NOT IF, BUT HOW

Munich RE

How Underwriters and Data Scientists Work Together

In the last decade, life insurance has seen a swath of data sources, predictive models, and technology become available for underwriting. The availability of data has grown and organizations have built data science teams to work alongside underwriters on risk selection. A strong working relationship between the two disciplines is table stakes. We'll explore three building blocks for successful collaboration between underwriters and data scientists.

Organizational Structure

At Munich Re, underwriting and data science report up to the same executive function, which has been conducive to our success. In some companies, data scientists work as a standalone team; in others, they are embedded within business units or functions. Each of these structures has its own strengths and weaknesses. Standalone teams promote standard definitions of data science roles and a clear career track for data scientists in the company. Integrated teams allow for cross-pollination of skills, less friction in adoption of data science work into business units, and development of domain expertise.

Language

Both data scientists and underwriters need to learn new languages when working together. Most historical underwriting data that exists today may be digital, but it is not structured in a very useful way. During an underwriting engagement, we specified the need for data in digital form. The underwriters confirmed that all the data was saved in digital form. Unfortunately, we found that "digital, structured data" referred to images stored as a mixture of TIFFs and JPEGs. While this data was useful, it is not what data scientists refer to as "digital". On the flip side, an actuary leading a newly formed data science team asked them to model and find key drivers for mortality. After months of work, the team came back with key insights on the most important factors for mortality, age followed by gender. While it was great to have this objectively verified, most life insurance professionals are already intimately familiar with the importance of age and gender in mortality.

Another area that requires bridging the knowledge gap is with respect to rules-based systems vs. predictive models. Most underwriters are familiar with building out rules to underwrite cases; it is intuitive to define a logical path using data to get to a decision. Rules-based systems work well when all situations are known and well understood; however, they become unwieldy and cumbersome to maintain as the rules tree becomes too large. Predictive models provide value when there is a lot of data, and the problem domain is sufficiently complex. An intuitive example of this is speech-to-text, or converting audio files of individuals speaking to transcribed text. The same word can be said in a variety of ways so a rules tree addressing just one word would have to be extremely large. Therefore, the leading speech-to-text models in the industry are all driven by machine learning.

W. Edward Deming said, "Without data, you're just another person with an opinion." Our experience has taught us that data scientists and underwriters think similarly in the way they view data as both professionals want to confirm their theories with hard facts.

Underwriters and data scientists work together the way rock climbers use belaying methods as part of the climbing system. Belaying is the practice of holding the rope so that the rock climber is able to continue climbing while protecting them from falling. We envision the underwriter as the person scaling the mountain and the data scientist belaying. Underwriters continue to own the philosophy of risk selection while data scientists develop tools and refine risk selection.

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Culture

The final pillar for successful collaboration is the type of people and culture in your organization, which makes quality recruiting of paramount importance. A key part of recruiting is to find candidates who are able to appreciate colleagues and work from diverse areas and backgrounds. This ties back to the development of our team name at Munich Re. "Integrated Analytics" is a relatively uncommon name for a data science team, but the name is purposeful. Our mission is not only to develop analytics but to have it integrated throughout the company, which we believe begins with a mindset of understanding others across the business.

While traditional underwriting skills are as critical as ever, project management and business analyst skills have become increasingly valuable as components of successful underwriting.

Key cultural attributes of successful collaboration:

- **Autonomy** to empower individuals to make decisions and act on them
- **Transparency** on strategy, objectives, and execution
- **People** over process
- **Curiosity** to ask questions beyond your individual practice area
- **Optimism** to continue even when initiatives fail
- **Courage** to challenge the status quo
- **Action** in lieu of stagnation: instill a bias for action

We believe that one of the most important action items to take away from this article is to invest in cross-functional training. Developing hands on training sessions where underwriters can see how data scientists build models and where data scientists can learn the complexities of how cases are underwritten is invaluable. Most underwriters find the discipline of data science fascinating. It has been interesting to see that when massive amounts of data are available, historical underwriting instincts are often validated. Social behavior factors, financial habits, driving habits and more can now be valuable attributes in powerful risk selection models. One of our data scientist shadowed an underwriter who was underwriting a case, which illuminated many aspects of underwriting that are seldom discussed – from negotiating with advisors to navigating through vast swathes of medical records at unnatural speeds. There are few things that contribute more to building an appreciation for different roles than sitting in someone else's shoes.

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