CENTER FOR BUSINESS ANALYTICS
UNIVERSITY of WASHINGTON | TACOMA
Milgard School of Business

Pricing Audit

HARBOR WHOLESALE FOODS

Project Overview

Business Problem → Pricing Errors → Project Objectives → Identify Anomalies → Project Significance → Customer Trust
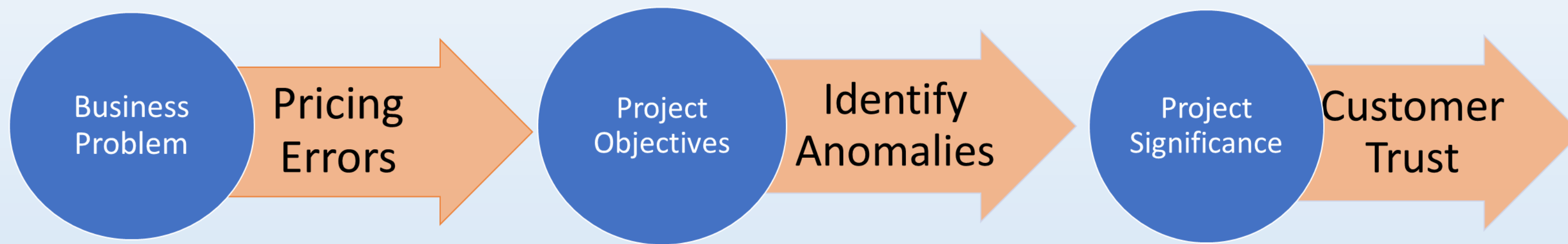
Marcus Ehrlander
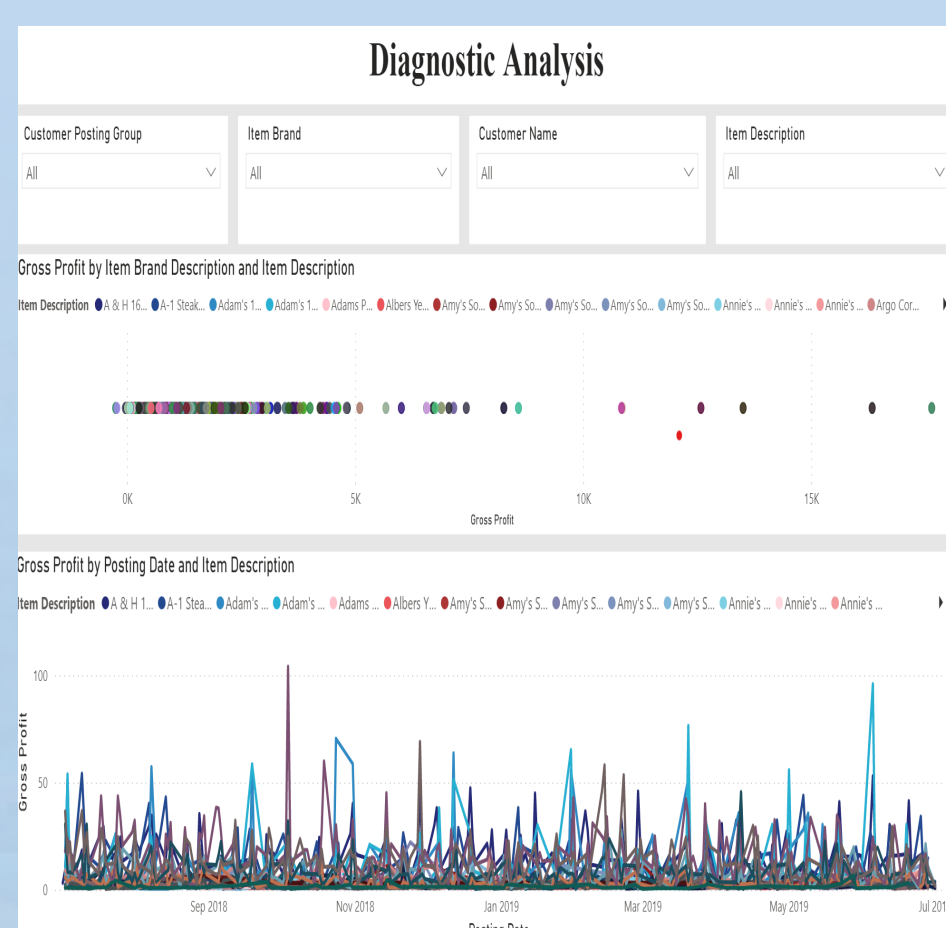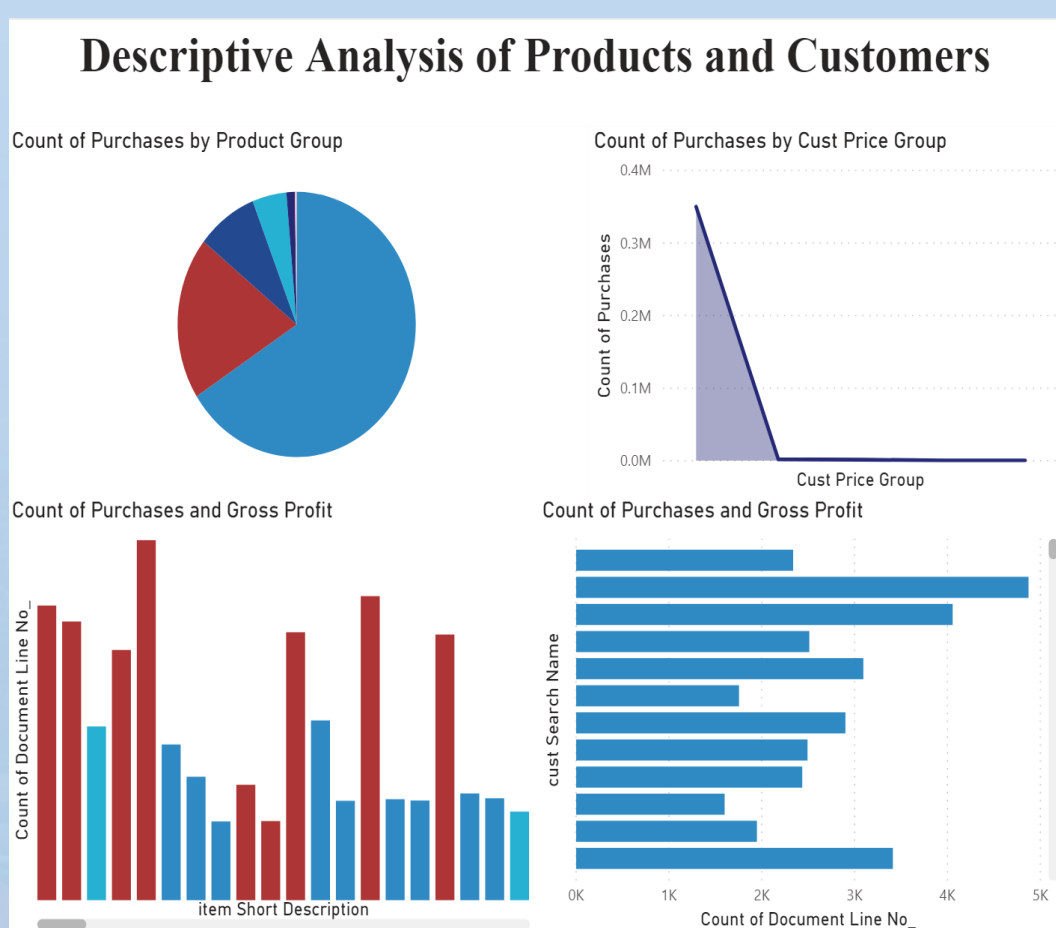ehrlam@uw.edu

Bo He
bhe5@uw.edu

Amer Imsic
iamer@uw.edu

Sushmitha Sreenivasan
sushms@uw.edu

How can you tell if a price is wrong? If the customer tells you, then it is too late. For our project we analyzed millions of rows of pricing data to see what patterns could be linked to an error in process. The goal: avoid costly rework, and keep customer trust.

Descriptive and Diagnostic Analysis

Descriptive Analysis of Products and Customers

Count of Purchases by Product Group
Count of Purchases by Cust Price Group
Count of Purchases and Gross Profit
Count of Purchases and Gross Profit

Diagnostic Analysis

Gross Profit by Item Brand Description and Item Description

Gross Profit by Posting Date and Item Description

Analytical Tools and Methods

Microsoft Azure
Microsoft SQL Server
R Studio
Power BI

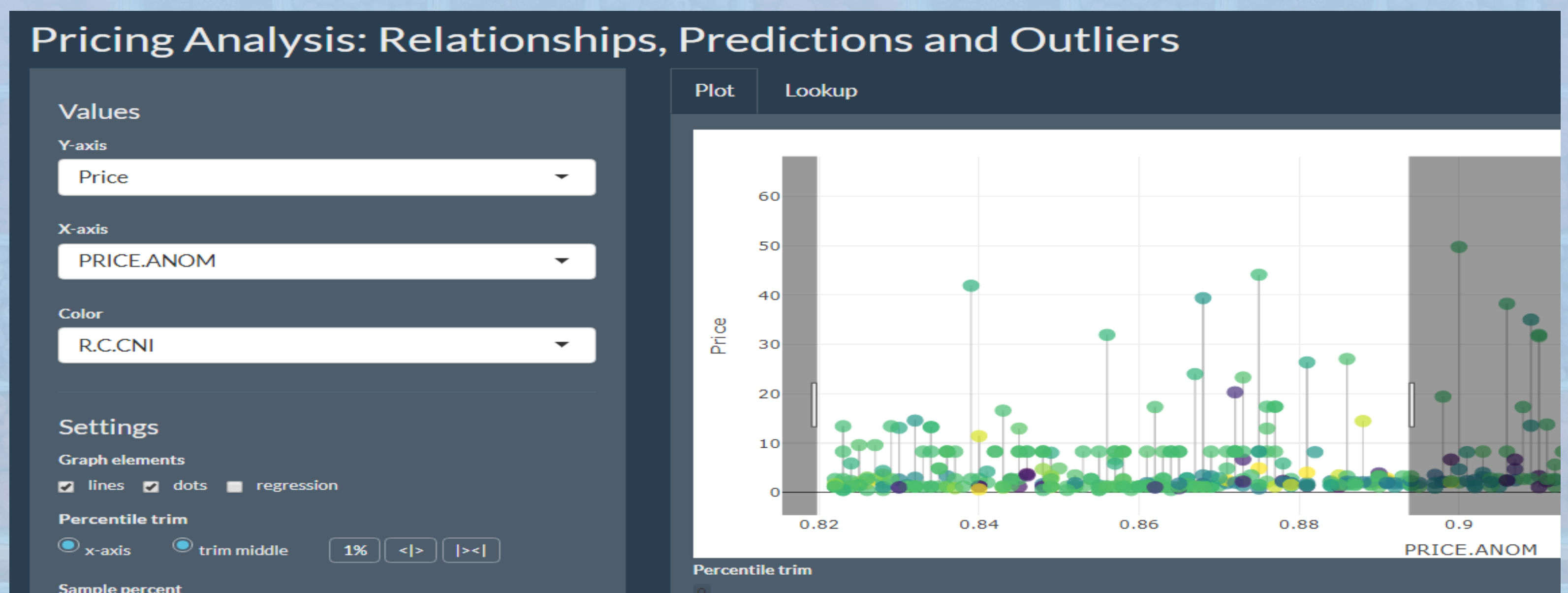Predictive Analytics — Forecasting, Unsupervised Machine Learning, Machine Learning, Boosted Tree, Regression
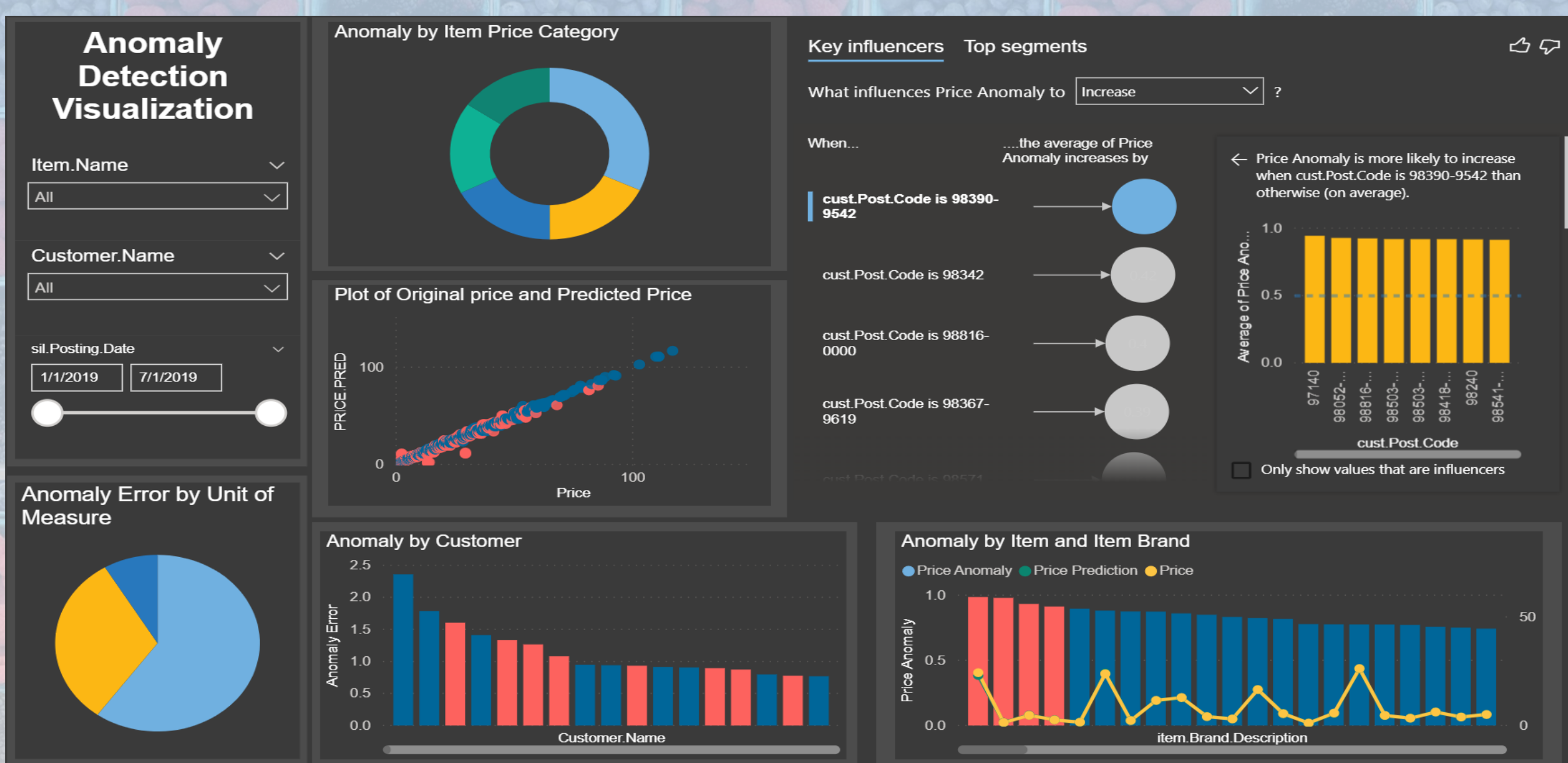
Dynamic Predictive Analytical Model

Our modeling assigned anomaly scores with two aims: precision, and transparency. Precision means that flagged prices should be *surprising* to the client. Transparency means that the client can see what factors are driving the anomaly.

Pricing Analysis: Relationships, Predictions and Outliers

Plot   Lookup

Values
Y-axis: Price
X-axis: PRICE.ANOM
Color: R.C.CNI

Settings
Graph elements: ☑ lines ☑ dots ☐ regression
Percentile trim
◉ x-axis ◉ trim middle   1%   <|> |><|
Sample percent

Prescriptive & Cognitive Analytics

To use our model, the client must apply it to new prices in real-time. We created a Power BI dashboard with integrated messaging via Power Apps as a flexible interface for ongoing review and analysis.

Anomaly Detection Visualization
Anomaly by Item Price Category
Key influencers   Top segments
Plot of Original price and Predicted Price
Anomaly Error by Unit of Measure
Anomaly by Customer
Anomaly by Item and Item Brand

Power App

Email Address:
Text input

Message:
Anomaly Score for item number for Customer Name is 0.46721284.

Send Email
Go Home

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Integration with PowerApps allows client to send out internal notices.