

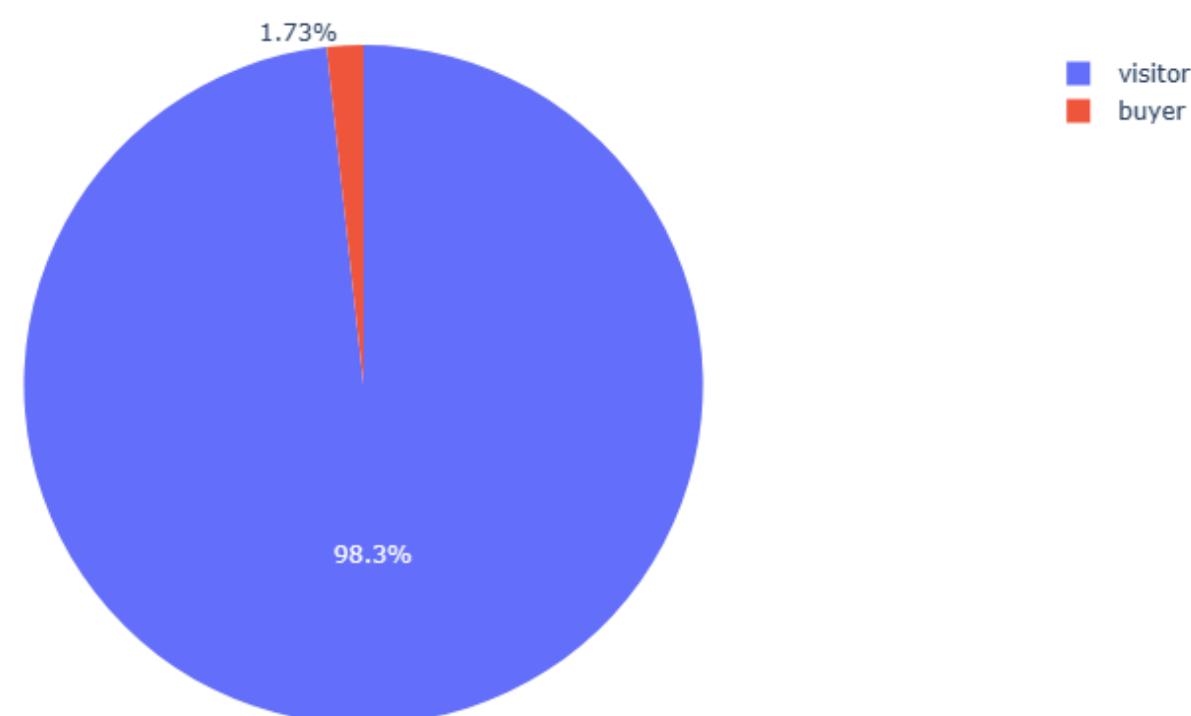
# E-Commerce AI-ML Case Study

E-commerce data is a valuable resource for Auto-ML applications in the E-commerce industry. E-commerce data consists of vast amounts of transactional and customer behavior data, including product information, user behavior, customer demographics, and transactional details. Auto-ML algorithms can be trained on this data to predict customer behavior, improve personalized recommendations, optimize pricing, and enhance customer experience.

The objective is to classify buyers and non-buyers, e-commerce businesses typically use supervised learning algorithms. These algorithms are trained on a dataset of historical customer data, which includes information such as demographic information, past purchases, browsing history, and other customer behaviors. The algorithm then uses this data to create a model that can predict whether a new customer is likely to make a purchase or not.

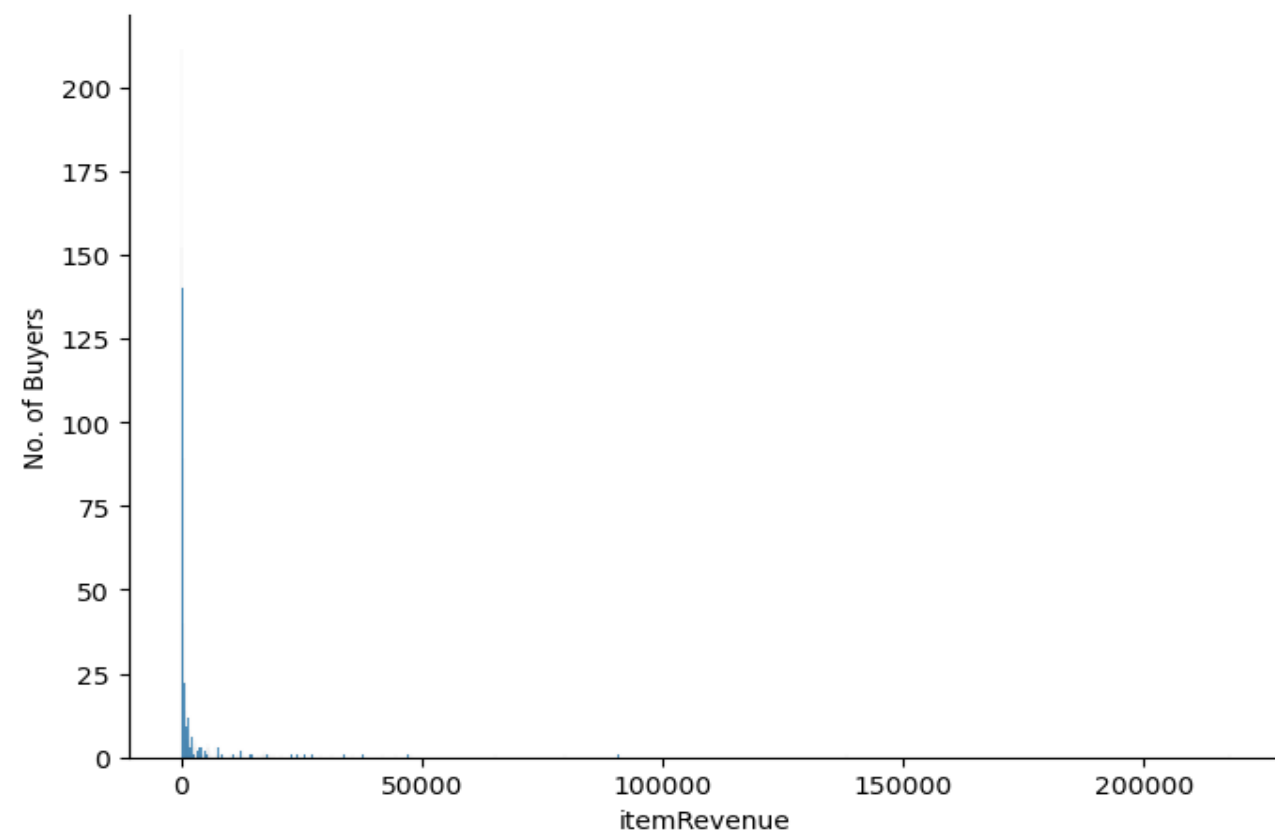
The use of Auto-ML in e-commerce can provide valuable insights and a competitive advantage for businesses. Auto-ML algorithms can analyze large data sets to uncover patterns and trends that would be difficult or impossible to detect manually. With this information, businesses can optimize their operations, improve their marketing strategies, and offer more personalized and relevant product recommendations to customers.

Class Distribution

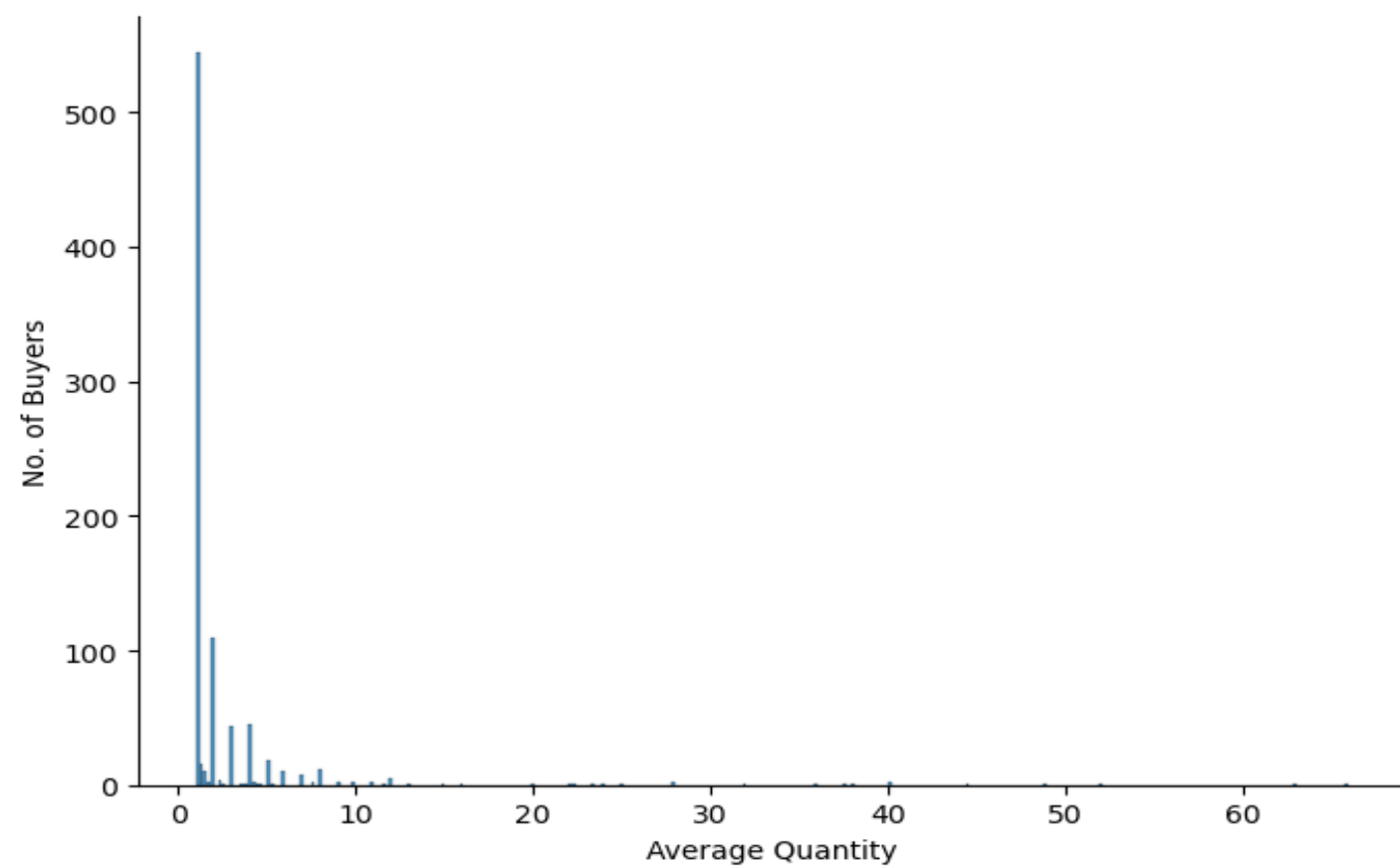


Status	No. of Users
Buyers	867
Non-Buyers	49133
Conversion rate	1.73%

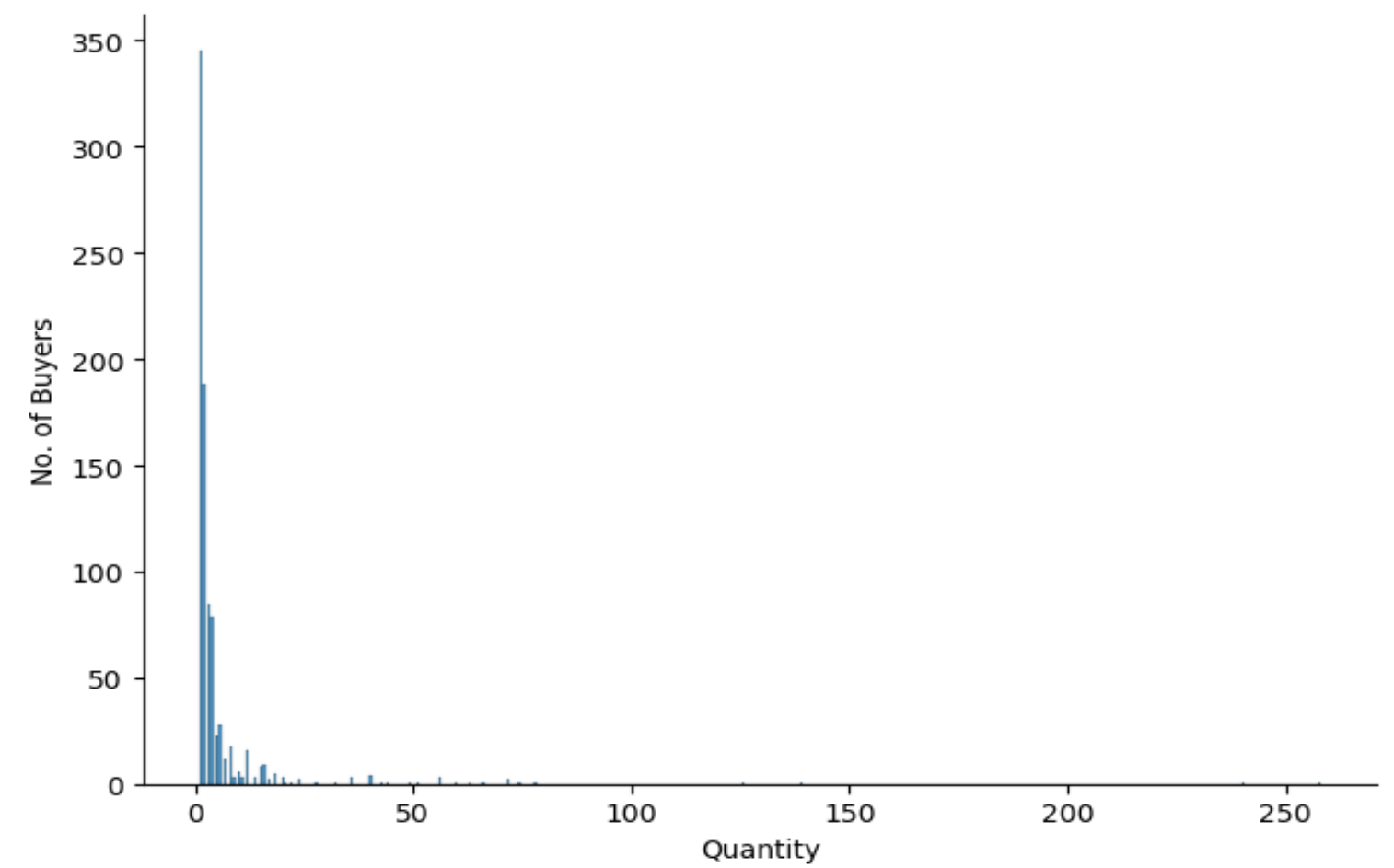
# Features Responsible



**Item Revenue:** The revenue generated from individual product sales depends on various factors such as the right price point, improving your website's conversion rate, using effective marketing strategies, and maintaining a healthy profit margin.



**Average Quantity:** The average quantity purchased per transaction.



**Quantity:** The number of quantities purchased can impact e-commerce conversions in several ways by monitoring and adjusting pricing, inventory management, customer satisfaction, and marketing strategies, e-commerce businesses can increase conversions and revenue.



**Unique Purchases:** Number of unique products in the purchase can impact e-commerce conversions in several ways by monitoring and adjusting pricing, inventory management, cross-selling opportunities, customer satisfaction, and marketing strategies

## Auto-ML Methodology Results

Case	Percentile	No. of Features	Random Forest	XGBoost	MLP	RNN	Avg. Accuracy
Case 1	25	30	100	100	100	98.28	<b>99.57</b>
Case 2	50	59	100	100	100	98.28	<b>99.57</b>
Case 3	75	88	100	100	100	98.28	<b>99.57</b>
Case 4	90	106	100	100	98.28	98.28	<b>99.14</b>

- Based on our observation , XGBoost and Random forest were the best performing algorithms with 100% accuracy across all percentile.
- 25<sup>th</sup> ,50<sup>th</sup> and 75<sup>th</sup> percentile are the best percentile with an average accuracy of 99.57%.

# Conclusion

In conclusion, the problem of classifying buyers and visitors using Auto-ML techniques is one that requires careful consideration of a wide range of factors. By using Auto-ML algorithms to analyze customer data, e-commerce businesses can identify the characteristics and behaviors of customers who are most likely to make a purchase. This can help them target their marketing efforts more effectively and improve their overall conversion rates. The dataset has 1419158 records with 1 Categorical Features and 118 Numerical Features. Out of 1419158 records a random sample of 50000 records is selected for modelling. 99.27% of the dataset shows the users were non-buyers.

For classification, models were created with algorithms using Auto-ML techniques like Recurrent Neural Network ,Multilayer Perceptron, Random forest and XGBoost . With these models, performance measurement values were obtained for feature sets of 30, 59, 88 and 106. The Auto-ML algorithms were able to predict whether a user is a buyer or not with an average accuracy between 98% – 100% and helped to identify factors that determine whether a user is buyer or not. The major factors include Item Revenue, Quantity, Average Quantity and Unique Purchases. When the results are examined, it is observed that with the addition of each new feature, the success of classification decreased . Based on the performance measurement values obtained, it is possible to say that the study achieved success in classifying whether user was a buyer or not.

By using these insights e-commerce businesses can improve their conversion rates, increase revenue, and enhance customer satisfaction.