Whitepaper.

Level Up: Pricing Innovation, Maturity & Value.

The principles and properties of a modern pricing platform

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About the authors.

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Konrad is a Principal Architect at Ascent. A lifelong software engineer, he knows what's important for developers to be successful. Konrad is a domain expert in reinsurance and identity and access management, with skills that have been forged and honed in many projects in the reinsurance industry over the last two decades.

Pricing calculation and data analysis are critical and fundamental capabilities for every insurance and reinsurance business.

So why do these capabilities typically still depend on manual tasks and decentralised processes? And what does a better solution look like? We discuss the characteristics of a modern pricing platform and the features it needs to meet the demands of a rapidly evolving industry.

The problem with pricing silos.

In many insurance and reinsurance businesses, Excel is still one of the most popular tools when it comes to pricing, market analysis, scenario testing and calculations in general.

Sometimes pricing requires underwriters and actuaries to spend hours cleaning and wrangling data before it is fit to use in pricing tools. Or sometimes the entire calculation takes place in Excel, using formulas, macros and add-ins.

Excel is easy to use and very flexible for underwriters who need to work with data and parameters to calculate alternative models, as it combines excellent user interface capabilities and a broad range of formulas and features. Very often, data is already exchanged via Excel files, so processing in Excel comes in quite handy.

This approach, however, is inherently problematic.

Reproducibility and data accessibility.

Excel delivers frontend, database, and calculation engine in one application – combining data and algorithms for pricing in a siloed environment (Figure 1). So when Excel files are stored in different places, businesses are liable to not only lose track of pricing results, but also the data and algorithms used to produce the results. And in scenarios where pricing results have to be reproducible (such as for regulatory requirements), this means keeping track of multiple versions of data-related algorithms and their parameters.

Furthermore, data in Excel files is rarely available centrally or in a standard format to be used later for more advanced data analytics, locking away potential value in folder structures. The distribution of these files also carries risk from a governance perspective, and make consolidated reporting on real-time KPIs extremely difficult and fragile.
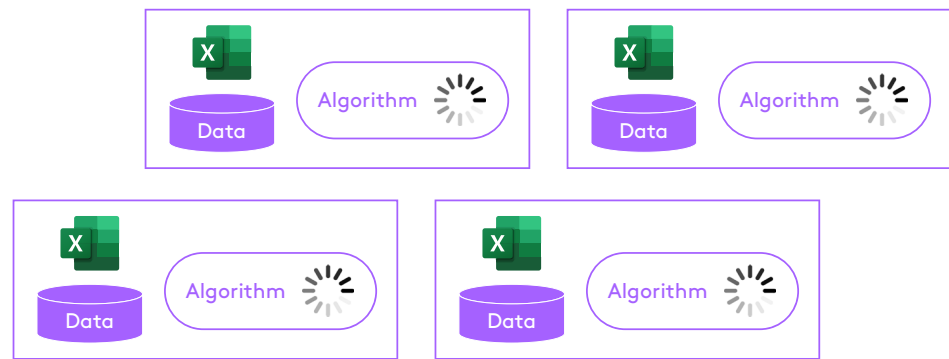
Figure 1: Excel data silos.

Market responsiveness.

In a competitive, recovering economy, insurers and reinsurers need to maintain focus on developing new products that can be brought to market quickly in response to consumer needs, and/or that make better use of data. It's therefore critical that the pricing solution is able to incorporate modern components like AI-based algorithms or new data (structured or unstructured, from internal or external sources). Similarly, legacy pricing approaches that entail manual processes and decentralised, non-standard data siloes prevent insurers and reinsurers from being able to pivot or capitalise on more granular or niche opportunities as they arise, as the cost and time involved are prohibitive.

A better approach to pricing.

Calculation engine.

To improve pricing workflows, insurance and reinsurance businesses need to rethink their approach to data and calculation. Important questions include:

- How do we embed a calculation engine that supports a centralised pricing approach?

- How quickly can the calculation engine deliver new features in response to changes in pricing strategy? How do we avoid the requirement for new products or updates every time?

- How does the pricing engine help us reduce time-to-market for new insurance products?

- How should we approach large-scale calculations or bulk analysis on a portfolio?

Underlying architecture.

Pricing may be all about data and algorithms, but they need to maintain a symbiotic coexistence with underlying software architecture to really deliver the extensibility, scale, and flexibility that modern insurance and reinsurance companies need.

Extensibility	The pricing solution needs to be able to update or include new algorithms and combine calculation steps. This should not require a fundamental change to the pricing applications to speed up product delivery.
Scalability	The pricing solution needs to scale with increased workloads. Pricing jobs can be long-running tasks that need to be managed to make best use of the platform. Some calculations might have real-time requirements, creating different challenges on the platform.
Flexibility	The pricing solution needs to be able to use variations and versions of data and calculations. Underwriters need to be able to compare versions of data sets, and also be able to use variations of data and pricing parameters to determine the best outcome.

The principles and properties of a modern pricing platform.

Based on our extensive experience with some of the world's leading insurers and reinsurers, we've developed a set of principles and properties that should guide the development of any modern, competitive pricing platform.

Principles.

- **Data-first approach**: Data must become a first-class citizen in the pricing solution. Data must be available centrally so that it can be used by different systems and must remain available for later use with more advanced algorithms.

- **Flow-based algorithms**: The calculation engine should use a flow-based algorithm that breaks the calculation exercise down into discrete steps. The flow combines data and processing steps to produce results. Think of a processing step as a formula, a script or a calculation kernel implemented in programming languages like R or Python. Figure 2 (p. 8) shows the principle of a calculation flow, including data and processing components. The pricing solution should allow the addition of new data and processing steps without fundamental change to an application of a digital service.

- **Calculation flow:** The calculation flow should be separated from software products used for data input and output. This makes the solution usable by different pricing tools and software products offered to clients. This also supports scalability when the pricing can be distributed across multiple servers, typically using a cloud platform that enables compute power to be dialled up and down as needed.
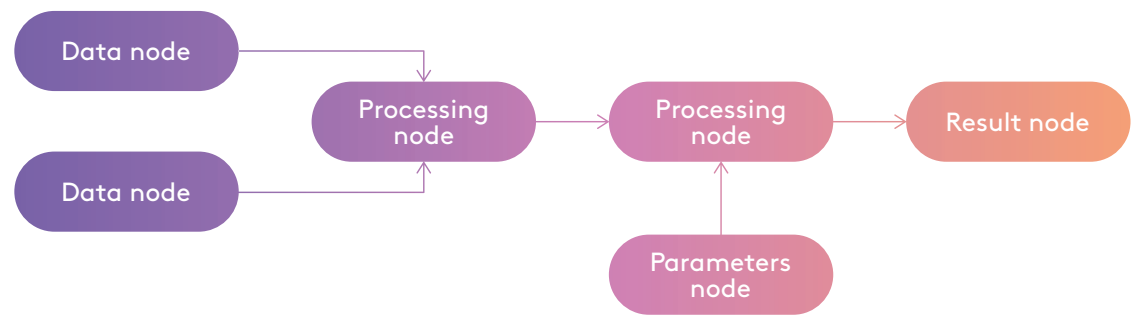
Figure 2: Calculation flow.

Data.

The use of both structured and unstructured data is constantly evolving. Data files used should be kept in central repositories like a data lake to ensure they are available for future or wider use. Structured data extracted from documents or Excel files should also be made available for consumption by multiple applications and services – a good example might be the use of loss data across many clients for market analysis purposes.

Underwriters often end up with multiple versions of data that reflect serial updates. A pricing solution must be able to keep track of different versions efficiently and provide the capabilities to compare them to understand what has changed. Similarly, underwriters might want to create variations of data or pricing parameters for as-if calculations to determine the impact on pricing results.

Being able to tag versions to data structures creates auditability, allowing businesses to track and reproduce pricing results, fulfilling regulatory requirements at the same time.

The calculation flow mentioned above helps to keep track of data lineage: which data set was calculated with what version of pricing algorithm to produce the actual results. This allows great control over dependencies and when results need to be recalculated.

Processing.

Calculations take input data and execute the processing steps as a flow. The generic nature of the flow offers several advantages:

1. **It decouples software tools and digital services from the calculation models.** Calculation kernels can be updated without changing applications, avoiding expensive and lengthy release cycles.

2. **It is extensible.** A workflow approach also allows for extending the calculation flow with additional processing steps. Algorithms can be implemented in traditional ways, like R scripts and Python, but can also involve modern AI-based approaches. By extending the calculation graph with alternative calculation flows, different results can be calculated, compared and weighted if required.

3. **It enables better simulation.** Being able to inject processing steps into a calculation is particularly useful for simulations. Consider this scenario: to test the effect of an increased inflation rate, a software system injects an additional processing step into the calculation flow and calculates the effect on the data. With the separation of the calculation flow from any software frontend, this can be done not only on a single data constellation, but also in bulk to determine the effect on an entire market or business model.

Calculation platform.

The separation of the calculation flow from a specific application or digital service also opens up new capabilities:

- New or updated calculation models can be defined without changes to a software system
- Large-scale calculations with large sets of data or long-running algorithms become possible
- Calculations and simulations of entire portfolios of contract or market data can be achieved.

A modern pricing solution supports both real-time and long-running pricing tasks, scaling to accommodate big workloads. Some models can involve significant requirements in terms of computing power, memory consumption and processing time. The underlying pricing platform must be able to monitor, audit, track, distribute, start and stop pricing jobs.

The solution needs to be able to distribute calculation steps across multiple nodes, adding computing power when needed and shutting down nodes when idle to minimise cost.

In summary.

Modern pricing platforms, built on the right principles, have the power to transform the way insurers and reinsurers operate, innovate, compete and respond to changes in the environment around them. Whether driven by regulatory requirements or client demand, the ability to absorb change in a cost-effective, non-disruptive way will be a critical success measure as the industry continues to evolve at pace.

If you are developing your own pricing platform, it's important to understand the specific properties that will maximise your investment. The principles and characteristics described in this paper should help steer your approach and improve your likely ROI, helping you deliver flexibility and scale with the ability to extend, include and combine sources of value. And if you are looking for a team of experts who have delivered solutions for Tier 1 insurers and reinsurers, we are just one email away.

ASCENT

How Ascent helps Insurers and Reinsurers.

Ascent helps leading global insurers and reinsurers to build new capabilities and accelerate digital maturity in the cloud. Over the years we've worked on a wide range of projects in the industry, from underwriting process automation and exposure data transformation to innovative applications and complete technology replatforming.

You can find out more about our experience here.

Data & analytics:

Helping you predict, prevent and personalise at scale.

Process digitisation & automation:

Free your underwriters, actuaries and agents.

Legacy system & application modernisation:

Transform performance, scale, governance.

Technology replatforming & cloud service adoption:

Industrialise, centralise & standardise across the value chain.

CX-driven innovation:

Build richer products and more informed experiences for your customers.

Get in touch.