

Supply Chain Management, Procurement and Retail

SPARK Matrix™: **Retail Forecasting &** **Replenishment**

Market Insights, Competitive Evaluation, and Vendor Rankings

November 2023



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Executive Overview

Quadrant Knowledge Solutions' SPARK Matrix: Retail Forecasting & Replenishment, 2023 research includes a detailed analysis of the global market regarding short-term and long-term growth opportunities, emerging technology trends, market trends, and future market outlook. This research provides strategic information for technology vendors to better understand the market supporting their growth strategies and for users to evaluate different vendors' capabilities, competitive differentiation, and market position. The research includes detailed competition analysis and vendor evaluation with the proprietary SPARK Matrix analysis. SPARK Matrix™ includes ranking and positioning of leading retail forecasting & replenishment vendors with a global impact.

Market Dynamics and Overview

Quadrant Knowledge Solutions defines retail forecasting and replenishment (RF&R) solution as “a solution that applies data-driven models and algorithms by considering the variables, such as historical sales data, economic trends, and seasonality, to predict consumer demand for products, optimize inventory levels, and ensure timely restocking.” RF&R solution broadly offers key elements such as demand planning, inventory management, replenishment planning, allocation, and promotional forecasting. The solution enables retailers and supply chain professionals to innovate, expand, and optimize end-to-end supply chain networks by accurately predicting demand patterns and trends spanning customer and product lifecycles. It supports demand-driven item replenishment to manage inventory levels and meet customer & business targets.

Retailers have historically faced numerous challenges in retail forecasting and replenishment, such as unpredictable demand fluctuations, inventory management complexities, data quality issues, changing seasonality and trends, supplier reliability, forecast accuracy, evolving consumer preferences, outdated technology, multi-channel coordination difficulties, economic factors, waste reduction, sustainability concerns, regulatory compliance, competitive pressures, and the need to meet increasingly demanding consumer expectations. Overcoming these challenges demanded a holistic approach, which combined advanced analytics, robust data management, modern technology, and adaptable supply chain strategies, allowing retailers to maintain competitive advantages in a constantly changing retail landscape. The retail forecasting and replenishment solution enabled retailers to leverage real-time data for efficiently administering the staff responsible for serving customers and delivering a seamless experience at the stores.

Retailers can leverage retail forecasting and replenishment solutions to optimize inventories, anticipate the demand for specific products in the market, and execute better pricing strategies for items. In addition to inventory management and execution of pricing strategies, organizations also leverage retail forecasting and replenishment solutions for assortment planning by employing artificial intelligence (AI), machine learning (ML), and advanced analytics to have a responsive and efficient supply chain.

The solution leverages AI and ML technologies to maintain inventory levels, enhance customer service performance, and maximize revenue. It helps retailers

efficiently plan demand based on products and their categories, locations, stores, and warehouses. The solution maximizes the demand planner's productivity by automating the end-to-end retail planning and replenishment process and alleviating the time consumed in the manual process of planning. It also helps organizations easily manage seasonal demand spikes, new product releases, small-quantity products, and one-time events. Several retail forecasting and replenishment solution vendors offer comprehensive capabilities, such as allocation and re-allocation, inventory planning, statistical forecasting, management of products having short lifecycles, dashboards, analytics, reporting, and exception management. However, the solution's capability to manage and streamline simple and complex supply chains and execute demand-shaping actions has generated the need for robust retail forecasting and replenishment solutions.

Retail organizations analyze supply chain dynamics to effectively manage their inventory & expenditures and fulfill product demands across various geographical locations. Excess products on the store floor that remain unsold take up space that would have otherwise been dedicated to products with a bigger demand. Organizations are continuously trying to maintain an optimal balance between sold and unsold goods by ensuring that their inventory of products aligns with customer demand. With changing market dynamics, there is also a huge change in demand for particular products, and its adoption trend is drastically changing as well. At times, organizations observe a sudden spike in demand or even deprivation for a particular product's demand. Organizations keep trying to understand and predict such product peaks and troughs in the market before its occurrence. Retailers are striving to better anticipate the right product and its volume required in the store and avoid circumstances where customers are unable to find their preferred products.

The retail forecasting and replenishment market is currently witnessing an increase in the use of AI and machine learning applications, predictive analytics, and data quality optimization and integration. Omni-channel optimization, supply chain visibility, and sustainability considerations are also gaining significance in the RF&R market. Real-time data from IoT devices, consumer-centric approaches, and blockchain technology are emerging trends in the market, while collaborative forecasting, demand sensing, and robotic process automation aim to enhance its efficiency. Inventory optimization models, AI-driven customer interactions, and advanced analytics for returns management are subjects of ongoing research in the RF&R market. These emphasize the ever-evolving nature of the retail field and the need for innovative solutions to address customer expectations, technological

advancements, and market dynamics.

Quadrant Knowledge Solutions' SPARK Matrix: Retail Forecasting & Replenishment, 2023 research includes a detailed analysis of the global market regarding short-term and long-term growth opportunities, emerging technology trends, market trends, and future market outlook. The study provides a comprehensive market forecast analysis of the global market for RF&R solutions in various geographical regions and the overall market adoption. This research provides strategic information for technology vendors to better understand the market supporting their growth strategies and for users to evaluate different vendors' capabilities, competitive differentiation, and market position.

The research includes detailed competition analysis and vendor evaluation with the proprietary SPARK Matrix analysis. SPARK Matrix includes ranking and positioning of leading Retail Forecasting and replenishment vendors with a global impact. The SPARK Matrix includes an analysis of the leading vendors, including Antuit.ai, Aptos, Blue Yonder, Impact Analytics, Kinaxis, Logility, LOGIO, Manhattan Associates, Oracle, RELEX Solutions, Retalon, SAP, SAS, Solvoyo, Symphony RetailAI, ToolsGroup, and Verteego.

The following are the key capabilities of Retail Forecasting & Replenishment (RF&R) solutions:

- **Demand forecasting:** Demand forecasting capability assists retailers in understanding consumer purchasing patterns and optimizing inventory management. It helps retailers in analyzing historical sales data, market trends, and seasonality to predict future demand for products. Additionally, it helps organizations to accurately analyze comprehensive data with the help of machine learning techniques to reduce forecast errors and collaboratively manage inventory deployment for fast & slow-moving goods, promotion goods, seasonal goods, short-demand goods, and fresh food goods.
- **Replenishment Planning:** Replenishment planning capabilities offer strategic methods for demand forecasts that retailers can use to ensure the timely restocking of inventory. It helps retailers minimize overstocking and understocking issues, enhance supply chain efficiency, reduce holding costs, and ultimately boost their ability to meet customer demands efficiently while simultaneously enhancing profitability.

- **Smart Allocations:** Retail forecasting and replenishment solutions offer smart allocation capability that helps retailers control and manage markdowns, distribute inventories, and optimize margins. The capability helps retailers maximize sales and optimize stock levels across the retail network by leveraging advanced algorithms, machine learning models, and real-time data analytics. The solutions utilize predictive analytics to optimize allocation and distribution across all channels for a wide range of scenarios, such as initial allocation, one-time buyers, new products, seasonal products, and fast/slow-moving products.
- **Inventory Management:** The inventory management capability of the RF&R solution helps organizations appropriately plan inventory in an optimized scenario to ensure that they can have the right inventory at the right time. It also helps organizations to gain higher profit margins and reduce inventory costs. Additionally, it helps organizations manage dynamic safety stock across the sales channels by integrating demand forecasting and smart allocation strategies to mitigate product unavailability, inefficient forecasting, operational inefficiencies, and undesirable consumer purchasing experiences. Inventory optimization minimizes excess inventory and enhancing overall supply chain efficiency, resulting in agile, responsive, and cost-effective retail operations that meet customer demand and maximize profitability.
- **Promotions Planning and Forecasting:** Promotions planning and forecasting capability, powered by AI, helps organizations forecast promotional demand. The RF&R solution automatically identifies the impact of past promotions and recommends best-fit timings, products, channels, and promotions costs. It analyzes existing organizational data to maximize the ROI and savings. It also helps organizations mitigate lost sales and out-of-stock situations after promotional activities. The interactive and easy-to-use dashboard of RF&R solutions enables organizations to gain real-time promotion planning visualization and demand-driven insights.
- **Reporting, Analytics, and Simulations:** The solution offers robust analytics and reporting capabilities that help organizations gain real-time information about overall business performance and operational costs. This enables supply chain stakeholders to make strategic decisions and achieve defined KPIs. It also helps retailers in planning the current and future product demands. The platform offers an intuitive dashboard that helps organizations to gather continuously updated information immediately.

Competitive Landscape and Analysis

Quadrant Knowledge Solutions conducted an in-depth analysis of major Retail forecasting and replenishment solution vendors by evaluating their products, market presence, and customer value proposition. The evaluation is based on primary research with expert interviews, analysis of use cases, and Quadrant's internal analysis of the overall market.

This study includes an analysis of key vendors, including Antuit.ai, Aptos, Anaplan, Blue Yonder, Impact Analytics, Kinaxis, Logility, LOGIO, Manhattan Associates, Oracle Retail, o9 solutions, RELEX Solutions, Retalon, Retail Express, SAP, SAS, Solvoyo, Symphony RetailAI, ToolsGroup, and Verteego.

Antuit.ai, Blue Yonder, Impact Analytics, Manhattan Associates, o9 Solutions, ToolsGroup, and Verteego are the top performers and technology leaders in the global retail forecasting and replenishment solution market. These companies are significantly investing in improving their artificial intelligence, machine learning, and advanced analytics capabilities to support a wide range of existing/new use cases as well as improve the overall supply chain collaboration, real-time forecasting, distributed product availability, dynamic allocation, and intelligent replenishment. Additionally, the focus of technology leaders is to offer an AI-driven retail forecasting and replenishment solution that helps retailers efficiently handle fresh food forecasting as well as daily & intra-day product forecasting, replenishment, and allocation.

Antuit.ai Forecasting, Allocation, and Replenishment solution assists retailers to estimate the future demand at several levels: channel, brand, SKU & week, enabling them to create optimal retail strategies and decrease inventory handling costs. Additionally, the FA&R solution enables retailers to yield major process improvements for the revenue operations unit. The various key differentiators offered by the solution are AI models, Omnichannel Awareness, and Multi-faceted optimization.

Blue Yonder's retail forecasting and replenishment solution leverages an AI/ML-driven Intelligent forecasting module that enables organizations to drive intelligent decision-making by leveraging internal and external demand signals, corporate strategies for pricing, promotions, markdowns, and service levels, and situational factors (such as seasonality, day of the week, and day of the month) to provide accurate forecasts about demand fluctuations and dynamic consumer

expectations. Blue Yonder retail forecasting and replenishment offer differentiator Dynamic master planning, scenario planning, root cause analysis, what-if analysis, and network resilience.

Impact Analytics offers Forecasting, Replenishment & Allocation solution that helps retailers calculate future demand and accordingly planning the inventory levels to be maintained across the stores to meet that demand. The solution leverages context adaptive variables to manage seasonal assortment, new launches, and inventory changes. FR&A solution offers a wide range of differentiators including new product forecasting, hierarchical forecasting, what-if simulation, and replenishment optimization.

Manhattan Associates' retail forecasting and replenishment solution offers demand forecasting capabilities that are powered by advanced machine learning which helps the organization to improve demand forecast and have accurate predicting with minimal human intervention. The solution offers unified visibility into the demand network and, to predict product demand accurately combines cutting-edge forecasting methods with demand cleansing, seasonal pattern analysis, and self-tuning capabilities.

o9 Solutions offers forecasting and replenishment solutions that assist retailers in predicting the possible future demand by considering various factors such as promotions, promotional displays, and discounts. Its solutions use advanced AI and machine learning algorithms to help organizations improve forecast accuracy, reduce inventory levels, increase sales, and reduce costs. Furthermore, based on the demand predicted, the solutions also enable retailers to replenish the required number of Stock Keeping Units(SKU) across the sales channels.

ToolsGroup offers both Demand Planning & forecasting software and Automated Replenishment software to assist the organization in anticipating uncertainties in demand which can influence optimal supply chain decisions, reduce lost sales, reduce inventory handling costs, and enhance product availability. The Forecasting and Replenishment software is augmented by Machine Learning (ML) which models recurring patterns like seasonality, internal sources of customer demand including promotions, and external factors such as weather. The solution uses its ML capability to assist operational planning for new product launches and seasonal demand. The solution enables the integration of demand and forecast data from various sources inside or outside the organization, resulting in effortless collaboration between various stakeholders in the supply chain. ToolsGroup

Automated Replenishment software assists organizations in aggregating product needs by SKU-location level. This ensured better visibility of data against the production or transport resources.

Verteego offers demand forecasting solutions to retail businesses. It uses machine learning to analyze historical sales data, market trends, and other factors and generate accurate forecasts of future demand. Additionally, its forecasting solutions leverage predictive models to anticipate future demand for stock-keeping units (SKUs), assisting them in deciding the optimum stock levels and ensuring optimal service quality while considering supply chain constraints. The solution supports organizations in enhancing their sales forecasting by predicting the buying behavior of customers.

Anaplan, Aptos, Kinaxis, Oracle, Relex Solutions, SAP, and Symphony Retail Ai are strong performers and emerging technology leaders in the global retail forecasting and replenishment solutions market. The emphasis of these companies is majorly on adopting technology for increased forecast accuracy, optimal planning, omnichannel product availability, and optimizing customer purchasing experiences. These companies are undergoing a major cultural shift with an increasing focus on inculcating a business and customer-centric culture, and the digital transformation approach is often considered as an initial step in achieving the same.

Anaplan, Logility, o9 Solutions, RELEX Solutions, Retalon, and SAS are among the major challengers in the 2023 Retail forecasting and replenishment SPARK Matrix. These organizations are offering promotional planning capabilities for ideation, brainstorming, and co-creation of accurate future demand planning and allocation. They are also putting in significant investments to support the omnichannel environment to provide a buy anywhere and return anywhere approach.

Aptos Forecasting, Allocating, and Replenishment (FA&R) solution enables retailers to generate the forecast, create recurring allocation orders, and maintain better inventory stock position across various sales channels resulting in optimized store inventory and reduced inventory handling costs. Some of the key technological differentiators include native multidimensional attribute-based planning, data management utilities, multi-echelon replenishment, what-if scenario analysis, and workflow management.

Kinaxis assists organizations in sensing demand by automating and optimizing forecasts with machine learning by considering both internal and external data signals. Also, the solution assists organizations in optimizing inventory turnover rate leading to reduced inventory carrying cost. The solution offers various differentiators including what-if scenario analysis, and multi-echelon inventory optimization (MEIO).

Oracle demand forecasting cloud service and replenishment optimization solution enables retailers to identify future demand trends and optimize the product inventory across multiple sales channels. The F&R solution enables end-users to respond seamlessly to various demand drivers such as trends, seasonality, and promotions. Moreover, the solution allows end users to view the entire supply chain enabling analytical processes and end users to work with the forecast, thereby enhancing inventory productivity. The solution also extends operational agility to end-users as the solution seamlessly adapts to new information without depending extensively on batch processes.

RELEX Solutions enables retailers to optimize their demand forecasting, replenishment, allocation, and promotion planning. The company allows retail organizations to optimize inventory levels across their supply chain, from distribution centres to store shelves. Moreover, Retailers gain real-time visibility into their supply chain, allowing them to monitor inventory movements and respond quickly to disruptions or changes in demand.

SAS assists retailers in maintaining optimal inventory levels, reducing carrying costs, and preventing stockouts or overstock situations with its cloud-native forecasting and optimized inventory replenishment solutions. The solution allows retailers to analyze data in real-time to identify and respond to demand spikes, supply disruptions, and other events that can impact forecasting and replenishment. Moreover, SAS's supply chain analytics solutions enable retailers to streamline their operations, improve supplier collaboration, and enhance overall supply chain visibility.

SAP's forecasting & replenishment (F&R) solution assists retailers to plan and manage efficient inventories across various nodes involved in outbound logistics. The solution helps organizations inventory costs and drive operations by planning and executing inventory strategies on a global basis. Retailers leverage the SAP F&R for enhancing resource utilization and allocation as well as streamlining and

standardizing retail operations, anticipating future demands of SKUs. The solution offers a wide range of key differentiators, such as master data management (MDM), order proposal management, and fresh item forecasting.

Solvoyo offers a cloud-native integrated retail planning platform that includes financial planning, merchandising/category management, pricing & promotion, store operations, supply chain planning, and advanced analytics & visibility. The platform's key technological differentiators include root cause analysis, predictive & perspective analytics, flexible & configurable UI, dynamic algorithms, supply chain automation, and others. Solvoyo Demand Planning UI offers forecast generation, demand collaboration, scenario-based demand planning, demand sensing, and demand shaping.

Symphony Retail AI's retail forecasting and replenishment enables retailers with the capability of estimating the demand and executing replenishment accordingly. Symphony Supply Chain Forecasting and Replenishment solution provides AI-driven demand forecasting that assists retailers to predict future demand with high accuracy resulting in inventory optimization, out-of-stock reduction, and productivity gains. Symphony's replenishment planning solutions help retailers optimize their inventory levels and ensure that they have the right products in the right place at the right time.

Other vendors considered in the study are, Logio, Logility, Retalon, and Retail Express, which are focusing on providing a unified commerce environment that can help them to optimize product availability, new product forecasting, seasonal forecasting, and short/Long term forecasting, and replenishment.

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Key Competitive Factors and Technology Differentiators

Following are the key competitive factors and differentiators for the evaluation of Retail Forecasting and Replenishment solutions (RF&R) and vendors. While a majority of the RF&R vendors may provide all the core functionalities, the breadth and depth of functionalities may differ by different vendors' offerings. Driven by increasing competition, vendors are increasingly looking at improving their technology capabilities and overall value proposition to remain competitive. Some of the key differentiators include:

- **Probabilistic forecasting:** RF&R solutions providers should enable Probabilistic forecasting capability to include uncertainty and probability factor in predictions so that retailers can make better-informed decisions regarding inventory management, staff scheduling, and supply chain operations. This capability allows retailers to optimize stock levels, reducing overstock and out-of-stock situations, while also aligning staffing resources with projected demand to minimize labor costs. Users should look for a vendor that provides probabilistic forecasting capability to optimize inventory and predict multiple demand strategies that reduce risk and improve operational efficiencies.
- **Inventory return optimization:** Demand forecasting and replenishment solutions should offer retailers a robust inventory return optimization capability for financial and operational planning. The solution should enable users to execute this financial and operational planning by outlining designated expenses and requisites including dimensions of logistics. Users should look for a solution that provides an accurate return forecast and enables them to test various what-if scenarios. The capability help retailers optimize product return forecast and estimation around the loss of exclusivity scenario. This will help users to make smart investment decisions. The solution should enable users to define the right return policies and maintain a budget for return orders and the degree of returnable orders based on their organization's business and financial objectives. It should provide an actual return forecast based on the inventory location in the supply chain network. This forecast should be driven by both online and offline sales. Moreover, the solution should provide an ability to integrate the return forecast with the allocation and replenishment solution to further manage the product supply and demand.

- **What-if scenario simulator:** What-if scenario simulator should assist businesses to effectively plan and respond to any favorable or unfavorable situation. Alternate estimation with a wide range of inputs assists retailers to be better equipped to manage potential circumstances or a mix of them seamlessly. Vendors can focus on enabling retailers to envision the effect on the demand or supply of stock-keeping units due to critical variables such as price, launch of new products, natural calamities, and market conditions. A What-if scenarios simulator also assists retailers to identify the financial trade-offs for alternative safety stock strategies hence minimizing the loss due to unforeseen situations and increased customer satisfaction.
- **New Product Forecasting:** RF&R providers should focus on deploying dedicated demand planning solutions that enable the management of new products from their ideation stage to the release stage. As these new products don't have any previous trends to inspect, retailers must introduce a few forecasting best-practice approaches. The solution should be proficient in consuming and aggregating datasets to predict new items' initial sales volume. These datasets may include past and present sales data of similar prevailing products, period of product release, and implications of unique selling propositions and marketing tactics. Another critical aspect the solution should support is estimating the effect of brand/product cannibalization. This helps users to calibrate management of the available items as well as allocation and re-allocation of supply chain assets. Depending on the vendor's capability the solution may gauge suppliers of raw materials, capacity of manufactured goods, and initial manufacturing volume and distribution. The solution should also support continuous monitoring of dealer, customer, and retailer feedback to understand any shortcomings in the products. Users should deliberately look into the forecast generated by the demand forecasting and replenishment solution and compare it with the emerging sales to understand the market reality.
- **Multi-echelon inventory optimization:** The solution should enable retailers to perform overly complex operations. It should enable manufacturers and distributors located at multiple tiers to ensure that the inventory levels of various types are accurate throughout all echelons in the network. Users should look at demand forecasting and replenishment solutions that enable them to manage inventory holistically and provide comprehensive visibility into all aspects of the demand chain. Depending on the vendor's capability the solution may support the re-computation of safety stock for a particular product dynamically. The solution should possess an engine for what-if

scenarios that enables demand planners to execute simulations for identifying the effect of quantity and capital on inventory policies.

Users should be adapted to multi-echelon inventory optimization from systems, people, and process standpoints. Organizations utilize basic guidelines to define lot size targets or safety stocks. Users must understand that multi-echelon stipulates advanced tooling technologies, and they should identify suitable progressive modeling tools based on their supply chain requirements.

- **Promotional forecasting and replenishment:** The demand forecasting and replenishment solution should allow marketing and customer experience professionals to design scenario-based promotions and campaigns aligning with their supply chain workflow. The solution should be equipped with sophisticated AI/ML capability that automates complex and varying factors such as demand signals, and lead times at the channel level for enhanced promotion planning. It helps retailers deliver an appropriate degree of operational information that is useful in designing and improving campaigns. The solution should include a simulation to test campaigns and promotions and understand their practicality. With this simulation, users can select suitable campaigns to achieve the target. Users can also monitor the execution of the promotions and ensure the demand is met by placing the right inventory in the correct position. The solution should be equipped with a robust promotion dashboard to track the effect on KPIs, and current promotional events, compare plans, determine outperforming sales channels and products, and receive notifications and anomaly reporting. The solution should efficiently link the promotions with inventory management to optimize replenishment, drive down costs, boost sales, and fulfill promotional demand. Along with promotion optimization, the solution should also support markdown optimization. It should automate and optimize the product price aligning with the retailer's strategy and gain comprehensive visibility into the anticipated effect.
- **AI/ML sophistication:** Demand forecasting and replenishment solution vendors' capability in offering sophisticated AI-driven models to provide accurate prediction of item demand may significantly differ in the retail space. The solution should be equipped with an advanced set of ML algorithms and models to deliver accurate demand forecasts. It should be able to aggregate and model the determining factors associated with demand highs or lows. Users should look at solutions that enable them to increase their operational efficiency. The solution should allow demand planners to emphasize resolving

issues by automating processes such as choosing optimal forecasting models or even digital transformation. The solution should be capable of automating intensive processes such as cleaning, modifying, engineering, and training data regarding customer demand and inventory availability. The solution should enable users to assess business performance through multilevel forecasting, advanced statistical modeling, demand classification, segmentation, and new product and promotional forecasting.

Vendors should offer a solution that provides comprehensive visualization describing the breakup of data that is impacting the demand prediction, allocation and re-allocation of stock. Users should look at solutions that harness real-time data about supplier status, customer expectations, and inventory to provide recommendations for equalizing overall demand and supply. Vendors are leveraging predictive and prescriptive analytics to understand the occurrence of supply and demand activities across the supply chain. Users should also look at vendors' capability to enable them to develop short-term and long-term plans by partnering with downstream and upstream solution providers. Depending on the vendor's capability the solution may offer an AI/ML-powered replenishment solution that can be customized for any supply chain functionalities. Users should adopt replenishment solutions based on their business complexity, management, and pricing structure.

- **Vendor Management and Roadmap:** Vendors' capability in formulating a comprehensive and compelling technology roadmap is a crucial factor for users, prior adoption of the demand forecasting and replenishment solution. The vendor should have a firm understanding of the market dynamics to analyze the potential investments of their assets. To gain a competitive edge or become a digital supply chain management pioneer, the vendor should have a strong strategic objective as well as the ability to identify the trends that can be implemented across their business. Users should look for vendors taking into account multiple horizons and adopting workflows and technologies core to their business in the future. Vendors should implement a gap analysis to determine priorities and deliver value to their stakeholders. Vendors' roadmap strategy execution should include specific timelines and estimated capital for each project. There should be a specialized team of delegations liable for the success of the roadmap and growth strategy.
- **Integration and interoperability:** Seamless integration and interoperability with different data-collection systems in real-time, is the key determinant for

demand forecasting and replenishment solutions to deliver high performance. The solution should be able to support seamless integration with enterprise systems like manufacturing execution systems (MES), enterprise resource planning (ERP), supply chain management (SCM), customer relationship management (CRM), and Internet of Things (IoT) platforms for a holistic strategy towards building a connected enterprise. Users should also evaluate vendors' capability to support interaction with the users and offer a holistic environment for the retailers and supply chain professionals. Also, users should assess the solution in offering breadth and depth of integration capability specific to their existing tools and infrastructure. Furthermore, solutions should facilitate users to sync with their native offering and leverage multi usability function of diverse tools and platforms. Apart from this, vendors may also provide support for comprehensive cleaning, transforming, and processing of complex chunks of data from many sources.

- **Scalability:** The demand forecasting and replenishment solution vendor should offer an automated and scalable solution having the capability to handle store or channel level forecast. The solutions should be capable of managing the forecasting of huge numbers (in millions) of products as well as handling the processing of huge audiences, regardless of any human intervention. It should be scalable enough to support a simulation tool that helps users understand distribution techniques, safety stock, order occurrence, and volume. Users should look at solutions that can be configured to deliver a significant level of availability for risk mitigating breakdown risk caused by to extension of services. The solution should be able to accommodate the latest tools, technologies, and processes to improve operational excellence. The solution should also accommodate new forecasting best practices and models across all areas of the supply chain. Almost all major demand forecasting and replenishment solution vendors claim to support a large-scale enterprise-class deployment capability. However, the depth of technical functionalities and capabilities for smooth up-scaling and down-scaling with multiples of hundreds/thousands of inventory/products may differ from vendor to vendor.
- **Cloud agnostic software:** Leading vendors are deploying their Retail forecasting & replenishment as a cloud-native Software-as-a-service solution within the cloud infrastructure. It uses technology stacks and architecture that enable fast, low-cost deployments, scalability, and the highest levels of system availability & security. Organizations should focus on leveraging cloud-based environments to seamlessly plan and simplify decision-making across

all levels of business ranging from operational to strategic level. Moreover, cloud native solutions assist organizations in attaining a unified inventory view optimizing end-to-end supply chain leading to reduced inventory carrying cost and stock-out scenarios. Cloud-native forecasting assists organizations of any size to carefully monitor and estimate inventory levels required along different nodes of the supply chain.

- **Automated seasonal profiling:** Organizations should concentrate on automating demand forecasts for each seasonal product which negates the need to manually create forecasts. Users should opt for a forecasting and replenishment solution that can continually monitor every seasonal profile to present an accurate view of any items' current demand or alert users and make automatic adjustments in forecasts. Automated seasonal profiling assists users in taking out the guesswork from seasonal adjustments by leveraging pattern-matching algorithms for improving forecasting accuracy along with efficiency improvements by leveraging product-level forecasts. Prominent vendors should leverage the right demand classification techniques that assist users in estimating sales fluctuations across a variety of demand behaviors. Additionally, the solution should also be capable of adding a seasonal profile to a new stock item with no historical data.
- **API Connectors and Microservices:** Leading vendors should offer API connectors that can facilitate interactions between separate solutions or platforms such as retail execution platforms and retail assortment management solutions. Vendors should create such processes that allow external agencies to extend the features of their platform through connectors that operate within the platform. Users can opt for solutions that can be integrated with other various solutions necessary for managing supply chain, procurement, and logistics. The solution should support restful API services for importing and exporting data as well as scaling horizontally across various cloud-based technologies.

SPARK Matrix™: Strategic Performance Assessment and Ranking

Quadrant Knowledge Solutions' SPARK Matrix provides a snapshot of the market positioning of the key market participants. SPARK Matrix provides a visual representation of market participants and provides strategic insights on how each supplier ranks related to their competitors, concerning various performance parameters based on the category of technology excellence and customer impact. Quadrant's Competitive Landscape Analysis is a useful planning guide for strategic decision-making, such as finding M&A prospects, partnerships, geographical expansion, portfolio expansion, and similar others.

Each market participant is analyzed against several parameters of Technology Excellence and Customer Impact. In each of the parameters (see charts), an index is assigned to each supplier from 1 (lowest) to 10 (highest). These ratings are designated to each market participant based on the research findings. Based on the individual participant ratings, X and Y coordinate values are calculated. These coordinates are finally used to make the SPARK Matrix™

Technology Excellence	Weightage	Customer Impact	Weightage
Demand Forecasting	15%	Product Strategy & Performance	20%
Replenishment Planning	10%	Market Presence	20%
Inventory Optimization	15%	Proven Record	15%
Supply planning	10%	Ease of Deployment & Use	15%
Smart Inventory Allocation	5%	Customer Service Excellence	15%
Promotions Planning	10%	Unique Value Proposition	15%
Reporting & Analytics	10%		
Maturity of AI, ML, and Automation Capabilities	15%		
Competitive Differentiation Strategy	5%		
Vision and Roadmap	5%		

Evaluation Criteria: Technology Excellence

- **The sophistication of Technology:** The ability to provide comprehensive functional capabilities and product features, technology innovations, product/platform architecture, and others.
- **Competitive Differentiation Strategy:** The ability to differentiate from competitors through functional capabilities and/or innovations and/or GTM strategy, customer value proposition, and others.
- **Application Diversity:** The ability to demonstrate product deployment for a range of industry verticals and/or multiple use cases.
- **Scalability:** The ability to demonstrate that the solution supports enterprise-grade scalability along with customer case examples.
- **Integration & Interoperability:** The ability to offer a product and technology platform that supports integration with multiple best-of-breed technologies, provides prebuilt out-of-the-box integrations, and open API support and services.
- **Vision & Roadmap:** Evaluation of the vendor's product strategy and roadmap with the analysis of key planned enhancements to offer superior products/technology and improve the customer ownership experience.

Evaluation Criteria: Customer Impact

- **Product Strategy & Performance:** Evaluation of multiple aspects of product strategy and performance in terms of product availability, price-to-performance ratio, excellence in GTM strategy, and other product-specific parameters.
- **Market Presence:** The ability to demonstrate revenue, client base, and market growth along with a presence in various geographical regions and industry verticals.
- **Proven Record:** Evaluation of the existing client base from SMB, mid-market, and large enterprise segments, growth rate, and analysis of

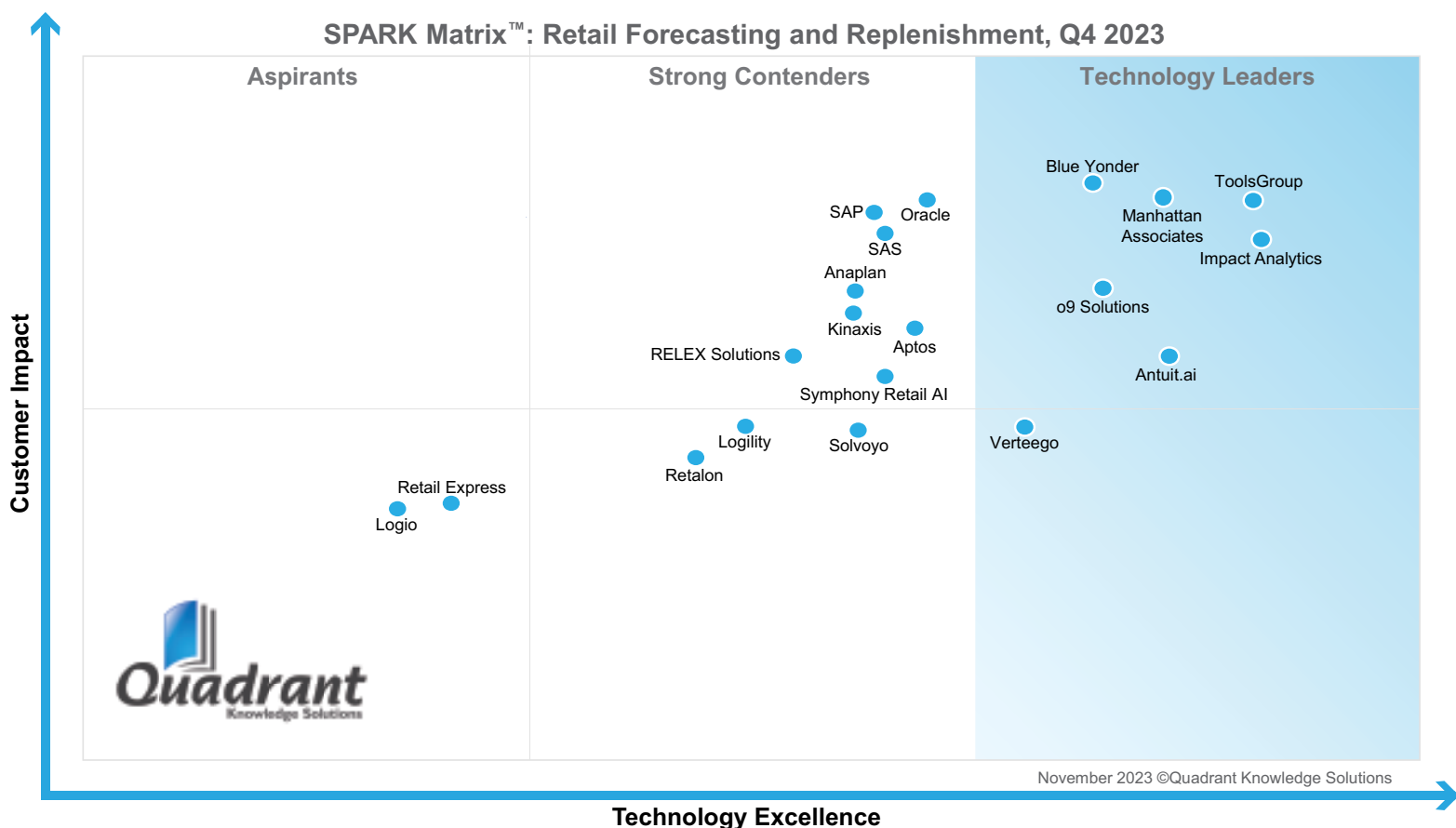
the customer case studies.

- **Ease of Deployment & Use:** The ability to provide superior deployment experience to clients supporting flexible deployment or demonstrate superior purchase, implementation, and usage experience. Additionally, vendors' products are analyzed to offer a user-friendly UI and ownership experience.
- **Customer Service Excellence:** The ability to demonstrate vendors' capability to provide a range of professional services from consulting, training, and support. Additionally, the company's service partner strategy or system integration capability across geographical regions is also considered.
- **Unique Value Proposition:** The ability to demonstrate unique differentiators driven by ongoing industry trends, industry convergence, technology innovation, and others.

SPARK Matrix™: Retail Forecasting & Replenishment Solution

Strategic Performance Assessment and Ranking

Figure: 2023 SPARK Matrix™
(Strategic Performance Assessment and Ranking)
Retail Forecasting & Replenishment solutions



Vendor Profile

The following vendor profiles have been written based on the information provided by the vendors' executives as part of the research process. The Quadrant research team has also referred to the respective company's website, whitepapers, blogs, and other sources for writing the profile. A detailed vendor profile and analysis of all the vendors, along with various competitive scenarios, are available as a custom research deliverable to our clients. Users are advised to directly speak to respective vendors for a more comprehensive understanding of their technology capabilities. Users are advised to consult Quadrant Knowledge Solutions before making any purchase decisions regarding Retail Forecasting & Replenishment solution and vendor selection based on research findings included in this research service.

ToolsGroup

URL: <https://www.toolsgroup.com/>

Founded in 1993 and headquartered in Boston, Massachusetts, USA, ToolsGroup provides retail and supply chain planning solutions. The company offers a solution suite called JustEnough that includes dynamic fulfillment, merchandise financial planning, allocation, allocation & replenishment, assortment planning, price optimization, and promotion & events. Its retail forecasting and replenishment solution offers various robust capabilities, such as demand sensing, production & capacity planning, probabilistic demand modeling & forecasting, inventory optimization, automated replenishment, and reporting & dashboarding.

ToolsGroup acquired Onera, an even-based data unification platform company, and MI9 Retail's demand management division JustEnough.

Analyst Perspective

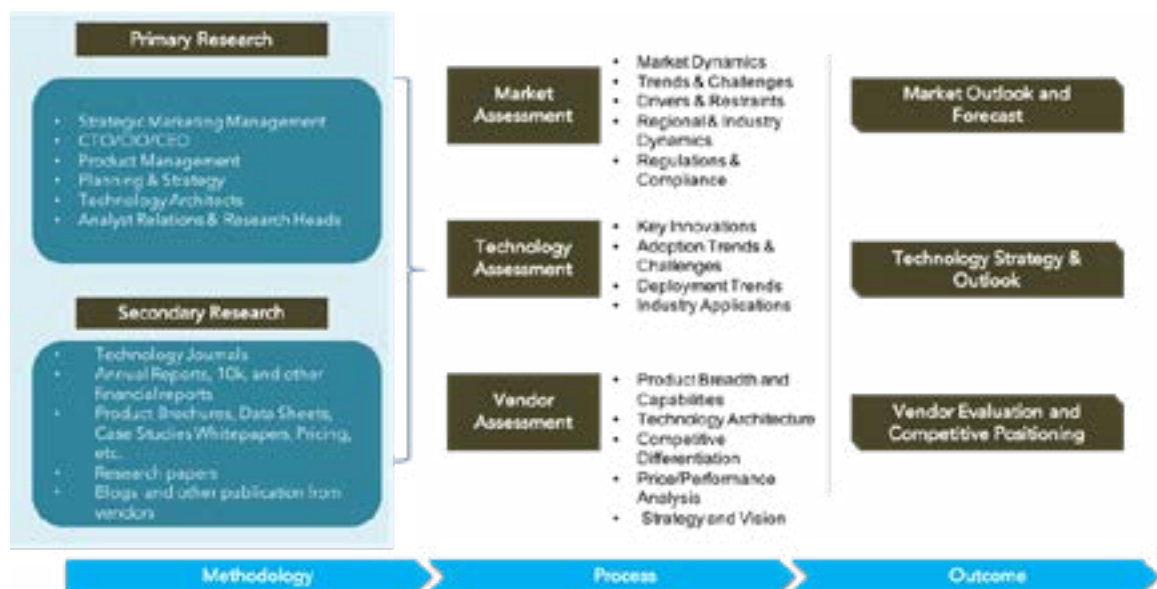
Following is the analysis of ToolsGroup's capabilities in the global retail forecasting and replenishment solutions market:

- ToolsGroup assists retailers in optimizing inventory management, replenishment processes, and overall supply chain performance with its demand forecasting and automated replenishment solutions. The company offers a service-driven supply chain planning platform, Service Optimizer 99+, that automates and streamlines supply chain tasks. The platform facilitates optimal supply chain decision-making, reduces lost sales, reduces inventory handling costs, and enhances product availability. Furthermore, the solution enables organizations to create a demand plan to optimize the SKUs offered based on target service levels.
- ToolsGroup offers an automated replenishment capability that allows retailers to gather precise and scheduled product replenishments based on forecasted demand, enabling demand planners to focus on critical tasks. Additionally, the company offers an inventory optimization capability that utilizes self-adjusting demand and inventory models to automatically determine the best inventory distribution throughout the supply chain to meet service level goals, minimize stock levels, and cut down on expenses.

- ToolsGroup provides demand sensing capability that utilizes point of sale (PoS) data to enhance sales forecasts, avoiding the need to rely on distributors or retailers. The demand sensing capability also enables retailers to perform dynamic optimization of inventory. It takes into account the inventory in regional warehouses to anticipate and update customer demand.
- ToolsGroup differentiates itself from its competitors with its probabilistic demand modeling and forecasting capability that helps organizations predict various possible demand outcomes and determine the probability of occurrence for each outcome, enabling them to reduce accuracy errors. Furthermore, ToolsGroup's forecasting and replenishment software is augmented by machine learning, which helps organizations model recurring patterns, such as seasonality; internal sources of customer demand, such as promotions; and external factors, such as weather.
- ToolsGroup caters to a wide range of use cases in the retail forecasting & replenishment segment, such as implementing demand forecasting, executing smart allocation solutions, providing automated replenishment, and performing inventory optimization.
- From a geographical perspective, ToolsGroup has a strong presence in North America and Europe and a fair presence in the Middle East and APAC regions. From an industry vertical perspective, the company has a presence across various industries, such as fashion, luxury, beauty, healthcare, food and beverages, outdoor and sporting goods, and footwear.
- The company's primary challenge is the increasing competition from local and emerging vendors with innovative offerings. However, with its AI-powered, cloud-native retail planning and optimization solutions, unified and centralized platform, and flexible & scalable architecture, ToolsGroup is well-positioned to expand its market presence in the global retail forecasting & replenishment market.

Research Methodologies

[Quadrant Knowledge Solutions](#) a comprehensive approach to conduct global market outlook research for various technologies. Quadrant's research approach provides our analysts with the most effective framework to identify market and technology trends and helps in formulating meaningful growth strategies for our clients. All the sections of our research report are prepared with a considerable amount of time and thought process before moving on to the next step. Following is a brief description of the major sections of our research methodologies.



Secondary Research

Following are the major sources of information for conducting secondary research:

Quadrant's Internal Database

Quadrant Knowledge Solutions maintains a proprietary database in several technology marketplaces. This database provides our analyst with an adequate foundation to kick-start the research project. This database includes information from the following sources:

- Annual reports and other financial reports
- Industry participant lists
- Published secondary data on companies and their products

- Database of market sizes and forecast data for different market segments
- Major market and technology trends

Literature Research

Quadrant Knowledge Solutions leverages on several magazine subscriptions and other publications that cover a wide range of subjects related to technology research. We also use the extensive library of directories and Journals on various technology domains. Our analysts use blog posts, whitepapers, case studies, and other literature published by major technology vendors, online experts, and industry news publications.

Inputs from Industry Participants

Quadrant analysts collect relevant documents such as whitepaper, brochures, case studies, price lists, datasheet, and other reports from all major industry participants.

Primary Research

Quadrant analysts use a two-step process for conducting primary research that helps us in capturing meaningful and most accurate market information. Below is the two-step process of our primary research:

Market Estimation: Based on the top-down and bottom-up approach, our analyst analyses all industry participants to estimate their business in the technology market for various market segments. We also seek information and verification of client business performance as part of our primary research interviews or through a detailed market questionnaire. The Quadrant research team conducts a detailed analysis of the comments and inputs provided by the industry participants.

Client Interview: Quadrant analyst team conducts a detailed telephonic interview of all major industry participants to get their perspectives of the current and future market dynamics. Our analyst also gets their first-hand experience with the vendor's product demo to understand their technology capabilities, user experience, product features, and other aspects. Based on the requirements, Quadrant analysts interview with more than one person from each of the market participants to verify the accuracy of the information provided.

We typically engage with client personnel in one of the following functions:

- Strategic Marketing Management
- Product Management
- Product Planning
- Planning & Strategy

Feedback from Channel Partners and End Users

Quadrant research team researches with various sales channel partners, including distributors, system integrators, and consultants to understand the detailed perspective of the market. Our analysts also get feedback from end-users from multiple industries and geographical regions to understand key issues, technology trends, and supplier capabilities in the technology market.

Data Analysis: Market Forecast & Competition Analysis

Quadrant's analysts team gathers all the necessary information from secondary research and primary research to a computer database. These databases are then analyzed, verified, and cross-tabulated in numerous ways to get the right picture of the overall market and its segments. After analyzing all the market data, industry trends, market trends, technology trends, and key issues, we prepare preliminary market forecasts. This preliminary market forecast is tested against several market scenarios, economic most accurate forecast scenario for the overall market and its segments.

In addition to market forecasts, our team conducts a detailed review of industry participants to prepare competitive landscape and market positioning analysis for the overall market as well as for various market segments.

SPARK Matrix: Strategic Performance Assessment and Ranking

Quadrant Knowledge Solutions' SPARK Matrix provides a snapshot of the market positioning of the key market participants. SPARK Matrix representation provides a visual representation of market participants and provides strategic insights on how each supplier ranks in comparison to their competitors, concerning various performance parameters based on the category of technology excellence and customer impact.

Final Report Preparation

After finalization of market analysis and forecasts, our analyst prepares necessary graphs, charts, and table to get further insights and preparation of the final research report. Our final research report includes information including market forecast; competitive analysis; major market & technology trends; market drivers; vendor profiles, and such others.

Client Support

For information on hard-copy or electronic reprints, please contact Client Support at
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