GlobalLogic®

OTT Personalization

An AI/ML Game-Changer

by Bhushan Balki, Solution Architect, GlobalLogic

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Introduction

The year 2020 changed our day-to-day lives in several ways, from how we live and work to the ways we unwind and relax. As the world fights the COVID-19 crisis, we are trying to prepare for ongoing economic challenges and repercussions of the global lockdown that are as yet unknown.

With limited outdoor entertainment options, mandatory social distancing, and weeks or even months spent at home, the Over-The-Top (OTT) media platforms are seeing a spike in their user base and viewership. In the early weeks of the United States shut down in March 2020, for example, consumption on OTT platforms rose 20% over the month prior.

Media OTT brands now have increased opportunities for customer acquisition and engagement. The only mantra OTT brands need to focus on is "personalization strategies to engage with your audience during social distancing and going forward."

1. Alexander, Julie. The entire world is streaming more than ever — and it's straining the internet, *The Verge*.

OTT Ecosystem and Challenges

Major players like Netflix, Amazon Prime, and Spotify are leading the race with a wide variety of content and immersive UI/UX experiences in the highly competitive OTT media. Setting oneself apart from the other players requires a deep understanding of one's audience and the ability to truly cater to their needs and preferences.

In this case, personalization becomes a key differentiator in these players' success. They seem to understand their audiences and serve them with relevant content.

Any OTT platform's success depends on four critical factors: content, discovery, user interface, and user experience. Personalization works with all of these factors and simultaneously helps OTT brands address marketing challenges related to:

- High customer churn.
- Targeting the relevant customer.
- Content discovery.
- Omnichannel viewing.
- Showcasing quality and relevant content.
- The high cost of customer acquisition.
- Increasing average user content consumption.
- Converting freemium users to paid subscribers.
- Competitive marketplaces.

What is Personalization?

Personalization is the customization of content to the individual through engagement in information filtering, classifying, prioritizing, and adjusting. It can be explicit using direct user inputs, or implicit by drawing on inferences created by the data.

Targeting is a form of personalization. Based on profiling, viewers are targeted with individualized content expected to have a specific impact on their decisions or behavior.

Recommending works by filtering, ranking, and prioritizing content is another form of personalization. Filtering can operate based on popularity, or it can be semantic (based on users' previous online behavior) and collaborative (based on the preferences of segmented audiences to which users belong).

Machine-Learning Personalization

The OTT industry is largely betting on artificial intelligence (AI) and machine learning ML) to grab 30 crucial seconds of the targeted customer's attention.

To get future-ready, the OTT giants such as Netflix, Amazon Prime, and Hulu are already investing in artificial intelligence and data to retain consumers. They realize that changing consumer interests, viewing habits, viewing patterns, genre preferences, etc., are key factors for success.

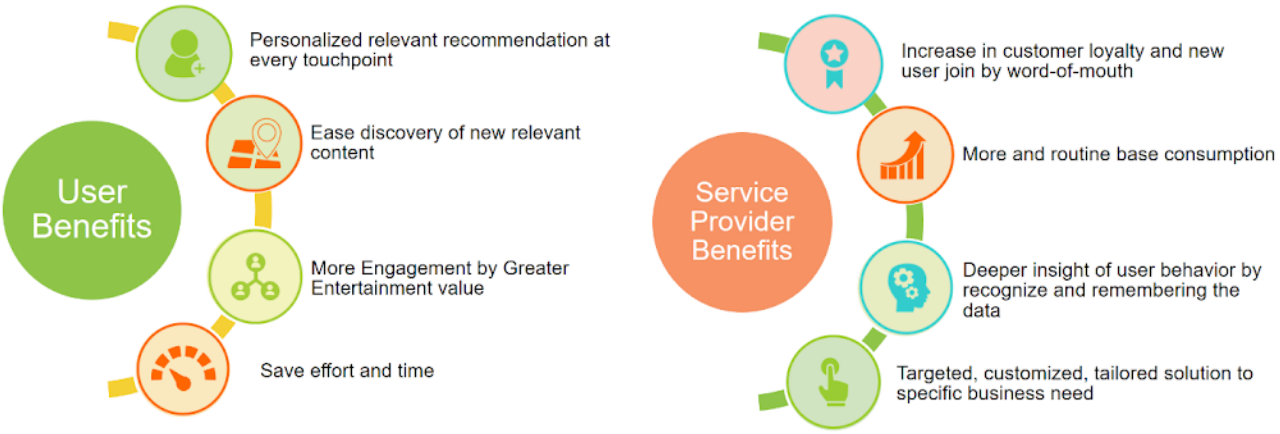
Machine-learning personalization utilizes algorithms and predictive analytics to dynamically present the most relevant content or experience for each visitor.

Machine-learning personalization provides a more scalable way to achieve unique experiences for individuals, rather than segments of people. It allows you to utilize algorithms to deliver these one-to-one experiences, typically in recommendations for products or content. With a next-generation platform, you can apply machine-learning personalization to recommending categories, brands, offers, and more.

In simple work, the personalization supported by AI/ML technology can be defined as delivering the right content, to the right user, at the right time, and across all the touchpoints.

Elements of Personalization

Benefits of Personalization

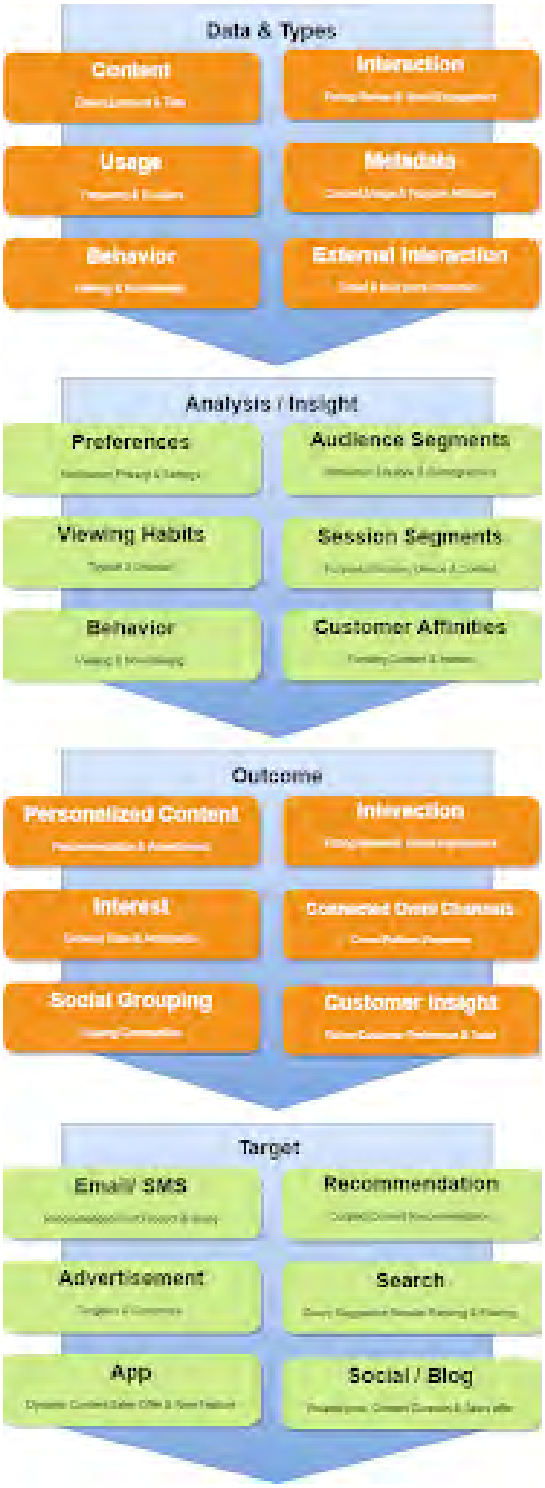


Machine-Learning Use Cases for Media

- Personalized Marketing Campaign - Personalize offers and messages tailored to the behavioral insights and personal data gained from real-time user interaction.
- Customer Sentiment Analysis - Customer sentiment analysis helps determine the positive and negative inferences from customer behavior and provides more concrete information for better-personalized recommendations.
- Personalized Recommendations - Analyze disparate data; enable the consumer to make customized content choices and the business to predict behavior.
- Customer Segmentation - Transform customer data into actionable user segments and develop a targeted, personalized plan to convert to a subscriber.
- Personalized Email and SMS - Drive more results through personalized email and SMS.
- Media Metadata Tagging - Automate the creation of rich metadata index (object, scene, activity, faces, etc.) extracted from audiovisual content and integrate into digital and media asset management systems.
- Automated Compliance Marking - Detect potentially inappropriate content to avoid compliance issues in global markets and increase brand safety for advertisers.

Predictive Personalization Journey

Technology is at the heart of personalization. It is where data, analytics, and artificial intelligence (AI) come together to deliver an exceptional experience. The figure below exhibits the personalization journey using machine-predictive personalization.



- Content plays a crucial role in personalization by uncovering customers' interests.
- Big data technology like Spark and AWS pipeline Splunk can easily ingest the data into the system.
- Data can be in different formats and come from various sources.
- Real-time or bulk schedule process.

- Segmentation of customers based on demographic, lifestyle, behavior, preferences, duration, device, and content.
- Clustering of customers based on past historical campaign/ promotion responsiveness data, including campaign/offer details and mode of communication.
- Customer affinities analysis to determine customer patterns and behaviors to assess trending content & interest.

- Understanding/knowing customer segments and targeting customers with personalized offers/promotion as per segments.
- Predicting optimal mode of communication for customers for new promotion/offers, maximizing customer responsiveness.
- Determining best subscription model/pricing model for packages/plans to offer to customers as per preferences, lifestyle, and viewing habits.
- Targeting customers to provide the customized recommendations and ads at all touchpoints to increase the horizon of OTT solutions.
- Touchpoints can be email, SMS, recommendations, ads, or apps across various sets of devices, maintaining universal user behaviors.

Machine-Learning Methods for Prediction and Personalization

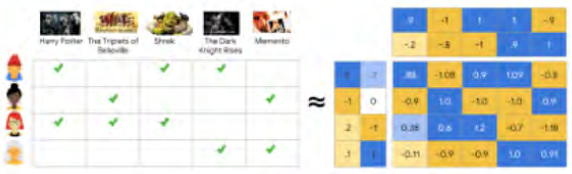
This section introduces different techniques in machine learning that can grow personalization.

Matrix Factorization and Markov Chains

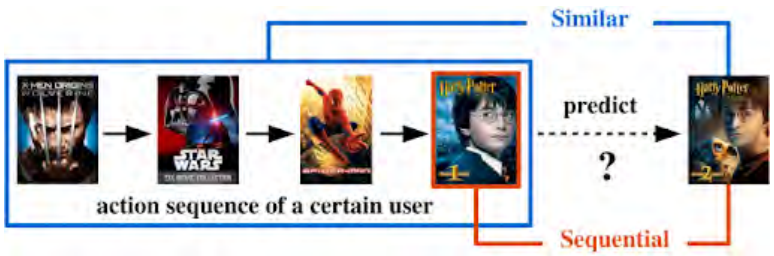
Conventional recommender systems often discard sequential information and focus on mining the static relevancy between users and items from interactions. For instance, a typical conventional recommender system based on matrix factorization may effectively model a user's general preferences by learning from their entire interaction history. Still, it does not model the order of the user's interactions.

One of the most popular approaches is using both matrix factorization (MF) and Markov chains (MC).

Matrix factorization methods learn a user's general taste by factoring the matrix from observed user-item preferences.



On the other hand, **Markov chains** methods model sequential behavior by creating a transition graph to predict the next action based on the user's recent actions.



Popular modeling choices for session-based recommender systems include Markov chains with matrix factorization to achieve good recommendation performance. Unlike conventional recommender systems, session-based recommender systems model the evolution of a user's short-term preference implied by sequential interactions in a session to recommend the next item a user may find interesting.

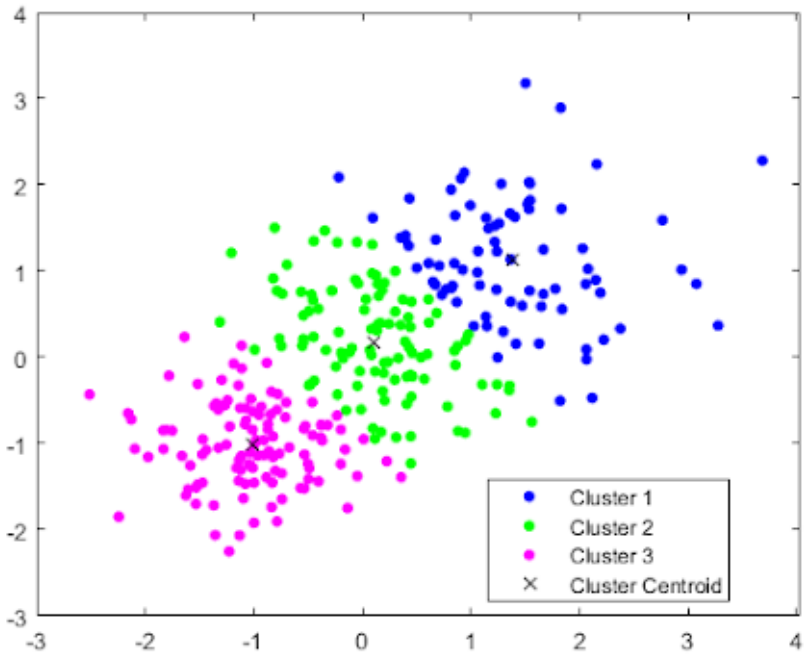
Clustering Algorithms

These are unsupervised ML algorithms used to analyze unlabeled data, segregate it into groups with similar traits, and assign it to clusters.

Among the most popular ones is the k-means algorithm. It starts with estimating the centroids for clusters and defining the number (k) in advance. The second step is assigning data sets to the nearest centroid based on the Euclidean distance. After that, recompute the centroids for all clusters.

You can use this ML method for:

- Video and audio classification (based on tags, topics, etc.).
- Customer segmentation (based on their purchasing, watch history, app behavior, etc.).
- Recommendation engine development.
- Social media analysis.
- Anomaly detection.
- And more.



Regression Analysis

This is a supervised ML algorithm for defining relationships between independent (predictor) variables and the dependent (target) variable. Regression (linear) aims at finding a straight line that can accurately depict the actual relationship between the two or more variables.

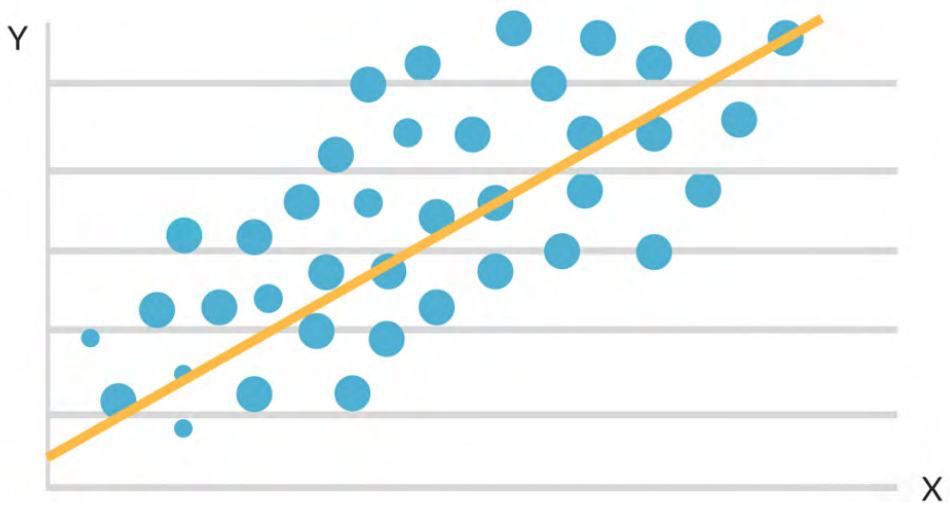
The most popular of regression techniques are linear and logistic modeling techniques.

Use it for:

- Predictive Analytics - Forecast future opportunities and risks in the OTT business. For instance, demand analysis predicts the number of items a consumer will probably purchase and watch, etc. Forecasting will help improve productivity, reduce cost, and improve operation.

- New Insights - Regression analysis techniques find a relationship between different variables by uncovering previously unnoticed patterns. For example, data analysis from point-of-sale systems and purchase accounts may highlight market patterns such as an increase in demand on certain days of the week or times of the year.

- Optimizing Marketing Campaigns - Predictive modeling creates and retains profitable users from the marketplace by determining customer behavior.



Association Rules

Association rules find interesting associations and relationships among large sets of data items. This rule shows how frequently an item set (e.g., a movie) occurs in a transaction. A typical example is market-based analysis.

OTT providers like Amazon or Netflix mine millions of users' data to see which movies or series are watched together with other movies. This detection reveals patterns of associations or rules, which is called knowledge. The provider builds this knowledge every day by mining its users' data. From that knowledge, the provider can make accurate predictions and recommendations to its users.

Conclusion

While the opportunity that OTT represents is extraordinary, it's also an increasingly crowded marketplace with market leaders like Amazon and Netflix, which provide endless options to customers. Viewers should find that content quickly before they disengage and start looking for other options. Churn rates for OTT are very high.

Efficient searching for the right content options from the content library is of paramount importance so that the consumer is not required to move away from the home screen. Predictive personalization makes this possible and results in better conversion, engagement, and retention. Stakeholders are using machine-learning algorithms to personalize content, forecast future trends, and empower them to make data-driven decisions.

About The Author

Bhushan Balki is an India-based Solution Architect for Technology at GlobalLogic. He is an explorer and covers full stack, big data, and machine learning, mainly for the telecom domain.

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