# Enhancing analytic-based decision support

Elytica provides optimisation and predictive modelling as an on-demand cloud-based service, allowing its clients to focus on their core business. We take care of the technology requirements and provide the mathematical modelling expertise to enhance analytic-based decision support across all levels of an organisation. More specifically, our solutions allow for the optimisation of strategic objectives by prescribing the best course of action at an operational level.

Capturing the business logic within a mathematical framework

The Elytica approach starts by understanding the business problem and by uncovering the business logic. A mathematical model captures this logic by relating input data to a set of decision variables, and by taking into account operational constraints.
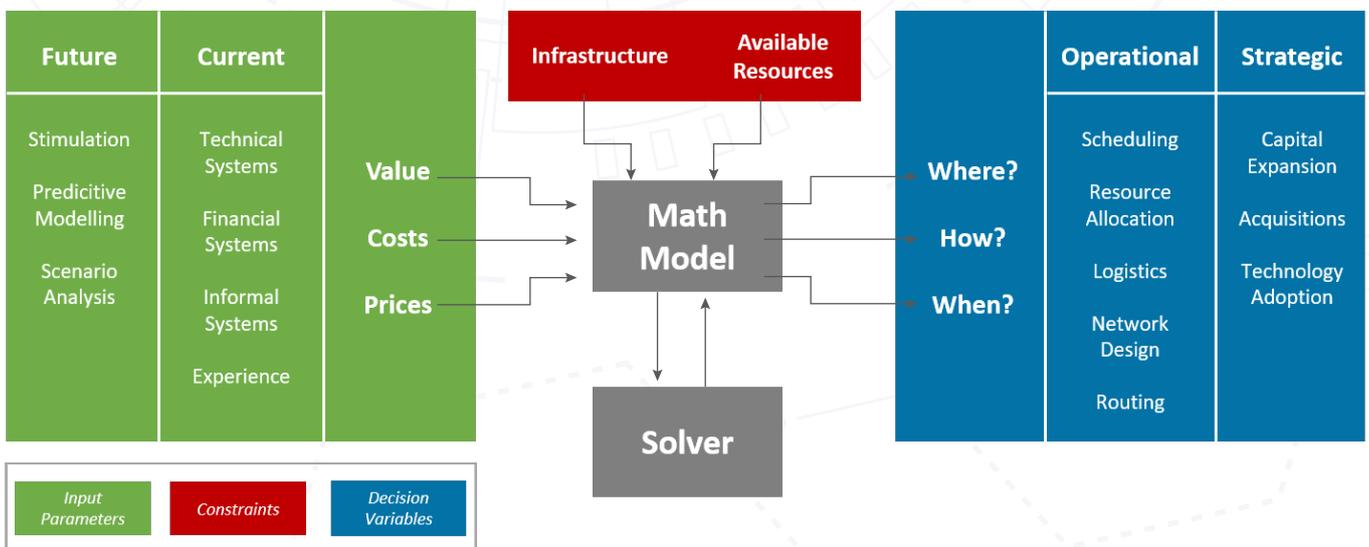
Separation of mathematics and solver technologies

The computation of solutions to an optimisation problem requires the application of a solver. A clear separation of the mathematical model and solver allows the use of multiple solvers (proprietary or open-source) in a distributed cloud environment. The onus is on Elytica to select the most effective and efficient solver to solve a specific optimisation problem.

Rapid deployment of optimisation solutions

Mathematical models are specified using a typesetting language and the Elytica interpretation engine envokes the optimisation solver of choice. That is, the traditional implementation phase of an optimisation solution, which involves a lot of coding, is completely bypassed.

A repository of optimisation models

Focusing more on the mathematics of optimisation enables the Elytica team to capture the intricacies of all subsystem. Independence from specific solver technologies allows the coupling of optimisation models related to different subsystem through a common objective function.

Predictive modelling as a service

Optimisation models are data-driven and are in most cases dependent on data generated by predictive models. The Elytica platform integrates predictive modelling with optimisation by supporting statistical programming languages like R and Python.

Integration of Elytica services

Optimisation models captured on the Elytica platform are accessible from within other systems. A Microsoft Excel add-in and the Python package elytica-dss, provide an easy to use mechanism for transferring data to the Elytica platform and for retrieving optimisation results. Computing resources are managed through the Elytica platform and scalability is achieved through a computing cluster.

The elytica platform

ERCS (Elytica Resource Constrained Scheduling Engine)
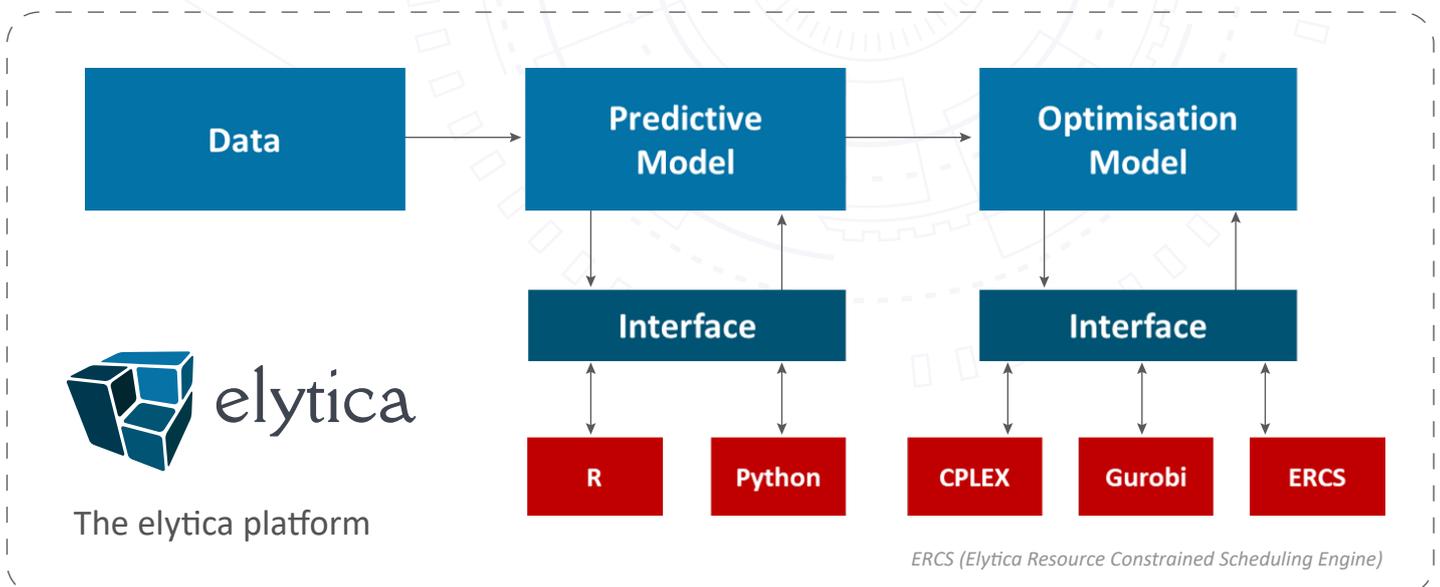
The Elytica team

The Elytica team comprises highly skilled technical specialists with more than 20 years experience in solving optimisation problems. We have mastered the art of translating business logic into mathematical models and we have gained the experience to apply appropriate technologies for the efficient computation of optimisation solutions.

Fanie Terblanche holds a PhD in Computer Science from the North-West University, as well as a PhD in Industrial Engineering from Stellenbosch University, South Africa. His main interest involves large-scale optimisation problems in mining, manufacturing, finance and telecommunications.

Ruan Luies holds a Masters degree in Computer Engineering from the North-West University and is currently enrolled for a PhD in Industrial Engineering. His interests include algorithm design, mathematical modelling, and bridging the gap between mathematical models and their implementation.

Sinisa Vukovic holds a PhD in Quantum Chemistry from the University of Toronto, Canada. He has worked as a scientist at the Cavendish Lab and Science Lead at Deloitte Omnia AI. His main interest involves large-scale analytics in mining, health care, drug design, finance and power grids.

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