Innovative risk solutions using big data

Baden-Baden, 24 October 2016

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Munich Re fosters innovation throughout the global organisation
Strong focus on tangible business impact

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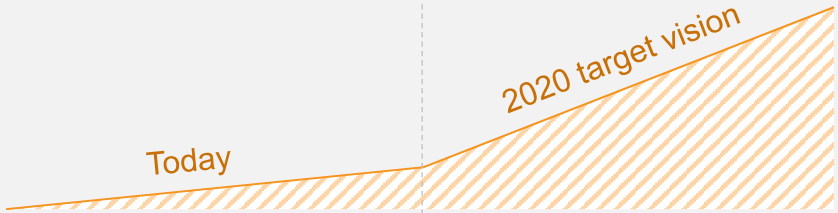
Significant focus on innovation …

Innovation infrastructure 1
- Innovation scouting
- Innovation labs
- Ideation
- Corporate partnering

Innovation areas 2
- New (re)insurance products
- New business models
- New clients and demands
- New risk-related services

Innovation enabler 3
- Data analytics
- Agile IT
- Collaboration

… with significant impact on business already today



- Innovation-related business already generating premium volume of ~€500m[1]

- Risk carrier for established and new (digital) insurance and non-insurance companies
- Provider of integrated risk services (e.g., sensor-based)
- Automation support for cedants (underwriting, distribution, claims)
- Tailored risk solutions and white-label products

1 Munich Re (Group); indirect effects on traditional business not included

Big data is challenge and chance for insurance industry

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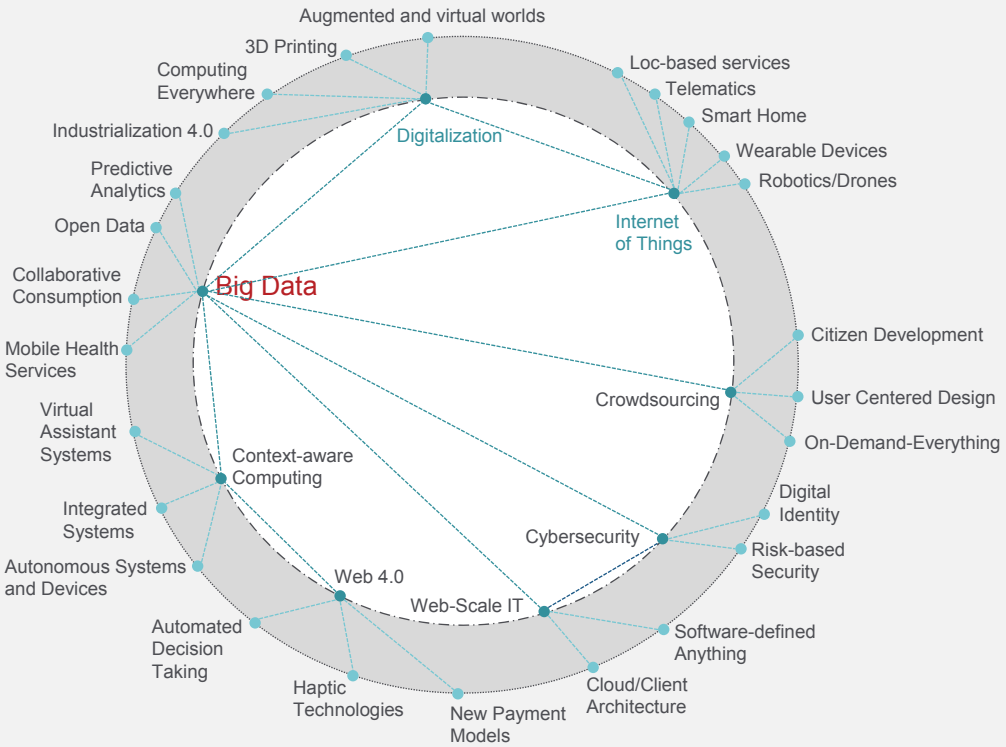

- Large amounts of previously unavailable data and sophisticated analysis methods uncover hidden data treasures
- The strategic dimension of big data in the insurance industry means
  - New insights for more clear-cut solutions possible
  - New competitors with special competence in data analytics
- Big data is undoubtedly an asset for the industry, but it comes at a cost
  - Need to come to grips with different data formats
    → technical competence & resources
  - Innovative, customer-oriented use of big data → strategic competence

What is big data?

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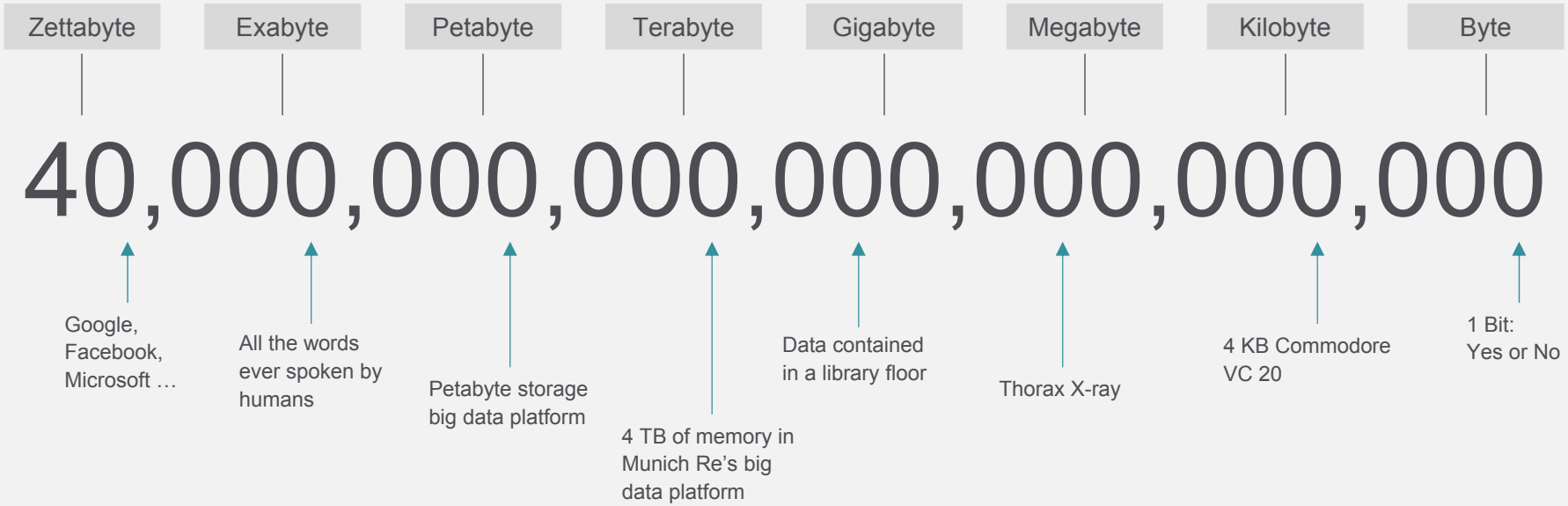
Data is now available in completely new qualities and quantities:



43 zettabytes = 43 000 000 000 000 000 000 000 bytes of data will probably be generated in 2020, 300 times the 2015 volume

Source: IBM & Univ. Berkeley

Big data use cases in insurance

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Make the uninsurable insurable

Extensive in-depth analysis of the available information. For example, wind farm yield cover reduces financial risk when investing in sustainable energy by processing data about wind speed, turbine performance, weather history, etc.

Consolidate information and processes

A high number of evaluable cases makes automation possible. For example, automated underwriting in non-complex cases at virtually no cost per policy

Workflows supported by artificial intelligence (AI)

Faster identification of relevant information enables the finding of hidden connections. For example, visual loss adjustment: data from satellites and drones make it possible to estimate damage to buildings

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Potential of data analysis for insurance portfolios

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Our advantages include

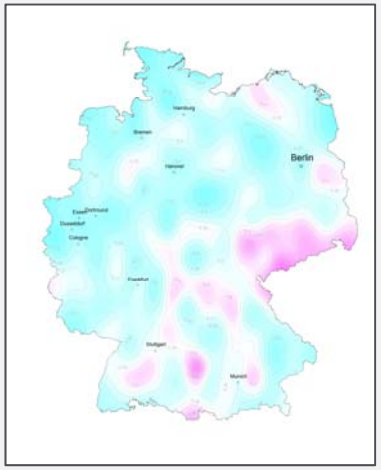
- our extensive (re-) insurance-specific knowledge
- high-end technological infrastructure
- top data science and data engineering teams

Using clients' data and our own, we can

- produce analysis of client portfolio as status quo
- highlight potential challenges such as overexposure or local concentration of policies
- detect trends like changing risks

Sales support: we can use machine learning techniques to identify local or other specific potential to help clients expand their business

Current policy distribution of client



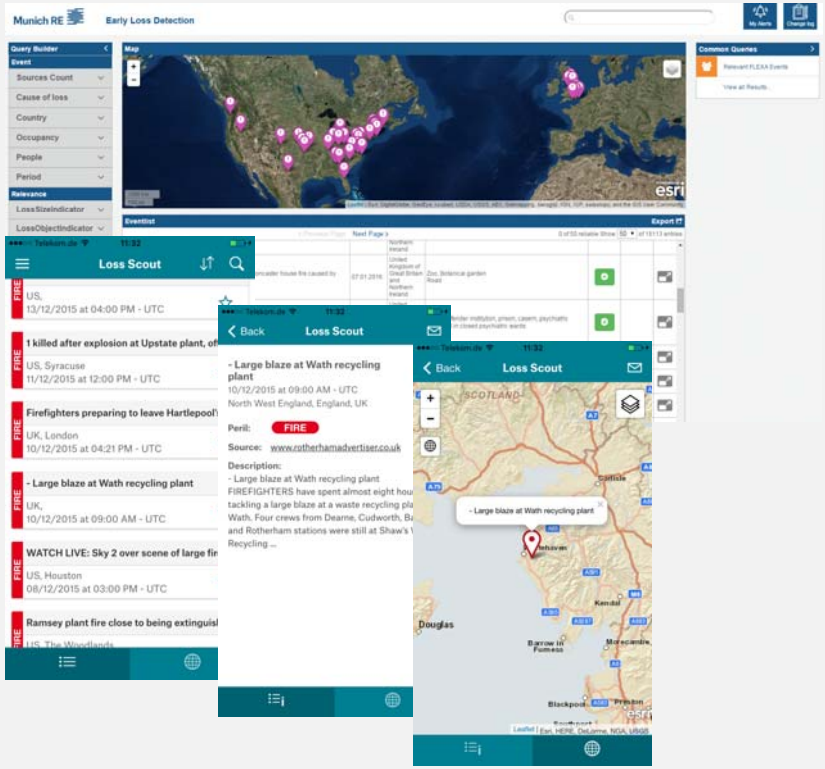
Purple =
high policy density

Predicted policy sales potential of client

Green =
high sales potential

Source: Munich Re

Early loss detection use case
Losses due to fire events



Is one of our insured buildings affected? Has the risk changed?

- Fully automated monitoring of around 7,000 digital news sources (approx. 250 GB) every day → early detection
- Automated alerts, via email for example, provide information about potential damage to insured objects
- Possible to match with risk data portfolio at the same time

→ Automated, faster and cheaper information about insurance-relevant loss events. In operation in US and UK

- Database on loss events allows in-depth trend detection

→ Identification of high risk areas
→ Faster & more effective claims management

Source: Munich Re

Oil & gas supply chain monitoring use case

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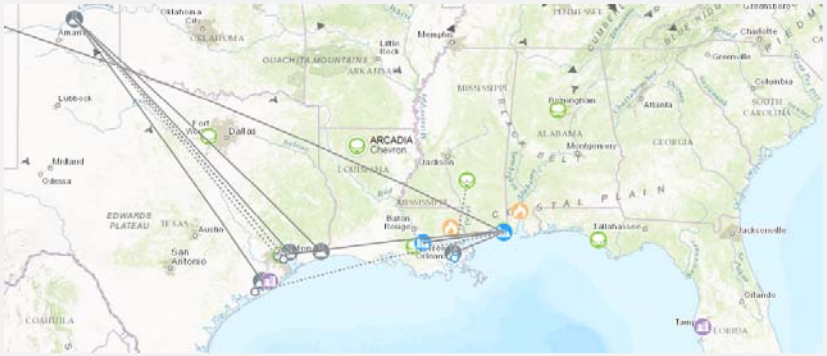

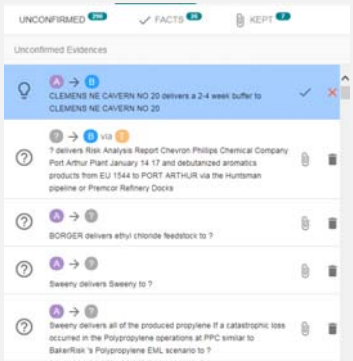

What is the supply chain structure of an insured company?

- With Energia, use of big data analytics to better identify critical parts and paths within an insured's supply chain, combining internal and external data
- Automatically extract information from thousands of free-form documents of around 200,000 pages using natural language processing and text mining technologies
- Manage the complexity of oil & gas supply chain network, thereby uncovering previously hidden supply chain risks, such as the impact of pipeline shutdown on refineries
- Enable advanced risk mitigation measures and improved risk-commensurate premiums

Source: Munich Re

M.I.N.D. use case
Risk management platform for nat cat pools

Realized in Mexico,
Deal signed for UK flood risks, available soon

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Disaster: Where is the risk? How high are the costs?

- M.I.N.D.: Processing huge amounts of information on losses, assets and other information on one platform
  - Efficient and pro-active risk management
  - Deeper insight by combining the client's data with Munich Re's expert knowledge and external data in order to better estimate damage claims and detect fraudulent claims
  - Efficient management of resources
  - Geospatial visualisation and analysis

What does the future hold for us: Artificial Intelligence

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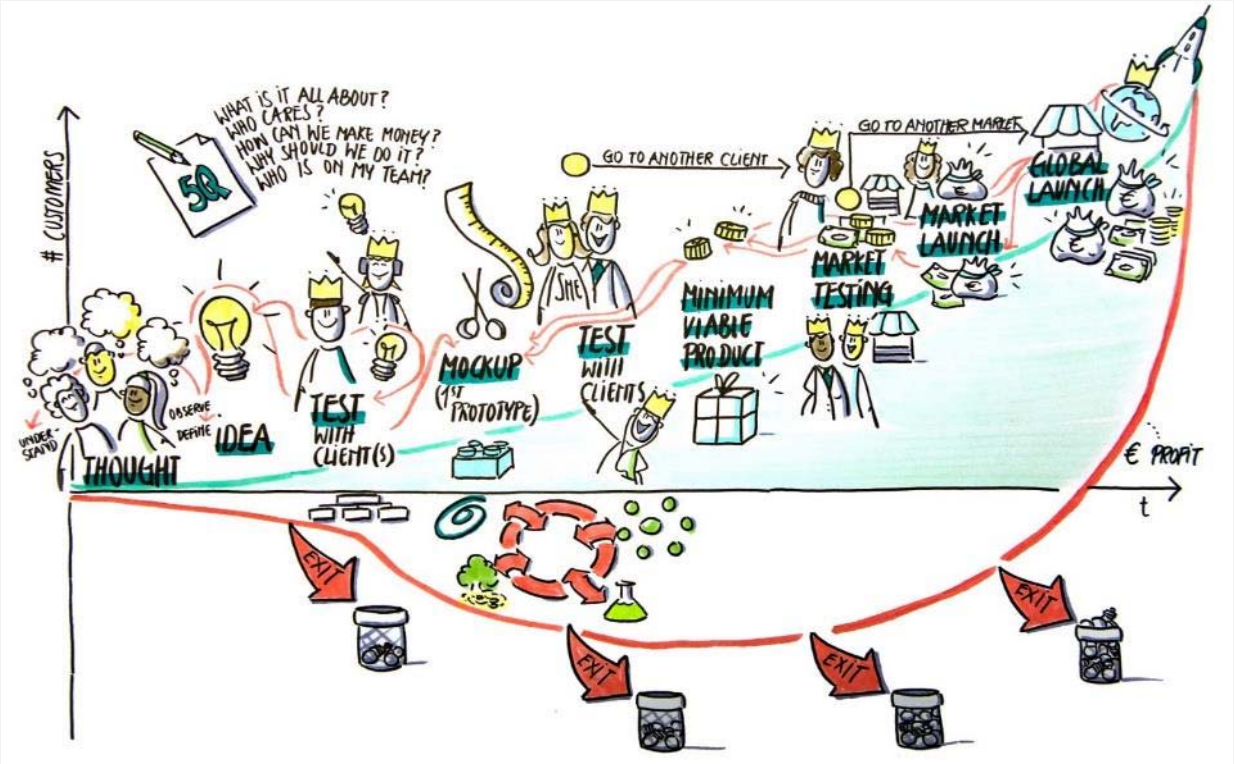
For example, natural language processing to understand the sentiment of written text; image analysis to estimate damage

Innovation at Munich Re: Making it work



Source: RID

Summary

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- Digitalisation and new technologies will affect the risk landscape. With all its related opportunities for growth and the challenges it presents, innovation is crucial for the insurance industry
- Large amounts of previously unavailable data and sophisticated methods of analysis will improve risk assessment, loss prevention and claims handling. Big data is also the basis for innovative solutions and new services, opening up new market potential
- For data analytics, insurance companies need special competence and resources as well as an open mind for customer-oriented solutions in a fast-changing world. Developing new know-how is an iterative process
- Insurers can expand the boundaries of insurability; we can consolidate information and processes, and support workflows with artificial intelligence
- Co-creation with clients is key and leads to faster und stronger market-oriented solutions such as risk management platform M.I.N.D.

> “Huge volumes of data may be compelling at first glance,
> but without an interpretive structure they are meaningless.” – Tom Boellstorff”

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Thank you very much for your attention.

Baden-Baden, 24 October 2016
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