Operationalizing Responsible AI in the Insurance Industry
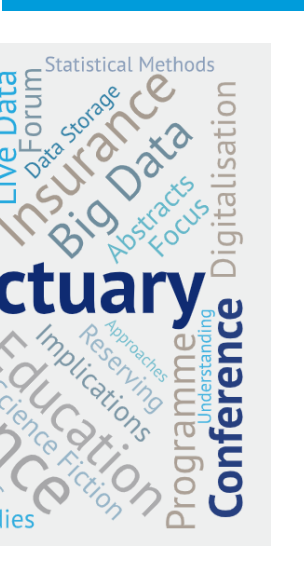
EAA e-Conference on
Data Science & Data Ethics

12 May 2022

Dr. Jordan Ko and Anthony Nelson

SAS Institute

AGENDA

1. Why do we need responsible AI?
2. The business imperative for responsible AI
3. A roadmap for implementing responsible AI
4. Demo: Responsible AI

WHY DO WE NEED RESPONSIBLE AI?

01

Regulations are coming, it is time to prepare…

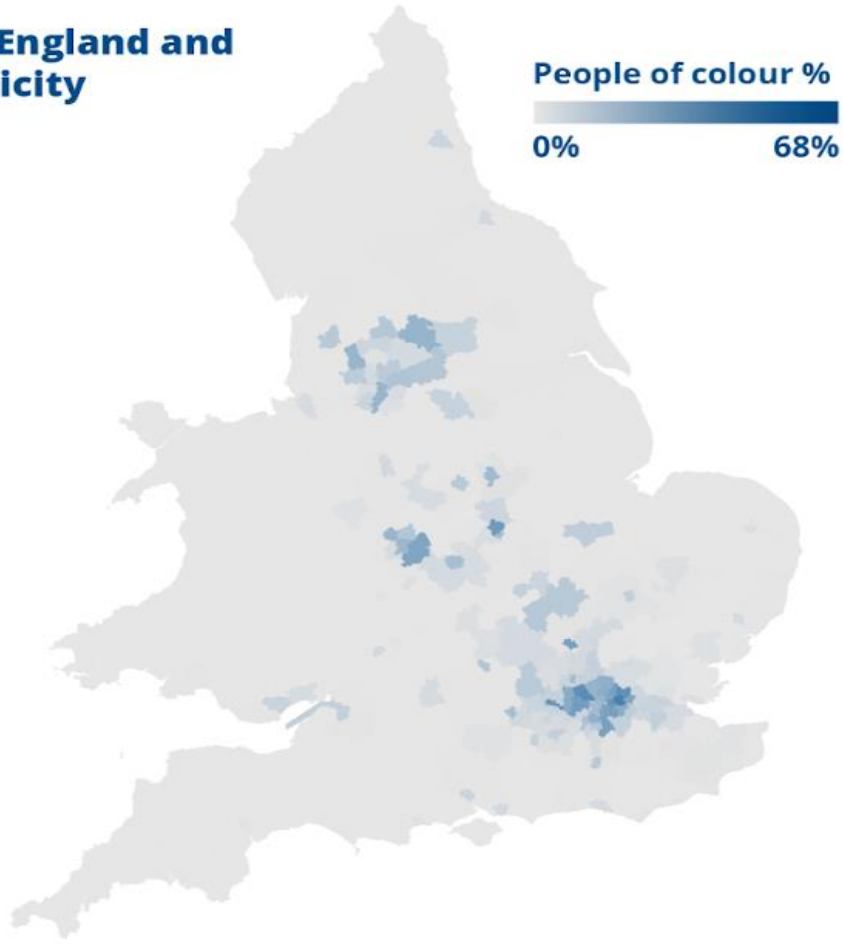Examples of AI applications currently in use

Examples of AI applications currently in use.

What if...
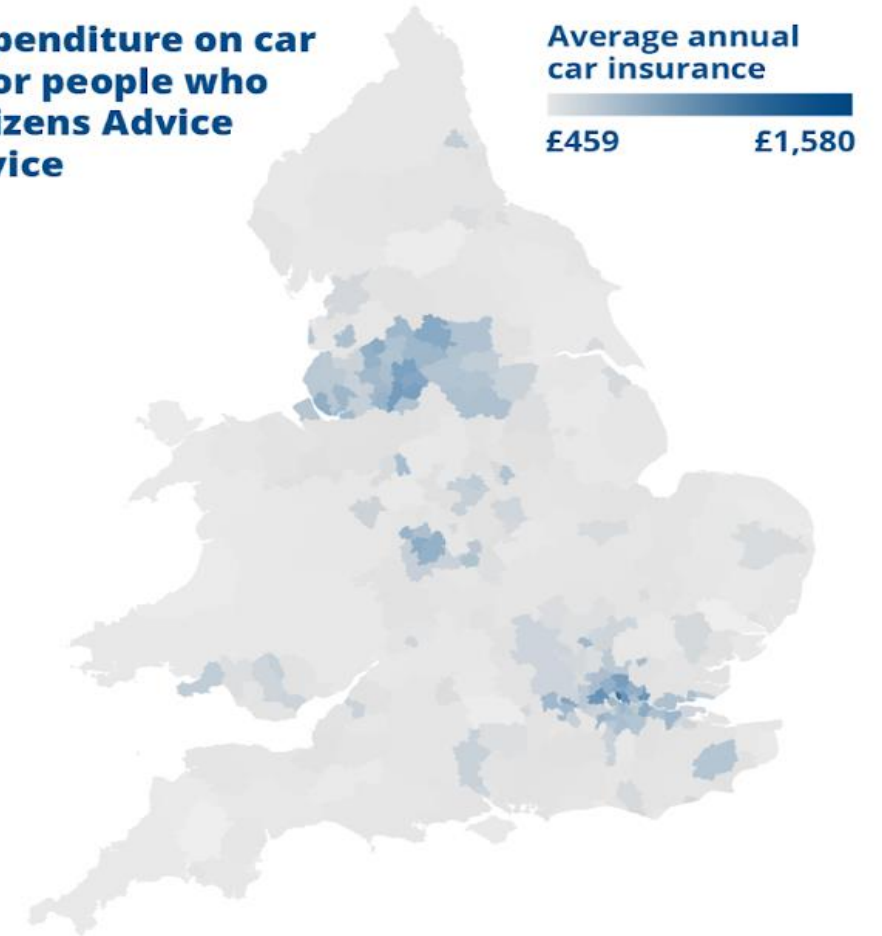
CLEAR CORRELATION BETWEEN AREAS WITH A HIGH PROPORTION OF PEOPLE OF COLOR, AND HIGHER CAR INSURANCE COSTS.

Population of England and Wales by ethnicity

People of colour %

0%   68%

Average expenditure on car insurance for people who came to Citizens Advice for debt advice

Average annual car insurance
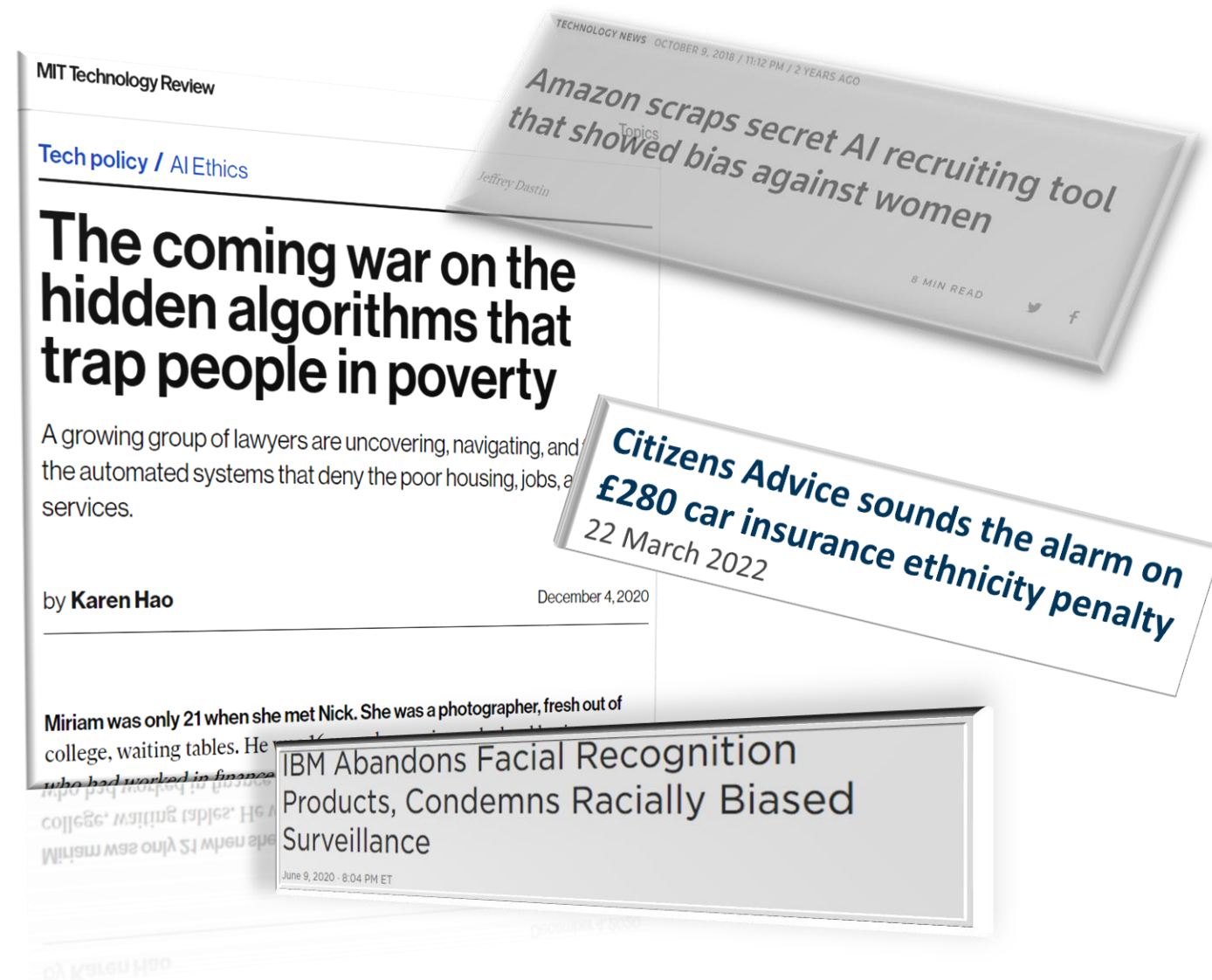
£459   £1,580

Source: https://www.citizensadvice.org.uk

THE BUSINESS IMPERATIVE FOR RESPONSIBLE AI

02

Protecting your brand

Mitigating the risk of brand-damaging public exposure

MIT Technology Review

Tech policy / AI Ethics

The coming war on the hidden algorithms that trap people in poverty

A growing group of lawyers are uncovering, navigating, and [...] the automated systems that deny the poor housing, jobs, a[...] services.

by Karen Hao   December 4, 2020

Miriam was only 21 when she met Nick. She was a photographer, fresh out of college, waiting tables. He [...]

TECHNOLOGY NEWS · OCTOBER 9, 2018 / 11:12 PM / 2 YEARS AGO

Amazon scraps secret AI recruiting tool that showed bias against women

Jeffrey Dastin

8 MIN READ

Citizens Advice sounds the alarm on £280 car insurance ethnicity penalty
22 March 2022

IBM Abandons Facial Recognition Products, Condemns Racially Biased Surveillance

June 9, 2020 · 8:04 PM ET

WHAT WOULD YOU DO IF YOU PERCEIVE AI-ENABLED INTERACTIONS TO BE ETHICAL?

Customers become **vocal advocates** when they believe AI is being used responsibly

Share positive feedback on social media	
Increase number of purchases	
Increased loyalty for the company	
Share positive experiences with friends & family	
Place higher trust in the company	

50% 52% 54% 56% 58% 60% 62%
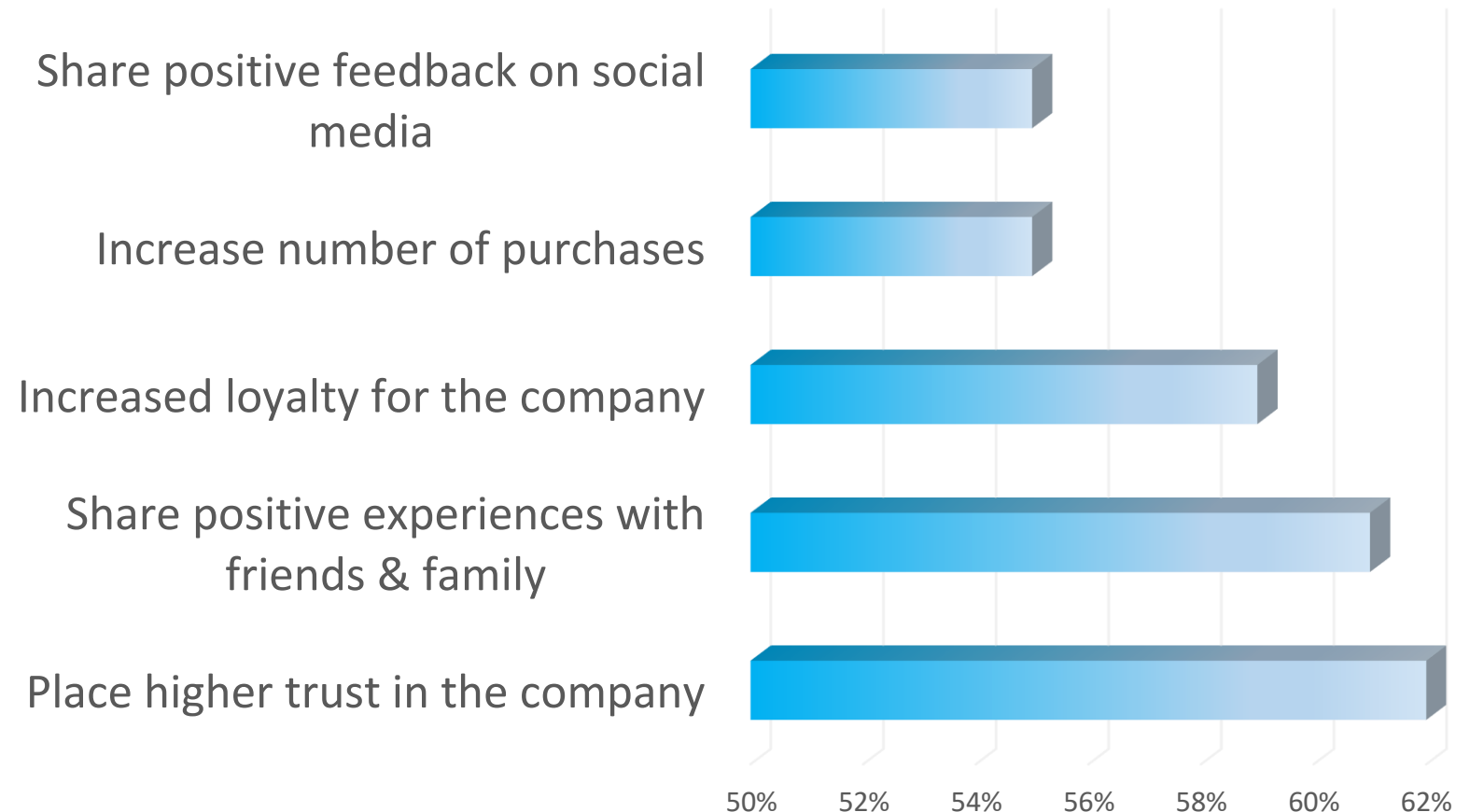
Business leaders recognize the need for responsible AI

Doing the right thing is good for business!

Organizations globally are recognizing the need for Responsible AI

64% Boost AI security with validation, monitoring and verification

61% Create transparent, explainable and provable AI models

55% Create systems that are ethical, understandable and legal

52% Improve governance with AI operating models and processes

47% Test for bias in data, models and human use of algorithms

3% Have no plans to address those AI issues

A ROADMAP FOR IMPLEMENTING RESPONSIBLE AI

03

1. DEFINE YOUR VERSION OF RESPONSIBLE AI GOVERNANCE PRINCIPLES BASED ON YOUR ORGANIZATION'S VALUES, CULTURE AND PRIORITIES
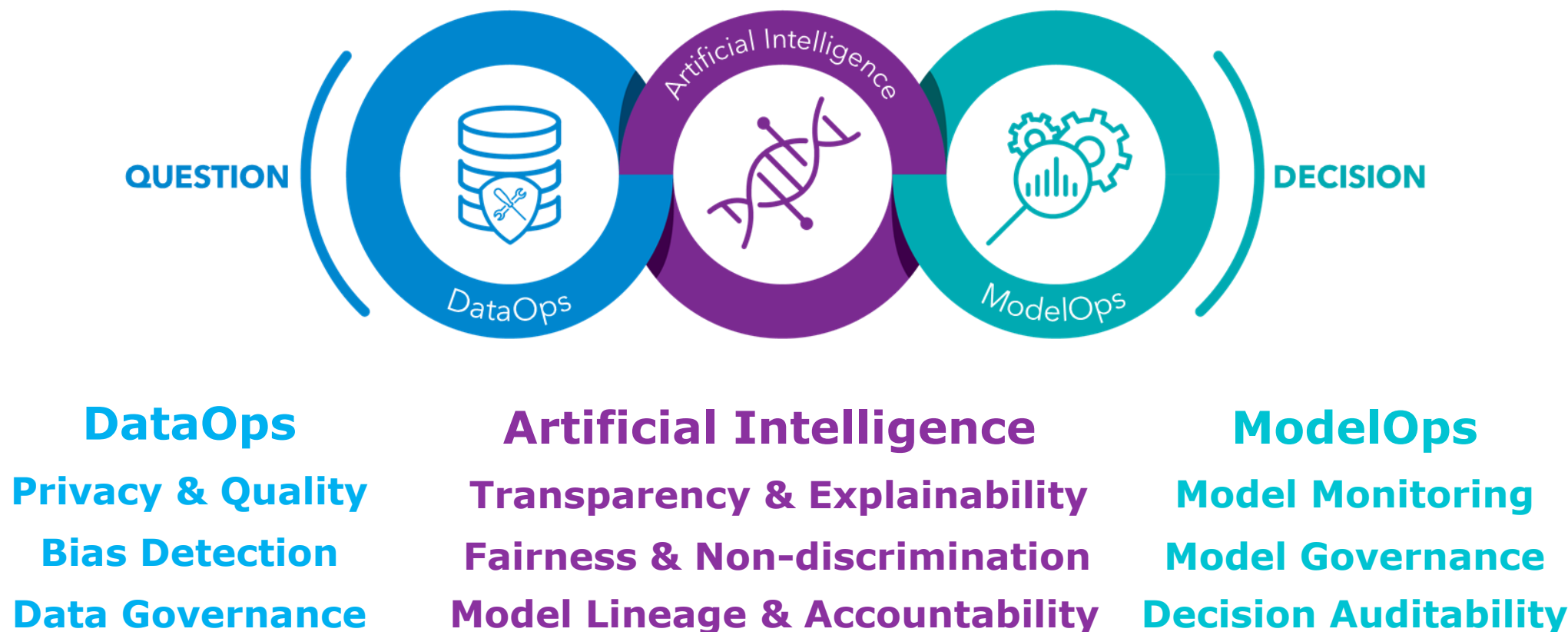

Proportionality

Robustness & Performance

Fairness & Non-discrimination

EIOPA AI Governance Principles

Data Governance & Record Keeping

Transparency & Explainability

Human Oversight
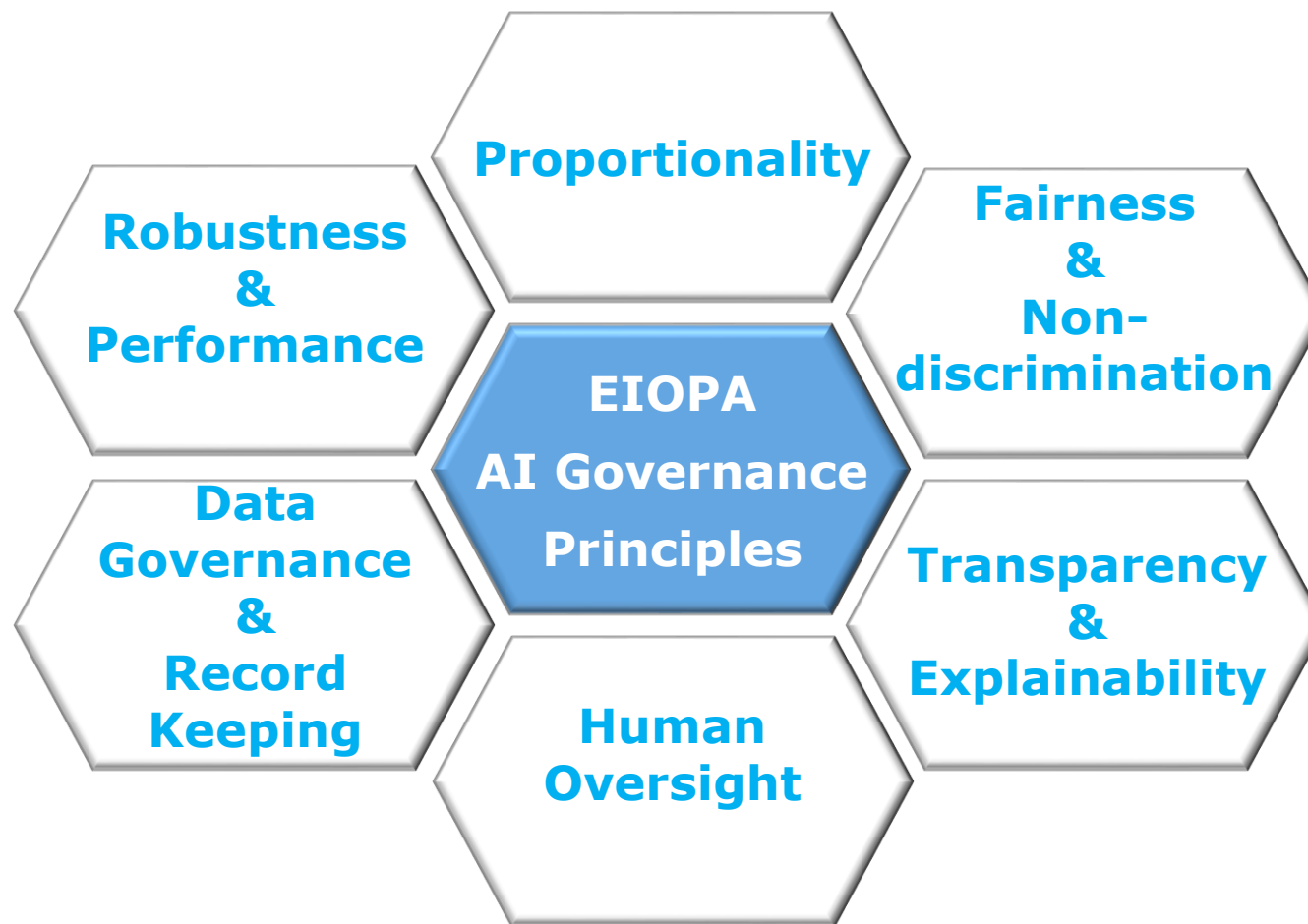
2. TRANSLATE THESE AI GOVERNANCE PRINCIPLES INTO PRACTICAL, ROLE-BASED GUIDELINES AND COMMUNICATE THEM TO EVERYONE INVOLVED IN DEVELOPING, DEPLOYING OR USING AI SOLUTIONS IN YOUR ORGANIZATION

management

actuaries

governance board

data engineers

IT

data owner

developers
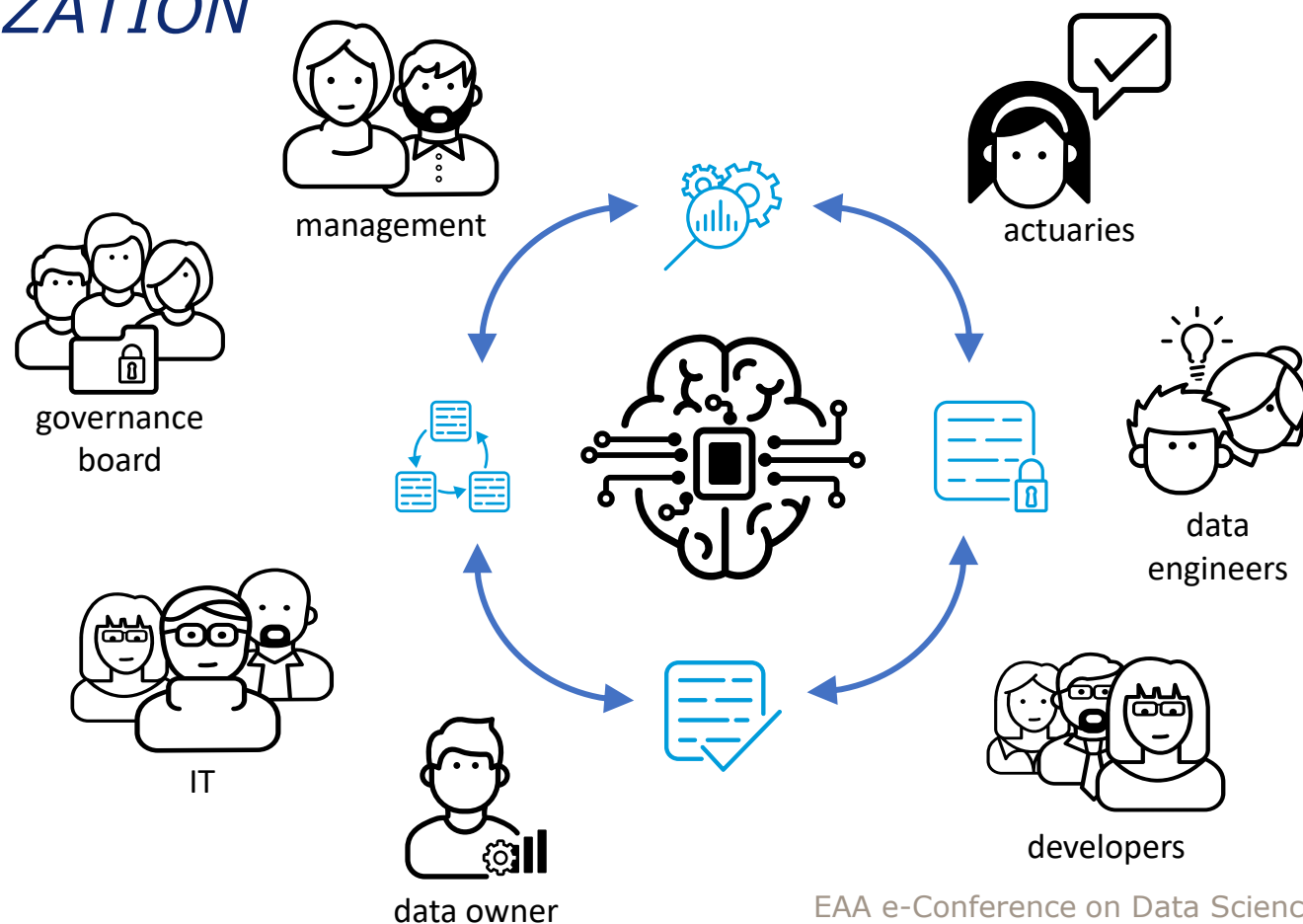
3. DEVELOP A STANDARDIZED, REPEATABLE PROCESS TO EVALUATE THE POTENTIAL RISKS AND POTENTIAL IMPACTS OF EACH PROPOSED AI SOLUTION

I. Unacceptable Risk

II. High Risk

III. Limited Risk

IV. Minimal Risk
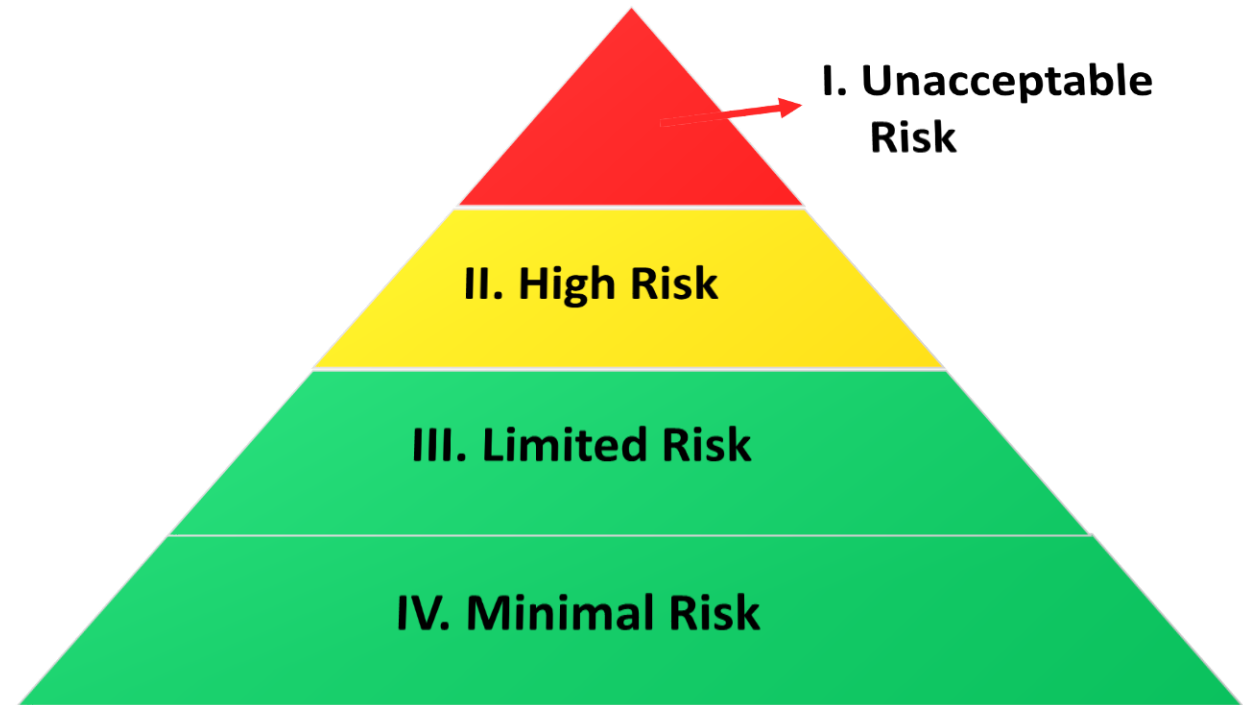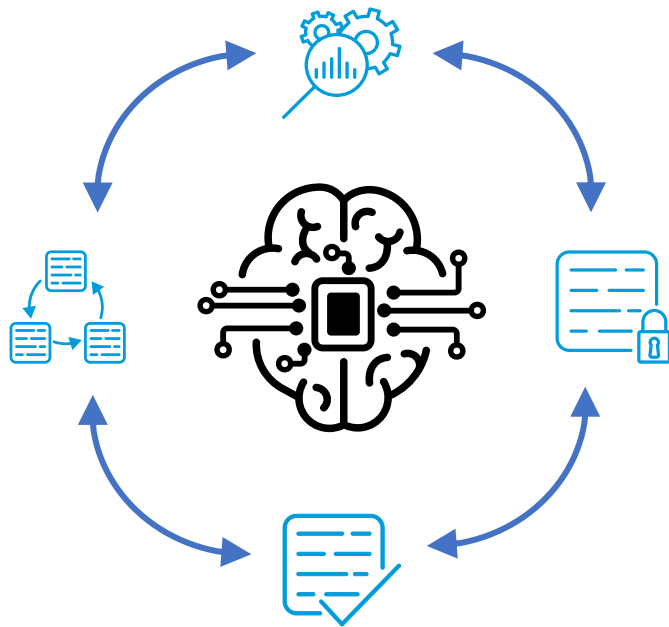
4. INFUSE YOUR AI GOVERNANCE PRINCIPLES AND YOUR ROLE-BASED GUIDELINES INTO EVERY STAGE OF YOUR AI LIFECYCLE

DataOps	**Artificial Intelligence**	**ModelOps**
Privacy & Quality	Transparency & Explainability	Model Monitoring
Bias Detection	Fairness & Non-discrimination	Model Governance
Data Governance	Model Lineage & Accountability	Decision Auditability

5. START TODAY!

Source: Pixabay

1

DEFINE
your version of AI governance principles

2

TRANSLATE
these principles into practical, role-based guidelines

3

DEVELOP
a repeatable process to evaluate the potential impacts and potential risks of each proposed AI solution

4

INFUSE
Your AI governance principles and role-based guidelines into every stage of your AI / analytics lifecycle

5

START TODAY!

DEMO:
RESPONSIBLE AI

04

Proportionality

Data Governance & Record Keeping

Fairness & Non-discrimination

Transparency & Explainability

Human Oversight

Robustness & Performance

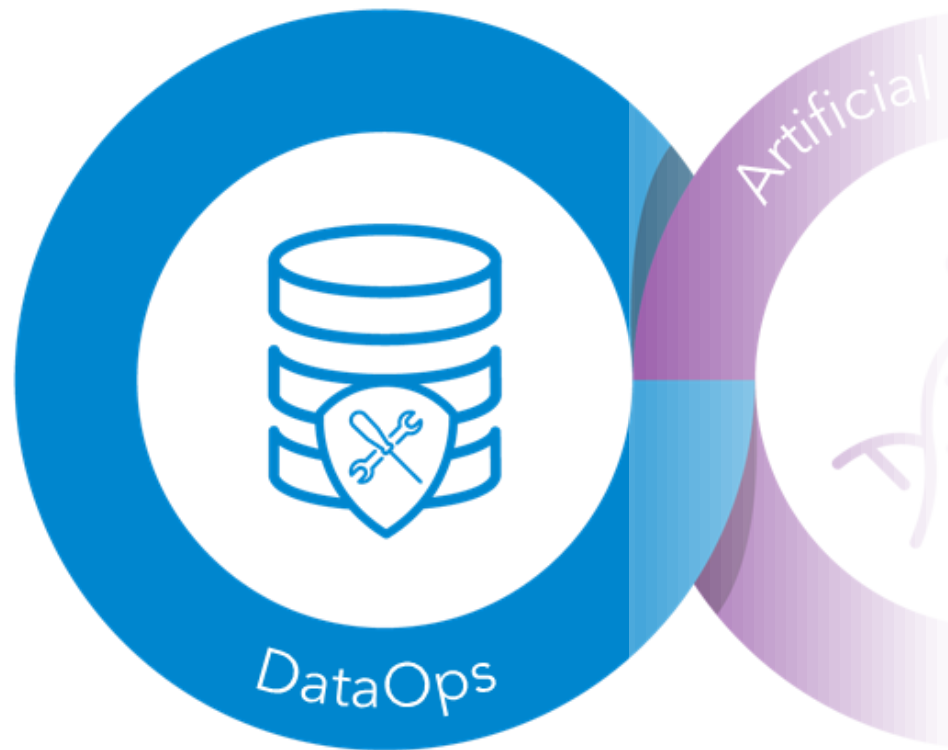## Auditable Evaluation Process

- A consistent methodology is vital identify the different risk tiers – use workflows that clearly define AI process steps

- Assign owners who are responsible and accountable for each step

- Maintain audit trail for use with compliance and audit teams

Example: Automation of Business Process Management for the Model Life Cycle

Data Governance

Centralized data management with key indicators on data quality

Detection of Private & Biased Data

Profile data to evaluate representation from a diverse population and flag PII fields

Privacy & Quality

- Data management should be centralized and integrated in the analytics process
- Identification of gaps in the data and how they can be filled
- Automatically identify privacy fields
- Continuous & automatic data monitoring with a consistent data & privacy policy
- Apply a consistent privacy policy
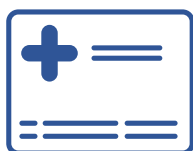
Example: PII data should be identified automatically and flagged for data stewards' attention
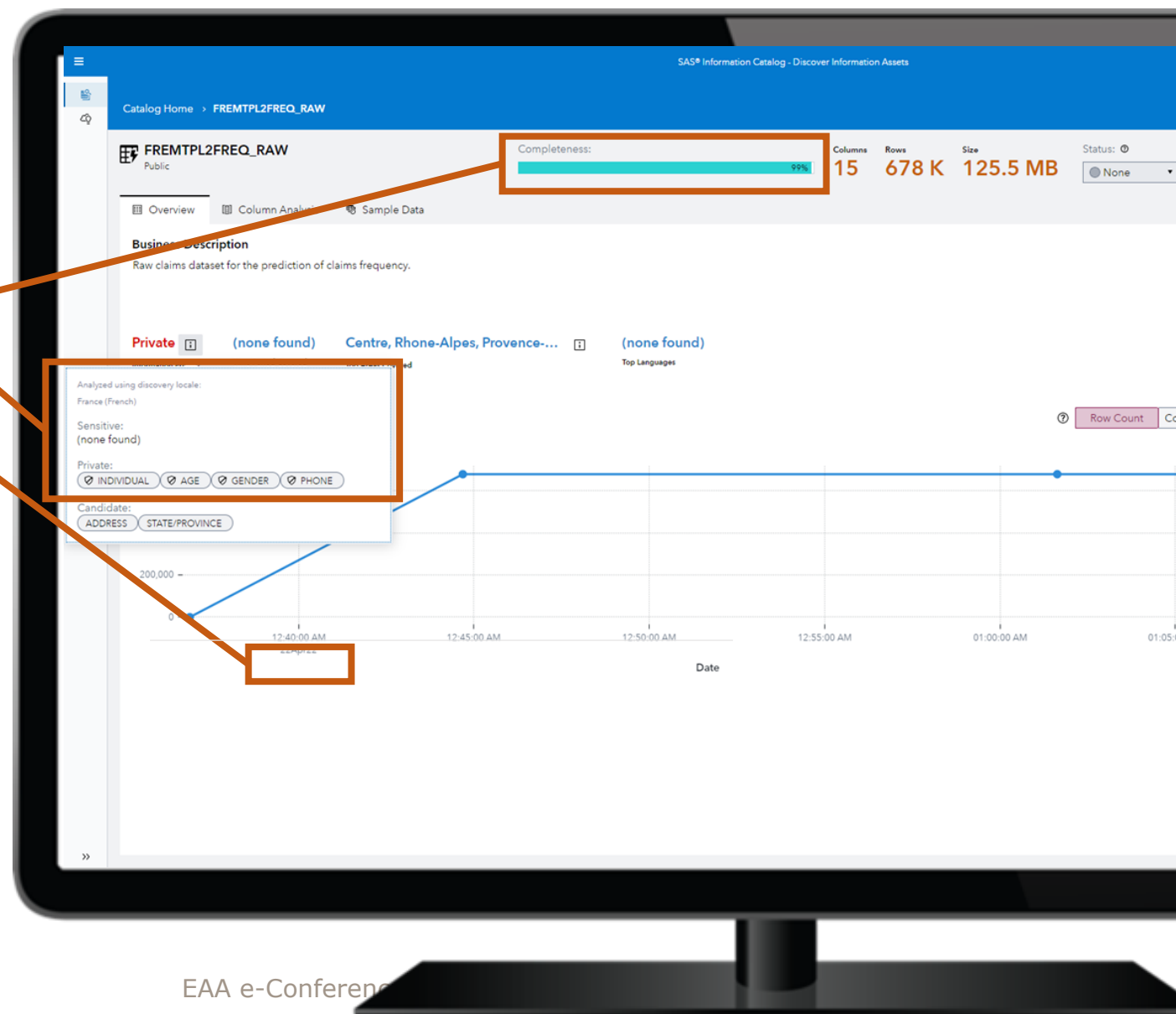
Bias & Fairness Assessment
Ensure models provide accurate and positive outcomes fairly across groups for sensitive attributes

Explainability
Explain the outcomes of a model or decision to auditors or customers

Explainability

- Every model provided with quantitative measures to explain model outcomes

- The importance of different variables are estimated and ranked

- Explain <u>how</u> a variable impacts model prediction

- Explain <u>why</u> a specific prediction was made

- Explainability for data scientists and citizen data scientists

- Inclusive so all can understand impact of decisions
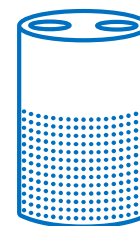
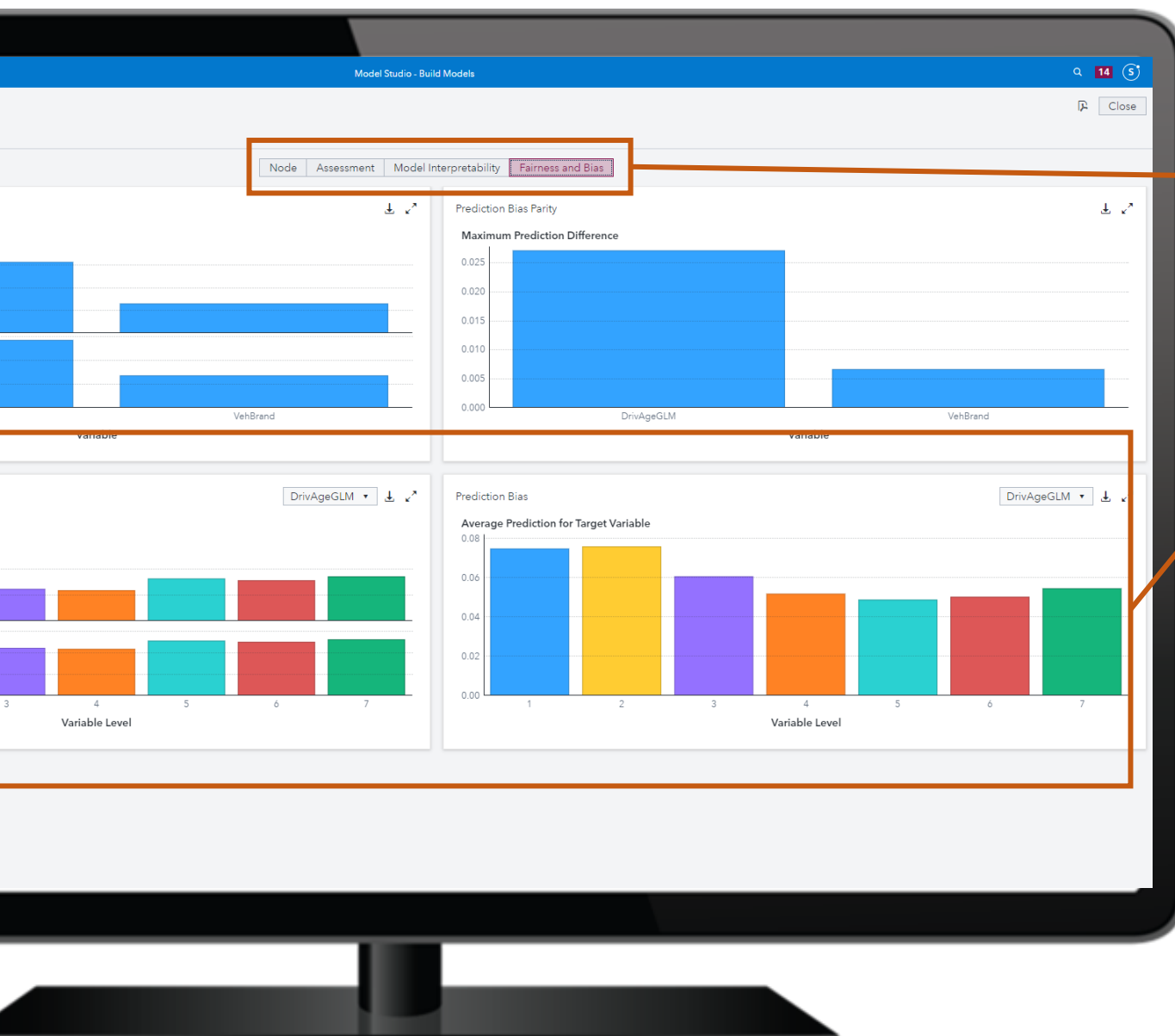**Example:** Understanding why a customer was approved or denied a loan.
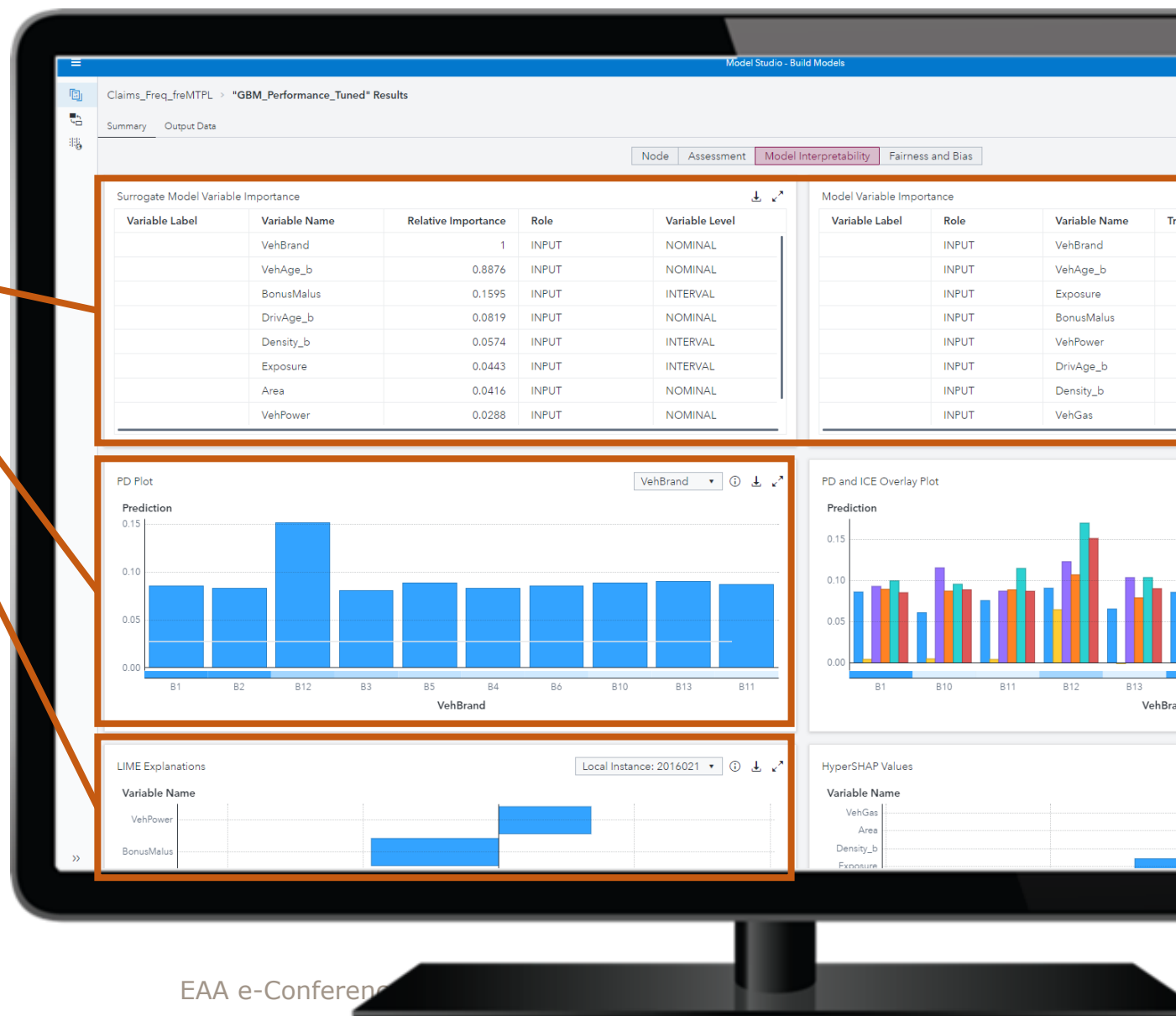
Equal Treatment

- Fairness and bias analysis need to be integrated in the process

- Assess whether models favor one group over another

- Visualize different treatments of across various target groups

Example:
Underrepresentation of certain target groups need to be identified and rectified

Model Governance

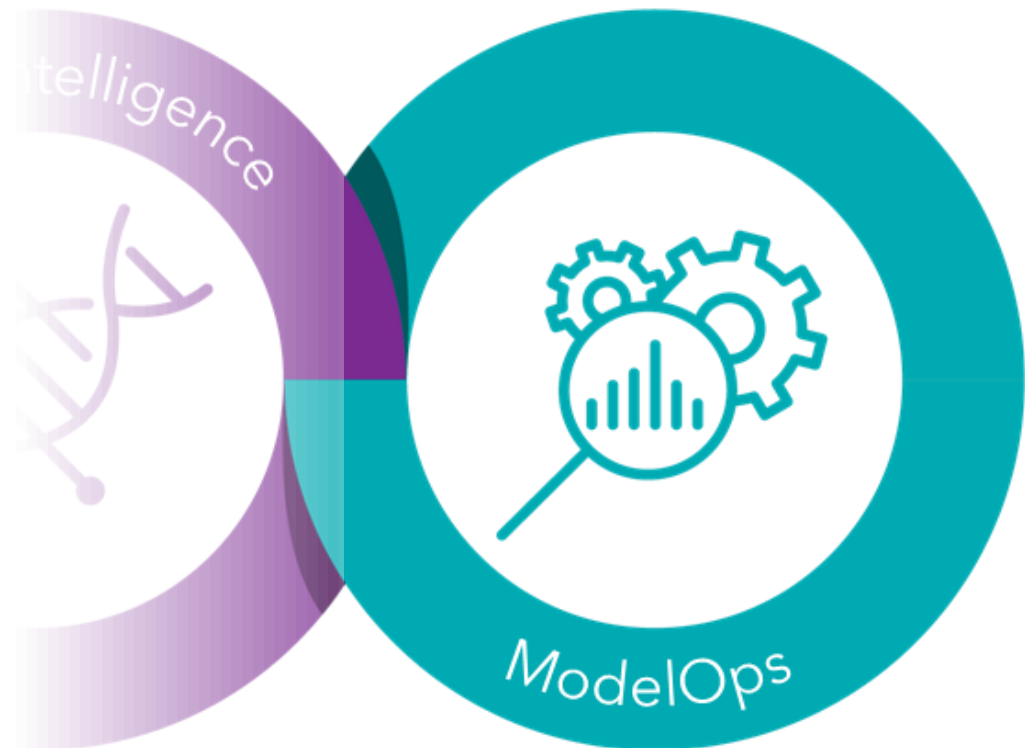Provide oversight over a population of models and decisions being made

Model Monitoring

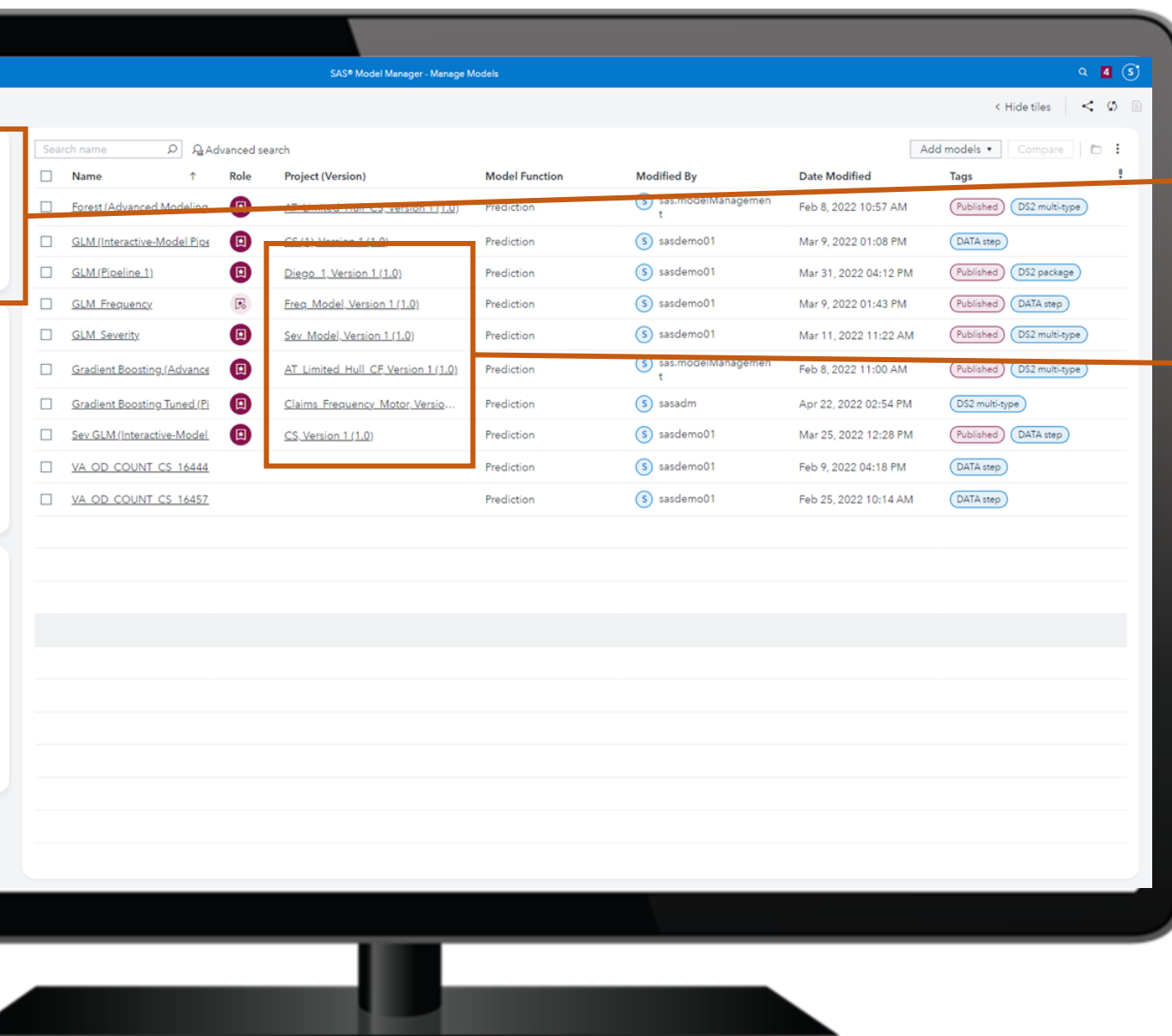Actively monitor models for change over time in variable relationships

Decision Auditability

Profile decisions to better enable compliance and responsibility

Central Repository

- Have visibility to all models and decisions you are making

- Simplify model management with life cycle templates and version control

Continuous Model Evaluation

- Central repository of trained models
- Evaluates how input variables affect predictive score over time
- Score model to estimate output accuracy
- Automatic performance reports that are regularly scheduled to be executed
- Alert when prediction exceed acceptable tolerance
- Future with Custom KPIs for tolerance
- Alert when prediction exceed acceptable tolerance

Thank you for your attention!

Contact

Anthony Nelson & Dr Jordan Ko

SAS Institute

Anthony.nelson@sas.com & jordan.ko@sas.com

+49 1511 4349780 & +46 72 564 80 41

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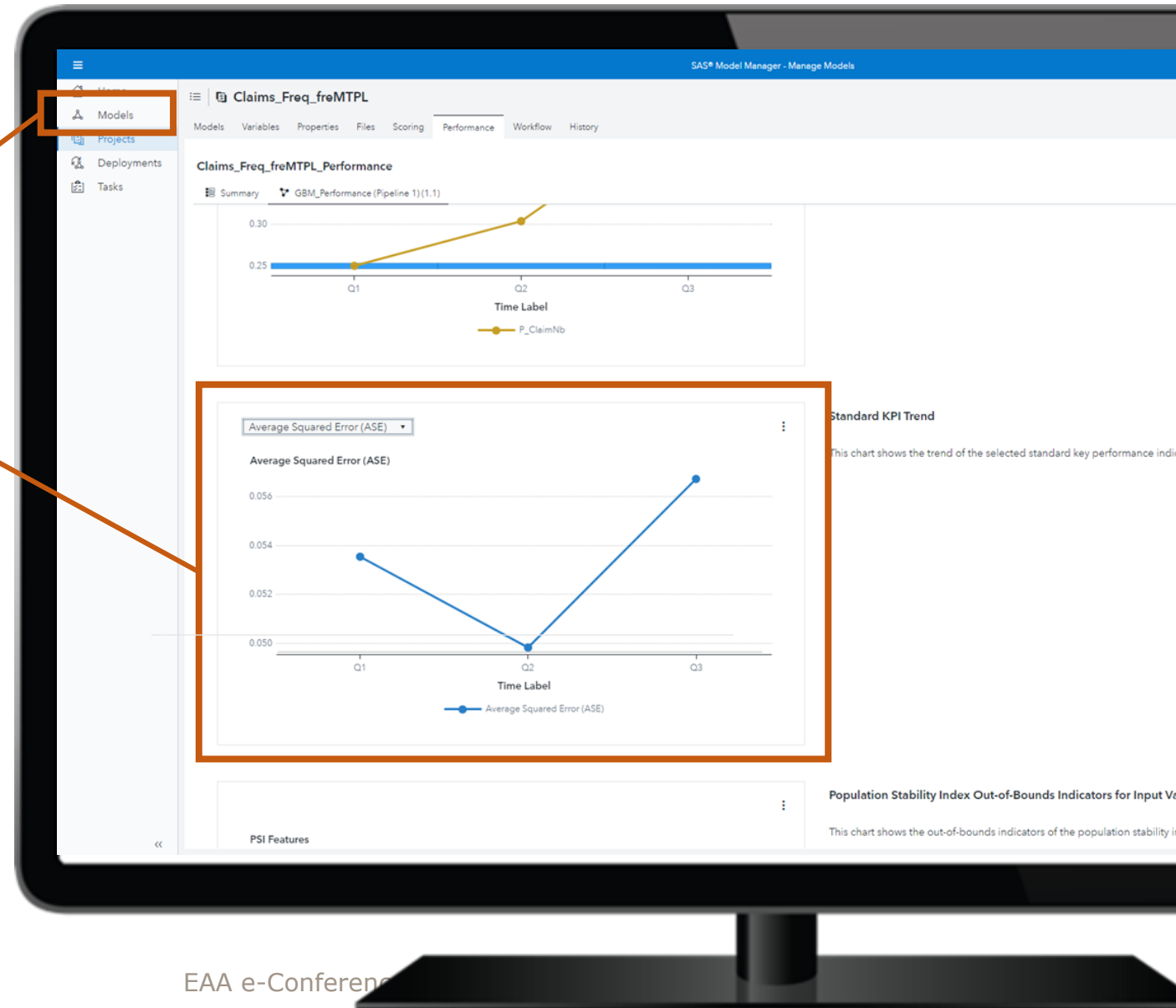
Anthony Nelson is a Senior Engagement Manager at the SAS Institute in Munich focused on the insurance industry with over 15 years of experience working with large multinational financial services organizations across Europe and in the United States. Anthony has focused on using technology to improve business operations, including leading large business process optimization, digitization and automation efforts. Anthony's passion for technology and the use of technology to solve complex business challenges led him to do advanced studies at MIT in Boston, MA where he focused on the application of analytics and artificial intelligence, skills he is now able to share with his clients in the insurance industry in Germany.

ABOUT ME

Anthony Nelson

SAS Institute

Dr Jordan Ko is an actuary working at the SAS Institute in Stockholm Sweden and has more than 15 years of experience with risk and advanced analytics. Prior to joining the insurance industry, Jordan had an international academic career having most recently served as a visiting fellow at London School of Economics. Jordan worked as a reserving actuary at an international reinsurer and is keenly interested in applying advanced analytics to insurance applications. He is passionate about insurance and volunteers for actuarial, microinsurance and sustainability related topics.

ABOUT ME

Jordan Ko

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