

# Long-tail liability risk management

It's time for a

# scientific

**Approach >>>**



**Insureware**  
Unique corporate culture of innovation

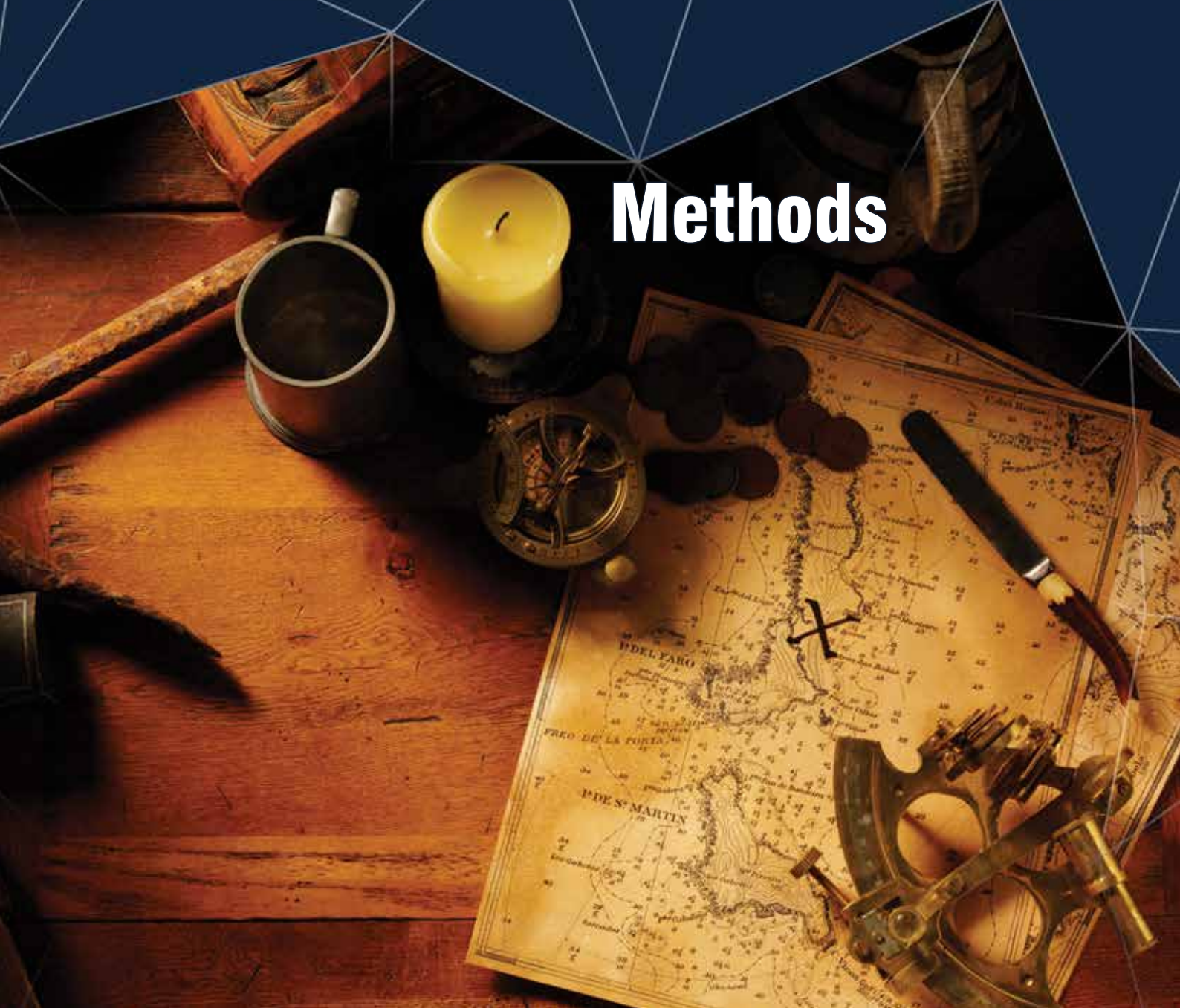


**Do you need to be confident about  
where your business is heading?**

**Discard**

**obsolete**

**Methods**



**Accurate and timely metrics critical  
for your financial decisions?**

**Embrace**

**disruptive**

**Technology**



## ICRFS™: The world's best long-tail liability risk management system

ICRFS™ is a high-powered analytical and data management system and the only actuarial software which treats insurance data arriving in calendar time as an essential feature of its modeling solutions. Designed with the P&C actuary and senior executives in mind, results are delivered in seconds.

The software is:

- small-footprint,
- intuitive and graphic,
- very fast, and
- rapidly implemented enterprise wide!

Insureware's new versatile technology, ICRFS™ Importer, accelerates the implementation process even further! ICRFS™ Importer builds a bridge between a database holding a mass of transaction records and an analytic engine which can analyse triangle data.



### ICRFS™ Importer

#### Access information instantly

- Connect large repositories of unit record data with ICRFS™
- Extract all database variables
- Create triangles at any granularity for analysis
- Convert claims table data into loss development triangles
- Aggregate:
  - Across all values of a variable
  - By particular values
  - Across multiple categories and values

### Relational databases

#### Access information instantly

- Small footprint
- Fast to implement enterprise wide solution
- Data organized according to your requirements
- Models and forecast scenarios saved in databases
- Simple to navigate
- Easy to monitor, manage, and update



Significant gains to an Insurance organization can be achieved by creating one or more ICRFS™ databases. These databases serve as a repository for all aspects of the company's long tail liability risks. All the information in the database including data, models, and results, are right at your fingertips.

### Modeling Frameworks

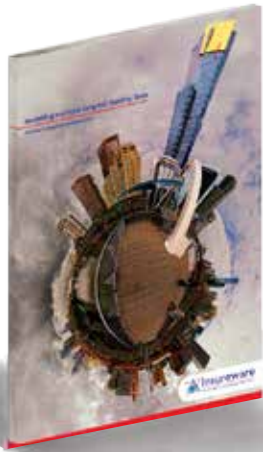
The identified models in the Probabilistic Trend Family (PTF) and Multiple Probabilistic Trend Family (MPTF) modeling frameworks describe the trends in the three directions (development, accident, and calendar) along with the volatility around the trends. They provide complete loss distributions by accident period, calendar period, and total.



## Modeling multiple long tail liability lines

### Get the complete perspective

- Introduction to probabilistic modeling frameworks
- Common drivers and measuring trends
- Correlations and their impact
- Long-tail liability risk profiles
- One composite model for the whole company
- Aggregate distributions for accident year, calendar year, and totals
- Quantiles (percentiles), V@Rs, and T-V@Rs
- Economic Balance Sheet and Solvency II metrics
- Real life case studies!



## Pricing: Segments, Layers and Reinsurance

- Introduction to probabilistic modeling frameworks
- Pricing future underwriting years including for the aggregate of multiple LOBs
- Pricing segments
- Assessing optimal outward reinsurance
- Layers and High Severity/Low Frequency
- Adverse Development Cover
- Real life case studies!



## Understanding correlations and common drivers

- Purpose of correlation measures
- Correlations are model dependent
- Common accident year and calendar year drivers versus correlations
- Impact of accident year drivers on pricing
- Real life case studies!



## Solvency II – one year and ultimate year risk horizons for long-tail liabilities

- Economic Balance Sheet
- Solvency II Capital Requirement
- Technical Provisions
- Market Value Margins
- IFRS 4 Phase II
- Fungibility and Ring Fencing
- Consistency of metrics on updating
- One year ahead metrics



# Mitigate model risk and see your business in a new light?

Insureware's platform

# ICRFS™

can be implemented enterprise-wide in a few days

## and gives you:

- Long tail liability Enterprise Risk Management
- Unparalleled insight and intelligence
- High powered analytics at ludicrous speed
- Structured databases for managing all risks
- ORSA and Solvency II metrics including the Economic Balance Sheet for the aggregate of multiple LoBs
- Single composite model for multiple LoBs
- Multiple aggregation at different levels of segmentation
- Reserve, pricing and reinsurance risk assessments
- Liability distributions and correlations by calendar year
- Risk capital allocation by LoB and calendar year
- Graphical displays of identified models
  - Trends in three directions
  - Volatility about trends
  - Correlations
- Comprehensive model identification and validation tools
- Creative solutions for insoluble problems within a robust, yet flexible, framework
- ... and much more!

Embrace technology delivering economic and strategic advantages:  
[icrfs.me/embrace-2015](http://icrfs.me/embrace-2015)



**Get a new perspective on your  
company's position?**

**View**

# Best's Schedule P

**in an ICRFS™ structured database with  
ICRFS-Plus™ modeling frameworks**



# ELRF™ Best's Schedule P 2014

Exclusive to Best's Schedule P subscribers

Insureware and A.M. Best have created ELRF™ Best's Schedule P 2014. This application, freely available with a Best's Schedule P subscription, is pre-loaded with Best's Schedule P data in an ICRFS™ structured database primed for Insureware's analytical tools.

## Structured access to Best's Schedule P data - Gross and Net

Empowered with this application you will obtain:

- Offline access to Best's Schedule P long-tail liability lines and derived financial metrics in an ICRFS™ structured database. Secure the information you need fast!
- Pre-calculated critical financial information:
  - o Reserves Held;
  - o %IBNR;
  - o Total Loss Ratio;
  - o Survival Ratios; and
  - o Much more!

Drill down by classification variables and sort metrics to glean hidden insights.

- All available Best's Schedule P triangles (Net and Gross):
  - o Paid losses;
  - o Case Reserve Estimates;
  - o Incurred Losses (not including BULK and IBNR);
  - o Bulk and IBNR;
  - o Number of Claims Reported; and
  - o Number of Claims Closed.

Acquire any Schedule P loss development array data for trend analysis instantly.

- Additional triangles:
  - o Reserves Held (CRE + BULK and IBNR); and
  - o Ultimates Held (Incurred Losses including BULK and IBNR).

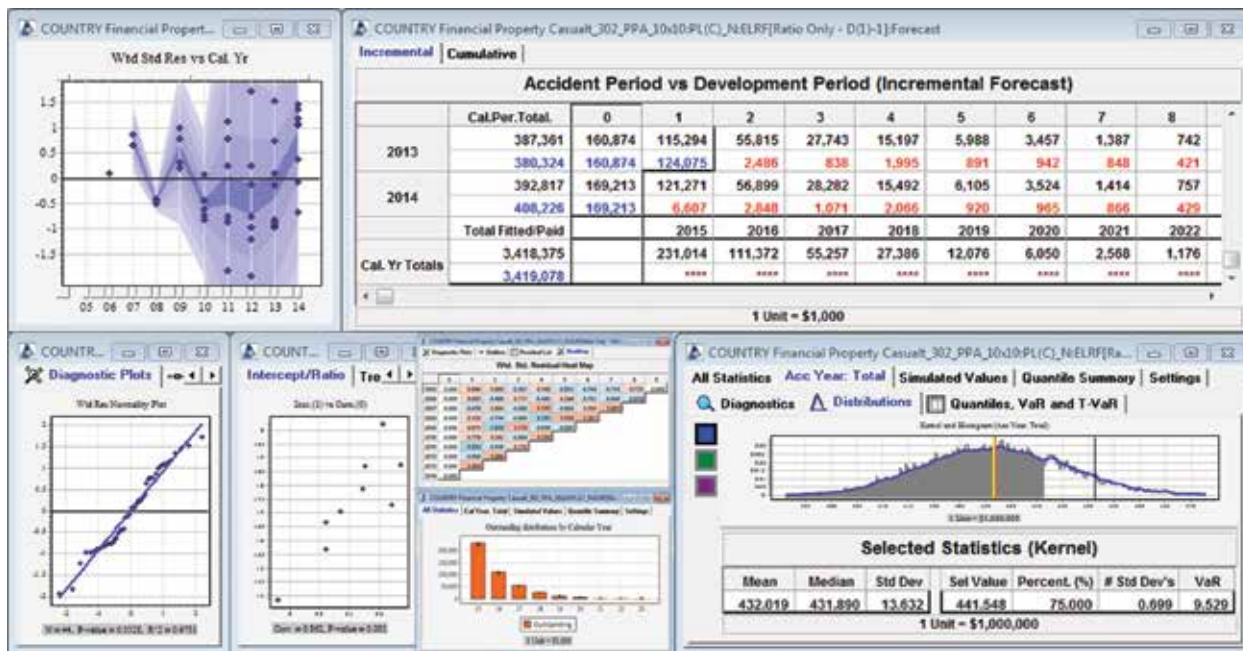
Construct a complete picture of a company's reported liabilities, their holdings, and their financial positioning in the industry.

Company Name	Line of Business	Reserves Held	Total (Gross) Premium	Survival Ratio	Relative Survival Ratio	Loss Ratio	Relative Loss Ratio
Berkshire Hathaway Ins Group (S)_B1_PPA_10x10	Private Pass...	16132964	6031632	2.33	1.07	71.49	1.05
Progressive In...	Private Pass...	1621742	6230327	1.99	0.93	61.96	0.91
USAA Group (S)_4000_PPA_10x10	Private Pass...	5003101	3020750	2.28	1.01	79.48	1.16
MetLife Group (S)_1500_PPA_10x10	Private Pass...	2651136	4480264	1.61	0.83	63.71	0.93
Amesex Fam...	Private Pass...	1977379	2026771	2.49	1.10	70.48	1.03
Travelers Gr...	Private Pass...	1116101	2245953	2.22	1.02	62.81	0.94
Ena Ins Group (S)_4200_PPA_10x10	Private Pass...	1115681	1152564	2.52	1.06	65.87	0.97
Auto-Owners Ins Group (S)_1254_PPA_10x10	Private Pass...	1066883	729384	2.76	1.27	77.70	1.14
MetLife Auto & Home Group (S)_1033_PPA_10x10	Private Pass...	1020225	1213571	2.11	0.97	64.62	0.95
Natl Ins Group (S)_2800_PPA_10x10	Private Pass...	1014054	544861	3.19	1.46	74.99	1.09
Auto Club Group (S)_312_PPA_10x10	Private Pass...	946227	4626713	2.08	1.28	78.08	1.15
CSAA Ins Group (S)_1700_PPA_10x10	Private Pass...	828294	11007833	2.01	0.92	66.96	0.90
MetLife Group (S)_1424_PPA_10x10	Private Pass...	663610	1376085	1.75	0.80	63.53	0.93
Auto Club Enterprises Ins Group _1870_PPA_10x10	Private Pass...	651329	1152629	1.93	0.88	62.04	0.91
Amica Mutual Group (S)_1922_PPA_10x10	Private Pass...	729504	392296	2.57	1.19	70.24	1.04
Haven Insur...	Private Pass...	483113	637289	2.01	0.92	62.97	0.96
Indy Property & Casualty Gr...	Private Pass...	482526	6448122	1.85	0.76	66.22	0.97
Falck Ins Group (S)_1842_PPA_10x10	Private Pass...	470882	372796	2.59	1.13	68.88	1.19
COUNTRY Financial Property Casualty...	Private Pass...	443775	579946	1.88	0.86	66.71	0.98
Amesex P&C Co (S)_1600_PPA_10x10	Private Pass...	383681	316292	1.89	0.83	62.46	1.21
Amesex P&C Group (S)_314_PPA_10x10	Private Pass...	379187	790891	1.93	0.72	60.93	1.01
Southern Farm Bureau Casualty Co...	Private Pass...	336990	4400649	1.87	0.86	74.62	1.09
Shelter Ins Co (S)_1500_PPA_10x10	Private Pass...	280358	377952	2.19	0.96	60.90	1.01
Alfa Ins Group (S)_116_PPA_10x10	Private Pass...	286625	3608189	1.90	0.87	66.87	0.96
Amesex National P&C Group (S)_1956_PPA_10x10	Private Pass...	259990	2345940	2.24	1.03	71.28	1.04
State Auto Ins Co (S)_1200_PPA_10x10	Private Pass...	254291	676642	1.73	0.79	68.49	0.97
National General Co (S)_1585_PPA_10x10	Private Pass...	249727	2534789	1.44	0.66	66.99	1.01
American International Group (S)_1843_PPA_10x10	Private Pass...	239543	4718138	1.96	0.90	73.79	1.00
Safety Group (S)_1890_PPA_10x10	Private Pass...	221670	279795	2.24	1.07	61.27	0.90
Group Mutual Casualty Fund (S)_307_PPA_10x10	Private Pass...	218145	340370	1.97	0.81	61.09	0.90
NYC Ind Ins Group (S)_1952_PPA_10x10	Private Pass...	170532	1744625	2.19	1.01	68.37	0.97





## Analytical tools including the Mack method and the bootstrap technique



Two modeling frameworks are included: the Extended Link Ratio Family (ELRF) and Link Ratio Techniques (LRT). The ELRF module formulates link ratio methods as regression estimators and extends them.

- Methods include:
  - Mack (regression formulation of volume weighted average, chain ladder);
  - Exclusion of whole periods or individual points from estimations;
  - Murphy;
  - Bornhuetter-Ferguson; and
  - Much more!

Within an interactive, intuitive, graphical interface.

- Comprehensive diagnostic tests to validate that assumptions made by link ratio and related methods are carried by the data - including the bootstrap technique.
- Link ratio techniques:
  - Volume weighted average, Chain ladder;
  - Arithmetic average;
  - Last N diagonal weighted average;
  - Two parameter smoothing;
  - Three parameter smoothing;
  - Bornhuetter-Ferguson; and
  - Much more!

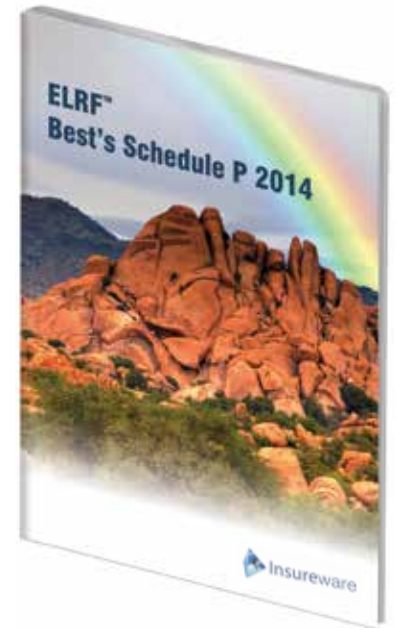
**Positioning. Acquisition. Investing. Monitoring.**  
**Be informed** with accurate and timely information.

## ELRF™ Best's Schedule P 2014

Exclusive to Best's Schedule P subscribers

- Free with a Best's Schedule P subscription
- Offline access to Schedule P long-tail liability lines and derived financial metrics
- Pre-calculated critical financial information including Reserves Held, %IBNR, Total Loss Ratio and more!
- Drill down by classification variables and sort metrics to glean hidden insights.
- All available Schedule P triangles (Net and Gross)
- Additional Reserves Held and Ultimates Held triangles where they can be calculated
- All analytical tools included in ELRF™

Construct a complete picture of a company's reported liabilities.



## ICRFS™ Best's Schedule P 2014

Exclusive to Best's Schedule P subscribers

- All of the benefits and features of ELRF™ Best's Schedule P 2014
- Probabilistic Trend Family (PTF) Modeling Framework:
  - Identify trends in the three directions (development, accident, and calendar);
  - Measure the volatility around the trends; and
  - Compare loss costs between companies and LOBs
- Multiple Probabilistic Trend Family (MPTF) Modeling Framework:
  - Measure correlation between LOBs driven by the data;
  - Determine risk capital allocation and diversification credit for entire companies
  - Calculate Solvency II one-year ahead statistics and associated risk for individual Lines of Business or whole companies; and
  - Much more!



ELRF™ Best's Schedule P 2014 is available to all Best's Schedule P subscribers through BestLink and requires an active Best's Schedule P subscription. The pre-loaded Best's Schedule P data includes both Net (20x10 and 10x10) and Gross (10x10) arrays.

For more information on Best's Schedule P  
please contact A.M. Best.  
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## ELRF™ Professional

ELRF™ Professional contains two of the analytic modules of ICRFS™. Namely the Extended Link Ratio Family (ELRF) and the Link Ratio Techniques (LRT) modeling frameworks. Fully featured relational databases can be created as a repository for all your data and models. A COM API is available to import/export data.

The Extended Link Ratio Family (ELRF) modeling framework formulates average link ratio methods as regression estimators and extends them. This includes Mack (volume weighted averages) and other weighted averages and extensions:

- o Murphy (an intercept)
- o A constant trend in the incrementals for each development period down the accident years

The Bootstrap technique in the ELRF module gives:

- o Distributions of reserves by accident years, calendar years, and total
- o Percentiles, V@Rs and T-V@Rs
- o ... and more!

Diagnostic statistics to test assumptions made by any ELRF model:

- o Residuals versus development year, accident year, calendar year, and fitted
- o Y|X plots to test whether link ratios have predictive power in the presence of an intercept
- o ... and more!

The LRT module includes a full range of methods:

- o Chain Ladder (Volume weighted averages)
- o Weighted averages
- o Two and three parameter smoothing
- o Bornhuetter-Ferguson
- o ... and more!

## ELRF™ Free:

### Do link ratio methods work for you?

Insureware also provides a free version of ELRF™ Professional with limited database functionality (and no COM access) for you to test whether link ratios work for your business.

All analytical methods available in ELRF™ Professional are included.



**FREE**

**Get ELRF™**

**Find out whether link ratio methods are endangering your company.**

**Contact [elf@insureware.com](mailto:elf@insureware.com) now to find out how to get your free software!**

## About Insureware

Insureware is not your typical long-tail liability risk management firm: we are R&D focused. Our team of world-class statisticians originated many of the ideas that the industry now aspires to. They have published numerous papers not only in actuarial journals but also in preeminent statistical journals. Insureware creates and supports the only comprehensive, enterprise wide, long-tail liability risk management software in the world.

Insureware creates unique collaborative partnerships with each client. The partnership facilitates the growth of incomparable knowledge, benefits, and applications.

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Insureware

Innovative Statistical Solutions for P&C Insurance