

**Profit Optimization through Data-Driven Analysis for Business  
Development and Understand Cycle shop trend  
Shop:Usman Cycle Works**

Submitted by

Name : Taniya Chouhan  
Roll number : 23f2003584



IITM Online BS Degree Program,  
Indian Institute of Technology, Madras, Chennai  
Tamil Nadu, India, 600036

## Contents

1 Executive Summary and Title	3
2 Organizations Background	3
3 Problem Statement	4
3.1 Problem statement 1: sharp decrease in profits	
3.2 Problem statement 2: Lack of Stocks	
3.3 Problem statement 2: Lack of Customer Insights	
4 Background of the Problem	4
5 Problem Solving Approach	5-6
6 Expected Timeline	6-7
7 Expected Outcome	7

## **Declaration Statement**

I am working on a Project titled “**Profit Optimization through Data-Driven Analysis for Business Development and Understand Cycle shop trend**”. I extend my appreciation to **Usman Cycle Works**, for providing the necessary resources that enabled me to conduct my project.

I hereby assert that the data presented and assessed in this project report is genuine and precise to the utmost extent of my knowledge and capabilities. The data has been gathered through primary sources and carefully analyzed to assure its reliability.

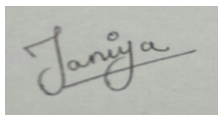
Additionally, I affirm that all procedures employed for the purpose of data collection and analysis have been duly explained in this report. The outcomes and inferences derived from the data are an accurate depiction of the findings acquired through thorough analytical procedures.

I am dedicated to adhering to the information of academic honesty and integrity, and I am receptive to any additional examination or validation of the data contained in this project report.

I understand that the execution of this project is intended for individual completion and is not to be undertaken collectively. I thus affirm that I am not engaged in any form of collaboration with other individuals, and that all the work undertaken has been solely conducted by me. In the event that plagiarism is detected in the report at any stage of the project's completion, I am fully aware and prepared to accept disciplinary measures imposed by the relevant authority.

I agree that all the recommendations are business-specific and limited to this project exclusively, and cannot be utilized for any other purpose with an IIT Madras tag. I understand that IIT Madras does not endorse this.

Signature of Candidate:

A rectangular box containing a handwritten signature in cursive script that reads "Taniya".

Name: Taniya Chouhan

Date: 03-10-2024

# **1 Executive Summary and Title**

The project focuses on a small shop 'Usman Cycle Works' a cycle shop which located at Rani

Satti Road Gandhi Chowk 333001 , Jhunjhunu, Rajasthan The business is B2C(directly sell product to customer) and deals in the segment of bicycles(adult and child both cycles) , tubes, tyers.The shop include variety of cycles Hero Cycle , Avon Cycle.

The major business issues that the organization is facing are related to less profit.When I talk to the owner he said that they face major issues after lockdown as their sales decreased abruptly due to competition from online platforms and they have lack of funds to set their business online and don't even have stocks. After talk to owner I understand majorly three problems, First sharp decrease in profits .Second Lack of Stocks .Third Lack of Customer Insights.

I have collected data of Sales and Purchase of the shop and will do analysis on both data to increase revenue and solve other problems.For this project I am thinking to use Data Cleaning tool Python (Pandas), Data Visualization Tableau or Power BI and Python Libraries, Reporting tools PowerPoint or Google docs, Statistical Methods tools Charts (bar chart, pie chart , histogram ,scatter plot, Line Graph, Box plots), Regression , Time series.

The expected outcome helps the organization to increase their profit and to understand customer's needs and satisfy their needs without overstocking or understocking.

## **2 Organization Background**

Usman Cycle Works is a small, family-owned bicycle shop located in Jhunjhunu, Rajasthan. Founded by Usman Chouhan, the shop began as a modest venture selling puncture repairs before expanding its offerings to include a variety of bicycles. After Usman's passing in 2016, his son, Mr. Mehboob Ali, took over the operations and continued to grow the business. Today, Usman Cycle Works offers a wide range of products, including various types of bicycles, tires, tubes, and essential cycling accessories such as lights, air pumps, cycle seats, and helmets etc. The shop has established itself as a trusted local resource for cycling enthusiasts and daily commuters alike, providing quality products and personalized service to the community.

### 3 Problem Statement (Listed as objectives)

**3.1 Problem Statement 1:** The shop has experienced a sharp decrease in profits due to increased competition from online platforms, making it essential to analyze sales data to identify high-margin products and effective marketing strategies.

**3.2 Problem Statement 2:** A significant lack of stock hampers Usman Cycle Works' ability to meet customer demand, resulting in lost sales opportunities; optimizing inventory management is crucial for maintaining adequate stock levels.

**3.3 Problem Statement 3:** The absence of customer insights limits the shop's understanding of consumer preferences and trends, making it difficult to tailor offerings effectively; conducting customer trend analysis will help improve engagement and sales.

### 4 Background of the Problem

Usman Cycle Works is currently grappling with several pressing challenges that hinder its growth and profitability.

**Declining Profits:** The shop has seen a notable decrease in profit margins, primarily due to the surge in online competition, especially after the pandemic. Many customers are now opting for the convenience of purchasing bicycles and accessories online, leading to a significant drop in foot traffic and sales. The shop's limited online visibility exacerbates this issue, preventing it from tapping into a wider customer base.

**Lack of Stocks:** Internally, the shop struggles with inventory management, which results in frequent shortages of in-demand products. Insufficient funds restrict the ability to stock up on popular items, causing frustration among customers who find themselves unable to purchase what they need. This inconsistency in product availability drives customers to seek alternatives.

**Lack of Customer Insights:** Externally, the absence of comprehensive customer data hampers the shop's understanding of market trends and consumer preferences. Without insights into what customers want, the shop's ability to tailor its offerings and marketing strategies is severely limited. This disconnect contributes to an ineffective sales approach and diminishes customer loyalty.

## 5 Problem Solving Approach

To address the challenges faced by Usman Cycle Works, a comprehensive data-driven approach will be implemented, focusing on enhancing profitability, optimizing inventory management, and gaining valuable customer insights. The following strategies outline the specific steps that will be taken:

**1. Data Collection and Cleaning:** The first step involves gathering sales and purchase data, ensuring it is clean and accurate for analysis. This process will utilize Python with Pandas for data cleaning, which includes handling missing values, correcting inconsistencies, and organizing data into a structured format for analysis. This foundational step is crucial for reliable results.

**2. Sales Analysis:** To tackle the issue of declining profits, a detailed analysis of sales data will be conducted. This will involve identifying trends in product performance, including which items have the highest profit margins and which are underperforming. Utilizing data visualization tools like Tableau or Power BI, I will create dashboards that display sales trends, seasonal fluctuations, and customer purchasing patterns. This analysis will help pinpoint high-margin products and areas where marketing efforts can be improved.

**3. Inventory Management Optimization:** Addressing the lack of stock requires an examination of inventory turnover rates and stock levels. By analyzing purchase data, I can determine which products need to be restocked and when. Implementing a just-in-time (JIT) inventory system will help ensure that popular items are available without overstocking. Additionally, predictive analytics can be employed to forecast future demand based on historical sales data, allowing for more informed purchasing decisions.

**4. Customer Insights Development:** Understanding customer preferences is essential for tailoring offerings and marketing strategies. Surveys and feedback forms will be utilized to collect direct input from customers regarding their needs and preferences. Additionally, clustering techniques can be applied to segment customers based on purchasing behavior, helping to identify trends and patterns. This information will guide product selection and promotional strategies to enhance customer engagement.

**5. Strategic Marketing Initiatives:** Based on the insights gathered, targeted marketing campaigns will be developed to attract both existing and potential customers. This may include promotions on high-demand items, loyalty programs, and social media marketing to increase online visibility. Collaborating with local cycling communities and hosting events can also enhance brand awareness and drive foot traffic to the store.

**6. Continuous Monitoring and Improvement:** Finally, the effectiveness of these strategies will be continuously monitored through regular data analysis and feedback collection. By establishing key performance indicators (KPIs) to track sales growth, inventory levels, and customer satisfaction, Usman Cycle Works can adapt its approach as needed to ensure sustained improvement and profitability.

Through this structured, data-driven approach, Usman Cycle Works aims to address its current challenges effectively and build a stronger foundation for future growth.

## 6 Expected Timeline

### 6.1 WORK BREAKDOWN STRUCTURE :

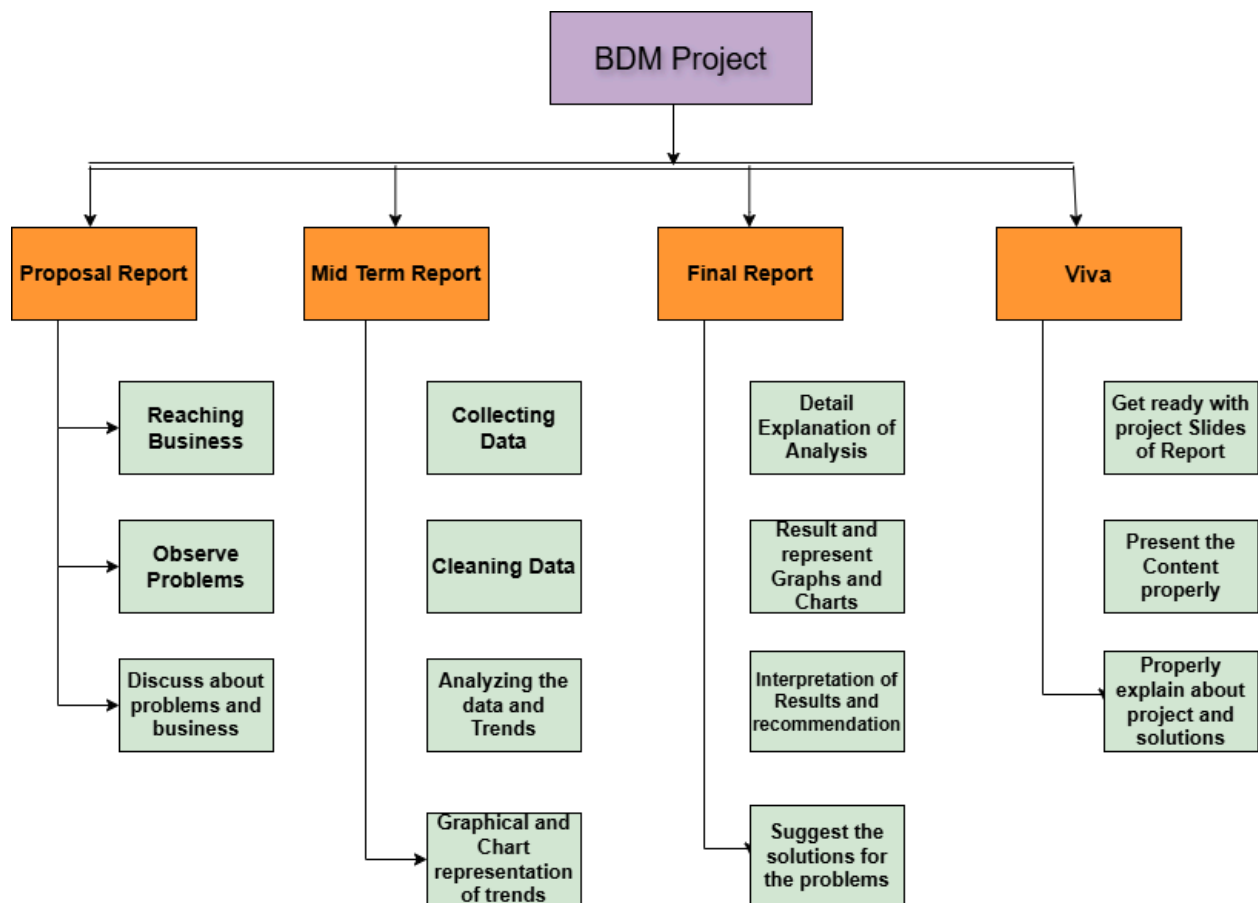


Figure 1 Work breakdown structure of this project

## 6.2 GANTT CHART



**Figure 2 Expected Timeline for completion of project**

## 7 Expected Outcome

The implementation of a data-driven approach at Usman Cycle Works is anticipated to produce several important outcomes that will significantly improve the business's operations and profitability.

**7.1 Proper Inventory Management:** Through my analysis, I will pinpoint the key factors leading to stock shortages and overstocking issues at Usman Cycle Works. By examining sales patterns and inventory turnover, I will provide the owner with actionable insights to optimize inventory levels. This strategy aims to reduce waste, improve cash flow, attract more customers, and ultimately drive higher sales.

**7.2 Increase in Profit:** My analysis will focus on identifying the main contributors to declining profits. By examining expense patterns and sales data, I will recommend strategies to reduce costs and enhance profitability. Increased profits will empower the owner to invest in shop maintenance, upgrade facilities, and provide employee training, thereby creating a more capable workforce.



**7.3 Enhanced Customer Insights:** By employing a data-driven approach, I will gather valuable insights into customer preferences and purchasing behaviors. This analysis will enable the owner to understand market demands better and refine product offerings accordingly. Additionally, I will assist in developing targeted marketing strategies to promote popular items effectively. This comprehensive understanding of customer needs will not only boost sales but also enhance customer loyalty, positioning the shop for future growth and success.