



The human advantage: Boosting automated retail systems



Introduction

The retail industry, like other industries, is trying to gain momentum in the era of automation. Chatbots and robots are not things of fiction anymore—businesses are increasingly using AI to facilitate automation in their operations to improve **efficiency** at a reasonable cost and enhance **scalability**.

While automation has accelerated processes and reduced manual efforts, a critical question is yet to be answered: Are we building systems that are responsible and secure enough?

This leads to another point of discussion, called human in the loop (HITL). Considering hallucinations and incorrect responses due to AI systems, implementing HITL while creating any kind of AI-based solution has become necessary and relevant. HITL implementation ensures that an AI-based system follows the basics of **ethics**, **empathy**, and **accountability**.

Context

Over the last decade, the retail industry has undergone a massive transformation. Physical stores have evolved into omnichannel ecosystems, clean analysable data has become the gold standard fuel to run decision-making engines. AI is powering pricing, personalisation, processing—everything one can think of.

However, as retailers adopt AI, they encounter a paradox: the more autonomous the system becomes, the less human involvement is required.

Core retail functions such as pricing, forecasting, and personalisation are now heavily dependent on algorithms. But these are the areas which will always need correct context understanding, emotional intelligence, and ethical reasoning.

This is why there's a need to balance the automation with human intelligence.

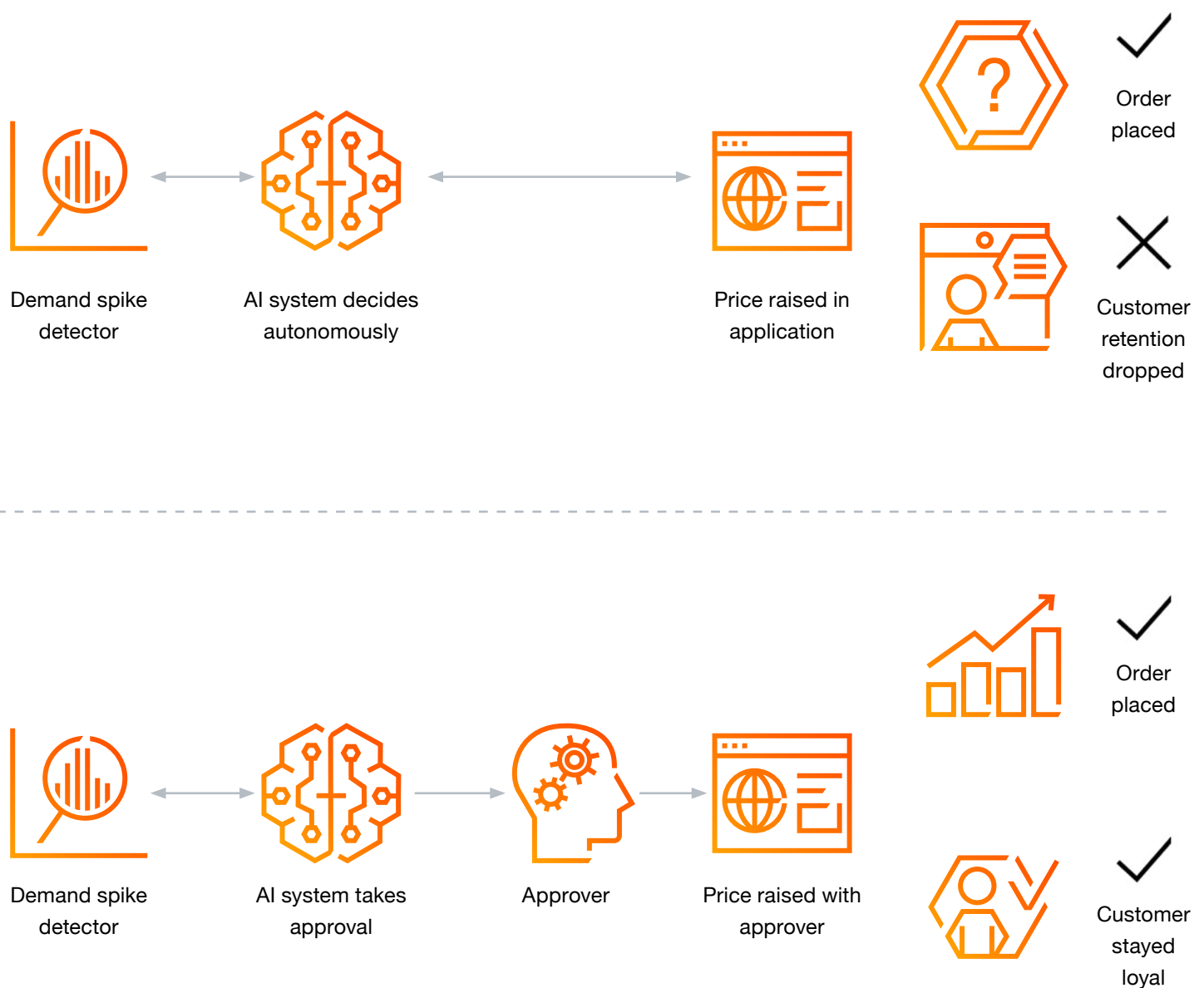


Beyond algorithms: The need for human oversight

Relying blindly on AI can cause unintended consequences. For instance, if an AI model is responsible for dynamic pricing of flight tickets and it observes a spike in demand, it would suggest raising the prices.

But if this situation happens during a natural calamity, the algorithm will not understand how human emotions work—it would miss the context. A human pricing strategist would therefore be required to weigh in ethics and business together.

Figure 1. Importance of humans in retail AI systems



Fraud detection: When intelligence becomes over-defensive

Safety protocols and fraud detection are integral parts of the retail industry. Systems are now smarter than ever. However, AI-powered systems often fail to detect loopholes, causing poor user experience and confusion.

Consider an AI system, trained on huge datasets, intelligent enough to understand patterns and fraud detection. It observes a very high purchase for a user from an unusual IP

address and blocks the credit card of a loyal customer on vacation. The system considered the purchase a potential threat, and initiated an irrevocable action. This could cause frustration for the customer and a possible switch to other options.

Such situations could be avoided if the system just flagged the event as an anomaly and escalated it to a human analyst. The analyst could then have used the recent travel notification, which is often unavailable to the system, to conclude whether the transaction was legitimate or not.

The new stockroom: Humans as AI trainers

Teams are now shifting their focus from performing mundane repetitive activities towards training AI systems to become safer and smarter.

In inventory forecasting, a standard AI system would perform very well in deducing demand patterns on clean, historical sales data. This same system would fail when deducing demand for the retail industry, as retail data is messy and chaotic.

A sudden internet trend can cause a huge spike in demand for an artisanal product to sell out overnight. An AI system with limited understanding of how internet trends work might overanalyse the situation and consider this pattern as a permanent baseline which can cause overstocking. It might also consider it a one-time statistical error and completely ignore it. This is a very common phenomenon known as model drift.

This is where we would need an AI safety trainer. A merchandiser with in-depth knowledge of the retail industry can thus become part of an active learning loop, wherein the AI system is taught how to deal with scenarios outside its comfort zone.

In case of a sudden surge in demand for a product that's been hyped up on social media—that does not sync with the historic data—the AI system would stop guessing and flag the event, creating an alert for human intervention. The merchandiser, who has the cultural concept of how viral trends work, will then analyse the scenario and authorise restock—if required.

Additionally, this validated input will now be a labelled data fed back to retrain the AI. Iteratively, such activities will gradually make the AI future-ready and improve its decision-making.

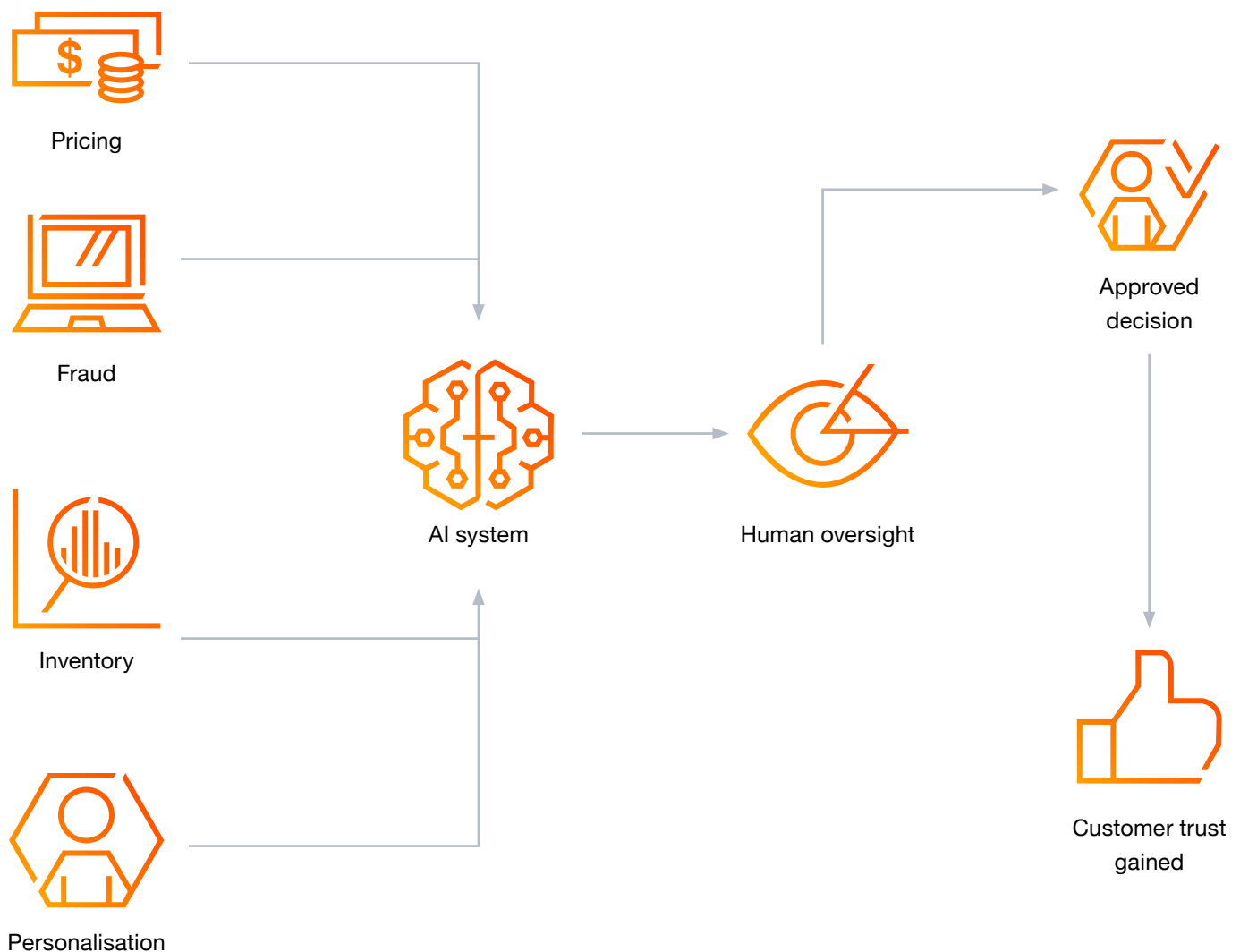


Personalisation with a pulse: Preventing algorithmic harm

With the help of recommendation engines, targeted offers, customised search results, and personalised shopping journeys, brands can make customers feel that they are being seen and understood. However, personalisation without human judgment can quickly turn into a harmful situation.

Recommendation systems choose products for the shopper by referring to different factors such as past browsing behaviour, purchase history, location, or demographic patterns. However, in addition to improving convenience, they can cause biased or uncomfortable situations.

Figure 2. Generic implementation of HITL in an AI system



For instance, a consumer who has searched for a medical product, financial aid, or a very personal item once, may keep seeing similar recommendations coming from different channels. What the algorithm perceives as relevant may be felt by the customer as an invasion of privacy.

Similarly, over-personalised pricing or promotions can make customers think that they are being treated unfairly compared to others. Human reviewers, customer experience teams, and ethics specialists can set guidelines for personalisation. They can tell which data should not be used, which product categories need extra sensitivity, and at which point recommendations should be toned down or removed. AI can spot trends, but human beings interpret discomfort, vulnerability, and brand reputation.

HITL is a good way to stop algorithmic bias as well. If an AI system only offers premium products to certain customer segments or excludes specific groups from offers, it will keep making the wrong assumptions. Human teams can perform audits on these cases, check recommendation results, and ensure that personalisation stays inclusive, open, and respectful.

Personalisation in retail should not be focused on only pushing people to buy more. It should be concerned with earning their trust. People will be more loyal to the brands that know them in a way that does not exploit them.

HITL ensures that automation remains responsible by facilitating a collaborative AI system guided by human values. In future, the top retailers will not be those who eliminate humans completely, but those who reconfigure human roles based on discretion, compassion, security, and planning.

In the age of AI automation, the human element isn't just persisting—it's emerging as the most vital component of all.



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