

FROST & SULLIVAN

Orchestrating a brighter world **NEC**

2022 COMPETITIVE STRATEGY LEADER

*SOUTHEAST ASIA
AI IN RETAIL INDUSTRY*

Best Practices Criteria for World-Class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each award category before determining the final award recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. NEC Corporation excels in many of the criteria in the artificial intelligence (AI) in retail space.

AWARD CRITERIA	
<i>Strategy Innovation</i>	<i>Customer Impact</i>
Strategy Effectiveness	Price/Performance Value
Strategy Execution	Customer Purchase Experience
Competitive Differentiation	Customer Ownership Experience
Executive Team Alignment	Customer Service Experience
Stakeholder Integration	Brand Equity

Retail's Digital Transformation: Snapshot

The global COVID-19 pandemic and resulting lockdowns and movement restrictions forced many retailers to suspend physical operations. It led to many challenges associated with manufacturing and distributing retail goods.

Over the years, the retail industry has shifted its focus from products to customer satisfaction, with shoppers increasingly using mobile devices for product research and shopping. The concept of online merges with offline is gaining popularity among retailers and is a more sophisticated version of the conventional online-to-offline model and omnichannel commerce.

The shift in customer behavior requires retailers to accelerate their digital transformation (DX) to cater to these changing expectations. Apart from responding to customers' necessities and demands, retailers need to eliminate inefficiencies from their operations. The emphasis must be on achieving customer satisfaction and continuously catering to changing customer preferences, driving business growth.

Artificial intelligence (AI) helps retailers gain new business and customer insights while enriching customer experiences and efficiently managing business operations. Although retailers have started deploying AI-based solutions, they must overcome specific challenges in obtaining data sets for machine learning (ML) algorithms. For instance, the larger the data set, the stronger the output of AI solutions. However, retailers have to safeguard customer-sensitive information while dealing with consumer data.

In addition, retailers need to invest in human talent and skills for data analysis.¹

NEC Corporation (NEC) uniquely leverages its AI technologies to meet its customer's needs. It is well-positioned to capitalize on new growth opportunities, cementing its standing in AI in the retail sector.

Founded in 1899 and headquartered in Tokyo, Japan, NEC is an information technology (IT) solution provider. The company leverages its AI technologies to furnish several packaged solutions that enhance customer experience and offer uninterrupted store operation for its retail industry customers. With extensive experience developing the hardware and software, IT consulting, solution implementation and deployment, and management after installation, NEC supports more than 100,000 stores globally.

The company's tailored solutions enhance consumers' shopping convenience, make it more personalized, and improve hospitality in customer services by enabling retailers to cater to every customer's particular needs. Additionally, NEC solutions provide the one-stop support that renders efficiency improvements for store operations.

In 2021, Frost & Sullivan recognized NEC for its cutting-edge AI technologies, best practices implementation, and customer-centric focus and remains impressed with the company's continuing innovation and sustained market position.

NEC: Future-focused, Innovation-led, Trusted AI Technology Provider

NEC's primary mission from its inception is to create value for the entire society by employing digital solutions and identifying and fulfilling customer needs. Continuous efforts on technology and applied analytics (on public and privately-owned data) aim to improve data-driven insights (tangible and intangible) and pave AI's roadmap in the retail sector. Additionally, the company seeks to enhance existing data management capabilities and ensure its implemented technology complies with industry-defined AI ethics and governance.

NEC Retail Applied Analytics

In 2022, NEC further strengthened its value proposition and commitment to supporting its customers with data insights (visualization, algorithms, and operations) and data engineering services (management and governance, infrastructure, and architecture). To that end, the company has

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***- Hemangi Patel,
Senior Research Analyst***

extensive expertise in cloud technology platforms such as Azure Data Studio and Amazon Web Services. It developed in-house skillsets in front-end retail user interface/user experience (UI/UX) design, back-end commerce, DevOps, app-centric cloud, and in-house analytics platforms in facial recognition, video/field analytics for malls, and biometrics for retail payments.

Besides, NEC's proprietary dotData platform enables predictive analytics. For example, it helps to gauge potential customers' spending trends,

¹ Global Retail Artificial Intelligence (AI) Growth Opportunities, (Frost & Sullivan, April 2022)

assisting retailers in designing effective promotional campaigns to boost sales. Based on customers' existing systems, the company offers the flexibility of implementing AI solutions either in the silo or as a single platform to handle end-to-end operations.

NEC focuses on tangible (footfall, emotions, heatmaps, and physical security) and intangible insights (fraud, point-of-sale transactions, natural language processing (NLP)). The company runs its security operations center to protect customers from fraud for security analytics. It provides meaningful reports and business insights to customers, driven by sales transactions. NEC's NLP focus enables retailers to run their help desk to offer automated replies to customer queries (through chatbox). Thus overall, the company's applied analytics focus helps retailers drive their customers' physical and online shopping experiences.

Maximizing Customer Experience

NEC taps into available growth opportunities by leveraging its consulting services, aspiring to co-create the future of retail. Its consulting services such as Digital Transformation Accelerator, Design Thinking, and Change Management aim to help customers extract the maximum value of their data.

The company leverages AI technologies to provide digital solutions and applied analytics to maximize consumer experience (CX), convenience, and uninterrupted store operation. Its retail-as-a-service is a one-stop solution that includes consulting, implementation and deployment, operations, and maintenance. Furthermore, NEC strategizes to improve CX by mapping every retail customer's journey. It includes evaluating functional metrics (productivity and efficiency) and physical and emotional parameters (mood and environment) and analyzing retail process heatmaps to examine CX.

The company's agile team and tools enable rapid application prototyping from hypothesis, done before any requirements gathering for actual Retail Experience Solutions. More than 200 professionals from Singapore, Vietnam, and India constitute NEC's agile consulting and development team. The team focuses on building capabilities in continuous integration and delivery, quality assurance, and security-by-design methodology, enabling the company to provide various configurations to the retail segment.

NEC implemented Smart Digital Advertising (SDA) for a property developer in Indonesia. The SDA technology (smart digital billboards) with NEC FieldAnalyst (video analytics software technology) can potentially disrupt conventional advertising businesses in Indonesia. The SDA solution helps advertisers evaluate offline advertising effectiveness and consumer targeting.²

The company works closely with regulators to implement a governing framework incorporating technological breakthroughs. It ensures the strictest compliance with the relevant laws and requirements as the regulatory environment changes. The "NEC Group AI and Human Rights Principles" (Companywide principles) guide its employees to understand the value of privacy and human rights as the highest priority in its business operations concerning the social implementation of AI and utilization of biometrics and other data.

² (https://id.nec.com/en_ID/press/202204/20220411-eng.html), accessed May 2022

Frost & Sullivan believes the company is uniquely prepared for today's demands and exceptionally positioned for tomorrow's needs. NEC's clear strategic vision and execution underpin its partner of choice status and sustainable growth for years to come.

Roadmap to Success: Customer-centric, Continuous, Proactive

With its customer-centric corporate philosophy, NEC operates on the central tenet that its success depends on customer satisfaction. This philosophy permeates the company's daily practices, with everyone in the company laser-focused on solving customer needs.

NEC advocates "Consumer-Centric Retailing" through its Smart Retail CX solution. The strategy addresses the challenges several retailers face, leading them to reduce the workload by half, double the charm, and eliminate fraud. Additionally, it helps customers develop a store with efficient operations management independent of physical employee presence while providing customers with a pleasant shopping experience. The company is developing the requisite services that combine its best-in-class technology suite to achieve such a system, including face recognition technology, image analysis, sensing, AI, and cloud computing.

Furthermore, NEC supports its customers (retail operators) by enabling them to provide timely updates and shopping suggestions per shoppers' unique needs, attracting them and driving their purchase decisions. To that end, the company is developing a system to capture the in-store shopper behavior and combine it with their membership information and order history by leveraging point-of-sale (POS) and e-commerce systems and video analytics and sensing technologies. Its biometrics and image analysis technologies uphold in-store biometric authentication payment systems that use fraud monitoring and multimodal verification.

NEC further supports retailers in driving a safe and secure shopping environment, preventing personal data leakage during payments and unauthorized usage. For example, it implemented a fully integrated, smart retail solution for malls in Indonesia, improving their online transactions' convenience, efficiency,

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**- Supriya Lala,
Best Practices Research Analyst**

and security levels. The company leverages the best-in-class AI-enabled application, Integrated E-Money Solution, and POS technology that verifies an order within one second, removing errors and delays. Simultaneously, it enabled the management to better view their sales and orders.³

In 2020, the company opened Japan's first cashier-less brick-and-mortar store in the NEC HQ building. Employees experience the convenience of quick shopping as it takes them just five seconds from

entering the store to finishing shopping. Before its deployment, NEC had teamed up with a convenience store to open a cashier-less convenience store utilizing facial recognition to authenticate shoppers and check them out.⁴

³ (<https://www.nec.com/en/case/aeon/index.html>), accessed May 2022

⁴ (<https://asia.nikkei.com/Business/Business-trends/Seven-Eleven-taps-facial-recognition-for-future-unstaffed-stores>), accessed May 2022

The company focuses on enhancing customers' operational performance. For example, its solution supports stores' order placement department to prevent stock-outs of daily-delivered foodstuffs based on advanced demand predictions (utilizing sales data), thus improving order placement efficiencies. Other efficiency improvements include lowered costs and employee workload driven by NEC's image recognition technology and robotics.

The system can identify stock-out merchandise and shelf locations from the shop images. It then allows robots to automatically transfer missing merchandise to the required shelves, freeing clerks from the exhausting task of merchandise transportation.

NEC meets with customers to assess their specific needs and develop tailored solutions with roadmaps for seamless execution. This foundational approach establishes ongoing trust with customers for long-lasting relationships extending throughout the solution's lifecycle.

Positioned for Growth

Since its inception, NEC's sterling reputation and customer-centric framework led to its coveted preferred partner status. Over the years, it added a range of new customers to its established base. Following the Companywide principles, the NEC Group is committed to:

- Ensure that all employees, customers, and partners utilize and implement NEC products and services.
- Upgrade and develop advanced technology and talent to promote AI's further utilization with respect for human rights as the highest priority. As part of its 2023 growth initiative, the company aims to improve its Core DX offerings' development and choice menus as a common platform and acquire professional personnel.
- Build partnerships and collaborate closely with industry stakeholders.

In 2022, NEC generated 3,014.1 billion Yen in annual revenue, a 0.7% increase from 2021, led by business growth improvements.⁵

For example, in its Core DX product, the company gained competitive advantages in cloud businesses driven by global strategic collaboration with hyper-scalers, strategic partnership programs, and large-scale project acquisition. Furthermore, the company focuses on transforming people and culture, leading to a 35% improved employee engagement score in 2022.⁶

NEC's impressive growth momentum and trajectory are a testament to its customer-centric approach, revolutionary technology, and exceptional operational strategies, earning its clients' trust and loyalty and enabling it to capture more market share.

In March 2022, the company held its inaugural online regional event, NEC Visionary Day ASEAN 2022, with six regional country affiliates (Indonesia, Malaysia, Philippines, Singapore, Thailand, and Vietnam). It introduced its smart retail solutions and hosted a successful webinar to engage existing customers and attract potential customers. Moreover, its NEC 2030VISION initiative identifies future customers and their ideal environment, society, and lives, defining the company's futuristic business focus.

⁵ (https://www.nec.com/en/global/ir/pdf/library/220428/220428_01.pdf), accessed May 2022

⁶ (https://www.nec.com/en/global/ir/pdf/library/220428/220428_01.pdf), accessed May 2022

NEC actively employs business activities to achieve this vision. The company continues developing its technologies, converting biometrics and AI into a shared platform, and taking its applied analytics to the next level. For example, it is presently testing the solutions that employ facial recognition and surface temperature measurement to visualize mall density, people counting (and shopper movement), detect unmasked people, and sense emotions to stock items boosting sales.

Furthermore, with the cashier-less brick-and-mortar store model tested in Japan, NEC seeks to replicate the concept with connected industries (linking travel, hospitality, and retail) in Singapore. The idea includes developing unique applications such as unmanned guest check-in at hotels, deploying robotics to enhance the guest experience, and room automation solutions. It is also helping propel airport automation, driven by its face recognition technology.

The company plans to either partner or undertake merger and acquisition activities to supplement its growth and expand its business and profits in Japan and globally. Besides retail, by utilizing groundbreaking AI technologies, such as image and video recognition, speech recognition, and machine learning, NEC excels in serving customers across public safety, energy, finance, and other sectors.

Frost & Sullivan believes the company is well-positioned to drive AI in the retail space into its next growth phase, capturing market share and sustaining its position in the coming years.

Conclusion

Frost & Sullivan believes that innovation and growth opportunities drive future success; many factors contribute, yet having a competitive strategy is critical. NEC Corporation (NEC) understands this core concept and is leading the artificial intelligence (AI) in the retail market due to its focused strategies, helping it outpace competitors. NEC leverages AI technologies to provide digital solutions and applied analytics to maximize consumer experience, convenience, and uninterrupted store operation. A one-stop solution through retail-as-a-service, its offering encompasses consulting, solution implementation and deployment, store system operations, and maintenance for its customers. By employing biometrics and face recognition technologies, the company's solutions add convenience and hospitality to customer services. Additionally, AI technologies for order placement support, workload reduction, and automated payment solutions help its customers improve efficiencies for employees and overall operations. Chiefly, NEC develops and implements its strategies with customers in mind, securing its position as a trusted partner.

With its strong overall performance, NEC Corporation earns Frost & Sullivan's 2022 Southeast Asia Competitive Strategy Leadership Award in the artificial intelligence in retail industry.

What You Need to Know about the Competitive Strategy Leadership Recognition

Frost & Sullivan's Competitive Strategy Leadership Award recognizes the company with a stand-out approach to achieving top-line growth and a superior customer experience.

Best Practices Award Analysis

For the Competitive Strategy Leadership Award, Frost & Sullivan analysts independently evaluated the criteria listed below.

Strategy Innovation

Strategy Effectiveness: Effective strategy balances short-term performance needs with long-term aspirations and overall company vision

Strategy Execution: Company strategy utilizes Best Practices to support consistent and efficient processes

Competitive Differentiation: Solutions or products articulate and display unique competitive advantages

Executive Team Alignment: Executive team focuses on staying ahead of key competitors via a unified execution of its organization's mission, vision, and strategy

Stakeholder Integration: Company strategy reflects the needs or circumstances of all industry stakeholders, including competitors, customers, investors, and employees

Customer Impact

Price/Performance Value: Products or services provide the best value for the price compared to similar market offerings

Customer Purchase Experience: Quality of the purchase experience assures customers that they are buying the optimal solution for addressing their unique needs and constraints

Customer Ownership Experience: Customers proudly own the company's product or service and have a positive experience throughout the life of the product or service

Customer Service Experience: Customer service is accessible, fast, stress-free, and high quality

Brand Equity: Customers perceive the brand positively and exhibit high brand loyalty

About Frost & Sullivan

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The Growth Pipeline Engine™

Frost & Sullivan's proprietary model to systematically create ongoing growth opportunities and strategies for our clients is fuelled by the Innovation Generator™.

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Key Impacts:

- **Growth Pipeline:** Continuous Flow of Growth Opportunities
- **Growth Strategies:** Proven Best Practices
- **Innovation Culture:** Optimized Customer Experience
- **ROI & Margin:** Implementation Excellence
- **Transformational Growth:** Industry Leadership



The Innovation Generator™

Our 6 analytical perspectives are crucial in capturing the broadest range of innovative growth opportunities, most of which occur at the points of these perspectives.

Analytical Perspectives:

- **Mega Trend (MT)**
- **Business Model (BM)**
- **Technology (TE)**
- **Industries (IN)**
- **Customer (CU)**
- **Geographies (GE)**

