University of Niagara Falls Canada

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Data Analysis Case Study 1

Assignment 1

Group - 8

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Project proposal

Our project's main goal is to improve corporate performance and market strategies by examing consumer behavior, sales trends, and performance metrics in the Northwind database.

Introduction

In order to derive significant insights into consumer behaviour, sales patterns, and marketing efficacy within the framework of the Northwind trading organization, this project makes use of data from the Northwind database. The business can improve business decision-making, maximize product sales, and enhancing its marketing strategy by evaluating this data. The company will be able to improve its marketing tactics, boost product sales, and make wiser business decisions as a result of this data research.

Chapter 1 : Problem Definition and Research Question

1.1 Problem Statement

The Northwind trading company faces challenges in understanding the impact of its marketing campaigns on customer purchasing behavior. Despite a wealth of transactional data in the Northwind database, there is limited insight into how targeted marketing efforts influence sales trends and customer loyalty. This project aims to bridge that gap by analyzing customer demographics, order patterns, and marketing activities to inform strategic decision-making and optimize future campaigns.

1.2 Research Question

1. What are the key customer segments based on purchasing patterns, and how do they influence overall sales?
2. What are the top-selling products, and how do seasonal variations impact sales?
3. How do discounts and promotional campaigns affect customer purchasing behaviour and overall revenue?

1.3 Relevance and Importance

To be competitive, Northwind Trading Company must comprehend sales trends and client behaviour. By responding to these inquiries, the business can:

- Enhance marketing tactics by focusing on the appropriate clientele.
- Determine best-selling items and seasonal patterns to improve inventory and sales strategy.
- Assess the success of marketing activities to boost revenue growth.

The study's conclusions will aid in strategic decision-making, enabling Northwind to optimize operational effectiveness and profitability.

Chapter 2 : Hypotheses Formulation

Hypothesis 1: Customer Segmentation & Sales Impact

- **H0 (Null Hypothesis):** Customer segmentation based on purchasing behaviour does not significantly impact overall sales.
- **H1 (Alternative Hypothesis):** Distinct customer segments exhibit different purchasing behaviours that significantly influence overall sales.

Hypothesis 2: Seasonal Sales Trends

- **H0:** Product sales remain stable throughout the year, with no significant seasonal fluctuations.
- **H1:** Certain products experience significant seasonal variations in sales.

Hypothesis 3: Promotional Campaign Effectiveness

- **H0:** Discounts and promotional campaigns do not significantly impact customer purchasing behaviour or revenue.
- **H1:** Discounts and promotional campaigns lead to increased sales and higher customer engagement.

Hypothesis 4: Order Processing & Customer Satisfaction

- **H0:** Order fulfilment time does not impact customer satisfaction or repeat purchases.
- **H1:** Faster order fulfilment results in higher customer satisfaction and increased repeat purchases.

Hypothesis 5: Predictive Sales Modeling

- **H0:** A predictive model using historical sales data cannot accurately forecast future sales trends.
- **H1:** A predictive model based on historical sales data can effectively forecast future sales trends.