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EUROPEAN INSURANCE
AND OCCUPATIONAL PENSIONS AUTHORITY

Big Data Analytics in motor and health insurance: a thematic review

28 June 2019

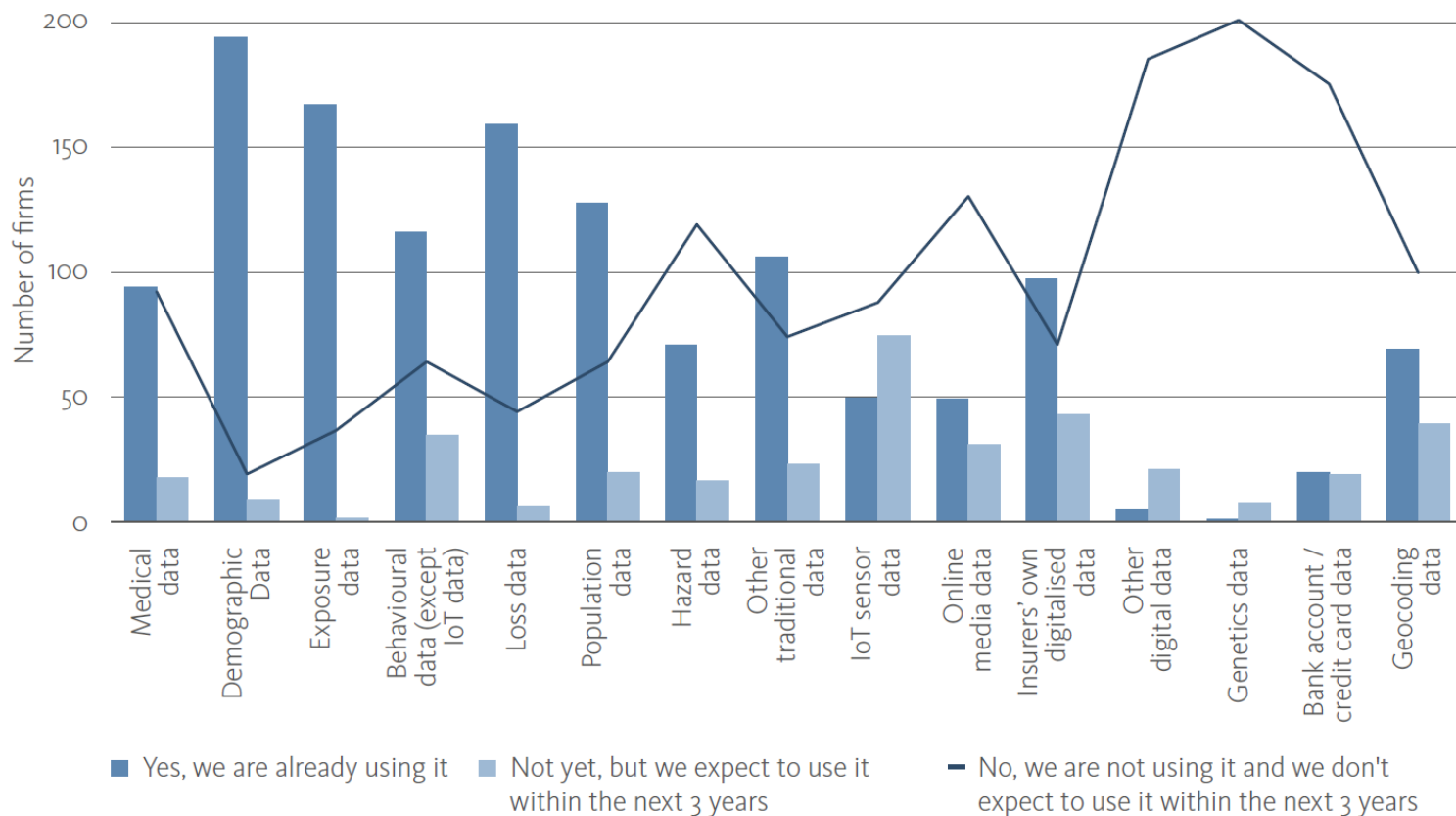
Types of data used by insurance firms

(I)

Traditional data sources	New data sources enabled by digitalisation
Medical data (e.g. medical history, medical condition, condition of family members)	IoT data (e.g. driving behaviour (car telematics), physical activity and medical condition (wearables).
Demographic data (e.g. age, gender, civil and family status, profession, address)	Online media data (e.g. web searches, online purchases, social media activities, job career information)
Exposure data (e.g. type of car, value of contents inside the car)	Insurance firms' own digital data (e.g. interaction with insurance firms (call centre data, users' digital account information, digital claim reports, online behaviour while logging in to insurance firms' websites or using insurance firms' app)
Behavioural data (except IoT data) (e.g. Smoking, drinking behaviour, distance driven in a year)	Geocoding data (i.e. latitude and longitude coordinates of a physical address)
Loss data (e.g. claim reports from car accidents, liability cases)	Genetics data (e.g. results of predictive analysis of a person's genes and chromosomes)
Population data (e.g. mortality rates, morbidity rates, car accidents)	Bank account / credit card data (e.g. consumer's shopping habits, income and wealth data)
Hazard data (e.g. frequency and severity of natural hazards)	Other digital data (e.g. selfie to estimate biological age of the consumer)
Other traditional data (e.g. credit scoring, claim adjustment reports, information from the auto repair shops)	

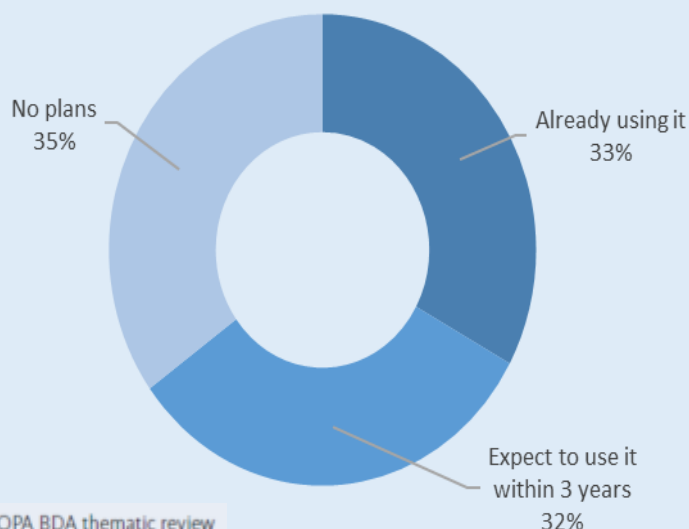
Source: The Geneva Association (the categorisation of types of data was slightly amended by EIOPA)⁴

Types of data used by insurance firms (II)



Source: EIOPA BDA thematic review

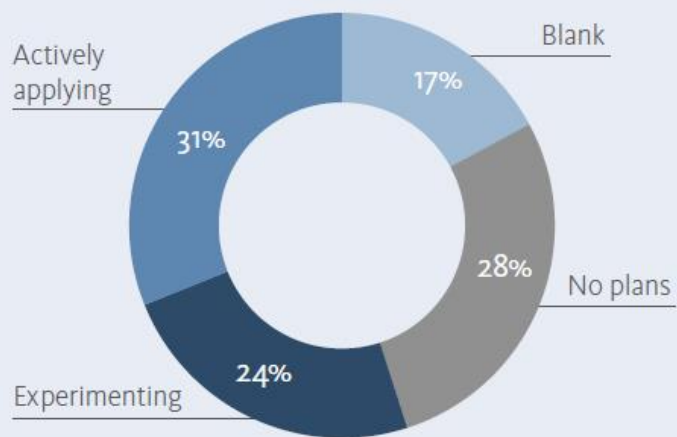
Use of cloud computing by insurance firms



Service model	Services offered to clients
IaaS – Infrastructure as a Service	IT resources such as computing power, data storage devices or networks are offered as a service.
PaaS – Platform as a Service	Next to the infrastructure the provider offers on the platform standardised interfaces , which are used by services of the customer.
SaaS – Software as a Service	Wide range of services / applications offered (e.g. machine learning , contact data management, financial accounting, collaboration applications).

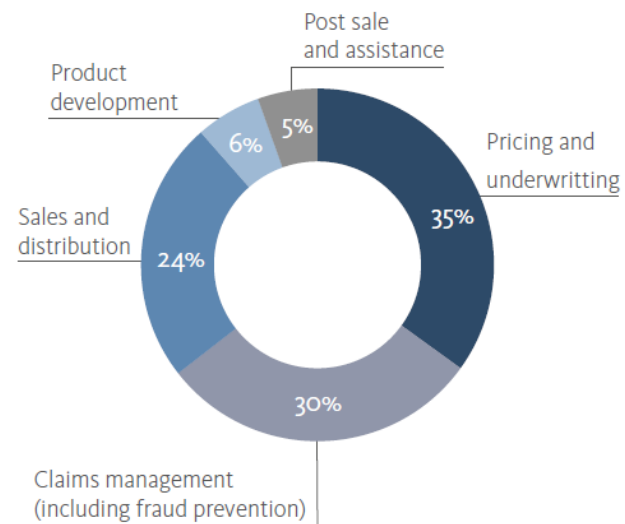
- Cloud computing is perceived as a **key enabler** of agility and data analytics

Figure 7 – Usage of BDA tools such as AI and ML



Source: EIOPA BDA thematic review

Figure 8 – Usage of BDA tools such as ML and AI across the value chain



Source: EIOPA BDA thematic review

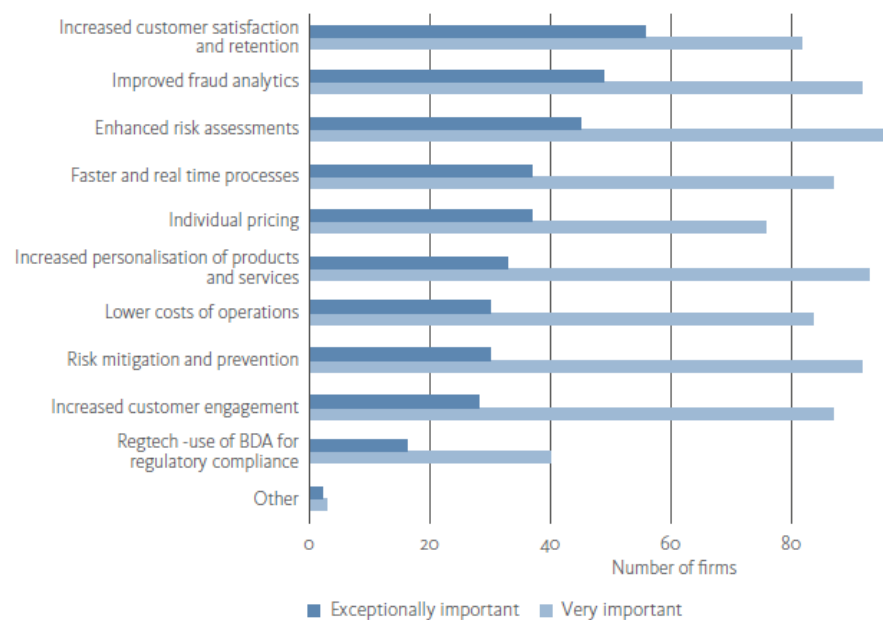
BDA use cases across the value chain



Product design and development	Pricing and underwriting	Sales and distribution	Post-sale services and assistance	Claims management
<ul style="list-style-type: none">• Usage-based insurance products• Tailor-made product and services• New products (e.g. cyber insurance)• Predictive modelling of disease development patterns	<ul style="list-style-type: none">• Enhanced risk assessments• New rating factors• New claims drivers and predictive models• Price optimisation practices• Churn models	<ul style="list-style-type: none">• Automated advice• Disintermediation of sales processes• Sophisticated customer relationship management (CRM) systems• Increased frequency and customer interaction: “Next best action”	<ul style="list-style-type: none">• Smartphone applications• 24/7 service, accessible from any location• Chatbots• Safety warnings in case of flood, storm, hail, etc. based on geolocation data	<ul style="list-style-type: none">• Enhanced fraud analytics• Optical character recognition (OCR) to estimate repair costs from images or videos• Automated segmentation of claims by type and complexity• Automated invoice verification and payment process

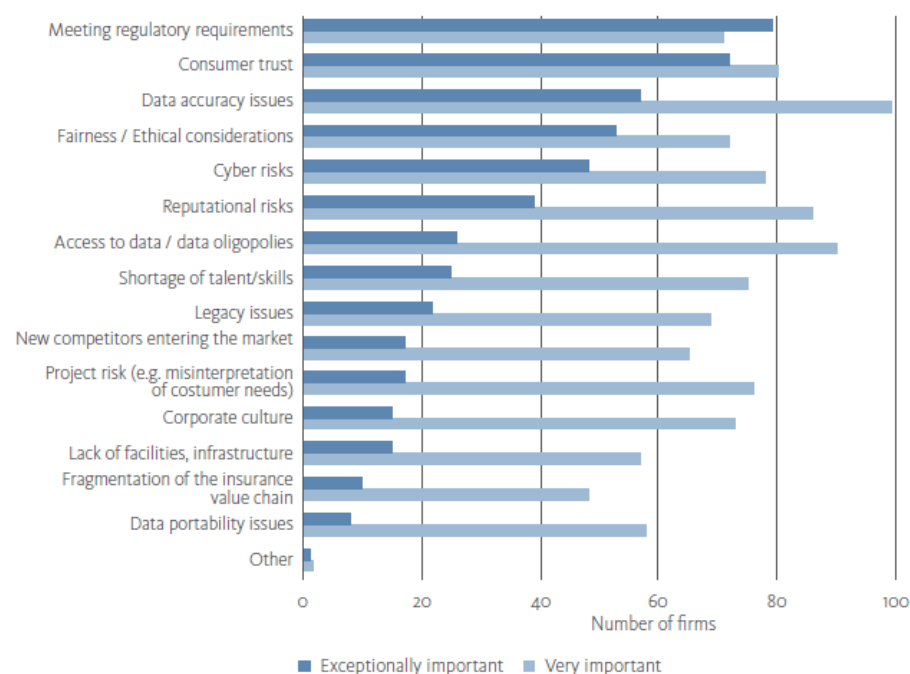
BDA opportunities and risks

Figure 32 – BDA opportunities according to insurance firms

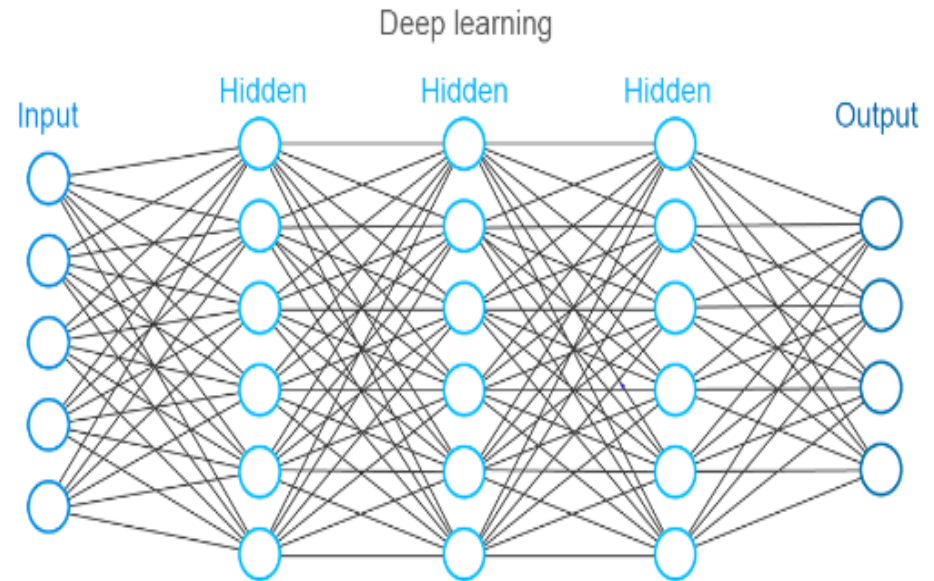
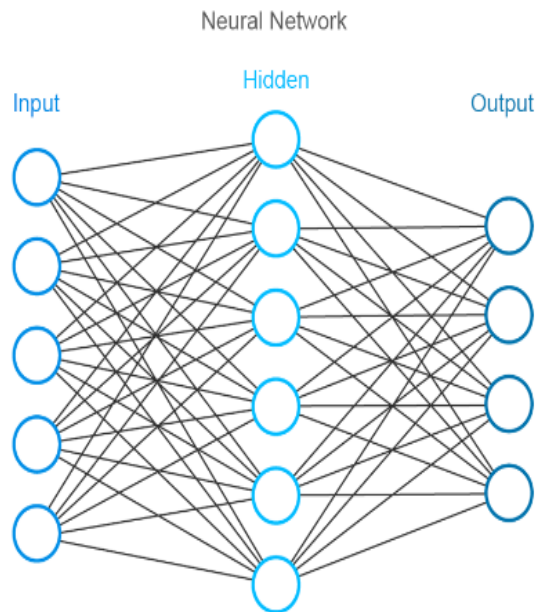


Source: EIOPA BDA thematic review

Figure 33 – BDA challenges according to insurance firms

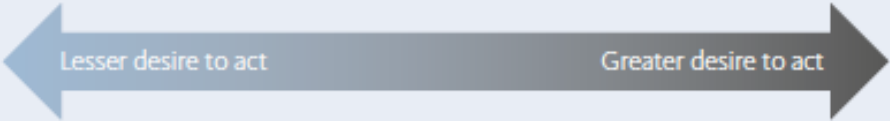


Machine learning: Artificial Neural Networks



- Issues around accuracy, transparency, auditability and explainability of **(black-box) AI / ML algorithms**

Fair / ethical use of data

		
<u>Who</u> is harmed by price discrimination?	Wealthier consumers - eg time poor, cash rich	Consumers with characteristics which might be deemed vulnerable (eg low income, old ag, etc.)
<u>How much</u> are these individuals harmed?	Profitability difference between consumer segments is minimal and is immaterial to the harmed segment	Significant profitability differences and the harm has a significant adverse effect on the segment affected
<u>How significant</u> is the pool of people harmed?	Very small minority	Significant group of consumers
<u>How</u> are firms price discriminating?	Transparent and based on behaviour which consumers can easily change (eg switching)	Hidden and based on intrinsic characteristics which consumers cannot easily change (eg personal characteristics)
Is the product/service <u>essential</u> ?	Product/service is considered non-essential but desired by some consumers	Essential product/service (eg current account or motor insurance)
Does <u>society view</u> the price discrimination as egregious/socially unfair?	Little concern expressed about practices and firm behaviour widely accepted	Persistent and broad-based concern expressed and firm behaviour seen as poor conduct

Source: UK's Financial Conduct Authority^{††}

BDA applicable legislation

European Union Charter of Fundamental Rights

Solvency II Directive

Insurance Distribution Directive

General Data Protection Regulation (GDPR)

Directive on Distance Marketing of Financial Services

E-Privacy Directive (legislative process on-going)

Unfair Commercial Practices Directive (UCPD)

Network and Information Systems Directive (NIS)

Regulation on a framework for the free flow of non-personal data in the European Union

The Council Directive 2004/113/EC on equal treatment between men and women in access to and supply of goods and services

- 1) **Joint Committee of the ESAs** work on AI
- 2) Discuss **ethical / fairness and supervision of AI/ML algorithms** with academia, industry, consumer associations and other relevant stakeholders
- 3) **Cloud computing** guidelines
- 4) **EU-US insurance project**
- 5) New workstream on **new business models and ecosystems** in InsurTech
- 6) Work on **cyber and IT risks**



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Thank you

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