

# Customer Segmentation: Tailoring Products & Services To Fit Their Needs

## ORGANIZATION

Our client is a well-recognized retail apparel chain headquartered in Texas and operating over 1,500 stores in the US and Canada. The company has acquired many big market players as its subsidiaries. They offer men's and women's clothing, footwear, tuxedo rentals, and suit pressing with quality, fashion, and innovation as central parts of each product. The company has many warehouse facilities with a reliable supply chain mechanism. Globally, around 22,500 employees provide high-touch, high-quality shopping experiences across their brands.

## CHALLENGE

Our client struggled with customer churn and intended to understand their customers better. The hopeful outcome of this understanding would be twofold. First, the client would be able to tailor products and services to customer needs. Second, they would be able to increase their ability to retain loyal customers. Unfortunately, they did not have a data-driven approach to customer retention and sales. Therefore, the first step was to perform customer segmentation which would help our client with:

- A better understanding of their customer base
- Determining unsatisfied customer needs.
- Target marketing
- Customized campaigns
- Uncovering cross-sell and up-sell opportunities
- Insights on product features development

XTIVIA's Data Science and Data Management Team assisted our client with data collection, data preparation, and model building to leverage the most appropriate machine learning algorithm for prediction accuracy.

## TECHNICAL SOLUTION

XTIVIA's Data Science and Data Management team collected data, prepared data, built the Customer Segmentation model, evaluated the model, and presented the segments to the client's IT and business users.

1. **Data Collection:** Data quality is essential to better segment our client's customers. These data included demographics, geographical, psychographic and behavioral.
2. **Data Preparation:** Once the team collected the data, the next step was to prepare the data to be fit for modeling. This involved preliminary analysis, profiling, cleansing, and standardizing the data as required before using it for modeling and other analytics.



- **Exploratory Data Analysis:** Understanding the data before data cleansing and performing an initial investigation on the data helps in finding missing values, identifying temporal variables, frequency distribution (by plotting numerical values), categorical variables, multicollinearity (interdependency between predictor variables), and outliers.
  - **Feature Engineering:** The next step in data preparation involved preparing data to be “model friendly.” We determined how to handle missing values, leverage numerical and temporal variables, normalize all variables, convert categorical data into numerical values, use different techniques to resolve multi-collinearity, and identify outliers.
  - **Feature Selection:** The final step in data preparation included selecting the variables from the dataset most influential in segmenting the customers.
- 3. Model Building and Evaluation:** Following the data preparation process, the next step involved selecting the most appropriate algorithm for prediction accuracy. In this case, the goal was an algorithm that provided the best clustering. Various clustering algorithms were considered, including Partition, Hierarchical and Fuzzy. Next, we optimized the K-Means using the Elbow Method. Finally, we evaluated the performance and accuracy of the model by using visual representation, cross-validation, and the Adjusted Rand Index, which explains the similarity between points within each cluster.

## BUSINESS RESULT

With XTIVIA’s assistance, the client gained a better understanding of the customer segments and their behavior. They were able to discover cross-sell and up-sell opportunities across lines of business and customize campaigns to fit customer needs. This resulted in improved customer retention, and assisted with designing effective pricing and promotion strategies.

### BY THE NUMBERS

- 1,500+ North American Stores
- 65+ Million eCommerce site visits
- 37+ Million loyal customers

### KEYWORDS

- Data Science
- Machine Learning
- Artificial Intelligence
- Clustering
- Customer Segmentation

### 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)