

WHITEPAPER

AI in Retail:

How Gen AI is Transforming Planogram Compliance

Abstract

The retail and consumer goods industry is experiencing significant changes driven by generative artificial intelligence (Gen AI). As brands face increasing competition, rapidly evolving consumer demands, omnichannel selling, and the digital transformation of commerce, Gen AI emerges as a transformative force. This whitepaper explores the current challenges in Planogram practices and the profound impact of generative AI use case on the “Store Audit Assistant” for retail planogram. It highlights how this technology empowers businesses to innovate, personalize, optimize store operations, and respond to changing market dynamics. We examine the use case and future possibilities, painting a vivid picture of how generative AI is pioneering the future of “Store Auditing” in retail planogram.

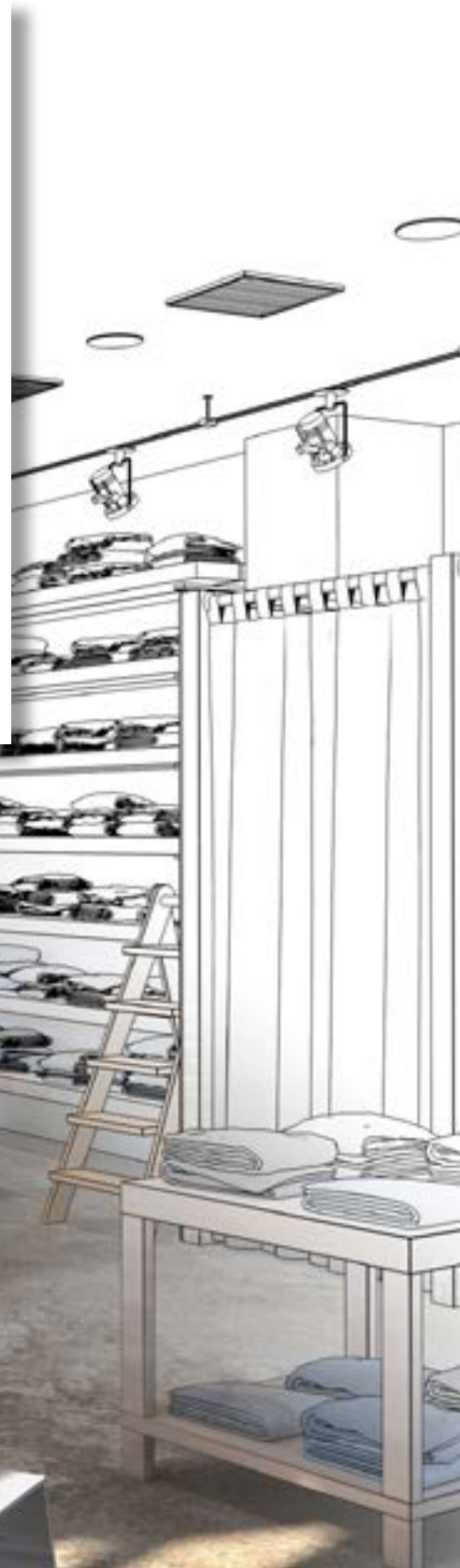


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Introduction

Planogram is a process of planning item placements on retailer's shelves, and is aimed at maximizing the sales and/or profitability. This process focuses on shopper needs and ensures optimal utilization of retail space. Essentially, the planogramming process is both a science and an art. Its data-driven approach involves significant time invested in detailed research of customer expectations, performance forecasts, and internal budgetary requirements. At the same time, arranging products to create strong visual appeal and attract customers within the given constraints is an art.

Retail space is limited. Proper space utilization is essential for business growth, better customer service and sustainability. Building a planogram is only half the story; its success hinges on perfect execution in the store. Hence, ensuring accuracy in planogram implementation is crucial for retailers' success.

Planogram compliance enables retailers and brands to take proactive measures, improving product availability, maximizing revenue, and optimizing space through timely and accurate updates on shelf status.

Research indicates

- Store staff turnover exceeds 60% over a long period, leading to low knowledge retention and a need for frequent training on store operations practices.
- A 10% increase in planogram compliance results in 1% reduction in out-of-stock items, which not only improves sales but also positively impacts customer experience, leading to higher footfall.
- 70 to 80% of trade managers' time is spent on operational activities, reducing their focus on building strong sales strategies. This can be mitigated with effective shelf management and proactive alerts to avoid out-of-stock situations.
- 25% of out-of-stock (OOS) issues are attributed to stock being in the store but not on the shelf, necessitating strong shelf management practices, including planogram execution compliance.
- About two-third of customers prefer to shop in physical stores, indicating that brick-and-mortar stores still play a critical role, underscoring the need for better shelf management.
- 67% of brand decisions are made while shopping in-store, where product display on the shelf significantly influences shopper decisions.



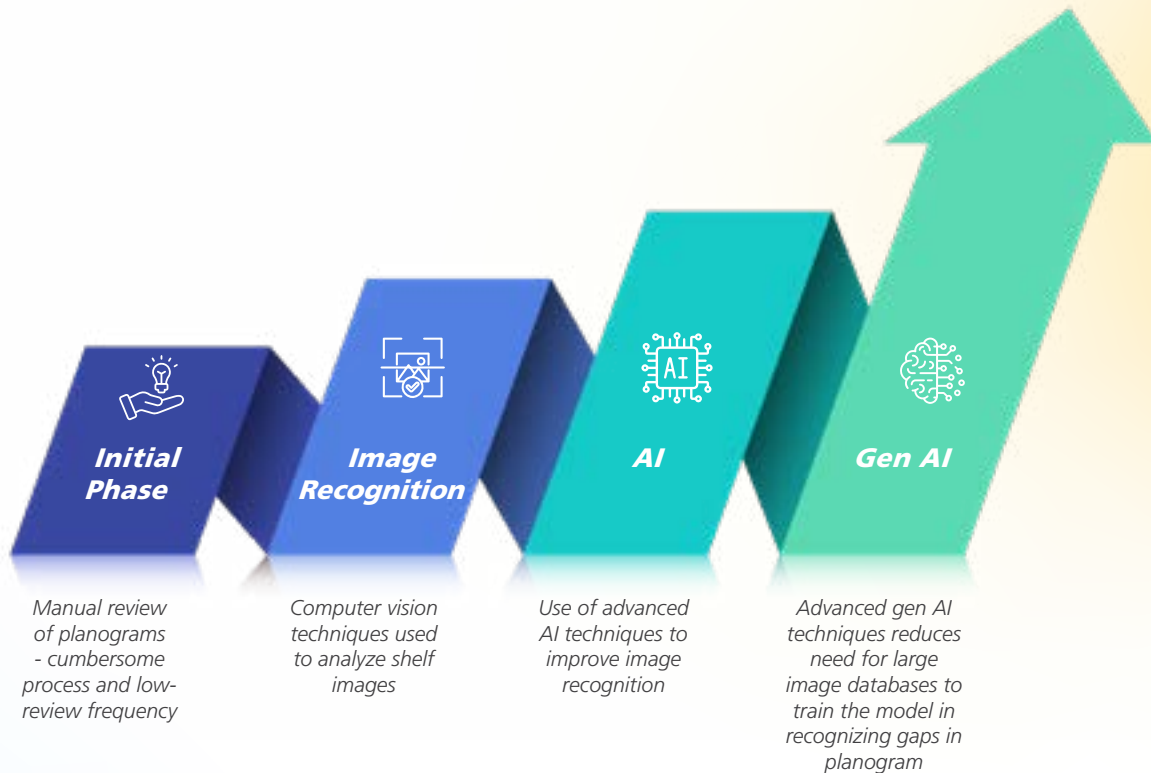
Need for planogram audit

Ensuring planogram compliance is complicated due to manual processes, the dynamic nature of shelves, and high attrition rates among store and field executives. Hence, there is a need for an automated solution to track execution as well as empower people, ensuring daily accuracy.

- **What You Plan Is What You Get:** Planogram audits ensure accurate execution, aiding retailers and CPG manufacturers in category presentation and visibility. They standardize displays across retail chains.
- **What Gets Measured, Gets Improved:** Regular shelf audits help retailers and CPG companies improve category and brand performance through proactive alerts on display gaps. They track key metrics such as availability and display accuracy, which helps evaluate planogram efficiency and build customized action plans for improvement.
- **Consistency Is the Key:** Consistency in planograms across the retail network is crucial for brand identity and better customer experience. Ensuring consistent execution in a large network of stores is challenging. Automating the planogram audit helps maintain display consistency and measure the accuracy of the planograms.
- **Data-driven Insights:** The dynamic retail shelf requires constant monitoring of product movements. Automating the planogram audit process helps store staff and field executives track the shelf multiple times a day, removing biases and generating actionable insights related to category performance.



The Journey So Far



During the late 90s, most of the retailers and CPG manufacturers heavily invested in tracking shelf execution with low success rates and delayed feedback from stores, making the information ineffective.

As technology matured, attempts were made to automate the process by using image recognition models. Over time, these models improved and gained industry acceptance in the last decade. Combined with augmented reality (AR), image recognition models not only enhanced audit accuracy but also provided a simple and efficient method for tracking shelf changes and empowering field and store personnel to take corrective actions. Advanced AI models further refined these image recognition techniques, leading to better accuracy and increased shelf execution.

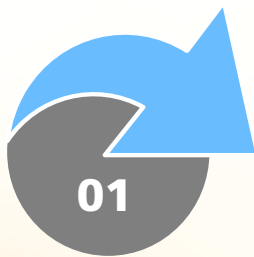
Thus, planogram audits have evolved from merely reviewing errors to becoming powerful tools for retailers, empowering ground staff to ensure higher fill rates, better inventory management, and display accuracy. Real-time store data can also be used to build intelligent recommendations related to item recommendations.



Limitations of Non-Generative AI Models

Initially, retailers and CPG companies relied on manual processes, which were time-consuming and had poor accuracy rates. With the development of artificial intelligence, various attempts were made to automate the process using image recognition techniques, allowing retailers to review planogram execution as needed without manual effort, saving time and improving accuracy.

Image analytics solutions are flexible as they use current images as input, providing instant update on compliance. The process is simple and convenient for anyone to use with no training.



Retail personnel takes picture using the mobile app



The app recognizes the image and compares with planogram



Generates recommendations based on store shelf conditions

However, these solutions often suffer from input data quality issues, as they depend on images taken in-store. Factors such as lighting conditions and the type of equipment used to capture images affect image clarity. The performance accuracy of image intelligence engines depends on the quality of the input images.



The model should also be capable of:

- Dealing with multiple colors, shapes, and sizes of products
- Identifying different orientation and facings of the same product and placements
- Handling geometrically distorted images
- Stitching multiple images or using videos as input

Major challenges of current models include:

- Insufficient data fails the model to adapt to the new or unseen data, increasing bias.
- Collating relevant images representing real-life conditions which is time-consuming and often increases model training time and cost.
- These models are developed on complex deep neural networks supporting the identification of minute details, leading to higher accuracy. However, they also demand higher computational needs, leading to higher costs.

Therefore, there is the need for a solution that can synthetically generate input, improving model accuracy while reducing training time and development costs. Generative AI advances the process to the next level by reducing execution time and labeling costs and improving the accuracy of the results. Apart from that it can be modeled to develop actionable insights for different personnel, empowering them to take timely actions to prevent out-of-stocks situations.

Generative AI is transforming planogram audits by offering innovative solutions that enhance efficiency and customer-centricity. The subsequent sections of this whitepaper will delve into the specific use cases of Generative AI for “Store Auditing” in retail planogram management, supported by real-world examples, and will address the challenges and opportunities presented by this advanced technology.



Key Elements of Gen AI-based Approach



Automated image recognition: The Planogram Auditing Assistant (PAA) powered by Generative AI uses mobile devices or in-store cameras to take pictures of store shelves, which are then analyzed using Generative AI algorithms. This process accurately identifies products, shelf arrangements, and planogram conformity, eliminating the need for manual inspection.



Planogram deviation detection: The PAA compares the designated planograms for each retail section with the detected shelf layouts. It highlights any deviations such as missing products, improper facing, or out-of-stock items, making it easier to find and fix compliance issues quickly.



Product availability monitoring: The PAA keeps a tab on the availability of the products indicated in the planograms by regularly examining shelf photos. To enable proactive restocking and avoid missing out on sales opportunities, it notifies merchandisers and store managers of low inventory levels or out-of-stock items.



Visual merchandising assessment: Considering elements such as product space, arrangement, and signage, the PAA evaluates the visual appearance of products on shelves. It provides visual heatmaps and analytics dashboards to enhance customer interaction and identify areas for improvement in visual merchandising processes.



Sales performance insights: The PAA links planogram adherence and visual merchandising with sales performance measures through integration with sales data analytics. It identifies relationships between product placement, sales patterns, and shelf layouts, giving valuable information for optimizing planograms to maximize revenue.



Adaptive learning capabilities: To increase its accuracy and efficacy over time, the PAA continuously learns from historical auditing data and user feedback. It adapts to changes in consumer preferences, retail layouts, and product assortments, ensuring that auditing procedures stay up to date.



Benefits of Gen AI Planogram Audit

Imagine a retail store using generative AI for their planogram audits. The AI system continuously monitors sales data and customer interactions. One morning, the AI detects an unexpected surge in demand for a particular product. It automatically adjusts the planogram to allocate more shelf space to this product and sends a notification to the store manager with the new planogram layout. Simultaneously, it updates the inventory management system to reorder the product if stock levels are low. Store staff use mobile devices to capture images of the shelves, and the AI analyzes these images in real time, ensuring that the new planogram is correctly implemented. Any discrepancies are flagged, and corrective actions are recommended.



Enhanced efficiency: By automating the planogram auditing process, the PAA saves time and money by minimizing the need for manual inspections. Merchandisers and store managers can focus on implementing corrective measures instead of spending hours on tedious auditing tasks.



Improved compliance: The PAA ensures uniform adherence to merchandising standards at every store location by accurately identifying deviations from planograms. This results in better product availability, visual coherence, and overall customer satisfaction.



Enhanced sales performance: Retailers can optimize planograms to improve sales opportunities and drive revenue growth by utilizing actionable insights obtained from sales data and auditing analytics. The PAA identifies opportunities for optimized product positioning and promotion, aiding in data-driven decision-making.



Real-time monitoring and notifications: The PAA provides real-time notifications for merchandising opportunities, planogram deviations, and out-of-stock scenarios. This allows for prompt interventions to resolve issues and capitalize on sales opportunities.



Scalability and adaptability: The PAA can easily scale and adapt to new requirements as the retail chain grows or modifies its product offerings. Its adaptive learning capabilities ensure that it continues to perform well in evolving retail environments.



Conclusion

Through the utilization of generative AI technology, retailers may optimize sales performance across their store network, increase operational efficiency, and improve planogram compliance by creating a Planogram Auditing Assistant. The future of planogram will be heavily shaped by generative AI. Businesses that embrace this technology will have the tools to offer highly personalized experiences, streamline operations, and thrive in the digital age.

All in all, generative AI can transform planogram management and store audits by making them more efficient, data-driven, and responsive to real-time conditions, ultimately improving both operational efficiency and customer satisfaction.

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Srini.KP is an experienced professional specializing in customer experience design and digital supply chains. His expertise includes supply chain management, go-to-market strategies, product management, logistics excellence, and omnichannel and digital transformation. Srini has hands-on experience in the Retail, Consumer Goods, Manufacturing, and E-Commerce sectors. A generative AI enthusiast, he is currently engaged in several key Gen AI projects at LTIMindtree.



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Manoj Panda is a Senior Principal in consulting for Retail and CPG. He has two decades of expertise in retail merchandising and store operations and excels in meticulous planning and execution of merchandising initiatives. His experience spans various facets of the retail landscape, making him a seasoned professional in optimizing product presentation and maximizing sales, thus contributing significantly to business success.



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[AI is transforming every sector and business function, resulting in rising interest in AI, its subdomains, and related subjects like machine learning and data science, as seen below. With the introduction of ChatGPT, interest in generative AI, an area of AI, skyrocketed.](#)





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