

# Item Affinity Analysis and Recommendations Using Amazon SageMaker

## ORGANIZATION

The client is a prominent retail apparel chain headquartered in Texas, operating over 1,500 stores across the US and Canada. With a history of acquiring major market players as subsidiaries, the company offers a diverse range of products, including men's and women's clothing, footwear, tuxedo rentals, and suit pressing services. Emphasizing quality, fashion, and innovation, they maintain numerous warehouse facilities supported by a robust supply chain network. Globally, approximately 22,500 employees deliver personalized, high-quality shopping experiences across their multiple brands.

## CHALLENGE

This project aims to drive sales by creating a recommendation engine for customers to suggest items they might be interested in based on multiple factors, such as prior search history, purchase history, and customer segment.

## TECHNICAL SOLUTION

XTIVIA leveraged AWS SageMaker's machine learning capabilities to build and deploy the recommendation system. The data was split into an 80/20 ratio for training and testing purposes. Extensive data wrangling was performed on the input dataset to eliminate irrelevant item recommendations. Utilizing domain expertise, the team conducted feature engineering and feature selection to enhance the model's accuracy and overall performance. The Apriori algorithm was employed for association rule learning, and the model was trained using production-like datasets. To address overfitting, regularization techniques were applied, ensuring a more robust and generalized model.

## BUSINESS RESULT

As a result of XTIVIA's efforts, the organization could drive revenues by increasing basket value, improving customer satisfaction (as evidenced by positive feedback), and gaining insights into the revenue-making potential from specific item combinations.

## KEYWORDS

*Data Science, Machine Learning, Artificial Intelligence, Association, Market Basket Analysis, Affinity Analysis, Recommendation System*

## SOFTWARE

*Python, Jupyter Notebooks, Snowflake Data Warehouse, SQL, Windows*

## ABOUT XTIVIA

XTIVIA is a proven technology integration and innovation company known for delivering leading-edge technology solutions to our clients' specific requirements, regardless of project complexity. We bring next-level business operations to reality through Application Development, Business Intelligence, Data Warehousing, Database Support & Management, Enterprise Information Management, Digital Experience Solutions, and Enterprise Resource Planning. Our success stems from a demonstrated ability to deliver deep expertise via professional services, empowering clients to leverage their chosen technology successfully, competitively and profitably. XTIVIA has offices in Colorado, New York, New Jersey, Missouri, Texas, Virginia, and India. [www.XTIVIA.com](http://www.XTIVIA.com)