

The Ultimate Question of Life, The Universe, AI and Everything

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GDPR is here, but will the AI Act kill us?

Transparency and Data Protection in GDPR and AI Act

- **Transparency:**

GDPR: Article 13 and 14 outline the right to be informed, which includes providing transparent information about the processing of personal data.

AI Act: Article 52 emphasizes transparency obligations for high-risk AI systems, including providing clear and accessible information to users.

- **Data Protection:**

GDPR: Articles 5-32 contain various provisions related to data processing, storage, and management, including data minimization, storage limitation, and data security.

AI Act: While not explicitly focused on data protection, the AI Act complements GDPR by ensuring AI systems adhere to data protection principles.

Accountability and Fairness in GDPR and AI Act

- **Accountability:**

GDPR: Article 5(2) establishes the principle of accountability, which requires organizations to be responsible for and able to demonstrate compliance with GDPR principles.

AI Act: Article 14 highlights the need for organizations to have a comprehensive and up-to-date risk management system in place for high-risk AI systems.

- **Fairness and Non-discrimination:**

GDPR: Article 9 prohibits the processing of special categories of personal data, which can be related to fairness and non-discrimination. Recital 71 highlights the need to prevent discriminatory effects in automated decision-making.

AI Act: Article 10 addresses the requirements for AI systems to be unbiased and nondiscriminatory, ensuring equal treatment of users.

According to the IAA, actuaries...

- Evaluate the likelihood of future events;
- Design creative ways to reduce the likelihood of undesirable events;
- Decrease the impact of undesirable events that do occur;
- Assist in the scientific analysis and quantification of risks;
- Measure, manage, and mitigate risks;
- Establish premiums, policy and claim liabilities, and appropriate capital levels;
- Assess financial security systems;
- Evaluate pension plan liabilities; and
- Determine the level of contributions required to finance pension, health care, and social insurance programs

Responsibilities of an actuary (From the AAE Code of Professional Conduct)

- An actuary...
 - ... must perform professional services competently and with care
 - ... must act in a manner that fulfils the actuarial profession's responsibility to the public by observing applicable technical and professional standards.
 - ... must perform specific professional services only if the actuary is competent and appropriately experienced to do so
 - ... should identify that the actuary takes responsibility for the results, subject (if applicable) to any stated caveats

Actuaries are, to do their work well, obsessive dataholics

- Traditionally data has been scarce, expensive to collect even when theoretically available, and costly and slow to process
 - actuaries have used simple proxies (e.g., gender, age, zip code) to differentiate between risks
- Novel developments in digitalisation mean that huge amounts of data are available, and costs of processing have gone down, also data science has massively developed
- AI holds lots of promises for actuaries to improve the way they perform their services – but with opportunities there are threats as well

Uses of AI and data among actuaries

- Ethical concerns mostly address the use of AI in front office activities, like
 - Underwriting
 - Pricing
 - Claims management, etc.

- Actuaries use data also in the back office
 - Calculating insurance liabilities
 - Risk management
 - Practical example in insurance: IBNR (Incurred but not reported) liability
 - Practical example in pensions: portfolio mortality vs. general population mortality

- In addition to ethical concerns also financial stability/back office deserves attention

How can actuaries apply novel data and analytical tools while also adhering to professional standards on issues such as the use of models?

European Standard of Actuarial Practice (ESAP 1) on General Actuarial Practice – Model Governance

- The actuary involved in using models should
 - Be satisfied that the model risks have been identified, assessed, and that there are appropriate actions to mitigate these risks
 - Be satisfied that an appropriate model validation has taken place: The model reasonably fits its intended purpose, meet's its specifications, the full or partial results of the model can be reproduced or any differences can be explained
 - Understand the model, the conditions under which it is appropriate for the model to be used including any limitations of the model for the intended use, the context in which the model will be used, how model inputs will be provided, and how the actuary expects the results of the model will be used
 - Be satisfied that there is adequate documentation and that the model is subject to appropriate controls (e.g., no unauthorized changes, and changes can be reversed)

Challenges in the use of AI

- Competence gap – recently qualified actuaries have data science included into their education, but older actuaries need to catch up
- The new models can be complex – but so are many traditional models like generalised linear models (GLMs)
- Models based on machine learning – challenges in model risks, model validation, limitations and conditions, changes and reversion of changes
- When using AI models extreme care is needed
- But also, the use of actuaries is recommended, and they are subject to extensive professional standards – and, after all, actuaries have in their history done most of the mistakes and can make sure they are not repeated

Does the use of external data and AI/ML analytics challenge the implementation of actuarial fairness? Are there other ethical risks that might emerge from the use of external data and AI/ML analytics?

Fairness and ethical considerations

- Actuarial fairness is a concept in the insurance industry that aims to establish fair premiums based on policyholders' risk exposure
 - Based on this principle, insurance has been able to play a prominent role in making welfare societies a reality, but
 - Is the traditional actuarial fairness up to date with current needs of our societies?
- With increased amounts of data and the use of AI actuaries can better differentiate between risks and increase the actuarial fairness of insurers' policies
- There have been thoughts that AI will individualise risks and kill insurance: this is not true as insurers compensate for actual losses, not the probabilities

Is actuarial fairness an ethically sound approach, and is it even always compliant with legislation?

- Applying pure actuarial fairness can lead to poverty premiums or to ethnicity premiums
- While protected attributes are not to be used, complex models need to be tested for illegitimate indirect discrimination (recognizing that there might be legitimate uses, however)
- In voluntary insurance lack of actuarial fairness can easily lead to adverse selection
- Everything will not be possible in private insurance, but in cover understood to be essential (i.e., areas where lack of cover leads to social exclusion) extra care should be undertaken in order to avoid socially harmful outcomes

Are there ways to improve the transparency and explainability of AI/ML analytics and addressing challenges related to the “black-box” effect?

The need for transparency and explainability

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The need of an explainable AI (XAI) framework for the insurance sector

- The Insurance XAI Framework should aim to align with the principles and objectives of the GDPR and the AI Act and introduce new elements that enhance the practical application and understanding of AI models in the insurance industry.
- Domain-specific definitions, a structured implementation template, XAI indicators, and innovative reporting solutions, the XAI Framework seeks to promote responsible and effective AI adoption within the sector while inviting further discussion and refinement of its proposed concepts and items.

Are there dangers with AI? – Henry Kissinger, Economist, May 17th, 2023:

“[We live] in a world of unprecedented destructiveness,” Mr Kissinger warns. Despite the doctrine that a human should be in the loop, automatic and unstoppable weapons may be created.

“If you look at military history, you can say, it has never been possible to destroy all your opponents, because of limitations of geography and of accuracy. [Now] there are no limitations. Every adversary is 100% vulnerable.”