



# Transforming Retail: Key AI Industry Use Cases



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# Abstract

Artificial intelligence (AI) is at the forefront of the technology market in 2024, with many companies adopting it to optimize operations and enhance profitability. According to a Gartner® [survey](#), 79% of corporate strategies consider AI and data analytics essential for success in the next two years.

However, a Harvard Business Review [article](#) published at the end of 2023 reveals that 80% of AI adoption projects fail due to leadership issues, uncertainty about expected outcomes, and the implementation of models not suited to the business's local needs. This highlights the need for a clear and well-documented use case before implementing AI-based technological solutions.

This whitepaper examines how five of the key business processes in the retail value chain can benefit from AI, focusing on critical areas such as customer personalization, inventory management, and customer service automation. It also explores the emerging technologies supporting these initiatives, such as machine learning, advanced analytics, and recommendation systems.

The whitepaper will provide use-case-level guidance for these five major retail business processes, offering a starting point for initiating AI transformation projects within companies. It emphasizes that effective AI implementation can significantly improve operational efficiency and customer satisfaction, provided that the challenges to be addressed, expected outcomes, and a well-supported project are clearly defined, secure, and scalable technological infrastructure.

After the Industrial Revolution, which marked a significant transformation in production methods and economic growth, the advent of the internet and emerging technologies has elevated innovation and business efficiency to a new level. Companies now have access to digital tools that facilitate global connection, instant communication, and massive data collection.

Emerging technologies, such as AI, advanced data analytics, and automation, have further revolutionized business processes. Today, organizations continuously seek to optimize their operations by integrating these technologies to improve efficiency, reduce costs, and increase profitability. The ability to analyze large volumes of data, automate repetitive tasks, and personalize the customer experience has allowed companies to rapidly adapt to market demands and maintain a competitive edge in an increasingly dynamic business environment.

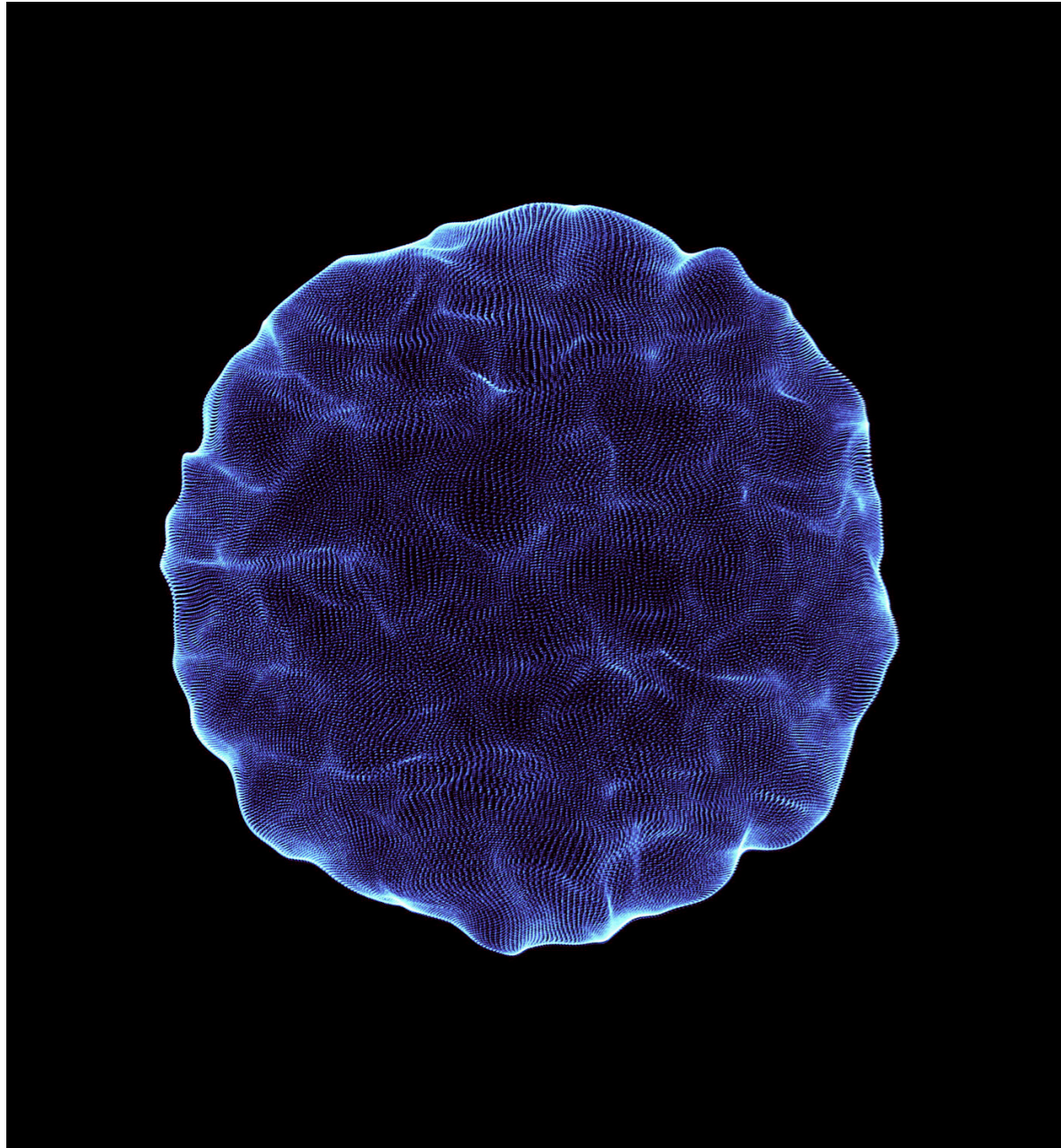
The retail industry is no exception to these needs, and to succeed in technology adoption and business transformation projects, it's essential to clearly understand the process to be improved, identify the problem to be solved, and define the expected outcomes.

We must also assess the feasibility of the project by considering data availability, technological infrastructure, necessary human talent, budget, and compliance with legal and ethical regulations.

According to a 2024 Harvard Business Review [publication](#), the business process is crucial to success. Beyond identifying the process, it's vital to have a clear understanding of existing process debt, poor practices, and inadequate technology implementation, and to ensure that the problem is well-defined from the outset.



# A refresher on Artificial Intelligence (AI)



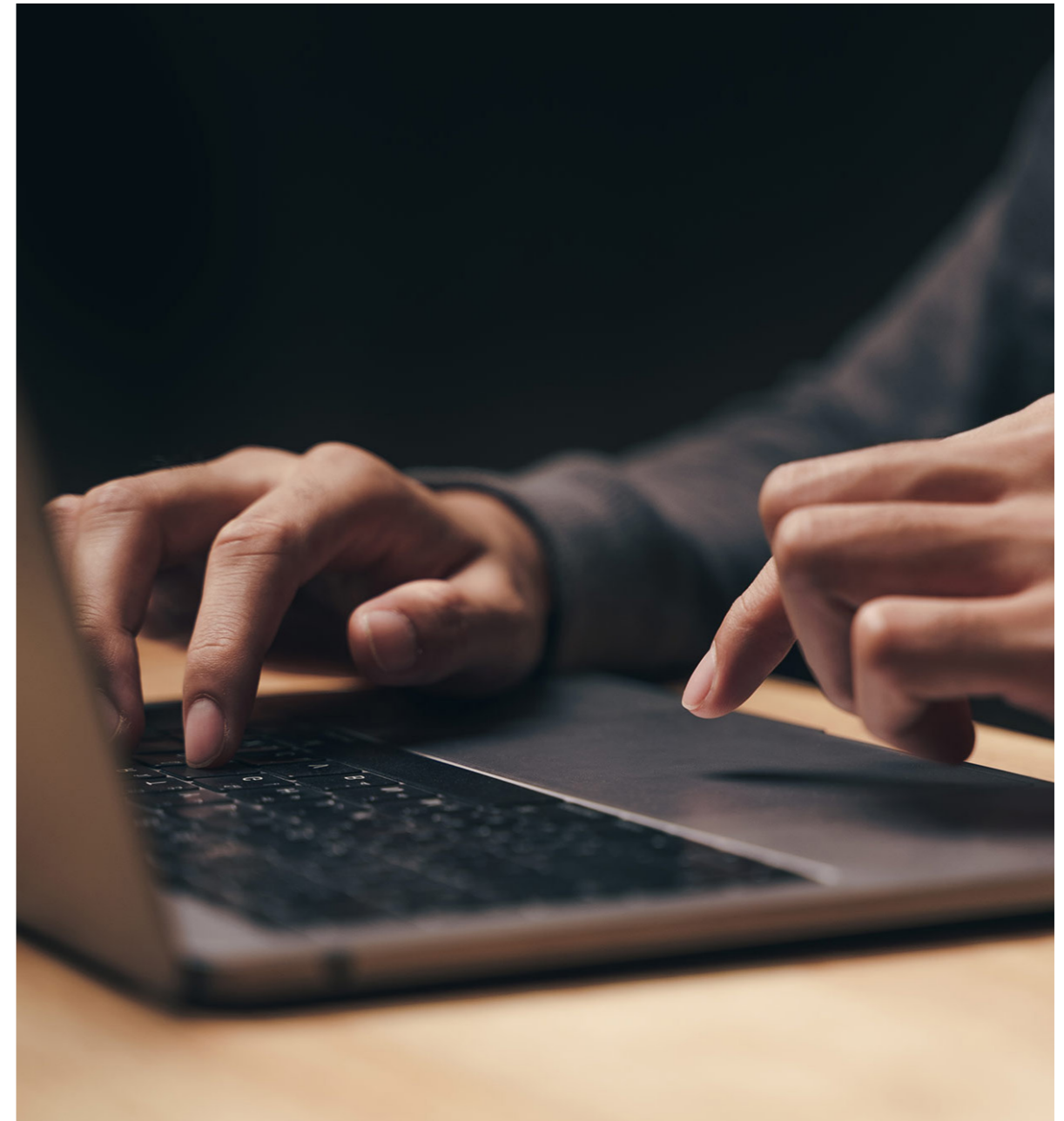
As with many concepts, the simpler it is, the easier it is to understand and apply in practical cases. That's why I loved the **definition** from Elegant published in 2024 in "What is AI? A Beginner's Guide to Artificial Intelligence," which describes AI as a set of technologies that enable computers to perform advanced tasks such as visual perception, language understanding and translation, data analysis, answering questions, artistic creation, video generation, and much more.

# Let's review the types of AI

When it comes to technologies, AI encompasses a variety of advanced tools and methods that enable systems to perform intelligent tasks. These technologies include:

- Machine learning (ML), which uses algorithms to learn from data and improve over time
- Deep learning (DL), a subcategory of ML that employs artificial neural networks with multiple layers to analyze complex data
- Natural language processing (NLP), which allows machines to understand and generate human language
- Computer vision, which enables systems to interpret and analyze images and videos
- Recommendation systems, which use historical data to predict preferences and future behaviors

These technologies, among others, drive innovative applications in areas such as automation, advanced analytics, and user interaction.



# AI use cases for the retail industry

Below, we will explore five of the most important processes in retail, and for each one, we will mention the process, the key use cases (or problems to solve), and the best technological tools according to analysts that could support a successful implementation.



## PROCESS 1:

# Inventory management

Inventory management in retail is the process of overseeing and controlling product stock levels to ensure they meet customer demand. This includes monitoring available quantities, planning and placing orders for replenishment, coordinating with suppliers, analyzing data to forecast demand, efficiently rotating inventory (which is crucial in omnichannel environments), managing returns, and optimizing storage space.

### Use cases:

- Precision in demand forecasting
- Minimizing stockouts and excess inventory
- Avoiding supply chain disruptions





## Precision in demand forecasting

One of the most critical challenges in inventory management is accurately predicting future product demand. AI-driven demand forecasting analyzes historical sales data, seasonal trends, and external factors (such as economic conditions and market trends) to predict future demand with high accuracy. This helps retailers optimize inventory levels, reduce stockouts, and avoid overstock situations, ultimately improving customer satisfaction and reducing storage costs.

In addition to these benefits, improved demand forecasting can also enhance liquidity, increase supply chain efficiency, support more informed strategic decisions, boost profit margins, and mitigate risks.

To achieve precision in demand forecasting, various AI techniques such as machine learning, deep learning, and reinforcement learning are utilized. Key technologies include time series analysis and data analytics

platforms recognized as leaders in the 2024 [Gartner® Magic Quadrant™ for Cloud AI Developer Services](#), such as Google Cloud AI, AWS Forecast, and Azure Machine Learning. Additionally, big data tools like Apache Hadoop and Apache Spark, widely used by major global retailers, and predictive analytics software such as IBM SPSS and SAS Forecasting, noted as Visionaries in the 2024 [Gartner® Magic Quadrant™ for Analytics and Business Intelligence Platforms](#), as well as Salesforce (Tableau), identified as a Leader in the same report, play a crucial role.

## Minimizing stockouts and excess inventory

Maintaining an appropriate balance in inventory levels to prevent stockouts and overstock situations is a persistent challenge. AI can address this issue by automating the replenishment process based on real-time data and predictive analytics. AI systems can recommend optimal reorder points and quantities, ensuring that popular items are always in stock while minimizing excess inventory of less demanded items.

Minimizing stockouts and excess inventory provides significant benefits to retailers, such as increased customer satisfaction, loyalty, and repeat purchases by ensuring that products are available when needed. Additionally, it reduces costs associated with storing excess inventory and losses from unsold products, particularly for perishable items, where these tools can effectively eliminate waste, improve operational efficiency, and optimize space utilization. It also prevents out-of-stock situations at the point of sale, which can lead to lost sales and a negative brand image. In summary, by effectively

balancing inventory, retailers can enhance profitability, reduce costs, and strengthen their competitive position in the market.

To minimize stockouts and excess inventory, various AI techniques are used, including machine learning, optimization algorithms, and reinforcement learning. Key technologies include automated replenishment systems recognized in the 2024 [Gartner® Magic Quadrant™ for Supply Chain Planning Solutions](#), such as SAP and Relex Solutions as Challengers, and Oracle Dynamics and Blue Yonder as Leaders. Real-time data analytics platforms like Apache Kafka and Apache Spark, widely used in retail, and AI-driven forecasting tools like IBM Watson Supply Chain and AWS Forecast, noted in the 2024 [Gartner® Magic Quadrant for Augmented Data Quality Solutions](#), also play a crucial role. These tools and technologies enable more efficient and accurate inventory management, improving product availability and optimizing stock levels.



### Avoiding supply chain disruptions

Managing disruptions in the supply chain is another significant challenge. AI can enhance supply chain visibility and resilience by analyzing data from various sources to identify potential risks and disruptions in advance. Predictive analytics and real-time monitoring of key process KPIs allow retailers to anticipate issues such as delays or shortages, enabling them to take proactive measures to mitigate these risks.

Avoiding supply chain disruptions offers retailers several key benefits, including increased reliability in product availability, which improves customer satisfaction and reduces the risk of lost sales. By anticipating and mitigating potential issues, retailers can maintain stable inventory levels, avoiding both stockouts and overstock situations. This also allows for more efficient management of operational costs and opens opportunities for better negotiations with suppliers, as well as improving responsiveness to unforeseen events. Together, these benefits ensure

smoother and more predictable operations, contributing to better profitability and a stronger brand image.

To avoid supply chain disruptions, various types of AI are utilized, including machine learning, predictive analytics, natural language processing (NLP), and optimization algorithms. Associated technologies include supply chain management platforms such as Blue Yonder, SAP Integrated Business Planning (IBP), and Oracle Supply Chain Management, recognized in the 2024 [Gartner® Magic Quadrant™ for Supply Chain Planning Solutions](#); real-time data integration systems like Apache Kafka and Azure Stream Analytics; AI-driven risk management tools such as Resilinc and Everstream Analytics, noted in the 2023 [Gartner® Market Guide for Supplier Risk Management Solutions](#); and simulation and scenario analysis platforms like AnyLogic, which received an excellent [review](#) in Gartner® Software review and ratings: Supply Chain Simulation, alongside FlexSim and others.

These tools enable more efficient and resilient supply chain management, improving visibility, risk anticipation, and strategic decision-making.

## PROCESS 2: Order processing

Order processing is a critical process in the supply chain that encompasses the receipt, classification, and fulfillment of customer orders. It includes inventory verification, order preparation, logistical coordination, and tracking until delivery. Efficient and accurate order processing is essential to ensure customer satisfaction and maintain smooth operations.

### Use cases:

- Order processing automation
- Ensuring order traceability and visibility
- Returns and refund management



## Order processing automation

Manual order processing can be slow and error-prone, leading to delivery delays and inventory inaccuracies. AI can optimize this process by automating order entry and workflow management. This includes enhancing order management to select the most efficient location for fulfilling the order, covering processes like picking, packing, and consolidation, and ending with last-mile delivery or final customer delivery.

Automating order processing improves operational efficiency by reducing handling time and human errors. This results in lower operational costs and increased customer satisfaction due to faster and more accurate delivery times. Additionally, it minimizes inventory management errors and optimizes the use of logistical resources, allowing for smoother operations with fewer disruptions.

The types of AI involved include natural language processing (NLP) to interpret order details, machine learning to predict patterns and optimize workflows, and selecting the best location for order fulfillment (such as dark stores, regular stores, warehouses, or distribution centers). Market tools for businesses of all sizes, recognized in the [Gartner® Market Guide for Distributed Order Management](#), include IBM Watson, Manhattan, Oracle NetSuite, and Blue Yonder, which offer solutions for order processing automation. Additionally, frameworks like Softtek's [Omnichannel Order Optimizer](#) provide excellent order management functionalities, integrating AI to enhance process accuracy and efficiency.

## Ensuring order traceability and visibility

Order processing can be challenging, especially when it comes to meeting delivery promises and keeping customers informed about their order status. By using advanced AI algorithms and real-time data analytics, retailers can gain accurate insights into order locations, identify potential delays, and foresee issues before they occur.

AI tools can integrate data from various sources, such as inventory management systems and logistics platforms, to provide a comprehensive view of the order lifecycle from purchase to final delivery.

Ensuring order traceability offers multiple benefits for retailers. Firstly, it enhances customer satisfaction by providing accurate, real-time updates on order status, reducing uncertainty, and increasing brand trust. It also allows retailers to quickly identify and address any delivery issues, helping to minimize returns and complaints. Efficient traceability facilitates

informed decision-making regarding inventory management and delivery route optimization, contributing to a more efficient and profitable operation.

To ensure order traceability and visibility, AI technologies such as machine learning and natural language processing (NLP) are used. These technologies help analyze large volumes of data and predict potential issues. Tools like AI-based supply chain management platforms and real-time tracking systems, provided by companies like IBM and SAP, enable seamless data integration and continuous order monitoring. Additionally, the use of IoT sensors and blockchain technologies can further enhance tracking accuracy and transparency, ensuring an immutable and accessible record of all transactions.



## Returns and refund management

Handling returns and refunds can be complex and time-consuming, impacting the customer experience negatively. AI can simplify this process by automating returns management and analyzing patterns to identify common causes of returns and reduce them.

Automation in returns and refund management enhances the customer experience by offering a more streamlined and frictionless process. This reduces processing time and errors associated with manual returns management and allows retailers to identify recurring issues to improve product quality and internal processes. Additionally, it facilitates inventory management by automating product returns, reducing the impact on the supply chain.

The types of AI involved include machine learning to identify return patterns and natural language processing (NLP) to process requests.

Tools like Zendesk, recognized in the 2023 [Gartner® Magic Quadrant™ for the CRM Customer Engagement Center](#), the recently launched Blue Yonder Return Management, IBM Watson Assistant, and Microsoft Dynamics 365 provide advanced solutions for automated returns and refunds management, integrating AI capabilities to improve process efficiency.

## PROCESS 3:

# Customer service

The customer service process in retail encompasses all activities related to providing support and assistance to customers throughout their shopping experience. This process includes handling inquiries, resolving issues, managing complaints, and providing information about products and services. Its goal is to ensure a satisfactory experience and address any problems the customer may encounter before, during, and after the purchase.

### Use cases:

- Automated responses with chatbots
- Sentiment analysis of customer reviews
- Personalized product recommendations



### Automated responses with chatbots

One of the main challenges in customer service is managing a high volume of inquiries efficiently. AI-powered chatbots can address this issue by automating responses to frequently asked questions and providing real-time assistance.

These chatbots can interpret and respond to customer inquiries accurately, reducing the workload on human staff and adapting to the languages and dialects relevant to the target customer base.

Implementing chatbots improves operational efficiency by reducing the need for staff to handle repetitive inquiries, decreasing customer wait times, and increasing overall satisfaction. This also allows human staff to focus on more complex cases and provide higher-quality service.

The AI involved includes natural language processing (NLP) and machine learning.

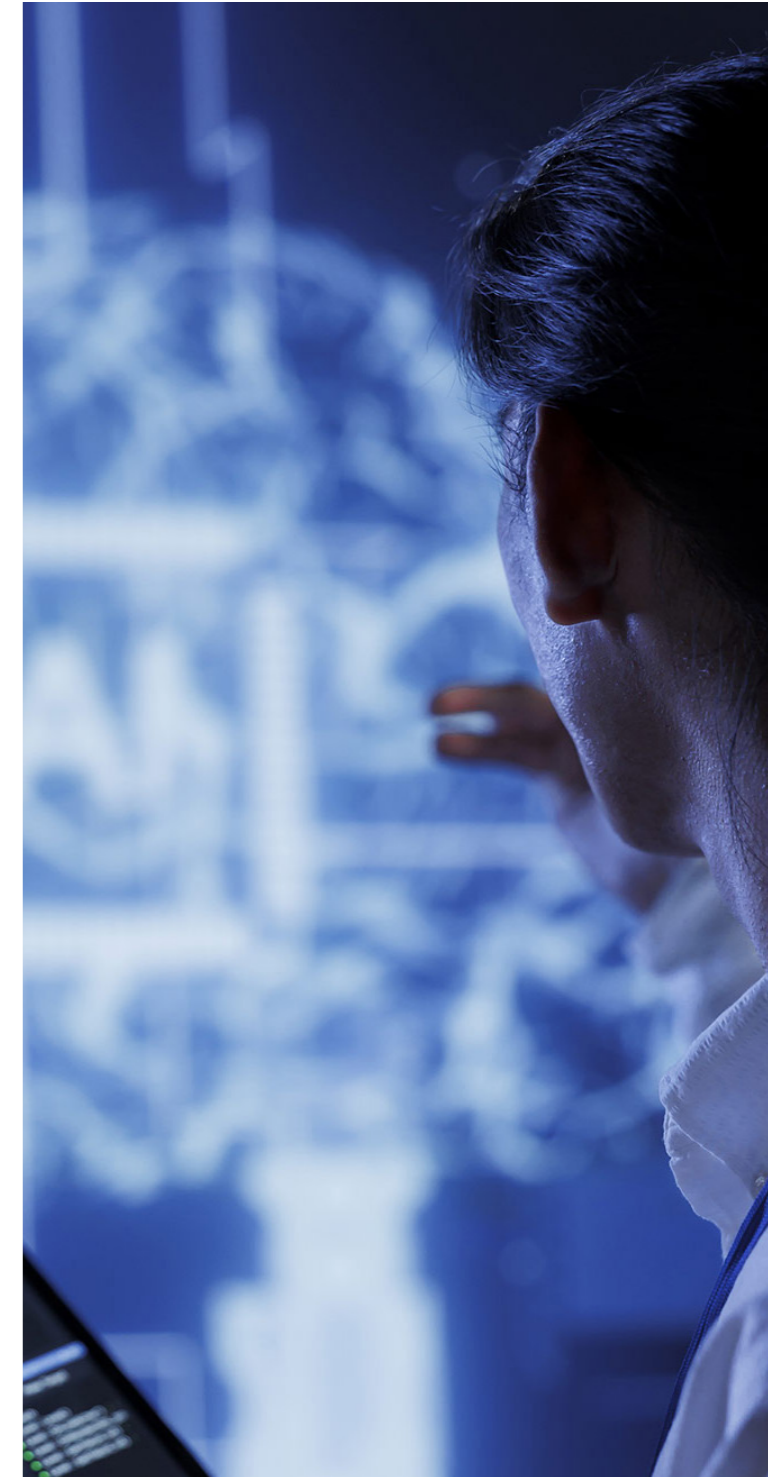
Leading tools in the market include IBM Watson Assistant, Google Dialogflow, and Microsoft Azure Bot Services, which have excellent reviews and ratings in Gartner® Peer Insights.

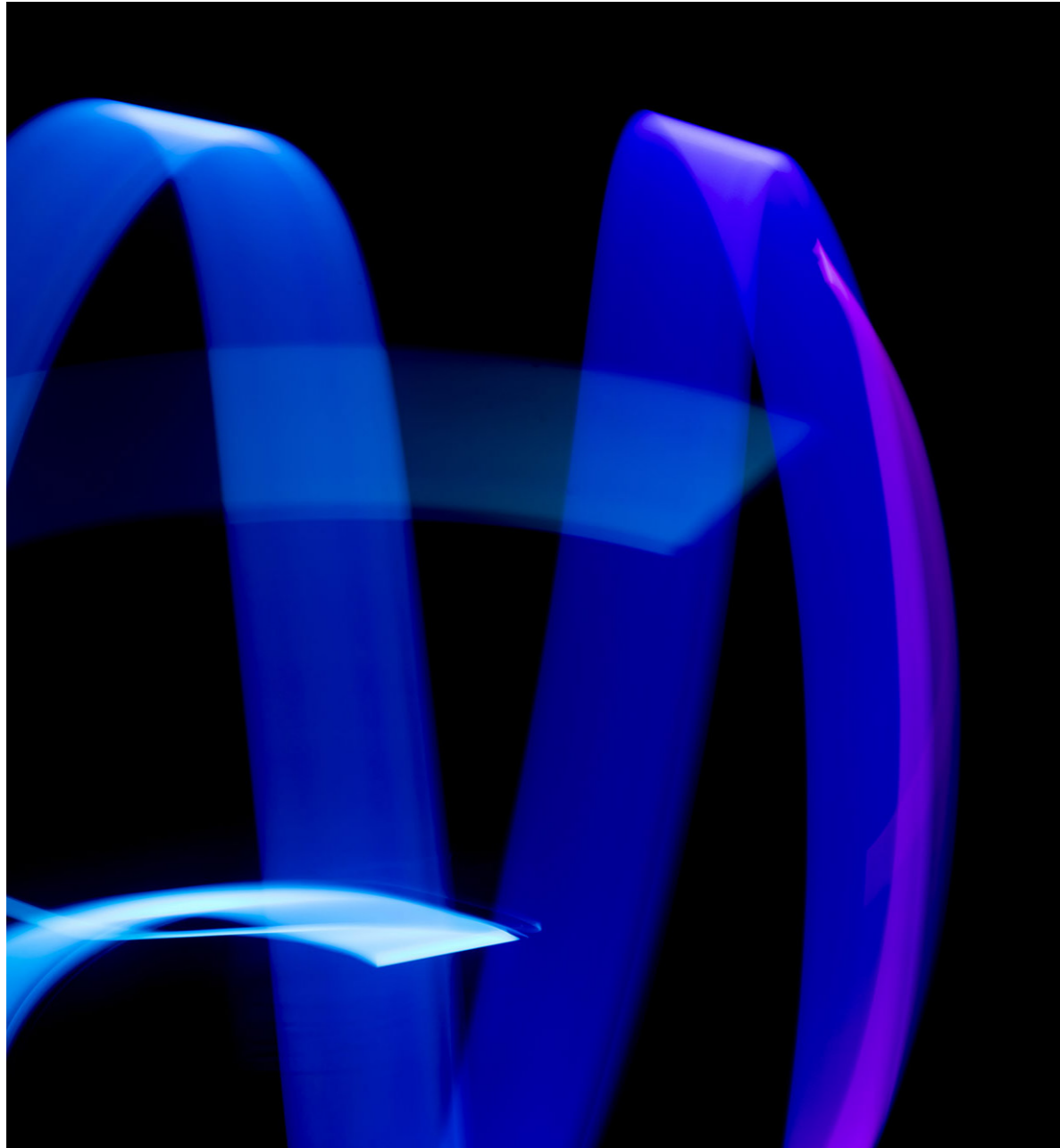
### Sentiment analysis of customer reviews

Manually analyzing customer feedback in reviews and surveys can be a tedious and inefficient process. AI can tackle this problem through sentiment analysis, which uses natural language processing techniques to identify the tone and emotions in customer reviews. This allows retailers to gain clear insights into customer perceptions in real-time.

Improving the understanding of customer sentiment helps retailers identify recurring issues and areas for improvement in their products or services. This enables a faster and more effective response to customer concerns, enhancing service quality and boosting customer loyalty.

The AI involved includes natural language processing (NLP) and sentiment analysis. Available tools include MonkeyLearn, Lexalytics, and RapidMiner, which are highly rated in Gartner® Peer Insight.





### Personalized product recommendations

Retailers face the challenge of offering relevant product recommendations for each customer across different sales channels and touchpoints. AI can enhance this process through recommendation systems that analyze customer purchase behavior and preferences to suggest personalized products. Using machine learning algorithms and predictive analytics, these systems can tailor recommendations based on purchase history and user interactions not only on traditional retail channels but also on social media, call centers, and other alternative channels.

Personalizing recommendations increases the likelihood of upselling and cross-selling, enhancing the customer experience and driving higher revenue. Additionally, a personalized shopping experience contributes to greater satisfaction and customer loyalty.

The AI involved includes machine learning and predictive analytics. Tools that can

support this case include Salesforce Einstein, Adobe, Treasure Data, SAP CDC, and Oracle, positioned in the 2024 [Gartner® Magic Quadrant™ for Customer Data Platforms](#).



## PROCESS 4: Merchandise planning

The merchandise planning process in the retail sector is crucial for efficient inventory management and sales optimization. This process includes demand forecasting, product selection, purchase quantity definition, and stock replenishment scheduling. Its goal is to ensure that the right products are available at the right time, minimizing both excess inventory and stockouts. Effective planning enables retailers to meet customer needs while maximizing financial performance and reducing operational costs.

### Use cases:

- Product selection optimization (assortment)
- Planogram compliance and stock replenishment assurance
- Precise last-minute assortment definition



## Product selection optimization (assortment)

The challenge in product selection is choosing the right items that meet customer demand and maximize sales. Artificial intelligence can address this issue by using machine learning algorithms to analyze historical sales data, market trends, and customer preferences, thus defining the appropriate product assortment in physical stores (e.g., by region or neighborhood), digital channels, and even non-traditional channels such as social media sales and conversational commerce.

Improving product selection through AI allows retailers to reduce the risk of product obsolescence, optimize shelf space, and increase customer satisfaction by offering products that are genuinely desired. This can also lead to increased sales and better inventory turnover.

In this case, machine learning and predictive analytics are used. Tools such as IBM Watson, Blue Yonder Assortment Planning, SAP

Integrated Business Planning (IBP), and Oracle Retail Analytics provide advanced solutions for optimizing product selection, all featured in the 2024 [Gartner® Magic Quadrant™ for Supply Chain Planning Solutions](#).

## Planogram compliance and stock replenishment assurance

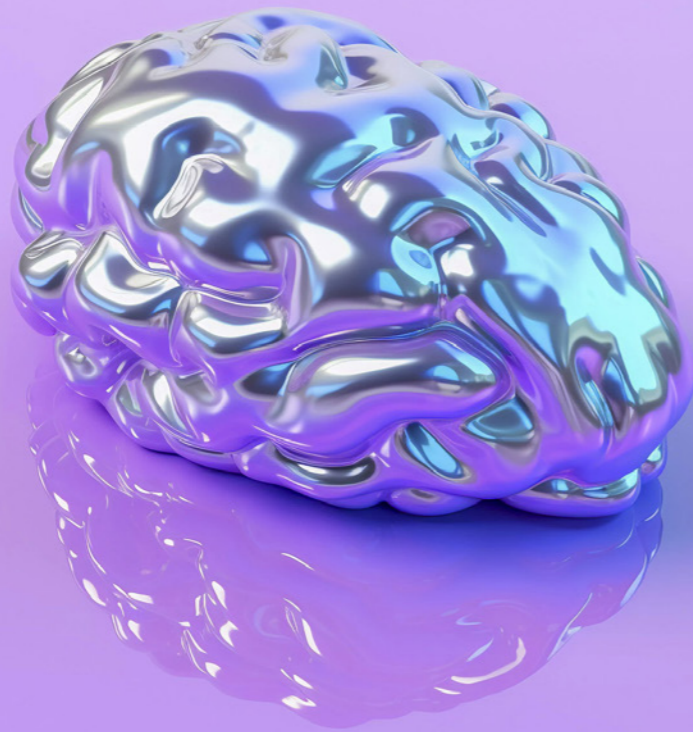
AI can transform planogram compliance assurance in stores using smart cameras and image analysis. By installing cameras on shelves, real-time images of product displays can be captured and automatically compared with the planned planogram. AI computer vision algorithms can identify discrepancies between the actual arrangement and the planogram, detecting errors such as product shortages or incorrect placements, and alerting staff to make immediate adjustments. This ensures that the planogram remains accurate and up-to-date at all times, optimizing product presentation.

Implementing a planogram compliance system offers multiple benefits for retailers. First, it ensures that products are displayed optimally, maximizing visibility and sales of items according to merchandising strategy. It also reduces the likelihood of human errors and ensures that promotions and featured products are correctly positioned. Additionally, rigorous planogram compliance can enhance operational efficiency and customer experience, as shelves

will be well-organized and products will be presented according to customer expectations, potentially increasing sales and customer satisfaction.

To ensure planogram compliance, AI technologies such as deep learning and computer vision can be used. Tools like image analysis solutions offered by companies like Amazon Web Services (AWS) and Google Cloud AI, which use convolutional neural networks (CNN) for image recognition, allow for automatic comparison of captured images with established planograms. These technologies integrate with high-resolution cameras and inventory and space planning systems to provide real-time analysis and improve planogram compliance accuracy. Additionally, AI-based data analysis systems can generate detailed compliance reports, facilitating decision-making and optimizing merchandising strategies.

### Precise last-minute assortment definition



AI can revolutionize precise last-minute assortment definition by analyzing purchase patterns and customer behavior in real time. Using machine learning algorithms and predictive analytics, retailers can identify high-turnover products and those that customers tend to buy in last-minute situations, dynamically adjusting the assortment to maximize sales and increase a crucial KPI for all retailers: average ticket value. AI can predict which products will experience a sudden demand based on factors such as special events, current buying trends, and historical data, thereby optimizing the offer in physical stores and digital channels to capture these impulse buying opportunities.

Implementing a precise last-minute assortment definition offers numerous benefits for retailers. Firstly, it maximizes sales opportunities by ensuring that the most desired and high-turnover products are available when customers seek them, which can significantly increase the average ticket value. Additionally,

a well-tuned last-minute assortment strategy can reduce the risk of excess inventory of less-demanded products, thus optimizing inventory management and reducing associated costs. This not only improves profitability but also enhances customer satisfaction by offering relevant products at the right time.

To improve precise last-minute assortment definition, AI technologies such as predictive analytics and machine learning can be used. Tools and platforms like Microsoft Azure's predictive analytics services and IBM Watson allow retailers to analyze large volumes of sales and customer behavior data to make accurate predictions about product demand. Moreover, real-time data processing technologies and AI-based recommendation systems can dynamically adjust the assortment based on emerging trends and customer preferences, ensuring that inventory aligns with last-minute buying opportunities.

## PROCESS 5: Marketing and advertising

Marketing and advertising management in retail encompasses the strategies and activities aimed at promoting products and services to attract and retain customers. This includes the creation and management of advertising campaigns, market and consumer behavior data analysis, audience segmentation, and the implementation of tactics to increase brand visibility and sales. The primary goal is to connect with the target audience effectively and generate a positive return on investment through persuasive and well-targeted communication.

### Use cases:

- Advertising campaign optimization
- Sentiment analysis and brand reputation management
- Advertising content personalization



## Advertising campaign optimization

The challenge in optimizing advertising campaigns is adjusting and personalizing them in real time to maximize effectiveness. AI can tackle this problem by analyzing historical and real-time data on campaign performance. It can identify patterns and predict which advertising strategies will be most effective, automatically adjusting ads and budgets to improve performance. Current trends show many retailers are entering the retail media network space, where campaign optimization becomes crucial to achieving desired effects.

For retailers, AI offers several benefits, including better budget allocation, increased conversion rates, and higher return on investment (ROI). It also enables agile responses to market trends and changes in consumer behavior, maximizing the impact of advertising campaigns.

Types of AI involved include machine learning and predictive analytics. Market tools such as Google Ads, Facebook Ads, and analytics

platforms like Adobe Analytics and HubSpot offer solutions for campaign optimization, all of which were positioned in the 2023 [Gartner® Magic Quadrant™ for B2B Marketing Automation Platforms](#).

## Sentiment analysis and brand reputation management

A key issue in managing brand reputation is monitoring and analyzing real-time customer perceptions of the brand across multiple channels. AI can automatically evaluate comments, reviews, and social media mentions to determine how consumers perceive the brand.

For retailers, sentiment analysis helps identify problem areas and opportunities for improvement in brand perception. It allows for proactive responses to emerging issues and strengthens relationships with customers by addressing their concerns and enhancing overall satisfaction.

Types of AI involved include natural language processing and sentiment analysis. Market tools such as Brandwatch, Lexalytics, and Mention, which have excellent reviews in [Gartner® Peer Insights 2024](#), provide solutions for sentiment analysis and brand reputation management.





### Advertising content personalization

The challenge in personalizing advertising content is creating relevant messages and offers for different customer segments, which is complicated without a deep understanding of consumer behavior.

AI can analyze interaction data and customer preferences, allowing for the creation of highly personalized and targeted content, especially in digital channels and with supplementary in-store sales assistance tools.

For retailers, personalization increases content relevance, improves the customer experience, and can lead to higher conversion rates and customer loyalty. By offering messages tailored to individual needs and desires, a deeper connection with consumers is fostered.

Types of AI involved include natural language processing and deep learning.

Tools featured in the 2023 [Gartner® Magic Quadrant™ for Multichannel Marketing Hubs](#), such as Salesforce Marketing Cloud and SAP Emarsys, offer solutions for advertising content personalization.

# Conclusions

There are numerous processes where AI can be applied for optimization and improvement, and I would venture to say that the use cases tend to be endless. To understand the potential impact of AI in the coming years, consider that according to a 2024 Forbes [report](#), the AI market was projected to grow by 38% in 2023, reaching figures between \$6.8 and \$7.2 billion. However, many technology enthusiasts remain skeptical about AI's growth in 2024, as indicated by the article.

In future whitepapers that I will be publishing, more use cases will be detailed, including areas such as financial management, where planning and consolidation can be optimized with AI; talent management, where personnel selection can be simplified; and store operations, where efficient staff planning can be based on historical customer traffic. Other processes such as phygital experiences (simultaneous physical

and digital experiences), predictive monitoring of business KPIs, and the supervision of devices and data transfers to ensure the correct operation of systems supporting processes will also be explored.

Today, I have presented only a few ideas that will offer alternatives for starting your AI project. The key to success lies in:

1. Identifying the business process and the problem to be solved.
2. Detailing the expected outcomes and conducting a feasibility review, ensuring data availability. Remember, data is the fuel for AI to operate effectively.
3. Identifying the necessary talent and resources.
4. Developing a budget that demonstrates time efficiency, effectiveness, performance, and increased sales.
5. Starting the AI project to achieve successful results.

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