

Dutch supervisors on AI at insurance companies

Summary note

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On 25 July 2019, the Dutch supervisors AFM and DNB published two articles discussing the use of **artificial intelligence** (AI) in the Dutch financial sector and specifically among Dutch insurers.

The first article¹ is a discussion paper written by DNB, containing a preliminary view on **regulation** of the use of AI in the financial sector. DNB invites market participants to send comments to ai@dnb.nl before **18 October 2019**. The comments will be used in a dialogue with the Dutch financial sector over the coming months.

The second article,² written jointly by the AFM and DNB, is an exploration of AI usage among **Dutch insurers**. It contains information insurers can use for the dialogue with the supervisors on potential regulatory responses towards the use of AI.

General principles for the use of artificial intelligence in the financial sector

Various research reports project up to a **2,000% increase** in AI-related revenue by 2025, and list the financial sector among those investing most heavily in AI. The impact of AI on financial services is of crucial importance, as the sector carries a serious responsibility towards society to ensure financial stability.

DNB lists chatbots and telematics as examples of AI applications in the Dutch insurance market, but envisions more applications coming up in the middle and back office settlement processes. These applications can improve customer experience, introduce highly personalised products, increase precision of risk models, and improve efficiency and effectiveness of core processes in general.

The increased importance and usage of AI in the financial sector make regulators rethink their traditional supervisory paradigms, especially from a point of view of operational controls rather than capital and liquidity requirements.

DNB invites market participants to comment on the following possible principles for the use of AI in the financial sector. The principles are divided over the key aspects of soundness, accountability, fairness, ethics, skills and transparency, collectively known as '**SAFEST**'.

Soundness

- 1) Ensure general compliance with regulatory obligations regarding AI applications.
- 2) Mitigate financial (and other relevant prudential) risks in the development and use of AI applications.
- 3) Pay special attention to the mitigation of model risk for material AI applications.
- 4) Safeguard and improve the quality of data used by AI applications.
- 5) Control the correct functioning of procured and/or outsourced AI applications.

Accountability

- 6) Assign final accountability for AI applications and the management of associated risks clearly at the board of directors level.
- 7) Integrate accountability in the organisation's risk management framework.
- 8) Operationalise accountability with regard to external stakeholders.

Fairness

- 9) Define and operationalise the concept of fairness in relation to AI applications.
- 10) Review AI applications and their outcomes for unintentional bias.

Ethics

- 11) Specify objectives, standards and requirements in an ethical code, to guide the adoption and application of AI.
- 12) Align AI applications and their outcomes with the organisation's legal obligations, values and principles.

Skills

- 13) Ensure that senior management has a suitable understanding of AI in relation to their roles and responsibilities.
- 14) Train risk management and compliance personnel in AI.
- 15) Develop awareness and understanding of AI within your organisation.

Transparency

- 16) Be transparent about policy and decisions regarding the adoption and use of AI internally.
- 17) Advance AI-driven decisions and model outcomes that are traceable and explainable.

¹ 'General principles for the use of Artificial Intelligence in the financial sector', available at <https://www.dnb.nl/nieuws/nieuwsoverzicht-en-archief/DNBulletin2019/dnb385020.jsp>.

² 'Artificiële Intelligentie in de verzekeringssector – een verkenning', available at <https://www.afm.nl/nl-nl/nieuws/2019/jul/verkenning-ai-verzekeringssector>.

Artificial intelligence in the insurance sector: An exploration

How is AI being used?

The most important AI applications for the insurance sector are **machine learning** algorithms. Several Dutch insurers already make use of machine learning for underwriting and other processes. The most commonly used techniques are clustering, random forest, gradient boosting and deep neural networks. In most cases, insurers are developing narrow AI applications focused on specific tasks, and machine learning is mostly used on an ad hoc basis to support traditional models.

Machine learning is already being used on a larger scale for **fraud detection**. The use of AI for pricing and acceptance has until now been limited, but Dutch insurers expect the biggest impact of AI in the coming years to be in these domains, especially within the casualty and income segments.

Points of attention for using AI

Points of attention for using AI are divided into three categories: embedding AI in an organisation, technical aspects of AI, and AI and the consumer.

Embedding AI in an organisation

Insurers must think in a systematic way about how they want to apply AI. A clear risk policy on the use of AI must be developed at the **board of directors level**, in line with the Solvency II requirement to record in a clear way the company's strategy, targets, risk appetite and risk limits, processes and roles.

Furthermore, the organisation must be sufficiently aware of the AI policy. The relevant parts of insurer—such as the data science department(s), actuarial function holder, risk management and the IT department—must sufficiently communicate and challenge each other.

Technical aspects of AI

Data used for AI applications must be **representative** and validated, because detecting and correcting errors or biases afterwards becomes increasingly difficult as models grow more complex. Furthermore, it is important when using AI to take into account both statistical risks (like overfitting) and model complexity.

Making results **explainable** is of great importance, especially with the new European General Data Protection Regulation (GDPR), which increases rights of consumers when they become subjects of automated decision making. Explainable means that insurers are able to indicate how certain input data leads to certain outcomes. Furthermore, insurers must be able to say which changes in individual input variables are needed to change the model prediction by certain amounts.

For some AI applications it is difficult or even impossible to achieve this level of explainability. These applications are called **black box models**. Black box models can still be used, but a careful consideration between the required level of explainability and the level of explainability that can be achieved must always be made.

Discrimination by AI applications is a concern. Discrimination is treating, penalising or excluding people in an illegal manner based on (personal) characteristics, the so-called illegal discrimination grounds. With machine learning and other AI applications, subtle dependencies can be captured which are potentially discriminatory but difficult to trace. When discriminatory biases in AI applications cannot be avoided, consideration must be given to avoiding use of the application for processes that affect customers directly (like pricing and acceptance or fraud detection).

When outsourcing AI applications it is crucial to monitor, test and challenge outsourced applications. Finally, model validation must determine that AI applications are fit for purpose, even when models are being frequently or continuously updated or retrained.

AI and the consumer

AI applications used in decision environments must stimulate consumers to make correct decisions, and cannot be used to nudge consumers towards decisions that do not benefit their financial well-being. Furthermore, AI usage must be acceptable from the point of view of society.

Effect of AI on solidarity

Finally, AI can influence the broader discussion of **solidarity**. With more data and more powerful models, insurers will be able to set premiums based on an individual's personal risk profile, which can increase differentiation in premiums.

This doesn't necessarily have to result in loss of solidarity, and can in fact increase solidarity and trust in insurance companies as a result of fairer pricing. On the other hand, personal risk assessments can result in uninsurability and exclusion of high-risk individuals, especially in the segments of disability insurance and term life insurance.

How Milliman can help

Milliman has a depth of experience and expertise in the insurance industry. We have consultants with strong quantitative skills and in-depth knowledge of machine learning algorithms as well as underwriting and other processes at insurance companies. We have decades of experience helping insurance companies in designing and implementing models in line with regulatory requirements.



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