Tyche
Modelling redefined
“RPC Consulting offers independent, fairly priced, integrated actuarial, management consultancy and software services.”
What is Tyche?

**Tyche is a high speed, flexible and low cost modelling platform**

Tyche gives companies a faster, more flexible way to explore, manage and communicate risks. As management, shareholders and the regulators strive for ever greater insight into the risks firms face, the ability for companies to model risks quickly, flexibly and accurately has never been more important. Tyche has been developed to help firms respond to these challenges and gain deeper and far more timely insight by leveraging affordable “commodity” hardware and ground breaking advances in parallel software design. This parallel processing is key and lies at the heart of Tyche’s performance capabilities and allows Tyche to work silently in the background so users can get on with more business centric tasks that deliver even greater value.

The design goals at the heart of Tyche are simple – deliver a solution that is faster, easier and cheaper. We have done that. By being easier to build, easier to debug, and easier to validate (and offering runtimes that can be up to 100 times quicker than incumbent systems even on standard desktop, server and grid hardware) modelling in Tyche can lower operating costs materially. Whether you are a smaller team or a global multi-jurisdictional enterprise, Tyche gives you the power and the functionality to do things you have never done before.

<table>
<thead>
<tr>
<th>Client</th>
<th>Model</th>
<th>Runtime: last-generation software</th>
<th>Runtime: Tyche</th>
<th>Tyche Speedup</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regional insurer</td>
<td>Capital model</td>
<td>5 hrs</td>
<td>2 mins</td>
<td>150x</td>
</tr>
<tr>
<td>Top 20 Lloyd’s</td>
<td>Lloyd’s capital model</td>
<td>9 hrs</td>
<td>3.5 mins</td>
<td>154x</td>
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<tr>
<td>Top 10 Lloyd’s</td>
<td>Gross underwriting</td>
<td>90 mins</td>
<td>30 secs</td>
<td>180x</td>
</tr>
<tr>
<td>Top 5 Lloyd’s</td>
<td>Gross underwriting + data export</td>
<td>2.5 hrs</td>
<td>1.5 mins</td>
<td>100x</td>
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<tr>
<td>Broker</td>
<td>Aggregate reinsurance pricing</td>
<td>15 mins</td>
<td>2 secs</td>
<td>450x</td>
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<tr>
<td>Top 20 Lloyd’s</td>
<td>Capital model</td>
<td>1 hr 15 mins</td>
<td>4 mins</td>
<td>19x</td>
</tr>
</tbody>
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How does Tyche work?

Today, computer hardware is more diverse, complex and powerful than it has ever been. However, most currently-available modelling software fails to take full advantage of these latest advances in technology.

Tyche is different.

Tyche has been designed specifically with the current generation of hardware in mind, with in-built future-proofing for new technology as it is introduced. The low level computational algorithms in Tyche have been written to make direct use of massively parallel SIMD (Single Instruction Multiple Data) architectures leading to significantly reduced run-times. The user interfaces and dashboards have been designed to make building models in Tyche easier and more intuitive. The structure of Tyche allows models to be audited more easily and the process to debug models is streamlined to reduce the complexity of correcting large scale calculations. These advances are all core to the design of Tyche and allow companies to create real value from their models by integrating their use in their day to day decision making.
If you already use one of the common actuarial programming interfaces, Tyche will feel very natural to use. As a first step, Tyche can replicate existing models with significant speed and functionality improvements. Models can then be refined to make optimum use of the parallelisation Tyche offers.

Being able to construct models with minimal effort is just as important as being able to run those models quickly. Tyche provides a suite of advanced model construction tools, enabling quick design and straightforward maintenance of complex models. In particular:

- Tyche has a clean and simple user interface
- FlowgramsTM visually represent a model more intuitively than a “pure code” approach
- customised node types provide convenient pre-built approaches for specific problems
- Tyche’s T# language offers a tailored solution for performing complex calculations
- Tyche’s dashboards allow for clear visualisation of results.

Tyche gives you a flexible, easy to use modelling tool
Where can Tyche be used?

Tyche is built for actuarial, quant, risk and research teams. It has been designed from the ground up to provide supercomputer power in a package that is as easy to use as a spreadsheet. It gives sophisticated modellers the power they need to create complex models whilst allowing less technical users to easily construct intuitive models that answer their questions.

Tyche works in both desktop and server environments. Tyche does not require specific hardware, although it can take advantage of more advanced hardware if it is available. The Tyche engine and toolkits host statistical modelling applications focusing on actuarial and financial analytics (life and non-life, reserving, pricing and capital modelling), econometrics and areas further afield.
Why choose Tyche?

There are a number of key features that make Tyche different. It goes beyond what other modelling platforms can deliver and allows you to create real value in different areas of your business.

Run on the platform you want
Tyche runs seamlessly on grid, cloud, server, desktop or laptop environments. It can also be offered as a hosted solution if needed.

Keep your costs down
The engine and toolkits are built and licensed separately. Annual set costs are highly competitive.

Don’t hang around
Think seconds and minutes for calculation of results – not days or hours.

Write in the language you know
Calculation units can be written in the languages you know including C++, C#, Visual Basic and Excel, but may also be written in our own scripting language T#, explicitly tuned to stochastic calculations.

Build models with no compromise
With in-built SDE integration capabilities and robust calibration, Tyche’s ground breaking speed supports “Stochastic on stochastic” making fully nested stochastic models a reality.

Leverage broad functionality
- Statistical routine library
- Linear and nonlinear optimisation
- Root-finding routines
- Calibration and fitting routines
- Excel/database import/export
- C#, C++, VB, Excel calculations