

# ProfitAero



A one stop solution to business intelligence for small/medium enterprises

Jaykumar Kakkad

Priyank Sharma

Sanjay P Josh

Aswin Nagarajan



## Summary

What is our solution?

- An intuitive and interactive ML based web application for Small and Medium Business(SMB) retailers
- Relies only on transactional data to overcome challenge of data gathering for SMBs
- Built in capability for descriptive and prescriptive analytics to gain insights into customers and product market base



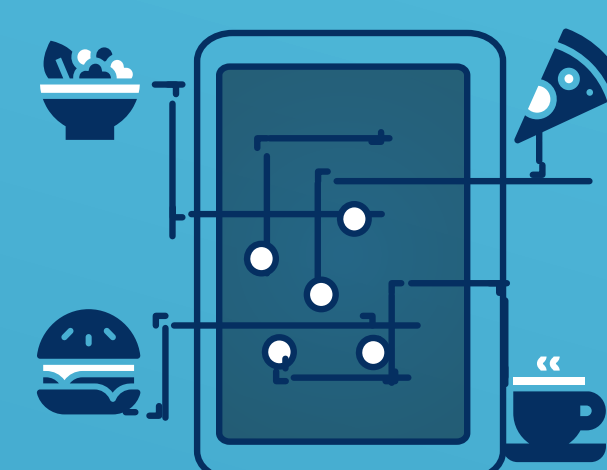
Take a Demo



## Benefit Case

Why use ProfitAero?

- Designed for SMBs, constituting 40-80% of total employment
- Cost effective solution (up to 95% less effort compared to current market standards)
- Save up to 80hrs/month in effort towards market planning
- Smart, informed and data driven approach towards portfolio management



## Our Design

What is our approach and it works?

### Market Overview

Bird's eye view to visually explore and summarize different markets. The interactive interface is a choropleth, with drop downs for time periods and various metrics. When clicked on a specific geography, a pop up shows micro and macro details about that market

### Product Analytics

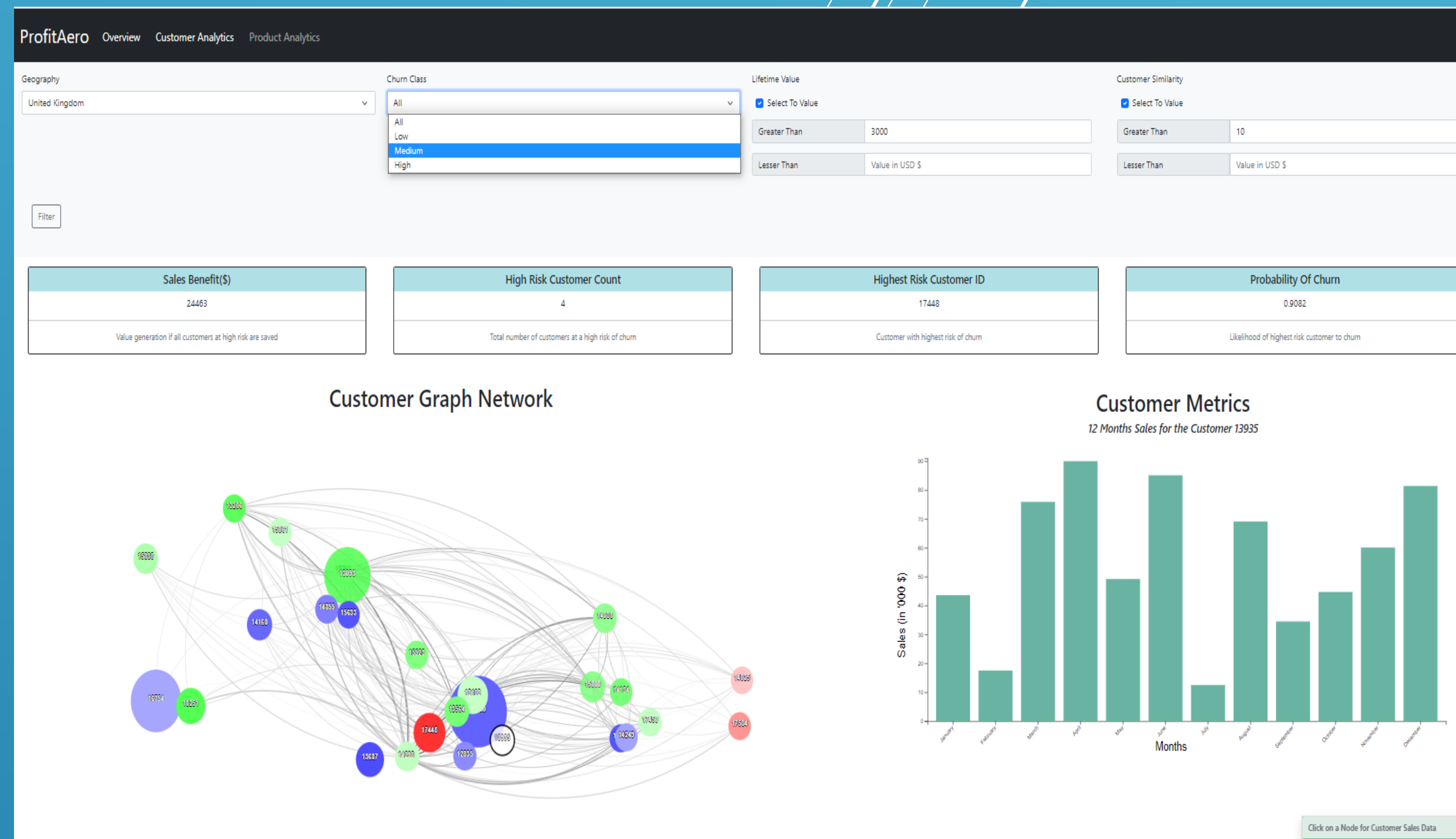
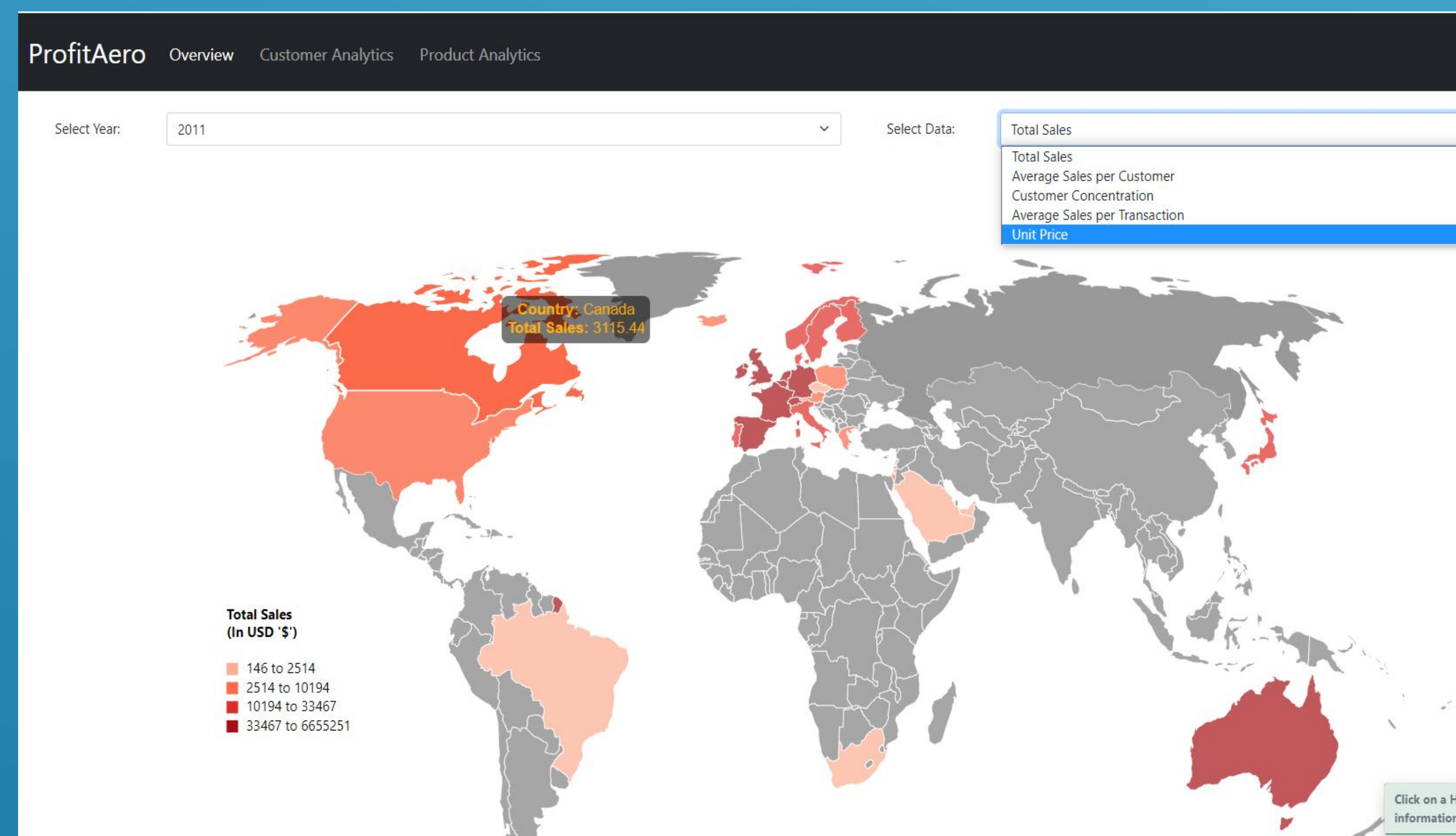
- Design of Apriori algorithm to find association among products
- Developed an attribution model for elasticities across products
- Used text embeddings to cluster product names into categories

### Customer Analytics

Gradient boosting based customer churn models to calculate churn probability and estimate CLTV based on customer revenues. A network graph is used to visualize interaction and recognize high risk customers. Clicking a node reveals a bar graph displaying buying pattern for last 12 months

### Innovation

- Direct actionable value insights in one click
- Improved customer churn models over traditional methods
- Unique platform, use of multiple algos to generate intuitive visuals



## Experiments and Results

What are the data requirements? | How have we evangelized it into a solution?

### Data

- Two years transactional data download for a retailer in Europe
- World leading economy indications
- 261MB on disk space, 16 columns and 1.04 Million rows

### Algorithms & Intuition

- GBM for customer churn
- Bayesian Regression for price elasticity
- TSNE for customer graph visual
- Weighted link for customer graph
- Roberta + K means for Product clustering
- Apriori for Association rule mining

### Sales Driver Model

Model	Median R2	Median MAPE
OLS	52%	34%
Bayesian Regression	63%	27%
Elastic Net Regression	65%	23%

### Product Clustering

- Embeddings from SOTA NLP techniques
- Clustering on embeddings.
- Frequency based name assignment

Name	Score
DBSCAN	0.0191
Agglomerative	0.0162
Spectral	0.0123
Kmeans	0.0290

### Churn Models

Model	Acc.	Recall	Prec.	F1
Decision Tree Classifier	0.65	0.61	0.62	0.62
Logistic Regression	0.72	0.68	0.70	0.69
SVM - Linear Kernel	0.67	0.67	0.69	0.63
<b>Boosting based Models</b>				
Gradient Boosting	0.73	0.73	0.71	0.72
CatBoost Classifier	0.73	0.73	0.70	0.72
Ada Boost Classifier	0.72	0.70	0.70	0.70
<b>Bagging Based models</b>				
Random Forest	0.72	0.70	0.69	0.70
<b>Probability based models</b>				
Linear Discriminant	0.71	0.64	0.72	0.67
Quadratic Discriminant	0.53	0.02	0.51	0.04

Conclusion & Results

€73k savings based on customer churn

€157k growth based on smart pricing

€18k cross selling opportunities