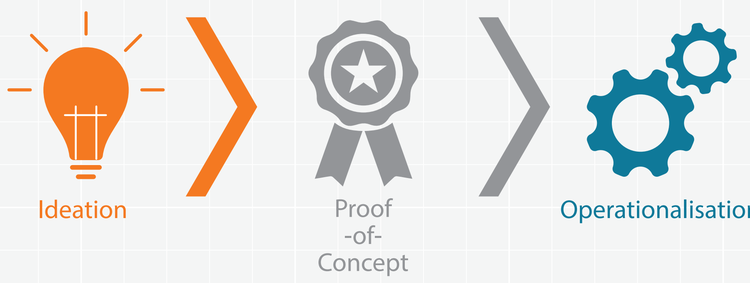
INTEGRATION of an *R* FORECASTING ENGINE in the *.NET* back-end of *c-Quilibrium's* CASH SUPPLY CHAIN OPTIMIZATION SOLUTION

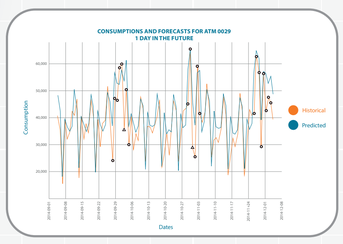
Davy Sannen

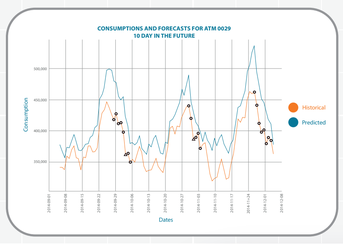
A data analysis project usually does not end after the analysis phase. Typically your newly developed R algorithms must be integrated into an operational production system before they can realize their added value. This presents us with some additional challenges to be tackled.

We share the choices we made, the R packages we used and the lessons learnt by integrating an R forecasting engine in the .NET back-end of c-Quilibrium's cash supply chain optimization solution and applying them in an operational environment.

Think BIG Act SMALL





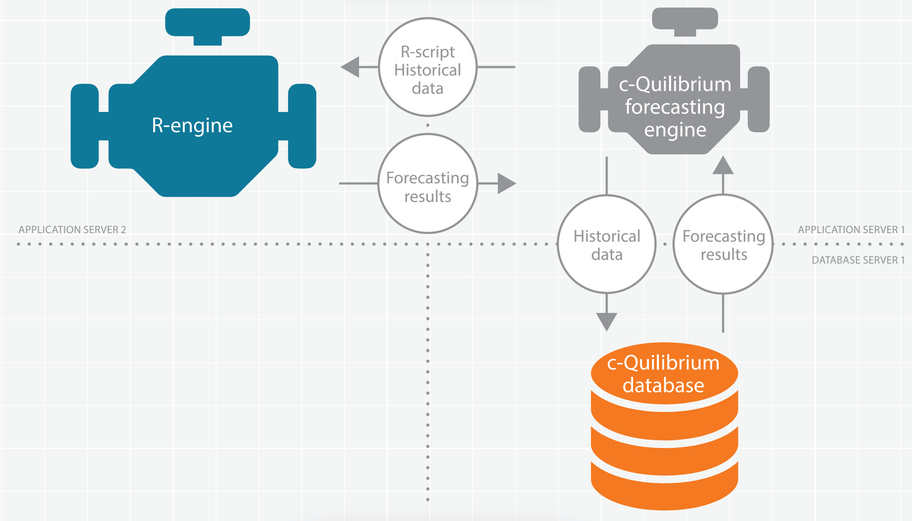


c-Quilibrium needed to improve its forecasting solution in terms of **accuracy, maintainability** and **computational efficiency**.

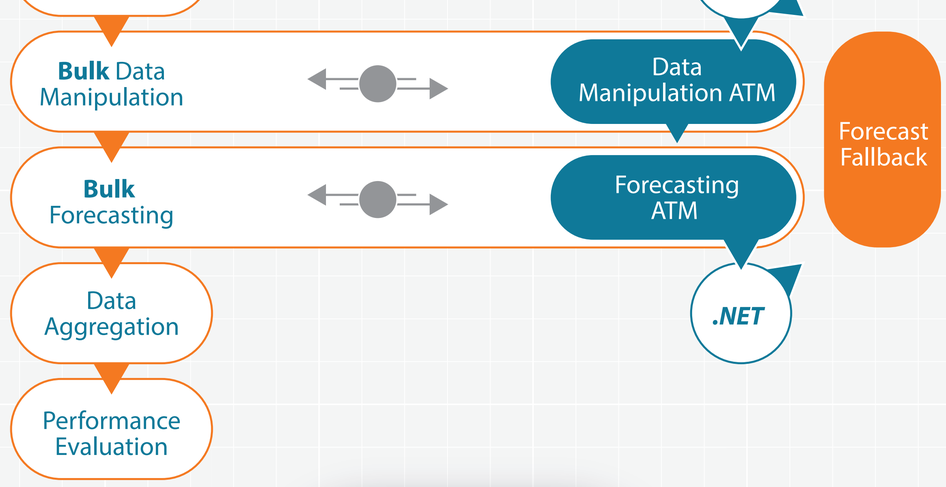
A **Proof-of-Concept** was realized by *AE* using R technology.

Main *R* packages used:
- **forecast**
  core forecasting algorithms, extended with custom code to handle all specific situations.
- **ggplot**
  visualization of the results.

ARCHITECTURE is



1 CODE BASE for analysis and production



R - .NET technological integration

Communication

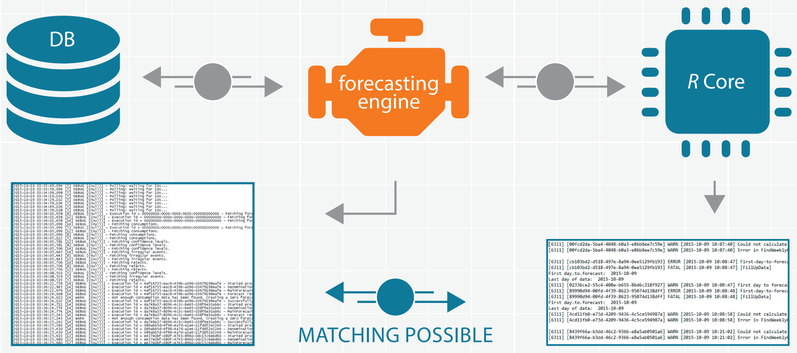
Several options: *R.NET, Rserve, DeployR, …*
Main considerations: price, parallelization, dependencies, *Windows* support.

- ***Rserve*** (http://rforge.net/Rserve) in combination with ***RserveCLI*** (http://rservecli.codeplex.com) was selected.

Logging

***.NET* package:** log4net
***R* package:** futile.logger

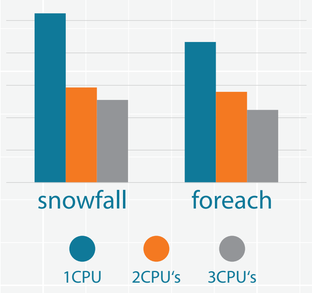
- Generic Rserve exception → logging at both levels needs to be matched!



Scalability

- **Parallelization in *R***
  Several *R* packages: *snowfall, foreach*
- Experimental evaluation.

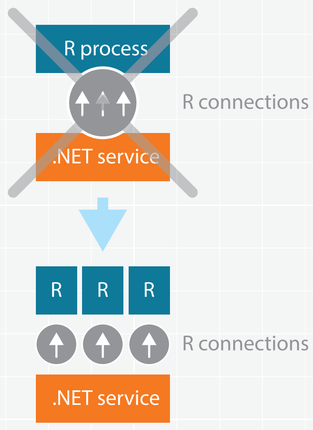
foreach vs. snowfall
experimental comparison



Analysis flow

Production flow

- **Parallelization in *.NET***
- Non-standard flow for *Windows*!



c-Quilibrium
optimising cash supply chains

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