

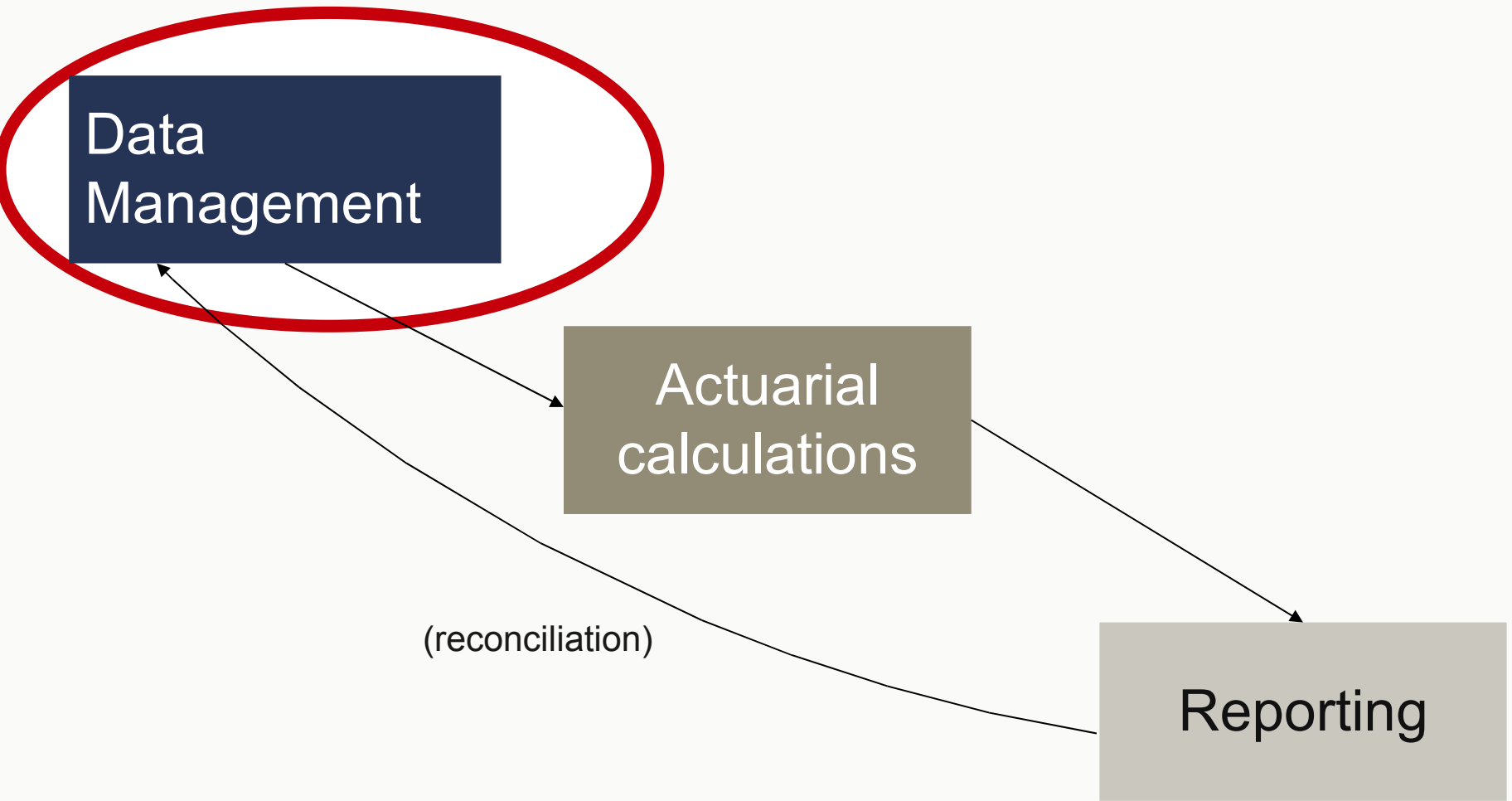
PillarOne – Open Source Reserving Software



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Intuitive Collaboration





PillarOne uses dedicated structured data types for all reserving objects, e.g. triangles, patterns, time series, projections.

A triangle for example is more than a collection of figures in cells.

It has

- a dated reporting interval structure (accident year, underwriting year)
- a development interval structure,
- a currency (where applicable)
- comments referring to the entire triangle, or to single cells, rows, or diagonals

Structured data types provide additional safety.

Structured data types give additional power

Structured data types prevent

- adding amounts of money to numbers of claims
- adding claims amount from an underwriting year triangle to those of an accident year triangle
- applying a method requiring a tail pattern to a line where none is defined
- discounting amounts in EUR with a yield curve for USD

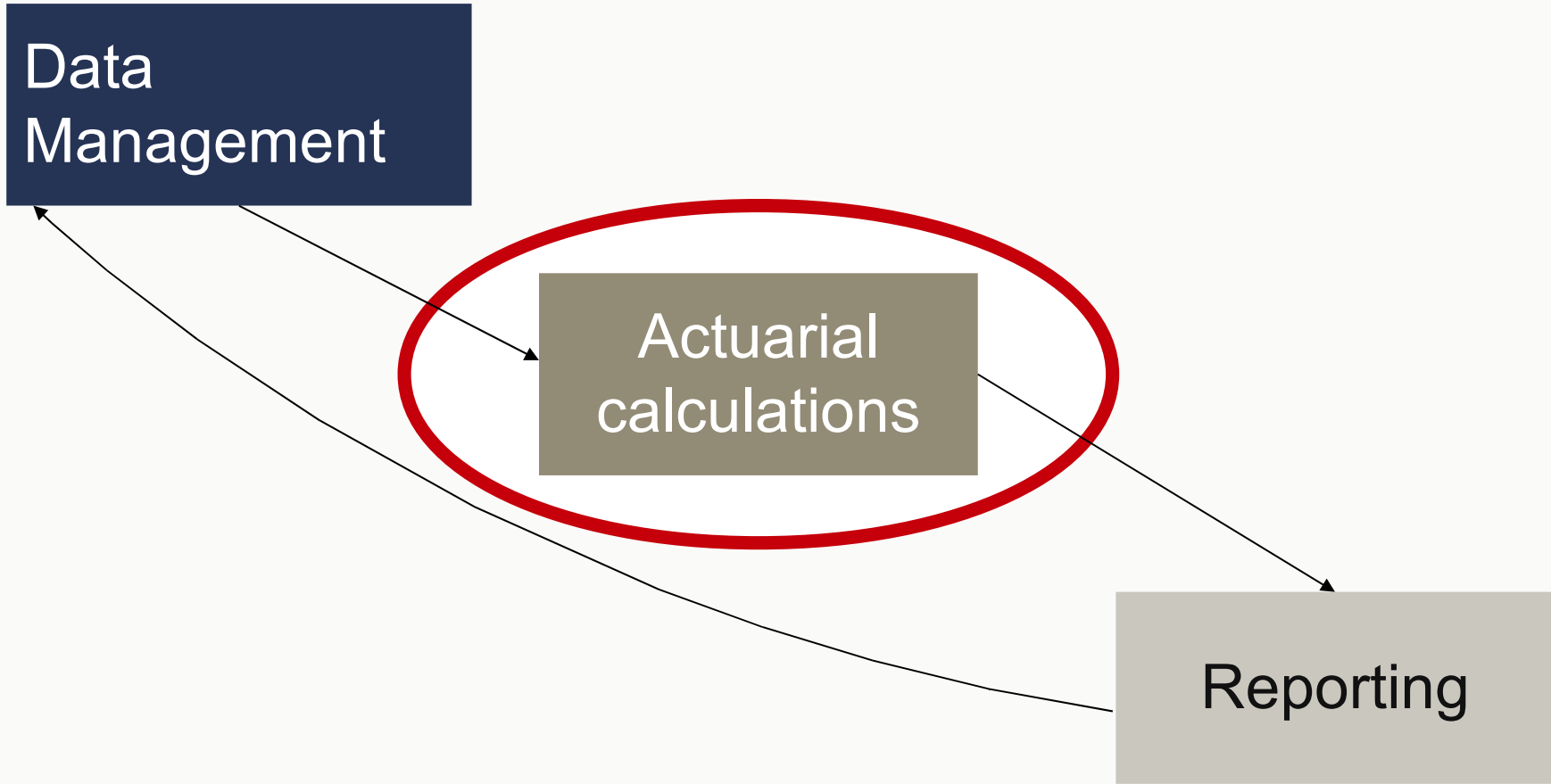
Structured data types ensure

- correct aggregation of triangles starting at different times
- ... even when they have different period lengths, as long as one is a multiple of the other

- Designed for enterprise use, data base oriented
- Native support of all major database formats.
Not limited to data import:
the whole reserving project **is** a database,
Results are objects added to the database

Advantages:

- All the well known advantages of professionally managed data handling: reliability, backups, ...
...historized save of all changes -> audit trail
- Enables cooperative multi-user work on the same data



Diagnostics

- Automatic scans for common data errors
e.g. negative cumulative paid
- Sensitivity analysis
- Runoff analysis (observed vs. predicted last diagonal)

Calculation methods

- Whole link ratio family (Chain-Ladder, regression, etc)
- Additive model, BF
- Definition of user-defined compound methods
- Use of tail patterns (generalization of tail factor)
- One-click “apply to all nodes” functionality

What is a *method* in PillarOne?

A method is a “thing” acting on a reserving node and returning a projection to ultimate.

A method combines

1) An algorithm (e.g. Chain Ladder)

2) Named data, e.g.

a triangle “paid claims”,

a tail pattern “chief actuary approved tail”

Chain Ladder on paid losses is thus a different method than Chain Ladder on incurred losses or Chain Ladder on paid LAE.

Any method can be applied to any reserving node containing the required data items.

Compound Methods

Are a powerful tool to combine one or several defined methods in a number of ways. The defined methods are parameters of the compound method. Compound methods may be parameters of other compound methods.

Examples

- **Compound Bornhuetter Ferguson**

Method specifies how to compute pattern

- **Compound by reporting period**

Specifies Method A for greenest n periods,
Method B for the others

e.g. BF for latest year, Chain-Ladder paid otherwise

- **Compound Sum**

$a \cdot \text{Method A} + b \cdot \text{Method B}$

Sum can be used to “average” projections of the same data, but also to aggregate projections of different data items, e.g. CL(paid losses) + BF(paid LAE).

- **Compound Sum weighted by TimeSeries**

Sum with period specific weights a_t (and $b_t = 1 - a_t$)

- **Compound from Incurred projection**

Uses a paid method as argument to get reserves and a

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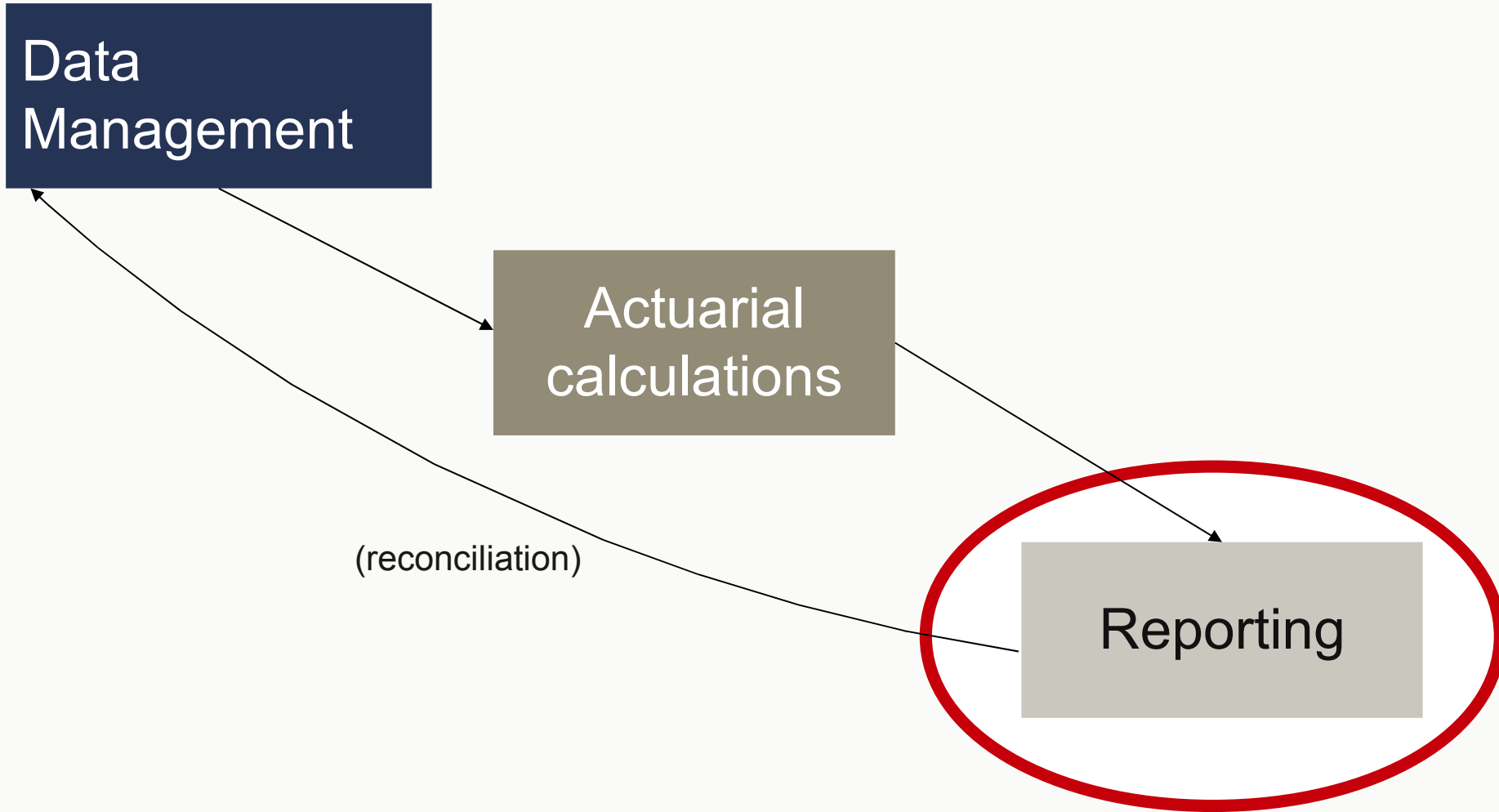
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- **Compound Sum weighted by TimeSeries**

Sum with period specific weights a_t (and $b_t = 1 - a_t$)

- **Compound from Incurred projection**

Uses a paid method as argument to get reserves and a cash flow pattern



Aggregation / Reconciliation

- Free multidimensional structuring of data, e.g. currency, continent, country, LoB, legal entity, corporate/private business, etc.
- Projections can be computed on aggregated node level and compared with aggregation of individual projections
- Automatic aggregation along hierarchy based on tags i.e. items with same name are collected within all child nodes
- Invalidation of projection depending on changed data (“referential integrity”)

Roadmap

Planned improvements

- more statistical tests, analysis and diagnostics
e.g. independence tests of reporting periods,
lines of business etc
- more pre-defined methods
e.g. methods producing accident year results from
underwriting year data, Munich Chain-Ladder
- easier data import from spreadsheets
- improved graphics
- “tags” for selective aggregation and reporting