

BUSINESS ANALYTICS & MATHEMATICAL OPTIMIZATION

Why data-driven optimization methods are critical for companies operating under volatility and uncertainty

OPTANO
a KEARNEY company

ECISIONS UNDER VOLATILITY: CLARITY DESPITE UNCERTAINTY

Companies today operate in an increasingly unstable environment that makes decision-making more difficult. Growing complexity, volatility, and uncertainty in strategic frameworks quickly undermine established planning assumptions. As a result, traditional methods struggle to adequately capture this dynamic, forecasts become less reliable, and the risk of misjudgments increases.

To nevertheless achieve dependable outcomes, organizations need methods that enable flexible information processing and a clear understanding of key interdependencies. What is required is an approach that systematically evaluates scenarios, provides robust options for managing risk, and helps set clear priorities. Modern analytical and optimization methods support reliable decision-making—even under volatile conditions.

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- From data to decision-relevant information through analytics
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- Business Analytics and Mathematical Optimization for superior decisions



PLANNING AND DECISION-MAKING UNDER UNCERTAINTY

Uncertainty destabilizes planning and complicates reliable decision-making.

Systematic methods provide clarity and enable robust decisions.

Many companys are confronted with planning environments characterized by high uncertainty. Unpredictable events—such as market shifts, supply chain disruptions, or regulatory interventions—can render even carefully developed plans obsolete within a short period of time. Decision-makers are often required to respond to new developments before information has been fully validated. This not only increases decision pressure but also negatively impacts the quality, transparency, and robustness of decisions.

Especially under uncertain conditions, the value of methods that enable rapid reassessment while delivering consistent results becomes evident. Modern optimization approaches support this process by explicitly accounting for uncertainty and systematically evaluating alternatives, enabling sound decisions even under time pressure.



CONFLICTING OBJECTIVES AND INTERDEPENDENCIES

In modern value creation systems, numerous—sometimes conflicting—objectives simultaneously influence planning. Companies must not only operate efficiently, but also remain resilient, sustainable, and customer-focused. These goals often compete with one another and require a clear understanding of interactions across the entire value chain.

As value chains grow more complex, cross-dependencies between individual processes increase as well—for example due to extended supply chains, complex production structures with many processing steps, or a high degree of customization. The more pronounced these interdependencies become, the more difficult it is to consistently and transparently reflect changes in individual factors across the overall plan. Without appropriate methodological support, local optimizations can lead to unintended and undesirable effects at the system level.

Conflicting objectives and interdependencies require a holistic planning perspective.

Modern optimization methods increase transparency and lead to better decisions.



Data-driven optimization methods enable organizations to balance objectives and interdependencies while allowing for rapid plan adjustments—even under uncertainty.

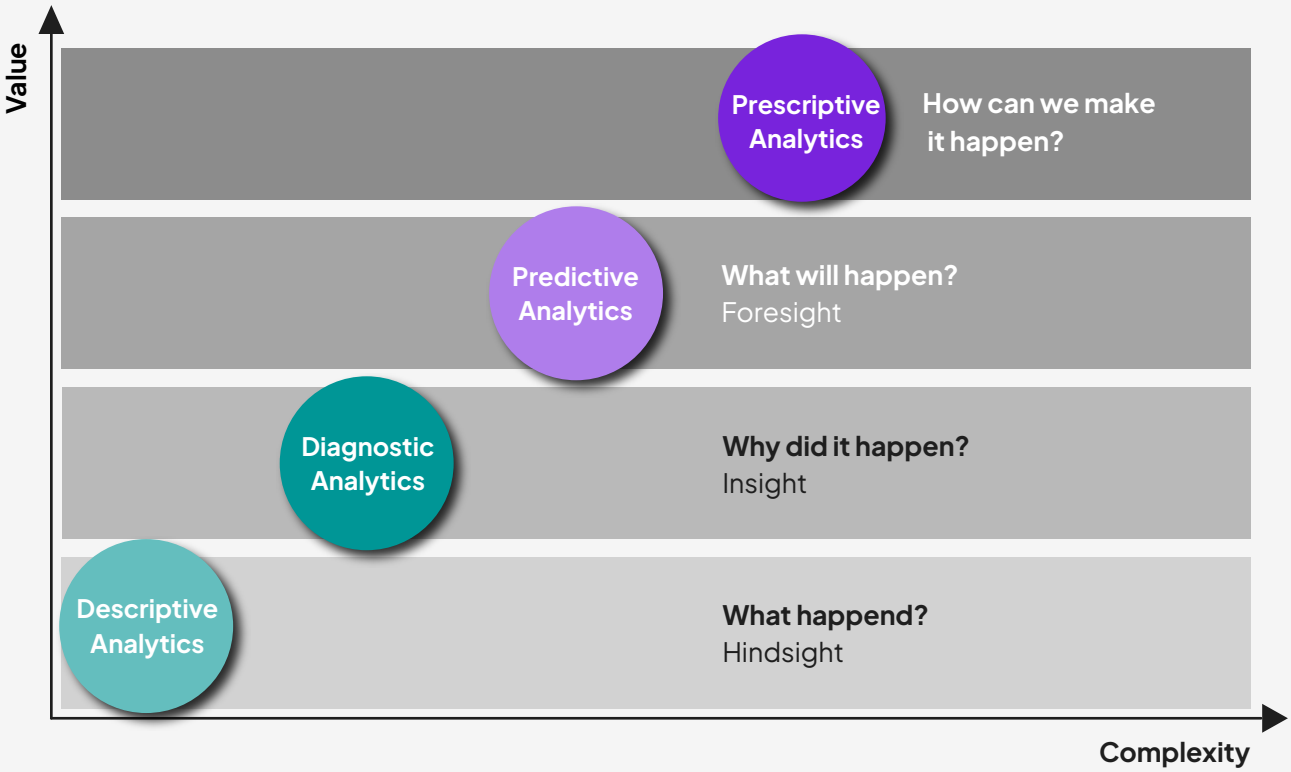
FROM DATA TO DECISION-RELEVANT INFORMATION WITH ANALYTICS

Analytics creates transparency and supports well-founded decision-making.

The analytics stages are differentiated using Gartner's maturity model.

Today, organizations have access to vast amounts of internal and external data—for example from ERP and CRM systems as well as publicly available sources. Leveraging this data effectively is essential to create transparency, identify relationships, and make informed decisions. Analytics aims to transform data into decision-relevant information and systematically apply it to planning, steering, and optimization.

To structure and assess analytical capabilities, Gartner developed a maturity model that distinguishes four stages of analytics development. With each stage, both analytical complexity and business value increase—along with the organization's competitive advantage.



GARTNER'S ANALYTICS MATURITY MODEL

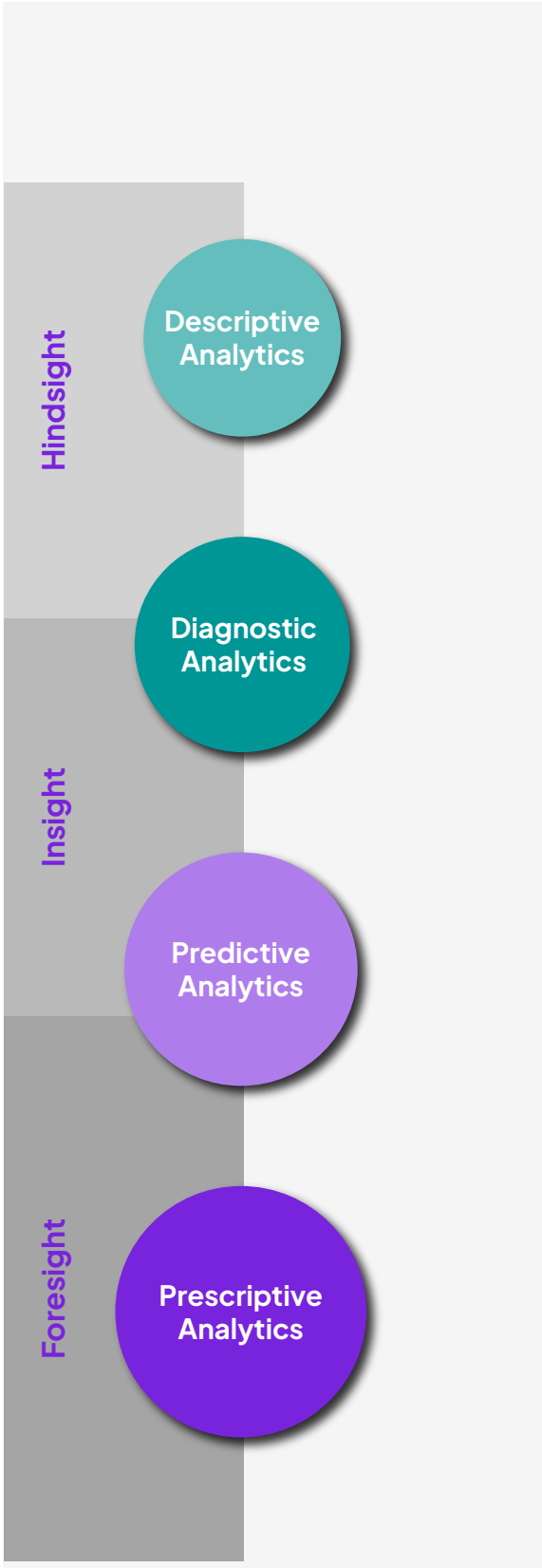
In addition to analytical complexity, the maturity levels differ in terms of human involvement in decision-making and the required competencies.

DESCRIPTIVE ANALYTICS
Descriptive analytics provides a retrospective summary. Existing data and information are processed to reduce complexity, resulting in key performance indicators that support decision-making. Final decisions, however, remain with experts who possess the necessary domain knowledge.

DIAGNOSTICANALYTICS
Diagnostic analytics analyzes historical data to identify root causes and their impacts, uncovering correlations and patterns. Proper interpretation requires industry expertise and methodological know-how. Consequently, deriving sound actionable recommendations depends heavily on domain knowledge.

PREDICTIVE ANALYTICS
Predictive analytics takes a forward-looking perspective, using historical data to build models that forecast future events. Anticipating trends and future states enables early process optimization. While domain expertise remains essential for translating predictions into actions, forecasts significantly enhance decision transparency.

PRESCIPRTIVE ANALYTICS
Prescriptive analytics represents the highest maturity level. It combines analysis and forecasting with structured decision logic to determine which actions are optimal under defined objectives, constraints, and uncertainties. Through systematic evaluation and prioritization of alternatives, concrete recommendations emerge. At the core of prescriptive analytics lies mathematical optimization.



A POWERFUL COMBINATION FOR BETTER DECISIONS

The methodological core of prescriptive analytics is mathematical optimization.

Optimization models identify the best solution based on sound scientific principles.

Business Analytics—specifically in the form of prescriptive analytics—enables organizations to derive concrete recommendations from data and make well-founded decisions. Mathematical optimization plays a central role by allowing complex decision situations to be formally modeled and systematically solved. Based on this foundation, data models are developed that realistically reflect even highly complex real-world problems.

Starting from defined objectives, the model identifies the optimal solution by systematically evaluating objective functions while accounting for all constraints, conditions, and variables. This makes it possible to transparently compare and prioritize decision alternatives.

Supported by modern technologies, powerful algorithms, and specialized solvers, organizations can make scientifically sound decisions that are consistently aligned with both strategic and operational objectives.



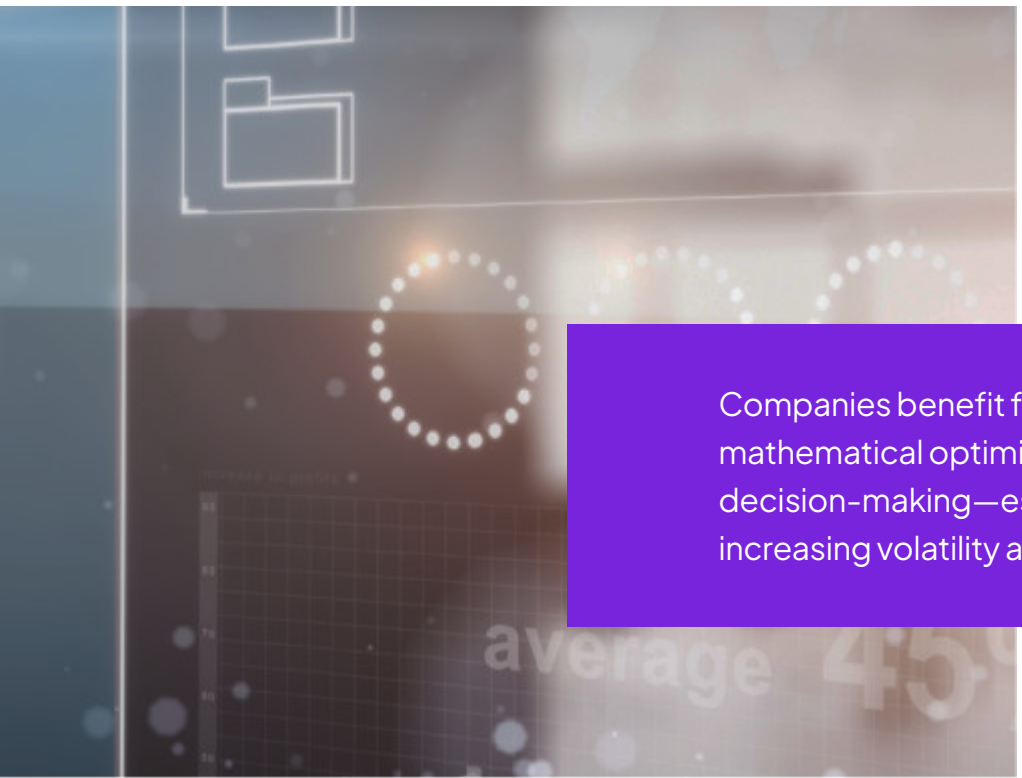
ANALYTICS AND OPTIMIZATION FOR BETTER DECISIONS

Business analytics and mathematical optimization together form the foundation for modern, data-driven decision support in organizations. They enable systematic analysis of large volumes of internal and external data and transform them into decision-relevant insights, creating transparency around relationships and developments. Conflicting objectives and interdependencies are explicitly considered, while decision alternatives are systematically evaluated and prioritized.

Especially in environments characterized by volatility and uncertainty, data-driven optimization methods reduce informational complexity and enhance the transparency and quality of decisions across the value chain. This enables organizations to make robust, scientifically grounded decisions even under time pressure—and to sustainably support both strategic and operational goals.

Data-driven optimization methods support well-founded decisions.

Business analytics and mathematical optimization strengthen the achievement of strategic and operational objectives.



Companies benefit from analytics and mathematical optimization through sound decision-making—especially in times of increasing volatility and uncertainty.

WHO WE ARE

OPTANO provides innovative solutions, enabling businesses to plan faster, better and more easily. Thanks to mathematical optimization, OPTANO finds the optimal solution to any problem.

Our software is customized to suit your specific needs. Whether you want to optimize your supply chain, your entire network or your production plans, OPTANO makes your planning process efficient, clear and flexible.

And that's not all: OPTANO supports you in your strategic decisions using Prescriptive Analytics. This means that you can consider various options in what-if scenarios and get sound recommendations for action - based on the sound analysis of your data and targets.

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