

**SUNGKYUNKWAN UNIVERSITY**

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# **DATA SCIENCE IN INSURANCE MARKETING**

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**INSURANCE AND PENSION MARKETING**

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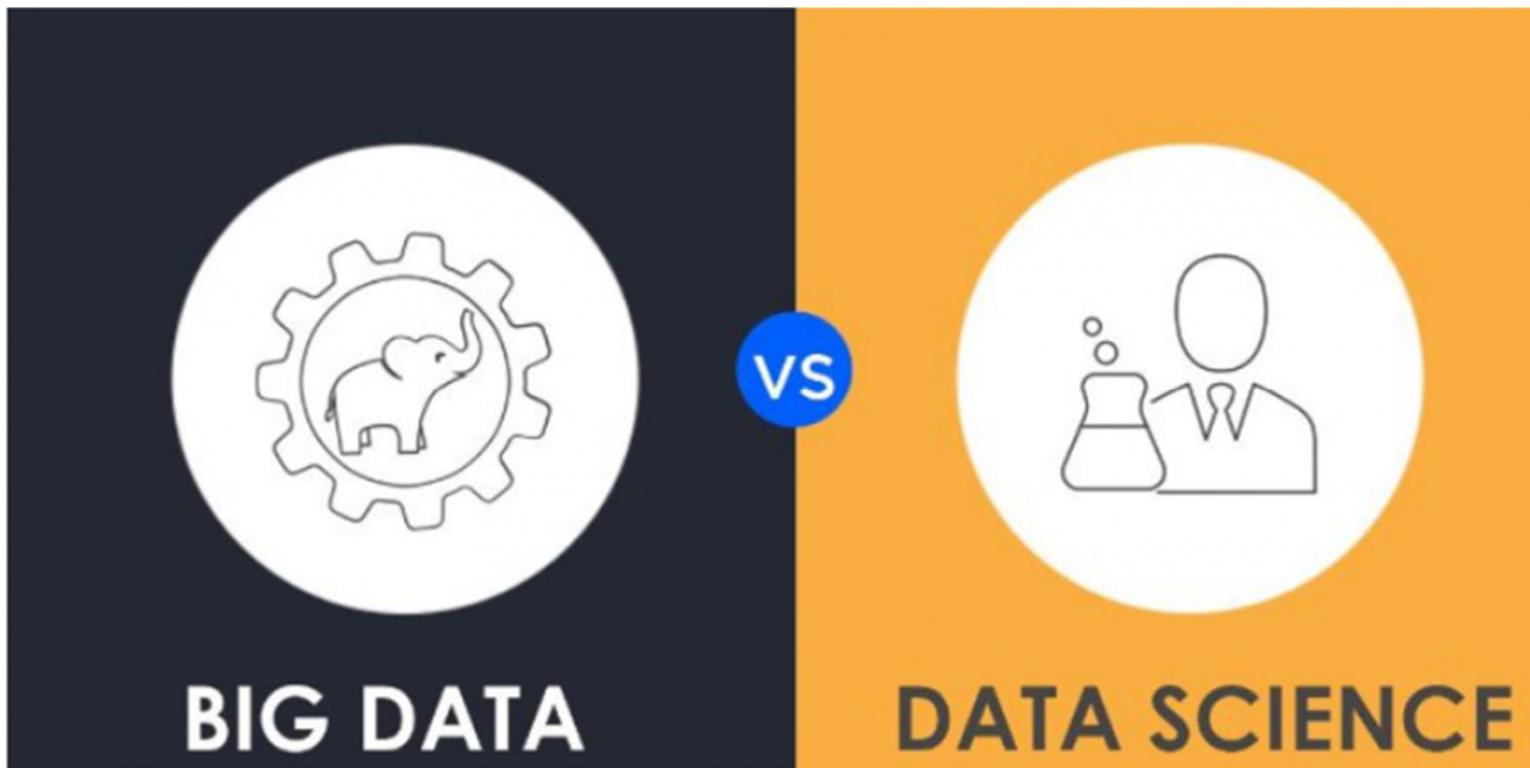
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# BIG DATA AND DATA SCIENCE

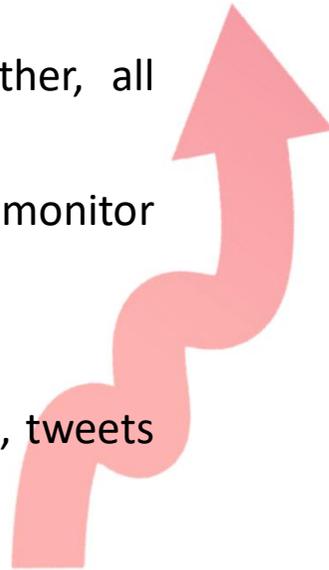
*The rise of Data Science*



# Global Explosion In Data

The world is now producing enormous amounts of data, with exponential growth in data generation seen in recent years

- **Greater volumes of data:** in 2015, it was estimated that no less than 2.5 quintillion bytes of data (i.e. 2,500 million billion bytes) were created every single day
- **Data being recorded in new ways:** collected via internet search engines, generated via social media, collected by mobile devices and telematics.
- **Internet of Things (IoT):** home gadgets connected through networks to each other, all generating data and communicating with human
- **Transforming fitness regimes** with the increasing popularity of wearable devices that monitor exercise regimes and provide data on wellbeing
- **Data** can be **stored, transformed** and **analysed** more **quickly** and **cheaply**
- **Technology** can now handle both **structured data** and **unstructured data** (images, tweets and text,...)



# BIG DATA AND DATA SCIENCE

**Big Data** relates to datasets too large to be handled by conventional data processing software:

- **Volume:** the vast amounts of data now being generated and gathered
- **Variety:** many different types of data brought together from different sources; with it being unstructured/structured, static/real-time and in-house/external
- **Velocity:** the increasing speed at which new data is processed and stored, making analysis in real-time possible
- **Veracity:** the need for data to be relevant, accurate, appropriate and consistent
- **Value extracted:** the value from the additional insight in seeing people/objects/processes in far greater detail.

## Data Science

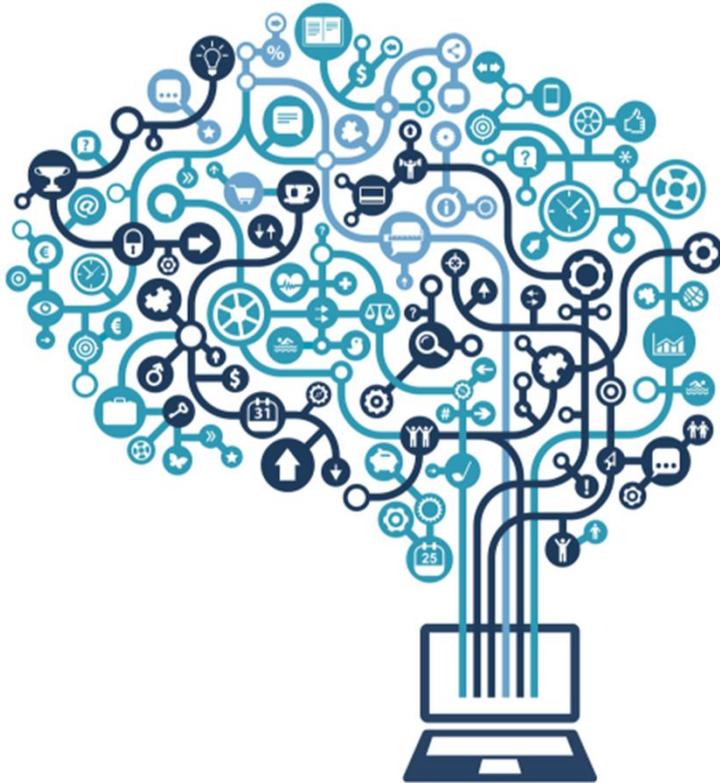
- Collection and use of Big Data
- Subsequent analytical tools, methodology and technology used to benefit from the extra insight offered by the corresponding data sets.



# DATA SCIENCE IN INSURANCE: BENEFITING FROM THE DIGITAL EXPERIENCE

*Data Science offers insurers a step-change in risk analysis by being able to see their risk exposures in much greater detail*

# DATA SCIENCE IN INSURANCE: BENEFITING FROM THE DIGITAL EXPERIENCE



**Data Science offers insurers a step-change in risk analysis by being able to see their risk exposures in much greater detail**

- How the products are offered, and to whom.
- Risk management: much more details
- Prediction
- Actuaries are already applying Data Science: telematic devices (moto insurance, wearable fitness devices) and advanced risk management in life insurance.

**Data Science: potential for innovation in insurance**

- Better consumer targeting/ product design
- More accurate risk assessment, underwriting and pricing
- Stronger engagement with consumers
- Better claims management

## Better consumer targeting/ product design



- Advantage of **new sources** of data → better **target** intended customers to **specific**, and **potentially** more suitable products.
- Analysis of **internet search histories** or of **social media content** → **predict** consumer preferences and behaviours.
- Analysis of trends in **preferences** and **behaviours** → understanding of **changes** in consumer needs → **development** of **innovative** new products and **design** of associated features.
- The increasing use of **smart Apps** by society at large and consequent analysis → some consumers groups to **access insurance**, including meeting **untapped** areas of demand for insurance.
- A more **rounded view** of consumers and their needs → not missing out on **necessary insurance cover**, or indeed **doubling-up** on cover elsewhere.

# More Accurate Risk Assessment, Underwriting And Pricing



Much of Data Science's potential in the insurance world relates to the **greater insight possible** in the **risk assessment process**

**Gather data** on applicants' (or their property's) characteristics → **underwriting decision**: accept the risk on standard terms/accept on modified terms/decline.

Data Science allows insurers to see their applicants' risk profiles in **much greater detail**

→ better-informed underwriting decisions

→ set premiums more accurately, in greater alignment with the corresponding level of risk.

**More accurate** and **detailed risk assessment**

→ increase insurance coverage or make it cheaper

Data Science can also reduce the effort involved in obtaining an **insurance quote**

## Stronger engagement with consumers

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**Consumer engagement** could also improve over the course of an **insurance policy**, **benefiting policyholder** and **insurer** alike.

**Reward** policyholders with **lower premiums** if their risk profile improves (via a telematics device in the case of motor insurance, or a wearable fitness device in a health context).

The prize of lower premiums could **encourage** policyholders to **reduce** the **'riskiness'** of their lifestyle.

→ Data Science offers clear **benefits** to **society**.

→ Consumer engagement is also being taken to the **extent of 'on demand' insurance**: at least one motor insurance provider is offering the facility to switch cover on and off via a smartphone. (Bajaj Allianz General Insurance)

# Better Claims Management

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**Data Science has a role to play in making insurance claim management and associated complaints processes more efficient, benefiting insurer and policyholder alike.**

- Data analytics can be used to **prioritise claims**
- Analysis of social media activity and connections can also be used effectively to **spot fraudulent claims activity**
- Fulfill the consumers' expectations with **speed** of response and **ways of doing business**

# DATA SCIENCE IN INSURANCE: BENEFITING FROM THE DIGITAL EXPERIENCE

Finally, emerging high technology 'Insure tech' firms are potential disruptors to the insurance market. Such Insure tech firms can be quite agile in their business model, and often have a very data-driven mindset and digital approach.



# PUBLIC INTEREST CONCERNS

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*As Data Science delves ever deeper into the insurance world, this raises questions over ethics and the general public interest.*

*Insurers and consumers could be impacted in new and unexpected ways, with potential unintended consequences and possible distortions in the insurance market.*



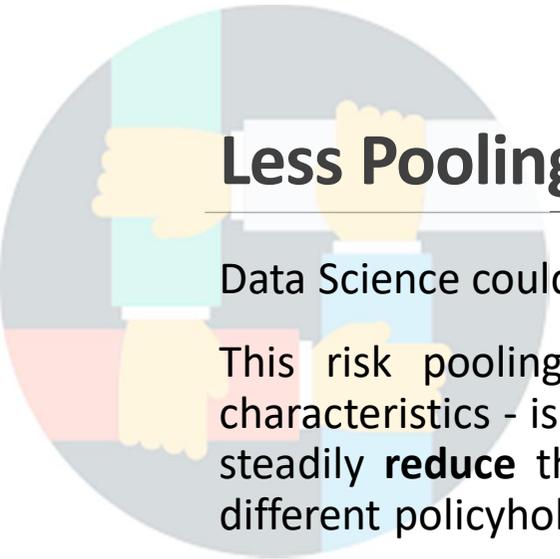
# Insurance Unavailable For Some?

**Certain subsets of the general public could find that Data Science has an adverse impact on the cost or availability of insurance**

If insurers have a clearer understanding of an individual's risk characteristics, then individuals in certain market segments may then find that insurance is **harder** or more **expensive** to obtain. For example:

- Young drivers with little driving experience accessing motor insurance
- People in declining health, finding health insurance becomes too expensive
- Older travellers requiring travel insurance, where current factors used to set insurance premiums are generally broad-brush rather than precise in nature.
  - Require some degree of intervention from Government, regulators or the insurance industry





## Less Pooling Of Risk

Data Science could also have an **impact** on the related **concept** of the **degree** of **pooling of risk**

This risk pooling - where risks are shared between policyholders with broadly similar risk characteristics - is a long established feature of insurance. It is likely that the rise of Data Science will steadily **reduce** the **size** of each pool, and **hence lower existing levels** of cross-subsidy between different policyholders

Society may desire a **degree** of **cross-subsidy** by retaining pooling of risk where this is deemed to be **'fair'**.

- EU: gender-specific pricing for insurance was banned in 2012 on the grounds of sex discrimination
- UK: the emergence of Flood Re\* recognises that as flood risk rises, both those at greatest risk and the industry need time to adjust; in this case, a temporary subsidy from policyholders with lower risk of their homes flooding to those with a higher risk

To the extent that Data Science further reduces the pooling of risk in the insurance market, further debate may be necessary to determine the degree of pooling society deems appropriate and what actions are required by Government, regulators or the insurance industry as a consequence.

# Price Discrimination

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- As the amount of data collected on individuals increases, the **extent of price discrimination** by insurers could also **potentially increase**
- Price discrimination refers to basing insurance premiums not only on the **individual's level of risk** and **associated costs**, but also on **wider factors** including their **sensitivity to price** and **brand loyalty**.
- It is by no means new, but **greater scope** to measure such **sensitivities increases** the risk that **vulnerable consumer groups** could be **impacted adversely** by such practices.
- Insurers would need to consider whether such **price discrimination** gives rise to any **conduct risk concerns**.

# Data: Property Of Insurer Or Individual?

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A further question relates to who owns the data being gathered on a policyholder. Does the relevant insurer own it, or the policyholder?



➤ If insight gathered via a telematics or wearables device were the property of the insurer, this could potentially **restrict** the consumer's **ability to access** a better deal elsewhere.



➤ Conversely, if it were the property of the consumer, could they then be obliged to share **pre-existing** data with an insurer if they changed provider?

# Transparency and judgement

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**Potential lack of transparency around Data Science and associated analytics, and understanding what is behind the analytical ‘black box’ can be challenging**

- **Risk of overreliance** on analytical model outputs: no model can replace human knowledge and judgement entirely.
- Some advanced pricing models may rely on algorithms rather than explicit rating factors, making it **difficult** to **establish** whether **price discrimination** is being applied
- Insurers are **transparent** in their use of data, to avoid **diminishing** the level of trust policyholders place in them, and in turn, **reduce** the **scope of data** policyholders are happy for the insurer to access

# Cyber risk

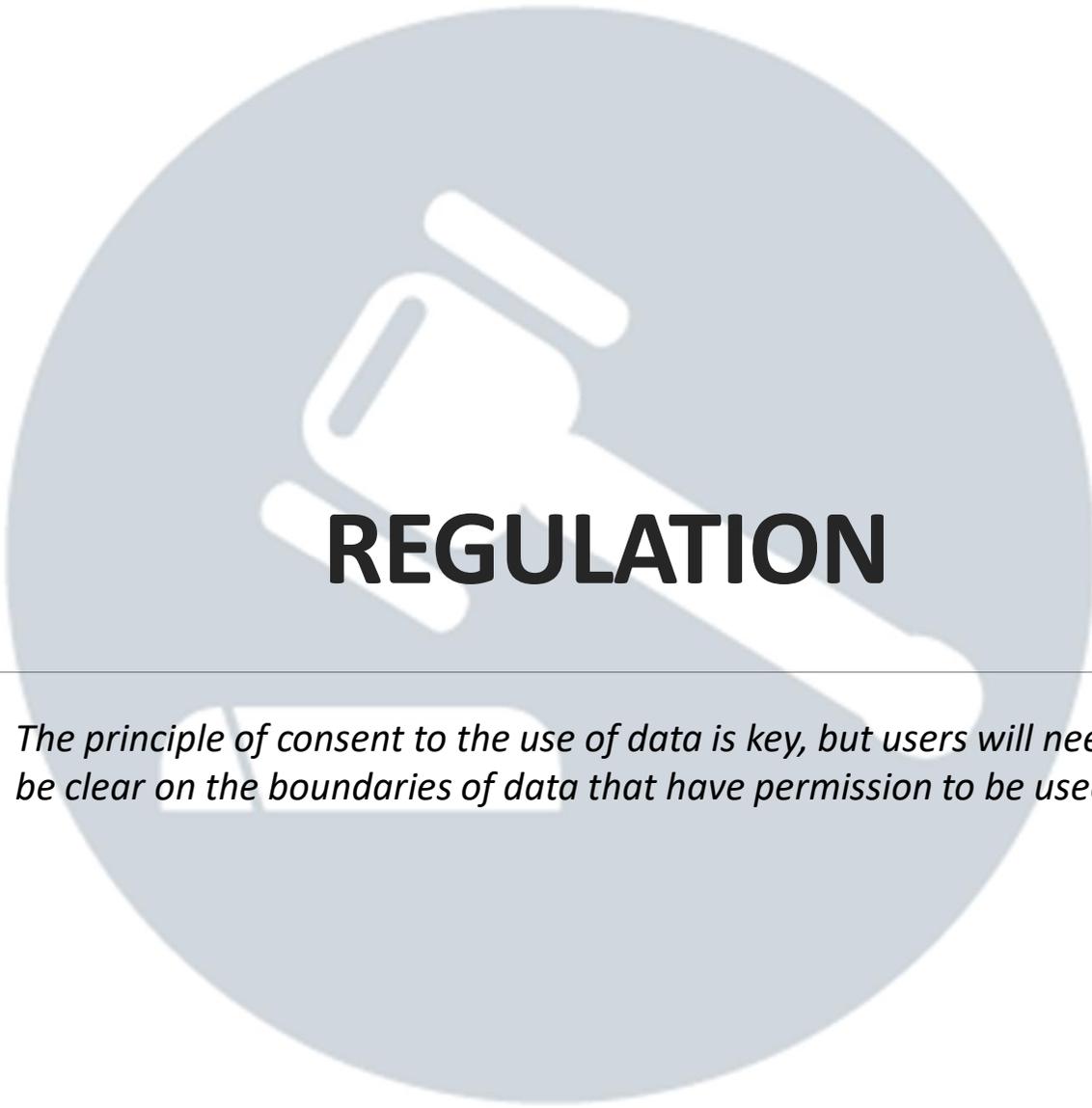
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**Cyber risk is an important emerging area of risk, and Data Science contributes to insurers' exposure to it as more and more data is accumulated.**

Risks of data being **lost**, **corrupted** or **stolen** are important issues for users of Data Science applications to consider

→ Processes will need to be developed with **appropriate controls** against hacking and other **unauthorised** users **accessing** this data.



# REGULATION

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*The principle of consent to the use of data is key, but users will need to be clear on the boundaries of data that have permission to be used.*

# Data Protection

**Compliance with existing and impending data protection legislation is highly relevant to Data Science**

- From 25 May 2018: The **General Data Protection Regulation (GDPR)** will apply in the UK
- From the 1990s: previous data protection legislation in the UK dates and much has changed in the intervening years

The **principle of consent** to the use of data is key, but users will need to be clear on the **boundaries** of data that have **permission** to be used

Insurers will therefore need to have **robust data governance** processes together with **suitable controls** to ensure that **relevant processing** meets current and **evolving data privacy regulation**.

Data Science also need to consider whether product design and pricing, and wider applications of Data Science, are putting **consumers' needs first**, and are in the **general public interest**



# Regulating Actuaries In The Public Interest

Given the potential ethical and wider public interest issues arising from the increasing use of Data Science, it is important to consider the regulation of professionals working in this field, be they actuaries, data scientists, risk managers or otherwise.



Institute  
and Faculty  
of Actuaries

- The **IFoA** regulates members to ensure the public interest, whilst supporting business and innovation. Ensuring the public interest relates to protection of the wider public and society as a whole, but also extends to ensuring public confidence in the actuarial profession by maintaining its good reputation. The public interest is served by actuaries adhering to high-quality standards of work and also by the ethics and professionalism of the actuaries who deliver it.
- As Data Science grows in importance, the IFoA will assess its regulatory framework to ensure that as public interest issues evolve, the regulation (and education) of members remains fit for purpose, without being overly burdensome.

# CONCLUSION

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Data Science is already starting to transform the insurance industry, offering clear benefits to insurers, policyholders and the wider public.

Increasing usage of Data Science gives rise to a range of potential public interest issues for the insurance industry, regulators, Government and other relevant stakeholders to consider

- A certain subsets of the general public could find that Data Science has an adverse impact on the cost or availability of insurance
- What are the rights but also obligations of policyholders with respect to data being gathered on them?
- How should insurers ensure transparency to maintain policyholders' trust in the use of their data?
- How do participants in the insurance market ensure compliance with current and evolving data protection regulation, whilst gathering and using greater amounts of data?
- More generally, are applications of Data Science in insurance putting consumers' needs first, or are there wider conduct risk concerns?

**THANK YOU**

**감사합니다!**