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Big Data: Big Opportunity or Big Risk for Actuaries?

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Why are we talking about (Big) Data?

The world (and insurance) is going digital

Data is a strategic asset

Owning data bring new risks

Actuaries have to understand the world around us

Data is an Actuary's lifeblood

Actuaries manage risks

Actuaries help our employers to capitalise on opportunities

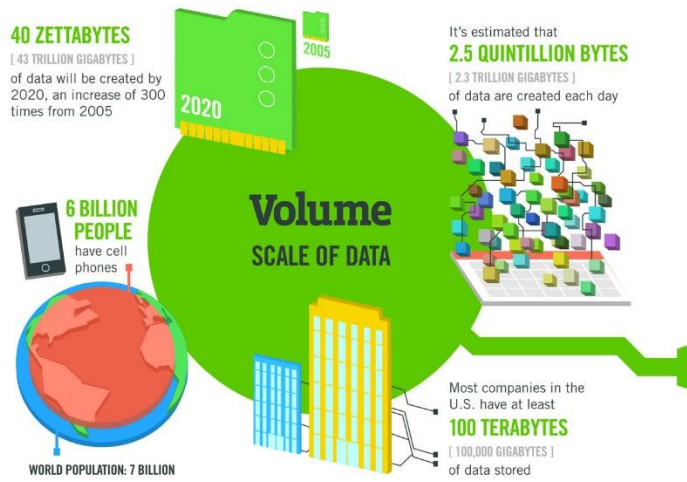


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Context Setting

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Thought leadership
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Working parties
Volunteering
Research
Shaping the future
Networking
Professional support
Enterprise and risk
Learned society
Opportunity
International profile
Journals
Support

What is big data? The 4 V's



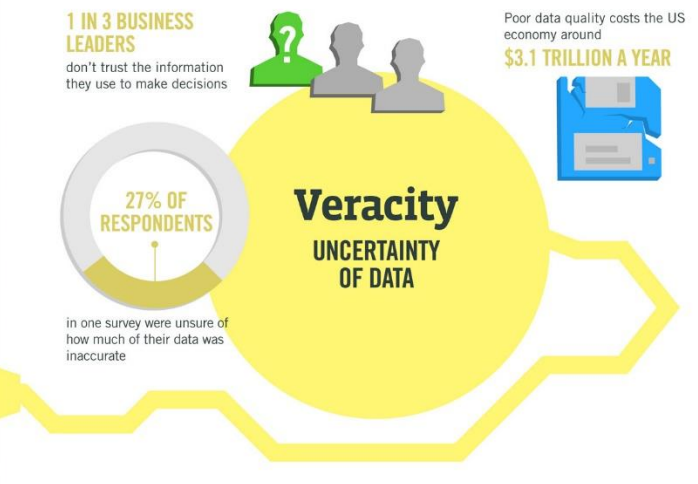
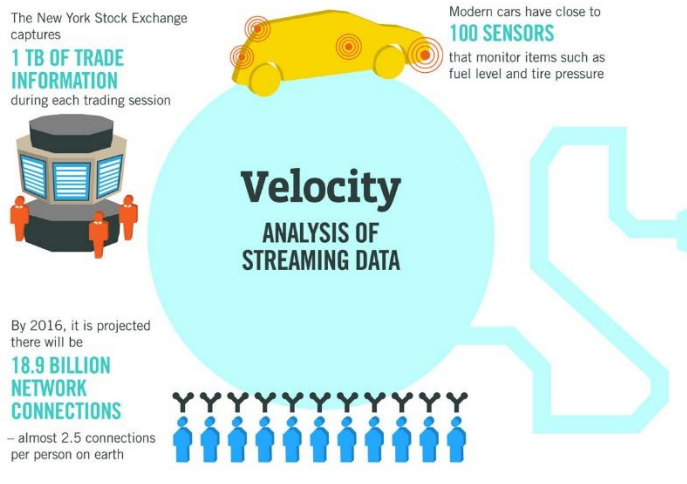
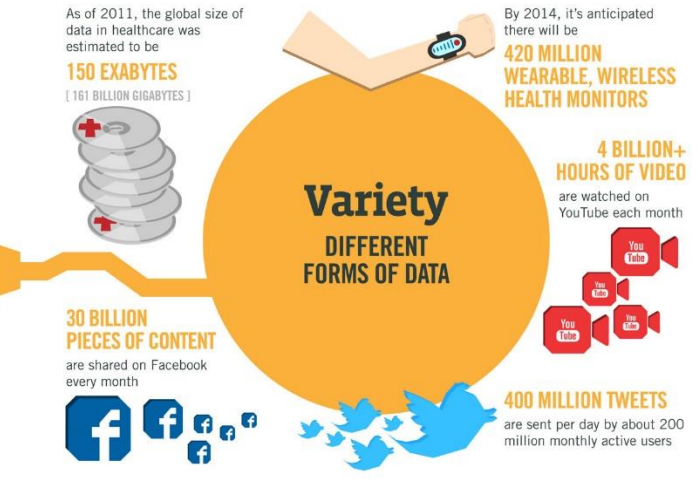
The FOUR V's of Big Data

From traffic patterns and music downloads to web history and medical records, data is recorded, stored, and analyzed to enable the technology and services that the world relies on every day. But what exactly is big data, and how can these massive amounts of data be used?

As a leader in the sector, IBM data scientists break big data into four dimensions: **Volume, Velocity, Variety and Veracity**

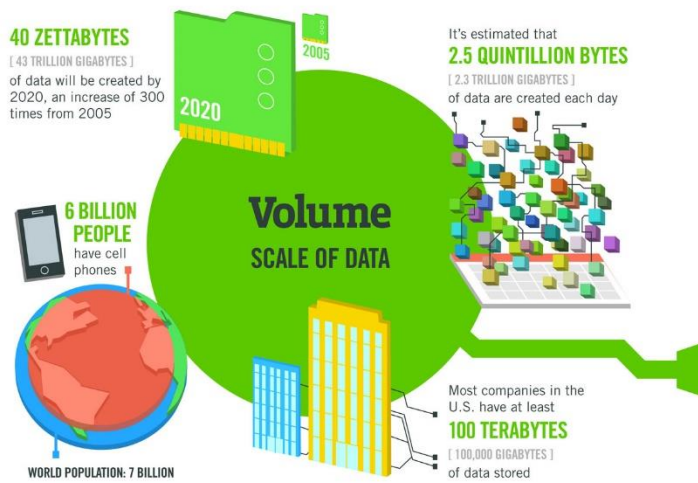
Depending on the industry and organization, big data encompasses information from multiple internal and external sources such as transactions, social media, enterprise content, sensors and mobile devices. Companies can leverage data to adapt their products and services to better meet customer needs, optimize operations and infrastructure, and find new sources of revenue.

By 2015 **4.4 MILLION IT JOBS** will be created globally to support big data, with 1.9 million in the United States

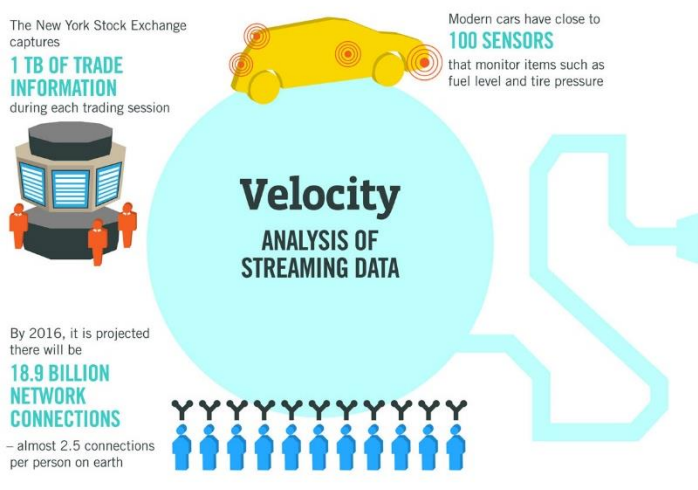


Sources: McKinsey Global Institute, Twitter, Cisco, Gartner, EMC, SAS, IBM, MEPEEC, QAS





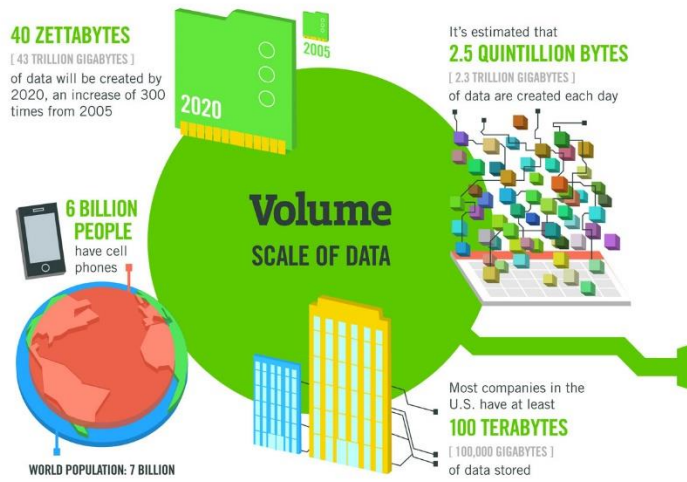
Organization	Amount of data stored
Google	15,000 PB
NSA	10,000 PB
Baidu	2,000 PB
Facebook	300 PB
Sanger	22 PB
Spotify	10 PB



Organization	Amount of data processed per day
Google	100 PB
Baidu	10-100 PB
NSA	29 PB
Facebook	600 TB
Twitter	100 TB
Spotify	2.2 TB
Sanger	1.7 TB

Sources: McKinsey Global Institute, Twitter, Cisco, Gartner, EMC, SAS, IBM, MEPTec, QAS

What is big data? The 4 V's



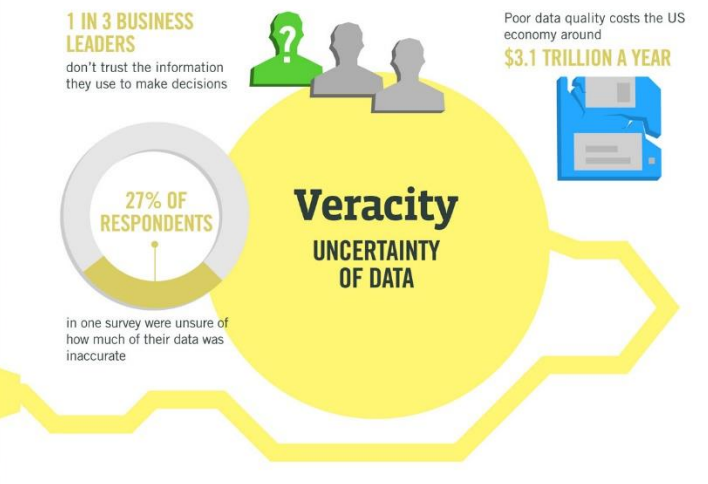
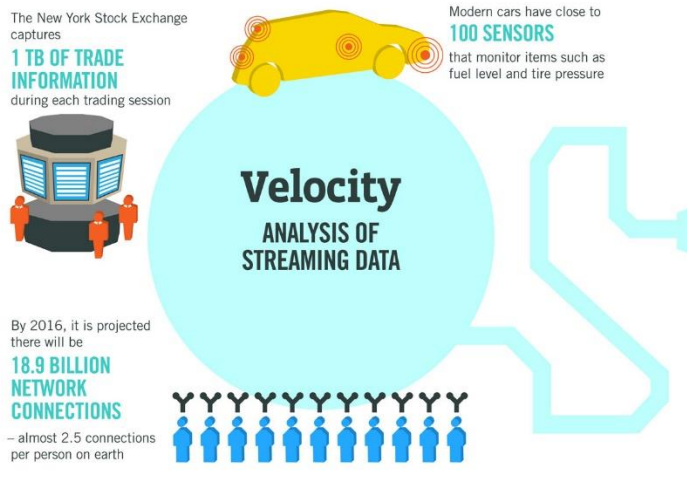
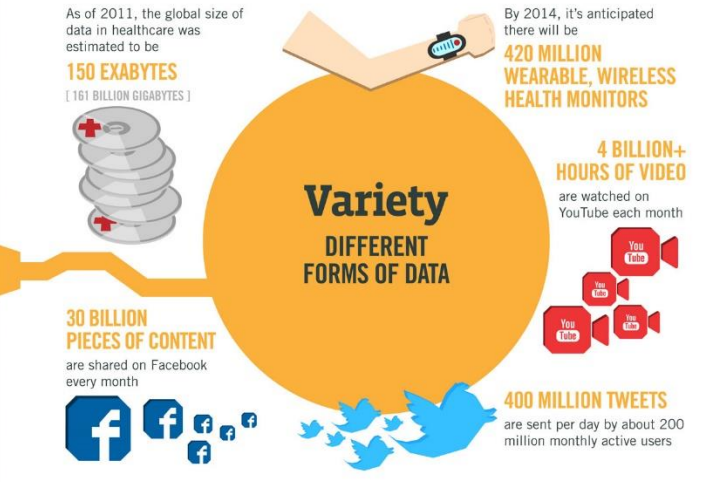
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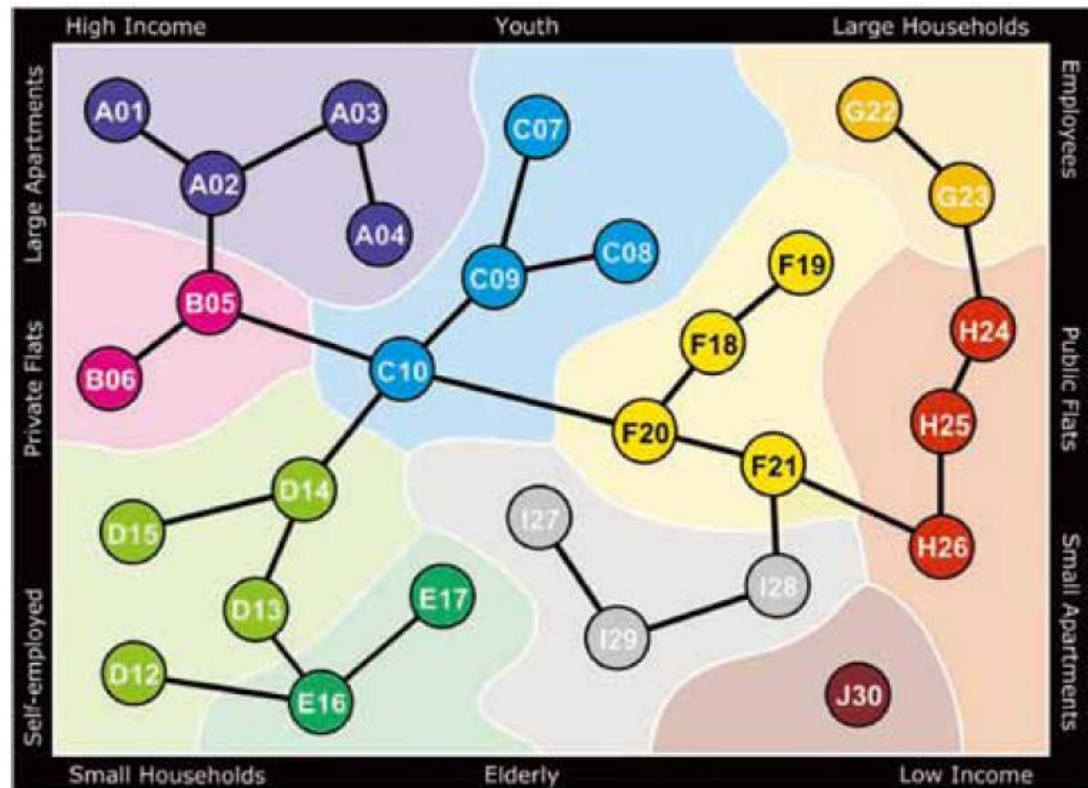
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Digital gives you the data and the ability to segment and deliver personalised solutions

- Traditionally marketing segmentations street level granularity – now household or person level
- Potentially hundreds of fields of collected or modelled data available for purchase



Source: Experian's Mosaic HK Brochure. <http://www.experian.com.hk/assets/mosaic/mosaic-brochure-hong-kong.pdf> Accessed 22 June 2015

Example: Zhong An launched more than 200 online insurance products for specific needs

银行卡盗刷资金损失保险



个人法律费用补偿保险



多轴飞行器责任保险



小米手机意外保



途虎轮胎险



乳腺癌基因检测保障计划



营运交通工具意外伤害保险



航空意外保险



公共交通场所安全意外险



私家车意外险



亲子旅行意外伤害保险



驴友旅行意外伤害保险



成年人重大疾病保险



未成年人重大疾病保险



女性特定疾病保险



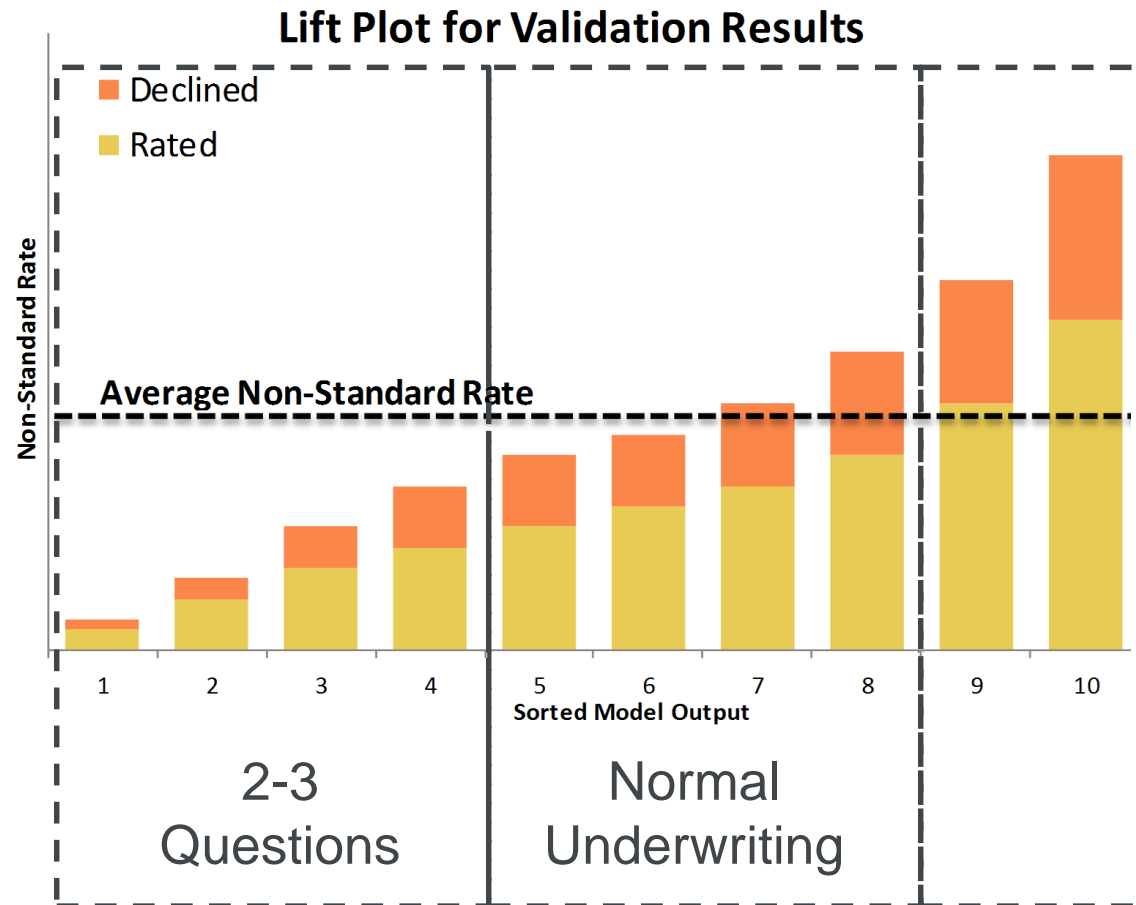
儿童齿科医疗保险



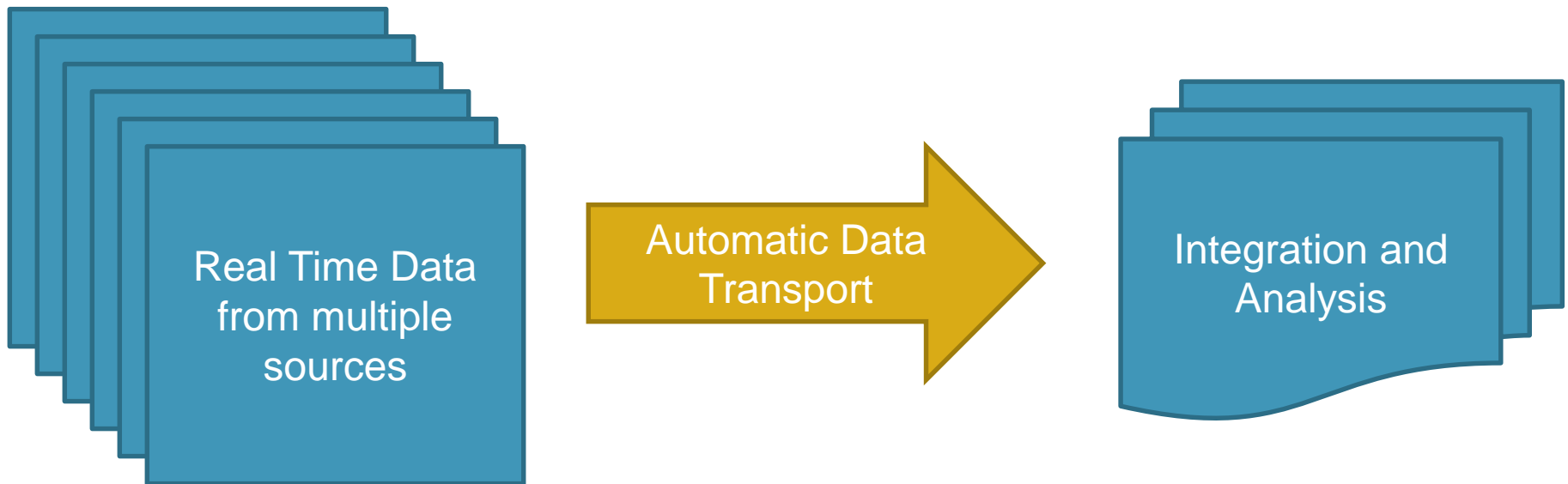
Using data to improve the customer journey

Example – Life Insurance

- Ask the fewest possible questions while managing risk
 - Replace actual disclosures with surrogates
- Higher conversion rates because of easier process
 - Use in conjunction with marketing segmentations

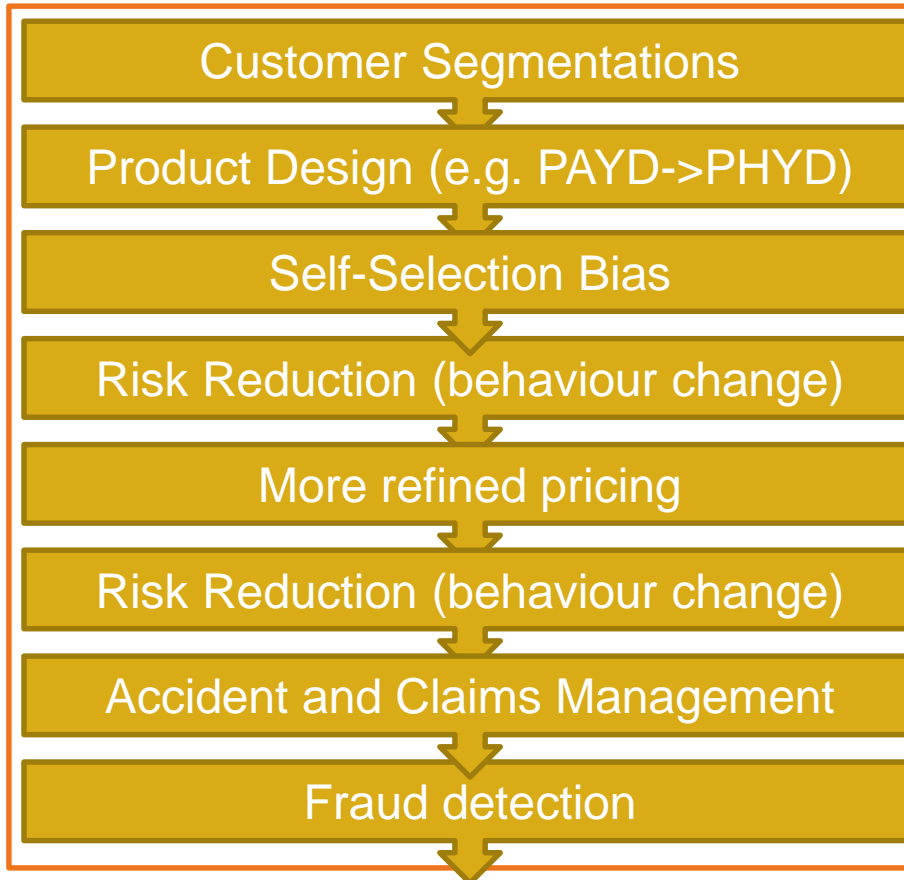


The Internet of Things (IoT) makes it economical to monitor just about anything



Telematics in Motor Insurance

Insurance Applications Across the Value Chain

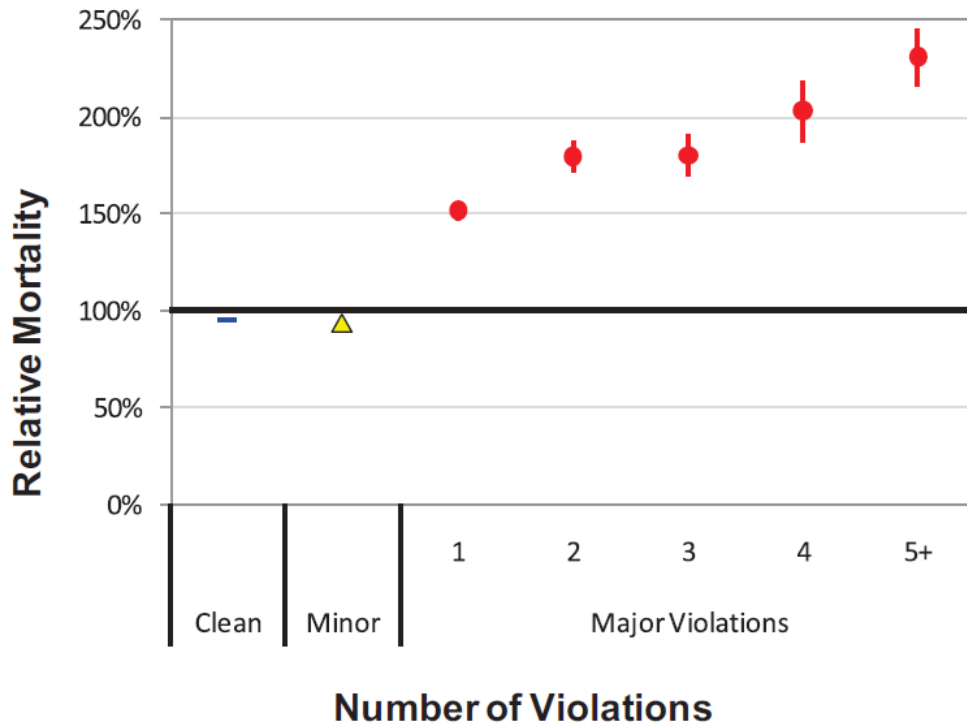


Lots of data and potential for engineered features

- Motor Telematic Data
 - Braking and acceleration
 - Cornering
 - Speed
 - GPS information
 - Number of passengers
 - etc
- External Context
 - Type of road
 - Points of interest
 - Weather
 - Traffic density
 - Known road issues e.g. Potholes,
- Lifestyle data

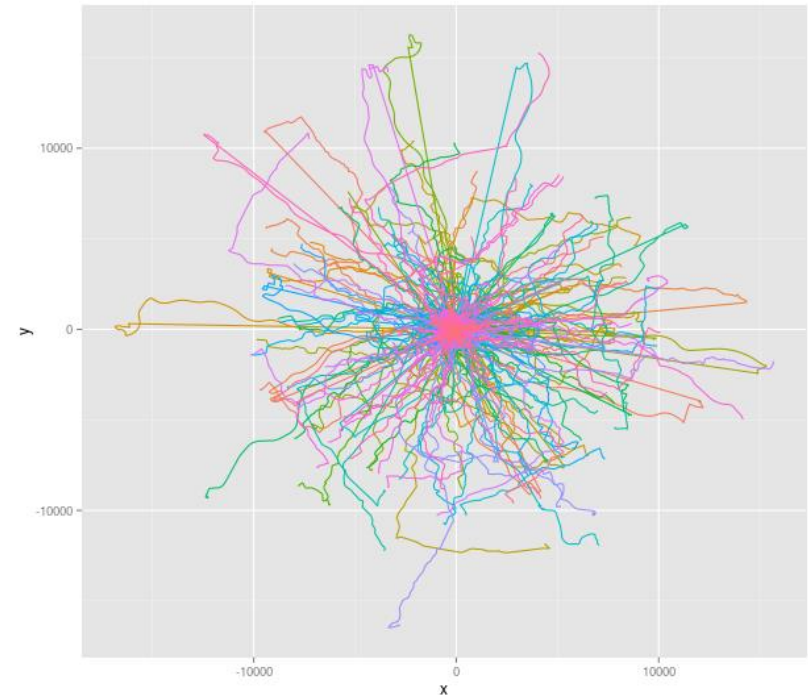
Data collected for one purpose will find multiple applications

Motor vehicle records indicate relative risk



Source: Rushing and Rozar. [An Analysis of Motor Vehicle Records and All-Cause Mortality](#). RGA 2012.

Telematic data to identify a driver signature



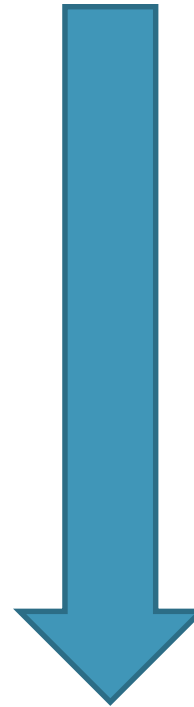
Source: Axa sponsored competition on Kaggle.

Wearables for Life and Health Insurance

Parallels with Motor Telematics

- Many applications in insurance but uptake largely limited to those self-selecting
- Highly relevant contextual data and need for feature engineering
- Need for partners
 - Data management potentially through data intermediaries
 - Do insurers want to provide the technology?

Future tech promises more useful data



- Steps
- Sleep (sleep phases)
- Heart Rate

- Stress
- Temperature
- Heart Rate Variability
- ECG
- Breathing Rate
- Sleep Apnea detection
- VO₂ and VO₂ Max
- Mood
- Blood Pressure
-



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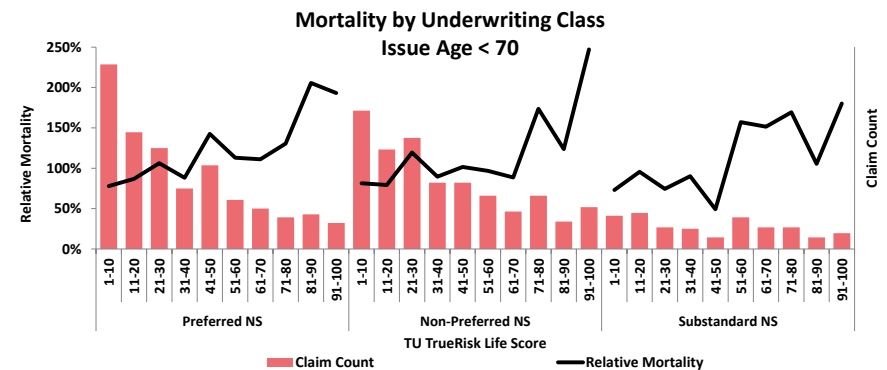
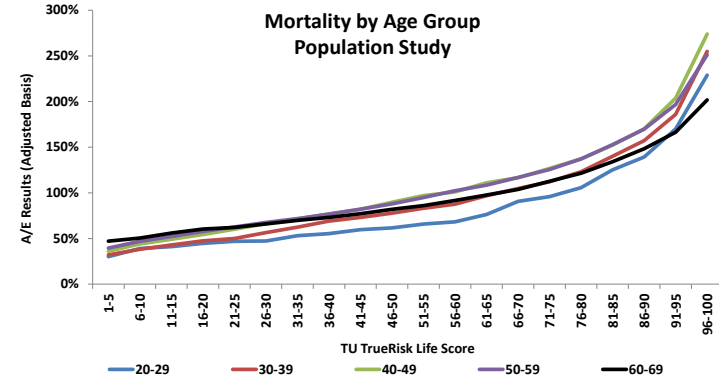
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Is your company making the most of your data? What other data can you use?

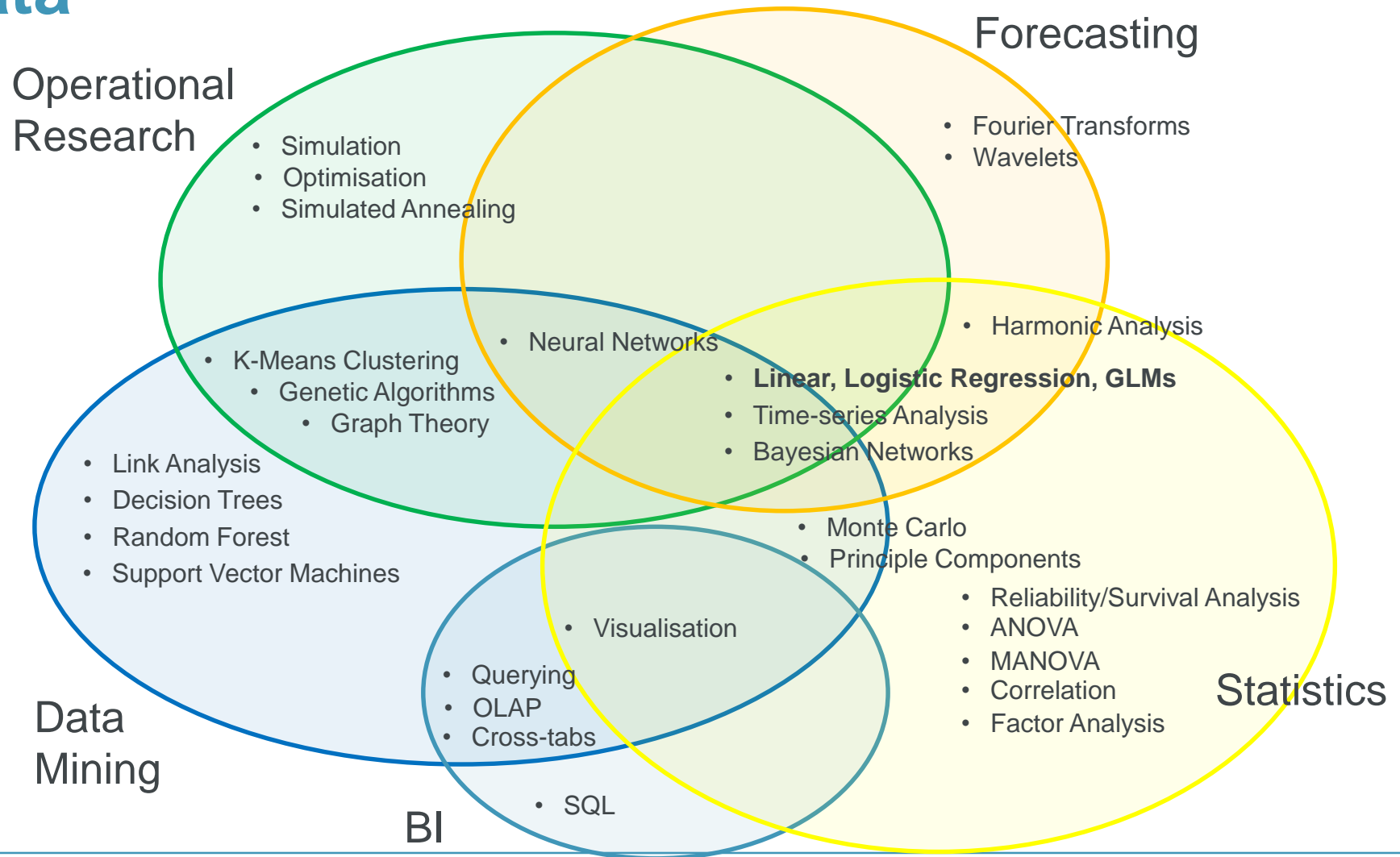
- Monetizing and maximizing the value of data
 - Growth of Chief Data/Digital Officer Roles
- Modern analytic techniques make more data available for analysis
 - Unstructured Data
 - Labelled and Unlabeled Data
 - Missing values
- Data Linkage internally and externally
- Unlinked “Useful” datasets for insight generation

Credit data is used in Non-life insurance and now also in Life Insurance

- Use of Credit Data to differentiate mortality risk
- Differentials between best and worst:
 - 5x in general population
 - 2x within preferred underwriting classes
- Specific data availability in US makes this possible
- Multiple applications to life insurance

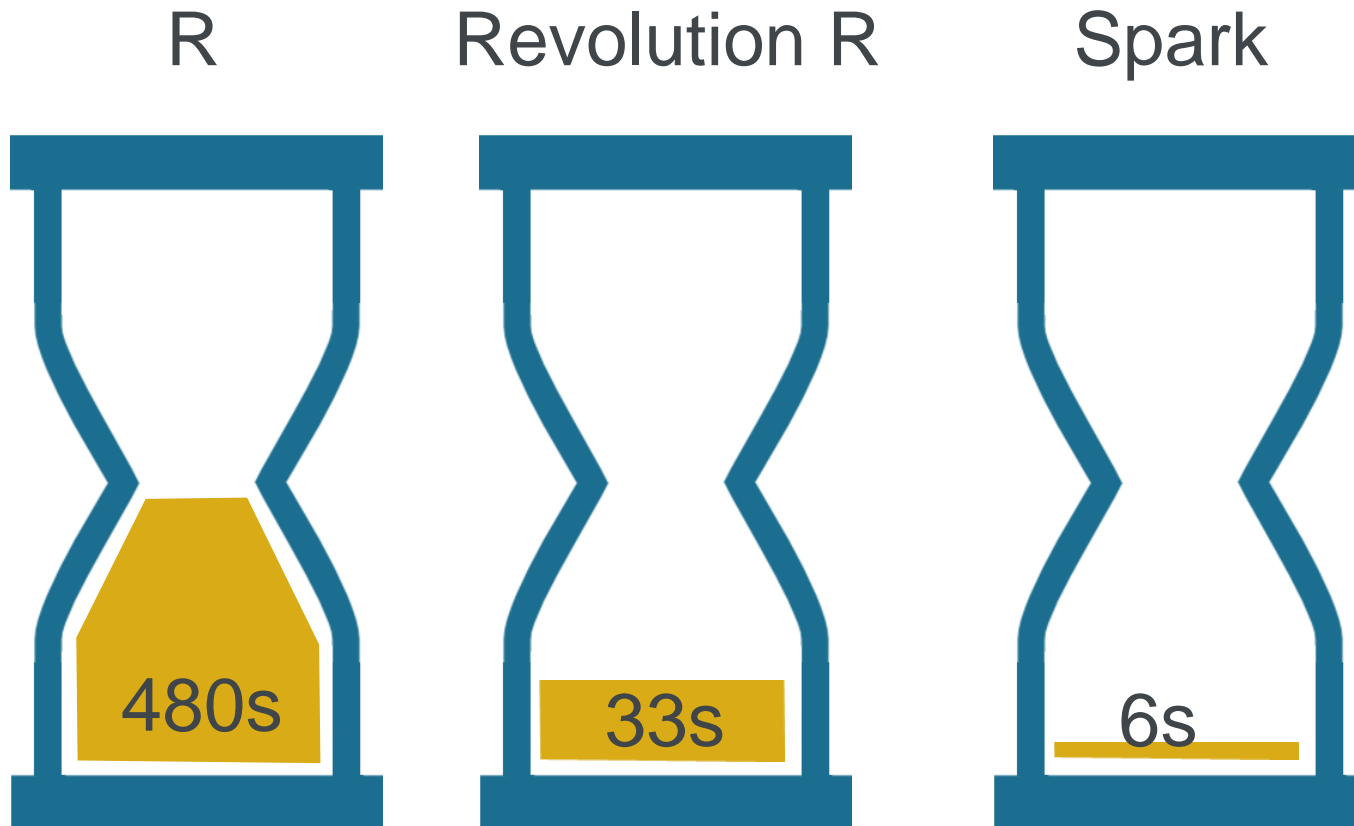


Analytics are needed to realise the value of data



Excel just isn't enough...

Example run times to fit a GLM to 10 million records with 50 variables



Correlation versus Causation

Cartoon used in live presentation suppressed for Copyright reasons.
The cartoon can be found here: <http://dilbert.com/strip/2015-12-07>



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Holding and using Big Data – Peter's 4 R's

Regulations

- Increasing focus
- EU General Data Protection Regulation (GDPR)
- Anti-discrimination legislation
- Profiling versus Decisions

How Data Makes Insurance Work Better for You

- 1. THE DIGITAL REVOLUTION AND BIG DATA** pg6
The world is changing at an unprecedented pace – so just what is so different about data these days, and why does that affect the insurance industry?
- 2. UNDERSTANDING YOU** pg10
Insurers need to understand you in order to provide you with products and services that really work for you.
- 3. GETTING THE RIGHT PRICE** pg14
Getting the right insurance isn't simply about getting the right product, it's also about getting it at the right price, which fairly reflects your circumstances.
- 4. ENABLING YOU TO MAKE THE RIGHT DECISIONS TO MINIMISE YOUR RISK** pg18
Insurers take on risk on behalf of their customers, and are keen to use the changing digital world to help customers understand and control the risks they face.
- 5. IMPROVING THE CLAIMS PROCESS** pg22
Insurers want to use data and technology to make the claims process as easy and flexible as possible, and to combat fraud more effectively.
- 6. HOW WE TREAT YOUR DATA** pg26
Using data innovatively means that insurers have to continue to build a trusting relationship with their customers, which involves being transparent about how we use your data.

Source: [How Data Makes Insurance Work Better For You](#), Association of British Insurers. Accessed February 2016

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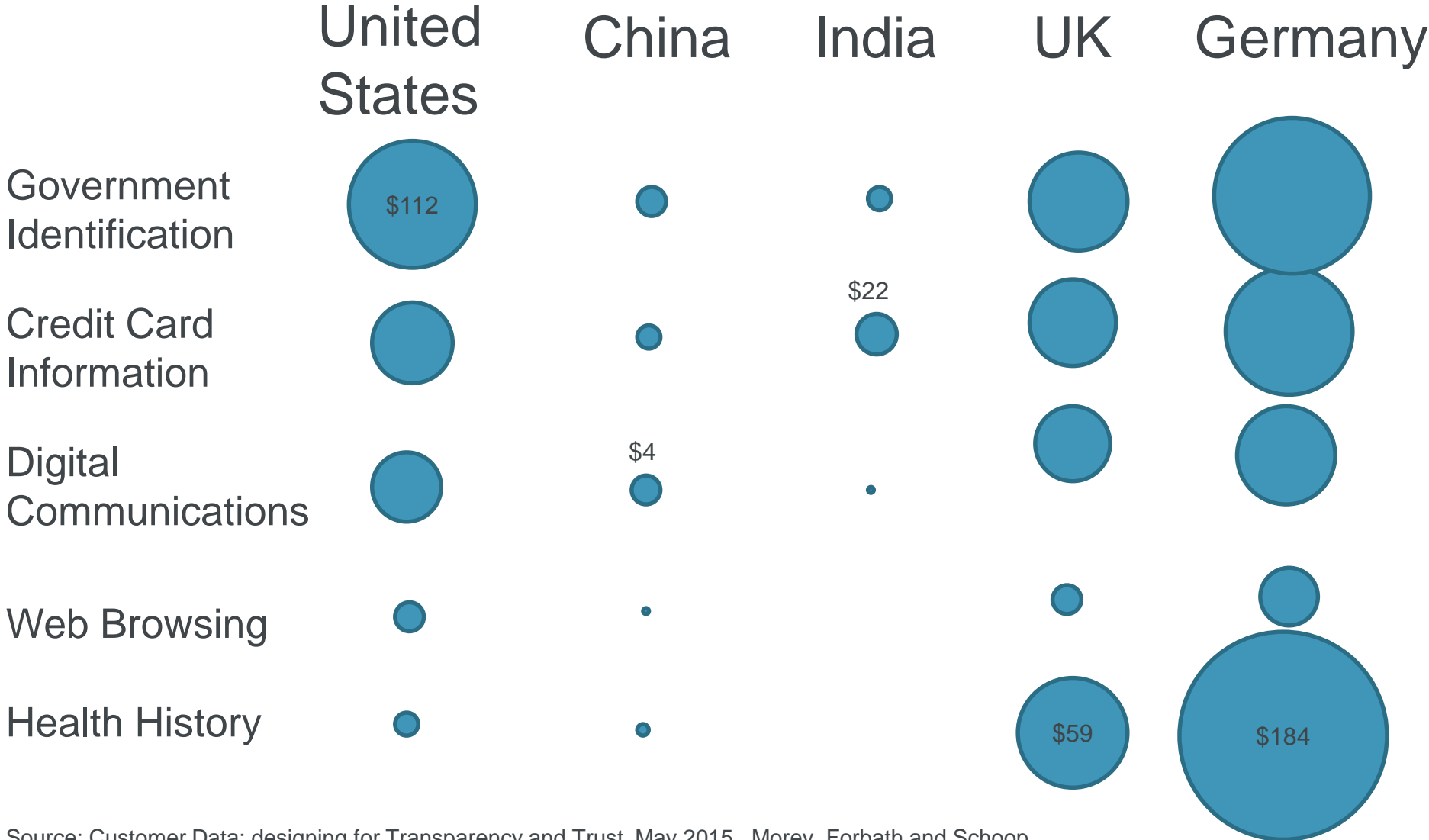
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Reasonable Expectations

- Fairness
- Country Specific
- Industry and data specific
- What have you told the client
- Does it benefit the consumer?

Approximate amount people would pay to protect each data type (US\$)



Source: Customer Data: designing for Transparency and Trust, May 2015. Morey, Forbath and Schoop.

Original source included other types of data, all with low amounts (e.g. search history, location, purchase history, contact information)

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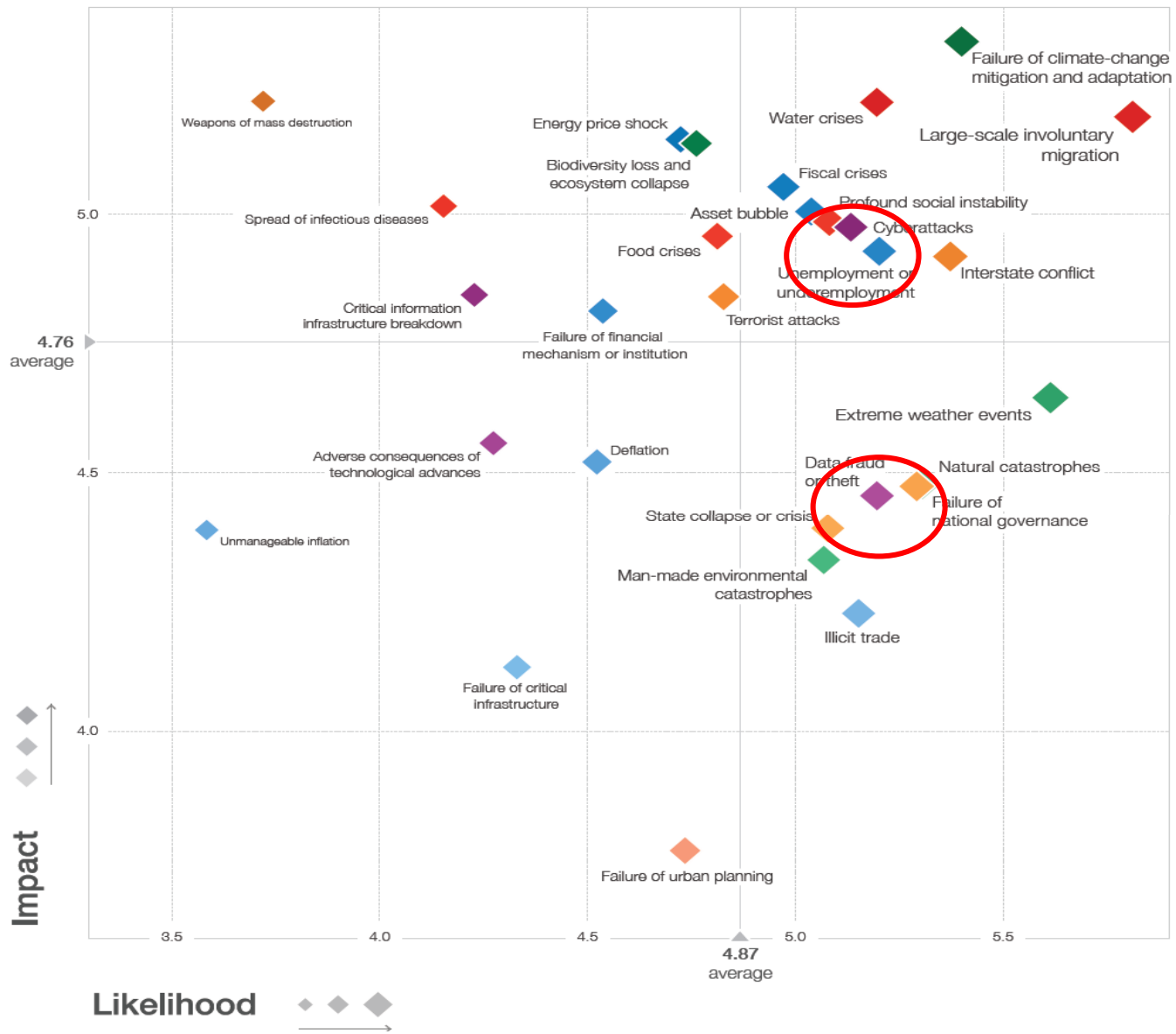
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Risks

- Reputational damage
- Financial Penalties
- Theft / Mis-use / Loss
- Data governance procedures and culture



Source: The Global Risks Report 2106, World Economic Forum, Switzerland, 2016

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Rewards

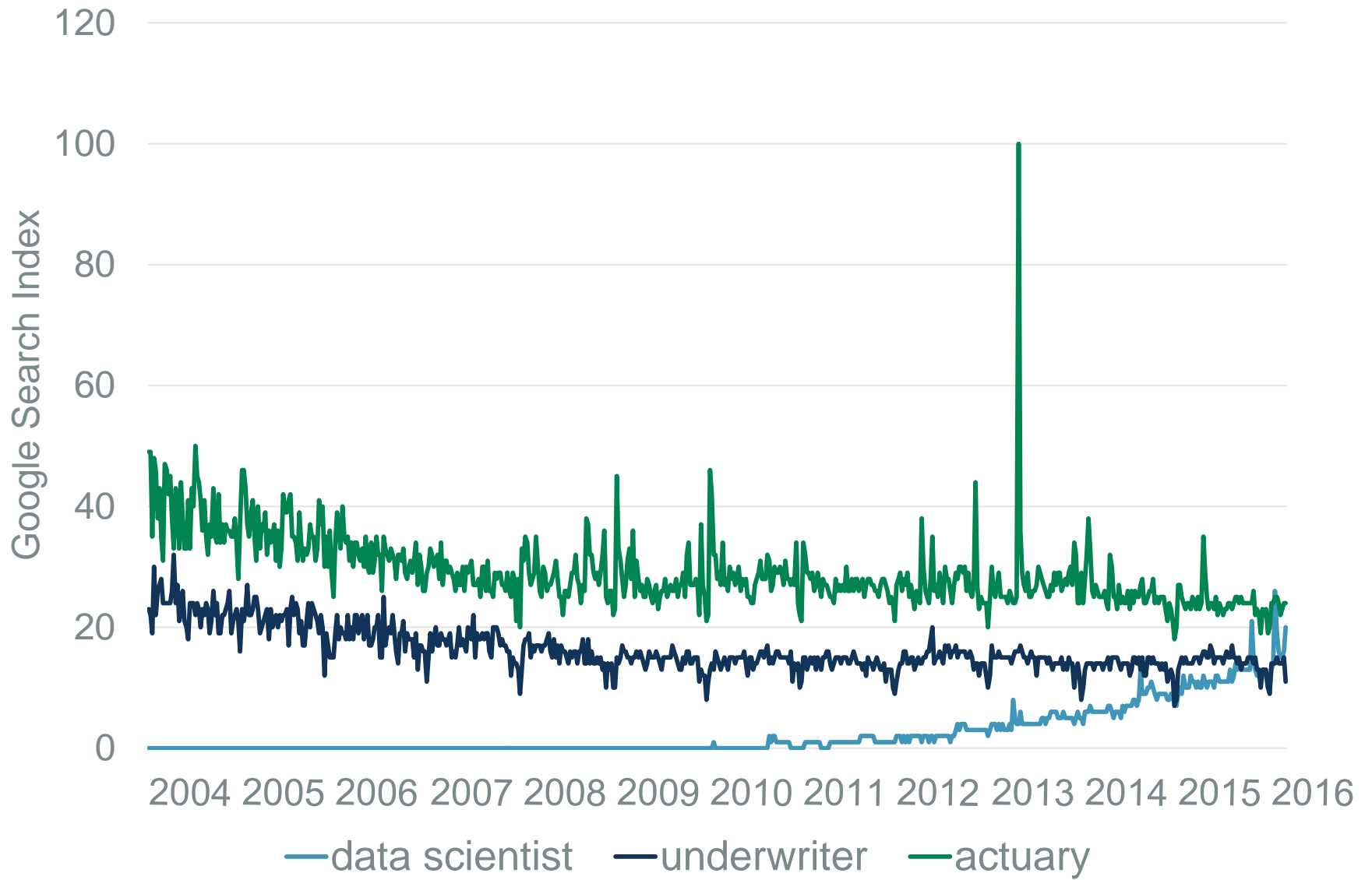
- Consumer
- Company
- Employee
- Regulator



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Conclusions

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Conclusions

- Digital is not just a new channel, digital is a fundamental change in the way people work and interact.
- The move to digital brings new emphasis to the power of data and analytics, presenting a world of opportunities for existing players and also disruptive new entrants
- Partnerships and multi-disciplinary working will continue to expand, particularly with other data science specialists
- Actuaries need to actively consider how to expand your skill sets to continue to grow and serve the public, your employers and the profession most effectively



Questions



Comments

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