The Actuarial Profession
making financial sense of the future

Modelling with PillarOne
Risk Management Meets Open Source

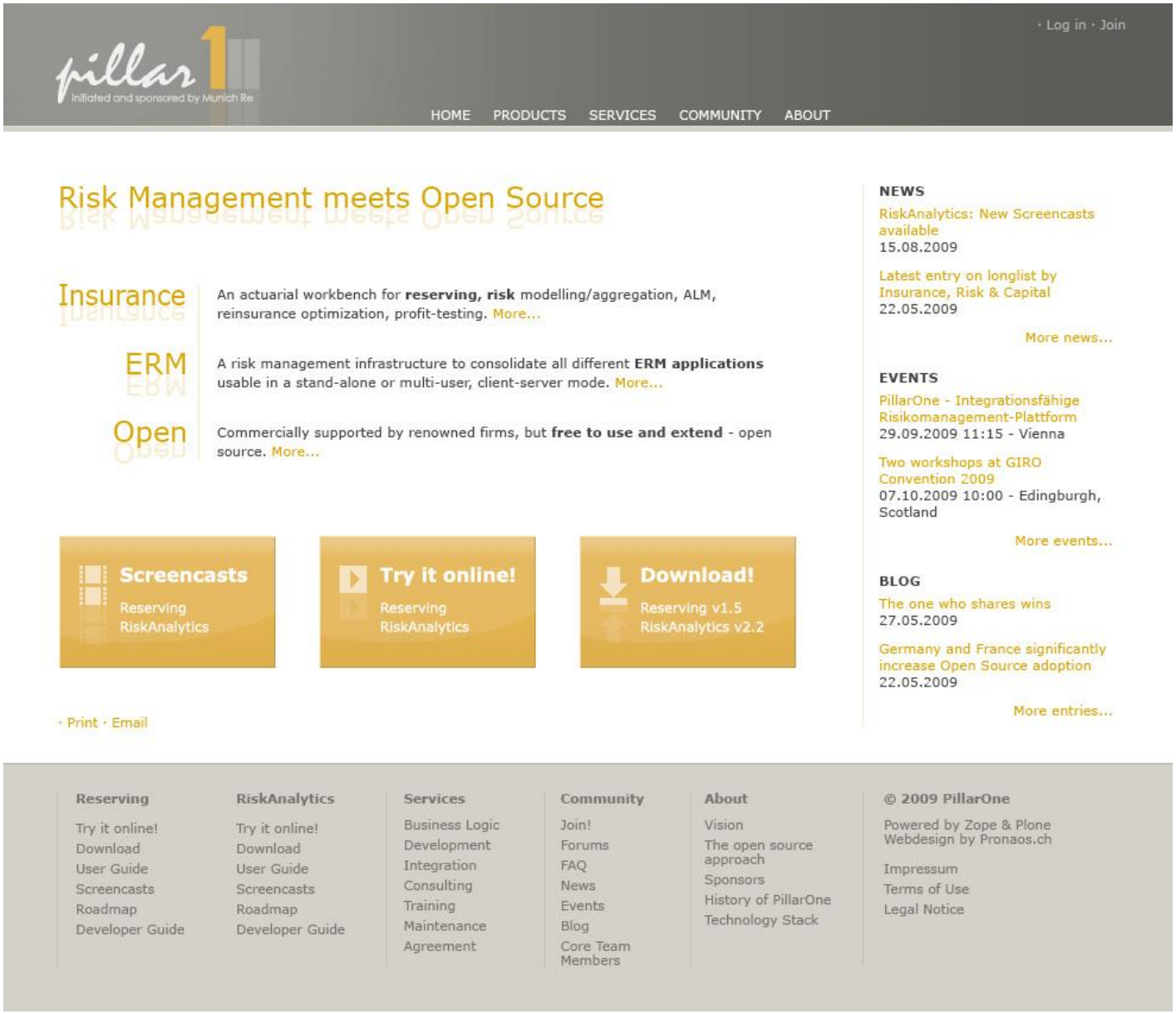
Markus Stricker and Stefan Kunz, Intuitive Collaboration
GIRO 2009, Edinburgh

PillarOne

- Driven by a community with dedicated resources – **open source**
- An **Enterprise software suite** for actuarial applications, e.g. reservierung, risk modeling/management and pricing/profit testing
- A **community** which encourages the exchange of concepts, methods and implementations around enterprise risk management

Software Platform

Community



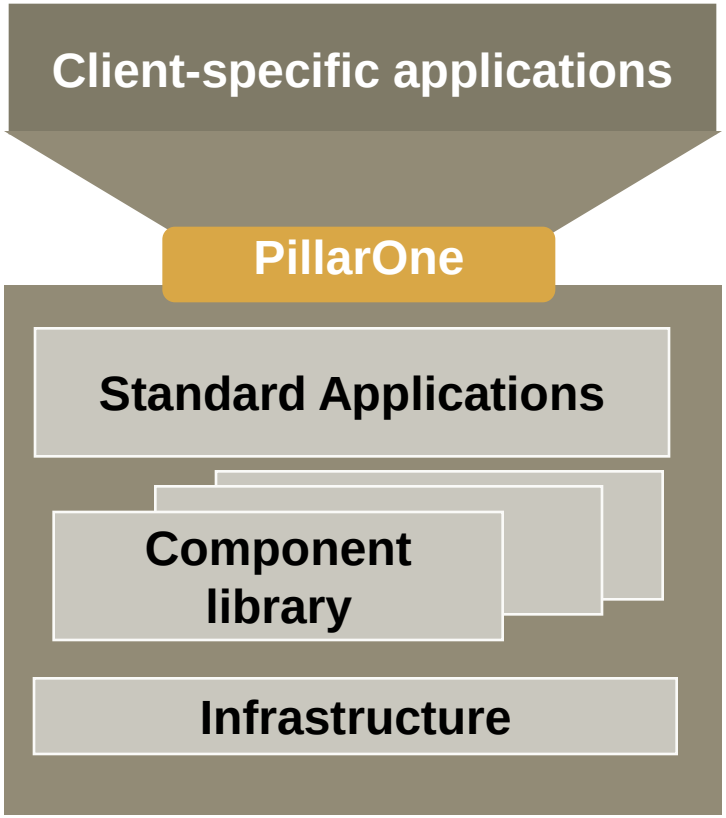
www.pillarone.org

An Actuarial Workbench

The IT challenges are the same for all market participants. The standard, economical approach is to

→ To provide a common risk infrastructure as a professional, modular base for an actuarial workbench.

→ To guarantee a high level of flexibility to implement company-specific models and tools



Applications/Products

- RiskAnalytics
  Modelling environment for deterministic and stochastic models, such as risk and capital models like Solvency II, ICAS, Swiss Solvency Test, reinsurance optimization, etc. (modelling examples follow)

- Reserving
  P&C reserving application (see Track B3)

- Life (in progress)
  Environment for embedded value and profit testing.

IT Advantages

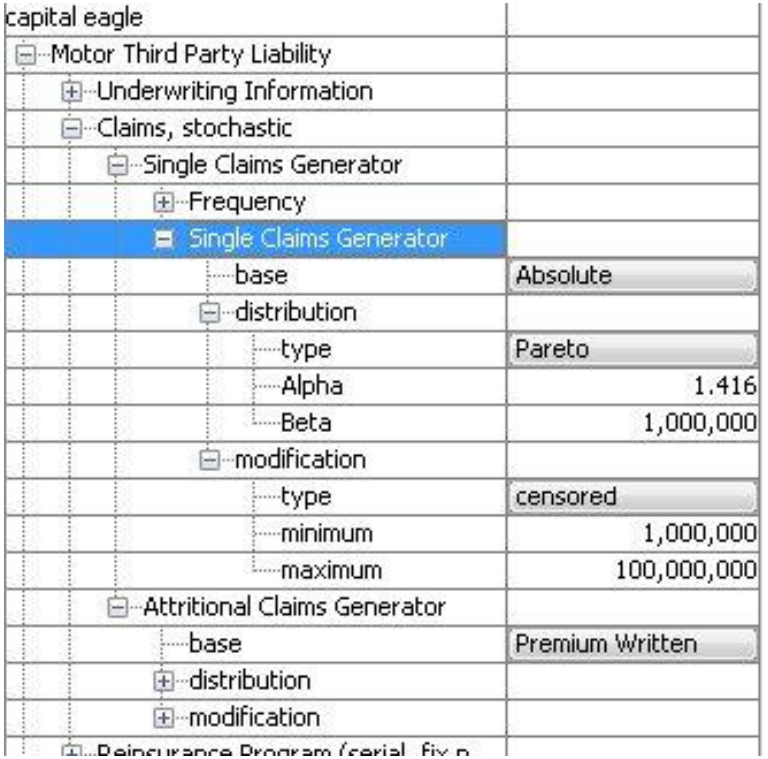
- Multi user, client-server and stand-alone
  - Client-server for an actuarial workbench in a company,
  - Stand-alone for consultants and evaluations
- Operational safety and audit trace
  - Includes data versioning to guarantee full reproducibility
  - Who did what and when?
- IT Integration:
  - Operating systems: Windows, Unix/Linux or Mac
  - Databases: MySQL, Oracle, MS SQL, db2, MaxDB, etc.
  - Authorization and authentication with LDAP or ActiveDirectories
  - Reporting Engines: JasperReport, Birt, Business Object, etc.

Business Advantages

- Validation
  - Automated testing of methods, components and models.
  - Validation rules for parameters.
- Simulation Engine
  - Includes support for multi-period simulations
- Libraries with re-usable business logic
  - Claims generators
  - Dependency models
  - Exposure and underwriting info
  - Reinsurance contracts
- Example models and applications

Models and Components

- A model is a collection of components
- Components can contain components → hierarchies
  Examples: LoB, claims generator
- Components can send and receive more than just lists/arrays of floating point numbers
  Examples: List of claims contains also claims origin, incurred date, exposure information



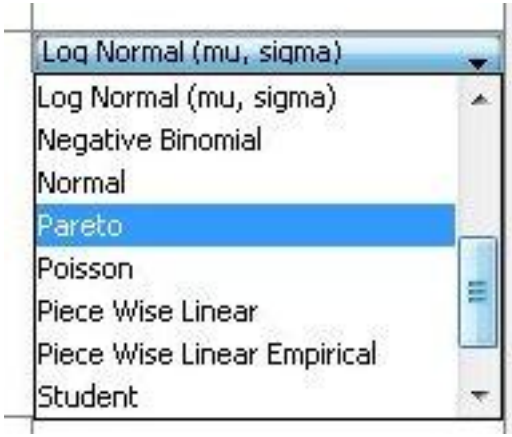
Components

Three different kinds of components

- Ordinary component: Captures a piece of business logic with parameters

- A placeholder for a set of components with similar properties – „chose from“

  Examples: Claims distributions, the model definition will not specify which one is used. The parameterization of the model will define it.



distribution	
type	Pareto
Alpha	1.416
Beta	1,000,000

distribution	
type	Piece Wise Linear
support points	[[0; 1]; [0; 1]]

distribution	
type	Log Normal (mu, sigma)
mu	0
sigma	1

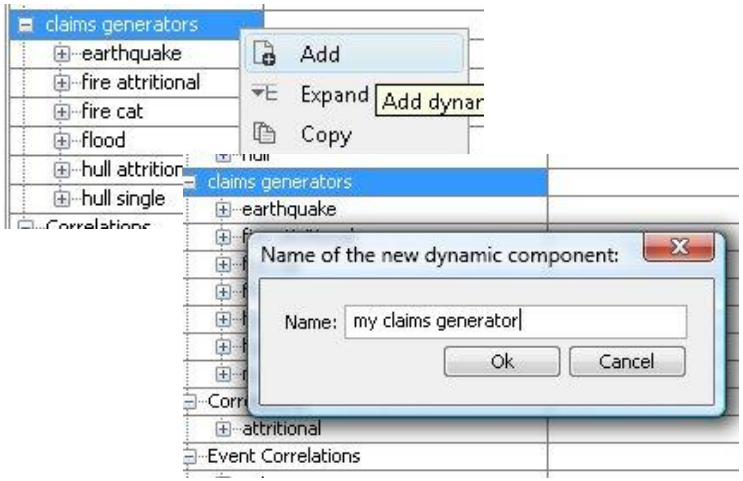
Dynamically Composed Components

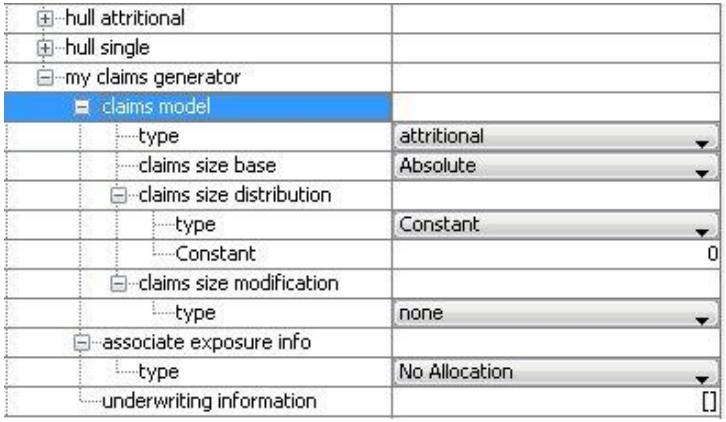
Dynamically composed components contain a user or data defined number of one component* type

→ Very powerful to specify models which can be extended in a safe and controlled way by business users

Examples: If a line of business component is dynamically composed, then the user can add LoBs by just adding their data in a parametrization

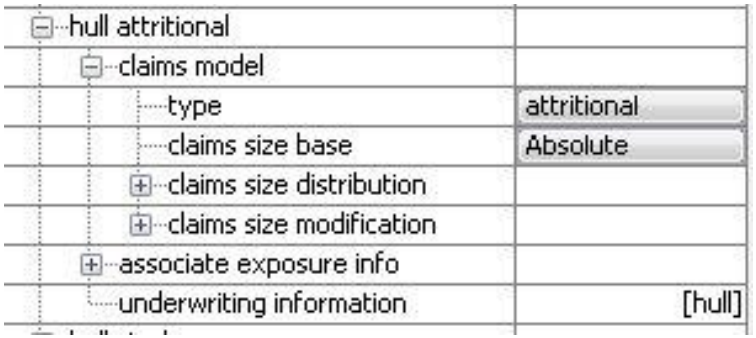
* Can contain a component hierarchy





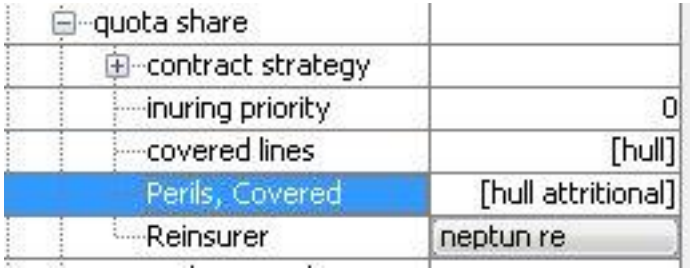
The Power of Typed Data

Example: Which claims are covered by a reinsurance contract?



- Claims are not just floating point numbers. They have other properties (e.g. claims type, currency, an incurred date)

  This way, components can filter the relevant information (e.g. for claims origin)



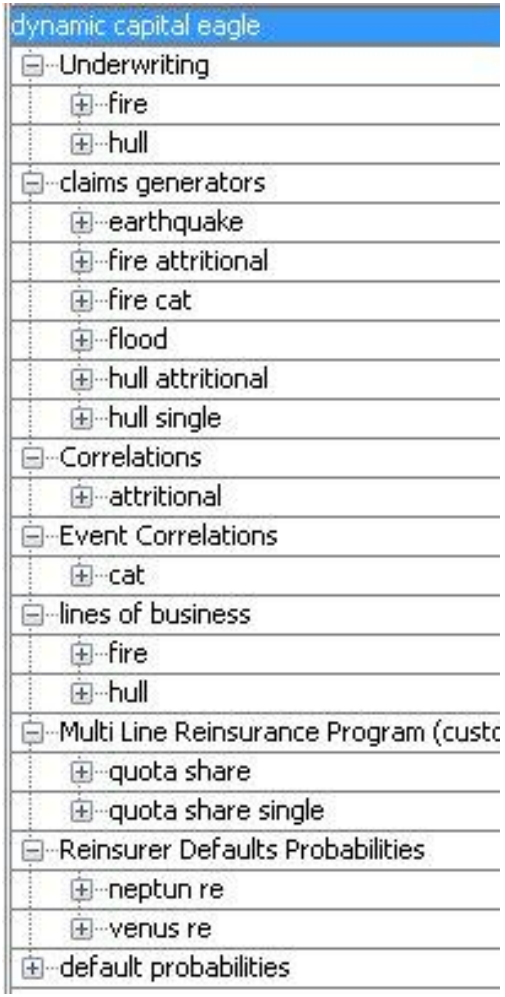
- In a dynamic model environment strong data types are essential

Model Prototypes/Templates

The example model to demonstrate the power of dynamically componsed components is Dynamic CapitalEagle.

All top-level components are dynamic:

- Underwriting
- Claims generators
- Dependency structures
- Lines of Business
- Reinsurance



RiskAnalytics – Roadmap

Fall 2009 – v 0.4

- Data driven modelling, including sample application for reinsurance modelling (as demonstrated)
- Internationalisation (GUI can be configured for any language)

Spring 2010 – v 0.5

- Components for asset modelling
- Components for reserve risk modelling, including import from PillarOne.Reserving
- Comparison of simulation results
- Commenting of parameters (collaboration support in multi-user mode)

Contact

INTUITIVE COLLABORATION

Markus Stricker
Managing Director
PhD, Actuary SAA

INTUITIVE COLLABORATION
Seestrasse 16
CH-8712 Stäfa
www.intuitive-collaboration.com

Phone +41.44.9261088
Mobile +41.76.4232667
markus.stricker@intuitive-collaboration.com

INTUITIVE COLLABORATION

Stefan Kunz
Consultant
MSc Actuarial Sciences

INTUITIVE COLLABORATION
Seestrasse 16
CH-8712 Stäfa
www.intuitive-collaboration.com

Phone +41.44.926 1088
Mobile +41.76.370 3186
stefan.kunz@intuitive-collaboration.com