

Recommendation Engine for Online Retailers

Machine Learning Platform Helps Retailers and Brands Deliver Personalized Shopping Experience For Increased Conversion Rates

Recommendation engines are machine learning algorithms capable of recommending relevant products to customers, based on an analysis of the customer's historical transactions.

Recommendation engines are able to boost revenue for online retailers. Approximately 35% of purchases on Amazon are due to machine learning algorithms which analyze transaction data to recommend products, according to a report by McKinsey & Company,

Content providers and online movies streaming services also owe much of their success to these machine learning algorithms:

- Nearly 75% of viewing on Hulu is due to its recommendation system.
- Approximately 50% of movies watched on Netflix are recommended by the company's recommendation algorithm.

PROJECT HIGHLIGHTS

- **Deliverables:**
 - Recommendation engine algorithm
 - Bidding algorithm
- **Timeline:**
 - 2 weeks: Proof of Concept
 - 4 months: Working model
 - 6 months: Final models and test deployment
- **Tech used:**
 - Python, MongoDB
- **Machine learning techniques:**
 - Collaborative Filtering

The Challenge

Build a Recommendation Engine For Online Retailers to Deliver Personalized Product Suggestions and Increase Conversion Rates

In 2017, digital marketing company FusePump needed its own recommendation engine to satisfy a big client, but lacked the internal capability to build machine learning algorithms that learn customer preferences and recommend relevant products.

Executives turned to Rediscovery.io, as a company specializing in developing bespoke machine learning solutions for business and academia.

FusePump asked Rediscovery.io to build a product recommendation engine able to:

- **Analyse user preferences and recommend relevant products based on online activity.**
- **Use anonymised data to not compromise customer privacy.**
- **Continuously learn from new data and new customers.**



ABOUT OUR CLIENT

<https://www.fusepump.com/>

FusePump is a London-based digital marketing agency providing **data-based solutions for retailers and brands.**

The company connects customers with real-time prices and easy purchasing through its BuyNow button, and partners with clients to develop custom solutions for unique business challenges, such as SkyePlatform, which offers personalized content for retail websites.

The algorithms created by Rediscovery.io are at the core of SkyePlatform.

FusePump also requested the product recommendations be at the core of a bidding platform that would allow brands and other retailers to compete for ad space.

If a retailer receives multiple bids for the same customer segment, it needs a way to choose the winning bid. Instead of relying on a human to make the decision, FusePump wanted to automate the process with a custom machine learning algorithm.

The Decision-Making and Development Process

PROOF OF CONCEPT

After meeting with the FusePump team to understand their needs, Rediscovery.io presented a description of the **Machine Learning** approach to the project and a development timeline.

An important milestone was the **early delivery of a proof of concept, a simple prototype with limited functionality**. A proof of concept is a vital part the development process, as it demonstrates that the algorithm works and helps non-technical employees understand how machine learning translates logic into code.

WHAT IS MACHINE LEARNING?

Machine learning is a branch of artificial intelligence that allows computers to learn without being explicitly programmed, and make data-based decisions without the need for human intervention.

Machine learning algorithms are trained to recognize patterns in data, then predict similar patterns in new data

DEVELOPMENT AND ITERATION

Throughout the course of the project, **Rediscovery.io collaborated with FusePump's internal development**, marketing, design and consulting teams to ensure the product aligned with the clients needs and was well integrated with FusePump's existing infrastructure.

To facilitate the development process and allow for slight change of requirements, the project was carried out through incremental improvements and iterations.

Rediscovery.io built the core Machine Learning engine behind our product recommendation system for a major client, and did brilliant work in designing the bidding algorithm. I highly recommend Rediscovery.io

DWAYNE MANZANO

FusePump Product and Project Manager

The Solution

Recommendation Engine and Competitive Bidding

SkyePlatform is a digital platform that helps online retailers and brands deliver a personalized shopping experience, leveraging algorithms designed by Rediscovery.io.

ALGORITHM 1: PERSONALIZED PRODUCT SUGGESTIONS

SkyePlatform's core functionality is powered by a **collaborative filtering algorithm that analyzes user preferences to suggest relevant products** to online customers. To protect customer privacy, data is stripped of all identifying information and stored in a secure database. Basic workflow:

- 1. The algorithm analyzes a customer's purchase history and estimates how similar items are to each other. Similarity is scored based on how many clients purchased the items together.**

For example, diapers and milk were more similar than diapers and beer, as many people who buy diapers also buy milk, but very few people who purchase diapers also purchase beer.

- 2. A customer's historical purchases are matched with similar products and assembled into a list of product recommendations.**

Customer anonymised ID	Customer bought	Top recommended item	Second top recommended item
ab2051xz	Diapers, Milk	Baby food	Cookies

- 3. When a customer visits the retailer website, the top ranking item is shown as an ad.**

The algorithm can then be improved by allowing it to take into account external factors, such as likelihood to buy based on time of the year - e.g. customers are more likely to buy blankets during the winter than during the summer.

ALGORITHM 2: COMPETITIVE BIDDING FOR AD SPACE

SkyePlatform also allows brands to bid on specific retail blocks and customer segments. Bids are weighted by the bidding algorithm, which builds a score based on multiple factors:

- **Likelihood of customers to purchase the product.**
- **Net margin of the retailer on the product.**
- **Size of the bid.**


Normally, accepting a bid would require a human employee. Instead, SkyePlatform automates the process thanks to its machine learning algorithm.

Results

Estimated 47% increase in sales and personalised customers experience

The algorithm created by Rediscovery.io sits at the core of SkyePlatform, allowing retailers and brands to deliver a more personalized experience for customers and in turn increasing revenue and customer satisfaction:

- **Estimated 47% increase in conversion rates as compared with static banner ads.**
- **Shoppers have a more engaging experience due personalized advertisements and products.**
- **Retailers maximize the value of their ad space and generate new revenue.**
- **Brands have a unique opportunity to influence shoppers with a high intent to buy. This allows brands to increase sales and reduce their advertising budget.**
- **More efficient use of advertising space for retailers.**



Are you considering building a machine learning solution?
We're here to help

FOR MORE INFORMATION

Please email hello@rediscovery.io or call **+44 20 7117 2582**