

# AI impact on insurance industry – APAC use cases – from Predictive UW to claims analytics

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# SOA Antitrust Compliance Guidelines

Active participation in the Society of Actuaries is an important aspect of membership. While the positive contributions of professional societies and associations are well-recognized and encouraged, association activities are vulnerable to close antitrust scrutiny. By their very nature, associations bring together industry competitors and other market participants.

The United States antitrust laws aim to protect consumers by preserving the free economy and prohibiting anti-competitive business practices; they promote competition. There are both state and federal antitrust laws, although state antitrust laws closely follow federal law. The Sherman Act, is the primary U.S. antitrust law pertaining to association activities. The Sherman Act prohibits every contract, combination or conspiracy that places an unreasonable restraint on trade. There are, however, some activities that are illegal under all circumstances, such as price fixing, market allocation and collusive bidding.

There is no safe harbor under the antitrust law for professional association activities. Therefore, association meeting participants should refrain from discussing any activity that could potentially be construed as having an anti-competitive effect. Discussions relating to product or service pricing, market allocations, membership restrictions, product standardization or other conditions on trade could arguably be perceived as a restraint on trade and may expose the SOA and its members to antitrust enforcement procedures.

While participating in all SOA in person meetings, webinars, teleconferences or side discussions, you should avoid discussing competitively sensitive information with competitors and follow these guidelines:

- **-Do not** discuss prices for services or products or anything else that might affect prices
- **-Do not** discuss what you or other entities plan to do in a particular geographic or product markets or with particular customers.
- **-Do not** speak on behalf of the SOA or any of its committees unless specifically authorized to do so.
- **-Do** leave a meeting where any anticompetitive pricing or market allocation discussion occurs.
- **-Do** alert SOA staff and/or legal counsel to any concerning discussions
- **-Do** consult with legal counsel before raising any matter or making a statement that may involve competitively sensitive information.

Adherence to these guidelines involves not only avoidance of antitrust violations, but avoidance of behavior which might be so construed. These guidelines only provide an overview of prohibited activities. SOA legal counsel reviews meeting agenda and materials as deemed appropriate and any discussion that departs from the formal agenda should be scrutinized carefully. Antitrust compliance is everyone's responsibility; however, please seek legal counsel if you have any questions or concerns.

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# A risk knowledge company

Swiss Re "Altbau", 19<sup>th</sup> century

# investing in risk pools

Swiss Re "Next", 2017



- #1 Global Reinsurer
- Founded in Zürich, 1863
- >14,000 employees (2500 in APAC)



Reinsurance products and services for P&C and L&H



Commercial insurance for mid-size & large corporates



Digital insurance engine and underwriting capabilities



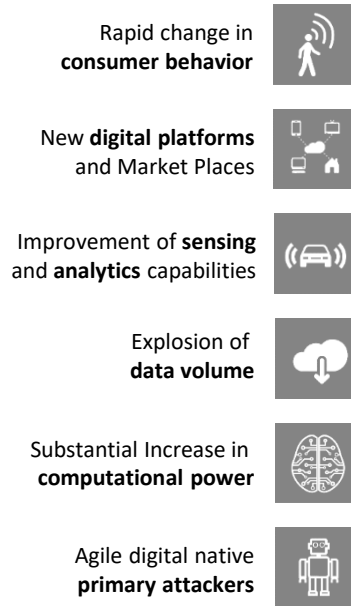
Data driven research and insights for the industry

Our Public Sector Solutions team supports the public sector to help increase insurance penetration around the world.



# Digital Transformation is accelerating across Asia and impacting the insurance industry in two overlapping waves

## The Digital Transformation



Technological Shift

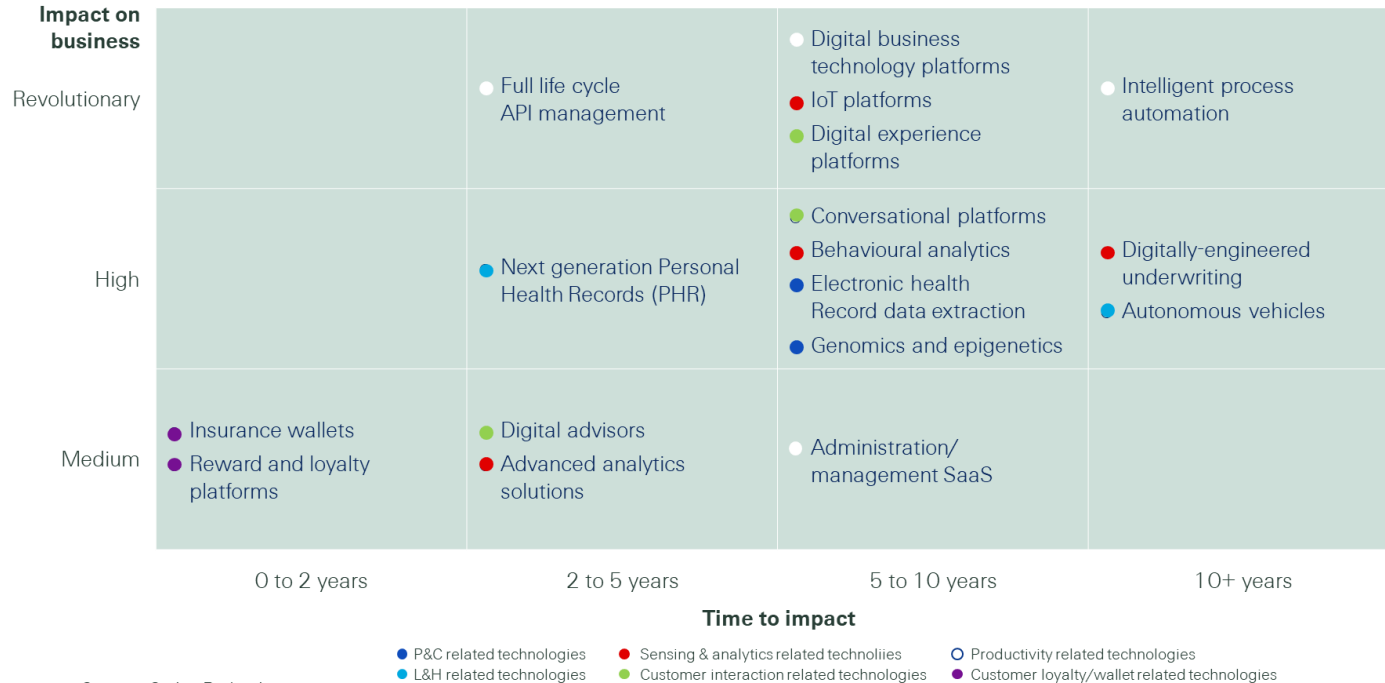


Behavioral Shift

## The Insurance Transformation



# New (emerging) technologies impacting insurance



Source: Swiss Re Institute

# Digital Ecosystems are suggested\* to account for 30% of global revenues by 2025

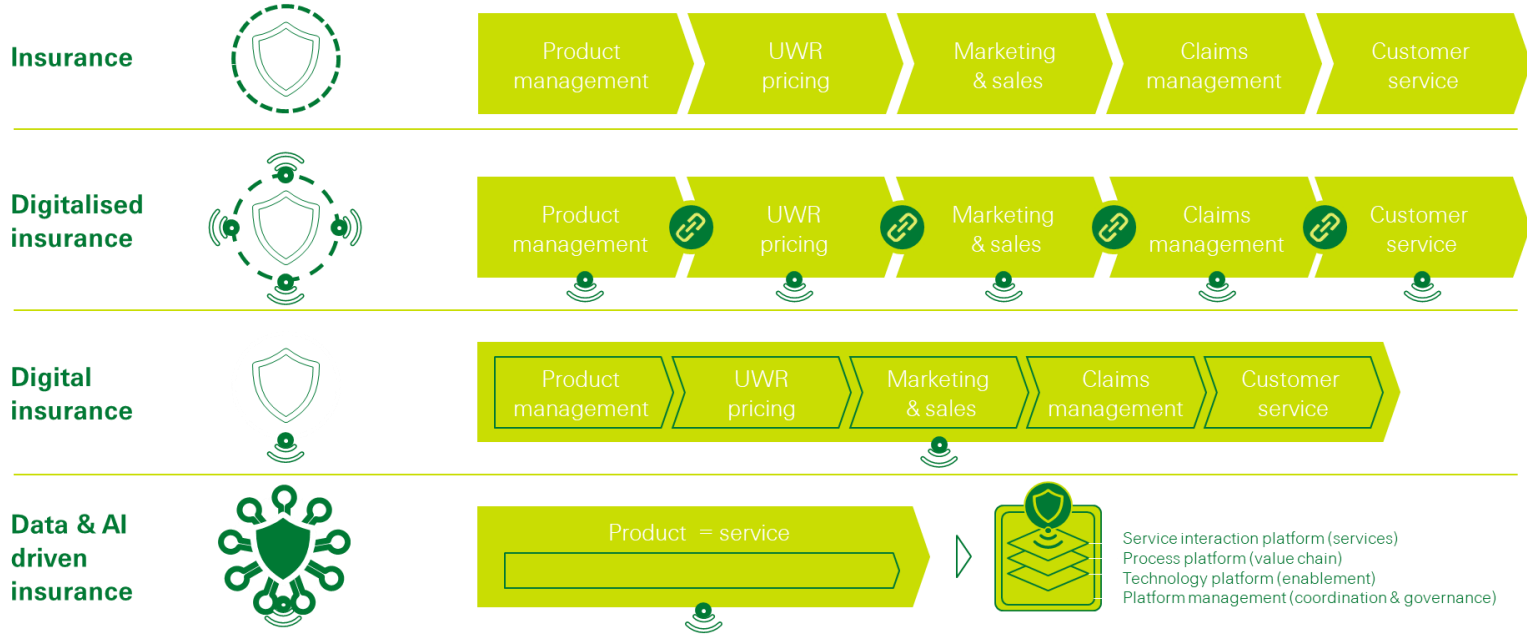
Ecosystem Cluster	<b>Health</b>	<b>Public</b>	<b>Learn &amp; Job</b>		<b>Home &amp; Stay</b>		<b>Market</b>	<b>Lifestyle</b>				
Ecosystem Domain	Health / Care & Wellbeing	Public Services & Government	Education	Job & Work	Housing	Energy & Utilities	B2C (Retail Commerce) Market Places	Mobility, Transport & Logistics	Food / Dining	B2C (Retail) Services	Leisure, Travel, Hospitality & Culture	Digital Media, Entertainment, Telecom
<b>B2C</b>	<b>Insurance</b>											
<b>B2B</b>	<b>Financial Services</b>											
Ecosystem Domain	Health / Care & Wellbeing	Public Services & Government	Education	Job & Work	Architect, Construction & Engineering	Energy & Utilities	B2B (Business Commerce) Market Places	Transport & Logistics	Food & Agriculture	B2B (Commerce) Services	Management Support Services	Digital Media & Content, Telecom
Ecosystem Cluster	<b>Health</b>	<b>Public</b>	<b>Educate &amp; Source</b>		<b>Build / Produce</b>		<b>Market</b>	<b>Deliver</b>	<b>Agro</b>	<b>Corporate Services</b>		

\* Source: Atluri V et al. (2017) Competing in a world of sectors without borders. McKinsey, July 2017

# Supporting the evolution to a more data & AI driven insurance

Involved stakeholder

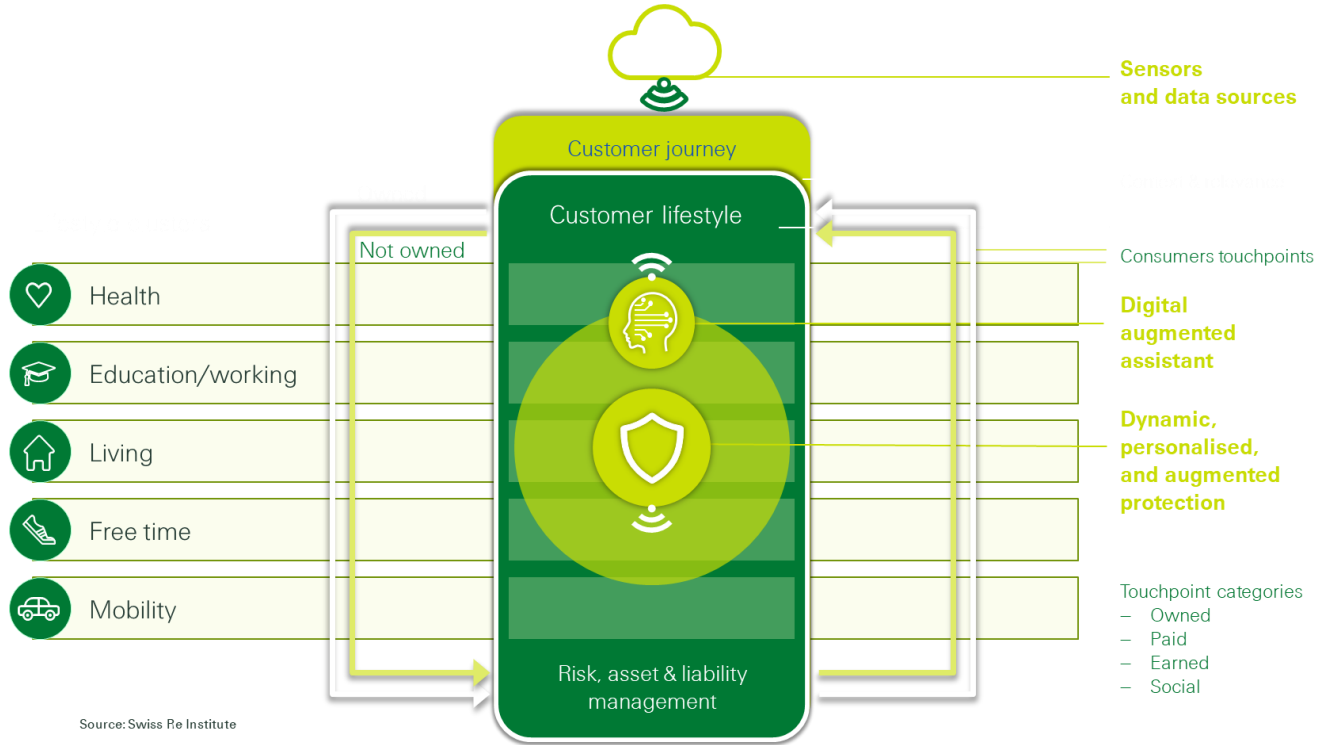
Value chain (example)



Source: Swiss Re Institute



# Data driven insurance enabled by digital-touchpoint insights and digitally-augmented assistants



## The need to evolve and adapt to ever-changing environmental challenge is constant...

Shifting market dynamics

Changing consumer preferences

Evolving new technologies



## For insurers, this means facing an ever growing list of new and evolving challenges and opportunities

How to **keep** my existing customers **engaged and risk-free**?

How to leverage technology to reduce my **operating costs**?

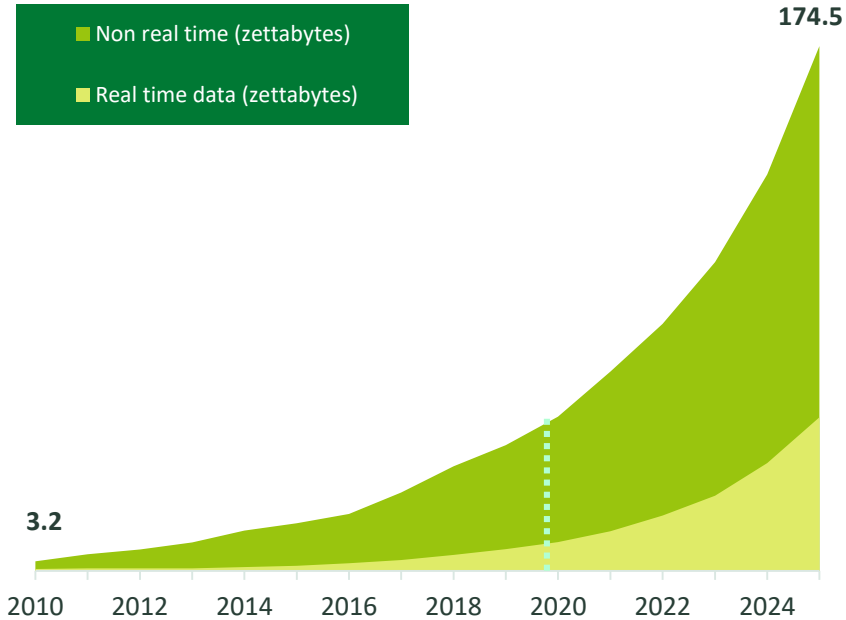
How to **unlock the value** of the **data** I already have?

How to convert more consumers with a **smooth and fast application** process?

How to ensure my tech investments are **“future-proof”**?

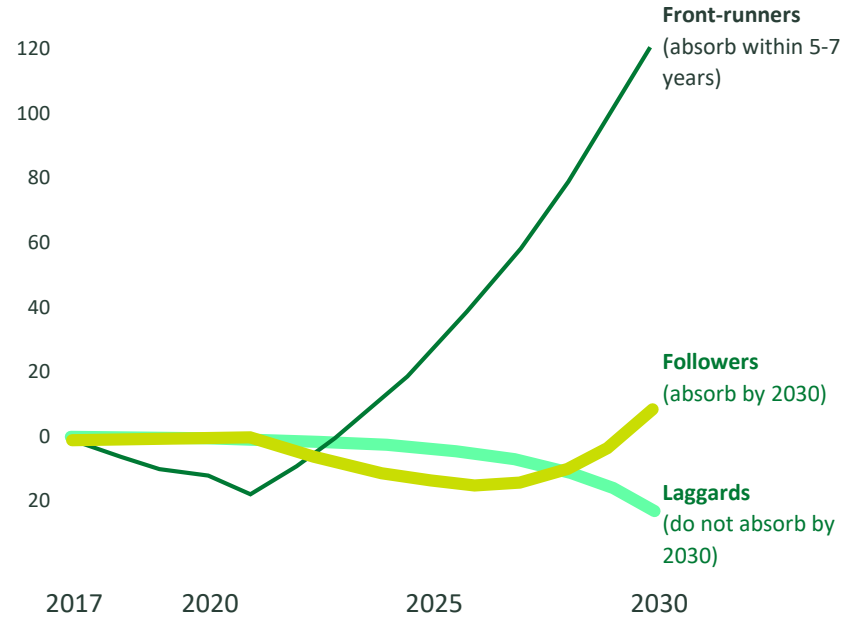
# Data & AI models now at the core of the business strategy

## Expected data growth 2010 to 2024 (zettabytes)



Source: IDC, Swiss Re Institute

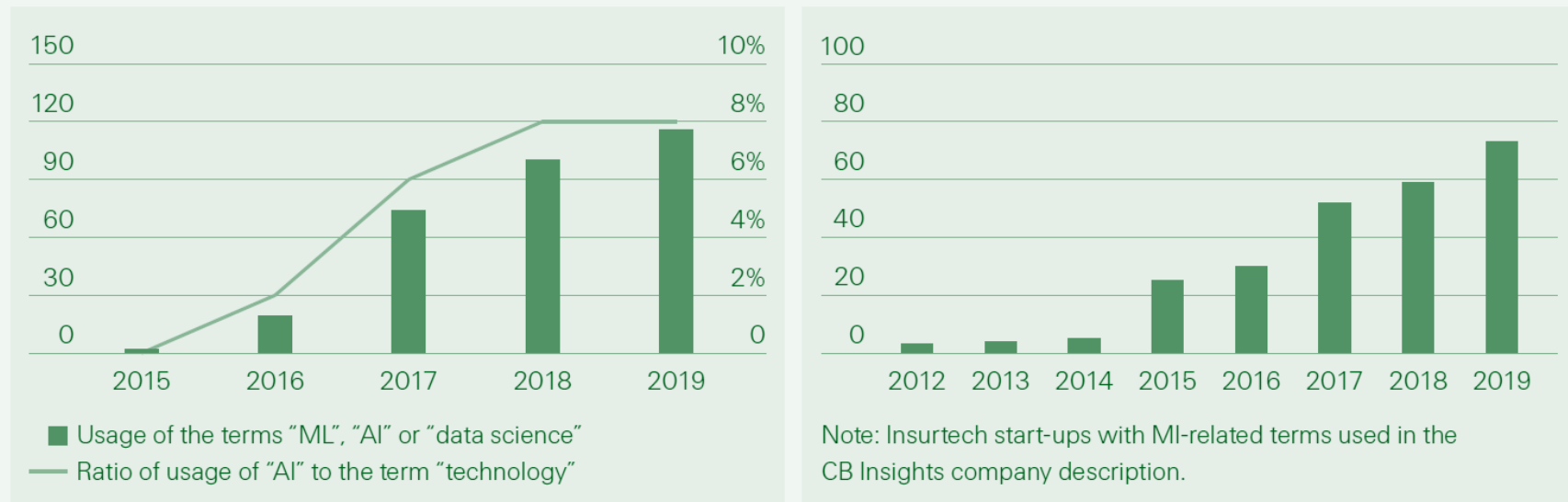
## Relative change in cash flow by AI adoption cohort (% change per cohort, cumulative)



Source: Jacques Bughin et al., Notes from the AI frontier: Modeling the impact of AI on the world economy, McKinsey Global Institute, 2018, and Swiss Re Institute

# Insurers have become more vocal about Machine Intelligence

MI-related mentions in insurer investor reports (LHS), and trend in Insurtechs using AL/ML technology



Source: Annual reports of 30 leading insurers, CB Insights, Swiss Re Institute

# Covid-19 acceleration for insurance to reach the digital / AI tipping point

“In 2019, Bain & Company projected that the number of digital consumers - anyone who has purchased a product/service online excluding travel in the past 12 months in SEA will reach ~310 m by 2025”

That day will arrive by the end of 2020 !

Source: Bain & The digital insurer

# Advanced analytics transforming customer data into (risk) insights

Apply advanced analytics to:



Acquire & enrich data

Insurance data



Sales campaign



In-force



Claims & services



Distribution partners

Needs analysis,  
Propensity to buy

Risk segmentation,  
Personalised risk scores

Propensity to claim

Propensity to lapse,  
Renew

Build & update models



Provide value with  
AI enabled solutions



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In-force



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Distribution partners

Alternative data



eWallet, Digital ecosystem...



Mobile, Wearable eHR, Sensors, ...



Images, video, sounds, text...

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Needs analysis,  
Propensity to buy

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Personalised risk scores

Propensity to claim

Propensity to lapse,  
Renew

Contextual distribution to micro segments, sense customer needs, identify sale triggers, automate sales compliance

Leverage data to create more precise, personalised, predictive UW solutions

Create dynamic risk engineering processes (e.g. regular risk assessment, dynamic pricing mechanism)

Better identification, prediction and management of risk to prevent, reduce, better manage claims

Automate risk retrocession, capital management, better manage reserves



Build & update models

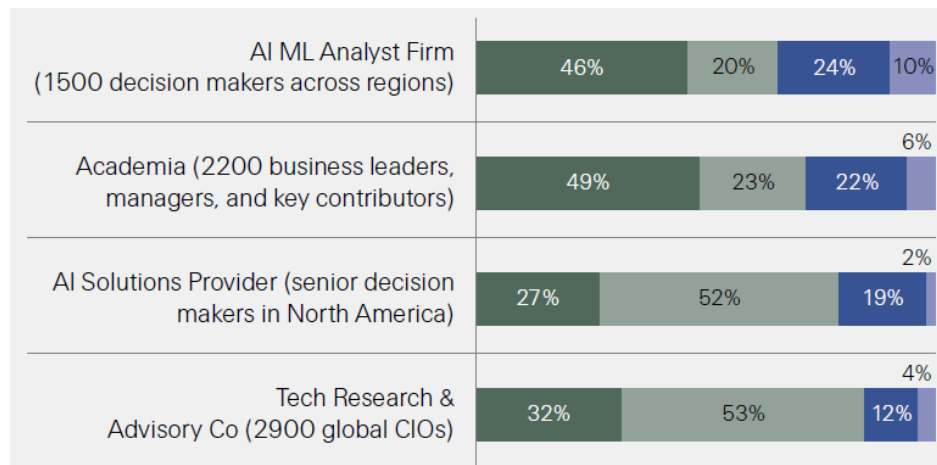


Provide value with AI enabled solutions



# Machine Intelligence (MI) has yet to transform insurance

- Few enterprises (less than 10%) have managed to build on successful pilots to deploy MI in multiple processes across the firm.
- Enterprise-wide transformative MI demands initial investment in digitising firm-wide operations.
- This will lay the foundation for firms to (1) apply MI to automate processes; and (2) introduce new offerings by cutting across company-wide silos to integrate data.
- To reap large-scale benefits from MI, they first need to digitise operations and break down data silos.
- We expect to see progress in this direction over the coming decade.



■ Planning but no action
 ■ Experimenting & piloting
 ■ Implementing narrowly (in near-term)
 ■ Implementing widely

## *Progress of AI implementation*

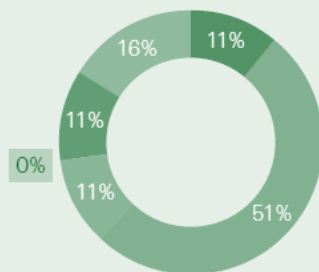
Source: Swiss Re Institute (based on multiple surveys, data anonymised, standardised and rescaled to make them comparable).

# Insurers have low maturity levels in terms of accessing and curating data for AI models

- Often, deployment fails because of poor data engineering.
- Firms typically start off with developing an algorithm and then under-invest in data engineering.
- For transformative impact enterprise wide, they should do the reverse

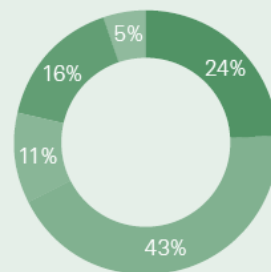
## Data maturity of insurers

Are you able to access all the data you need for AI?



- Access is very difficult and a barrier to AI
- Some data is accessible to start building POCs
- Core set of data consistently accessible to build models
- Extended set of data seamlessly accessible to many BUs
- Proactive and efficient access across the firm
- Not aware

Is accessible data cleaned and consolidated for the use with AI?

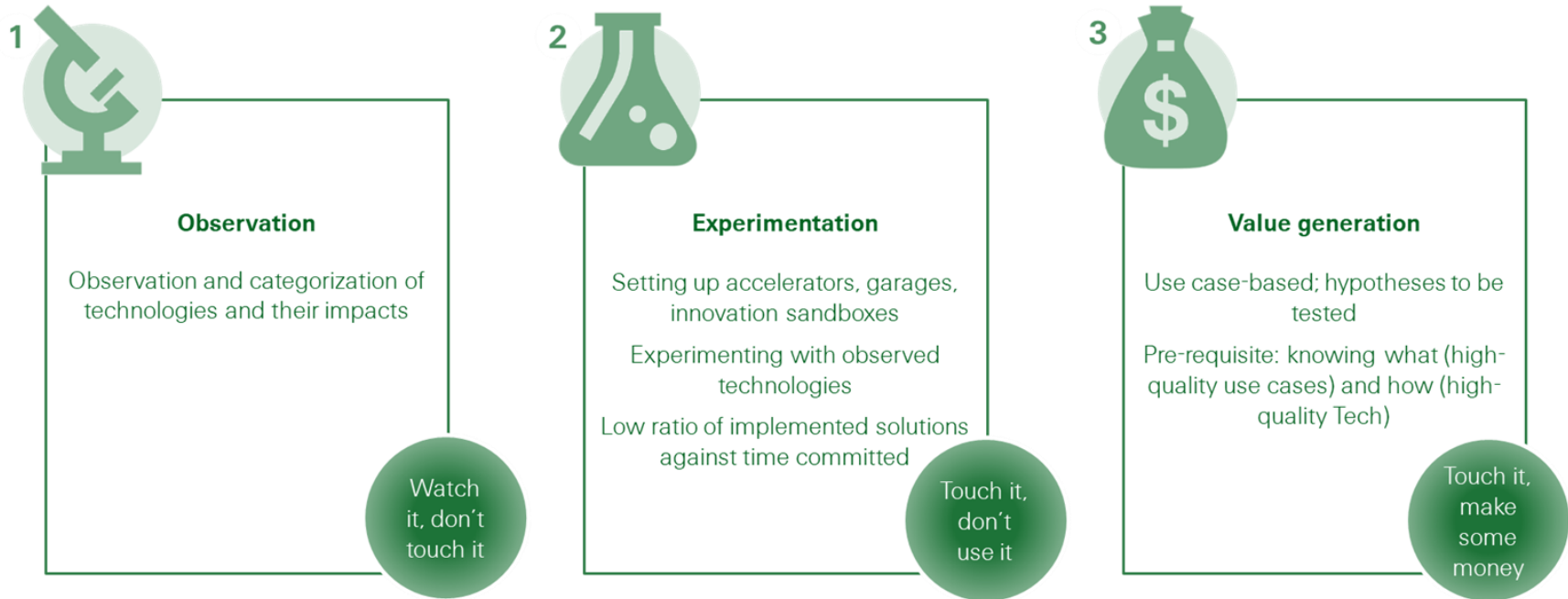


- We don't know if our data is ready to use
- Some cleansing and consolidation for specific use cases
- Begun to standardize data cleansing and consolidation across the firm
- Standard data cleansing and consolidation pipeline, with tools
- Actively evolving data cleansing and consolidation, with automated tools

Source: *The Five Dimensions of Enterprise AI, Element AI, May 2020, Insurance respondents only*

# Value at scale comes when bringing tech & data to solve real business challenges

Insurtech engagement levels by the insurance industry



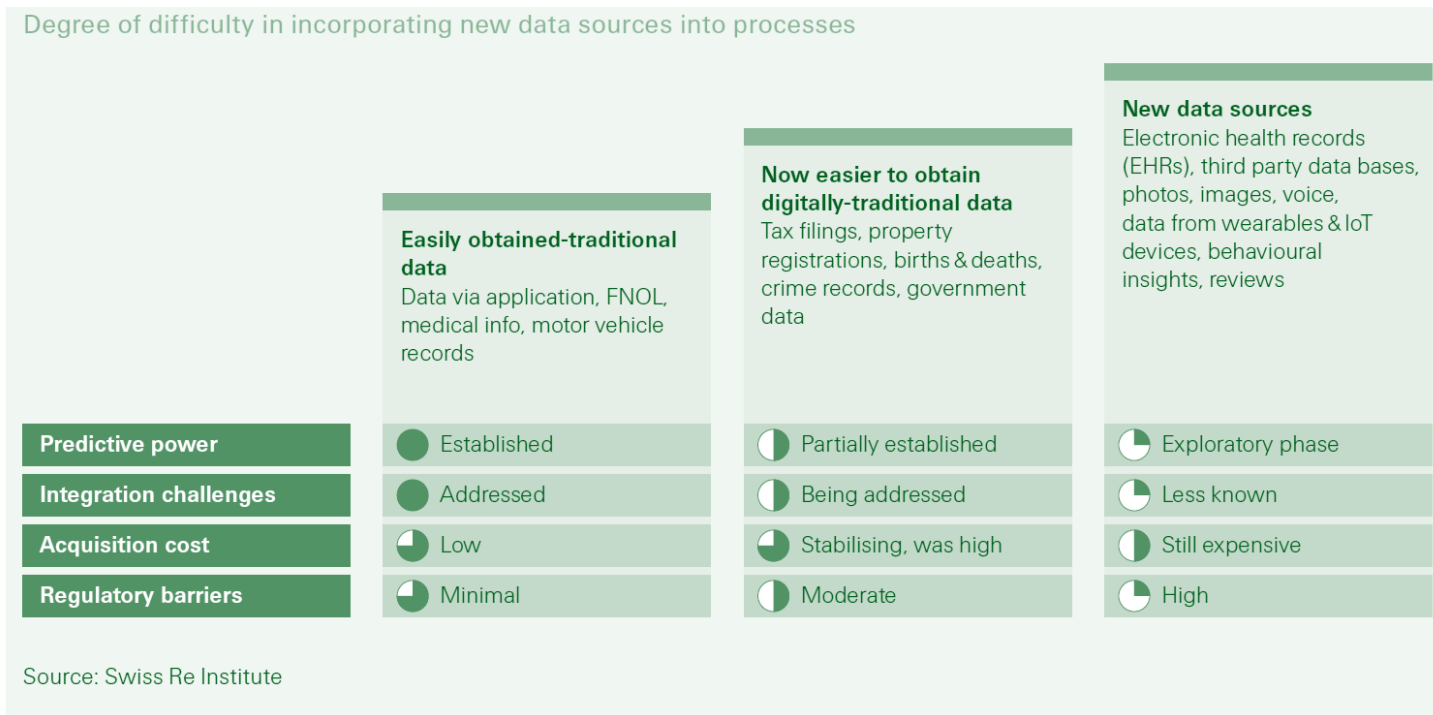
# Insurers should also focus on non-model issues holding back wider adoption : trust, technology, talent and tenacity

## Non-model considerations for enterprise-scale of MI-enabled systems

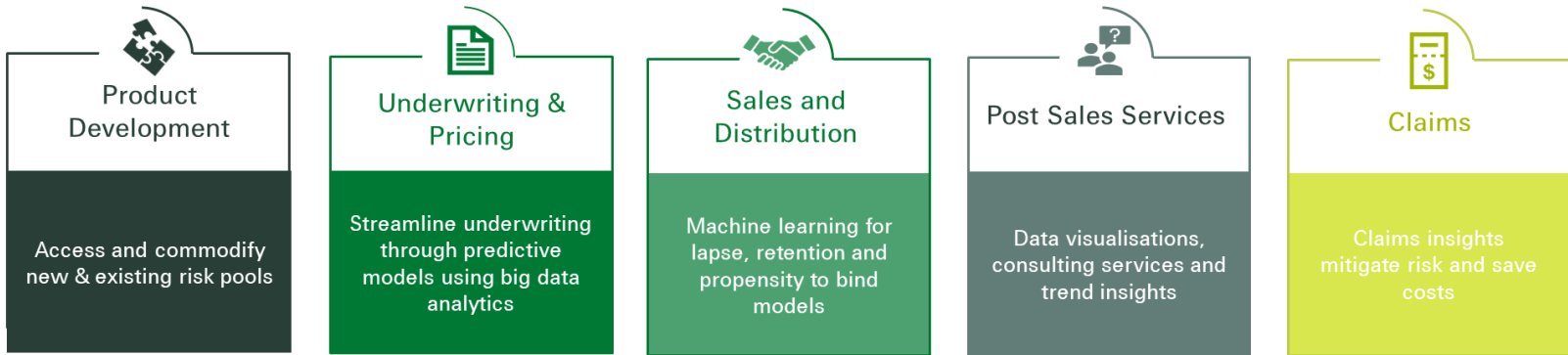
Key findings	Implications for the current model	Outlook
Trust: Develop an algorithmic risk and digital ethics framework	Better equip MI-enabled systems against risks, eg, adversarial attacks	Balance different definitions of fairness and incorporate self-monitoring into MI-enabled systems from the design phase
Technology: Balance internal versus external expertise	Understand how procuring MI differs from traditional software to reduce risks and maximise ROI	Develop approaches to harmonize fragmented technologies.
Talent: Develop talent and skills	Identify how MI can complement current actuarial-science- based approaches	Encourage all staff to learn new MI-related tools and leverage citizen data scientists
Tenacity: Foster a dynamic tech-informed culture; engage with regulators	Use sandbox approaches to test MI at scale	Educate regulators. Keep humans in the loop

Source: Swiss Re Institute

# Adoption of new data & models to come only with a clearer understanding of correlation with actual risk experience



# Swiss Re's analytics have assisted insurers across the value chain



- Market & portfolio insight analytics
- Modularized tailed digital enabled product that fit customer life cycle

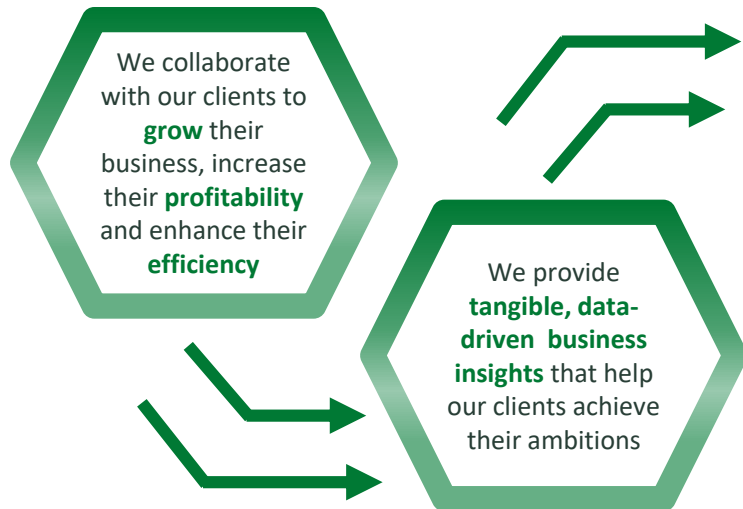
- Predictive underwriting models & solutions -SIO/GIO offers
- Disease propensity/ dynamic underwriting leveraging 3<sup>rd</sup> party health data

- Digital channel, paid-search, landing page, media optimization to maximise ROI and raise conversion
- Next best product to offer using ML models for all distribution channels
- Contact center optimization, agent retention, sales call leads allocation models for higher conversion & effectiveness
- Partner db extraction models- secure conversion

- Early warning indicators monitoring dashboard
- Customer call-in to cancel call allocation models to raise persistency rate
- Paper/text/call digitization
- Big data text analytics → Service call analysis (via speech to text solution) in order to optimise customer experience
- NPS at each touch point- post sales/claims

- ML model for expanding the existing auto processing target segment
- Develop full auto payment segment by ML models
- FNOL-Real time claim distribution model to claim adjusters by claim complexities using AI models.
- Fraudulent claim detection models & automate fraud detection process

# What we've already achieved with our L&H clients



## Disclosure rates

Improvement in disclosure rates for smoking and drug status of **30%**



## Pricing accuracy

More accurate pricing leads to increased underwriting profit of: **5%**



## Non-disclosure

Reduction in non-disclosure of **50%**



## UW efficiency

Complete Underwriting experience in less than **4 mins**



## STP Rate


Typical to achieve STP rates as high as **60-80%**



## Behavioural Economics

Fewer words as opposed to traditional interview, about **40%**

# L&H Analytics Swiss Re selected use cases

Client's challenge	What we did 	Impact
<p>Underwriting process is rule-based and manual and potential clients are very much fixed for two large <u>Thai</u> Clients</p>	<ul style="list-style-type: none"> <li>• Risk labelling based on UW decision and health claims</li> <li>• Built a data-driven predictive underwriting model</li> <li>• Threshold tuning with actuarial knowledge</li> </ul>	<ul style="list-style-type: none"> <li>• Automated data-driven underwriting solution</li> <li>• 63% of existing customers ie. 260k leads generated for G/SIO</li> </ul>
<p>Leading superannuation funds in <u>Australia</u> is looking to analytics insights on claim data</p>	<ul style="list-style-type: none"> <li>• Build predictive models for TPD claims/Premium SG and memberships</li> <li>• Assist on data visualizations</li> </ul>	<ul style="list-style-type: none"> <li>• USD\$25m revenues over the rate guarantee period for the L&amp;H operation with our data capability as a key differentiator.</li> </ul>
<p><u>Malaysian</u> banca client wanted to expand their customer base through simplified underwriting without pricing load</p>	<ul style="list-style-type: none"> <li>• Risk labelling based on UW decision and health claims</li> <li>• Built a data-driven predictive underwriting model</li> <li>• Threshold tuning with actuarial and UW knowledge</li> </ul>	<ul style="list-style-type: none"> <li>• 30% of existing customers eligible for GIO/SIO offers, of which 60% are from duration 4 years+</li> </ul>
<p><u>Asian</u> insurers tended to charge very high premium loadings or even avoid selling insurance to diabetics, resulting in a protection gap for them.</p>	<ul style="list-style-type: none"> <li>• Modelled incidence rates of diabetics of having various complications and death over a 15 years horizon under structured care to ascertain the actual underlying risk and contributing factors</li> </ul>	<ul style="list-style-type: none"> <li>• Proposal to adjust LifeGuide to widen acceptance criteria for diabetics in asia</li> <li>• Work with insurers to reduce the protection gap for the diabetics</li> </ul>
<p>Lack of expertise in claims analysis for a leading <u>German</u> client</p>	<ul style="list-style-type: none"> <li>• Using historic data, we built a predictive model that gives scores to claims adjudicators on which claims are more likely to be closed after human review.</li> </ul>	<ul style="list-style-type: none"> <li>• 7% improvement in closure rate</li> <li>• EUR 5-8 million release in combined reserves</li> </ul>



# What we've already achieved with our P&C clients



## Premium growth

Unlocked premium growth potential of: **>3%**



## UW profitability

Improved portfolio loss ratio by: **6%**



## Pricing accuracy

More accurate pricing leads to increased underwriting profit of: **5%**



## UW efficiency

Reduced time to underwrite commercial risks by: **95%**



## Volatility reduction








Long-term result volatility reduced by: **10%**



## Powerful performance evaluation

**INSTANT** Outside-in smart visualisation of portfolio performance

# L&H Analytics Swiss Re selected use cases

Client's challenge	What we did 	Impact
Complex commercial liability portfolio with poor profitability 	<ul style="list-style-type: none"> <li>Portfolio modelling, profitability analytics, refinement of client segmentation</li> <li>Redefinition of UW strategy</li> </ul>	<ul style="list-style-type: none"> <li>New UW guidance, risk appetite and strategy</li> <li>6% improvement in loss ratio</li> </ul> <b>30</b> Months
Underperforming D&O portfolio with unknown root causes 	<ul style="list-style-type: none"> <li>Industry research, identification of potential loss drivers and enrichment with external data sources</li> <li>Portfolio modelling, loss driver, refinement of segmentation</li> </ul>	<ul style="list-style-type: none"> <li>Driver of loss analysis</li> <li>Refined UW strategy</li> </ul> <b>2</b> Months
Support go-to-market strategy for high growth ambitions 	<ul style="list-style-type: none"> <li>Unique market analysis for &gt; 30 countries</li> <li>Granular risk attractiveness information across various LoBs and countries and development of liability pricing tool</li> </ul>	<ul style="list-style-type: none"> <li>Market prioritization</li> <li>Roll out of go-to-market strategy</li> <li>Input for liability pricing</li> </ul> <b>34</b> Months
Partner on SME Transformation 	<ul style="list-style-type: none"> <li>Development go-to-market strategy including investment case</li> <li>Building of cross-sell, lead and churn model as well as automated UW engine</li> </ul>	<ul style="list-style-type: none"> <li>Unlocking growth potential</li> <li>Reduce churn and increase cross-selling as well as automate UW</li> </ul> <b>12</b> Months
Lack of understanding of shortfall potential for casualty accumulation 	<ul style="list-style-type: none"> <li>Leverage data science for scenario identification</li> <li>Application of Swiss Re's L-Cat model / capabilities</li> </ul>	<ul style="list-style-type: none"> <li>Quantification of shortfall using Swiss Re's L-Cat model</li> <li>Tailor-made RI solution</li> </ul> <b>4</b> Months
Lack of UW expertise expanding into new industry segment 	<ul style="list-style-type: none"> <li>Aggregation and analysis of various data sources by leveraging various data science disciplines</li> <li>Enrichment of analysis with qualitative Swiss Re UW expertise</li> </ul>	<ul style="list-style-type: none"> <li>Quantification of market potential and definition of risk appetite</li> <li>Tailor-made UW tool</li> </ul> <b>3</b> Months

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