



Tech Trend Radar 2019 – Top 10 Trends

Full report can be requested for Munich Re Clients

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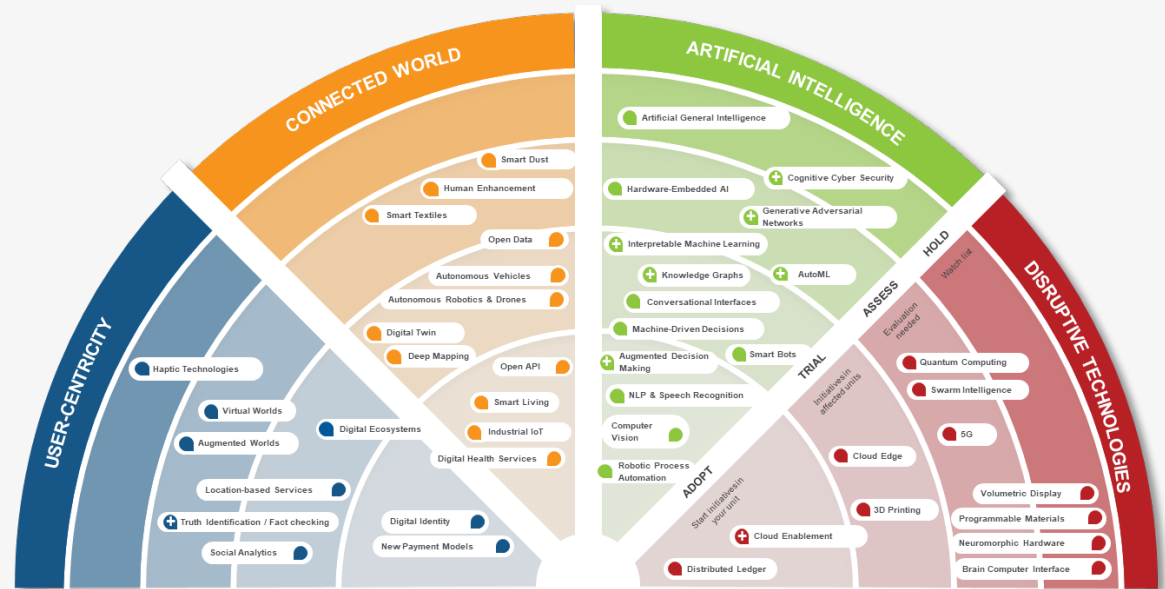
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Tech Trend Radar Tech Trend Radar 2019 – Introduction

The Tech Trend Radar 2019 provides information about technology-driven trends, which are relevant in 2019 for Munich Re, ERGO and the global insurance sector. It is a collaborative initiative by Munich Re Business Technology and ERGO IT Strategy. The Tech Trend Radar 2019 aims to sharpen awareness, evoke discussion and initiate new business opportunities appealing to all insurance clients and units within the Munich Re Group. Furthermore, there is a strong alignment with Business Units and Strategic Units within the Munich Re Group.

In cooperation with Deloitte and the Institute of Electronic Business, future trends have been gathered, aggregated and rated in order to provide a comprehensive view of technology trends, their maturity and relevance for the Munich Re Group and the insurance industry.



We're just getting warmed up!

Technology is changing at a breakneck pace and increasingly influencing our lives, both personally and professionally. It's not just a tool, but a guide to make us more agile and innovative.

From aerospace to venture capital, technology has been a key productivity and growth driver for many industries over the past decade. But if you look back just five or six years ago, it wasn't considered as a critical topic in insurance.

Fast forward to 2019: we're seeing more and more technology innovations changing the daily activities of both insurers and their customers. For example, buying insurance on mobile devices, the automation of claims processing and the availability of new data sets for assessing risk are all reshaping both how we operate and what our customers expect from us.

Rapidly evolving technologies like robotic process automation, cognitive cyber security and quantum computing are opening up entirely new business opportunities for a wide array of industries – including insurance.

This year's edition of the Tech Trend Radar aims to shed light on the progress of key innovation developments and attempts to provide an educated kind of assessment for how – and when – you can expect to them become relevant for your business.

While it's always fun to talk about new technologies, we must also take an active role in not only adapting to these changes, but actually driving them in our business. I'm optimistic about the potential the future holds for us in terms of optimizing our operations and working better, stronger, and faster than ever before.

One thing is for sure – technology will continue to provide us with many new opportunities and I, for one, am excited by both the changes it will bring and how we can make productive use of them.

It's my hope that the Tech Trend Radar will offer you valuable insights into the technological possibilities before us and help inspire your future decisions.



Robin Johnson
Global Chief Information Officer
Munich Re Group

Start Exploring!

Technology has always been a huge source of inspiration. There is a reason that still today the light bulb is the near universal pictogram for an idea. But until what seems rather recently, tech mostly inspired the inventors and tech geeks. Today however, everyone is using technology, looking for inspiration and everyone drives the development further by the data produced in our daily lives. The speed of the developments continues to increase. Breakthroughs in the key fields AI, extended reality, robotics, energy, biotech, space/satellites and transportation have been and will continue to be made at a much higher velocity than in the past. The underlying question however remains the same: this should be possible or available, easier, there must be data that can help us?

Yes, there is. Quantum computing and 5G will open new doors for inspiration on how to enhance our private lives and our economic offering. Moore's law, valid since 1965, will soon be history.

We are about to be at a crossroads, and it is more than exciting to watch what opportunities arise. You have to pay attention to tech and science trends inside and adjacent to your industry. To stay vigilant, assess and adapt trends

and new opportunities, find partners and platforms, be inspired – this is what our Tech Trend Radar is about.

About half of the interactions you have with computers will be using your voice by the end of 2020. Last year, ERGO was among the first in Europe to introduce an E2E travel insurance purchase via conversational interface to their customers. In digital health services, we offer a partly electronic health record. Our customers' advantage? Our digital manager helps you to keep an eye on your own health in everyday life.

Like us, the Tech Trend Radar readership is constantly on the move to seek inspirational ideas to turn digital technologies into accessible services and products for our customers. The Tech Trend Radar offers a filter and looks at the most promising megatrends.

It is here to inspire you – enjoy seeking your inspiration and deciding on your priorities in 2019!



Tomasz Smaczny
COO of ERGO Technology & Services Management

A world full of opportunities

It is time for the next release of Tech Trend Radar and we are enthusiastic to present the fifth edition to you. The Tech Trend Radar this year is broad and robust - with detailed analysis of 46 tech trends, accompanied by more than 140 use cases and scenarios of diverse industries demonstrating the applications of the tech trends now and in the foreseeable future.

What is new this year? Right after you have a look at the keywords of the tech trends on the radar, you can immediately find the newly added Top Ten Trends for the insurance industry.

Why do we have a new edition this year? While many great leaders and heads of organisations may have a thorough understanding for how their industry and individual companies tick, they might not have the deep technical knowledge regarding emerging trends like AI, Distributed Ledger or extended reality.

We hope this report will give you a full picture of all the current and upcoming tech trends and drive insightful discussions within your organisations. It is our goal to make connections among the tech trends and more importantly, to facilitate you to think exponentially and plan for the next strategic move.

We appreciate your feedback and would be delighted to discuss further with you!



Jason Engelbrecht
Chief Technology Officer

Syndicate 457
Underwriters at Lloyd's
Munich Re

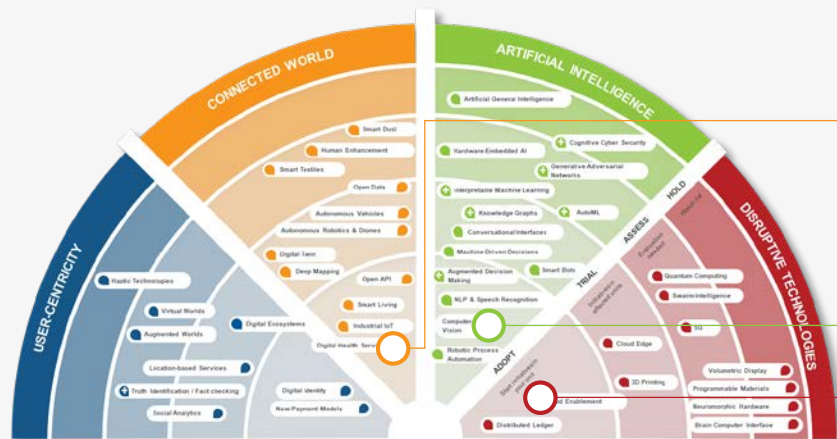
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Tech Trend Radar 2019

- The Tech Trend Radar began in 2015 as a collaborative initiative around trend monitoring between Munich Re and ERGO.
- This year's report contains 46 relevant trends that have strategic and operative relevance for the insurance industry, starting with the top ten. It includes the anticipated impact of each trend, supported by cross-industry use cases.
- Our aim is to promote innovative initiatives around each tech trend and intensify collaboration and interaction with and amongst our clients.
- The trends are categorised into four fields: User-Centricity, Connected World, Artificial Intelligence and Disruptive Technologies.

Top Ten Trends

The Tech Trend Radar starts with the most relevant trends for the insurance sector in 2019.



The **Insurance Value Chain** represents the key processes running at insurance companies. The coloured value chain elements indicate where to start initiatives regarding the trend.

The **Tracking Slider** provides a comprehensible indication regarding the costs and added value around the adoption of the trend:

- **Savings potential:** Estimated mid- and long-term ROI based on possible savings, e.g. in operational costs compared to the other top ten trends
- **Earnings potential:** Estimated revenue that the implementation of this trend is expected to bring in comparison to other top ten trends
- **Expenses:** Estimated relative investment costs for implementing this trend
- **Market adoption:** Estimated amount of anticipated users in the global market

Two Trend attributes explained

To navigate swiftly through the radar, we added attributes to certain trends:

PLUS: Denotes trends that have been added in 2019.

+ Cloud Enablement

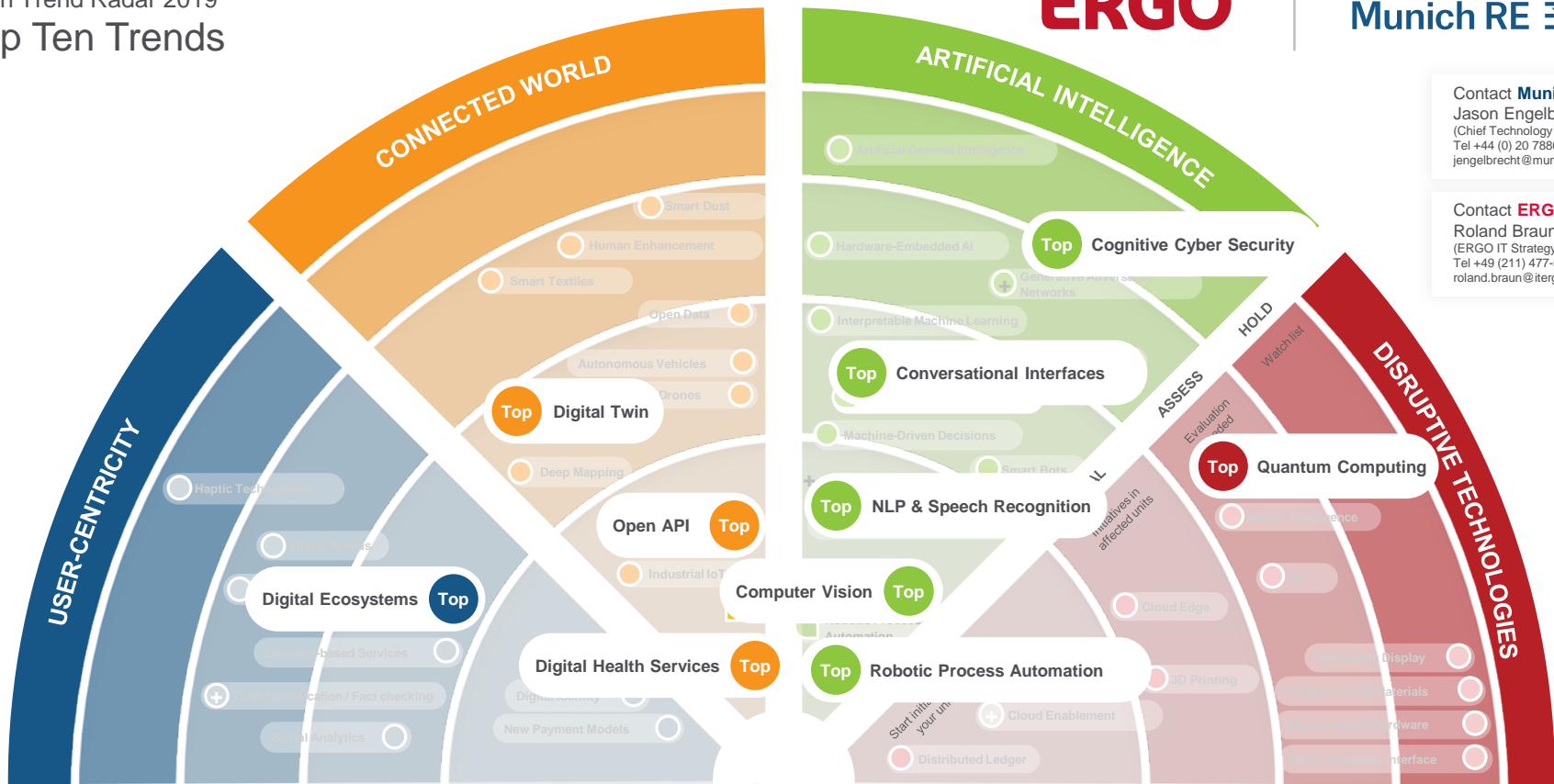
TOP: Trends that belong to our Top Ten Trends selection.

TOP Computer Vision

Tech Trend Radar 2019
Top Ten Trends

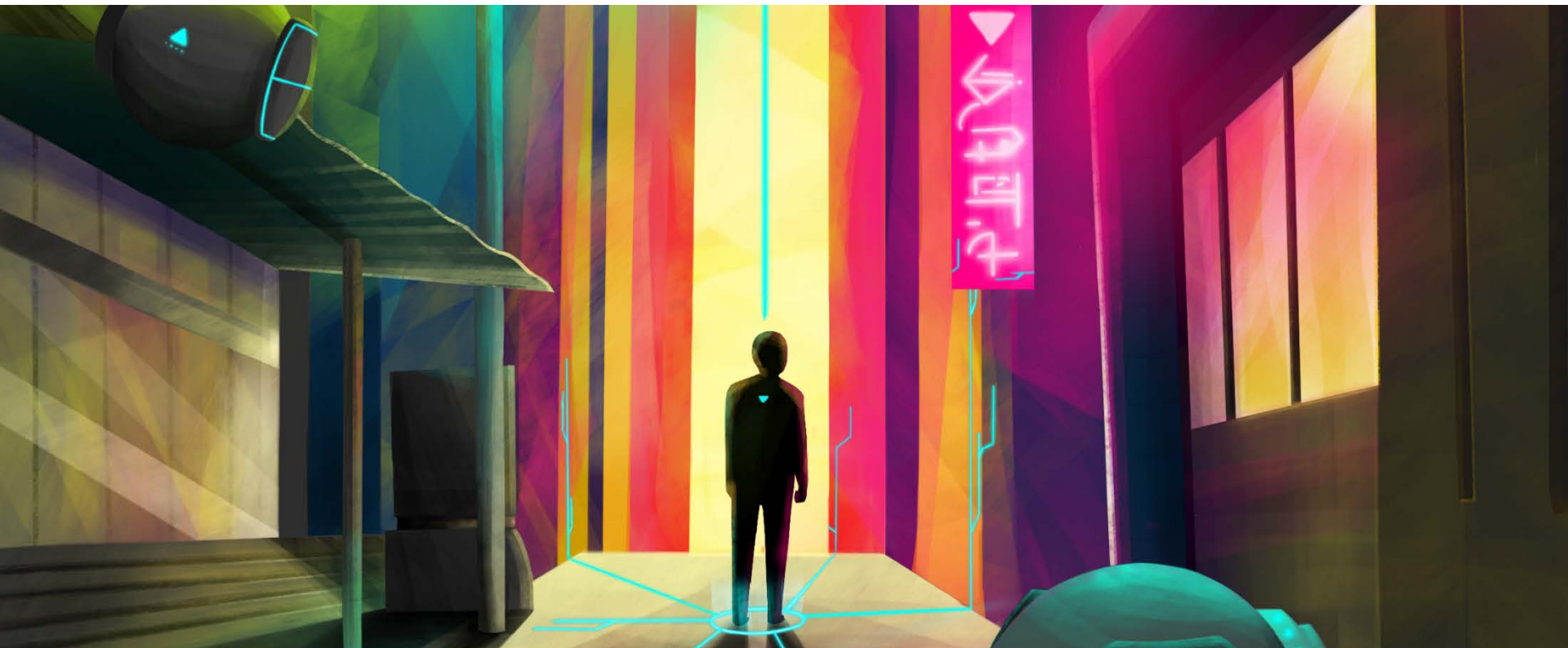
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User Centricity Digital Ecosystems



A group of stakeholders that connect through digital platforms for a beneficial purpose

Digital transformation has been a main concern for many organisations in recent years. The next stage is to establish a digital ecosystem, which will help them interact with those outside the company. These systems are informed by knowledge of natural ecosystems, especially aspects of competition and collaboration among diverse entities. Similarly, digital ecosystems enable a company to interact with customers, partners, other industries and competitors.

Strongly intertwined is what the banking sector experiences under Open Banking. The Danish firm Danske Bank, for example, used a network of partners and businesses to create an online system combining customer data with house market listings, thereby providing potential home buyers with cost estimates for tax, heating and electricity.

INSURANCE VALUE CHAIN



OPPORTUNITIES

- In combination with other technologies such as Blockchain, digital ecosystems may allow for a complete unbundling of services. The main functions of banks, such as lending, money transfer and safekeeping of assets could be offered by a group of separate providers in a digital ecosystem.
- There's a shift in the business model to a "layer player" pattern. This means that one step in the value chain is offered to a large number of customers. For example, collaboration with specialists for the underwriting of exotic risks or for more efficient claims handling.
- Digital ecosystems offer access to capabilities and resources on a global scale and have the potential to reshape entire markets. On-boarding costs for consumers should be low, since all data can be shared within the ecosystem.

RISKS

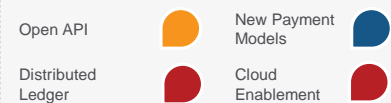
- Since digital ecosystems comprise several partner companies, open communication and clear rules are paramount to prevent misuse and data leakage.
- Underestimated complexity with regards to legacy systems and architecture as well as data governance and compliance standards.
- Requires an advanced technological basis in order to be cost-effective.
- Customers may have to talk to several providers instead of one entity offering a complete package of all services.
- Certain companies in the ecosystem may play a crucial role and therefore become indispensable or act as a bottleneck.

TREND EVOLUTION



Boosted by Open Banking and the PSD2 regulations enforced in 2018, Digital Ecosystems is a trend that finds itself on the plate for implementation in 2019.

RELATED TRENDS





User Centricity Digital Ecosystems



FACTS & FIGURES



Daimler and BMW have joined forces and invested €1bn to leverage their car sharing offerings DriveNow and Car2go and create new customer-centric mobility services.

PSD2

— 2019 —

With the European regulation Payment Service Directive Two (PSD2) taking effect in 2019 banks are required to provide customer account data and payment interfaces for third parties.



Gartner predicts a 2 to 5-year evolution path until open banking platforms reach market maturity.

BUSINESS VALUE

Risk Coverage



Insurers are a perfect fit for digital ecosystems that need to cover risk, e.g. mobility, health, or smart homes. The right entry point to the customer journey might not be the earliest possible, though.

Secure platforms



New providers, e.g. telcos and airlines, enter the financial market and drive innovation towards the financial sector. Higher transactions security and decrease of fraud are expected with PSD2.

Platform expertise



Considering underestimated lock-in effects, partners and vendors are to be chosen wisely. In-house expertise in vendor and technology partner management in the cloud era and smart investment strategies are key.

INSURANCE VALUE CHAIN



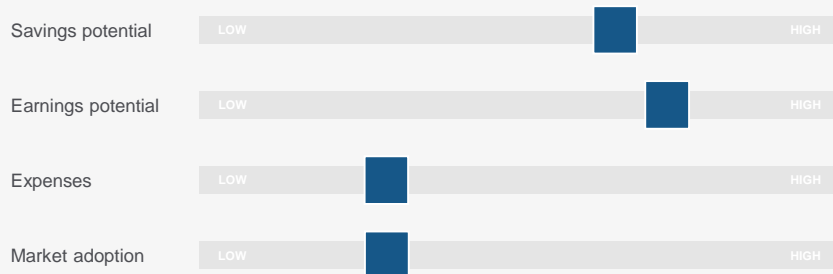
Digital ecosystems provide entry points for nearly all value-creating areas.

Cross-market analytics based on financial transaction data will help improve financial products and services, e.g. insurance pricing models

Assess potential partners based on target groups and future customer profiles

Curation of own customer data in digital ecosystem is key

TRACKING SLIDER





User Centricity Digital Ecosystems



PING AN MEDICAL TECHNOLOGY Health Ecosystem



Health-tech ecosystem to replace doctor appointments

Ping An Medical Technology is part of the Ping An Group, which is considered to be one of the greatest research and development practices in China. The medical solution subsidiary comprises the possibility to enjoy AI-assisted doctor appointments, simple internet advice or in-house medical treatment. Thus, doctors, hospitals, pharmacies, physiotherapy centers, health check-ups, fitness, beauty care, insurance and e-commerce are all part of the broad digital ecosystem, which enhances the efficiency of medical resources while providing a great user experience

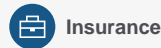


HOMELYFE/YOLT Shared Platform



Home insurance in 60 seconds

The digital insurance service (insurtech) Homelyfe partnered with the smart money app Yolt, aiming at empowering customers to seamlessly and securely source a home insurance quote in just 60 seconds. The money app Yolt was developed to provide customers with a single touch point that gives an overview of all (bank) accounts. Thus, the user can analyse his general spending habit within in the app and further receives advises on how to better manage money, including for example also the offer to get better deals. The partnership with Homelyfe now further enables customer to manage their home insurance within the app.



VOLKSWAGEN Volkswagen We



Establishing a group-wide platform for the new ecosystem

As cars are increasingly becoming digitalized, a new digital ecosystem is required that supports and complements the holistic system. Volkswagen therefore announced the further acceleration of a cloud-based infrastructure, which encompasses not just the vehicle but also the customer (device and service platform). The 'Volkswagen We' ecosystem also has a unified programming language and contains open interfaces that aim at encouraging third parties to participate and develop software





User Centricity Our Solutions



MUNICH RE Realytix



Source: iStock

Designing innovation from idea to market

Realytix is a cloud-based digital transaction platform for primary insurers, brokers and MGAs focusing on worldwide non-life standard business. It opens up entirely new opportunities in development and distribution of non-life-commodity products. Time-to-market is key: With Realytix, insurers can take product innovations from initial idea to market readiness in just a few weeks. Via the platform they can immediately be put into production.

Munich Re is also driving forward the automation of reinsurance products with Realytix providing online skills for facultative risks.

Benefits at a glance:

- Much reduced time to market
- Customizable, flexibly implementable platform
- Digital distribution
- Increased (process) efficiency, cost and time savings



MUNICH RE Infrastructure Risk Profiler



Source: Munich Re

Holistic risk assessment for infrastructure investments

Proper analysis of risks typically associated with infrastructure requires comprehensive expertise drawn from diverse fields. The extensive IRP-analysis covers all risk factors pertinent to infrastructure projects: Macroeconomics, technology, natural hazards, project execution and operation, environmental impact as well as microeconomics. The approach considers and weights relevant risks individually and holistically.

Benefits at a glance:

- Holistic, objective and transparent overall perspective
- Solid basis for an informed investment decision to better secure the return on their investments
- Thorough analysis within up to 4 weeks
- Comparability of different infrastructure projects that match their individual appetite



MUNICH RE NatCatSERVICE



Source: plainpicture/Weslende1/Martin Kietzke

Complex risk modelling with regard to natural perils

The NatCatSERVICE data base enables evaluations, analyses and applications for risk modelling with regard to natural hazards.

Munich Re provides comprehensive data on insured, economic and human losses caused by any kind of natural peril. Data are received from own sources as well as from insurance associations and from systematic evaluation of media reports. It is used for developing customized insurance solutions, for political decision-making processes and also by researchers.

Benefits at a glance:

- Flexible, easy to use and fast
- Reliable data on natural catastrophes back to year 1980
- Hazard-specific analyses (e.g. tropical cyclones, hurricanes/typhoons, earthquakes)
- Charts can be shared directly (social media channels/download)

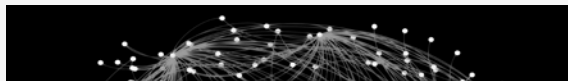




User Centricity Our Solutions



MUNICH RE Risk Suite: Claims



Source: Shuoshu / Getty Images

Comprehensive business insight on one platform

Risk Management Partners helps insurers and loss adjusters to assess individual risks applying Munich Re know-how and manage portfolios dynamically.

One of the use cases of the Risk Suite for Claims is to document historical information on losses, comparing with current pictures of damages.

Benefits at a glance:

- Huge amounts of information on losses, assets and other information processed and enriched with Munich Re data
- Claims data analysis
- Portfolio visualization and analysis
- Accumulation analysis
- Reporting via customized dash boarding



MUNICH RE Risk Suite: Location Risk Assessment



Source: Munich Re

Comparing risk assessments on a global scale

The location risk intelligence technology helps risk managers and underwriters to carry out natural hazard analyses and compares assessments at any time, from the location-based individual risk through entire risk portfolios.

Complex interrelationships are transparent, pricing calculations become more precise, and cost-driving extra charges are reduced. It speeds up business processes and enhances both, portfolio management and claims management.

Benefits at a glance:

- Comprehensive Geo Coder
- Hazard Score rating on a worldwide base
- Risk evaluation on a global scale
- Munich Re risk insights included
- Climate change impact evaluation



MUNICH RE Risk Suite: Compliance



Source: Wavebreak Media Ltd / Alamy Stock Photo

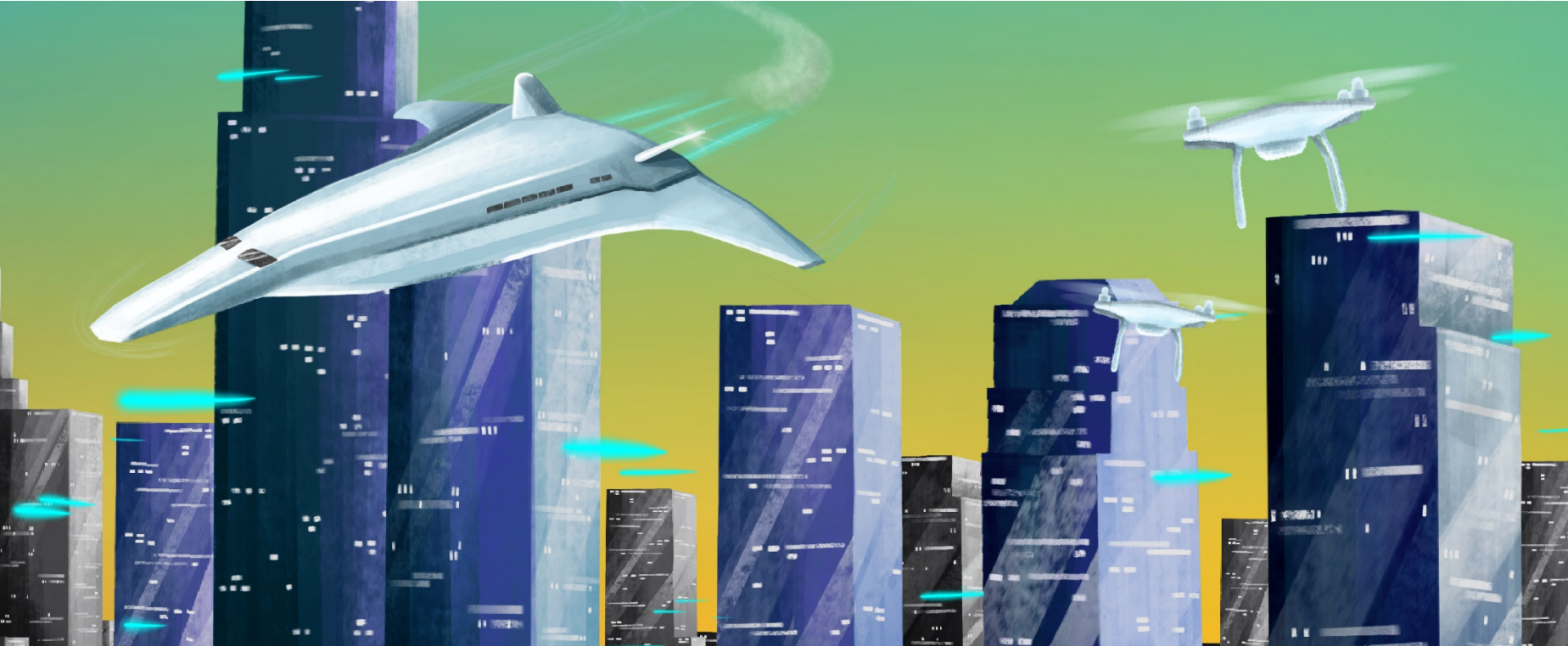
Implementing the requirements of GDPR

Risk Management Partners offers a cloud solution to guide you through the complex requirements of the new EU General Data Protection Regulation. A dialogue system guides process experts and data security staff through the relevant workflow. It classifies data, compares processes with legal requirements, illustrates the process architecture, and explains the procedure step by step. It automatically generates the legally required documentation including an overview of processing activities, documentation of the data protection, impact assessment, a ready-to-sign agreement on data processing and templates to fulfil information requirements.

Benefits at a glance:

- Easy-to-use dashboard for data protection professionals
- User friendly, fast and secure for all involved stakeholders
- Automatic generation of required documents legally required by GDPR





Connected World Digital Health Services



Advanced technology enables the monitoring of health indicators, provides detailed analyses and makes initial diagnoses

Game-changing technologies and digital services offer more innovative ways of monitoring health and well-being. Digital platforms will increasingly develop into agencies for an initial health consultation before actually seeing a physical doctor. These digital health managers might restructure the entire health and insurance infrastructure.

Additionally, major advancements in home care are still to come, so that people can continue living relatively independent lives for a much longer time. Soon, new care products will emerge, e.g. care robots or virtual reality devices that enable the experience of 3D/4D body insights and which provide new therapy approaches such as anti-phobia training.

INSURANCE VALUE CHAIN



OPPORTUNITIES

- Enable personalized therapies for critical/complex illnesses and thereby reduce follow-up treatment costs.
- Data can speed up claims handling, since illnesses and the corresponding treatments are detected and reported automatically.
- Insurance premiums can be adjusted to reflect the altered risk situation due to digital health services monitoring.
- Participation in the digital health ecosystem may bolster health insurance sales.

RISKS

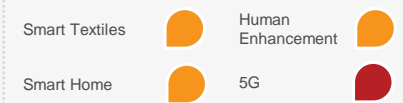
- Data leakage/hacking attacks.
- Personal information could be used to the disadvantage of the insured.
- Device failure could have dangerous consequences for patients.
- Reduction of contact with human medical experts may have unanticipated mental consequences due to missing empathy.

TREND EVOLUTION



Digital Health Services was a trend already classified in the ADOPT stage back in 2015 and 2017. Now is definitely the time to start launching initiatives!

RELATED TRENDS



Connected World Digital Health Services



FACTS & FIGURES



Currently, just 34% of American adults are connected in a digital way with their health insurance provider. The industry thus is lagging behind.



AI already effectively proved medical diagnosis functionality. In fact, breast cancer was identified with an accuracy rate of 89%, compared to 73% by humans.



Digital health services are generally used less frequently than comparable models in other industries (highest number of nonusers).

INSURANCE VALUE CHAIN



Customizing offers based on health status; e.g. raising premium in real-time

Data from digital health services may improve health insurance underwriting

Engaging customers by rewarding "healthy behavior" and monitoring health status by using NLP

BUSINESS VALUE

Simplify



Combining health service with NLP allows customers to record both their general health status and biometric data in a simple way, which in turn fosters customer engagement.

Risk Mitigation



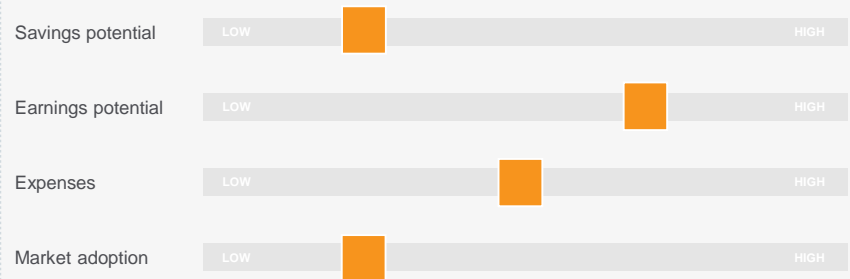
Insurance companies are able to reduce eventual (health) risks due to the integration of continuous health monitoring, which is offered within the holistic digital health service application.

Customer Demand



Forrester revealed that the majority of people in fact demand access to health platforms to schedule appointments, receive coverage suggestions and reward healthy behavior.

TRACKING SLIDER





Connected World Digital Health Services



EteCRX Smart Pill



A smart pill tracks opioid use

A group of Japanese scientists developed a hypoallergenic electronic sensor that is applied directly to the skin. It is designed to be worn continuously and monitors the state of health over a long time. The elastic electrode is constructed of breathable nanoscale mesh and is biologically compatible with the body. It is applied by spraying a bit of water so that the PVA nanofibers can stick more easily to the skin. The technology can improve nursing care by monitoring patients' vital signs. Moreover, athletes can benefit by using the device because they can supervise physiological signals and bodily motion over a long period.

Verge Genomics AI-based Drug Discovery



Simplifying drug discovery by using AI

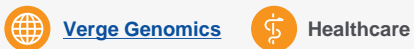
The aim of Verge Genomics is to become the very first company that is processing drug development automatically, which makes it not just faster, but also cheaper. Based on an algorithmic approach, they will be able to map out exactly those genes that cause a disease and subsequently find drugs that target all the genes at once starting with the preclinical trials. The cost curve of pharmaceutical development can thus be improved and patients can be helped more efficiently and faster.

Panasonic Talk to Me



Talking to coma patients despite physical distance

The Japanese electronics company Panasonic has found a way to let coma patients hear the voices of their relatives. By adding a GSM chip with an open phone line to regular speakers and fixing them to the beds of coma patients, family members can call their relative on their own phone number. They can talk to them or play music independent of visiting hours. The benefits: According to a medical study from Northwestern University, hearing familiar voices and music triggers the first glimpse of awareness and helps coma patients to recover consciousness faster.





A proprietary software or application programming interface that is publicly available to developers

Basically, an API allows one piece of software to interact with another piece of software, whether in one system or in a network or distributed environment. Open APIs are published on the internet and shared freely. A company might publish the API of their software to encourage external developers to figure out new ways of using it.

Ideally, this creates a win-win situation: The external developer can make money by licensing a new service with advanced functionalities, such as an innovative use of the service in ways the originator hadn't thought of. And the company benefits from more widespread use of their service.

INSURANCE VALUE CHAIN



OPPORTUNITIES

- Open APIs increase competition between providers, since everyone can integrate their systems and contribute to better products and services. Consumers are thus likely to benefit from cost-effective services tailored directly to their demands.
- Open APIs enable the growth of a digital ecosystem, allowing for complete and seamless integration with service providers.
- Open APIs decrease the need for individual development of certain digital solutions, since the software and systems from specialized providers can be integrated into the existing IT architecture. Open APIs can be used to access the large community of freelance developers to create innovative applications.
- Open APIs increase the production of new ideas without investing directly in development activities.

RISKS

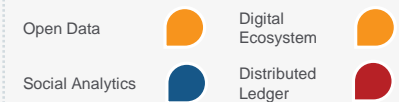
- Individuals may lose control of their data and cannot trace it to see whether it is used for fraudulent activities.
- Third parties providing the actual services related to the open API might push insurers into the background and dismiss them as mere transaction providers.
- Loss of competitive advantages due to lock-in effects.

TREND EVOLUTION



After remaining in the TRIAL stage from 2015 onwards, Open API is recognized as adoptable. Accordingly, initiatives in that field should be launched soon!

RELATED TRENDS





Connected World Open API



FACTS & FIGURES



25% of all insurance transactions involving their own ecosystems will depend on open APIs by 2021.



More than half of insurance CIOs could achieve a return on investment within two years of implementing open APIs.



87% of all organizations either use or already provide open APIs and consequently exploit all including benefits.

INSURANCE VALUE CHAIN



Designing new insurance products by involving customers in an ideation-process

Customer are able to share data in real-time in a machine-readable format with the insurer, which improves customer-related processes, e.g. claim process

BUSINESS VALUE

Connect



Open APIs can connect people, organizations and things. Hence, the technology enables an interwoven and connected ecosystem of partners. Open APIs create a symbiosis between providers and users, where borders fade.

Enable



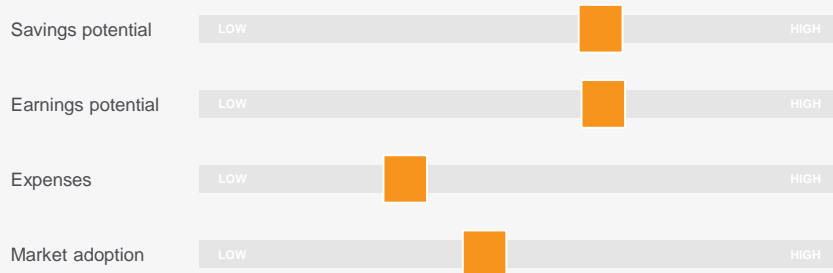
Through open APIs, businesses can share information with their ecosystem and thereby help creates a market for their offerings that previously did not exist.

Create



Usage and provision of APIs can function as catalyst for open innovation. Organizations can learn from how third parties use their APIs to create entirely new offerings.

TRACKING SLIDER





Connected World Open API



THE OPEN INSURANCE INITIATIVE Open API for insurers



Making insurers' data available

OPIN is aiming to assist Various insurance stakeholders by providing the required capacity to integrate insurers' data into applications through open APIs. Insurers will thus be able to research, collaborate and leverage innovative solutions and business models. A main advantage of the initiative is the development of ever more sophisticated utilities that enable customers to reach out for cheaper and highly accessible products.

OPEN LEGACY API Software



Extending and transforming core (legacy) systems

Open Legacy enables enterprises to extend and transform core (legacy) systems such as IBM i (aka AS/400) and connects the application to web, mobile, and cloud. The platform-based solution enables developers to solve high impact business problems quickly and in a reliable way, which fosters enterprise-wide agility and favors the implementation of new and innovative solutions at comparably low costs and with a high success rate.

RAPID API API Marketplace



Offering the world largest API Marketplace

RapidAPI is far more than a standard API marketplace as it aims at providing developers with a single location to discover and use all of the APIs that their organization offers, both internally and externally. Since developers don't need a separate API key for every service, an increase in productivity is to be expected. RapidAPI manages user authentications, billing and usage analytics across all of the APIs. Also, it enables the cooperation with whatever API gateway is in use and allows administrators and operations teams control over and visibility into API usage.



Connected World Digital Twin



A virtual counterpart of a real object that enables IT systems to interact with it rather than the real object directly.

Basically, a digital twin helps to improve maintenance, upgrades, repairs and operation of the actual object. For example, it could be a model of a sound system that enables a remote user to control the physical system with buttons on a mobile device.

Furthermore, digital twins can be used for product development as they enable product testing and simulations without having to actually construct a physical object, thus driving innovation efficiency.

Even though the idea of the digital twin is still in an early development state, strong development figures are expected. Hundreds of millions of things will most likely have digital twins in the future.

INSURANCE VALUE CHAIN



OPPORTUNITIES

- Digital twins allow exploration and improvement in production processes without expensive physical prototypes, something that will be particularly important in the Internet of Things (IoT) era.
- Companies can use digital twins to show their products to customers or other third parties during the manufacturing process.
- Insurance companies could maintain a digital counterpart of the computer system in an insured's car in order to monitor usage-based (mileage-based) car insurance contracts (through sensors in the physical product).
- Digital twins may be created on a Blockchain to reflect ownership rights of physical objects. This could replace comparable existing ledgers such as land registers.

RISKS

- Particularly for products with long lifetimes, such as buildings, aircraft, ships, etc., digital twins might become unusable at some point (due to software issues).
- Firms employing digital twins provided by third parties face a lock-in risk with their vendor, since switching to other vendors may become very costly at some point.
- A digital twin could be hacked in order to fake damage, which, in turn, triggers a claim payment from the insurer.

TREND EVOLUTION



Digital Twin appeared in 2015 as a HOLD trend, but was shifted to ASSESS and remained there. This year it is classified as TRIAL, as the first initiatives have already started

RELATED TRENDS



Connected World Digital Twin



FACTS & FIGURES



It is predicted that 41% of major industrial companies will use digital twins by 2021.



Generally, the integration of digital twins will lead to an increase in efficiency.



By 2020, billions of digital twins for a wide range of things will exist.

INSURANCE VALUE CHAIN



Using collected data to create new insurance products

Customers can flexibly choose the insurance. For example, smartphone insurance is activated solely when leaving the apartment

Digital twins facilitate claims handling if data on damage can be transferred from the physical product in real time

BUSINESS VALUE

Reliability



Predictive maintenance data that is generated by digital twins help customers to enjoy a higher reliability of their real-world objects as possible defects can be prevented.

Process Optimization



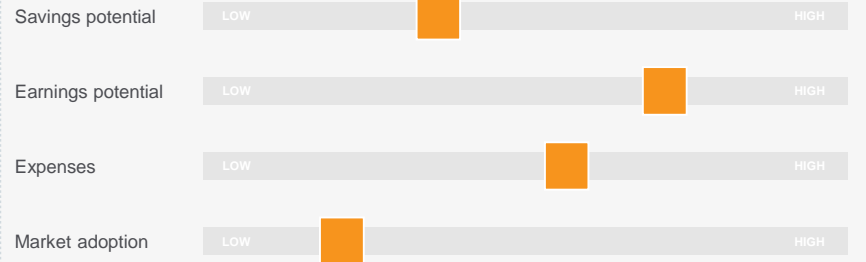
Organizations can use digital twins to aid factory operation. Data from digital twins will improve planning and identify issues, e.g. machine failure.

Data Mining



Data from cases like car usage can uncover user needs that serve as a starting point for new offerings.

TRACKING SLIDER





Connected World Digital Twin



TWAICE Predictive Battery Analytics



Increases battery life and reliability

TWAICE develops digital twins of batteries based on battery analytics software, which are continuously updated with field data. Thereby a virtual testing environment is created, as well as a generally quicker development phase and a better battery management. Besides, the platform further stores and provides battery data centrally and offers on-demand reports. Due to the additional feature of predictive diagnostics, the whole process of battery testing is simplified, the battery lifetime is improved and costly downtimes are prevented.

RIDDLE&CODE Blockchain Interface



Provides the infrastructure for crypto and machine economy

According to consulting firm Deloitte and Austrian Blockchain solution provider RIDDLE&CODE, Blockchain technology is the most suitable and efficient way to generate, monitor, and exchange digital twins. RIDDLE&CODE combines the security of smart cards with the potential of Bitcoin Technology and the Internet of Things. This is achieved by extending smart card chips in form and function. This way the sophisticated security measures known from the credit card industry get transferred into the Blockchain world and the physical internet.

REPUBLIC OF ESTONIA Digital Nation



Becoming an e-Resident

Estonia offers a government-issued, official digital identity primarily for digital entrepreneurs, freelancer, digital nomads and startup companies. The e-Residents are with it able to register an EU-based company without determining a fixed location or a local director and can furthermore manage everything remotely online – from digital contract signing and authentication, encryption and secure document delivery, online declaration of business taxes, to having access to a virtual market place of service providers.





Connected World Our Solutions



DKV / ERGO Digital Health Services



Source: DKV

Extended digital services by phone, video or chat

DKV extended the scope of services provided by the DKV health helpline to provide telemedicine support via app. Customers with general health queries can receive advice from doctors and other healthcare specialists. They can choose to make a phone call, send an email, chat or set up a video call – all from within the new health consultation app. Most channels are available around the clock. The service also includes an instant consultation option for urgent issues and specialist consultations allowing short-term appointments.

Benefits at a glance:

- Telemedicine support available without time, channel or geographic restrictions
- An addition to a consultation with a physician in a doctor's office



Digital Health Services

ERGO Smart Living



Source: Mauritius Images / Westend61 / Uwe Umstätter

ERGO Safe Home in cooperation with Deutsche Telekom

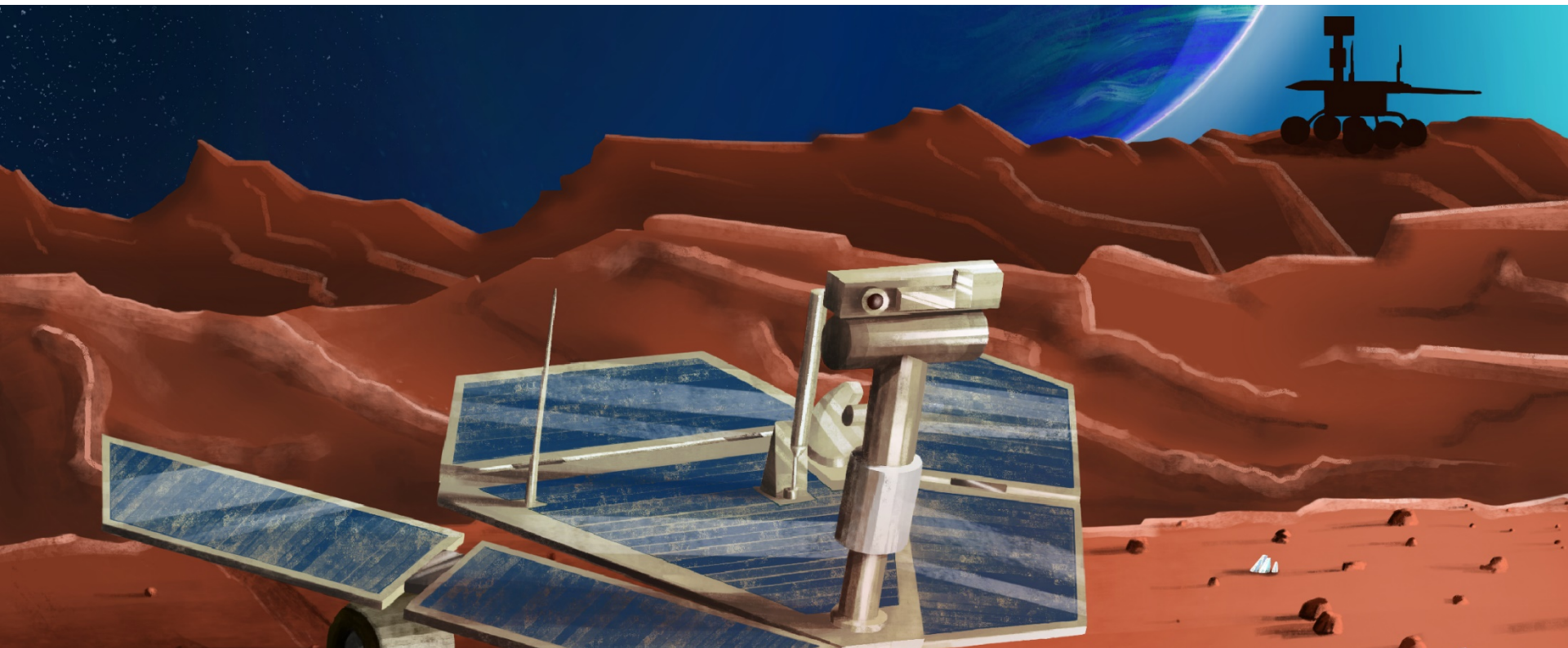
ERGO is cooperating with Deutsche Telekom in providing a virtual product bundle consisting of insurance, service and smart home technology. In case of emergency (such as water leakage detection, smoke alarm or burglary alert), an automatic alert chain ensures someone is taking care of the customer's home, even when the homeowner is not able to react immediately. This fully automatic process is in place between ERGO's customer service department and Telekom's Magenta SmartHome backend.

Benefits at a glance:

- Home emergency are detected as quickly as possible
- Assistance is initiated if necessary
- ERGO Household Insurance provides financial security in case of damages



Safe Home





Artificial Intelligence Robotic Process Automation



The application of technology that allows companies to achieve automated business processes

Just as industrial robots are remaking the manufacturing industry by creating higher production rates and improved quality, RPA “robots” are revolutionizing the way we think about and administer business processes such as IT support, workflow, remote infrastructure and back office work.

RPA provides dramatic improvements in accuracy and cycle time and increases productivity in transaction processing while elevating the nature of work by removing people from dull, repetitive tasks. RPA scenarios span a wide spectrum, ranging from something as simple as generating an automatic response to an e-mail to deploying thousands of bots, each programmed to complete a specific task, to automate jobs.

INSURANCE VALUE CHAIN



OPPORTUNITIES

- RPA contributes to high employee satisfaction levels since it assumes monotonous tasks. Employees can thus concentrate on activities that are more important.
- Focus on core business as operational tasks can be automatized.
- RPA bots act only on the user interface of CRM or ERP systems and interact non-invasively with any type of infrastructure.
- Through the combination of Artificial Intelligence, NLP and RPA it is possible to develop Intelligent Process Automation (IPA) solutions that foster significantly more efficient operating customer support, financial accounting or complaint management.

RISKS

- Since RPA is unable to read and process non-digital data, it only works in combination with other technologies (for example, AI). This, however, may turn out to be too costly.
- Generally, RPA is not an intelligent cognitive solution and is therefore unable to learn. Hence, continuous monitoring and adjustment is necessary.
- Depending on the RPA's programming, inputs need to be in an identical format. However, this does not work for insurance documents, particularly for the different business lines.

TREND EVOLUTION



HOLD
Watch list

RPA is a trend, that has continuously evolved over time and is now in the ADOPT stage, after being classified as TRIAL during the last years.

RELATED TRENDS

Advanced ML



Digital Ecosystem



Machine-driven Decisions



Autonomous Robotics





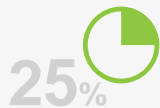
Artificial Intelligence Robotic Process Automation



FACTS & FIGURES



RPA software market is expected to grow by 41% year over year through 2022.



Based on the predicted growth rate, more than 25% of potential tasks will be suitable for RPA.



By the end of 2022, 85% of large and very large organizations will have deployed some form of RPA.

BUSINESS VALUE

People Performance



Through the usage of RPA, in particular time-consuming tasks can be sourced out. Therefore, people can increase their productivity by primarily focusing on high-value tasks.

Risk Management



Organizations can reduce eventual human errors, balance rising labor costs and hedge against staff attrition and knowledge loss.

Scalability



RPA has limited impact on the existing information and technology landscape, reduces labor volume and provides reusability of technology, patterns and programs.

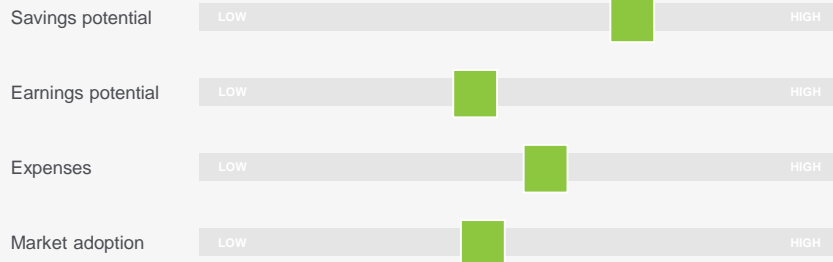
INSURANCE VALUE CHAIN



Reduction of eventual human errors in insurance documents

Accelerating claim processes by running the FNOL-process via RPA. The associated acceleration of the claims process improves customer experience and satisfaction

TRACKING SLIDER





Artificial Intelligence Robotic Process Automation



AFLAC Automated Claim Process



One day pay with automated Insurance claims process

Due to the intensive need for documentation stemming from multiple sources, claim processes are usually very complex. Lengthy and manual processes further cause customer dissatisfaction and internal issues. AFLAC therefore applied robotic processing automation in the field of claims processing in the insurance industry, with the expectation that it leads to an immediate and tangible ROI. According to external sources, solutions using RPA halves registration times – if not more.



BLUEPRISM Automation Tool



Building a high-growth responsive business

Blue Prism's RPA platform is a sophisticated automation tool, which can be combined with other disruptive technologies to optimize processes. This directly or indirectly leads to an improved customer experience by re-focusing on service value, better work experiences and increased productivity. It also results in lower costs to scale, supports projected growth, and reduces expenses for talent acquisition. Also, a higher data quality is generated by avoiding human errors and a higher revenue can be earned, which goes along with a cost optimization.



ANOTHER MONDAY Automated HR File Process



Electronically processed personnel files

Every company keeps personnel files on their employees. However, these files are usually managed manually, with every document needing to be processed on an individual basis. Another Monday therefore introduced an RPA-based solution to automate this process. The format type of a received document is thereby checked and subsequently uploaded to the right file. In case a different file type is received, the order needs to be manually processed by an employee and the software robots will simultaneously ask the sender to attach a file in the correct type and resend the mail.





Artificial Intelligence Computer Vision



Computer vision enables computers to gain high-level understanding from digital images or videos.

Computer vision tasks include methods for acquiring, processing, analysing and understanding digital images, as well as the extraction of data from the real world. For example, computer vision can help an AI system, such as a robot, to navigate through an environment by providing information through vision sensors.

INSURANCE VALUE CHAIN



OPPORTUNITIES

- By identifying objects on smartphone pictures, image recognition may offer cross-selling opportunities for insurers. Computer Vision allows insurers to improve their risk underwriting since it extracts and analyses visual information (e.g. images of property).
- This is particularly interesting for small-scale risk coverages such as smartphone or pet insurance, which require an accurate premium. If the premium is too high, low-risk customers are likely to switch provider. If it is too low, loss ratios will explode.
- Computer vision may be used to reconstruct accidents or collisions from a smartphone's camera and accelerometer data.
- Brick-and-mortar stores could use computer vision to provide their customers with product recommendations during their shopping experience, based on the items already added to their shopping trolley.

RISKS

- The computer vision algorithm must be trained to become reliable.
- In insurance claims handling, the application of computer vision additionally needs to be fraud-proof.
- Implementation on a larger scale may require an investment in computing power.
- Training data should be validated.

TREND EVOLUTION



Computer vision reached the ADOPT stage in 2018, where it remains in 2019. Thus, initiatives are required!

RELATED TRENDS

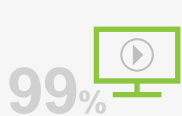




Artificial Intelligence Computer Vision



FACTS & FIGURES



By 2020, 99% of video or image content captured by an enterprise will be analyzed by machines.



By 2022, all premium smartphones and up to 30% of all basic smartphones will include an advanced-image analysis function.



Gartner predicts Computer vision to become one of the main disruptors in 2023.

BUSINESS VALUE

Predict



By applying computer vision, the individual condition of a given property becomes visible, which will form the basis for predicting eventual damages. The pricing can be attached to that.

Automation



With the usage of computer vision, a greater level of automation can be ensured, which in turn affects quality, speed and reliability.

Enable



Computer vision is one of the main factors that enables remote healthcare and supports by offering life insurance rates, e.g. based on geometric features (BMI).

INSURANCE VALUE CHAIN

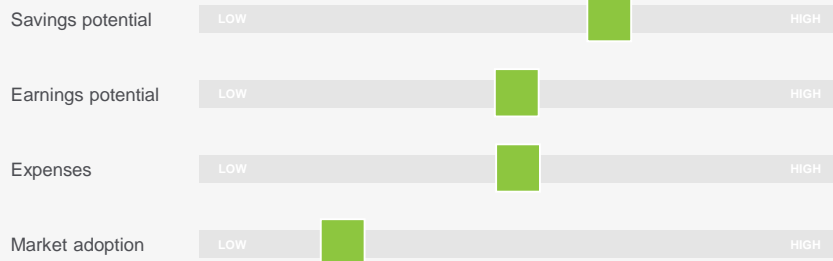


Reduction of eventual human errors in the insurance documents

Providing improved customer experience by introducing face recognition

Accelerating claims processes through virtual damage detection

TRACKING SLIDER





Artificial Intelligence

Computer Vision



RESEARCH

Computer Vision in Medicine



Deep-learning cardiac motion analysis

Motion analysis helps to understand the behavior of moving objects in sequences of images. Image sequences of the heart are used and acquired via cardiac magnetic resonance imaging. Time-resolved three-dimensional segmentations are created using a fully convolutional network trained on anatomical shape priors. The dense-motion model forms the input to a supervised denoising autoencoder, which is a hybrid network consisting of an autoencoder that learns a task-specific latent code representation trained on observed outcome data, yielding a latent representation optimized for survival prediction.



SENSETIME

Face Detection Tracking



Helping to create smart cities

SenseTime is an AI (deep learning and computer vision) company founded in China that is valued at over US\$ 4.5 bn. With having the aim to build a smart city, a crucial part of public space management is leveraging technologies in the area of face recognition, video structure analysis, crowd density monitoring, reverse image search and trajectory analysis. And this is basically what SenseTime does. These technologies improve the general public safety management and quality of life for citizens, due to the increase in security and the availability of more convenient and personalized services.



NANONETS

Semantic Segmentation at Scale



Created a digital version of an anchor man

Nanonets is a full-stack ML provider that provides solutions at scale for cutting-edge problems in the field of computer vision. The company simplified the process of building deep learning models. There is hence no need anymore to find the right infrastructure to host a model. The data need only be uploaded with an example beforehand, so that the computer is able to understand the logic behind it.





Artificial Intelligence NLP & Speech Recognition



Natural-language processing (NLP) can ease human-computer interaction and leads to machines understanding and acting on natural-language content.

NLP is improving significantly; visible accomplishments include technologies such as Microsoft's Skype Translator, which translates in real time from one spoken language to another, or Google's information cards that offer answers instead of a list of page links. For most enterprises, the simplest, strongest and most immediate use cases for NLP are typically related to improved customer service and employee support.

INSURANCE VALUE CHAIN



OPPORTUNITIES

- Insurers could use this technology to develop services that help customers understand their insurance contracts, i.e. explain wordings, technical terms, etc.
- Data collected through speech recognition could potentially be applied for other business purposes.
- Since microphones need to be turned on permanently, tremendous amounts of (personal) data are generated that, in turn, require companies to strengthen their security measures. Insurers could therefore benefit from an increasing demand for cyber coverage.
- Speech recognition is likely to significantly accelerate claims handling since documentation can be done much quicker, leading to higher efficiency.

RISKS

- Unauthorized usage of NLP & SR devices could lead to the conclusion of contracts or products/services purchases without the necessary legal prerequisites being fulfilled. For example, children or people who are not contractually capable might be able to conduct transactions.
- The provider must ensure that user commands are not misinterpreted and therefore result in erroneous transactions.

TREND EVOLUTION



Similar to last year, Natural Language Processing is classified as an ADOPT trend, implying the need to integrate it in your business!

RELATED TRENDS





Artificial Intelligence NLP & Speech Recognition



FACTS & FIGURES

38%
AC

38% of organizations within the insurance industry are actively experimenting with or are planning to introduce AI.

30%
🕒

Using NLP in the sales area reduces the average engagement time of sales employees by 30%.

16,1%
CAGR

It is assumed that the NLP market will grow from US\$ 7.63bn in 2016 to US\$ 16.07bn in 2021, which is expressed by a CAGR of 16.1%.Gartner.

BUSINESS VALUE

Retention



A better response rate and an automated escalation process improve customer satisfaction, retention and, thus, generate a revenue uplift.

Risk Management



NLP has the potential to detect schemes, lies and other threats, which is a great benefit in terms of a holistic risk management of insurance companies.

Accelerate



AI (e.g. chatbots) can match reported claims with similar cases in the database and can thus decide whether the claim is legitimate, which then triggers an automated approval.

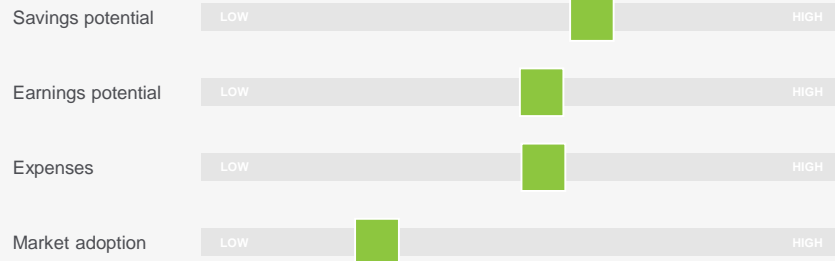
INSURANCE VALUE CHAIN



Fraud detection through deep analysis by AI of customer words

Accelerating claim processes by enabling an atomized matching of claims with past cases

TRACKING SLIDER





Artificial Intelligence NLP & Speech Recognition



PLANCK RE AI & Open-Web Data Mining



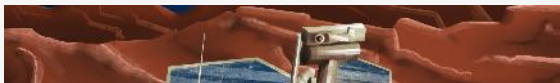
Automating the underwriting process

The system invented by Planck Re is able to fill in an ACORD form with information such as the sewage conditions, flood zone information, and crime rate, based on just the name of a business and its physical address. The system further processes data about the construction date, as well as any details concerning remodelling done on the building and permits associated with it.

This happens based on deep learning capabilities, pattern classification, NLP and named-entity recognition and data mining on big data that was gathered beforehand.



OPEN AI Natural Language Generation

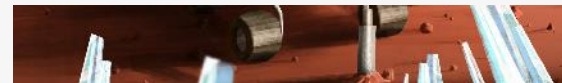


Completing texts based on prompts

The machine learning computer model of Open AI was trained on about 8 million web pages and is subsequently able to generate synthetic text based on written prompts. Due to the long sequence of training, the technology is able to predict the most probable next word based on how the words on the website are read. The underlying algorithm is hence able to produce full paragraphs of texts – so, it could write a chapter of a book, based on the previous chapter.



LAIX AI News



Created a digital version of an anchor man

LAIX Inc. is an AI-company in China that aims at creating products and services that popularize learning. The platform is based on deep learning and is developed by input of world's leading educational experts and cognitive scientists.

The so-called Liulishuo platform delivers a personalized, user-centric learning experience that is accessible to anyone, anywhere, at anytime. Teachers can hear, understand, interact with and evaluate the performance of students. Further, the platform evolves over time and, thus, delivers more tailored learning programs to each user.





Conversational User Interfaces



Conversational User Interfaces, such as chatbots or personal assistants, will bring about a paradigm shift in how humans interact with the digital world.

In Conversational User Interfaces (CUIs), users and machines interact primarily in the user's spoken or written natural language. These interactions range from simple utterances to highly complex interactions.

CUIs have experienced explosive growth in 2016/17 with chatbots, messaging platforms and virtual assistants, especially home speakers such as Amazon Echo and Google Home.

INSURANCE VALUE CHAIN



OPPORTUNITIES

- In terms of privacy, CUI threads are transparent and accessible for the consumer, whereas this does not hold true for apps/websites. The customer can therefore access any information at any time.
- If embedded in a company's website, consumers do not need to install a software or an app in order to use the services. Thus, on-boarding is much quicker and more efficient.
- Since Generation Y customers are already used to chatting on WhatsApp and WeChat, they may prefer a CUI as a means of interaction with their insurance company as well. The customer could, for example, file a claim using the chat window by simply sending a picture of the damage, together with a short description of the incident.

RISKS

- CUIs are subject to cyber security issues; for example hacking of a conversation might result in loss of sensitive data.
- Certain issues may be hard to describe and clarify using CUIs in the chat form. This could be mitigated by voice CUIs.
- Voice-based CUIs such as Amazon Echo are usually installed in the consumer's home and therefore raise privacy concerns, since the providers could theoretically overhear each and every conversation.

TREND EVOLUTION



CUIs gain prominence, as they are being integrated in broader AI solutions. Similar to the years before, it is in the ASSESS stage.

RELATED TRENDS

- Internet of Things
- Smart Bots
- NLP
- Machine-Driven Decisions

Artificial Intelligence Conversational User Interfaces



FACTS & FIGURES



By 2021, 15% of all customer service interactions will be entirely handled via AI, which represents an increase of 400% from 2017.



16% of American citizens revealed that they are engaged with a virtual assistant on an (at least) weekly basis.



The general business value of AI will increase to US\$ 3.9 trillion worldwide in 2022. Digital assistants/agents represent a great part of this.

BUSINESS VALUE

Efficiency



The usage of conversational AI improves efficiency, reduces costs, time and drives intelligence across all channels, especially for engagements in marketing and customer service.

Sales Accelerator



Due to the faster response to inquiries, digital assistants are able to process more requests and are further able to detect eventual possibilities for upselling actions.

Customer Loyalty



Offering simple and accessible, multichannel customer services that introduce more customized approaches will drive customer satisfaction and thus generate customer loyalty.

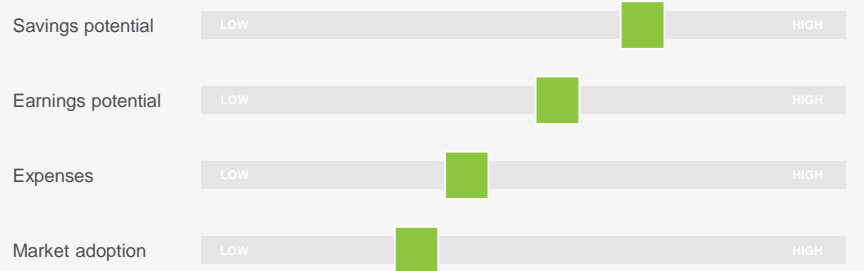
INSURANCE VALUE CHAIN



Providing detailed, real-time calculated information to customized insurance products by integrating AI in combination with QC

Improving resolution time of customer queries (e.g. payment, status of claims)

TRACKING SLIDER





Conversational User Interfaces



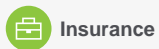
BOOST.AI

Virtual Assistant for Insurance



AI-powered conversational insurance

The insurance module offered by Boost.AI includes the majority of user intents, which are necessary to process customer claims. Besides, pre-made content for both customer service and sales are available. Thus, the claims handling process becomes easier and more accessible and efficient, while being able to increase the accuracy of the incoming data. As the module additionally offers pre-made coverage for a great amount of claims, employees are able to spend more time on other, more advanced features.



SEMANTIC MACHINES

Conversational Computing



Enabling conversational interfaces with artificial intelligence

Semantic Machines aims at introducing AI technology that enables conversational computing, which forms the basis to communicate naturally with computers. This technology can thus be integrated in the field of search, e-commerce, social networks, productivity software, and devices. For now, NLP research primarily focused on helping computers understand the way people say commands. But with conversational computing, new technology has to extract semantics across multi-turn natural language exchanges and maintain contextual understanding over time.



ARTIFICIAL SOLUTIONS

Human-like Interface



Enabling dialogs with devices

Artificial Solutions already patented a technology, which enable humans to intelligently converse with applications and services that run on their computers, mobiles, wearables, and other electronic devices in a human-like way.

With the technology, a wide range of natural language applications such as virtual assistants, chatbots, speech-based conversational UIs for smart devices and such, can be easily integrated, which is why it is already used in a variety of businesses.





Artificial Intelligence Cognitive Cyber Security



Leveraging information retrieval capabilities formerly limited to human brains to prevent cyber attacks

With the increasing complexity of IT systems, cyber criminals are evolving to be extremely high-skilled experts. Thus, cyber security solutions must always be one step ahead. To meet this challenge, cognitive technologies come into play.

Cognitive capabilities integrated into cyber security systems enable them to “understand” information from external sources like blogs, social media or publications, as well as internal systems to identify cyber security risks.

INSURANCE VALUE CHAIN



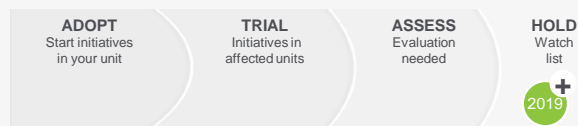
OPPORTUNITIES

- Cyber security systems extended by cognitive technologies extend the early-warning systems of IT security departments.
- Cognitive Cyber Security enriches and strengthens the service portfolio of organizational and industry related cyber security. Executives have identified cognitive technologies as disruptive technology to strategically invest in.
- Intelligent cyber security systems may enable insurers to better understand and control cyber risks and therefore underwrite larger limits of cyber coverage.

RISKS

- Cognitive Cyber Security is not yet established as a reliable cyber security solution to trust. Highly specialized resources that bring expert knowledge in the fields of cognitive technologies as well as cyber security are to be acquired. Convincing investment plans need to be build-up. Operational costs may increase massively.
- The more maturity Cognitive Cyber Security solutions gain, the higher their vulnerability for hackers of new generations.
- Reliance on cyber intelligence may give institutions a false sense of security against cyber attacks.

TREND EVOLUTION



With Cognitive Cyber Security, a new trend is approaching the year in the field of Artificial Intelligence. Watch the evolution of this trend!

RELATED TRENDS

- Digital Ecosystems
- Distributed Ledger
- Quantum Computing
- Machine-Driven Decisions



Artificial Intelligence Cognitive Cyber Security



FACTS & FIGURES



34% of those enterprises that either plan to or already apply AI, are triggered by the desire to mitigate security risks.

AI
2025
ML

By 2025, AI and ML will become a common part in the field of cyber security.



It is predicted that between 1.5 million to 3.5 million open positions in cybersecurity will be available in 2021.

INSURANCE VALUE CHAIN



Track risks in real time, at scale; while improving effectiveness

Advanced fraud detection, particularly for real-time payments

BUSINESS VALUE

Detection of risks



With the support of cognitive methods and general AI, a more holistic approach to cyber security is enabled. Malicious activities can thus be sensed proactively causing a reduction of operation costs.

Decision making



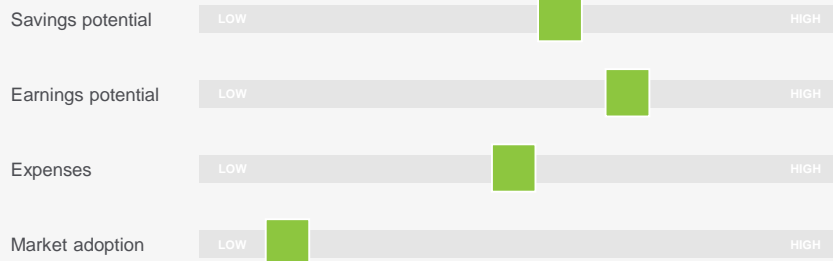
By using Cognitive Cyber Security, companies can increase efficiency of decision making when detecting an eventual threat.

Vulnerability Management



Applying AI in the field of cyber security generates a more accurate picture of internal risks. Eventual vulnerabilities can be managed more efficiently.

TRACKING SLIDER





Artificial Intelligence Cognitive Cyber Security



SENSEON Sensory AI



Sensory artificial intelligence platform for cyber defense

Senseon offers Sensory AI for cyber defence. Due to its multiple threat-detection senses, the technology understands anomalous behavior along an organization's entire digital architecture. It builds a clear and holistic view of threats, which other systems cannot even detect. The uniquely applied bots continuously observe networks and cloud perimeters. They thus are able to not only identify weaknesses, but also threat information, which provides useful insights from an attacker's perspective. Based on that, customers can better understand the reality of their environments including eventual unknown vulnerabilities.



OUTTHINK Cyber Security Learning



Future of cognitive cyber security learning & risk management

OutThink was initially based on a national research project that focused on managing the human factors involved in IT security. The project aimed at developing a framework that empowers employees to become the strongest, risk aware link in defending the organization, instead of being a vulnerability. OutThink is now an interactive, dynamic, and engaging web-based platform (SaaS) that allocates the right knowledge and skills to match internal roles in different cultures. It is thus not just a simple cybersecurity awareness tool, but a cognitive learning and human risk management solution.



RESEARCH Early Detection of Threats



Cognitive Techniques for Early Detection of Threats

Nowadays, the early detection of cybersecurity events is essential. This research paper thus describes a cognitive framework that illustrates the power of semantical knowledge representation and ML-techniques. The cognitive cybersecurity system processes information from textual sources and various agents (host and network-based sensors), and presents it in a knowledge graph. Based on that, the system derives better intelligence to security administrators. Hence, cognitive loads can be decreased and systemic confidence increased.





Artificial Intelligence Our Solutions



MUNICH RE MIRA Digital Suite



Source: Munich Re/Daniel Grizelj

Accelerating life insurer's underwriting and claims handling

MIRA Digital Suite provides life insurers the tools they need to utilize competitive advantages through digitalization: Cloud-based MIRApply completely digitalises key parts of the risk assessment process, reducing the time required by Underwriters by up to 90% – to just five minutes. CLARA halves process duration from claims notification to decision-making. In future, it will serve as the platform for deployment of artificial intelligence – e.g. machine-learning

Benefits at a glance:

- Faster process time in underwriting and claims handling
- Innovative, flexible and customized products
- More efficient processes inside the company
- Improved risk results
- Access to the newest, continuously updated insurance solutions



MUNICH RE FIVE



Source: Munich Re

Rules-based investment strategies

Using modern technologies, FIVE develops rules-based investment strategies for insurance companies and institutional investors globally. Insurance clients value the convenience of a one-stop-shop that's combines investment strategies, guarantees and insurance covers into a single product solution – lean and tailored to individual needs. Moreover, they can access a suite of highly diversifying return sources, benefit from cost-efficiencies, and aim to improve their balance sheet utilization.

Benefits at a glance:

- Access to a selection of quantitative investment strategies
- Better risk transfer by sourcing complete investment solutions directly from Munich Re
- Attractive payouts with guarantees and insurance covers



MUNICH RE Epidemic Risk Solutions



Source: Callista Images / Getty Images/Cultura RF

Holistic solutions saving lives, protecting economies

Epidemic risks are hard to predict and even harder to insure. New covers are data based and incorporating intelligent accumulation management. The major advantage of an insurance approach to epidemic risks is that the ex-ante financing of necessary response measures is geared to rapidly contain the outbreak itself. Both the course and severity of an epidemic can be influenced, even during the outbreak. Additionally, the potentially severe financial consequences for companies can be mitigated.

Benefits at a glance:

- Revenue stability
- Balance sheet protection
- Indemnification of lost revenues or profits





Artificial Intelligence Our Solutions



ERGO Mailbox Sorting and Task Assigning



Source: mauritius images / Masterfile

Cyber security assistant for Google Assistant and Amazon Alexa

About 300,000 e-mails are sent to ERGO Direkt's 120 different mailboxes yearly, with only 2/3 addressed to the correct business unit. Using an AI application with text recognition models, each word is translated into a number or multidimensional vector. Words with similar meaning or words often used in a similar context, are represented as vectors in proximity to each other. This method, the so-called word embedding (Word2Vec), was applied to all e-mails over a span of two years, generating a set of data to train an artificial neuronal network. This neuronal network is now able to recognise syntax and semantics, as well as text patterns. It forms the centerpiece of our so-called AI classifier.

Benefits at a glance:

- Incoming e-mails are now immediately routed to the correct address
- Accuracy of over 90%



Sorting mailbox and assigning tasks with AI

ERGO TRAVEL INSURANCE Selling Insurance via Voice Recognition Systems



Source: AdobeStock

Buying medical travel insurance via Amazon's Alexa

By saying "Alexa, start Europäische Reiseversicherung", customers can initiate a dialogue with Amazon's Alexa. In the course of the conversation with the virtual assistant, they are asked to state their destination, along with the number and ages of persons travelling with them.

After submitting an order with obligation to pay, the travel insurance is booked.

Benefits at a glance:

- Bookings are made entirely by means of a spoken dialogue and no additional signature is required
- Purchaser identity verification is done by Alexa directly by comparing with the customer data in the Amazon account



Medical travel insurance via Amazon's Alexa

DAS UK & DAS SPAIN / ERGO Cyber security information and guidance via virtual assistants



Source: AdobeStock

Cyber security assistant for Google Assistant and Amazon Alexa

DAS customers and the general public can ask their voice-activated Google Home or Amazon Echo devices a range of questions regarding cyber security. The DAS Cyber Security action for Google Assistant, for example, is launched simply by saying: "OK Google, talk to DAS Cyber Security."

The launch of these cyber security assistants follows recent research from DAS UK and HSB Engineering Insurance that showed widespread confusion and misunderstanding concerning cyber security, with significant numbers of UK consumers failing to take even the most basic online precautions.

Benefits at a glance:

- Users get a better understanding of cyber risks, learn how to stay safe online, and find out what to do if things go wrong



Cyber Security Assistant



Artificial Intelligence Our Solutions



DAS SPAIN / ERGO

ProofUp



Source: DAS Spain

DAS Cyberbullying Insurance

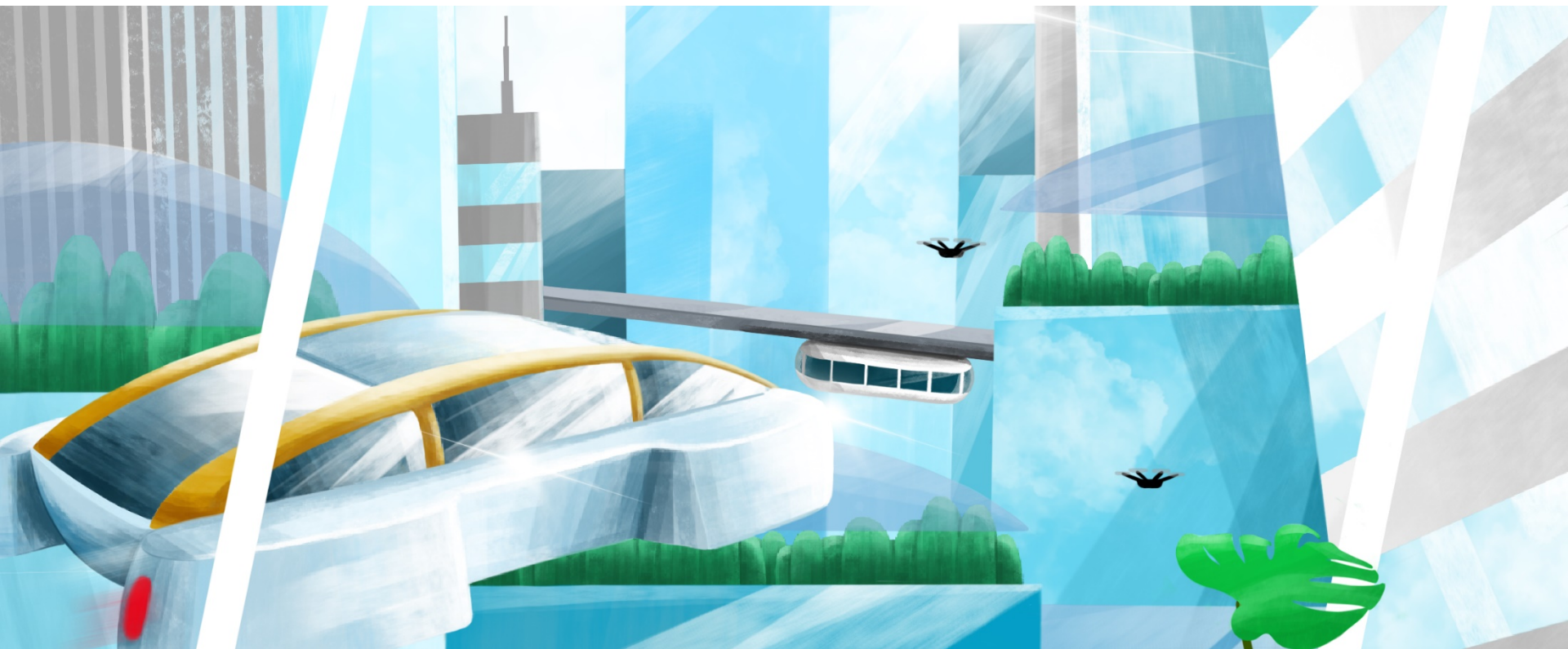
Social networks and mobile phones are increasingly a part of young people's daily lives and cases of school bullying continue to rise.

The DAS cyberbullying insurance includes the ProofUp smartphone app that kids can use to record harassment and share it with their parents. Parents only have access to the content their children decide to upload onto the app and, if they feel there is proof of harassment, the multimedia files (video, audio, images, etc.) can be sent to DAS, from where the parents will be advised on the best way to proceed to protect their child.

Benefits at a glance:

- Children are free to decide what to upload to the app for parents
- Optional location function, with consent of both the child and parents
- Alert button in case of emergency







Disruptive Technologies

Quantum Computing



Quantum computing stands for unprecedented computing power. It will fuel technological development over the next five to ten years

Instead of working in bits of 1 or 0, quantum computing makes a whole new form of computers possible: so called qubits (quantum bits) hold all the possible results at the same time and can be linked into an entanglement with other qubits, which increases the speed of calculation many times over.

Where a conventional computer would take impossibly long to produce a result, quantum computing might soon be able to handle more complex algorithms and, therefore, more complex and urgent questions and problems. General purpose quantum computers will probably never be realized. Rather, they are accelerators capable of running a limited number of algorithms and will be dedicated to a narrow class of use.

INSURANCE VALUE CHAIN



OPPORTUNITIES

- Quantum computing is particularly helpful for training and teaching AI devices since it can handle large amounts of data in a short time. Furthermore, due to the higher efficiency, AI could learn from experience or correct itself once a false decision is likely to be made.
- Quantum computing can improve drug development through analysing an almost infinite number of molecule interactions in a second. Moreover, by analysing human gene sequences much faster and more efficiently than is possible today, it allows personalized drugs to be developed.
- Sensor measurements from smart devices (smartphones, smart home devices, wearables, etc.) are delivering tons of data in real time. Full automation of business processes in insurance (underwriting, claims handling) based on these data flows may not be feasible with current computers and thus require quantum computing.

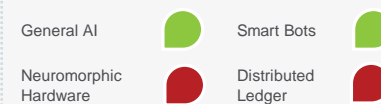
RISKS

- The current standards of data security will no longer hold once quantum computing becomes available, particularly if the wrong parties win the race to develop the first quantum computer.
- A substantial leap in computing power may be especially problematic for technologies such as Blockchain, which rely on the limitations of current generation computers due to its tamper-proof characteristic.

TREND EVOLUTION



RELATED TRENDS





Disruptive Technologies

Quantum Computing



FACTS & FIGURES



By 2023, 20% of organizations will be budgeting for quantum computing projects, compared to less than 1% in 2018.



It is expected that the research phase on quantum computing will end in 2020, followed by a ten-year commercialization phase. The race has already started!



Volkswagen tested QC to calculate the fastest route to the airport while minimizing traffic. A traditional computer needed 45 minutes for the calculation, QC just a fraction of a second.

BUSINESS VALUE

Competitive advantage



Quantum computing can help businesses to optimize efforts in machine learning, AI and neural networks and thus potentially generate a competitive advantage.

Quantum as a service (QCaaS)



Due to the complexity of quantum computing, it is recommended to use quantum as a service (e.g. IBM) rather than buying the hardware.

Data Security



Quantum computing will advance cryptography and encryption and increase data security.

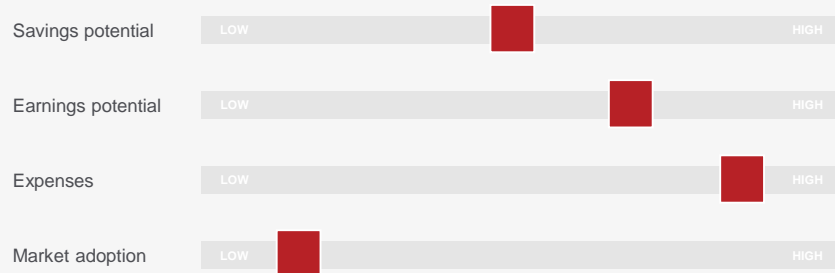
INSURANCE VALUE CHAIN



Modelling of natural catastrophe risk (property insurance) or any other complex accumulation risks (cyber, supply chain interruption, liability) requires massive computing power and could therefore substantially benefit from quantum computing

Full automation of business processes in insurance like claims handling is based on heavy data flows between devices. This may in a long-term view not be feasible with current computers and thus require quantum computing

TRACKING SLIDER





Disruptive Technologies Quantum Computing



QC WARE Quantum Tech for the Masses



Developing algorithms and software to generate accessibility

QC Ware is a quantum computing cloud platform company that aims at developing accessible enterprise software solutions for quantum computers. It has established itself as a leading company in the field of quantum computing as many well-known companies have already invested or in case of NASA and US National Science Foundation partnered with the company. Thereby QC Ware strives to develop algorithms and software that make quantum computing easily accessible in terms of both hardware and reducing complexity.

COLDQUANTA Cold Atoms for Quantum Tech



Enabling quantum technologies with laser-cooled atoms

ColdQuanta develops unique laser-cooled and ultra-cold atom enabled quantum technologies and executes related research and development. Already founded in 2007, they were able to introduce several commercial products. The next big project now to come is the development of core performance aspects of quantum computing, which would make it actually suitable for commercialization.

Q-CTRL Black Opal



Powerful business insights automatically

The initial goal of Q-CTRL is to improve hardware performance and accelerate the useful introduction of quantum computing by, for example, suppressing randomized errors, which counts as one of the biggest issues when it comes to quantum technologies. They even introduced Black Opal, which is a commercially available quantum control solution based on an intuitive cloud platform. The hardware-agnostic software then reduces incoherence and errors.





Disruptive Technologies Our Solutions



MUNICH RE Remote Claims Adjusting



Source: Mark Downey / Radius Images

Algorithm-based, automated claims processing for natural catastrophes

Natural catastrophes generally result in wide-scale losses that require enormous effort and resources to settle. Insurers' claims departments are stretched to the limit for weeks before and after an event and struggle to cope.

Munich Re is developing an automated claims processing from aerial imagery. The focus is on offering as a service insurance and claims expertise, along with solutions for remote identification of damage. Once the technologies are sufficiently established, it would be possible to handle all of an insurer's claims management for natural catastrophes from your office.

Benefits at a glance:

- Lower claims handling costs
- Improve reaction times
- Enhance fraud detection possibilities



MUNICH RE One Cat Parametric Solutions



Source: millionhope / Getty Images

Comprehensive and rapid response to natural catastrophes

When a devastating natural catastrophe strikes, companies and organisations need their insurance claims to be settled quickly in order to avoid cash flow problems. Traditional covers often only respond after lengthy claims adjustments, and leave gaps in costs associated with restoring to the pre-event level.

To close these gaps, Munich Re has designed "One Cat", a tailor-made solution concept with an unprecedented level of transparency and a very simple payout process.

Benefits at a glance:

- Parametric triggers ensure rapid recovery
- Covers previously uninsurable risks from natural catastrophes
- Unprecedented level of transparency
- No deductibles
- Reduced claims-related expenses





Disruptive Technologies

Our Solutions



HDFC ERGO

Camsurvey Claims Service



Source:HDFC ERGO

Fast claims services via livestreaming inspection

HDFC ERGO understands speedy claims settlement is of utmost importance for customers. Jaldi (Fast) Claim services support quick and seamless claims settlement processes.

As part of the service, HDFC ERGO installed cameras in network workshops that enable them to remotely assess vehicle damages. The cameras are centrally controlled and images are livestreamed for inspections and assessed by their central team so that claims can be approved instantly.

Benefits at a glance:

- The process of appointing a surveyor to conduct the physical inspection of the vehicle is eliminated
- Time saved for policyholders
- Quick settlement of claims arising from minor vehicle damages



[Camsurvey claim](#)



Connected World Our Solutions



MUNICH RE IMPROVEX



Source: bestbrk / iStock / Getty Images

Portfolio management with dynamic data exchange

Munich Re's core client data exchange platform provides valuable insights on pricing and strategy. Our own comprehensive data form the core of these data pools, which are supplemented with data from participating client companies. In return, they receive defined insights from an unrivalled, quality-assured database that they can use to make permanent improvements to their underwriting strategy, portfolio management and pricing.

Benefits at a glance:

- Strengthens participants' competitive position and opens up new possibilities to identify attractive business potential
- Interactive heat map helps to identify "white spots" and allows to challenge the underwriting and growth strategy
- Next-level empirical pricing parameters make it possible to optimize excess pricing and attachment point strategy



MUNICH RE Cyber Solutions



Source: Munich Re

A new kind of cyber insurance – beyond traditional reinsurance

Cyber threats are one of the biggest security risks of the 21st century. Cyber insurance is no small matter and the cyber covers available on the market differ greatly. Munich Re offers insurers holistic solutions that go well beyond pure insurance coverage. It is a comprehensive network covering every aspect of cyber claims. The one-stop solutions offer a clear cost advantage and take up significantly fewer of insurers' resources.

Co-operation and underwriting services include:

- Legal advice and wording analyses
- Workshops, training and client seminars
- Technical risk assessment support
- White-label concept design for cyber products
- Threat intelligence sharing and cyber-claims information exchange
- Innovative cyber products and co-creation in the cyber network



MUNICH RE IoT Solutions



Source: Munich Re

Integrating tech, risk management & financing

Munich Re helps you to transform your best-selling products and services into smart holistic solutions that put customers first.

Teaming up with Munich Re allows you to safely grow your business and win new customer segments without having to significantly tie up resources or face all of the technology, investment and economic risks yourself.

Benefits at a glance:

- Cutting edge technology (hardware, software and retrofitting)
- Use-case development
- Risk management services
- Ecosystem partners
- Tailored financial solutions.





START


STOP

ENGINE

In charge

Munich Re Business Technology
ERGO IT Strategy

In association

Deloitte Consulting GmbH **Deloitte.**
Institute of Electronic Business (IEB) 

In consultation

Munich Re Client Management
Munich Re Reinsurance Development
Munich Re Corporate Underwriting
Munich Re Communications
Munich Re Information Technology



Image: Munich Re



Image: Munich Re

STEP 1: SCREENING

Analysis of trend developments

Compiling developments and new trends for 2019 with external analysts' reports, internal market know-how following **4 Golden Rules**:

1. Technologies that potentially disrupt the insurance industry.
2. Technologies that potentially change the business model.
3. Technologies that improve RUN trends and support GROW and TRANSFORM trends.
4. Technologies that potentially have a influence on RUN, GROW and TRANSFORM.

STEP 2: AGGREGATION

Definition of trend fields and subtrends

Aggregating data from screening processes and defining the most relevant trends categorised in four primary fields

Further drill-down and validation with market data and identification of corresponding use cases

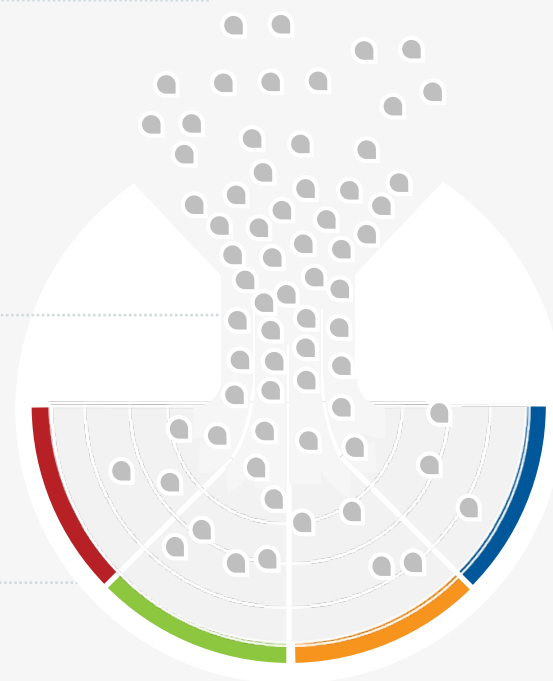
Disclaimer: References to companies do not constitute or imply endorsement of any company or organisation.

STEP 3: EVALUATION

Assessment of impact and relevance

Classifying trends according to their level of relevance for ERGO and Munich Re

Trend segmentation and classification in the Tech Trend Radar 2019 to their impact



Result:
Total Trends

Result:
Aggregated Trends

Result:
4 Trend Fields with
48 Subtrends

TECH TREND RADAR 2019

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