

Design and development of an application for the optimisation and simulation of cross-asset portfolios with backtesting of strategies

Client / sector	Large European bank
Project description	<p>Design and development of an application for the optimisation and simulation of cross-asset portfolios with backtesting of strategies</p> <ul style="list-style-type: none"> • Connection to historic market data across various asset classes and from different data providers • Implementation of the analysis of portfolio risk regarding volatility, value at risk, conditional value at risk, drawdown and time to recovery as well as tracking error; budgeting of risk • Calculation of key figures for the absolute and relative development of a portfolio against a benchmark • Use of Stein estimators based on risk premiums for the derivation of long-term yield forecasts • Integration of investor-specific strategic market opinions into the strategic allocation via the Black Litterman model • Simulation of Monte Carlo scenarios based on stochastic processes with jumps, skewed distributions and fat tails; multi-dimensional coupling with correlations and copulas • Algorithms for the optimisation of the risk-return profile of the asset allocation under auxiliary conditions from regulatory and investment guidelines; Robustness due to re-sampling techniques • Evaluation of the historical performance of different investment strategies through rules-based backtesting
Service	<ul style="list-style-type: none"> • Creation of technical concepts, consulting • Design of the software architecture and user interface • Responsibility for and execution of the software development • Project and release management • Execution of tests deployment • Technical support
Technology	C#/.Net; interfaces to MS Excel, Bloomberg, Datastream
Professional input	Financial know-how, applied mathematics (primarily statistics, stochastic, optimisation)
Scope	Variable, usually 1-2 consultants, project history > 10 years
Tags	cross-asset, quantitative investment strategies, risk analysis, Monte Carlo simulation, portfolio optimisation, backtesting