

Artificial Intelligence in Retail

Solutions driving the future of retail

As a retailer, you want to add value to customers by responding to their individual needs as best you can. But what about new entrants who deliver greater value to customers, more efficiently, whilst you still use a traditional retailer business model?

This is where Artificial Intelligence (AI) comes in.

AI has the ability to address and solve a myriad of problems retailers are facing, at scale. Many retailers have seen the impact AI has on their overall value chain and experienced the value it adds for their customers.

What is AI?

Artificial Intelligence (AI) is dominating conversations in various industries and is emerging ever more within the retail industry. Simply put, AI refers to a system's ability to learn from and solve new problems in a constantly changing environment, through complex algorithms and models that continuously collect and analyse data (Cao, 2021).

Research has shown that to remain relevant, retailers need to adapt to the ever-changing competitive landscape and diversified customer markets. They need to become leaner, more agile and innovative by adopting new technologies within their value chain (Oosthuizen, Botha, Robertson & Montecchi, 2020).

Where can AI be applied in the Retail Value Chain?

AI has the ability to analyse and convert retail data such as purchase, online browsing, social media and customer satisfaction data, into highly accurate insights. These insights can then be used within decision support systems, allowing business to more effectively respond to customer's buying needs.

Although impressive, AI can be taken even further and applied throughout a retailer's value chain ensuring optimisation of its processes and the making of highly effective decisions. The following section provides a high level overview of the different sections within a retailer's value chain, and the possible implementation of AI in each. Note that although these are separate topics, a lot of value and innovative solutions come from combining solutions in each section to create a whole system of interlinked solutions.

Knowledge and Insight Management

This area refers to the management, sharing, using, creating and processing of information to provide meaningful insights. Data inputs are transformed into outputs that contribute directly to the company's knowledge base. This knowledge and insight is then used in the strategic decisioning making process by you and your management.

Examples of AI technologies used in this area include deep learning, intelligent apps and insight engines. The biggest challenge in this area is the current linear approach in the retail value chain which hinders access to the advanced knowledge and insights available through AI technologies (Wirth, 2018).

Inventory Management

As a retailer, one of the main objectives is to match supply with demand. To do so, sales forecasts need to be continually revised to accurately predict the demand. AI can assist in balancing the demand and supply through *predictive inventory management*. Implemented effectively, this could lead to improvements in forecast accuracy, optimise inventory levels throughout the supply chain and reduce out-of-stock rates through predictive machine learning (ML). Furthermore, ML can be useful for marketing purposes, managing promotions and experimenting with changes to individual stores (such as determining what products are frequently bought together and changing the store layout to promote these purchases).

Management of Goods

The management of goods takes place within the domain of trade marketing and includes target formulation, strategy selection and the management of the marketing mix (the 4 P's - product, price, place and promotion). Due to its analytical nature, all tasks in the marketing mix are applicable for AI which can help retailers make smart marketing decisions (Weber & Schütte, 2019). Some of the most prominent AI applications include:

- Dynamic pricing - A pricing strategy where products/services are adjusted either in real-time or via smarter future markdowns based on current market demand.
- Sales forecasting - AI-based complex models can be used as a basis for long term forecasting.
- Customize store layout - to influence the customer's purchase journey and maximise customer satisfaction and sales opportunities.
- Assortment management - determining the optimal assortments for different store locations.
- Store location decision - location intelligence technology platforms can be used to lower the risks associated with the opening of new stores while maximizing returns.

Order Management

Order management refers to all activities from the warehouses to the stores and includes the restocking of stores, keeping the shelves filled and reacting to customer demand. Thus, AI can be implemented for *replenishment optimization* - determining the right time to place orders at the right quantity. Benefits such as improved inventory levels and optimization of shelf space is realised.

Logistic Management

Logistics include all activities related to storage, removal of goods from storage and timely fulfilling orders with the agreed quantity and quality. AI can be implemented in the following logistical areas (to name a few):

- Packaging optimization - ML can be used to select the ideal packaging and size for shipment.
- Route optimization - not only referring to transportation routes between warehouses and physical stores, but also within the warehouse itself.
- Storage optimization - optimize the amount of the time it takes to retrieve products from their storage location within the warehouse.
- Assortment optimization - within the warehouse and stores. Systems calculate how many items of each product should be stored in different warehouses/stores depending on region, season, demand, etc.

Operations management

In this regard, AI is designed to improve operational inefficiencies that slow down the movement of products through the value chain. AI-related consulting and systems integrations, computer vision, machine learning, process automation and virtual assistants can speed up the overall value chain whilst minimising cost.

Financial accounting

Although system support in this area is well-advanced, large amounts of financial data are still not digitalized. Financial activities include invoice entry and verification, deviation control and the settlement of remunerations. AI can be implemented in the following ways:

- Automatic reading and validation of documents through software recognition based on ML.
- Recognition of invoices and receipts through automatic assignment to accounts.
- Reconciliation of account data through algorithms that compare document information with transactions in the company's bank account.

The above information provides a high-level overview of the different types of AI solutions that can be implemented throughout the retail value chain. To effectively use the magnitude of data available within the retail value chain, it is crucial to have automated systems in place to collect and analyse the data at scale while empowering your employees with the insights and decision support systems to better serve your customers.

AI has the ability to revolutionize the retail industry driving lower costs, ensuring value chain optimization and improving the overall customer experience through value added operations. With the ever-changing market demands, don't you think it's time to change your retail technologies? *AI-think so.*

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