24 SEVEN EXPANSION PLAN

Advanced Topics in Information Systems INSY 695 (077)

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SECTION 1 : INTRODUCTION & PROBLEM DESCRIPTION

Problem Description

- Transformation: "24Seven" evolved from a local shop to a 24-hour convenience store chain with 10 Canadian locations.

- Expansion Plan: Leadership aims to **open the 11th store** strategically to enhance accessibility and reliability for customers.

- Strategic Need: Locating the new store **strategically** is crucial for customer satisfaction and business success.

- Analytical Solution: An **interactive dashboard** utilizing open-source datasets will help in decision-making and **forecasting sales/demand** for the new store.

SECTION 2 : EXTERNAL DATA COLLECTION & CLEANING

External Data

Dataset 1: Population by Postal Code
- Source: https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=9810001901
- Description: Provides population counts by postal code areas, aiding in understanding potential customer base sizes for location optimization.

Dataset 2: Population by Gender and Province
- Source: https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=1710000501
- Description: Offers population distribution data by gender within provinces, facilitating demographic segmentation and targeted marketing efforts.

Dataset 3: Population by Age and Province
- Source: https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=1710000501
- Description: Contains data on population distribution by age groups across provinces, assisting in demographic targeting and predicting demand for age-specific products.

External Data

Dataset 4: Couche-Tard Canada Locations
- Source: https://www.couche-tard.com/list-canada-stores?lang=en
- Description: Lists the locations of Couche-Tard convenience stores throughout Canada, providing insights into the competitive landscape and market saturation levels.

Dataset 5: Canadian University Enrollment
- Source: https://univcan.ca/universities/facts-and-stats/enrolment-by-university/
- Description: Enrollment figures for Canadian universities, aiding in understanding potential markets in areas with high student populations.

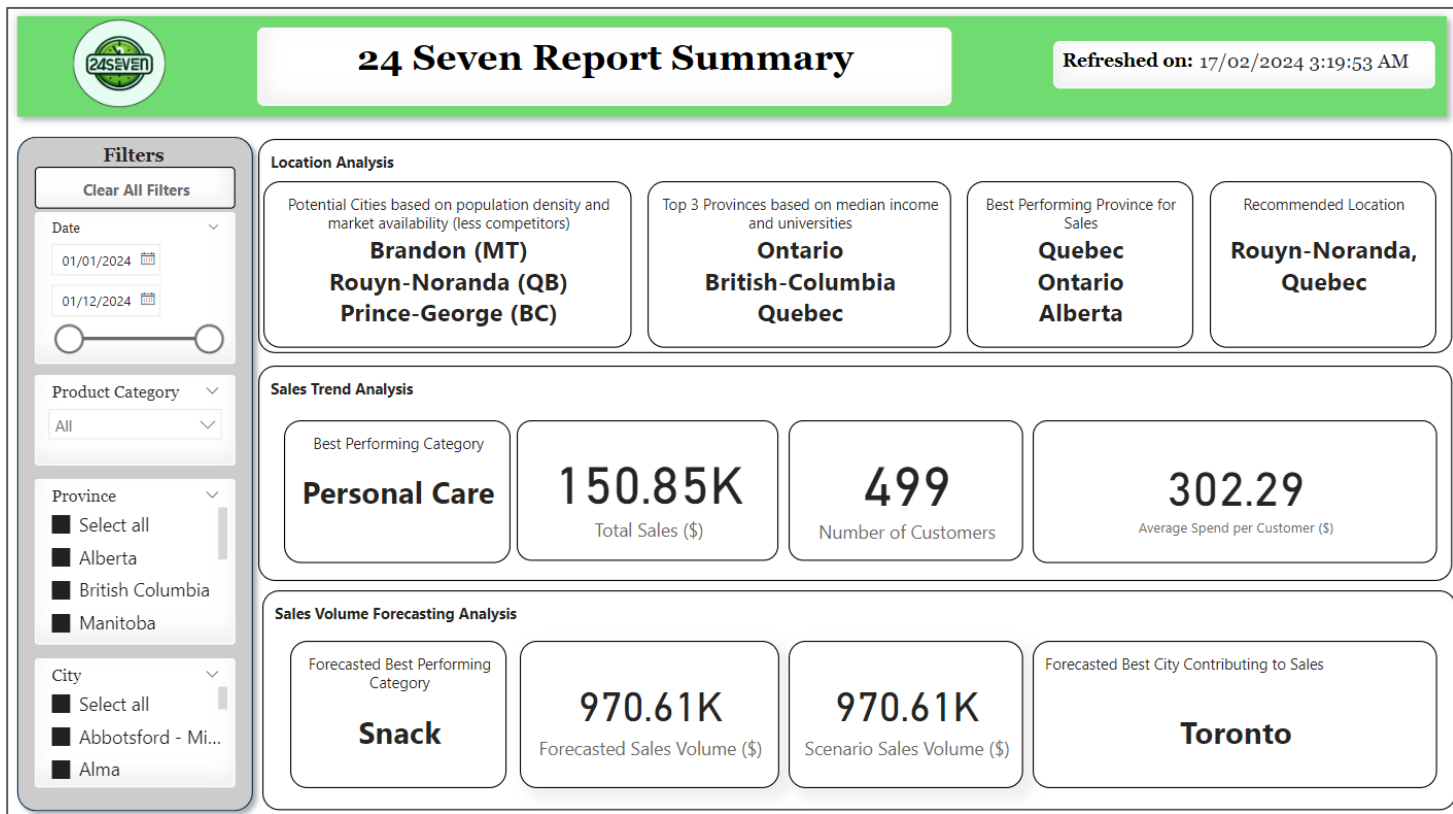**Dataset 6: Median Household Income by City**
- Source: https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=9810005501
- Description: Provides median household income levels by city, enabling socio-economic segmentation and predicting spending patterns.

Data Cleaning

- Addressed inconsistencies, missing values, and formatting errors to ensure data accuracy and consistency. (Example - blank spaces before postal codes in store location)

- Standardized data formats (city, province, postal code, etc.) for better use in maps

- Inconsistencies in province and city names (Example - London Ontario was showing up on the map as London UK), had to add a column for country

- Applied transformation techniques such as removing duplicates, correcting errors, and removing n/a's

Summary Dashboard Extract

24 Seven Report Summary

Refreshed on: 17/02/2024 3:19:53 AM

Filters

Clear All Filters

Date
01/01/2024
01/12/2024

Product Category
All

Province
- Select all
- Alberta
- British Columbia
- Manitoba

City
- Select all
- Abbotsford - Mi...
- Alma

Location Analysis

Potential Cities based on population density and market availability (less competitors)	Top 3 Provinces based on median income and universities	Best Performing Province for Sales	Recommended Location
Brandon (MT) **Rouyn-Noranda (QB)** **Prince-George (BC)**	**Ontario** **British-Columbia** **Quebec**	**Quebec** **Ontario** **Alberta**	**Rouyn-Noranda, Quebec**

Sales Trend Analysis

Best Performing Category			
Personal Care	**150.85K** Total Sales ($)	**499** Number of Customers	**302.29** Average Spend per Customer ($)

Sales Volume Forecasting Analysis

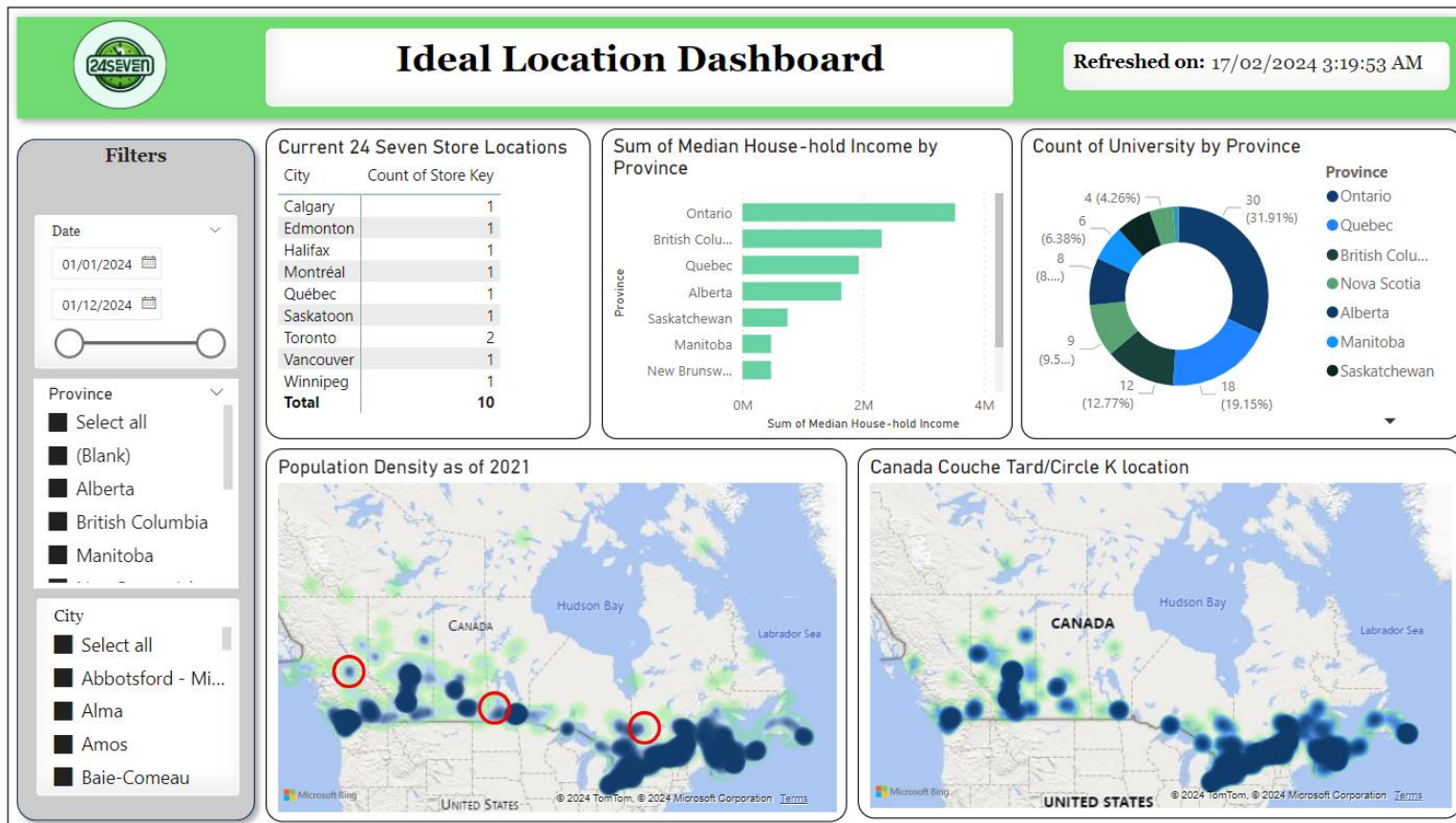| Forecasted Best Performing Category			Forecasted Best City Contributing to Sales
Snack	**970.61K** Forecasted Sales Volume ($)	**970.61K** Scenario Sales Volume ($)	**Toronto**

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SECTION 3 : USE CASE 1 – OPTIMAL LOCATION

Description & KPI's

Description: The Optimal Location Dashboard is designed to guide 24 Seven in identifying strategic locations for expansion by analyzing multiple data points, including current store locations, median household income, university presence, and competition density.

- KPI 1: Existing Store Distribution
- KPI 2: Provincial Economic and Educational Indicators
- KPI 3: Population Density Versus Competition

Dashboard Extract

Ideal Location Dashboard

Refreshed on: 17/02/2024 3:19:53 AM

Filters

Date
01/01/2024
01/12/2024

Province
- Select all
- (Blank)
- Alberta
- British Columbia
- Manitoba

City
- Select all
- Abbotsford - Mi...
- Alma
- Amos
- Baie-Comeau

Current 24 Seven Store Locations

City	Count of Store Key
Calgary	1
Edmonton	1
Halifax	1
Montréal	1
Québec	1
Saskatoon	1
Toronto	2
Vancouver	1
Winnipeg	1
Total	**10**

Sum of Median House-hold Income by Province

Ontario
British Colu...
Quebec
Alberta
Saskatchewan
Manitoba
New Brunsw...

0M 2M 4M
Sum of Median House-hold Income

Count of University by Province

Province
- Ontario
- Quebec
- British Colu...
- Nova Scotia
- Alberta
- Manitoba
- Saskatchewan

4 (4.26%)
6 (6.38%)
8 (8....)
9 (9.5...)
12 (12.77%)
18 (19.15%)
30 (31.91%)

Population Density as of 2021

Canada Couche Tard/Circle K location

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SECTION 4 : USE CASE 2 - SALES TRENDS

Description & KPI's

Description: The Sales Trend Analysis Dashboard serves as a focal point for understanding 24 Seven's performance over time. It combines historical sales data, customer demographics, and regional sales information to provide a better view of the company's sales dynamics.

- KPI 1: Sales Performance Over Time
- KPI 2: Customer Engagement by Product Category
- KPI 3: Demographic Sales Analysis
- KPI 4: Regional Sales Distribution

Dashboard Extract
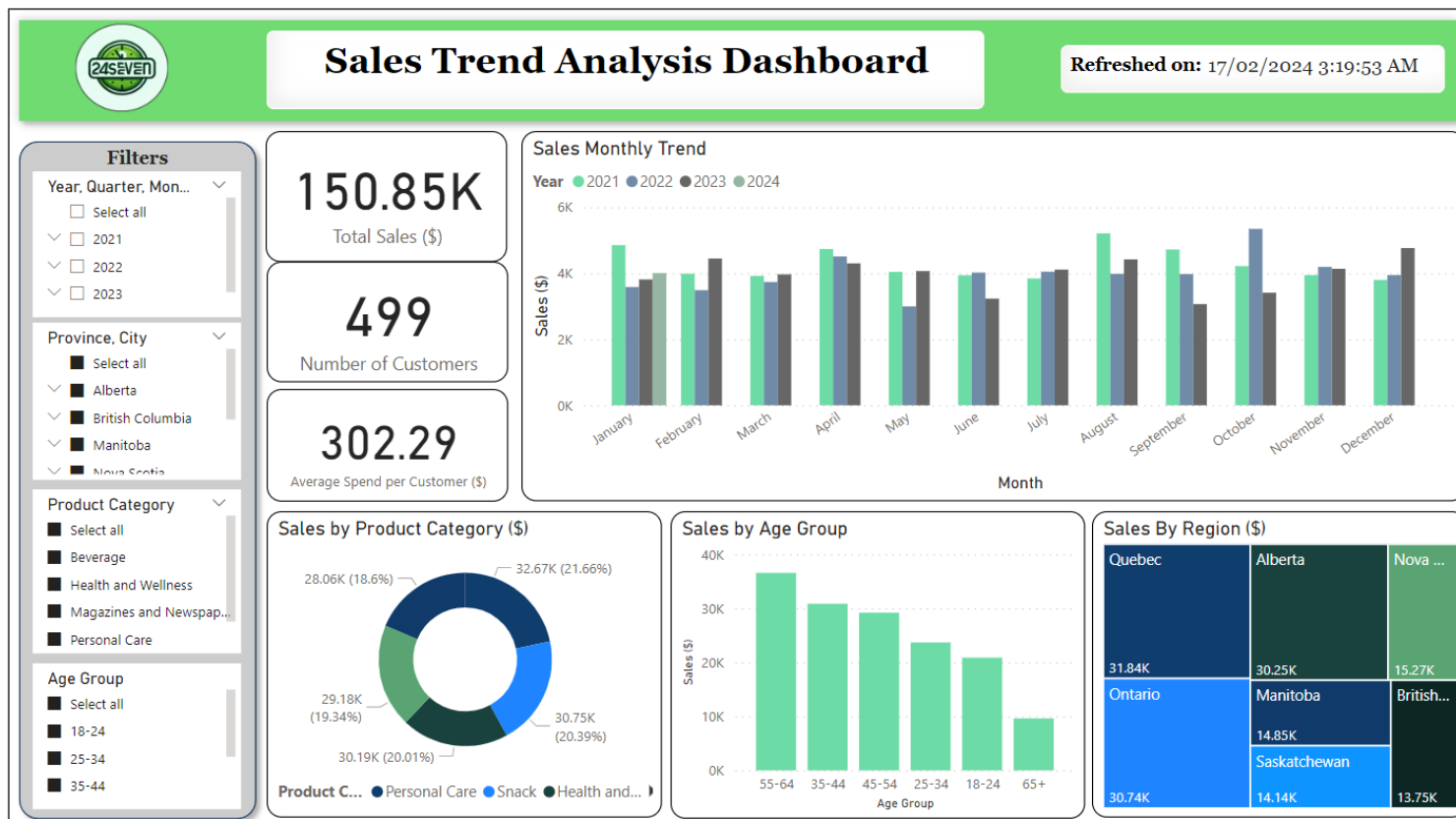
SECTION 5 : USE CASE 3 – FORECASTING SALES

Description & KPI's

Description: This dashboard is a tool developed to assist 24 Seven in forecasting sales demand and conducting scenario analysis for potential new store openings across Canada. It integrates advanced predictive analytics to estimate demand and allows stakeholders to interactively model various 'what-if' scenarios by adjusting discount rates and demand changes.

- KPI 1: Forecasted Sales Volume
- KPI 2: Scenario Analysis Impact
- KPI 3: Cumulative Sales Volume Comparison

Forecasting Algorithm

- **Model Selection:** Utilized multiple regression algorithms including linear regression, decision tree regressor, random forest regressor, and gradient boosting regressor.

- **Model Evaluation:** Evaluated models based on mean squared error scores, selecting the gradient boosting regressor for its superior performance.

- **Feature Importance:** Utilized random forest feature importance to identify and eliminate less impactful features, enhancing the gradient boosting model's accuracy.

- **Forecast Generation:** Leveraged the gradient boosting regressor to forecast monthly sales volumes for each city by category in the year 2024.

- **Scenario Simulation:** Enabled scenario analysis by adjusting variables such as demand and discount percentages, providing stakeholders with insights into potential sales variations.
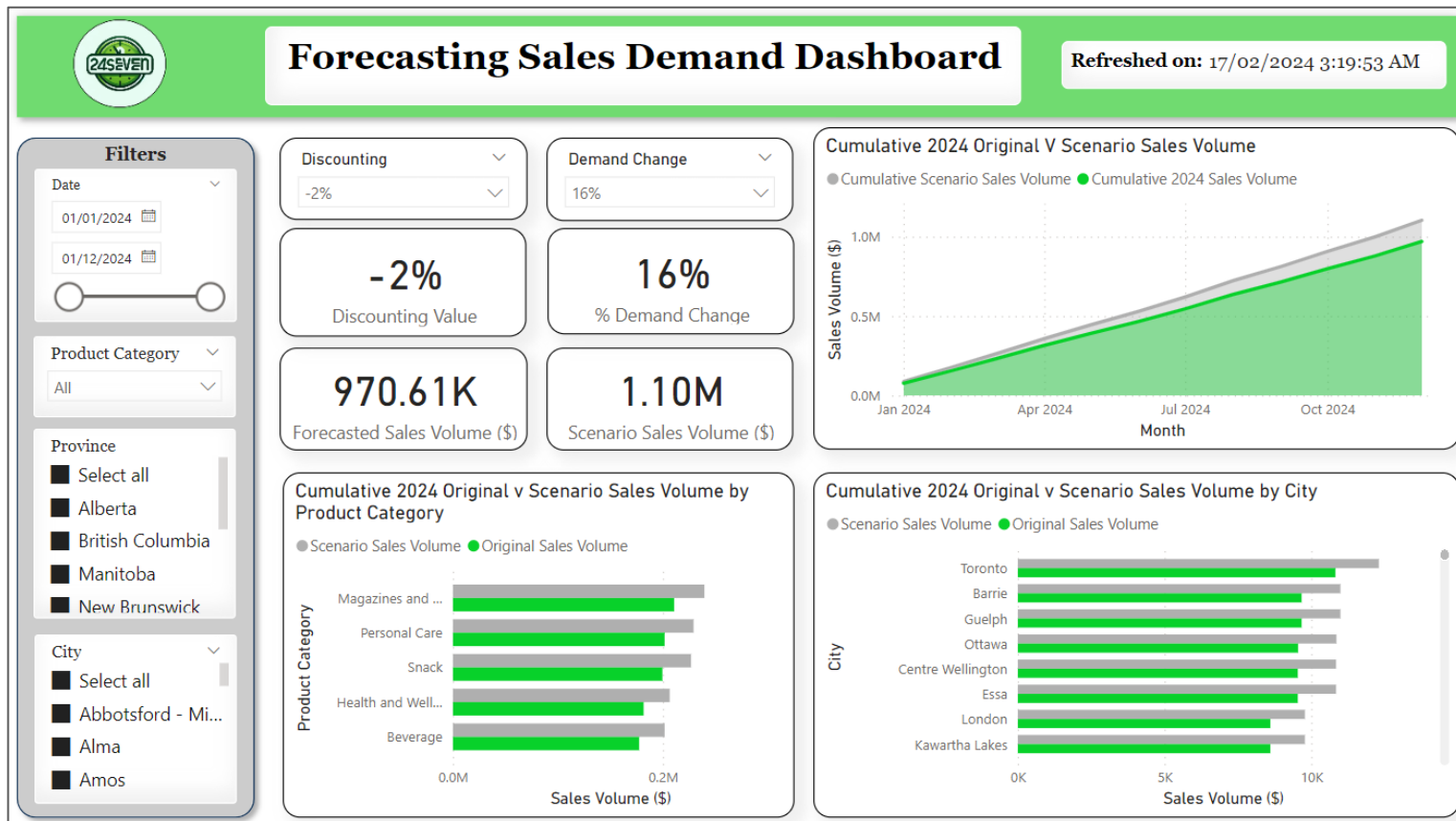
Dashboard - Scenario 1
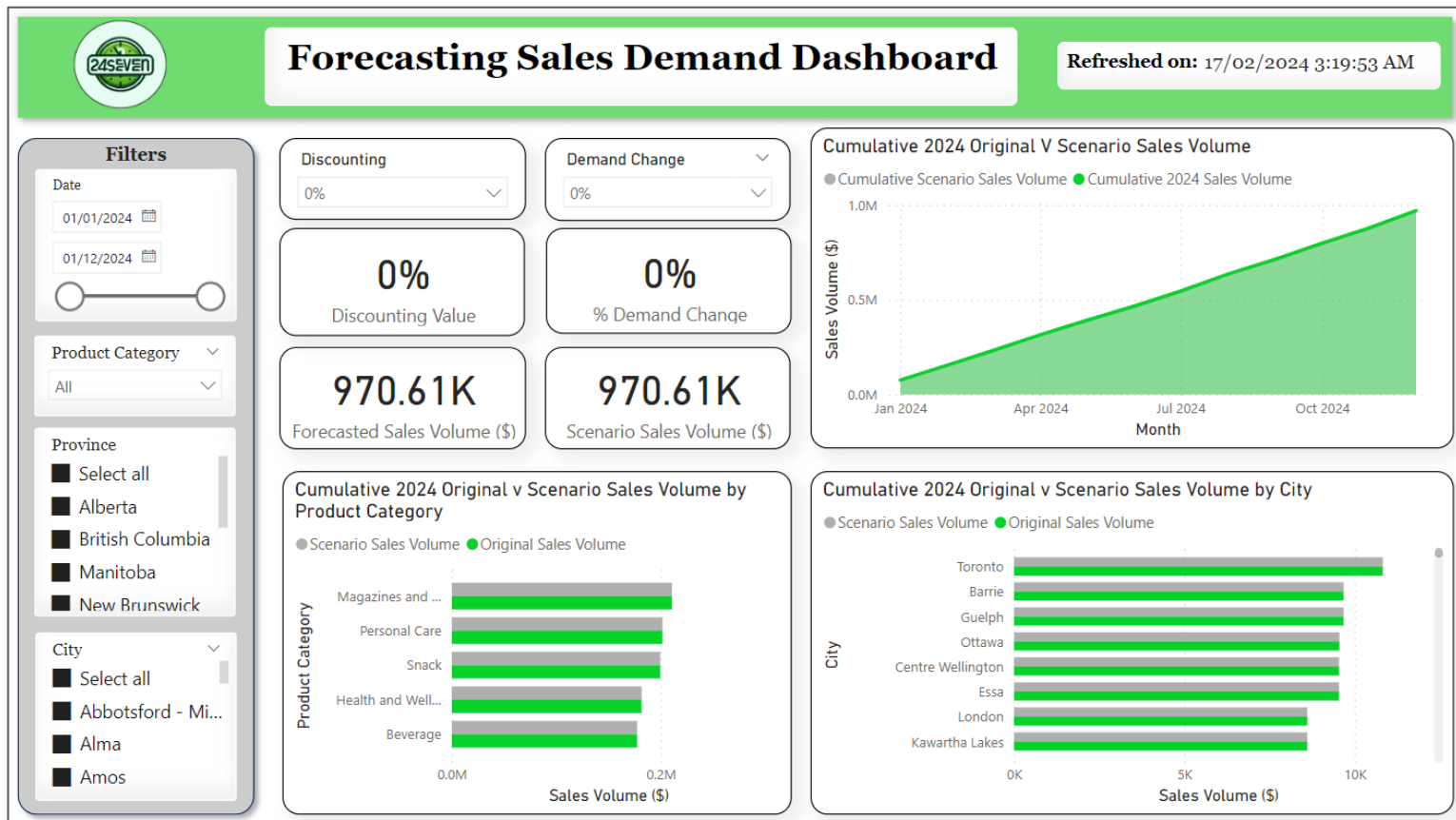
Dashboard – Scenario 2
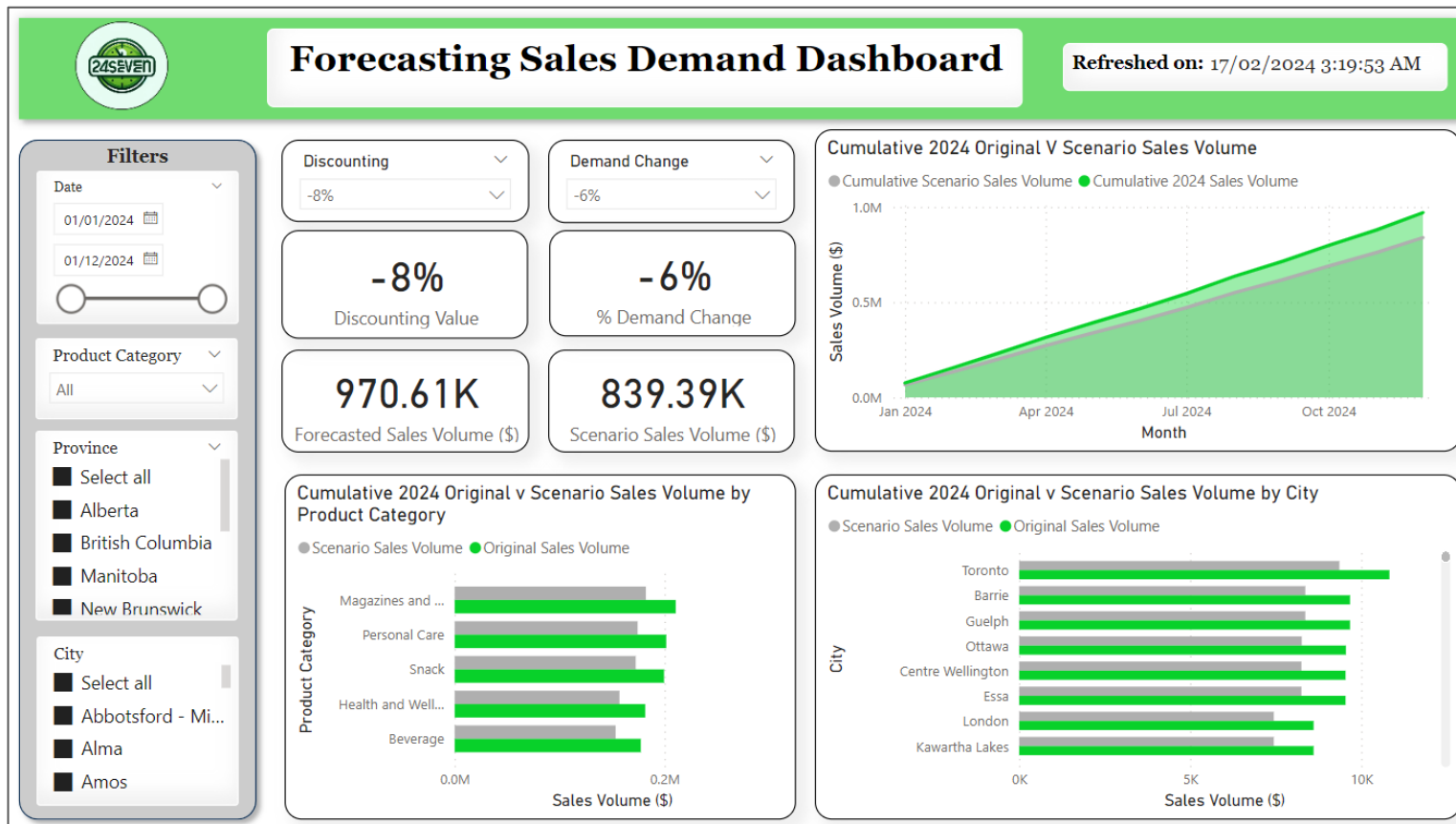
Dashboard - Scenario 3

SECTION 6 : BUSINESS IMPLICATIONS

Dashboard Insights

- Ideal location is **Rouyn-Noranda** based on high population, low competition and high income, high universities and high sales in QB
- High median household incomes in specific provinces (ON, BC, QB) correlate with higher sales volumes (ON, QB, AL), suggesting a **link between regional economic health and store performance**.
- The customer demographic data, such as age distribution, suggests that certain **age groups (25-44) are key contributors** to sales, providing a target for focused marketing and product placement.
- Seasonal trends in sales are evident, with **certain months (December, August) displaying significant peaks**, which could guide inventory management and promotional activities.

Business Implications

- The insights can inform strategic decisions about where to open new stores, focusing on high-growth potential areas with affluent populations and less market saturation.
- Tailored marketing campaigns can be developed to target the most responsive customer demographics, potentially increasing market share in key segments.
- Data-driven inventory planning can help optimize stock levels to meet predicted demand, reducing the risk of overstocking or stockouts.
- Scenario planning capabilities enable the company to prepare for various market conditions, ensuring agility and resilience in sales strategies.

THANK YOU

IF YOU HAVE ANY QUESTIONS, FEEL FREE TO ASK!

SECTION 7 : RESOURCES

Resources

- Alimentation Couche-Tard. (n.d.). Find a store. Retrieved February 12, 2024, from https://www.couche-tard.com/list-canada-stores?lang=en

- Environment and Climate Change Canada. (n.d.). Canadian Climate Normals. Retrieved February 12, 2024, from https://climate.weather.gc.ca/climate_normals/index_e.html

- Statistics Canada. (n.d.). Population estimates on July 1st, by age and sex. Retrieved February 12, 2024, from https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=1710000501

- Statistics Canada. (n.d.). Population and dwelling count highlight tables, 2016 Census. Retrieved February 12, 2024, from https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=9810013801

- Statistics Canada. (n.d.). Table 111-0009 - Family characteristics, median income by family type, annual. Retrieved February 12, 2024, from https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=9810005501

- Statistics Canada. (n.d.). Population estimates on July 1st, by age and sex. Retrieved February 12, 2024, from https://www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=1710000501

- Universities Canada. (n.d.). Enrolment by university. Retrieved February 12, 2024, from https://univcan.ca/universities/facts-and-stats/enrolment-by-university/