



Actuarial Technology Issues – A Roundtable Discussion – August 2022 Update

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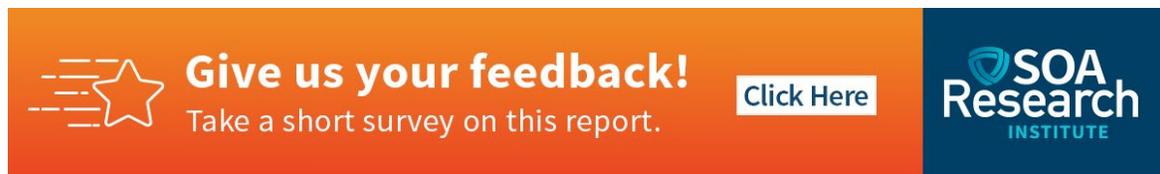


Actuarial Technology Issues – A Roundtable Discussion

August 2022 Update

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A horizontal banner with an orange-to-red gradient background. On the left is a white star icon with horizontal lines extending from its left side. To the right of the star is the text "Give us your feedback!" in a bold, white, sans-serif font, followed by "Take a short survey on this report." in a smaller white font. Further right is a white rectangular button with the text "Click Here" in a blue, sans-serif font. On the far right of the banner is the SOA Research Institute logo, which consists of a blue shield icon and the text "SOA Research INSTITUTE" in white.

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CONTENTS

Background and Objectives	4
Executive Summary	5
Section 1: Defining Actuarial Technology and the Biggest Current Issue	6
Section 2: Documentation	7
Section 3: Release Management	8
Section 4: LDTI	9
Section 5: Acknowledgments	10
About The Society of Actuaries Research Institute	11

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Background and Objectives

Advances in technology continue to evolve at a rapid pace, and actuarial work continues to benefit from the adoption and use of new and better tools as they become available. The pace of change creates many issues around optimal use of technology tools and the training and management of actuaries who use them.

On August 29, 2022, the SOA Research Institute assembled an industry expert panel to discuss current issues in actuarial technology. This was the third time such a panel was assembled, and most panelists had participated in the previous discussions. Each participant volunteering for being part of the discussion was selected because of their management-level responsibilities for the application of technology in an actuarial context. The group was diverse in terms of employment, including company actuaries from life, health, and property/casualty backgrounds, as well as consultants from various kinds of firms. This panel included participants from outside the U.S. as well.

The objectives of this panel discussion were:

- to further develop an outline and improve understanding of current issues in the general area of actuarial technology and
- to help identify directions for future research efforts.

This document summarizes the discussion that occurred during the meeting. To encourage candor during the discussion, participants were assured that this report would not attribute comments to individuals or companies, so no names appear in the body of the report. The names of those who participated are included at the end of the report.



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Executive Summary

The discussion focused on three specific topic areas:

1. Documentation
2. Release management
3. LDTI (Implementing the Long Duration Targeted Improvements in GAAP accounting)

Discussion of documentation was wide-ranging, with general agreement on its importance, but no clear consensus on a management approach. Even discussing a way to categorize various purposes for documentation led to several different categorization methods.

Assigning ownership and responsibility for documentation was considered important. Giving users ownership helps ensure the usability of documentation. Assigning responsibility can be an issue when that responsibility needs to be divided between Actuarial and IT.

Technology itself can be leveraged to help manage documentation. There was quite a bit of discussion about a WIKI-like tool to help link various documents and make them more readily accessible to users.

The need to maintain documentation was mentioned as a barrier to change, an issue that relates to the topic of release management.

Release management is the art of balancing the risk of change created by any new release with the need for changes and updates. Some viewed this as a part of model risk management.

Different users of a model can have contrasting needs for updates and mediation may be necessary. The ownership of release management decisions can lead to some adverse incentives. For example, an IT-owned release management process for all software beyond Excel can be a barrier that incentivizes use of Excel, even when Excel is not the best tool for the job.

Regression testing was mentioned as a necessary part of release management. Several issues were mentioned in that regard, including the time required, the potential for automation, the difficulty of automating regression testing in a complex financial model, and the need to review the effect of changes in calculation output on decision-making.

The intersection of release management and data management led to an interesting discussion around the ownership of data management tools and the need to connect capabilities with responsibilities.

Implementation of LDTI was considered by most panelists to be a work in progress. It tends to put a focus on the required partnership between actuarial and IT due to the increased data requirements, such as cohort data for cohorts of old business. It also puts a focus on limitations of existing systems. The use of a roadmap for improving compliance over time was mentioned, but there was concern over auditor acceptance of a plan for moving toward compliance in place of more immediate compliance. Documentation and analysis of any calculation approximations being made was mentioned as a key to auditor acceptance.

Section 1: Defining Actuarial Technology and the Biggest Current Issue

At the start of each of these panel discussions, panelists were each asked to briefly define actuarial technology and the biggest current issue.

Panelists tended to either define actuarial technology very broadly or to focus on the main use of technology in their employment environment. Broad definitions ranged from “all technology is actuarial” to “technology is an end-to-end process.” More focused definitions included “technology is the model” and “technology is analytic tools and all data handling.”

Panelists gave more diverse responses when describing the biggest current issue in actuarial technology. Data management came up most frequently, but the following other issues were mentioned:

- Keeping up with the pace of new technology; the slow speed of new adoption
- Dealing with limitations of existing systems
- Working with third parties and partnerships
- Finding the best way to use a grid
- Speeding up processing and reducing errors
- Bridging the gap between reporting tools and decision-making tools
- Bridging the gap between computer science and actuarial science

Section 2: Documentation

The role of documentation in managing the use of actuarial technology generated a lively and diverse discussion. It was acknowledged that documentation not only serves regulatory requirements, but can also be a key part of a technology transformation effort. While its importance was unquestioned, there was no clear consensus on either defining the scope of the issue or approaches to its management.

Documentation serves multiple purposes, but there were different approaches to categorizing them. Panelists mentioned the following ways of categorizing documents:

- SOX (U.S. regulatory) documents, system architecture documents, user manuals, and requirements for changes to models and processes
- How to get things done (how to) vs. what is being done
- Actuarial documentation vs. IT documentation
- Data documentation vs. model modular documentation vs. accounting documentation

Ownership was mentioned as an important consideration. Different categories of documentation have different owners and different users. If ownership is unclear or unassigned, the documentation is less likely to be effective.

Giving users ownership was mentioned as important. This is not always easy. One panelist mentioned a situation where a consulting actuarial firm had a different standard for documentation than the client company; the consultant's approach was more detailed and centralized. This was partly a question of the intended user: the consultant viewed the documentation as being for the actuary, while the client viewed it as being for the entire cross-functional team.

Assigning responsibility for documentation was also mentioned as important. Dividing that responsibility between actuarial and IT can be an important task, but when the responsibility is divided, it can be hard to have consistent documentation that covers the entire system architecture.

An emerging use of technology is in managing documentation. One panelist mentioned a move to a WIKI framework and use of a vendor tool (Confluence) to connect various documents and make them more usable and searchable than a network drive. Both user guides and system docs are included in the scope of the system and individual users can subscribe to the documentation that they find important. Having centralized documentation allows for easier data governance and greater "cross-pollination" among users. There are also tools that help keep documentation near the process being documented. For example, there are tools in Python that automatically produce updated documentation when code is changed.

Differences between documentation standards within the U.S. (where companies are subject to SOX requirements) and elsewhere were discussed. It was noted that, in Europe, the requirements are more in the form of guidelines than strict rules, but the general need is the same. To some degree, IT documentation is less regulated than actuarial. International requirements tend to focus more on details of calculations and less on data management. Overall, the requirements are more similar than different, and multi-national carriers tended to use similar documentation standards across all countries. It was noted that Solvency II auditing is ramping up, so these issues will be getting more attention in the coming years.

The burden of maintaining documentation was mentioned as a potential barrier to change. In some situations, the effort needed to update required documentation can be greater than the effort to otherwise implement a change due to onerous risk management policies. This incentivizes developers to not make useful changes and only make those changes that are absolutely necessary. Panelists mentioned the need to keep documentation simple and focus on the value it adds.

Section 3: Release Management

Any new release of a system involves change and creates the risk of making a mistake. Release management is partly the art of optimizing the balance between reducing risk and making needed changes and updates.

Panelists related this to model risk management policy and indicated release management may be a part of model risk management. Different users of the same model may have different needs for updates and mediation can be necessary if there are conflicts. There may be no single optimal schedule for releases: a spectrum may need to be used and adjusted to each situation.

Regression testing was mentioned as a necessary part of release management that takes time to develop. Automated test scripts and “red flag” tests can help speed up the process, but it can be difficult to automate testing for something as complex as an enterprise financial model. If the same model is handling multiple accounting bases, a code change that impacts core functionality used for all bases requires considerably more testing. When a change affects calculations and numerical results, there must be an evaluation of the effect of the change on decision-making and that can take time as well. Because of that, changes to calculations may need a different release management process than changes to user interfaces or report formats (e.g., “core” releases quarterly for calculation changes with enhanced review vs. minor releases bi-weekly for interface changes).

The ownership of release management can create incentives or disincentives for the use of various tools. Imposing an IT-owned release management process on all software beyond Excel can encourage users to resort to Excel for everything. Actuaries will work outside the system to get what they want and need, particularly if they feel they aren’t getting the necessary support from IT or don’t understand the full IT process. Actuarial needs tend to emphasize flexibility and frequent changes, while IT has more interest in control and less frequent changes. Mediation can be required to meet the needs of all parties.

The intersection of data management and release management generated some discussion. Several panelists mentioned having a data management committee with wide representation outside IT. The purpose of such a committee is to try to satisfy everyone’s needs and prevent teams from going off in separate directions and duplicating effort. One panelist mentioned an effort to democratize data by giving tools to business owners to do things for themselves, but with defined responsibilities and consequences if they don’t adhere to their responsibilities. In this structure, taking things away from users can lead to adverse consequences.

Section 4: LDTI

The need to meet new GAAP reporting requirements under LDTI (Long Duration Targeted Improvements) is creating a push to re-examine and update actuarial technology. To fulfill the regulatory requirements, more complex models and new calculations are required, and companies have been willing to invest in transformation efforts to meet these requirements. Most panelists described this effort as a work in progress that will evolve and improve over time.

A significant issue in meeting LDTI needs is the partnership between actuarial and IT. Panelists observed that LDTI increases data requirements and the complexity of required models, both of which suggest the need for a closer partnership with IT. However, the intricacies of the accounting changes can make it more difficult for actuaries to understand the specific requirements of the changes which, in turn, makes it harder for them to translate those requirements for IT. Actuaries don't always work well with IT, but LDTI requires both groups to forge a strong partnership.

One panelist observed that, in companies where the actuarial/IT partnership has been weak, LDTI can make it worse. An organization needs to put significant money and effort into these updates, and the degree of investment has varied by company. Some companies have made much more progress than others.

In some cases, the feasibility of meeting the requirements exactly may be constrained by existing systems and available effort. For example, the regulations require results to be split out by year of issue, even when those cohorts may be very small or old. When a larger and longer effort is required, one needs a plan of attack that may include documenting shortcomings in the near term along with a plan to address them going forward. There was some debate and differing opinions over auditor acceptance of such an approach. Clear documentation of any approximations being made in the short run, along with a clear plan for improvement, was mentioned as a key to auditor acceptance.

There was significant discussion around the large scale of the needed changes leading to desperation, burnout and, sometimes, misuse of tools such as low code/no code to get things done in a less than sustainable fashion. In many cases, the focus on decoding the regulations has required so much time that there has been relatively little effort to automate these processes, resulting in substantial manual work in the short term and the need to improve these processes after LDTI goes live. Anecdotes such as these underscored the difficulty of managing LDTI implementation, and emphasized the need for a strong partnership with IT.

Section 5: Acknowledgments

The researchers' deepest gratitude goes to those without whose efforts this project could not have come to fruition: the Project Oversight Group for their diligent work overseeing, reviewing and editing this report for accuracy and relevance.

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About The Society of Actuaries Research Institute

Serving as the research arm of the Society of Actuaries (SOA), the SOA Research Institute provides objective, data-driven research bringing together tried and true practices and future-focused approaches to address societal challenges and your business needs. The Institute provides trusted knowledge, extensive experience and new technologies to help effectively identify, predict and manage risks.

Representing the thousands of actuaries who help conduct critical research, the SOA Research Institute provides clarity and solutions on risks and societal challenges. The Institute connects actuaries, academics, employers, the insurance industry, regulators, research partners, foundations and research institutions, sponsors and non-governmental organizations, building an effective network which provides support, knowledge and expertise regarding the management of risk to benefit the industry and the public.

Managed by experienced actuaries and research experts from a broad range of industries, the SOA Research Institute creates, funds, develops and distributes research to elevate actuaries as leaders in measuring and managing risk. These efforts include studies, essay collections, webcasts, research papers, survey reports, and original research on topics impacting society.

Harnessing its peer-reviewed research, leading-edge technologies, new data tools and innovative practices, the Institute seeks to understand the underlying causes of risk and the possible outcomes. The Institute develops objective research spanning a variety of topics with its [strategic research programs](#): aging and retirement; actuarial innovation and technology; mortality and longevity; diversity, equity and inclusion; health care cost trends; and catastrophe and climate risk. The Institute has a large volume of [topical research available](#), including an expanding collection of international and market-specific research, experience studies, models and timely research.

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