MAID Working Party Update

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27 March 2018

Agenda

Introduction to Data Science

Introduction to MAID

Update from Workstreams

2016 Output

2017 Output

Next Steps
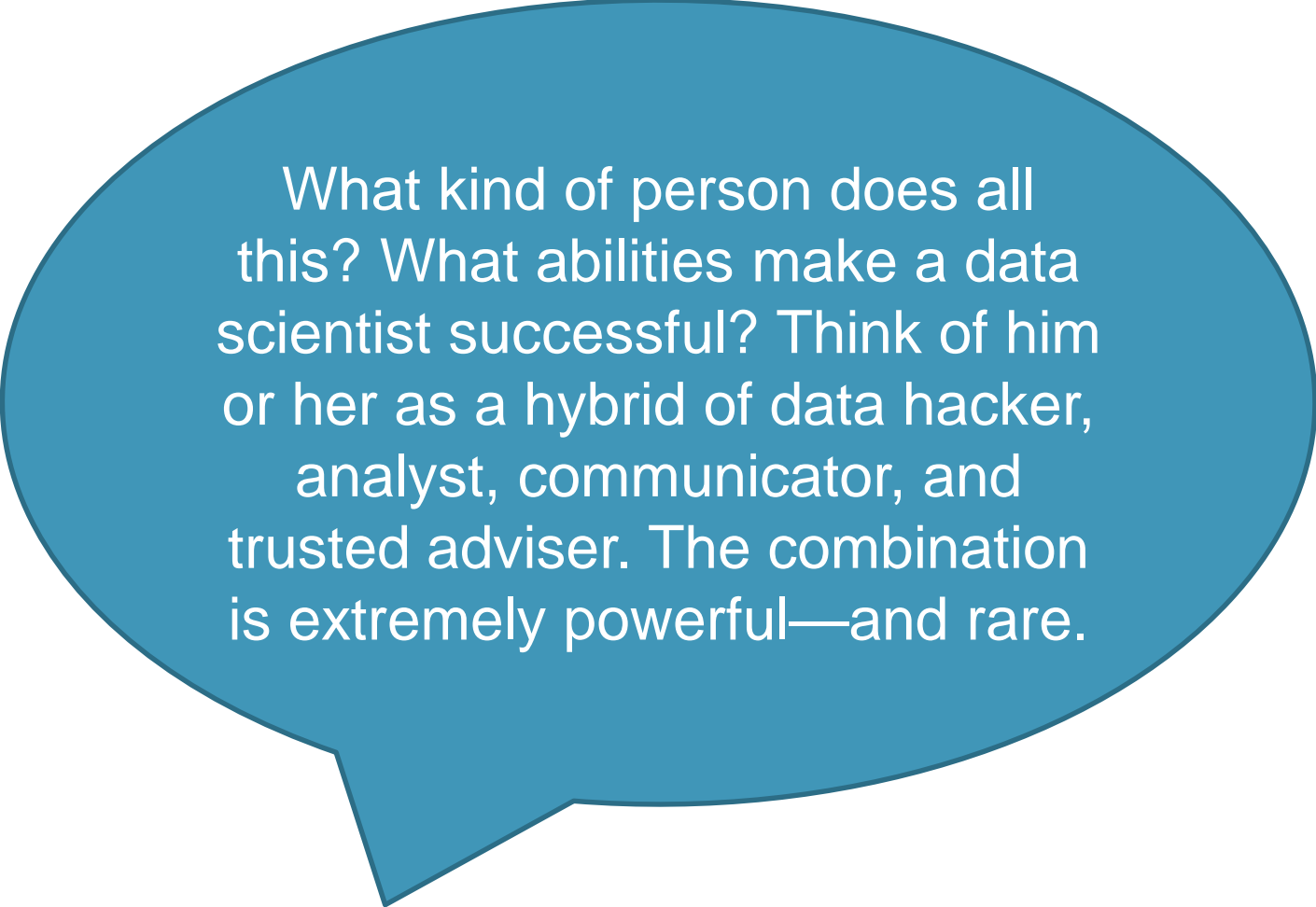
Questions

MAID Working Party Update

Introduction to data science and MAID

27 March 2018

Introduction to Data Science

- A definition: the use of scientific methods to derive insights from data
  - Applied statistics: data collection → data modelling / analysis → decision making

- "Big data: The next frontier for innovation, competition, and productivity" *(McKinsey, May 2011)*
  - *"By 2018, the United States alone could face a shortage of 140,000 to 190,000 people with deep analytical skills as well as 1.5 million managers and analysts with the know-how to use the analysis of big data to make effective decisions."*

- "Data Scientist: The Sexiest Job of the 21st Century" *(Harvard Business Review, Oct 2012)*
  - *"More than anything, what data scientists do is make discoveries while swimming in data."*

- 2013: IEEE Task Force on Data Science and Advanced Analytics – http://dsaa.co/

- 2015: European Association for Data Science – https://euads.org/

What kind of person does all this? What abilities make a data scientist successful? Think of him or her as a hybrid of data hacker, analyst, communicator, and trusted adviser. The combination is extremely powerful—and rare.

Introduction to MAID

- Cross-practice working party

- Established in Jan 2016
  - Chaired by Michael Tripp (GI Board chair)

- Aimed at informing the IFoA position and response to new opportunities in data science

- Organised into four workstreams with a steering committee
  - Workstream 1: research
  - Workstream 2: new approaches to current actuarial work
  - Workstream 3: new opportunities for actuarial work
  - Workstream 4: implications for professional affairs

- IFoA website: Practice areas > Cross Practice Work > Research Working Parties > Modelling, Analytics and Insights from Data
  - https://www.actuaries.org.uk/practice-areas/general-insurance/research-working-parties/modelling-analytics-and-insights-data

MAID Working Party Update

Updates from working party workstreams

27 March 2018

Workstream 1: research

- Awareness of data science and 'Big Data' research

- Promote new research

- Identify current and future key trends in the area

- Conduct literature review of existing resources and platforms

- Review international practices

- Identify relevant conferences and events

Workstream 2: new approaches

- New approaches to current actuarial work

- Consider how a variety of data science techniques could be applied in a current actuarial context

- Techniques considered include (but are not limited to)
    - Supervised learning
    - Unsupervised learning
    - Reinforcement learning
    - Decision aid
    - Bayesian learning
    - Deep learning

- Prepared a sessional paper for presentation at the Data Science Summit

Calibration plots (reliability curve)
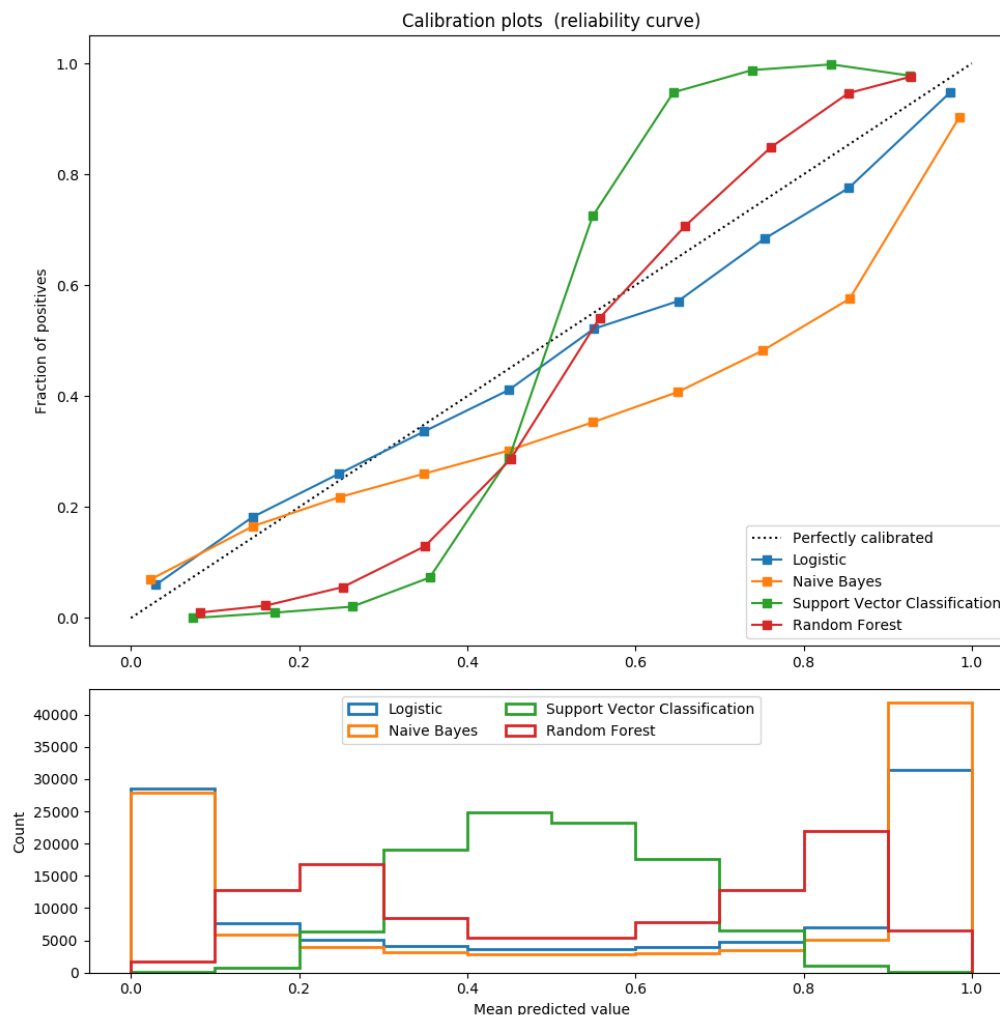
Workstream 3: new opportunities

- Focussed on the opportunity to develop actuarial science into new areas

- Brainstormed and researched areas of new technology

  - Machine learning

  - Advances in disease diagnosis

  - Augmented reality / Virtual Reality / Wearables

  - Genetic database

  - Autonomous agents

  - Telematics

- Currently interviewing recruitment agents and researching job descriptions on data scientists to assess suitability of actuaries for these roles

  - Professional discipline: how important is oversight/membership of a professional body?

  - Mathematical skills

  - Numerical computing skills

  - Other skills: skills that an experienced actuary would not be generally expected to have

  - Domain knowledge: how important is knowledge of the industry (as opposed to more generic knowledge)

  - Salary cost (typical UK value, including average bonus)

  - Communication skills

  - Application of judgement

Workstream 4: professional affairs

- To consider the implications for the profession of advances in data science, and to help the IFoA develop a data science strategy

- Drafted four short opinion-based essays covering five areas of interest
  - Discussed essays and wrote paper for IFoA management board meeting

- What others professional bodies are doing
  - IAA: established Big Data Working Group, with co-ordination across member bodies
  - Actuaries Institute (Australia): Data Analytics Working Group, akin to MAID
  - Institut des Actuaires (France): new Data Science qualification
  - CAS Institute (US): launching predictive analytics/ data science credential
  - SoA (US): developing predictive analytics certificate

- Construction of a data science organisation relationship map

MAID Working Party Update

Outcomes of the working party

27 March 2018

2016 Output

- Data Science Universe Event *(May)*

- IFoA Member Survey on the Data Science Universe *(Oct–Nov; results Feb 2017)*

    – Increase awareness amongst actuaries of data science methods and techniques, and the opportunities they may present

    – Ensure that pre- and post-qualification learning equips future and current actuaries with the tools and techniques required

    – Support advancement through research, encourage adoption by practitioners, demonstrate thought leadership outside the profession

    – Collaborate with other professionals and disciplines to share knowledge and skills and to advance techniques and methods

    – As part of the IFoA's public interest role, ensure that the regulatory and ethical implications are understood and relevant action taken

Data Science Digest

- Provides the IFoA membership with updates on the latest data science developments and MAID working party updates

- Issue 1 published in April 2017

- Issue 2 published in September 2017

Institute and Faculty of Actuaries

Data Science Digest
Issue 1 - April 2017

From the Institute and Faculty of Actuaries MAID working party

Background

The revolution has already begun. With rapid advancements in technology, we can collect, store and draw insights from data like never before. Yes, we think that 'Big Data' is going to change the world and we want to be ready to embrace the opportunities that come along with it.

The purpose of this digest is to excite and engage the profession about 'Big Data' by providing updates on some of the latest developments within data science and also MAID working party updates.

The first issue covers a recap of actuaries and data science in 2016 in addition to some new developments in 2017.

Modelling, analytics and insights from data (MAID) working party updates

Big Data: Opportunities or Big Risk for Actuaries?

This was the title of the final Plenary session at the 2016 IFoA Asia Conference. The presenter, Peter Banthorpe, is the Global Head of R&D at RGA and is a Fellow of the Institute of Actuaries. One of the key themes in Peter's presentation was a look at the relevance of data in a digital world, the way this world is transforming and the impact this is having on the insurance industry. For the full presentation please click here.

An introduction to the data science universe

The IFoA's Modelling, Analytics and Insights from Data (MAID) working party hosted its inaugural seminar in 2016 discussing the topic of the 'Data Science Universe', in particular the themes of big data, machine learning, and predictive analytics. The seminar featured thought-leading speakers and academics from different sectors of industry and academia. The purpose of the seminar was to discuss the rapid developments in the Data Science Universe and the wider implications for the profession. Outputs from the 12 May Data Science Universe Event can be found on the IFoA's website.

The data analytics actuary

In May 2016, the Actuaries Institute gave a presentation at the IAA President's Forum in St Petersburg, Russia. The presentation primarily covers the emergence of the data analytics actuary and what the various actuarial professions across the globe are doing in response to a rapidly evolving digital world. The full presentation can be found here.

Insurers test the limit of telematics' big data

Telematics devices are revolutionizing the way that insurers price car coverage. Telematics (black boxes installed in vehicles to monitor and measure what happens

Issue 1 - April 2017

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Data Science Summit

- Held on 12-13 Sep 2017

- The Future of Data Science – McKinsey

- Data Protection – Imperial College

- Education and Business development

- Professionalism in Data Science – Royal Statistical Society

- Break-out sessions on what initiatives other global actuarial bodies are undertaking

- Live stream of Autumn Lecture: Data Science and its Potential for Actuaries and Policy Making

Practical Application of Machine Learning Within Actuarial Work

- *Published Jan 2018*

- Machine learning overview

- Case studies

  - Utilising unstructured data in forecasting interest rates

  - Pricing of marine hull

  - Supervised learning in exposure management

  - Mortality experience analysis

- Programming languages and applications

Strategic Vision for the Profession

- Dec 2017: presentation to Management Board

- Jan 2018: presentation to Council
  - 19th Global Conference of Actuaries

- Lifelong Learning: Data Science course

Next Steps

- Transition to a Member Interest Group

- Final workstream output
  - Terms of reference
  - Article for *The Actuary* on the role of actuaries in data science
  - GIROC: One-day machine learning / data science workshop
  - Lifelong Learning: Data science virtual conference – 5 November 2018

Questions

Comments

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