albatross

Real-time discovery infrastructure for large-scale marketplaces

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Table of Content

- Executive Summary 2
- About Albatross 2
- Primitives 3
- Technology 4
  - Real-time discovery feed 4
  - Recommending new items 4
  - Optimizing beyond engagement 4
  - Beyond the Discovery Feed 5

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Executive Summary

Millions of users interact with a fast-changing catalog made up of unique new items with inconsistent metadata. For marketplaces at this scale, the core challenge is not only ranking known products better. It is discovering the right candidates in real time: new items with no impressions, items with limited or poor metadata, and products that become relevant only as user intent shifts within a session.Albatross addresses this challenge by capturing in-session intent and turning it into adaptive discovery experiences.

About Albatross

Every click tells a story
but platforms are not listening. Recommendations keep recycling popular items, optimizing for past behavior and ignoring what users want right now. Albatross learns from every click, view, and search, transforming static recommendations into living, responsive experiences.

Perception models: the new frontier of AI
Generative AI creates content. Perception AI understands context.
Albatross is pioneering perception models: AI trained on live behavior that understands user intent as it changes. Instead of relying on static rules, fixed segments, or historical profiles, Albatross captures the moment and uses it to decide what each user should see next.

Real-time AI requires real-time infrastructure
Until now, discovery systems could not adapt instantly to changes in user behavior. They were built around static profiles, batch updates, and offline retraining. Albatross processes live events, updates user and item representations with every interaction, and serves low-latency predictions that adapt to user behavior in-session.

Albatross at scale

- 30+ billion predictions per year
- >1000 requests per second
- 150+ million products orchestrated
- <100 millisecond end-to-end latency

One platform. Multiple discovery primitives.
Albatross is not a personalization tool. It is the AI infrastructure behind real-time product discovery: its primitives turn live events into user intent and adaptive user experiences. Whether the input is a user, an item, a list of items, a search query, or a set of candidates to rank, Albatross returns the best items to show next, in the right experience, for each user, in real time.

AI that works in your environment.
Every platform is different. Catalogs are messy. User behavior is sparse. Existing systems are complex. Albatross combines powerful AI primitives with a solution layer that adapts to each customer environment: from data enrichment and model configuration, to optimizing for company-defined metrics and deployment.

Primitives

Here is a summary of the Albatross primitives described above: modular building blocks that turn live behavior, catalog intelligence, and real-time context into adaptive recommendations, search results, and ranking decisions across the user journey.

Primitive	What it does	Primary benefit	Use cases	Input
Discovery Feed	Adaptive product discovery for every session.	Drives discovery, engagement, and conversion	Homepage, category pages, specific recommenders, marketing campaigns	user_id, use_case_id, k
Similar Items	High-coverage alternatives across large, changing catalogs.	Improves product exploration and substitution	Product detail pages, item alternatives, second-hand marketplace substitution	item_id, k
Playlist	Sequential recommendations from a set of selected items.	Builds contextual discovery experiences for baskets, collections, and saved lists	Basket building, checkout page, saved items, style boards	list of item_ids, k
Dynamic Ranking	Reranks a candidate list in real time to meet a business objectives	Optimizes feeds and search results for company-defined metrics	Purchase optimized recommenders, search results reranking, promotion balancing	User_id, list of item_ids, objective
Contextual Search	Search that is aware of the user session and context, not only the query.	Turns search into a personalized, adaptive experience	Personalized search reranking, query refinement, multimodal search	query, user_id, k

All primitives are built on the same perception and ranking infrastructure. Customers can use Albatross to generate recommendations, personalize search, or rerank candidate lists from existing systems.

API reference: docs.usealbatross.ai

Technology

Real-time discovery feed

Traditional collaborative filtering and rules-based recommendation systems struggle to keep up with fast-changing user intent and dynamic catalogs. Recommendations often remain static as users browse, click, and refine their interests. New items may also take days to surface, because legacy systems typically need a sustained volume of interactions before they can recommend them with confidence.

Albatross takes a different approach. It uses sequential embedding models trained on live user-event streams. These models learn how users respond to products, content, and discovery decisions, then predict the next best items or actions to serve at each point in the user journey.

Every new click updates Albatross's understanding of the user in real time. Recommendations are regenerated instantly and served with low latency, so the feed adapts as the user explores. New listings can also become recommendable within hours of entering the catalog, rather than waiting days for interaction history to accumulate.

In real-world second-hand marketplace deployments, a feed optimized to surface the next best items to click delivered up to **4x higher engagement** and **tens of millions in incremental revenue**. Users explored more of the catalog, discovered more relevant content, and converted at a higher rate.

Recommending new items

With Albatross, new items do not need to wait days before they can be recommended. The platform connects directly to the catalog and transforms raw item data into rich item representations that capture semantic similarity, allowing new and updated listings to be understood almost immediately.

For fast-moving marketplaces, this means fresh inventory can become discoverable within hours of entering the catalog. Even when catalog data is messy, incomplete, or inconsistent, Albatross's representation engine is designed to filter out noise and extract the signals that matter. This helps surface relevant new items quickly, without depending on a long history of user interactions.

Optimizing beyond engagement

A real-time discovery feed can drive meaningful gains in both engagement and purchase rate on its own. For many businesses, however, the goal extends beyond clicks. The objective may be purchases, bookings, revenue, retention, or another outcome that occurs later in the journey rather than immediately after a recommendation.

Albatross supports this through a ranking plug-in designed to optimize for custom business metrics. The ranking layer combines real-time user-item affinities with catalog attributes and live business context, such as pricing, availability, promotions, and margin signals.

This allows recommendations to be optimized for conversion, engagement, revenue, or customer-defined objectives, while balancing exploration and exploitation through adaptive ranking logic. The result is a discovery experience that remains responsive to each user's behavior while staying aligned with the business outcome that matters most.

Beyond the Discovery Feed

Albatross also supports a broader set of adaptive discovery primitives that can be deployed across the customer journey, from product pages to checkout, CRM, and search.

Similar Items: helps users keep exploring when they land on a product, listing, or piece of content. It identifies high-quality alternatives across large and constantly changing catalogs by using item representations built from catalog data, not only interaction history. This makes it especially useful in marketplaces where inventory changes quickly, attributes are incomplete, and product data can be messy or inconsistent. Albatross can still understand semantic similarity between items, filter out catalog noise, and surface relevant substitutes even when listings are new or sparsely interacted with.

Playlist: works like an adaptive feed, but starts from a sequence of items selected by the customer or business. Instead of recommending from a blank user session, Albatross uses the provided item sequence as context and generates the next best recommendations around it. This is useful for cross-sell, cart completion, saved lists, collections, CRM campaigns, and curated shopping journeys. For example, a basket, wishlist, or set of recently viewed items can become the starting point for a personalized sequence of recommendations that completes the user's intent and encourages deeper discovery.