Actuaries Institute website. At the top, there is a navigation bar with links for Home, Calendar, Quick Search, and Login. Below the navigation bar is the Actuaries Institute logo and contact information: Call us +61(2) 9239 6100, Email Us, and social media icons for Twitter, LinkedIn, Facebook, and YouTube. The main content area features a header with the text "Actuaries in Data Analytics" and a navigation menu with categories: ACTUARIES AND DATA ANALYTICS, PEOPLE AND NETWORK, EVENTS, KNOWLEDGE, and NEWS. The main content area is titled "Using data analytics to deliver trusted insight and commercial strategy" and includes two icons: "Vision" (an eye icon) and "Mission" (a target icon). The text under "Vision" states: "That Actuaries are recognised as experts in data analytics not only in financial services but all industries. That Actuaries are sought after for their trusted insights and commercial strategies". The text under "Mission" states: "To support and promote Actuaries working in data analytics by providing lifelong learning opportunities, thought-leadership and promoting our expertise in data analytics to business and government leaders." A sidebar on the right contains a quote: "The actuarial skill-set is well positioned to contribute to data analytics and many actuaries are making significant contributions today in the areas of financial services, loyalty schemes, retail, telecommunications and technology."

The Australian Experience

Established a Data Analytics Working Group at the start of 2015

There are 4 main areas of focus:

- **Vision** - Determine a strategic vision for Actuaries
- **Actuarial Community** - Develop a Community for Actuaries working in data analytics
- **Education** - Investigate short, medium and long term qualification and CPD requirements
- **Employer engagement** - Better understand the needs of employers

Australian DAWG activities

- Held data analytic conference



- Determined CPD framework
- Held MOOC study group
- Run yearly Kaggle competition
- Established Data Analytics Community Linked-in group
- Set to launch data analytics microsite

CPD Framework

Data Analytics - General

Data Architecture

Programming

Data Preparation and Exploration

Data Analysis

Data Communication and
Visualisation

Other International Initiatives

South Africa – Wider Fields

- Wider Fields / Business Intelligence Forum of the Actuarial Society of South Africa (ASSA)
- Work streams: Eminence, Education, Research
- Objectives:
 - Increase awareness amongst students, the Profession and in the industry
 - Host Sessional meetings & Presentations at Convention
 - Drive research topics
 - Investigate need for analytics syllabus in actuarial curriculum

During 2015:

- Presented to Uni Actuarial students to create awareness
- Hosted well-received Sessional meetings
 - Predictive Modelling using Survival - Data Mining
 - Advanced Analytics on a Shoestring
 - Big Data – Big Opportunities
 - Data Visualisation Techniques
- several presentation slots at Actuarial Convention

- **Strategic Plan 2016-2019**
 - Strategic Goal: CIA members are recognized as the leading professionals in predictive modelling and big data in Canada by 2021
- **CIA Education System**
 - New CIA education syllabus identifies predictive modelling as a key element of Associate education
 - Delivery of education and assessment via education partners
- **Predictive Modeling Committee**
 - Promote actuaries with PM field both within and outside the profession;
 - Identify existing and new research in PM that will draw attention to the work of actuaries;
 - Contribute to education and continuing education

The CAS Institute



- New subsidiary of the Casualty Actuarial Society
- Provides credentialing and professional education to quantitative specialists in selected areas
- Predictive Analytics / Data Science credential launching in 2016-2017
- For actuaries and non-actuaries
- Offerings in other analytics and quantitative specialties will follow

Overview on 2014-2016 period and coming actions

Waypoint on past and future actions of Big Data Committee

- BDC was established in January 2014,
- Objectives
 - Developing a data scientist culture
 - Assessing the impacts of Big Data Technology shift on actuarial and business practices,
 - Updating / Enhancing initial core syllabus
- Actions of BDC
 - Information with conferences , communication (more than 20 conferences in 2 years), and congress (100% data science, colloquium SCOR-Institut)
 - Establishing work streams for assessing specific issues (Mathematical and IT context, Professional and Education impacts, Regulatory issues ...)
 - Joint WG with local regulators (data & freedom, insurance)
 - Pushing new actuary generations for using Machine learning / BD
- BDC Findings
 - Evolving data regulatory environment scrambles the way to use external data sources in insurance offers / products
 - Data Quality and Traceability are strong requirements and customers behavioral knowledge highlights the importance for mastering analytical algorithms and technical environment,
 - Actuaries might have a strong role ... if they develop adequate skills and promote jointly their education and professional values in such environment.

Data science for actuaries award (DSA)

- DSA was established in 2015
- DSA is an education program for actuaries focused on data science
 - Already 2 promotions with a total of 40 students,
 - Awarded for its innovation in 2016 by the Insurance industry
- With DSA , the Data Scientist Actuary is be able to :
 - Implement statistical methods using Python (or R),
 - Evaluate a given algorithm's performance (complexity measure, memory footprint..) and distribute the algorithm when needed
 - Make decisions on how to handle data storage
 - Use advanced offline/online methods
 - Identify relevant reporting and visualization tools
 - These newly acquired skills will enable the Data Scientist Actuary to perform teamwork with IT and Marketing departments to ensure new offers' efficiency and solvability
- Core syllabus corresponding to 168 hours :
 - A - Python
 - B - Data mining with R
 - C - Practical Machine Learning
 - D - Statistical Learning Foundations
 - E - Distributed Machine Learning and applications
 - G - Case Studies
 - H - Data science personal project & presentation
- EAGER TO ADAPT IT TO A NEW GLOBAL AWARD « CEDA » LIKE CERA !



The IFoA...

Identified the need to diversify into non-traditional sectors where the actuarial skill-set adds value:

- Data Analytics is a chosen area
- Introducing skills in Data Analytics as part of our Curriculum;
Review – started with Associate/Fellowship, moving on to Certified Actuarial Analyst (CAA)
- Exploring its wider implications for the actuarial profession and its regulation - through our Analytics and Data Working Party

Big data initiative

Launched in 2015, Big Data Working Party is SAS' initiative to explore the future of big data, analytics and unstructured data in Asia and what actuaries need to do to have the right skillsets that will be in demand for such work. The working party is made up of actuaries and data scientists based across Asia from diverse range of industries.

Key achievements

- Developed a practical case study using medical data to demonstrate machine learning techniques to actuaries which is used to deliver CPD training to members
- Presentations and published articles at conferences and afternoon forums in Singapore, Hong Kong and Malaysia
- Organized hands-on workshop on machine learning using R with participants from all around Asia
- Supporting regional societies by sharing knowledge and in organizing of CPD events and workshops
- The 2016 General Insurance Conference in May has a particular focus on big data

Where to from here?

Continue to equip the profession with tools to make the most of opportunities that big data brings to actuaries and their companies

- Workshop on text mining and transaction sequencing coming up
- Asia Actuarial Analytics Challenge underway. Deadline 30 September 2016
- Developing more practical case studies which actuaries working in different areas may use to apply in various business situations
- We are also looking out to organizations wishing to collaborate with us on research and development in practical applications of data analytics in actuarial context

Other regional activities

- **Thailand –**
Machine learning workshop conducted by local society with assistance from Singapore Actuarial Society's BDWP
- Interest from other regional societies for conducting more workshops with assistance of Singapore

SOA Predictive Analytics

- Underway
 - Numerous meeting sessions, seminars and webcasts
 - Predictive Analytics and Futurism Section
 - Limited attendance seminar in Advanced Business Analytics (8+ administrations)
- Forthcoming
 - Enhancements to associateship education
 - Development of concept map of skills and abilities
 - Certificate in Predictive Analytics
 - Limited attendance seminar in Health Analytics



IAA NON-LIFE INSURANCE SECTION
SECTIONS ASSURANCE NON-VIE DE L'AAI

ASTIN have established a Data Analytics Working Party

Multiple smaller groups established to write research pieces on

- Predictive modeling
- Telematics
- Data Governance &
- Machine learning

Where to?

- Many associations taking initiatives in data analytics
- Building collaboration between different associations will help create a consistent message and improve education
- Potentially developing of an international analytics strategy for the profession



Finally

- Data analytics represents a major opportunity for the actuarial profession
- Cooperation between different actuarial associations will enable the profession to make the most of this opportunity otherwise we may be become marginalised
- Some have suggested we may even end up with a CERA type credential – is this something to work towards?

