

**THE INNOVATION SUBCOMMITTEE OF
REINSURANCE ADMINISTRATION PROFESSIONALS ASSOCIATION
PRESENTS**

**THE ROAD TO BETTER LIFE
REINSURANCE DATA**

***HOW PREMIUM VALIDATION CAN IMPROVE THE INDUSTRY'S LARGEST
CHALLENGES IN REINSURANCE DATA MANAGEMENT***

INDUSTRY WHITE-PAPER

FALL 2018

Executive Summary

An innovation committee was established at the Fall 2017 RAPA Convention. The group was tasked with attempting to define where the reinsurance industry needs to go in the next 5, 10, or 20 years, as well as outlining the major challenges that we as an industry face. As part of this challenge, the committee initially came up with four different industry hypotheses:

1. a treaty management hub would help automate the treaty management process.
2. industry standard language would simplify the complexity of treaty language.
3. a contributory database would give the industry a baseline for benchmarking.
4. a premium validation tool would address the risk of future systemic financial risk.

We took those ideas and sent them in a survey to members of the RAPA board as well as their partners and the broader RAPA members. Out of more than 100 survey respondents, 37% responded that a premium validation tool would have a dramatic and lasting impact to the industry, adding significant value through efficiency gains and industry standardization. So it was from here that we embarked on our journey...

Over the last 12+ months, through various coordinated activities, monthly calls, and Google Docs training, the team, in addition to managing their daily workloads, contributed their time, expertise, and creativity to come together at various times throughout the day and night to produce this document. And we are proud to share it with the broader industry.

This white paper represents a first time production of an industry deliverable in life reinsurance, co-created with the intent of addressing a wide scale business problem. A special thanks goes out to all the members of the innovation committee who, without their participation and contributions, this white paper would not be possible. Our vision is that this is not the end, but the beginning. We have proven that industry collaboration **IS possible**, and hope future committees can continue moving the needle to further drive transformative change in life reinsurance.

Special thanks to the following members of the innovation subcommittee for their time, expertise, and contributions:

Mitch Ocampo (Committee Chair)

Lili Chen
John DeCarlo
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Jackson National
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Problem Statement

The validation of life insurance premiums is a crucial part of the insurance/reinsurance process. For global reinsurers, the teams that process insurance premiums often lack the tools and capabilities to validate data they receive from their ceding clients, confirming that monthly premium totals by book of business or treaty can reconcile to their counterparty. Additionally, on the other end, the data received from carrier clients contain a wide range of unique products, plans, tables, and other nuances, creating an environment that requires bespoke and custom handling of data elements in order to ensure this mapping is synchronized.

The Direct Writer

From a direct writer perspective, validation of premium is important for a number of different reasons. First off, it's important to understand the structure of the reinsurance deals to determine ceded amounts. Secondly, the calculations to determine these ceded amounts can be complex in nature, so direct writers need to test premium calculations against the treaty parameters, to determine treaty compliance.

When issues are found in audits, they are often tasked with assessing the financial impact of the situation, before they can make a decision on how best to rectify the issue. A premium validation tool would allow the direct writer to become more proactive instead of reactive during this process.

The Reinsurer/Retro

From a reinsurer/retrocessionaire perspective, they face similar issues as direct writers. One significant difference however is the sheer magnitude and volume of the data involved. As opposed to a direct writer, the reinsurer/retrocessionaire is dealing with multiple companies and their blocks of business.

The major goal of this whitepaper is describe a solution that has the capacity to ingest these large amounts of data, including treaty and premium parameters, and be able to validate premiums efficiently and accurately in real time.

Financial Impact

As stated above, the validation of premium is a crucial part of the insurance/reinsurance process, as the accuracy of this premium can influence downstream financial results. Teams of data management and premium processing personnel try to validate some premium at the time of receipt by ceding companies.

In most cases however, the systems are not set up to adequately handle the complexity and quantity of data from such a wide range of treaties, each possessing their own unique products, plans, tables, and other nuances.

Therefore, premium validation sometimes occurs far later in the administration process. This separation creates a lag between the premiums received, the validation of these premiums, and the resulting output from analysis, creating additional overhead in the process in the form of accounting reversals, back-dated adjustments, and other reconciliatory tasks. Not to mention that incorrect premiums can often go unnoticed for years. The amount of strain this introduces to basic accounting practices and downstream impact to operations personnel within the ecosystem is another point of inefficiency that can benefit from a more streamlined process.

“In many companies, validation only occurs when audit teams select blocks of business for testing. Having a more robust tool would improve accuracy and enable direct writers to assess ALL business rather than statistically through a sampling of transactions.” - Anonymous, Industry Carrier

Many times, errors in premium also affect historical billing records, and this is a systemic problem across the industry. Being able to improve the accuracy of historical records across life insurance would be a wide scale benefit to all participants in the value chain.

Additionally, having the ability to automate the reinsurance calculations would enable the direct writer to be more proactive in their approach to treaty compliance rather than being reactive to concerns raised during an audit. This also gives a higher level of confidence to the reinsurer that the direct writer is proactively evaluating their reinsurance program, creating tangible improvements in data accuracy, timeliness, and efficiency, while aligning mutual goals and benefits for counterparties in the reinsurance transaction.

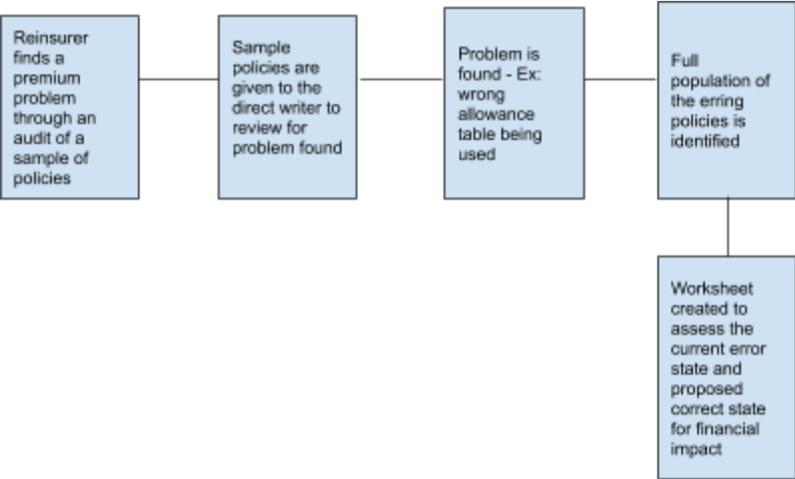
Many times, historical billing records are impacted by the error. Being able to effectively assess the impact would be beneficial to all. Having the ability to automate the reinsurance calculations will enable the direct writer to be more proactive in their approach to treaty compliance rather than being reactive to concerns raised during an audit. This also gives a higher level of confidence to the reinsurer that the direct writer is proactively evaluating their reinsurance program.

In other instances, premium validation may occur within the actuarial teams where models have been set up to assess the accuracy of premium payments against expected values. The purpose of those is not necessarily to flag individual premium errors, but to determine how the block of business is performing against predicted totals.

Within most companies, premium validation is done using basic Excel spreadsheets. These spreadsheets must be adapted for a wide range of products, types of business, allowances/multiples, and other parameters. With each treaty, specific adaptations must be made. Tools and spreadsheets used by one reinsurer/insurer can be wildly different from company to another. Due to the complexity and difficulty of interpreting the wording of each treaty, this may lead to the inability of partners to validate treaties or blocks of businesses premiums, on a timely basis of such analysis. This points to the need for an efficient and standardized tool to be used across the reinsurance industry.

Our major goal is to produce a systems solution that has the capacity to ingest the large amounts of data, treaty/premium parameters and validate premiums efficiently and accurately in real time.

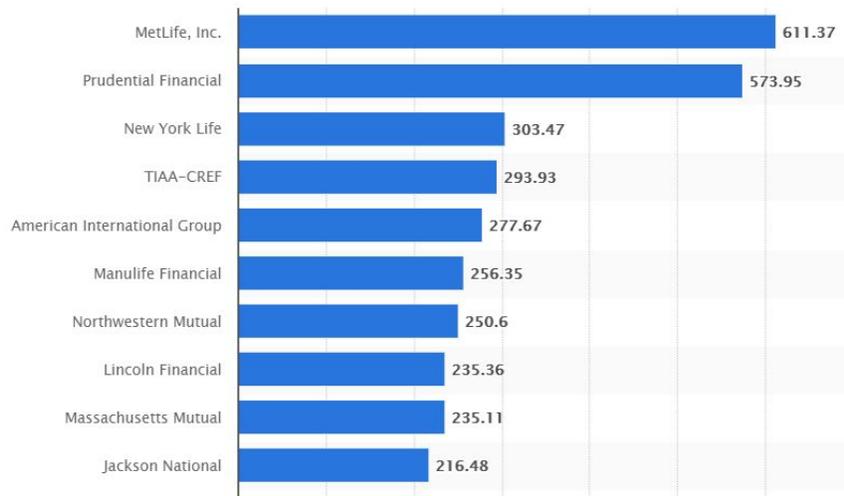
Current State Process



Industry Context

While it's important to focus on the problem at hand, it's worthwhile to remind the reader about the importance that insurance has on the global economy. According to the statistics portal Statista, in 2016, the global insurance industry generated \$5.02T USD in gross premiums. Compare this number with the 2016 global GDP of roughly \$75T USD, insurance as an industry represents about 6% of global economic production, a significant number considering a global population of 7.4B. From a US perspective, the insurance industry is also a considerable employer, with 797 US insurance companies and over 2.54 million US insurance employees employed.

Top 10 Largest Life Insurance companies by assets (billion), 2016



Proposed Solution

The committee envisions a proposed solution that is easy to use, cost-effective, and integrates the existing systems of insurance. We imagine it will be a web-based platform, making it easy to share with others custom rate tables or other factors needed for premium calculation. It will be linked to a standard reinsurance administration system such as TAI, as well as any other data storage applications currently in use with the reinsurer. The data will be extracted from the application into the platform to calculate large scale cession data. Pre-existing rate files within the treaties (or the actuarial department) will be extracted and placed in reference so they can be used as an independent check of the rates within the system and for premium validation.

Today's current process is manual, time consuming, inaccurate, and lacks data processing capabilities at scale. Therefore, each reinsurer will have a program for centralized treaty data to streamline the treaty management processes. Scan quality is very important especially when dealing with numbers and rate tables. There will be the ability to edit data the tool absorbs, such as changing PLT rates due to amendment agreements, or pay factor changes. This will increasingly cut down on under- or over-paid premium as well as force reinsurers to ensure clean data.

Solution Criteria

The committee envisions a product that can provide the automation, data accuracy, and streamlined interface for supporting the process of premium validation. The approach to solution design is to establish a series of criteria that the solution must meet. These criteria are as follows:

1. The system must be scalable.

Due to the size and complexity of transactions, it's important that the solution can scale to meet large volumes of data. It must be able to handle tens to hundreds of millions of records for monthly transaction processing, large scale reporting, and near real time lookups to support actuarial research and experience

analysis. Transparency of the tool is important to be able to share the tool among various individuals both within the company and externally (auditors, reinsurers, etc.). This would focus more on the calculation itself. We need to be able to easily see and share the actual calculation being done for the validation. As a result of this requirement, the committee envisions a cloud based solution, hosted with a data center provider with global capabilities, fully redundant and running in a utility based consumption model.

2. The system must be easy to use.

This sounds implicit, but it's important that usability is considered as part of the solution. Therefore, the committee suggests a web-based interface, device agnostic, and capable of being distributed across an entire organization without effort. Minimal programming knowledge should be required. Furthermore, the solution should be capable of working with numerous carriers and reinsurers, and provide context-sensitive capabilities for providing support for individual company needs, fields, business processes, and so on.

3. The system must be cost effective.

Today's economic climate makes it difficult to spend significantly up-front on technology. The committee envisions a subscription based service with monthly fees, with a one-time conversion project to load the data. A cost/benefit analysis needs to be created and evaluated for the prospective system. The overall costs of the solution should be right-sized and equal to the value that the system generates.

Furthermore, an industry based platform that can be co-funded by participating members could be one way of supporting the costs of such a solution, relying on the shared benefits and value that the software platform brings to the entire industry as a whole, and offsetting costs associated with design, development, and ongoing maintenance of the system.

4. The system must be secure.

As we move increasingly towards a digital first world, the threat of cybersecurity continues to grow. For insurance companies, the threat is increased due to Personally Identifiable Information (PII) required to do business. Regulators are working to create legislation that protects consumer data, and these legislations lead to further requirements for software and systems that support insurance. States like New York have passed cybersecurity regulation requiring dedicated staff, a cybersecurity plan, a comprehensive cybersecurity policy, and reporting systems for cybersecurity events. Over time, we expect other states to adopt similar requirements that safeguard customer data against the threat of cyber attack, and demand a system that can meet the high expectations for data protection.

Solution Vision

Solution Architecture

The general direction for the platform is a web-based program that can easily communicate with any reinsurance administration system such as TAI, and possibly other reinsurance and data storage applications. This integration would enable any participating re/insurance company to benefit from the premium validation platform.

The system will be built using an integrated architecture, with potential for supporting a business layer for simplifying data access and allowing counterparties to share data with each other. This feature would allow a single source of truth for counterparties to share treaty terms and conditions and arrive at similar results for premiums and claims payments on a monthly basis.

Elements of the proposed platform would be modeled after specific business processes, such as “GetPolicy” or “GetTreaty” for example, allowing for interacting applications to send and receive data through standardized communication protocols. It is also possible these processes would be available through an industry API, and compatible with such insurance specific platforms such as R3 Corda, InsurWave, or the Canopy Framework provided by the Risk Block Alliance. These integration points would allow seamless and frictionless interaction between third party systems in a digital first way, while establishing a trusted consensus mechanisms among counterparties that otherwise need to know little else of each other.

From a data perspective, the committee envisions two methods for data access, retrieval, and storage. The first option would be a traditional columnar database such as Microsoft SQL Server, Oracle, or IBM DB2. This database would provide the fundamental support for CRUD-related activities (Create, Read, Update, Delete) and serve as the repository for handling and managing premium validation transactions, and comparisons with the paper treaty. This would also be the environment by which the treaty parameters from the physical treaty would be stored, related, and compared.

The second method would be more of a No-SQL database, such as Cassandra or MongoDB, with the performance and scalability to support tens of millions of records. These no-SQL solutions would also be a great mechanism for supporting the conversion, management, and ongoing maintenance of extracting alternative data points from physical treaties, and use AI based technologies to improve the accuracy of these alternative data points over time, leveraging clustering and other matching algorithms to combine like datasets down the road.

A sample list of solution partners across the proposed architecture.

<i>Product/Platform</i>	<i>Description</i>	<i>URL</i>
<i>R3 Corda</i>	<i>Consortium Blockchain for Insurance and Banking</i>	<i>www.r3.com/corda-platform</i>
<i>MongoDB</i>	<i>No-SQL Database</i>	<i>www.mongodb.com</i>
<i>SortSpoke</i>	<i>AI Based OCR Technology</i>	<i>www.sortspoke.com</i>
<i>Microsoft SQL Server</i>	<i>Standard Columnar Database</i>	<i>www.microsoft.com/sql-server</i>

Basics for an MVP

The basics for the premium validation tool needs to satisfy a baseline series of functions which are outlined further in this section. Of-course over time, the requirements may change and improve, however the committee believes the items below represent the minimum viable components in order to market test a solution.

1. **Support for Historical Premiums** - Once the program has been created, it would be good to not only check the current years premium but also have the capability to validate all the historical premiums on a treaty.

2. **Support for Backwards Recursion** - How the calculations are done now does not mean they were always done that way. If there is a problem in the historical billing, the tool should help define the extent and magnitude of the problem, which will aid in the problem resolution and help define the priority of the fix. Furthermore, understanding the prior methods can provide insight into the reasons for modifying the process in the first place.

3. **Reinsurance Administration System Integration** - The tool will need the ability to read the policy set-up from the reinsurance administration system and then be able to independently calculate the reinsurance premiums and allowances. With the historical billing, it would need to be able to know the extent of any policy changes that have occurred over time.

4. **Premium Validation Rules Engine** - The core brain of the system, the system needs to demonstrate an efficiency gain by automating premium validation. This is predicated on treaty and policy terms and conditions being available in a digital format, and therefore using an OCR tool such as SortSpoke to digitize paper treaties, along with a mechanism for processing future treaty and policy terms in a digitally native way.

5. **Open Collaboration Model** - The platform will need to be open sourced and available for any organization to use, assuming they serve a role in the life insurance industry. This network based approach benefits all participants, including the joining member, through the network effect and thereby strengthening the notion of a “standard”.

6. **Cost Sharing and Joint Governance** - Lastly the system must embrace a cost-sharing model powered by the industry, and governed by its members. This structure, similar to MIB, would ensure a common approach based on democratic values and complete with voting rights for changes and updates would power a scalable industry capable solution that could grow over time.

Concluding Summary

At the root of reinsurance administration is data management. This process of reconciling and validating data among counterparties is a key aspect to maintaining proper premium levels at the individual carrier level, for the reinsurer, and across the industry. Combine this challenge with all the manual data validation occurring at any given carrier on any given month and we have a systemic inefficiency on our hands.

Validating premium among counterparties is a difficult task today. It requires multiple levels of reconciliation, various sources of truth when it comes to producing the data sets required for

reconciliation, and in the end requires significant business expertise to understand both current and historical transactions of record.

But the level of difficulty doesn't have to be this way. In this paper, and through the active coordination of multiple parties in the insurance industry, the innovation subcommittee has identified the key requirements and use cases towards moving an industry standard premium validation tool forward. By acting together in a coordinated and standardized fashion, and leveraging technology where appropriate to address efficiency gaps, we hope that the members of the life reinsurance industry can continue to work together to continue move towards a digital future and pave the way for the industry ahead.

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