AI Powered Recommendations

Use of AI in Recommendation Engine

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Introduction

Imagine walking into your favorite store, and the storekeeper immediately knows what you are looking for—whether it is the latest fashion trend or a book you didn't even know you wanted. In the world of online shopping, recommendations are expected to play the role of keeping the visitor interested. Hence, the recommendations engines need to be agile, have a good memory and be continuously learning just like the smart storekeeper, guiding you to products and content tailored just for you thus enhancing your digital purchase journey.

At the core, recommendation systems use advanced algorithms and a wealth of data to understand and predict consumer preferences, considering everything from consumer's past purchases and search history to demographic details. By doing so, they help consumers discover things they might never have come across otherwise, making their shopping or browsing experience more delightful, enjoyable, and relevant.

In today's digital marketplace, where choices can be overwhelming, these systems are invaluable. They not only enhance user experience but also drive engagement and satisfaction. From referring to the latest series on Netflix or the perfect pair of shoes on Amazon, recommendation systems are behind the scenes, making sure consumers find what they need quickly and effortlessly. These systems do not just react to user actions; they anticipate consumer's desires based on patterns in behavior. They analyze data like clicks, likes, and past purchases to make thoughtful suggestions, ensuring consumers always find something that piques their interest. Big names like Amazon, Netflix, and Spotify have embraced these systems as they significantly boost user satisfaction and drive substantial revenue.

> 65% of subscribers inevitably choose one of the AI generated viewer specific recommendations suggested by Netflix - **Fortune**

Recommendation systems are AI-driven tools that leverage machine learning and big data to make personalized product suggestions to consumers. They enhance user experience and are widely used by content and product providers to drive consumer engagement and sales. They're about making consumer's feel understood and valued, turning shopping into a personalized journey that feels uniquely theirs.

The context of this white paper is to introduce recommendation algorithms commonly used in recommendation engines and how Logixal has utilized these algorithms to build its recommendation engine.

Challenges

Various hurdles that commerce businesses face today are:

As the product catalog grows and the customer base expands, these challenges become even more pronounced. Managing and processing vast amounts of data, thousands of products, hundreds of users, and millions of interactions, is a challenge. The complexity of keeping track of what is popular, what's new, and what's trending becomes overwhelming.

Navigating these challenges involves more than just offering a wide range of products. It requires a thoughtful approach to understand customers' behaviors, predict their needs, and deliver personalized experiences that drive engagement and sales. These recommendations are a win-win for both business as well as customers. The customers can quickly find products of their choice and the sellers get to offload their goods quickly.

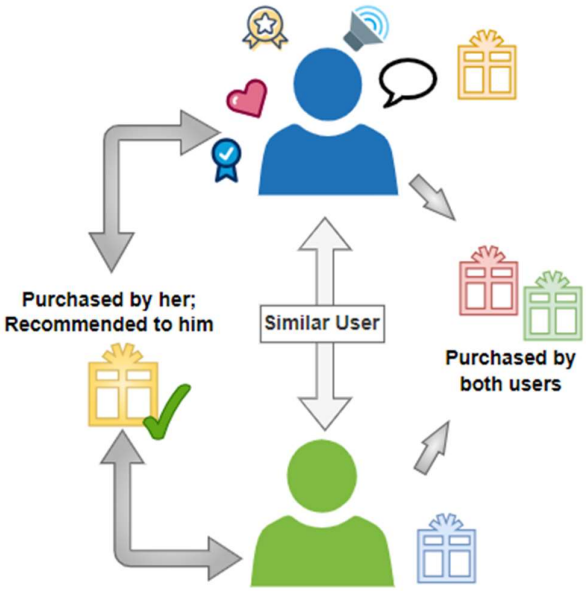
In short, turning visitors into buyers, retaining them for the long haul, and maximizing their spending are ongoing challenges that require a blend of strategy, insight, and innovation.

Solution

Turning these challenges into opportunities by using a toolbox full of smart, innovative solutions to tackle the hurdles of running an online store is the key to enhance the digital commerce strategy. These smart and innovative solutions are based on two broad types of recommendation systems viz. Collaborative filtering and Content filtering.

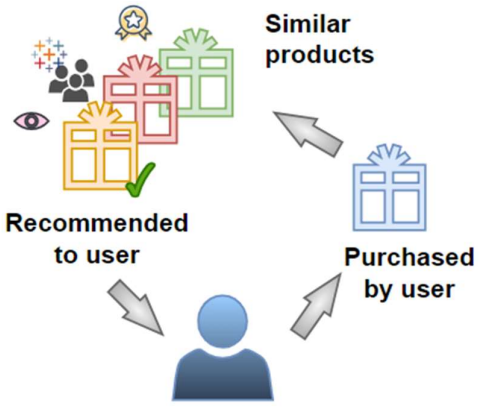
Collaborative filtering

Collaborative filtering algorithms collate and recommend selective items based on preference information from many users as collaborative approach. For example, if a system knows that one user and another user share similar tastes for a product, it might recommend a product to users based on other user's choices. This approach uses similarity of user preference behavior, given previous interactions between users and items, recommendation algorithms learn to predict future interactions of the user. These recommendation systems build a model from a user's past behavior, such as items purchased previously, or ratings given to those items and similar decisions by other users. The idea is that if a group of people have made similar decisions and purchases in the past, then there is a high probability they will agree on additional future selections.



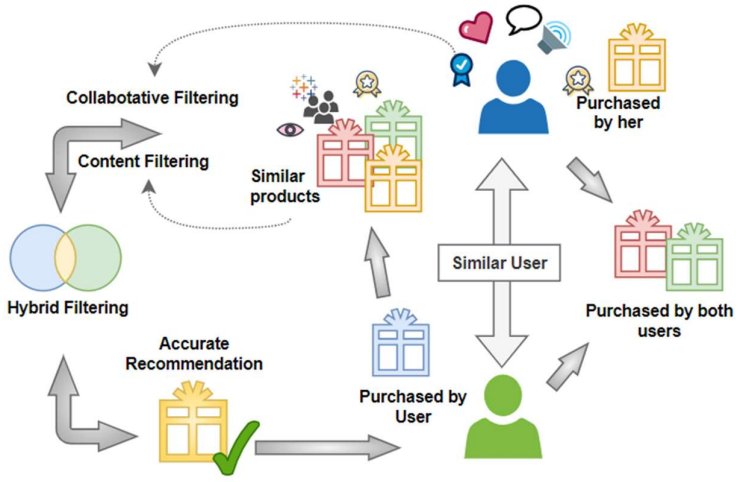
Content filtering

Content based filtering uses the attributes or features of an item (known as content) to recommend other items to users. This approach is based on similarity of the item and its features, the category of that item, along with information about other users' interactions with this item (e.g. view count of that item, average reviews of that item), model the likelihood of purchase of such an item. Content-based filtering recommends items based on product attributes and directly related to the characteristics of the item the user has shown interest in.



Hybrid recommendation systems

Hybrid recommendation systems combine both content-based and collaborative filtering techniques to provide more accurate and diverse recommendations using a combination of user data, item data, and other contextual information to generate recommendations. Hybrid recommendation system uses content-based filtering to recommend items that are like the ones the user has interacted with before, and collaborative filtering to recommend items that other similar users have liked or interacted with.



With these recommendation algorithms, the Hybrid recommendation is most preferred as it combines the best of both approaches, bringing in the following benefits:

- **Improved Browse-to-Purchase Ratio**: Recommendation systems act as a personal shopping assistant, making the site more engaging and intuitive, guiding visitors to the products they're most likely to love. By analyzing past behaviors and preferences, these systems suggest items that match customers' interests, making it easier for them to find what they want and take the leap from browsing to buying.
- **Boost Repeat Business**: Providing personalized experiences by leveraging data from previous interactions like purchase history and browsing patterns, one can tailor the communication and offers to meet customer's evolving needs. A customer who feels valued and understood with tailored loyalty programs, personalized emails, and special promotions turn from a one-time shopper into regular user.
- **Increasing Transaction Size**: Through strategic recommendations and promotions, cross-selling and upselling become second nature with a well-tuned recommendation engine. Suggesting complementary products or offering discounts on additional items can encourage customers to add more to their cart, increasing the overall Average Order Value (AOV) of each transaction.
- **Scaling with Growth**: As the store grows, the recommendation system acts as a powerful assistant that can handle large volumes of data, adapt to new products, and analyze customer interactions to provide relevant suggestions. This ensures

that the site remains effective and engaging, even as the catalog expands and customer-base grows.

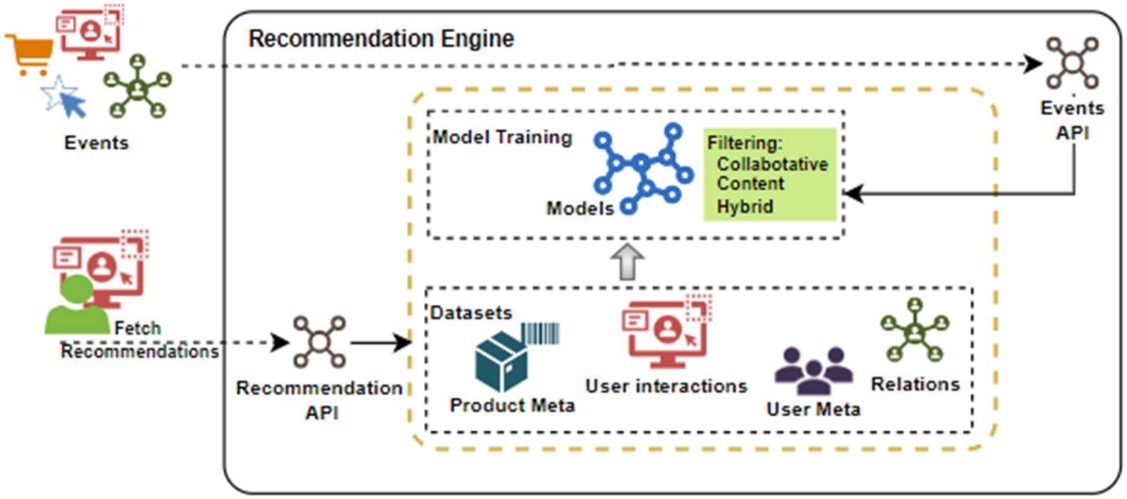
- **Improving Product discovery and Search accuracy**: Recommendations expose users to products they might not have otherwise discovered by suggesting similar items, cross-sell opportunities, or trending products, leading to more browsing and higher sales and enhances search functions by analysing intent and suggesting related products or categories even when queries are ambiguous. This ensures that customers find what they're looking for, boosting conversion rates.

By focusing on personalization, data-driven insights, and strategic recommendations, one can create a shopping experience that feels both seamless and intuitive. It is about making every interaction count and ensuring that every customer feels like they're getting exactly what they need. These solutions help transform challenges into opportunities for growth, creating a more dynamic, responsive, and successful digital commerce environment for a long-term success.

Leveraging the Hybrid recommendation system algorithm, Logixal has developed a Recommendation Engine for providing recommendations via an API.

Logixal's AI Powered Recommendation Engine

Logixal's in-house AI powered Recommendation Engine, one of the capabilities of DES (Data Engineering Suite), is AI/ML powered Experience Engine with pre-configured domain -specific fragments. Not only is it a cloud native application but also a framework which helps in integrating existing applications as well as enhance user experience by using simple but powerful Machine Learning Algorithms running on industry standard application software.



DES consumes only public and sanitized data like Product events, Customer events, Order events and Store feeds to provide recommendations to users. DES does not store any personal information of any system users.

Benefits Delivered

A well implemented recommendation system not only enhances customer experience but also significantly boosts the success of the business by:

- **Improving Retention**: Recommendation systems are like personal assistants who remember user preferences and makes users feel understood. When a recommendation system consistently offers relevant and personalized suggestions, it creates a sense of connectivity and value. Customers are more likely to stay loyal to a brand that seem to understand them, leading to higher retention rates and long-term relationships.
- **Increasing Sales**: A customer greeted with smart recommendations feels welcome and starts to think: "I didn't know I needed that, but now I do!" Research shows that accurate recommendations can boost sales by up to 50%. Whether suggesting complementary items or highlighting popular products, these systems drive impulse buys and encourage customers to spend more, enhancing overall revenue.
- **Forming Customer Habits and Trends**: Customers develop a routine to come back to the site when they feel understood, and they know they'll find what they're looking for. A recommendation system that consistently provides relevant and engaging content helps shape these habits and influences customer behavior. It turns casual visitors into habitual users who rely on your site for their needs.
- **Speeding Up the Pace of Work**: For analysts and researchers, a recommendation system can be a game-changer. Imagine saving hours of time by having tailored suggestions for resources and materials. Instead of sifting through mountains of data, they receive curated recommendations that streamline their workflow and boost productivity.
- **Boosting Cart Value**: Think of a store where every customer leaves with a little extra in their cart. For digital commerce businesses with vast inventories, manually suggesting products is not feasible. Recommendation systems, however, can automatically find the perfect moment to suggest additional items or new arrivals, either on the site or through follow-up emails thus enhancing the shopping experience and increasing the average cart value (ACV).

The benefits of recommendation systems go beyond just making personalized suggestions. They create a more engaging and efficient shopping experience, fosters customer loyalty, and drives substantial business growth. By making every interaction count and leveraging data effectively, these systems turn potential into performance, leading to a more successful and profitable business.

Summary

Personalized recommendations are more than just a feature, they are a powerful strategy that can transform connectivity with customers and drive businesses forward. By leveraging recommendation systems, businesses not only just show products but also offer a tailored shopping experience that feels personal and intuitive.

1. Converting Visitors into Buyers: Recommendation systems help turn casual browsers into committed buyers by suggesting products that align with their interests and preferences. This targeted approach makes it easier for customers to find what they want and move from exploring to purchasing.

2. Increasing Value per Transaction: These systems can also boost the value of each transaction. By recommending complementary items or displaying popular products, they encourage customers to add more products to their carts, eventually increasing the average order value.

3. Driving Repeat Business: When customers feel understood and valued, they are more likely to return. Personalized recommendations create a sense of connection and relevance, which helps build loyalty and encourages repeat visits.

A next-generation recommendation system leverages the full potential of customer data to present the most relevant products in real time. It considers not just individual preferences but broader trends and similarities between users. This approach not only enhances customer experience but also improves overall business performance.

By incorporating recommendation systems into their strategy, businesses ensure that each customer interaction is meaningful and engaging. This leads to lower churn rates, increased purchases, and a healthier return on investment. It is about creating a shopping environment where every customer feels like they are getting exactly what they need, making their experience with the brand both memorable and rewarding.

Recommendation systems are essential for modern e-commerce, providing tailored product suggestions that enhance user experience, drive sales, and improve customer retention. By understanding visitor preferences and leveraging advanced analytics, these systems optimize business performance and deliver measurable benefits.

About Logixal

Since 2005, Logixal, is focused on composable solutions & digital banking enterprises. Logixal has partnered with industry leading platforms to provide custom implementations or in-house enterprise solutions. For over 18 years we have been providing services to Retail, Luxury Goods, Manufacturers, Distributors, Media, Telecom, and Subscription model-based businesses serving customers across Americas, Europe, Asia, Africa & Middle East.

Visit http://www.logixal.com for more information

Footnotes/Sources

- What is a Recommendation System? | Data Science | NVIDIA Glossary
- Introduction to Machine Learning Recommendations | Google Developers