Title: Intuilize Customer Segmentation using ML

Intuilize is a leading ML and change management company dedicated to enhancing the profitability of wholesalers through the optimization of pricing and inventory. Many midsize wholesalers in the US and Canada face challenges in effectively managing their pricing strategies due to a lack of qualified personnel, skills, experience, and time. Recognizing this pain point, Intuilize offers a proven change management process and price optimization models to empower wholesalers to effortlessly implement optimized pricing in their Enterprise Resource Planning (ERP) systems.

Our price optimization model efficiently determines the ideal price for every customer/SKU pairing. A typical wholesaler has an average of 5,000 customers and 10,000 to 100,000 SKUs. This means that setting prices properly is crucial. Two key factors that greatly influence the accuracy of our model – and thus overall profitability – are customer and product segmentations.

This project aims to enhance Intuilize's customer and product segmentation, as well as to reliably estimate the likelihood of customers or products transitioning between segments. We will provide the team with data about wholesalers (de-identified) and transactions. The team will experiment with various ML classification models to discover the most accurate one. Once the optimal classification model has been determined, the team will then estimate the probability of customers and products moving either up or down within their segment.

Imagine a scenario where a model has identified 7 customer segments (1, 2, 3, 4, 5, 6, and 7), and it reveals that customer ABC currently belongs to segment 7. However, in 3 months, the model will reevaluate the customers using new transactional data and predicts that the probability of customer ABC moving to segment 4 will massively increase from 10% to 90%.

The project will use data science and ML engineering skills with a specific focus on classification and prediction models. We will provide the features utilized in our current classification schemes, as well as suggest new ones for the team to experiment with.

Our data set is comprehensive but is not particularly large. The team will need to be creative and comfortable with machine learning concepts and models such as logistic regression, KNN, Bayes, Decision Tree, SVM, LDA, etc. Because of this requirement, a majority of team members assigned to this project will need prior experience in ML.

The client lead will be Mahesh Iyer, who will also include platform engineers and Intuilize’s product manager as required.

Deliverables	Type of work	Activities	Resources	Tech Skills	Priority
Requirements Analysis Document (RAD)	Requirements analysis	Work with client to understand the details of what the predictor needs to do, and why, and how.	Client lead and SMEs	System and requirements analysis and documentation	High
Data Model Design and Plan Document (DMDP)	Data model planning – what are the fields and structures of the data that will be available for use?	Work with client and colleagues/SMEs to identify all data fields and structures available for use. Assure compliance with privacy regulations and/or best practices.	Client lead and SMEs.	Data model design and documentation	High
Data Gathering and Aggregation – data set to be used for training and testing	Creating the data set to be used for training and testing	Work with client to gather and prepare data to be used.	Client lead and SMEs, project coach	Data preparation	High
Machine learning predictors – working systems, notebooks, and documentation	Machine learning modeling and documentation	Use machine learning techniques to build a variety of predictors. Create working systems, document design choices in digital notebooks, provide thorough documentation of design, test, and execution environments and choices. Compare and document performance results of different approaches attempted.	Project coach, Freely available ML tools	Data science and machine learning, Python, SciKit learn, Jupyter, etc.	High
Summary of Findings – presentation and document	Summarize results of exploration and recommendations for putting work into practice	Compare and contrast all ML models and approaches explored, describe pros and cons of models built and tested, make recommendations for best opportunities for application of results	Client lead, SMEs, project coach	Written and oral presentation	Medium
Handover document	Project next-phase planning and documentation	Descriptions and plans for what to tackle in the next phase of the project. An example might be if more/new data features required to get good-enough performance, focus there. Another example might be: if there is a clear winner in terms of model and data set, move on to building a hardened app that can be deployed to the client's customers.			High