



Actuarial Technology Issues – A Roundtable Discussion – April 2023 Update

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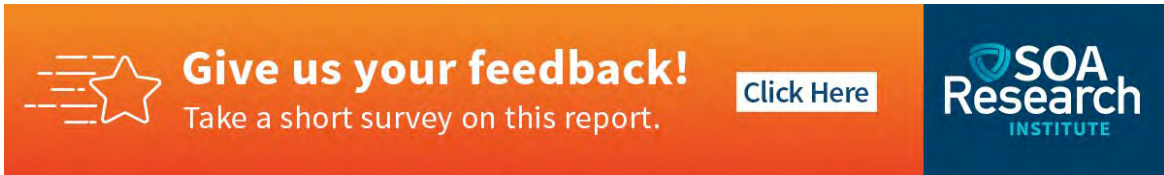


Actuarial Technology Issues – A Roundtable Discussion

April 2023 Update

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Executive Summary

The topic of “Actuarial Technology Issues” spurred a wide-ranging discussion. Topics that generated comments included:

1. Drivers of the need for transformation over the years,
2. Data management issues and the relationship between actuaries and data scientists,
3. The conflict between efficiency and flexibility,
4. Pros and cons of “one model on one platform,”
5. Potential uses of AI (artificial intelligence),
6. The importance of partnerships, inter-disciplinary teams, and knowledge sharing, and
7. Organizational barriers to increased productivity.

The discussion was free-flowing, often touching multiple topics at the same time. To best capture the flow of the discussion, this report uses an approach that narrates the discussion as it occurred.

Section 1: Narrative of the Panel Discussion

The discussion began with introductions; each participant introduced themselves. All panelists had technology-related responsibilities and, consistent with the topic area, many were insurance company actuaries with modeling responsibilities. The group was diverse, however, also including consultants and marketing specialists based both in the US and overseas.

A brief slide show was presented to set the stage for discussion. A timeline was presented to summarize recent transformations in the use of technology by actuarial teams:

- Before the 1990's, mainframe computers were used for most actuarial calculations.
- First transformation - around 1992, cash flow testing requirements were introduced, and PC-based modeling packages came into use, managed mainly by actuaries.
- Second transformation – the need for more computational power to handle emerging requirements like AG 43 and stochastic modeling created a need for actuaries and IT professionals to work together.
- Third transformation – the need for a more controlled and efficient environment encouraged a process-oriented transformation, focused on getting results in a short timeframe, with increased attention to governance.
- Fourth transformation – the introduction of IFRS 17 internationally and LDTI for US GAAP pushed this work into the realm of public financial reporting. Not only are results needed in a short timeframe, but analysis and an explanation of those results are also needed quickly, and in a form that can be easily communicated. This requires partnerships, not only between actuarial and IT, but also across the financial management spectrum.

Panelists generally agreed with this broad overview of history. One panelist pointed out that issues with the desktop computing environment of the 1990's led to the need for later transformations.

One panelist noted that the optimization of HPC (high performance computing) is ongoing, with much benefit still to be realized. Cloud capabilities are just beginning to be tapped.

Several panelists focused on issues surrounding data as the most urgent. There is a need for lockdown for efficiency, while still allowing flexibility for actuarial analysis. The need for both efficiency and flexibility can create headaches.

Many companies now have data warehouses, so there has been progress in managing data, but as modeling requirements change and expand, there is a need for more types of data. Cash flow data and transactional experience data were given as examples. One challenge is to make assumption frameworks fluid, and a production-focused modeling environment impairs that flexibility.

Panelists said that it can be hard to externalize assumptions from models so that any assumption can be fed into a model. This task was termed “relatively intractable.” The concept of an assumption data mart was mentioned, with a key issue being the degree of granularity in assumption sets. Along with this concept, the idea of having an assumption database architect with authority, perhaps comparable to the model steward, was put forward.

Such an arrangement puts focus on governance policies. There is a business need for assumption governance, but governance controls and “guardrails” can impair the flexibility needed for effective actuarial analytical capabilities. It seems few companies have an advanced thought process in addressing this issue.

One panelist noted that the granularity of assumptions tends to differ between pricing and modeling of existing contracts. Detailed granular models of the block of existing contracts become unwieldy, and this creates some tension between teams focused on pricing new business versus the management of existing contracts.

The move to “one model on one platform” was mentioned as the root cause of some of the tensions mentioned above. As more use cases arise, the scope of the model and its ability to meet diverse needs can cause tension. Different use cases require different configurations of a modeling platform.

A European panelist commented that this can be addressed in the design of the model structure. A modular structure allows different configurations for different purposes or use cases, but with multiple configurations, change control becomes complicated.

Much of the motivation for “one model on one platform” comes from financial reporting requirements, so analytical needs may not get the same level of attention. One direction transformation can take is to develop flexible analytical capabilities that leverage a centralized single model platform.

Panelists noted that different users of a model need different sets of results. Even just within the realm of financial reporting, there are “mutually exclusive” reporting needs between jurisdictions and between lines of business. It can be hard to adapt the “one model” approach to all needs. One panelist explained the advantages of having more than one modeling system, including an improved ability to spot and highlight mistakes, and the ability to do different things with features of different systems. Some nervousness was expressed about giving one vendor complete modeling control.

Other panelists mentioned the resources needed to support multiple models as a barrier to taking that approach. However, it was noted that companies often have separate models for financial reporting versus pricing work.

At this point, discussion turned from models to focusing on enabling actuaries to do their job more productively. A brief survey done before the roundtable was summarized. Responses ranked the most important issues / directions as follows:

1. Empowering people
2. Improving processes
3. Improving technology
4. Other

The issue of empowering people sparked a discussion around the use of artificial intelligence (AI). AI can help empower people to do more, but not if they know nothing about AI. There was debate over whether all actuaries need AI training, though it was agreed that AI has the potential to be used in several different areas of actuarial work.

For example, AI can write computer code. This, combined with the emergence of open-source libraries, is a significant issue.

AI can also be used in data analysis. One panelist mentioned a case where the data science team is separate from the actuarial team. They talk together but there is a definite difference in mindset. Actuaries are constrained by regulation from reflecting certain behaviors in rating plans, but data scientists don't feel such constraints. Data scientists seem more open to working with any observed relationships in the data, and AI can help identify such relationships. Ethics and codes of conduct come into play here. One panelist suggested that actuaries focus on reviewing relationships identified by data scientists and AI, testing them logically from a broader point of view. There is a risk that one can over-delegate judgment. The SOA board has discussed this issue, but currently has no answer or course of action.

There are other potential uses of AI, such as documenting code and developing test cases. We are only at the start of this journey, according to the panel.

The focus of discussion then turned back to actuarial teams. Where do you go to get what's needed to make a transformation successful?

According to the panel, a key issue is staff relationships and the transfer of knowledge both between groups and from one generation to the next. The needed relationships are not just within actuarial teams but are cross-disciplinary in nature. The goal is to build partnerships, not just alliances.

One panelist mentioned a structure that worked well. Entry-level teams including actuarial students were set up to be multi-disciplinary. This requires an organizational mechanism and commitment but has been effective. Another panelist agreed and noted that both IT and HR can be among the disciplines teamed together.

One panelist reacted to this with the idea that transformation requires the right people doing the right work. Today's workforce is specialized and people are most effective doing work in their area of specialty. For example, keeping actuaries and data scientists each focused on their separate area of specialty can be effective.

It was agreed that data is still one of the core challenges in actuarial transformation. Getting data from here to there and massaging or reformatting it still involves a lot of work. User teams need to work with data teams to effectively manage the interface between available data and its use in actuarial models.

Such efforts can focus on ETL (extract, translate, and load) processes and make them more efficient, but problems arise when the model changes or needs flexibility. Data governance can create trip wires that inhibit adaptation by creating requirements that draw sharper lines than the actual data. Governance may not recognize that the relationship between models and data is fuzzy and needs to be flexible. One consultant on the panel said that "boundary of control" issues have arisen many times.

One panelist opined that governance is used to prevent such flexibility for good reason and there is comfort with that approach. There is value in stability. It was clear that there is a range of opinions when it comes to balancing control with flexibility.

Discussion then turned to focus on productivity. What are barriers to increasing productivity? And what is behind the drive for more productivity?

Inertia in organizations was mentioned as a barrier. Any change bears a burden of proof that it is justified.

Knowledge sharing was mentioned as a problem. Often, actuaries don't do a good job of documenting or explaining why models work the way they do, or even exactly how they work. Knowledge sharing and documentation require an investment.

Development of a standard library of computer code was mentioned as a path towards productivity. It was noted that the SOA has tried using GitHub but the level of usage by members is dismal. A possible explanation put forward was the lack of universal usability across different systems and different environments.

Resistance to sharing responsibilities was mentioned as a barrier to productivity. Locally focused efforts tend to be sub-optimized. It can be hard to change that without an external catalyst. In the past, the catalyst has been new financial reporting requirements such as LDTI. It's not clear what the catalyst may be going forward.

It was noted that budgets have expanded to fund the implementation of LDTI, and that the follow-up budget reduction will drive a need for increased productivity.

A few different panelists mentioned approaches they are taking to increase productivity:

1. Simple organizational changes, such as the creation of a system change approval group in actuarial rather than IT.
2. Focusing on minimizing project size and maximizing speed of delivery, thereby avoiding monstrous projects altogether due to the rapid rate of change in the business environment.
3. Integration of high value analysis to get true enterprise business pictures. One difficulty with this has been convincing top executives of the need for it.

At this point, the discussion came to a close with a brief mention of plans for future roundtables on actuarial technology issues.



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Section 2: Acknowledgments

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