ACTUARIAL ASSOCIATION OF EUROPE
ASSOCIATION ACTUARIELLE EUROPÉENNE

1 PLACE DU SAMEDI
B-1000 BRUSSELS, BELGIUM
(+32) 2 201 60 21
INFO@ACTUARY.EU
WWW.ACTUARY.EU

4 February 2019

Dear Sir, Madam,

We attach below the input of the Actuarial Association of Europe (AAE) in the context of the draft report "State-of-the-Art | Algorithmic decision-making – Version 1.0" published in December 2018.

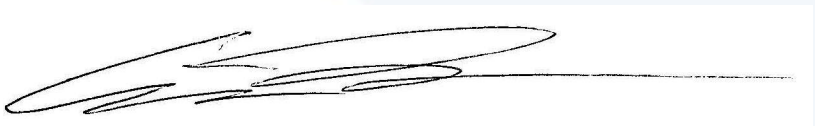
We have discussed the report in our organization and we are impressed by the work presented.

Adding an analysis of the professions already working with Artificial Intelligence and on how they tackle the underlying issues would further enhance the report from our perspective. In fact, we are convinced that the Actuarial Profession is closely related to algorithmic decision-making and that the actuarial professional framework is fulfilling the conditions described in the document.

The AAE would be happy to give you more details on the actuarial work and the professional organization and on how it can be considered in the context of algorithmic decision-making.

Therefore, do not hesitate to contact our Chief Executive, Ad Kok, at aamkok@actuary.eu

Sincerely yours,



Esko Kivisaari
AAE Chairperson

ARE THERE ANY DISCUSSION POINTS, CHALLENGES, INITIATIVES ETC. NOT INCLUDED IN THIS STATE-OF-THE-ART REPORT?

Artificial Intelligence in the financial industry is a real opportunity but could also be a threat if used in unethical manners (e.g. discrimination, etc.). Therefore, we would welcome that the report touches more on the bodies which currently work on Artificial Intelligence such as the Actuarial Profession which has already found solutions to some of the challenges.

TO WHAT EXTENT IS THE ANALYSIS CONTAINED WITHIN THIS REPORT ACCURATE AND COMPREHENSIVE? IF NOT, WHY NOT?

The report is comprehensive and offers interesting insights in the different challenges that Artificial Intelligence creates. An analysis of what different Professions have already put in place to tackle some of the challenges such as the unethical use of Artificial Intelligence could be added to further enhance the content of the report. Therefore, we would like to highlight below what our Profession does and how it solved some of the Artificial Intelligence challenges.

The Actuarial Profession and the actuarial process

The Actuarial Profession applies Actuarial Science which includes a number of interrelated subjects, including mathematics, probability theory, statistics, finance, economics, and computer science. Historically, actuarial science used deterministic models in the construction of tables and premiums. The science has gone through revolutionary changes since the 1980s due to the proliferation of high speed computers and the union of stochastic actuarial models with modern financial theory.

Actuarial Science is close to Artificial Intelligence, as it is using data in order to understand a behavior or a risk better. For the past five years, our discipline is considering the use of machine learning algorithms to increase insurance services but also predictions accuracy. It is not without caution that actuaries are using those new models and tools. Since actuaries are responsible for the risk control, they have to ensure that any algorithm is fair and understandable. The use of deep learning or complex non-parametric models stimulates actuarial research and extends its traditional knowledge of the risk control to new procedures. With that matter in mind, insurance companies have developed new products and risk models. The use of telematics is a good example: the data coming from connected cars allows fitting new algorithms with non-traditional information. Chatbots are more and more popular to handle insurance claims and image recognition allows estimating severities of damage and speed-up refund procedures.

The process involved in the actuarial activity is similar to the process described at page 8 of the document. In fact, the actuarial process generally covers the following steps:

- Problem definition: precise objective of the actuarial analysis to be agreed with the end user of the results and the report.
- Assumption setting: determine the context, the characteristics of the variables and parameters and quantify where appropriate. Identify the scope for sensitivity and scenario testing.

- Data collection: collect and validate the relevant data related to the internal activities of the entities involved and to the external environment.
- Model set-up: create the algorithms generating the intermediary and final results underlying the valuation, opinion, advice, and support for decision-making.
- Output: generate the output with a granularity depending on the purpose of the analysis.
- Analysis and checking: judge the outcome based on the initial analysis and the professional experience of the actuary.
- Reporting: delivery of the report, system, as agreed upon with the client.

Each step is divided into appropriate phases allowing for a proper design and control process.

The approach of the Actuarial Profession with regards to AI challenges

One of the challenges that Actuarial Sciences is mostly dealing with is that insurance companies are facing collectives of risks but have to offer more and more often bespoke pricing to an individual risk level within the collective (e.g. motor insurance offers more and more individual pricing, but all motor risks are one collective in an insurance company). Artificial Intelligence techniques help to understand individual risks in more detail. Nevertheless, the ethics of applying individual pricing and secondly, the technical feasibility are key challenges that actuaries have to consider. As example, for some types of business, there is an important time lag between the collected data and the period of application of Artificial Intelligence techniques (e.g. the trends in life insurance and life-long health insurance appear over a long period of time). Therefore, actuaries have to understand what the Artificial Intelligence techniques are doing and are not "allowed" to use Artificial Intelligence tools where they cannot interpret the results. This is something which is complex to regulate and therefore, ensuring that those Professionals are following Professional Standards and a Code of Conduct is of utmost importance for the credibility and the trust placed in the Profession.

Therefore, in many countries, actuaries must demonstrate their competence by passing a series of rigorous professional examinations and show that they complete a Continuing Professional Development program. In addition, each Fully Qualified Actuary must abide to the Code of Conduct. The Code of Conduct applied by the Member Associations of the AAE (most recent version approved on 22 September 2017) provides guidance on the behavior expected of actuaries when performing services, to give intended users of those services confidence that they are carried out professionally and with care.

The Code refers to 5 main principles:

- Integrity, which can be related to the fairness and equity principle mentioned in the Algo:Aware document;
- Competence and care, which can be related to the accountability principle mentioned in the document;
- Compliance, which can be related to the privacy and liability principle mentioned in the document;
- Impartiality, which can be related to the accountability principle;

- Communication, which can be related to the transparency and scrutiny principle mentioned in the document.

In addition, the European Standards of Actuarial Practices (ESAP) provide guidance to actuaries when performing actuarial services to give the intended users confidence that:

- Actuarial services are carried out professionally and with care;
- The results are relevant to their needs, are presented clearly and understandably and are complete;
- The assumptions and methodology (including but not limited to models and modelling techniques) are disclosed appropriately.

ESAP1 covers the General Actuarial Practice. General Actuarial Practice does not depend on a specific context and can be related to robustness and resilience principle as mentioned in the document. In fact, it covers the compliance, the acceptance of an assignment, the knowledge of relevant circumstances, reliance on others, materiality, data quality, assumptions and methodology, process control, peer review, treatment of subsequent events, retention of documentation, communication and disclosures.

TO WHAT EXTENT DO YOU AGREE WITH THE PROMINENCE WITH WHICH THIS REPORT PRESENTS THE VARIOUS ISSUES? SHOULD CERTAIN TOPICS RECEIVE GREATER OR LESS FOCUS?

Initiatives by the Actuarial Profession could be added to the report as Artificial Intelligence methods are already applied and solutions to some challenges are already implemented.

BRIEF DESCRIPTION OF THE ACTUARIAL ASSOCIATION OF EUROPE AND THE ACTUARIAL PROFESSION

The Actuarial Association of Europe (AAE) was established in 1978 under the name Groupe Consultatif to represent actuarial associations in Europe. Its primary purpose is to provide advice and opinions to the various organisations of the European Union - the Commission, the Council of Ministers, the European Parliament, the European Supervisors and their committees – on actuarial issues in European legislation.

The AAE currently has 36 member associations in 35 European countries, representing over 24,000 actuaries. Advice and comments provided by the AAE on behalf of the European actuarial profession are totally independent of industry interests.

The Actuarial Association of Europe is registered in the EU Transparency Register under number 550855911144-54 (www.actuary.eu).