Society of Actuaries in Ireland

Data, Modelling, and Ethics
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28 October 2020

Disclaimer

The views expressed in this presentation are mine only and do not represent those of the Society of Actuaries in Ireland, my employer or EIOPA's Experts Group in Digital Ethics.

Overview

Data, Modelling, and Ethics

- Introduction
- Fairness
- Transparency
- Governance
- Summary and links

Fairness, Non-discrimination, Availability, Affordability, Socio-economic inclusion, Transparency, Explainability, Reproducibility, Auditability, Trustworthiness

Introduction – Why is this an issue?

WIRED

The Apple Card Didn't 'See' Gender—and That's the Problem

The way its algorithm determines credit lines makes the risk of bias more acute.

https://www.wired.com/story/the-apple-card-didnt-see-genderand-thats-the-problem/

The response from Apple just added confusion and suspicion. No one from the company seemed able to describe how the algorithm even worked, let alone justify its output. While Goldman Sachs, the issuing bank for the Apple Card, insisted right away that there isn't any gender bias in the algorithm, it failed to offer any proof. Then, finally, Goldman landed on what sounded like an ironclad defense: The algorithm, it said, has been vetted for potential bias by a third party; moreover, it doesn't even use gender as an input. How could the bank discriminate if no one ever tells it which customers are women and which are men?

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Introduction – How does it affect insurance?

S&P Global
Market Intelligence   17 Aug, 2020

NAIC re-examining issues of race in insurance after decades of inaction

https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/naic-re-examining-issues-of-race-in-insurance-after-decades-of-inaction-59935817

Among those barriers, Birnbaum noted a lack of minority voices in the industry as well as in regulatory and consumer leadership, and an imbalance between consumers' access to critical regulatory and legislative processes and the access afforded insurers and producers, many of which have the ability to use "policyholder funds to press for their interests."

In the era of big data, Birnbaum also said the regulatory oversight of advisory organizations has become "obsolete" and has failed to address antitrust and consumer protection issues. Regulatory oversight is needed for currently unregulated data and vendors of algorithms for pricing and other functions, he added.

To also said "data and accountability" are needed and that transparency would be central to businesses measuring their progress.

Introduction – How does it affect insurance?

THE IRISH TIMES

Dual insurance pricing more widespread than admitted, regulator finds

Central Bank warns against 'unintended consequences' as Government considers ban

⏱ Wed, Sep 9, 2020, 12:07 | Updated: Wed, Sep 9, 2020, 19:07

Joe Brennan, Harry McGee

https://www.irishtimes.com/business/financial-services/dual-insurance-pricing-more-widespread-than-admitted-regulator-finds-1.4350544

FCA FINANCIAL CONDUCT AUTHORITY

FCA sets out proposals to tackle concerns about general insurance pricing

Press Releases | First published: 22/09/2020 | Last updated: 22/09/2020

The FCA has today published the final report of its market study into the pricing of home and motor insurance. The FCA is concerned these markets are not working well for consumers and is setting out proposed remedies to address this.

https://www.fca.org.uk/news/press-releases/fca-sets-out-proposals-tackle-concerns-about-general-insurance-pricing

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Introduction – How does it affect us?

Central Bank of Ireland's Dear CEO letter in relation to differential pricing in motor and home

While a number of firms maintain that they do not utilise differential pricing in their pricing practices, the Central Bank observed that the majority of firms utilise differential pricing through techniques such as price elasticity modelling, retention/lapse modelling, conversion rate modelling and the use of models that facilitate the flexing of sales remuneration.

There were varying degrees of awareness of pricing practices at Board of Directors[1] ("Board") level and, in many cases, it was not evident that Boards had appropriately considered or discussed the impacts of their firms' differential pricing practices on their consumers.

Firms failed to have clearly documented controls in place to quantify or monitor the impacts of differential pricing on consumer groupings in advance of pricing model implementation.

While firms have developed pricing policies, which clearly impact customers, they have not sufficiently considered customer interests. Failure to ensure that customers are at the centre of pricing decisions raises questions regarding how customers' interests are considered as part of the pricing process and creates significant concerns in respect of a firm's culture.
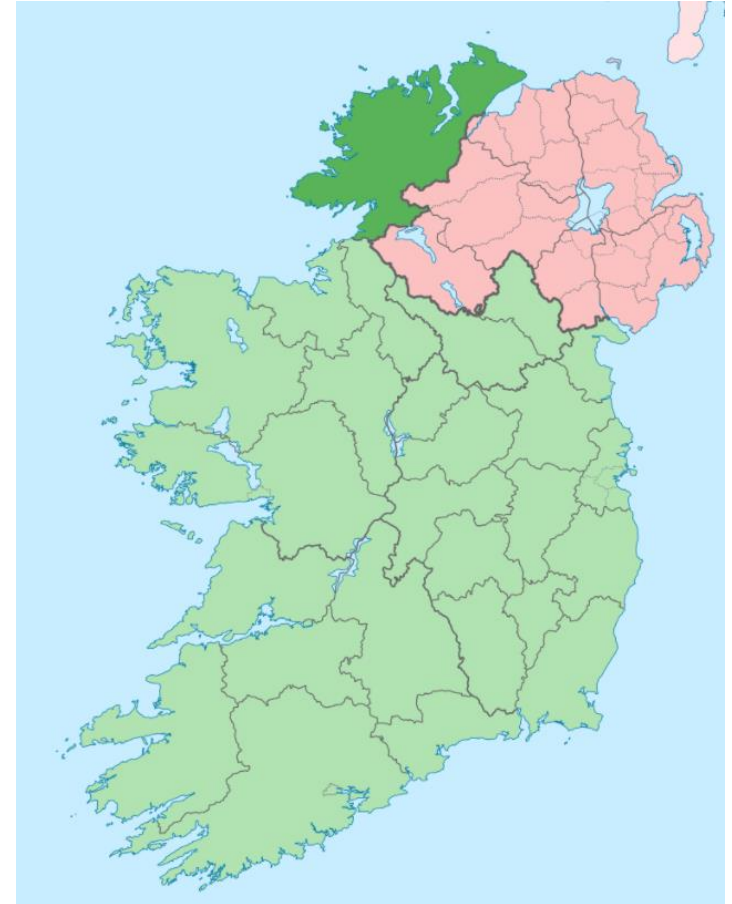
Fairness

- Ethics and fairness are not Compliance
- Ethics are specific to the individual
- We will not all agree on fairness and that is fine
- You, in your company, will not either and that is fine too
- But you need to reach consensus and articulate it clearly
- Affordability, accessibility, non-discrimination, inclusion…
- Lack of diversity results in lack of awareness
- Is "*culture fit*" good to foster diversity in a company?
- Ethics in relation to behavioural impact

Fairness – food for thought

- Donegal is rural, sparsely populated and with limited work options

- Young, male driver from Donegal seeking motor insurance

- What if gender pricing is allowed?

- What if not?

- Does Donegal have anything to do with pricing?

- Is that fair?

- What is the best or least bad outcome?

- What if we only sell online?

Fairness – what can we do?

- Statistical models are designed to discriminate
- Intentional vs. accidental, unlawful vs. unethical
- Intended use is important, not just the modelling or data
- Bias in data vs. bias / unfairness in model application
- Address bias in data
- Address bias in models by monitoring outcomes and actively looking at minority or disadvantaged classes
- Pay attention to public opinion and consumer associations

Transparency – To whom?

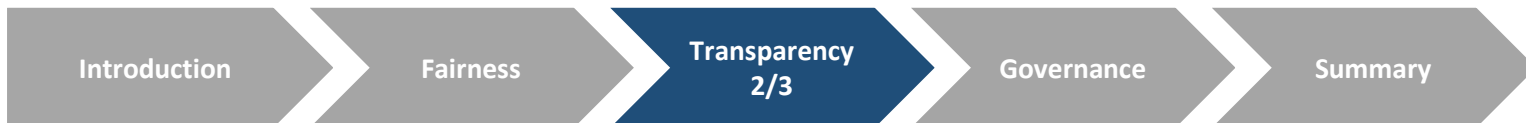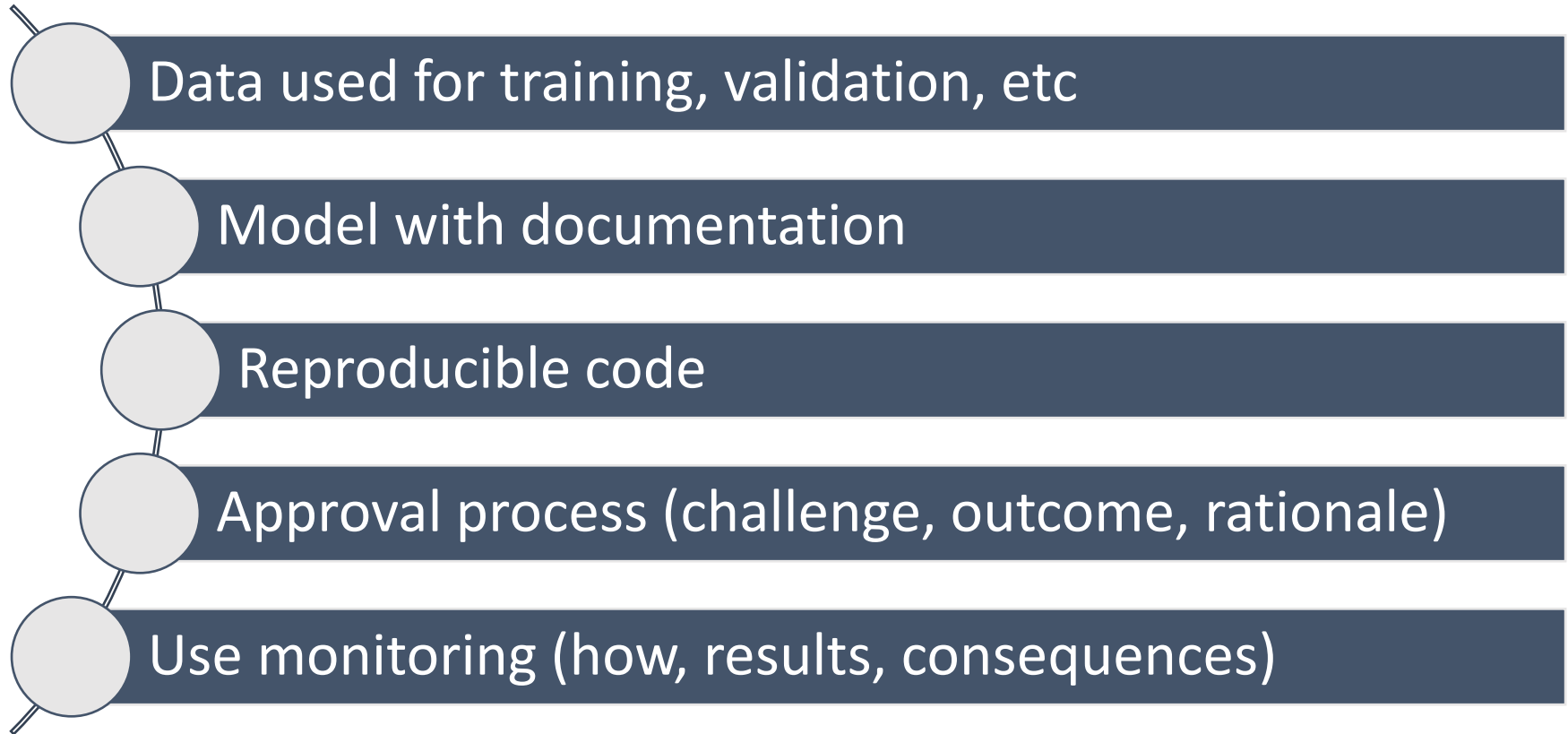**Transparency - Explainability – Reproducibility - Auditability**

Modeller	Peer reviewer	Model user
Internal auditor	Risk function	External auditor
Board of directors	Supervisor	Customers

Transparency – What has to be transparent?

Data used for training, validation, etc

Model with documentation

Reproducible code

Approval process (challenge, outcome, rationale)

Use monitoring (how, results, consequences)

Transparency – what is transparent enough?

- Transparency must depend on the audience
- Do you understand the model? Can you explain it?
- Can someone else reproduce your results?
- Confidentiality vs. interests of users and stakeholders
- Depth and technical detail appropriate to the audience
- Proportionality based on potential impact and intended use
- Potential impact to customers, stakeholders, company, market, etc.
- Impact based on likelihood and severity from the position of the affected party
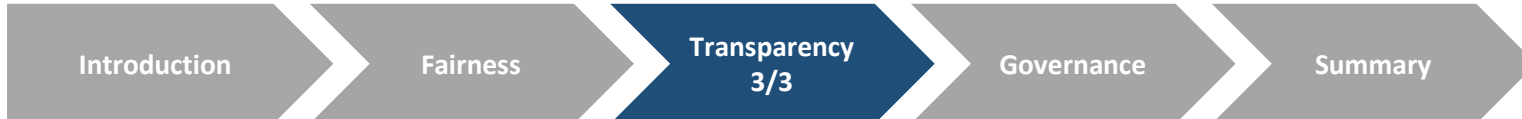
Governance – some comments

- *The aim is to have structures, policies and processes to ensure fairness and ethical use of data and models*

- How do you know that your use of data and models is fair?

- Frameworks born from Solvency II are rarely fit for purpose if using machine learning / artificial intelligence

- Do not reinvent the wheel

- Proportionality based on impact and intended use

- Proportionality applied to transparency and explainability

- Consider overlaps between actuarial and machine learning

- Linked to risk appetite statement

Governance – some comments

- Ethics Committee?
- Ethics added to terms of reference of relevant committees
- Chief AI Officer? Scope added to existing role? No need?
- AI Committee? Scope added to existing committee?
- Who is responsible? Who is accountable?
- Minutes: **if it is not documented, it never happened!**
- Evidence proposal, challenge, outcome and rationale for decision making
- Document rationale for ethical trade-offs
- Back up plan: what if your model seems to discriminate

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Summary

Fairness
- Challenging
- Need diversity
- Biased data and uses
- Evolving

Transparency
- Explainability
- Auditability
- Audience
- Risk and impact

Governance
- Do not reinvent
- Evidence
- Audience
- Risk and impact

Summary

Forbes

AI Has Resulted In "Ethical Issues" For 90% Of Businesses

Carly Page Contributor ⓘ
Consumer Tech
I cover Tech in Europe, including big tech, PC hardware and telecoms

While two-thirds (68%) of consumers expect AI models to be fair and free of bias, Capgemini's findings show that only 53% of organizations have a leader who is responsible for ethics of AI systems, such as a Chief Ethics Officer, and just 46% of have the ethical implications of their AI systems independently audited.

https://www.forbes.com/sites/carlypage/2020/10/01/ai-has-resulted-in-ethical-issues-for-90-of-businesses/#4da2d1703ff0

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Useful resources and links

- Code of Conduct of the Society of Actuaries in Ireland, your actuarial profession if other or that of the International Actuarial Association

- Institute and Faculty of Actuaries' Guide for Ethical Data Science (https://www.actuaries.org.uk/upholding-standards/data-science-ethics)

- European Commission's Guidelines for Trustworthy AI (https://ec.europa.eu/futurium/en/ai-alliance-consultation)
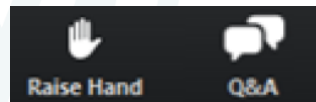
Useful resources and links

Selected videos

- Gabriel Bernardino, *"Digital Responsibility in Insurance and the Role of Actuaries"* actuview

- Colm Fitzgerald, *"Ethics as a Value Adding Component in Data Science"* actuview

- Prof. Dr. Mirko Kraft, *"Data Risk Governance Addressing Ethics in Insurance"* actuview

- Julián Arévalo, *"EIOPA's Work on Big Data Analytics and Digital Ethics"* actuview

- Jaya Handa, "Thought Leaders in Privacy Interviews"
  (https://www.dataguidance.com/video/jaya-handa-privacy-director-liberty-specialty-markets)

Questions

Please click on the 'Raise Hand' icon

to ask a question

and

<u>wait to be unmuted</u>

or

Use the Q&A function

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