



FINAL PROJECT – PROPOSAL
“E-COMMERCE DATA ANALYSIS USING BUSINESS
INTELLIGENCE TOOLS”

BIT2053
FUNDAMENTALS OF MODERN DATA
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TABLE OF CONTENTS

1.0 INTRODUCTION	1
2.0 OBJECTIVES.....	1
3.0 BUSINESS SCENARIO	1
4.0 BUSINESS QUESTIONS	1
5.0 DATASET OVERVIEW	2
6.0 METHODOLOGY	3
7.0 TOOLS & TECHNOLOGIES	3
8.0 EXPECTED OUTCOMES	3
9.0 CONCLUSION	4

1.0 INTRODUCTION

The rapid growth of e-commerce has generated massive volumes of transactional data. Businesses require effective data-driven decision-making strategies to remain competitive. This project proposes the use of modern data analysis techniques and Business Intelligence (BI) tools to analyse an online retail dataset. By identifying key sales trends, customer behaviours, and geographic opportunities, the project aims to provide actionable recommendations that can optimize business performance.

2.0 OBJECTIVES

1. To apply modern data analysis techniques to a real-world e-commerce dataset.
2. To design and develop an interactive BI dashboard for decision support.
3. To derive actionable insights that improve sales, customer engagement, and market expansion strategies.

3.0 BUSINESS SCENARIO

The dataset represents an online retail company based in the UK that sells giftware items to global customers. Management requires a clearer understanding of revenue performance, customer segmentation, and international sales distribution. BI dashboards will be developed to assist in monitoring key metrics and supporting strategic decision-making.

4.0 BUSINESS QUESTIONS

1. Product Performance : Which products generate the highest revenue, and how can inventory management be optimized?
2. Customer Value : How can we segment customers to identify high-value buyers and improve retention strategies?
3. Geographic Expansion : Which countries generate significant revenue, and where are potential opportunities for market growth?

5.0 DATASET OVERVIEW

Particular	Description
Source	Online Retail dataset from UCI Machine Learning Repository (also available on Kaggle)
UCI Link (Kaggle)	https://archive.ics.uci.edu/dataset/502/online+retail+ii (https://www.kaggle.com/datasets/mashlyn/online-retail-ii-uci)
Time Period	December 2009 – December 2011
Total Records (Raw)	1,048,575 transactions
Attributes	8 columns (Invoice, StockCode, Description, Quantity, InvoiceDate, Price, Customer ID, Country)
Countries Covered	41

Table 1 : The Dataset Particulars

Preprocessing Plan :

1. Remove duplicate entries.
2. Handle missing descriptions and customer IDs.
3. Convert date formats for temporal analysis.
4. Create new derived metrics. (e.g., Total Amount = Quantity × Price)

6.0 METHODOLOGY

Method	Implementation
Data Collection & Preprocessing	Clean, transform, and structure dataset for analysis.
Exploratory Data Analysis (EDA)	Identify trends, outliers, and key statistics.
Visualization & Dashboard Development	Create interactive BI dashboards in Google Looker Studio.
Insights & Recommendations	Translate findings into actionable business strategies.

Table 2 : Analysis Methodology

7.0 TOOLS & TECHNOLOGIES

Tools	Description
Python (Pandas)	Data preprocessing & EDA.
Google Looker Studio	BI dashboard visualization.
GitHub	Repository management & version control.

Table 3 : Tools Used in Analysis

8.0 EXPECTED OUTCOMES

1. A cleaned and processed dataset suitable for analysis.
2. An interactive BI dashboard with at least five visualizations and filters.
3. Key business insights on revenue, customer value, and market trends.
4. Actionable recommendations for product, customer, and geographic strategies.

9.0 CONCLUSION

This project will demonstrate how modern BI tools and data analytics can transform raw transactional data into meaningful business insights. The outcomes will help the retailer optimize inventory, strengthen customer relationships, and expand international presence. By bridging technical analysis with business strategy.