TABLE OF CONTENTS

01 ENTERPRISE OPTIMIZER®

02 ENTERPRISE OPTIMIZER® MODELING FEATURES

03 ENTERPRISE OPTIMIZER® ARCHITECTURE

04 ENTERPRISE OPTIMIZER® SERVER™

05 THE SCIENCE BEHIND ENTERPRISE OPTIMIZER®

06 TECHNICAL REQUIREMENTS

07 ENTERPRISE OPTIMIZER® FUNCTIONAL AREAS AND CAPABILITIES
ENTERPRISE OPTIMIZER® (EO) is the leading prescriptive analytics, optimization-based analytics platform for integrated business planning and advanced decision-making.

EO complements today’s business intelligence and planning solutions by enabling a new level of decision support – one that incorporates a more realistic, more accurate representation of an organization’s business context and its constraints. EO helps users predict how certain forecasts will impact their business operationally and financially, while identifying opportunities, evaluating risks, and conducting what-if/optimization analyses to determine the best path forward.

EO EMPOWERS USERS TO IMPROVE PERFORMANCE ACROSS THE ORGANIZATION IN AREAS SUCH AS:

- Integrated Business Planning
- Policy and Strategy Planning
- Sales and Operations Planning (S&OP)
- Enterprise Optimizer Modeling Features
- Supply Chain Network Optimization
- Resource Allocation
- Product / Customer Mix Planning
- Marketing Spend Optimization
ENTERPRISE OPTIMIZER®
MODELING FEATURES

EO’s visual modeling language has built-in tools for constructing an integrated model of the business, including everything necessary for physical and logical processes and financial flows. EO models are rigorous, self-consistent, highly scalable, and customizable. Modelers can quickly build and deploy solutions that improve decision making right out of the box:

OPTIMIZATION AND MONTE CARLO SIMULATION SUPPORTING 360° WHAT-IF ANALYSES

VISUAL DRAG AND DROP MODELING WITH INTUITIVE USER INTERFACE

PHYSICAL FLOWS INCLUDE:

- Purchasing, transforming, transferring, holding, and selling of materials
- Common process idioms such as discount curves; multi-level BOMs, rates, yields, straight time, overtime, and slack hours; holding and transportation costs; currency and unit conversions; on/off and buy/sell decisions; many others
- Embedded expert knowledge supports batch processing, sequencing, blending, constraint sets, sole sourcing, pooling, open/close decisions, inequalities, and many others
- Modeling of stochastic variables to specify uncertain or random values for prices, costs, rates, volumes, yields, transit times, other parameters

FINANCIAL FLOWS INCLUDE:

- Driver-based allocations, summary accounts, aging, horizontal and vertical roll-ups, transfer prices, taxes, source and use of funds, NPV calculations
- Automatic generation of complex underlying mathematical representations for input to the market leading commercial solver Gurobi Optimizer from Gurobi, LLC and River Logic’s Mixed Integer Optimizer (MIO)
- A truth maintenance system that ensures model consistency and reduced risk of errors through data checks, mass/energy balancing, and financial auditing
ENTERPRISE OPTIMIZER® ARCHITECTURE

EO’s main system architecture includes a Visual Modelling Interface, Data Store, Translator Engine Mathematical Representation, Solver(s), and Knowledge Bases.

VISUAL MODEL INTERFACE

A clean Visual Model Interface enables real-world processes, activities, and constraints to be rapidly prototyped using drag and drop to define model objects and links. The interface allows the model design to then be clearly communicated to all stakeholders for better understanding of the problem definition.

DATA STORE

Data is imported into the Data Store by easy-to-use wizards that map internal tables to external data sources such as Microsoft SQL Server and Oracle relational databases, Microsoft Access, Microsoft Excel or text files. Once imported, data is saved inside a COR data file format, similar to Microsoft Office file.

TRANSLATOR ENGINE

When the model is solved, the Translator Engine interprets the diagram and its stored data, and then applies built-in rules and consistency checks from EO’s Knowledge Bases. EO then generates the Mathematical Representation in memory by converting the model and data into a matrix of equations.

SOLVER

Once the mathematical representation is complete the problem is loaded into the Solver where optimization occurs. This step can include solving for the primary problem and complex summary and detailed unit cost calculations. Once complete, solve results are automatically translated and loaded back into the model. Results are immediately available for further analysis in EO dashboards or to be exported to Microsoft Excel or any relational database and viewed in Microsoft Power BI.
ENTERPRISE OPTIMIZER® SERVER™

(EOS) facilitates the deployment of EO models in multi-user, multi-tenant situations; to manage complex jobs requiring many tasks or multiple solves; or, to utilize multiple servers distributed across a network, both behind a corporate firewall or a public or private cloud. EOS includes over 50 different tasks including all commonly used EO API methods as well as executing Rest API web requests, Python scripts, SQL stored procedures, SSIS packages, and PowerShell tasks. The Service Oriented Architecture (SOA) allows application developers to quickly build robust, secure, and scalable solutions. End-users can access EO models from a browser by leveraging EO Server’s REST and SOAP web APIs.
THE SCIENCE BEHIND ENTERPRISE OPTIMIZER®

Enterprise Optimizer® is built on Constraint-Oriented Reasoning™ (COR), a 5th Generation Programming Language (5GL) that enables users to quickly create high-value analytical solutions in complex problem domains. With COR, problems are defined as constraints expressed with an intuitive specification. The specification can combine multiple forms of constraint representations, including graphical, symbolic, quantitative, and relational. Unlike conventional approaches where modelers use visual techniques to define and sequence equations, COR automatically generates mathematical representations of all system constraints and their interactions. This enables users to easily modify the problem they are solving without requiring them to restructure mathematical representations or redefine input and decision variables.

TECHNICAL REQUIREMENTS

MINIMUM RECOMMENDED HARDWARE REQUIREMENTS

Operating System: 64-bit
Memory: 8.0 GB or higher
Processor: 2 GHz or faster with multiple cores
Hard Drive Space: 8 GB (for program, models, and secondary files)

OPERATING SYSTEMS

Windows 10, 8.1
## Enterprise Optimizer®

### Functional Areas and Capabilities

<table>
<thead>
<tr>
<th><strong>Business Analysis</strong></th>
<th><strong>Market Modeling</strong></th>
<th><strong>Process Modeling</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Consideration of financials, markets, operational variables, business constraints in one integrated, simultaneous representation</td>
<td>- Linear, piecewise-linear, and step-change price and demand curves</td>
<td>- All inputs and outputs, including by-products and emissions</td>
</tr>
<tr>
<td>- Optimization to any financial (e.g., profitability, revenues), process (e.g., volume, inventory), or managerial metric (e.g., NPV, SLAs)</td>
<td>- Contractual commitments and SLAs as constraints</td>
<td>- Resources (personal, physical) and activity</td>
</tr>
<tr>
<td>- What-if questions to changing assumptions or loosening constraints</td>
<td>- Competitor financial structures, potential actions, and impact on prices and demand</td>
<td>- Batch and continuous process flows</td>
</tr>
<tr>
<td>- Modeling of stochastic variables to specify uncertain or random values for price, cost, volume, others</td>
<td>- Monte Carlo simulation analyses of impact from a range of values</td>
<td>- Conditional minimums</td>
</tr>
<tr>
<td>- Monte Carlo simulation analyses of impact from a range of values</td>
<td>- Opportunity Values™ identify profit improvement opportunities on the margin for products, customers, resources, and any other constraints in the system</td>
<td>- Production sequencing</td>
</tr>
<tr>
<td>- What-if questions to changing assumptions or loosening constraints</td>
<td>- Improvement and opportunity costs of over-constrained variables</td>
<td>- Pooling of inventory and resources</td>
</tr>
<tr>
<td>- Modeling of stochastic variables to specify uncertain or random values for price, cost, volume, others</td>
<td>- Complex inter-dependency modeling to identify maximum potential from each scenario</td>
<td>- Automatic mass/energy balancing</td>
</tr>
<tr>
<td>- Monte Carlo simulation analyses of impact from a range of values</td>
<td>- Infeasibility analysis of over-constrained operational and financial resources of managerial metrics (e.g., SLAs, emissions)</td>
<td>- Full and partial-load transportation</td>
</tr>
<tr>
<td>- What-if questions to changing assumptions or loosening constraints</td>
<td>- Opportunity Values™ identify profit improvement opportunities on the margin for products, customers, resources, and any other constraints in the system</td>
<td>- Inventory (LIFO, FIFO), holding cost degradation, and shrinkage</td>
</tr>
<tr>
<td>- Modeling of stochastic variables to specify uncertain or random values for price, cost, volume, others</td>
<td>- Complex inter-dependency modeling to identify maximum potential from each scenario</td>
<td>- Product mix analysis and optimization</td>
</tr>
<tr>
<td>- Monte Carlo simulation analyses of impact from a range of values</td>
<td>- Infeasibility analysis of over-constrained operational and financial resources of managerial metrics (e.g., SLAs, emissions)</td>
<td>- Resource open/close decisions</td>
</tr>
<tr>
<td>- What-if questions to changing assumptions or loosening constraints</td>
<td>- Improvement and opportunity costs of over-constrained variables</td>
<td>- Network design and optimization</td>
</tr>
</tbody>
</table>

River Logic, Inc. | Enterprise Optimizer® 10.1 | Product Data Sheet | July 2020
Enterprise Optimizer® is a registered trademark of River Logic, Inc. Copyright © River Logic, 2020. All rights reserved.
Full financial reporting structure replicating a company’s GL
Audit quality income, balance sheet, and cash flow statements using GAAP accounting
Financial, budget (vertical and horizontal) consolidations, including beginning balance
NPV, Economic Profit, and all other financial ratios at corporate and division levels
Detailed unit costs and profitability by customer, products, resource, channel partner, and facility (includes ABC)
Resource utilization and implications on unit costs and profits
Capital expenditure allocation and optimization
Transfer cost and tax planning
Full and partial ownership of assets
Working capital management
Sources and uses of cash (treasury)
Multiple currencies in a single model with automatic conversion
Customized depreciation schedules
Customized aging of accounts and inventory value

Intuitive drag and drop interface
Automatic propagation of categories through the model (e.g., material names, locations)
Visualization of constraints and material flows
Automatic propagation of constraints (e.g., min/max)

Full consistency check for names, labels, units/unit conversions, and constraints
Identification of unconnected graph elements
Flagging of mutually exclusive and/or infeasible conditions
Flagging of pre- and post-solve imbalances in financial accounts
Checking and application of factors and adds to a given variable
Mathematical checks and automated error correction of problems related to scaling, computational efficiency, and other issues
About River Logic

River Logic has a global innovator in prescriptive analytics since 2000 by offering an optimization platform that is purpose-built for business users rather than data scientists. Its solutions enable enterprise-wide optimization via a revolutionary cloud-based scenario experience that supports collaboration, data management, workflows, and more. By understanding how to best utilize cross-functional resources and manage complex trade-offs, companies make more impactful decisions.

River Logic goes to market primarily through partner organizations like PwC, Deloitte, Accenture, and Microsoft, helping them develop high-value applications that monetize their IP. Recent clients include Unilever, BHP, Boise Cascade, McKee Foods, Boral, and the Russian Post. Typical client value-add ranges from 10% in cost reduction to profit improvements equal to 2-5% of annual sales. River Logic strives to help every customer achieve at least 10X return on investment, but it is common for customers to see even higher returns.

CONTACT US

8150 N.Central Expressway, Suite M2025 Dallas, TX 75206
riverlogic.com
info@riverlogic.com
214-393-4650
214-393-4651
sales@riverlogic.com