



SPARK Matrix™

Supply Chain Management, Retail & e-Commerce

SPARK Matrix™: Intelligent Retail Pricing and Promotion Optimization, 2021

Market Insights, Competitive Evaluation, and Vendor Rankings

August 2021

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Executive Overview

This research study includes a detailed analysis of the global Intelligent Retail Pricing and Promotion Optimization market regarding short-term & long-term growth opportunities, emerging major trends, vendor landscape, and competitive positioning. The study provides competition analysis and ranking of the leading vendors in the form of the SPARK Matrix. This research provides strategic information for technology vendors to better understand the market and support their growth strategies, as well as for users to evaluate the capabilities, competitive differentiation, and market position of different vendors.

Key Research Findings

Followings are the key research findings:

Technology Trends

The Intelligent Retail Pricing and Promotion Optimization vendors continue to invest heavily in improving platform capabilities such as simulation, competitor benchmarking, price tracking and matching, promotional planning, and product visibility. Vendors are also leveraging AI, ML, automation, and advanced analytics technologies to provide accurate pricing and promotion forecasting and anticipate response to the price variations based on demand.

Key Market Drivers:

- The rise in online and mobile shopping is driving retailers to adopt IRP&PO platforms to deliver competitive pricing and personalized promotional offers to stay ahead of the competition.
- IRP&PO vendors are significantly investing in improving their artificial intelligence, machine learning, and advanced analytics capabilities to support a wide range of use cases, as well as improve the overall sales strategy and business performance.
- The value proposition of AI/ML-driven pricing solutions includes adjusting product prices based on changing market conditions, providing intelligent discounts, optimize existing data usage, and determining product performance is driving significant adoption.
- The IRP&PO platform's ability to provide contextualized real-time pricing for customers based on their communication channels, geographical

location, seasonality, and more to delight customers and maximize repeat purchases.

- The ability of the platform to provide simulation/what-if capability to formulate and understand the performance of pricing and promotional strategies, especially owing to the uncertainties in the COVID-19 pandemic, changing customer behavior, and dynamic competitive landscape.
- Growing focus on leveraging automation across various pricing processes such as formulating pricing strategies, tracking, and understanding these strategies' impact and performance to drive increased ROI.
- Customers have grown more price-sensitive as a result of the worldwide pandemic, prompting retailers to implement advanced pricing solutions to meet the need for competitive pricing and drive customer loyalty. Organizations are focusing on offering market-based pricing as customers are comparing alternative product prices to get the best deals.
- Continued investments towards several digital transformation projects and customer-centric initiatives.

Competition Dynamics:

- This study includes analysis of key intelligent retail pricing and promotion optimization vendors, including Aifora, Antuit.ai, Revionics (an Aptos Co.), Blue Yonder, Clear Demand, Competera, Daisy Intelligence, DemandTec, Dunhumby, Engage3, First Insights, Hypersonix, IBM, Intelligence Node, IRI Worldwide, Logility, Mi9 Retail, Oracle Retail, Periscope by McKinsey, RELEX Solutions, Retail Express, Retalon, SAP, Solvoyo, Symphony RetailAI, Yieldigo.
- Revionics (an Aptos Co.), Blue Yonder, Intelligence Node, Mi9 RetailAI, Oracle Retail, Periscope by McKinsey, Symphony RetailAI are amongst the top performers and 2021 technology leaders in 2021 SPARK Matrix analysis of the Intelligent Retail Pricing and Promotion Optimization market. Aifora, Daisy Intelligence, and Solvoyo are amongst the emerging IRP&PO technology leaders.
- Antuit.ai, Dunhumby, First Insights, IBM, IRI Worldwide, Logility, RELEX Solutions, and SAP have been positioned as the major challenges. The other vendors captured in the SPARK Matrix include Engage3, Competera,

Retail Express, Hypersonix, Yieldigo, Clear Demand, Retalon, and
DemandTec.

Market Overview and Technology Trends

Price optimization is a strategy that global organizations and brand owners have implemented based on various factors, including competitive pricing, margin-based pricing, price elasticity, and more. However, with increasing changes in consumer behavior and demand, where customers expect brand owners to anticipate their requirements and fulfill expectations, retailers need a more holistic pricing solution to formulate and implement effective price optimization strategies throughout the entire product lifecycle. Retailers are also increasingly looking at supporting the omnichannel environment to monitor customer behavior at every stage of their journey and optimize their pricing strategies to drive increased profits and reduce waste.

Towards this end, AI-powered price optimization solutions deliver actionable insights accounting for several factors, including seasonality, prize zones, store types, fulfillment methods, different sizes, inventory availability, along with demand forecast, price elasticity of demand, competitive pricing, and more. These insights enable retailers to gain a comprehensive view of the performance of various pricing strategies, forecast customer demand and allow the retailers to select and set optimum prices for their products accurately. A well-executed price optimization process helps retailers understand how customers are responding to their product prices and enabling them to achieve organizational goals of improving sales, profitability, growth, customer engagement, and brand loyalty.

Retailers are also looking at adopting an end-to-end approach to formulate price optimizations strategies, gain advanced customer insights, and drive customer engagements in an omnichannel environment. Retailers are increasingly adopting intelligent retail pricing and optimization software for price optimization, regular price optimization, promotion price optimization, markdown price optimization, and contextualized real-time pricing. Retailers leverage an intelligent price optimization platform that can offer accurate insights accounting for a wide range of influencing factors such as competition, weather, season warehouse costs, operating costs, etc., and suggest reliable insights. The platform helps retailers formulate their price optimization strategies quickly and efficiently. It allows retailers to gauge the demand and align the product's initial prices, discounts, and promotions with organizational goals. A retail price and promotion optimization platform can provide a reliable price optimization solution that can anticipate customer demands and recommend strategies to set up prices accurately. This helps the organizations gain a competitive advantage by proactively identifying customer demand across various stages of the product lifecycle and achieving organizational goals with the right pricing and promotion optimization strategies.

Quadrant's research on Intelligent Retail Pricing and Promotion Optimization focuses on exploring the current market scenario, market dynamics, and short-term and long-term growth opportunities across various industries and geographical regions.

Market Definition and Key Capabilities

Intelligent retail pricing and promotion optimization platforms offer various lifecycle pricing solutions that enable retailers to manage every aspect of pricing and promotions in real-time. The platform leverages AI/ML technologies to offer intelligent insights and analytics based on several factors, including demand forecast, local conditions, competition, season and brand loyalty, and others, to facilitate intelligent pricing and promotion decisions across the product lifecycle. It enables retailers to optimize pricing throughout the entire product lifecycle and across all channels and helps them meet their business objectives by increasing profit margins, maintaining price consistency across multiple channels, and reducing excess stock and waste. The platform offers comprehensive AI-powered capabilities for dynamic pricing, managing prices across all channels, and improving markdown pricing. Retail pricing and promotion optimization platforms offer capabilities for initial price optimization, regular price optimization, promotion price optimization, markdown price optimization, and contextualized real-time pricing. With advanced AI and ML algorithms, these platforms can recognize the various influencing factors such as demand, sales, season, and more and offer real-time pricing suggestions.

Following are the key capabilities of Intelligent Retail Pricing and Promotion Optimization solutions:

- ◆ **Intelligent Pricing Optimization:** The platform offers AI and a data-driven recommendation engine to manage and optimize the product pricing by accurately suggesting initial price, regular price, and markdown price. The platform helps organizations set up the initial price based on historical data and similar product line-ups. It also offers organizations thorough estimates of future sales and product demand in order to determine the initial price and amount of product that must be manufactured. The platform automates price recommendations across the supply chain network based on sales, promotion, markdown, and actual available inventory. The platform is capable of dynamically recommending prices based on demand spike, seasonal demand, and competitor price change. It enables the organization to configure pricing models to achieve set KPIs and liquidate old/unsold inventory. The platform also provides a competitive price

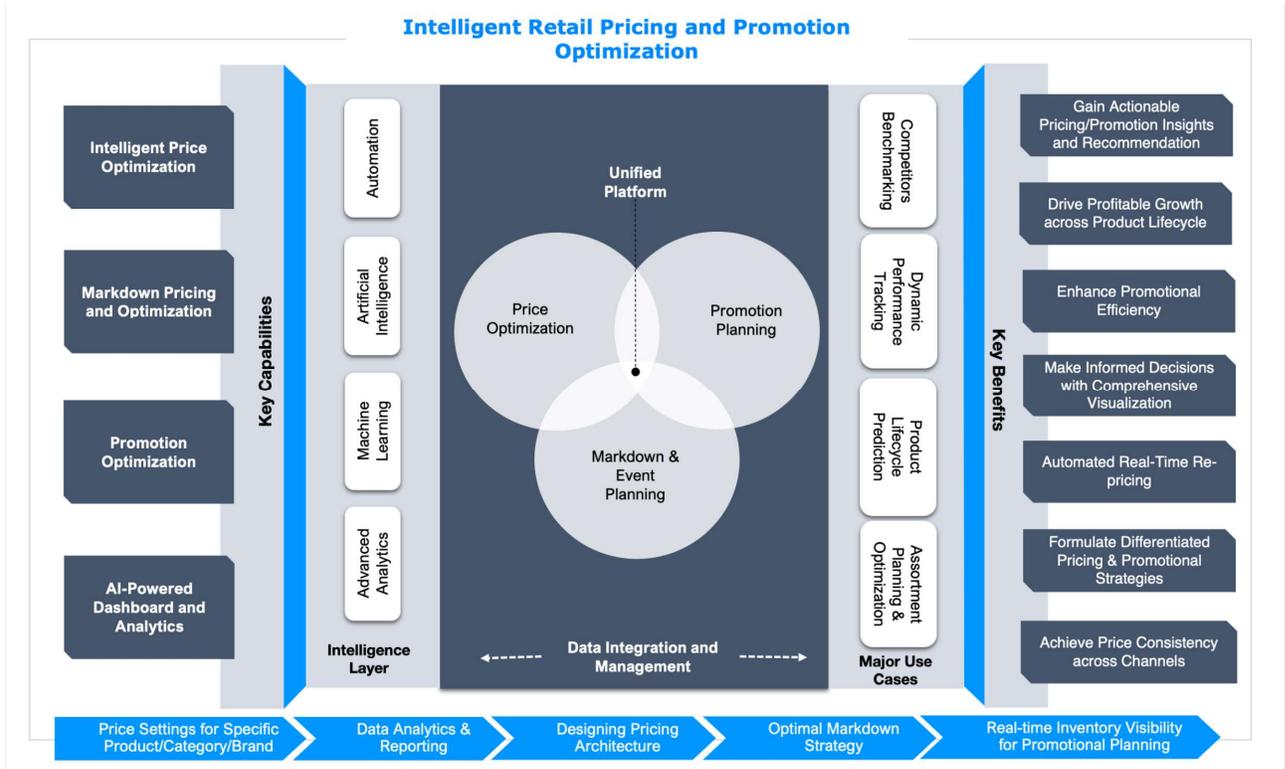
tracking/matching feature that allows businesses to set the price of different product categories based on their competitor's pricing and similar products.

- ◆ **Markdown Pricing & Optimization:** The platform offers markdown pricing & optimization capability that helps organizations to strategically target the right product at the right time and the right price. It facilitates organizations to optimally maximize margins, define competitive discounts, and provide real-time product availability. The platform also offers AI-driven markdown optimization support that includes automated diagnostics, dynamic decision making, predictive and perspective analytics functionalities. The AI-driven markdown optimization capability allows the organization to identify optimal markdowns and configure the best-fit pricing strategy. The platform can specifically categorize product pricing based on geographic regions, store location, seasonal demand, product range, and categories. Depending on the vendor's capability, the platform may offer markdown optimization and management support for a short life and long life inventory.
- ◆ **Promotional Optimization:** The platform offers AI-powered customer-centric promotion planning & forecasting capability that helps organizations efficiently evaluate, plan and forecast promotional activities. The platform helps the organization to make data-driven decision-making to gain higher profit margins. It manages multi-channel promotional planning and forecasting, with real-time visibility of end-to-end SKUs from a centralized location. The platform empowers organizations by automatically planning and executing new campaigns, events, and promotional activities. Organizations can define campaign start and end dates in the calendar, define event name, promotion layout and budget, and target customers based on their geographic location, preferred product pricing, and categories. The platform's recommendation engine helps organizations optimize sales, margins and maximize revenue growth. It also offers features such as visibility into category spend, what-if analysis, workflow analysis, and promotional ad-planning. The native what-if capability evaluates various scenarios to analyze current and future promotional outcomes.
- ◆ **AI-powered Dashboard & Analytics:** The platform provides AI-driven price tracking support that helps organizations dynamically focus on specific product pricing to take appropriate actions. It tracks price changes and reverts with the updated changes to all connected systems in real-

time. The platform's promotional analysis feature provides users with real-time visibility into the performance of campaigns, events, and promotion activities and analyzes them. It helps organizations to identify accurate pricing & promotional model for similar products. The platform evaluates customer purchasing patterns & behavior to estimate sales forecasts. It also provides visibility into product mix patterns, which helps organizations efficiently design cross-product selling campaigns. The platform also provides an AI/ML-powered dashboarding functionality that helps organizations visualize pricing models, exceptions, promotional planning, and markdown operations in real-time. Organizations can track performance and make informed decisions based on real-time recommendations provided by the native recommendation engine. They can create a centralized collaborative plan that may aid in the development of a synchronous plan for retail and manufacturing in order to achieve strategic goals. Depending on the vendor capability, the platform may also offer a granular analytics feature to deep dive into macro and micro-level comparisons. The platform helps organizations gather and manage and gather frequently refreshed real-time data from various inter-connected systems to gain valuable insights into price across the channels and make business-critical decisions as per their business requirements.

Quadrant Knowledge Solution's Intelligent Retail Pricing and Promotion Optimization (IRP&PO) study includes vendors who provide solutions for pricing, promotion, and markdown optimization. The market is in the emerging stage and is quickly moving into the growth stage of the overall product lifecycle maturity model. The overall market, as well as the vendors positioning, is expected to change significantly in the coming years.

Figure: A Framework for Intelligent Retail Pricing and Promotion Optimization Platform



Factors Influencing Market Development and Growth

The following dominant technology and market developments are influencing the overall global intelligent retail pricing and promotion optimization solution and market growth:

Growing Focus on Offering Contextualized Pricing Models to Drive Customer Loyalty and Revenue Growth

Driven by the customer-centric approach and evolving customer expectations, retailers are constantly focusing on formulating/reformulating their marketing and pricing strategies to stay ahead of the competition. Customers often share their information and expect retailers to offer more personalized deals in return. In addition, the global pandemic has triggered tough competition amongst retailers, which has significantly driven retailers to adopt event-driven pricing. Retailers are looking at advanced pricing solutions that enable them to leverage and analyze customer information to deliver contextualized offers. Retailers are emphasizing adopting intelligent retail pricing, promotion, and markdown platforms equipped with contextualized real-time planning and pricing features that facilitate the management of in-store/online product prices for customers. As retailers also seek to increase customer loyalty, they are also increasingly looking at advanced pricing solutions with the ability to fulfill the right price at the right time to the right customer. IRP&P platform vendors are aware of the market scenario. They are concentrating on helping retailers by capturing information such as past purchases, brand loyalty, purchase frequency, and more to offer competitive real-time product pricing. Vendors are also focusing on offering an AI-driven robust contextualized pricing feature that considers various aspects such as retailers' product range and demand, existing stock levels, and more to provide optimal price recommendations and automatically change prices without jeopardizing margins. As contextualized pricing features are enthusing the retailers, many vendors have either already developed this feature or are planning to incorporate it as a part of their product roadmap. Contextualized pricing and price discrimination have a fine line between them; hence retailers and vendors must understand the distinction.

Continued Enhancements in AI and Machine Learning Capabilities for Demand Prediction and Price Optimization

A retail organization usually faces challenges while setting prices for their goods or services and delivering unique promotional offers crucial to executing any business. They are constantly focusing on delivering a better customer experience by providing the customer with products based on their needs, preferences, and communications channels. With growing competition to acquire customers, price is becoming a key factor in sustaining the fast-paced retail space. Low-cost products have evolved into the main priority for all customers, due to which the emphasis on price optimization is increasing. An organization's internal system probably captures a large amount of customer data. This data is becoming a key driver to optimize pricing and promotional success. Combining this data with emerging technologies such as artificial intelligence and machine learning is helping organizations improve customer experience and increase loyalty. Retail organizations leveraging AI/ML-based pricing and promotion capabilities are gaining a competitive edge and delighting their customer with creative pricing and promotions. In contrast, organizations that fail to understand the importance of AI/ML are missing huge opportunities that the dynamic retail space offers.

Figure: AI and Machine Learning are Transforming Pricing and Promotion Process



Source: Quadrant Knowledge Solutions

Retailers are leveraging AI/ML for implementing dynamic pricing to maximize competitiveness and satisfy customers with the right pricing. The AI-driven automated pricing is helping organizations to get near-real-time pricing with minimum maintenance. Retailers are leveraging this predicted pricing to segment

their market or capture critical business information to make informed decisions. Vendors are leveraging AI/ML to design or enhance their pricing solution to provide fair product pricing based on the current market scenario, seasonality, competition, or level of niche. Vendors are focusing on enhancing their IRP&P platforms by developing advanced algorithms capable of learning patterns exhibited by the data and forecast demand levels. They are also building or enhancing sophisticated predictive models that determine the ideal price for every product or service.

ML-driven models are also helping organizations by accurately anticipating the promotion-related aspects such as start or end, ideal factors, and more. It is also assisting retailers in capitalizing on missed opportunities by assessing the buyer data and estimating the impact of promotions across channels. Many vendors are investing significantly in continuously working on the ML models to personalize the promotions by learning each buyer's behavior and recommending promotions to buyers exhibiting similar patterns. These models are also helping users by anticipating ideal prices for maximizing sales and promotion revenue. Organizations are leveraging the sophisticated ML models to experiment with various strategies to optimize promotional campaigns.

The adoption of AI/ML is also helping organizations uncover interesting business and customer data/insights and enabling business leaders to act on these insights. AI-driven advanced capabilities for demand forecasting and predictive analysis will continue to provide users with a comprehensive understanding of business-critical factors such as demand, turnover, profit per unit, and customer behavior and satisfaction. In the coming years, the use of AI to derive actionable pricing and promotional insights will rise significantly. Also, the market is expected to witness new entrants offering robust IRP&P platforms that will enable brands to measure, analyze and anticipate customer behavior, churn, and loyalty effectively.

As per Quadrant's analysis of the overall market, supply chain management technologies are becoming collaborated, automated, and intelligent. The adoption of automation, machine learning, and AI is amongst the most significant trend and is expected to grow significantly in the upcoming years. Machine learning and artificial intelligence are expected to drive the next generation of supply chain management solutions with the emergence of a self-aware platform integrating humans, data, and technologies.

COVID-19 accelerating the adoption of intelligent retail pricing, promotion, and markdown platforms

The COVID-19 pandemic has wreaked havoc on the supply chain and the retail industry. Customers' purchasing behavior, habits, and preferences have also changed significantly due to the closure of physical stores and the increased emphasis on digital shopping. Customers have become more price-conscious than in the past and are putting pressure on retailers to reassess their item prices. Therefore, many retailers are embracing the IRP&P platform in order to boost customer acquisition and gain a competitive advantage. Retailers are focusing on providing dynamic, competitive, and personalized pricing to their customers amid pandemics by leveraging the unified platform equipped with comprehensive automated pricing, promotion, and/or markdown optimization capabilities. They are looking at IRP&P platforms that can efficiently and accurately anticipate the price sensitivity factor and offer automated, real-time pricing to the customers to gain loyalty and meet the evolving market demands.

Vendors are providing retailers the ability to rapidly test the what-if scenarios to better understand the demand levels in these uncertain times. Vendors are also concentrating their efforts on enhancing their platform's AI capabilities to provide accurate demand and promotional forecasts as well as improve the markdown performance. Vendors are also focusing on offering sophisticated analytics along with competitor intelligence to help retailers manage and optimize the markdowns, price, and promotion. In addition, they are also continuously working on addressing retailers' needs regarding online/offline channel-specific pricing and promotion approaches to boost business revenue. In order to address the gap between inventory and pricing, drive desired business outcomes, and the need to sustain in volatile retail space, it is crucial for retailers still relying on manual pricing to shift to AI-driven platforms that can track the pricing landscape in real-time.

Competitive Landscape and Analysis

Quadrant Knowledge Solutions conducted an in-depth analysis of major intelligent retail pricing and promotion optimization vendors by evaluating their product features & functionality, market presence, and 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 analysis of 26 key vendors, including Aifora, Antuit.ai, Revionics (an Aptos Co.), Blue Yonder, Clear Demand, Competera, Daisy Intelligence, DemandTec, Dunhumby, Engage3, First Insights, Hypersonix, IBM, Intelligence Node, IRI Worldwide, Logility, Mi9 Retail, Oracle Retail, Periscope by McKinsey, RELEX Solutions, Retail Express, Retalon, SAP, Solvoyo, Symphony RetailAI, Yieldigo.

Blue Yonder, Oracle Retail, Revionics (an Aptos Co.), Periscope by McKinsey, Symphony RetailAI, Mi9 Retail, and Intelligence Node are amongst the top performers and technology leaders in the 2021 SPARK Matrix analysis of the global Intelligent Retail Pricing and Promotion Optimization market. These companies provide sophisticated products and solution portfolios to enable organizations to manage, automate, and optimize pricing and promotional strategies to drive profitable growth and customer loyalty & satisfaction. These vendors are also at the forefront in providing modern architecture, comprehensive out-of-the-box capabilities, integration & interoperability with various data sources, and best-of-breed supply chain technologies. Aifora, Solvoyo, and Daisy Intelligence are amongst the emerging technology leaders and are leading the market with effective competition and growth strategy execution.

IBM, SAP, Dunhumby, IRI Worldwide, RELEX solutions, Anutuit.ai, Logility, and First Insights have been positioned as the primary challengers in the global IRP&PO market. These companies provide comprehensive retail pricing and promotion optimization to support companies in supporting a variety of use cases to optimize dynamic pricing, price benchmarking, master data management, maximize markdown performance tracking, and product lifecycle predictions use cases. These companies are cognizant of the upcoming market trends and have outlined a comprehensive roadmap to tap into future growth opportunities. Engage3, Competera, Hypersonix, Retail Express, Yieldigo, Clear Demand, Retalon, and DemandTec are some of the other key vendors positioned in the 2021 IRP&PO SPARK matrix.

As per Quadrant's research analysis, the IRP&PO market is in the emerging stage and is quickly moving into the growth stage of the overall product lifecycle maturity model. The overall market, as well as the vendors positioning, is expected to

change significantly during the forecasted years. While a majority of the vendors may provide all the core functionalities, the breadth and depth of the capabilities may differ by different vendors' offerings. Users should evaluate IRP&PO platforms that offer comprehensive capabilities to provide seamless connectivity with organization-owned tools and platforms, a broad range of out-of-the-box capabilities, scalability & extensibility, unified pricing & promotional visibility, advanced analytics, markdown optimizations, event & campaign management, and such others. Additionally, the vendor's customer value proposition may differ in terms of ease of deployment, ease of use, price/performance ratio, support for a broad range of use cases, global support service, and such others. The supply chain and retail space are continuously transforming, requiring vendors to expand their R&D investments, make continuous enhancements to their software and provide a robust technology value proposition to ensure future customer needs are met. The vendor's ability to accommodate emerging technology trends such as artificial intelligence, machine learning technologies, and capability to offer a holistic and unified platform is increasingly becoming key differentiators for selecting IRP&PO platforms.

Key Competitive Factors and Technology Differentiators

Followings are the key competitive factors and differentiators for the evaluation of Intelligent Retail Pricing and Promotions Optimization vendors. While the majority of the 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:

- **Integration & Interoperability:** Organizations are growing and have a long-term vision of exponential growth. In addition, it is critical to be compatible with all existing platforms and capable of being easily scalable. Seamless integration and interoperability with the organization's existing technologies are amongst the most crucial factors impacting the technology deployment & ownership experience. Intelligent Retail Pricing and Promotion Optimization vendors may provide out-of-the-box integration connectors, well-documented API, and a RESTful API to achieve seamless end-user experience and business process design. The vendors should enable direct integration with multiple ERP, CRMs, MMS systems, MDM, and other planning, operations, and financial systems. Users should also evaluate vendor capability that offers seamless integration with any databases and systems. The vendors should also support quick integration with organizations' in-house solutions such as planning, assortment, replenishment, forecasting, and other solutions that will provide unified data visibility, transparency, and accountability across the organization. Users should also consider vendors who support omnichannel integration with retailers, manufacturers, and distributors in order to have unified inventory visibility when developing promotional activities, markdown operations, and pricing strategies. Additionally, vendors are also increasingly integrating with advanced analytics solutions providers for a granular understanding of the pricing patterns and promotional analysis. Vendors are also focusing on providing campaign management that will leverage campaign design.
- **The Sophistication of Technology Platform:** User should evaluate an intelligent retail pricing and promotion optimization solution that offers comprehensive capabilities such as intelligent pricing management & optimization to accurately define and recommended initial price, regular

price and promotion price; markdown pricing & optimization to seamlessly target the right product at the right time and with competitive price; promotional planning & forecasting to offer customer-centric promotional planning & forecasting to evaluate, plan, and forecast promotional activities; AI-powered dashboard & analytics to seamlessly track & monitor pricing, promotion analysis, exception management, and alerts & notifications. The intelligent retail pricing and promotion optimization market is gearing up with various vendors offering comprehensive capabilities at different levels of technology maturity. Users need to evaluate the solutions based on the configurable nature of the intelligent AI-infused platform that allows offering industry-specific and user-specific use-cases. Additionally, the vendor's customer value proposition may vary in terms of ease of deployment, ease of use, price/performance ratio, support for a broad range of use cases, global support service, and such others. Users should also look for vendors offering multi-team management, multi-lingual support, notification & alerts, and user-based configuration platform. Users should also look at vendors that are offering a cloud-based platform that enables them to accommodate evolving customer requirements. Vendors should also offer configurable event calendars that will assist the user in building strategic planning for their promotion activities and calculating optimal pricing models. Users should also look for vendors that offer dynamic pricing, real-time price optimization, and price matching functionality. This will help users to define competitive pricing by running various what-if scenarios to choose the best-fit business strategies and compare the price of the product against similar competitor products with lower refresh rates.

- **Use-Case Diversification:** Users should evaluate vendors that are capable of supporting their organizational use cases across industry verticals and have a customer-centric approach. The solution should be capable of handling dynamic business requirements in an ever-evolving environment. Users should evaluate vendors that support various use-cases such as dynamic price recommendation, competitor price tracking, similar product matching, product lifecycle prediction, assortment planning, markdown pricing & performance tracking, master data management and promotional planning, campaign planning, and social media/e-commerce integration. Users should also focus on vendors having broad use case coverage in industry verticals comprising fashion & apparel, home décor, food & groceries, health & beauty, retail, e-commerce, automotive, and more. Depending on the vendor's capability, the solution may also support

manufacturing and operation-related use cases to seamlessly plan and predict the pricing. The solution must be able to provide flexibility in addressing organizations' challenges by supporting new use cases that can be customized based on business requirements and objectives.

- **Scalability:** Intelligent retail pricing and promotion optimization vendors should be able to manage and process millions of data sets and transactions on a scalable/flexible platform. The platform should be able to dynamically scale up and down to meet demand spikes without interruption and should be able to handle higher data volumes without slowing down. Users should look into intelligent retail pricing and promotion optimization systems that offer high-level customization and configuration in order to provide a high level of availability for developing superior processes/methodologies and supporting customer-specific use cases. The platform should also support interactive What-if analysis for evaluating different price points and should support automated diagnostics for identifying all products that need price action. The intelligent retail pricing and promotion optimization platform should be able to support both cloud-based and on-premise deployment strategies. The platform should incorporate a robust system failure detection and recovery mechanism to avoid service disruptions. It should have an intuitive and adaptable user interface, and it should enable enterprise readiness, robust security, and compliance. The platform should be built on an open architecture to allow for the development of new functionalities, a smooth transition of existing platform capabilities following mergers and acquisitions, and the ability for professional service teams and business partners to accommodate unique price requirements. The depth of technological functions and capabilities for smooth up-scaling and down-scaling with multiples of hundreds/thousands of data transactions may vary from vendor to vendor.
- **Vendors' Strategy Roadmap & Vision:** Prior to adopting the intelligent retail pricing and promotion optimization platform, users must assess the vendor's capacity to develop a comprehensive technical and competitive roadmap, technical advancements, and market growth strategy. To examine the prospective investments of their assets, vendors must have a clear awareness of market dynamics. Users should evaluate vendors who consider numerous business horizons and implement workflows and technologies critical to their future success. Vendors should have a clear strategic goal and action plan in place that can handle current and projected market upheaval as well as ongoing innovations to improve the overall technology ownership experience. Users should assess vendors'

ability to align their product enhancements with emerging market opportunities and trends as well as evolving buyer requirements. They should evaluate vendors that engage with their customers to understand the critical needs and requirements to design a comprehensive roadmap, which may include upgrading existing technology, implementing modern AI/ML-driven technologies, product launches, and more. Users should consider the vendor's focus on potential investments in mergers and acquisitions and partnerships, as well as R&D of new platform features and functionalities. The vendor's ability to leverage capabilities of AI/ML, analytics, transformation, and automation across their business and applications, should also be evaluated by users. It is also critical for users to understand that vendors have the essential resources and expertise to execute the outlined roadmap. In addition, users need to assess the vendor's ability to set benchmarks and deadlines for the strategy and roadmap it has created. Also, the users should evaluate whether the vendor is focussing on features that will increase the retention of the platform.

- **Maturity of AI/ML and Analytics:** IRP&PO solutions' capability to offer sophisticated analytics, reporting, and AI capabilities may significantly differ from vendor to vendor. Many leading IRP&PO platform providers have integrated AI, machine learning, and predictive and prescriptive analytics capabilities into their solutions to offer deep-dive analytics/actionable insights and functionalities to help organizations improve the stock quantity based on demand variation, understand various promotional factors, existing product categories and attributes, and new product launches. The AI/ML-driven platform should enable users to perform competitor benchmarking to pinpoint the potential opportunities by gaining real-time visibility into their pricing and product catalogs. Users should look at platforms that offer simulation/what-if capability to review the performance of various pricing, promotional strategies and adopt the ideal strategy to boost revenue. They should also look at platforms that leverage various ML models for providing accurate forecasting to optimize the sales strategy. The platform should include an intuitive and unified dashboard that provides comprehensive visualization into the complete profits, sales, price information, price fluctuations, discounts, and competitor intelligence.

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 makings, 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 SPARK Matrix.

Technology Excellence	Weightage	Customer Impact	Weightage
Sophistication of Technology	20%	Product Strategy & Performance	20%
Competitive Differentiation Strategy	20%	Market Presence	20%
Application Diversity	15%	Proven Record	15%
Scalability	15%	Ease of Deployment & Use	15%
Integration & Interoperability	15%	Customer Service Excellence	15%
Vision & Roadmap	15%	Unique Value Proposition	15%

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 such 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 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

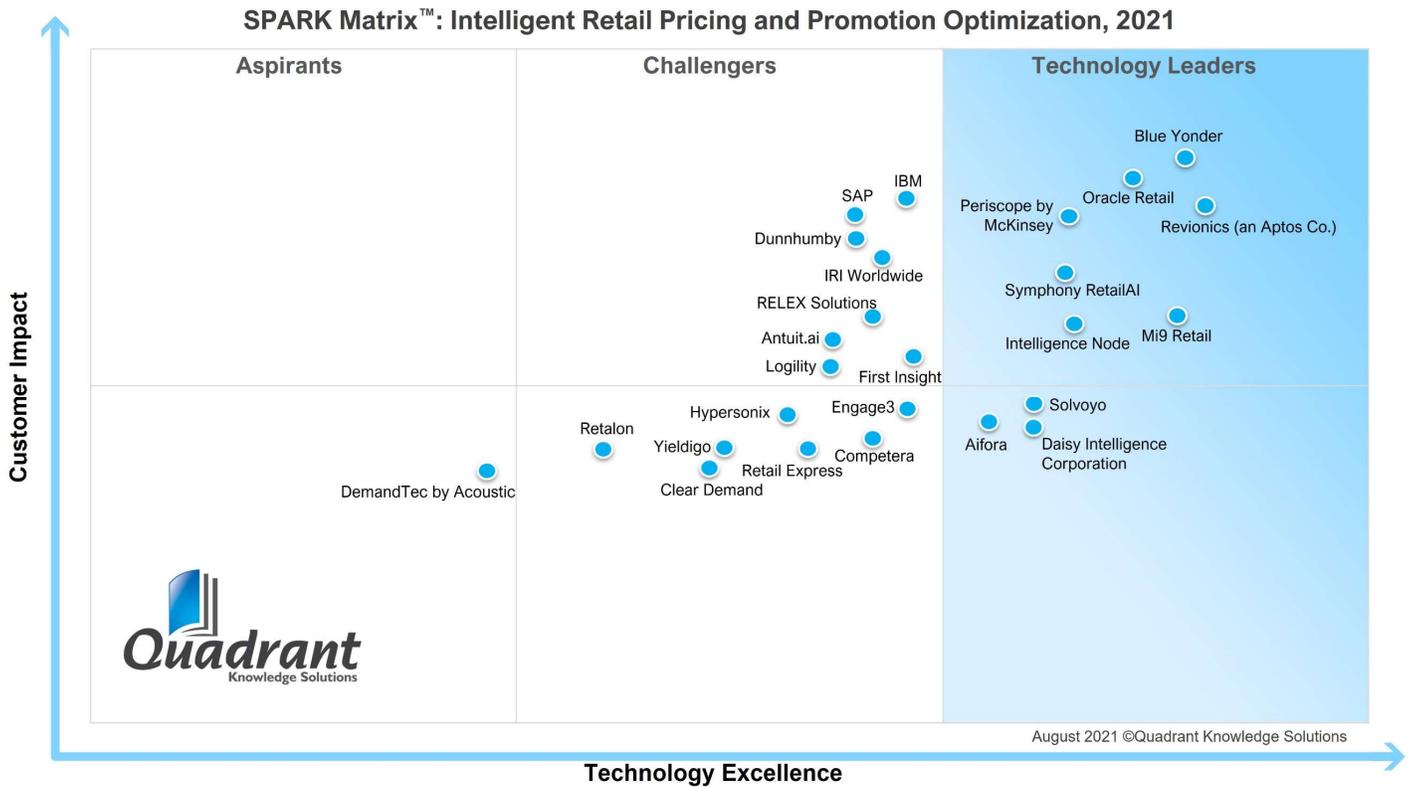
- ◆ **Product Strategy & Performance:** Evaluation of multiple aspects of product strategy and performance in terms of product availability, price to performance ratio, excellence in GTM strategy, and other product-specific parameters.
- ◆ **Market Presence:** The ability to demonstrate revenue, client 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 segment, 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 the vendor's 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 such others.

SPARK Matrix™: Intelligent Retail Pricing and Promotion Optimization

Strategic Performance Assessment and Ranking

Figure: 2021 SPARK Matrix™
 (Strategic Performance Assessment and Ranking)
 Intelligent Retail Pricing and Promotion Optimization



Vendor Profiles

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 intelligent retail pricing and promotion optimization technology and vendor selection based on research findings included in this research service.

Revionics, an Aptos Co.

URL: <http://www.revionics.com>

Founded in 2002 and headquartered in Austin, Texas, Revionics is a provider of retail pricing, promotions, markdowns, and advanced analytics solutions. In 2020, Aptos acquired Revionics to expand and diversify its customer base of global Tier-1 retailers by adding the latter's price optimization SaaS solutions to Aptos' Merchandise Lifecycle Management suite. Revionics offers cloud-based SaaS solutions that are equipped with advanced analytics and AI. These solutions help retailers manage and optimize their pricing, promotions, and markdowns and deliver immediate as well as long-term pricing recommendations. The Revionics intelligent retail pricing and promotion optimization platform offers capabilities like price optimization, markdown optimization, and promotion optimization.

The Revionics' intelligent retail pricing and promotion optimization platform offers effective pricing policies to help retailers form better and sophisticated pricing strategies. The retail price optimization capability of the platform helps retailers streamline operations with a sophisticated rules-based engine. The capability automates pricing compliance, policy management, and pricing processes and provides a rules-based pricing engine with flexible rule management, including category, KPIs, and more. It also offers price suggestions based on key triggers such as margins, cost shifts, new goods, and competitive price shifts. The platform also offers real-time OR batch data integration for seamless processing. The platform's price planning and optimization feature facilitates price advantage for retailers by predicting demand fluctuations and proposing best-specified rates. The platform allows retailers to take advantage of price suggestions based on financial objectives and helps them expand efficiently to handle goods or shops while managing prices with fewer efforts. Also, the platform's AI suggests adequate reasoning to retailers for various price suggestions. The platform facilitates the optimization of prices at all levels, including products, groups, zones, and categories. It offers self-learning AI models for price recommendations that are tailored to retailers' consumers' buying habits. It also enables target-based optimization in a single click while adhering to rules, restrictions, and objectives. The platform facilitates retailers with price scenario simulations along with robust reporting of insights into the impact and value provided by price changes. It also offers a dynamic pricing feature that helps retailers respond to market developments, competition moves, consumer behavior, and more through built-in AI. The platform facilitates retailers with real-time responsive pricing and a flexible setup of rules and constraints with prioritization and weighting to gain an edge over its competitors.

The platform's promotion optimization capability provides effective and targeted promotions to retailers by bringing pricing, marketing, and category teams together through established promotional analytics and planning procedures. The platform offers features such as profitable promotions, promotional effectiveness, predictive planning, and maximum impact. It also evaluates current promotions to identify winners, eliminate underperformers, and uncover new opportunities. The platform facilitates retailers with customized plans leading to effective promotions for achieving specific business goals and objectives. The platform also helps retailers maximize promotional offerings and utilization of vendor funds by matching the right items with the right vehicles.

The platform's retail markdown optimization capability crafts distinct markdowns optimized for inventory and profit goals. The platform helps retailers boost short-term and seasonal goods sales through its short-life markdown capabilities. It identifies and executes optimized markdown plans to clear seasonal inventory profitably. The platform's short-life markdown feature provides regular insights that allow retailers to spot vital demand signals and filter noise, resulting in increased revenues. The platform helps retailers clear seasonal insights by simplifying markdown management with planning and optimization at every style, color, or product level. It also builds markdown plans for the right goods at the right cadence for optimized outcomes. The platform offers automated recommendations based on pre-defined hierarchy rules and budgets. The solution also offers a 'what-if' analysis tool that helps users make the best decisions possible. The long-life markdown feature of the platform's retail markdown optimization capability helps retailers to avoid last-minute reductions and facilitates them with a markdown strategy using AI. The platform provides retailers with a user-friendly markdown process along with customizable grouping and administration of clearing events. It also uses sophisticated scenario simulations to uncover the total cost of mistimed markdowns. The platform supports extensive analytics to enable exception handling and tools to track execution while creating appropriate markdowns by dynamically clustering stores depending on store demand criteria.

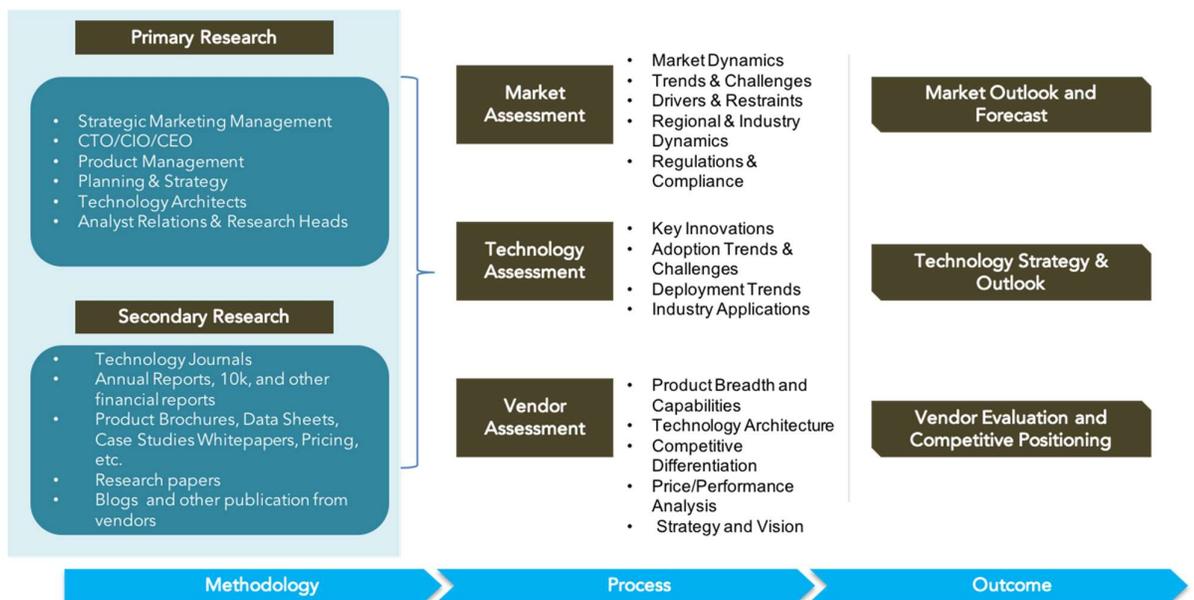
Analyst Perspective

Following is the analysis of the Revionics' capabilities in the Intelligent Retail Pricing and Promotion Optimization market:

- Revionics focuses largely on the omnichannel life cycle and dynamic pricing solutions. It uses machine learning to forecast price, elasticity, margins, unit parity, and product linkages. Its dynamic pricing procedures employ artificial intelligence to comprehend new inputs such as costs, competition, and trends. The platform's key technological differentiators include SaaS, providing science-based pricing, promotion, and competitive insights, machine learning solutions for translating shopper insights and competitive response, AI to enhance customer engagement, etc.
- The company supports various use cases such as data-driven price optimization, boosting competitive pricing by leveraging competitive insights, customer-focused price execution, science-based AI solutions to gain competitive insights, zone strategies to make precise and dynamic pricing decisions, etc.
- From a geographical presence perspective, Revionics has a major presence in the Americas, Europe, and Asia-Pacific. From an industry vertical perspective, the company holds a customer base across a range of retail verticals, including grocery, club and discount, sporting goods, convenience, home improvement, drug and pharmacy, beauty, and such others.
- Revionics faces competition from well-established and niche players in the retail price optimization platform market. However, with its comprehensive and sophisticated range of retail planning and optimization solutions along with transparency in price recommendations, what-if simulations, and a transition from rules-based pricing to optimization, Revionics will continue to hold a strong position in the intelligent retail price and promotion optimization market.
- Concerning product strategy & roadmap, Revionics' intelligent retail pricing and promotion optimization platform will help retailers adjust to prices in a balanced and consumer-focused way. Revionics' intelligent retail pricing and promotion optimization platform's capabilities could rest in expanding its product offerings to incorporate more online selling, personalized pricing, subscription pricing, and analytics capabilities in the future.

Research Methodologies

Quadrant Knowledge Solutions uses 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 analysts 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 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 whitepapers, brochures, case studies, price lists, datasheets, 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 perspective 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 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 scenarios, industry trends, and economic dynamics. Finally, the analyst team arrives at the 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 the finalization of market analysis and forecasts, our analyst prepares necessary graphs, charts, and tables 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 others.