Data Analytics: Welches Geschäftspotenzial steckt in unseren Daten?

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Monica Epple
Head of Digital & Smart Analytics EMEA
monica_epple@swissre.com
“Tech is changing the rules of the game. Tech transformation is here and accelerating, the only uncertainty is who will be the winners.”

Christian Mumenthaler, Group CEO
Agenda

01 Vision and Strategy of Analytics
02 Value Proposition and Capabilities
03 Project Examples
04 What is new?
01 Vision and Strategy of Analytics
The **Digital Transformation** offers opportunity along the **insurance value chain**

### The Digital Transformation

- Rapid change in consumer behavior
- New digital platforms and Market Places
- Improvement of sensing and analytics capabilities
- Explosion of data volume
- Substantial Increase in computational power
- Agile digital native primary attackers

### Analytics Opportunities

#### Strategic Growth
- Where are new market opportunities?
- What is my best go-to-market strategy?
- How can I price new markets and risks when data is rare?

#### Portfolio Performance
- Which areas in my portfolio are under- and over performing, and why?
- How can I leverage new data sources to improve my underwriting?
- How exposed am I to casualty catastrophe loss scenarios?

#### Efficiency & Effectiveness
- How can I link and exploit the multiple data sources available to me?
- Can I streamline the review of my policy wordings?
- Can I optimize my capital management by targeted RI solutions?
Smart Analytics will be leveraged to support across your entire value chain
From innovative design to claims optimisation

**Product design**
We assist you in designing innovative products adapted to digital environments.

**Digital consumer**
You profit from digital consumer engagement and predictive churn modelling.

**Underwriting**
We reduce your operational effort with automated and predictive underwriting.

**Business management**
We increase your process efficiency through contracts intelligence and easy self-service options.

**Claims**
You benefit from faster, more insightful processing and early warning functionalities.
02
Value Proposition and Capabilities
P&C Analytics: Who we are and what we offer

Who we are

P&C Analytics:

We are a dedicated cross-functional team combining profound industry knowledge, risk expertise, data science and IT capabilities...

What we offer

...to provide data-driven solutions...

• based on state-of-the-art data science disciplines
• incorporating Swiss Re industry insights and 150 years UW expertise
• internally validated and of highest quality
• flexible and customizable, from ready-to-deploy tools to bespoke consulting services

...to generate tangible and actionable business insights for our clients
## Use Cases: We are an experienced partner and have already supported various clients

<table>
<thead>
<tr>
<th>Client’s challenge</th>
<th>What we did</th>
<th>Impact</th>
</tr>
</thead>
</table>
| Complex commercial liability portfolio with poor profitability                      | • Portfolio modelling, profitability analytics, refinement of client segmentation  
• Redefinition of UW strategy                                                                                                                                                                               | • New UW guidance, risk appetite and strategy  
• 6% improvement in loss ratio                                                                                                                                                                             |
| Lack of transparency on P&C portfolio and loss ratio drivers                        | • Customized Portfolio Insights deployment  
• Portfolio tracking through interactive and state-of-the-art visualization                                                                                                                                 | • Customized Portfolio Insights version  
• On demand analytics                                                                                                                                                                                        |
| Lack of go-to-market strategy for high growth ambitions                              | • Unique market analysis for > 30 countries  
• Granular risk attractiveness information across various LoBs and countries                                                                                                                                 | • Market prioritization  
• Roll out of go-to-market strategy  
• Input for liability pricing                                                                                                                                                                                |
| Non-competitive pricing due to lack of pricing relevant data                        | • Leverage of Swiss Re’s forward-looking modelling expertise  
• Provision of industry-specific increased limits factors for affected markets                                                                                                                                 | • Improvement of technical price and thus competitiveness  
• Unlocking growth potential                                                                                                                                                                                |
| Support in SME transformation                                                       | • Developed in-depth go-to-market and agent & broker strategy  
• Building of digital insurer capabilities                                                                                                                                                                | • Development of strategy  
• Enable targeted growth                                                                                                                                                                                     |
| Lack of UW expertise expanding into new industry segment                            | • Aggregation and analysis of various data sources by leveraging various data science disciplines  
• Enrichment of analysis with qualitative Swiss Re UW expertise                                                                                                                                           | • Quantification of market potential and definition of risk appetite  
• Tailor-made UW tool                                                                                                                                                                                       |

**Use Cases:**

- We are an experienced partner and have already supported various clients.

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**Client’s challenge:**

- Complex commercial liability portfolio with poor profitability
- Lack of transparency on P&C portfolio and loss ratio drivers
- Lack of go-to-market strategy for high growth ambitions
- Non-competitive pricing due to lack of pricing relevant data
- Support in SME transformation
- Lack of UW expertise expanding into new industry segment

**What we did:**

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- Redefinition of UW strategy
- Customized Portfolio Insights deployment
- Portfolio tracking through interactive and state-of-the-art visualization
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**Impact:**

- New UW guidance, risk appetite and strategy
- 6% improvement in loss ratio
- Customized Portfolio Insights version
- On demand analytics
- Market prioritization
- Roll out of go-to-market strategy
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- Unlocking growth potential
- Development of strategy
- Enable targeted growth
- Quantification of market potential and definition of risk appetite
- Tailor-made UW tool
Broad set of analytic capabilities to generate powerful insights
Our actionable business recommendations can help you reach your strategic objectives

Our analytics offering

**Bespoke**
We choose and combine the right analytic methodologies to tailor scope and results of our analysis to your individual needs.

**Forward-looking**
We leverage predictive analytics to not only analyse what happened in the past but also anticipate what is going to be relevant for your business in the future.

**Intuitive**
We provide you with intuitive, easy-to-understand analytics that focus on what is really relevant for your business.

**Creative**
We think outside of the box and leverage multiple ideation techniques to produce more than standard commodity analytics.

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SET OF TOOLS

- **Big Data Methods**
- **Visual Analytics**
- **Predictive Modelling**
- **Machine Learning**
- **Text Analytics**
- **Geo Data Modeling**
**Delivery Team:** The team and technical capabilities that Swiss Re is continuously improving

### Delivery Team

**Core Team:**
- P&C Analytics
- Digital & Smart Analytics
- Domain IT
- Experts

**Analytics consultants**

**Extended Team:** Additional capacity, deployed on a project basis.
- Digital & Smart Analytics
- Experts

### Capabilities provided by Data Scientists

- Basic statistical modelling
- Time series analyses
- Geospatial Analytics
- Predictive modelling
- Tool development
Project Examples
A client story: Improved performance with insights

How we use analytics to impact our clients’ underwriting strategy and improve profitability

The client

Very large, global insurer.

Struggling with the rapidly changing industry, volatile and large losses and looking for solutions to better understand the changing risk landscape

The challenge

CLIENT: 
No significant improvement achieved despite various internal portfolio “deep-dives” over past years.

INDUSTRY: 
Loss severity and frequency changes, impact of technology, cost pressure

Our support

Enhancement of client portfolio data with external data sources

Detailed portfolio modelling and loss driver analysis by leveraging Swiss Re’s analytics tools and capabilities

Development of tactical risk map for future underwriting selection process and development of tailor made underwriting tool.

The Results

Developed new underwriting strategy and fine-tuned risk appetite based on analytics findings

6% decrease in portfolio loss ratio with further improvements expected

6 months from kick-off to market roll-out
Loss Driver Analysis: Five analytics work streams yielding a strong impact on the UW strategy for APS

**Identification of loss drivers**
- **Why**: Lack of segmentation of Tier 1 accounts, causing large losses
- **How**: Leveraging analytics to better understand loss drivers and improve client segmentation

**Tracking policy wording coherence**
- **Why**: Uncertain policy wording coherence in inhomogeneous German market
- **How**: Policy-wording analysis leveraging SR’s Blockfinder

**Interactive portfolio visualization**
- **Why**: Lack of easy-to-use and interactive way to track developments in portfolio performance and composition.
- **How**: Customization of SR’s Portfolio Insight

**Validation & fine-tuning of strategy**
- **Why**: Rapidly changing recall risk landscape and an abundance of (thus far unused) external data
- **How**: Detailed analysis of NHTSA recall database resulting in tangible business insights

**Development of APS Recall Tool**
- **Why**: Lack of ability to analyse external / industry loss data in systematic and periodic way
- **How**: Development of a bespoke & interactive UW tool, fed by up-to-date industry data

- New UW strategy / risk appetite matrix, leading to a 2 pct loss ratio improvement y-o-y
- Novel interactive / web-based APS Recall tool
Loss driver analysis: The client adopted our insights as key ingredients of an APS underwriting strategy.

We adopted the use of part group information for...

- Client segmentation
- Re-balancing of portfolio by part groups
- Use in referral criteria
- Prioritization of target account list
- More restrictive use of limits for exposed part groups

New APS Risk & Referral Matrix

IC Company Risk & Referral Matrix
APS Tier 1 Accounts (ToB 353) Pure & Partial
Loss driver analysis: Validation and fine-tuning with external industry data

We use the recall database from the US National Highway Traffic Safety Administration (NHTSA) to...

- identify recall trends / problematic part groups
- validate / fine-tune our risk appetite.

This database tracks all NHTSA safety-related defect and compliance campaigns since 1967.

1 Other: Consists of child seats, and recalls without a classification

We found good alignment of NHTSA recalls with our part group segmentation

The APS recall risk landscape is rapidly changing

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03 | Project Examples

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Swiss Re
## Loss Driver Analysis: Spotting new risk factors for underperforming motor fleet book

<table>
<thead>
<tr>
<th>Company</th>
<th>Vehicles</th>
<th>Drivers</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔ Programme type</td>
<td>✗ Number of vehicles</td>
<td>✔ Number of drivers</td>
<td>✔ Accident frequency predictions</td>
</tr>
<tr>
<td>✗ State</td>
<td>✗ Vehicle age (average, minimum, maximum)</td>
<td>✔ Age of drivers (average, minimum, maximum)</td>
<td>✔ Accident severity predictions</td>
</tr>
<tr>
<td>✔ Operating radius</td>
<td>✔ Number of drivers per vehicle</td>
<td></td>
<td>✔ Population/vehicle density</td>
</tr>
<tr>
<td>✔ Year the company became a customer</td>
<td></td>
<td></td>
<td>✗ Unemployment rate (sector relevant)</td>
</tr>
</tbody>
</table>

### Potential actions items

| a) Geographical focus | c) Driver age as UW dimension |
| b) Portfolio pruning strategy | d) Focus on companies with a balanced fleet size vs. driver pool |

### Pattern present

- No pattern observed
Company: Besides differences in programmes operating radius and start of client relationship as major driver of loss ratio

- Deep-dive into companies that are clients since 2009, 2011, 2016 and 2017 and understand if continuing the relationship is reasonable
- Deep-dive into companies with relationship start 2009/2010 → hard pruning of portfolio

Possible action items

- Slightly higher loss ratio for policies with predominantly vehicles categorized as “local” regarding their operating radius compared to “intermediate”
- Looking at 2017 results we see elevated loss ratios for client on boarded during the recession
  - as well as such over the last two years
**Vehicles:** Age of fleet does not seem to have a strong trend with regards to loss ratio, but number of drivers to number of vehicle does

- **Median model year**
- **Driver-to-vehicle ratio**

### Possible action items

- Follow a more conservative UW approach on submission with missing information, in particular for companies with too high number of vehicles per reported driver.
- Also more conservative approach for companies with a massive number of drivers per vehicle (or adapt tariff).

### Graphs

- **Median model year**
- **Driver-to-vehicle ratio**

- **No clear pattern with respect to the median fleet age.**
- **Also investigated maximum and minimum model year without identifying trend.**

- **Higher number of drivers per vehicle leads to a higher usage and hence higher exposure.**
Drivers: Characteristics around drivers as differentiators with respect to profitability

Number of drivers

<table>
<thead>
<tr>
<th>Gross written premium in mUSD</th>
<th>Loss ratio</th>
<th>GWP</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td>181</td>
<td>53</td>
</tr>
<tr>
<td>0-5</td>
<td>83</td>
<td>36</td>
</tr>
<tr>
<td>6-10</td>
<td>156</td>
<td></td>
</tr>
</tbody>
</table>

Driver age (avg.)

<table>
<thead>
<tr>
<th>Gross written premium in mUSD</th>
<th>20 and younger</th>
<th>21-25</th>
<th>25-30</th>
<th>30-35</th>
<th>35-40</th>
<th>40-45</th>
<th>45-50</th>
<th>50-55</th>
<th>55-60</th>
<th>60-65</th>
<th>65-95</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss ratio</td>
<td>53</td>
<td>21</td>
<td>9</td>
<td>27</td>
<td>47</td>
<td>71</td>
<td>82</td>
<td>60</td>
<td>24</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>GWP</td>
<td>36</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Possible action items

- Gear risk appetite towards large companies
- Follow a more conservative UW approach on submission with missing information
- Either increase tariff for companies with average driver age between 25 and 35
- ... or have a reduced risk appetite for this segment

• Loss ratio decreasing with the driver force
• Potentially due to larger companies
• In general issue with companies with sparse information

• Companies with younger, but somehow not completely unexperienced drivers pose less profitable risks with the current tariff.
Area: Accident risk seems to be not fully reflected in tariff – Companies active in areas with higher accident frequency tend to show higher loss ratio

**Possible action items**

- Targeting areas with a lower predicted accident frequency
- Focus expansion more on more rural/smaller metro areas, although fewer opportunities
- Possibility to perform a deep-dive on the market structure

**Predicted accident frequency**

<table>
<thead>
<tr>
<th>Gross written premium in mUSD</th>
<th>Loss ratio</th>
<th>GWP</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-0.72</td>
<td>19</td>
<td>196</td>
</tr>
<tr>
<td>0.72-1.08</td>
<td>59</td>
<td>59</td>
</tr>
<tr>
<td>1.08-1.44</td>
<td>59</td>
<td>172</td>
</tr>
<tr>
<td>1.44-1.80</td>
<td>+4</td>
<td>60%</td>
</tr>
<tr>
<td>&gt;1.80</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gross written premium in mUSD</th>
<th>Loss ratio</th>
<th>GWP</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;300 veh/sq</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>300-1k</td>
<td>44</td>
<td>32</td>
</tr>
<tr>
<td>1k-2k</td>
<td>51</td>
<td>32</td>
</tr>
<tr>
<td>2k-10k</td>
<td>39</td>
<td>51</td>
</tr>
<tr>
<td>10k-25k</td>
<td>56</td>
<td>39</td>
</tr>
<tr>
<td>25k-50k</td>
<td>58</td>
<td>56</td>
</tr>
<tr>
<td>50k-100k</td>
<td>58</td>
<td>58</td>
</tr>
<tr>
<td>100k-200k</td>
<td>108</td>
<td>58</td>
</tr>
<tr>
<td>&gt;200k</td>
<td>+11</td>
<td>108</td>
</tr>
</tbody>
</table>

**Vehicle density**

- We see a 4 pp difference in loss ratio considering below average risk areas to the highest accident frequency areas
- Sparsely populated areas show a lower loss ratio while it seems to saturate for densely populate areas
- Effect closely linked to accident frequency
Three different avenues how to apply the insights

Steering of in-force business

- Definition of client “value” (e.g. for maximum rebate) based on perceived average profitability
- Definition of focus areas for next tariff review

Growth strategy

- Focus areas for diversification of the portfolio
- Definition of target segment

Prospecting

- Analysis of individual prospect clients
- Understand if expected profitability is above or below average
- Input to the prospective process

<table>
<thead>
<tr>
<th>Company</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client A</td>
<td></td>
</tr>
<tr>
<td>Client B</td>
<td></td>
</tr>
<tr>
<td>Client C</td>
<td></td>
</tr>
<tr>
<td>Client D</td>
<td></td>
</tr>
<tr>
<td>Client E</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Company</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company F</td>
<td></td>
</tr>
<tr>
<td>Company G</td>
<td></td>
</tr>
<tr>
<td>Company H</td>
<td></td>
</tr>
<tr>
<td>Company I</td>
<td></td>
</tr>
<tr>
<td>Company J</td>
<td></td>
</tr>
</tbody>
</table>

Accident frequency
Marine Hull 2.0 – Insights and Pricing
Turning Marine Hull into a quantified business with an end-to-end business solution for efficiency and profitability

Challenge

• Marine is highly cyclical business where profitability depends heavily on market and client segmentation.

• Amidst the technological transformation of shipping, marine hull underwriters face the challenge of only a small number of observed claims and limited data on which to base their decisions.

• Building on Swiss Re’s marine historical loss and exposure data, we integrated new sources of global vessel data to support decision-making and created three tools that support portfolio steering, opportunity sourcing and costing.

Approach

• Swiss Re entered a partnership with an external data provider to access data from 150,000 vessels worldwide.

• Combined the data with internal historical claims data and built a machine learning model that captures the key drivers for all different hull incident categories including large losses.

• Applied state of the art visualization techniques to analyze better our portfolio and benchmark our performance against the market.

Achievements

• Developed 3 productive dashboards that generate insights to support the underwriters in their decision making process.

• Finalized methodology for the Total loss model, fully integrated in Pythia platform.
## Aligning the Planets

### Who brought what...

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management</td>
<td>▪ Strong vision on how to transform the existing business</td>
</tr>
<tr>
<td></td>
<td>▪ Full support to the project</td>
</tr>
<tr>
<td></td>
<td>▪ Committed technical resources</td>
</tr>
<tr>
<td>Actuaries</td>
<td>▪ Expertise on the initial costing model</td>
</tr>
<tr>
<td></td>
<td>▪ Costing technicality</td>
</tr>
<tr>
<td></td>
<td>▪ Acumen on existing IT systems (claims, exposure)</td>
</tr>
<tr>
<td>Underwriting</td>
<td>▪ The Marine expertise on the vessels and the market</td>
</tr>
<tr>
<td></td>
<td>▪ Feedbacks and sanity checks on the results</td>
</tr>
<tr>
<td>Digital &amp; Smart Analytics</td>
<td>▪ Technology for dynamic pricing &amp; Advanced ML techniques &amp; Visualization acumen</td>
</tr>
<tr>
<td></td>
<td>▪ A fresh, new look at the data</td>
</tr>
<tr>
<td></td>
<td>▪ Methodology to drive digital transformation (Prototyping, Agile, Project Management)</td>
</tr>
<tr>
<td>IT</td>
<td>▪ Dashboards and model integration</td>
</tr>
<tr>
<td></td>
<td>▪ Data feed implementation from the external provider</td>
</tr>
</tbody>
</table>
Predictive Underwriting for Bancassurance
Using financial transaction data to automatically classify standard vs substandard risks

Challenge
• Selling insurance for death, critical illness and disability benefits through the banking channel is nothing new, however often conversion rates fall short of expectations.
• A key obstacle is long and complicated underwriting procedures that are unattractive for bank advisors and customers alike.
• Swiss Re is collaborating with a key client in a high growth market to automate the underwriting procedure by leveraging existing data on financial transactions.
• By reducing the number of underwriting questions and medical tests required as well as by automatically classifying most standard risks, such models can accelerate underwriting and increase conversion rates.

Approach
• Built a predictive model that classifies individuals into standard and sub-standard risks. Applicants with a high probability to be standard risks can be automatically underwritten by the client.
• The model takes into account demographic data such as age, gender, income and smoker status, as well as financial transaction data of the individual. Transactions are aggregated by month and industry code to proxy the life-style behavior of the applicant.
• A machine learning algorithm was trained on over 33,000 past underwriting cases to accurately combine all features to a reliable risk classification and underwriting decision.

Achievements
• Extracted life-style / behavioral proxies from billions of financial transactions.
• Agile predictive modelling in coordination with external client.
• Delivered predictive modelling results to client for validation.
What is new?
Working together with the client on a success story

Success can be measured by combining Analytics and Insurance Expertise

Data Driven Approach
- Combination of
  - various data sources and formats
  - existing and new data (e.g. out of sensors or satellite imagery)
- Machine Learning methodology
- Increased computer performance
- Involvement of Data Scientists

Expertise & Execution in cross functional teams
- Leveraging
  - Risk & Industry Knowledge
  - Advanced Analytics Capabilities
  - Agile Approach & Rapid Prototyping
- Focus on execution
- Data Scientists are embedded into the business (hybrid model & dedicated teams)

Business Impact
- Tangible & measurable results can be realized at an early stage with respect to:
  - Growth
  - Profitability
  - Efficiency Gains
Appendix
Combining different data sources to generate tangible insights

Applying Advanced Analytics Capabilities enable us to combine different sources and formats on a very granular level

Combining external and Swiss Re proprietary information ...

... to generate tangible risk insights for steering property growth

We leverage our collaborations with data providers, tech firms as well as our in-house risk data to unique combinations of data sources that yield tangible risk insights

External
- Google (partnership with Swiss Re on geo-data)
- Company databases (BvD, D&B, etc)
- public data (US government, fire incident data, etc)

Swiss Re
- Swiss Re’s Cat Models
- Exposure information
- Loss experience

Client
- possibility to further data enrichment with client portfolio and loss information

Target, 2615 Tuscany St, Corona, (33.8266 latitude, -117.5162 longitude)

Swiss Re Cat Models:
- flood return period = 100y
- earth quake hazard = very high
- storm hazard = very low
- wildfire risk = significant

Swiss Re Exposure:
- structure type: reinforced masonry (horizontal and vertical reinforcement)
- design year = 2012
- number of stories = 1

External data:
- Distance to fire station = 742 m
- Google customer rating = 4.2 star (1 to 5)
- Corporate
  - headquarters = Minneapolis, Minnesota
  - revenue = ~70b USD

Outcomes
- Enhanced Risk Selection, Assessment and Benchmarking
- Unlock profitable growth opportunities
- Increase Claims Prevention
- Enhanced Portfolio Steering and UW decisions