

## National College of Ireland

### Project Submission Sheet – 2021/2022

**Student Name:** Krishnanunni Raju , Nivedita Vishwanath Hiremath , Pramod Ramu ,  
Sai Rajasekhar Reddy Evuri and Savin vishwas Karkada  
.....

**Student ID:** 20232217, 21108471 , 20205759 , 20250151 , 20184727  
.....

**Programme:** MSc. Data Analytics **Year:** 2021  
.....

**Module:** Business Intelligence and Business Analytics  
.....

**Lecturer:** Vikas Sahni  
.....

**Submission Due Date:** 14-12-2021  
.....

**Project Title:** Business Analysis of Walmart  
.....

**Word Count:** BIBA Project Specification Report - 1566  
.....

**I hereby certify that the information contained in this (my submission) is information pertaining to research I conducted for this project. All information other than my own contribution will be fully referenced and listed in the relevant bibliography section at the rear of the project.**

**ALL internet material must be referenced in the references section. Students are encouraged to use the Harvard Referencing Standard supplied by the Library. To use other author's written or electronic work is illegal (plagiarism) and may result in disciplinary action. Students may be required to undergo a viva (oral examination) if there is suspicion about the validity of their submitted work.**

**Signature:** Krishnanunni Raju , Nivedita Vishwanath Hiremath , Pramod Ramu ,  
Sai Rajasekhar Reddy Evuri and Savin vishwas Karkada  
.....

**Date:** 14-12-2021  
.....

#### PLEASE READ THE FOLLOWING INSTRUCTIONS:

1. Please attach a completed copy of this sheet to each project (including multiple copies).
2. Projects should be submitted to your Programme Coordinator.
3. **You must ensure that you retain a HARD COPY of ALL projects**, both for your own reference and in case a project is lost or mislaid. It is not sufficient to keep a copy on computer. Please do not bind projects or place in covers unless specifically requested.
4. You must ensure that all projects are submitted to your Programme Coordinator on or before the required submission date. **Late submissions will incur penalties.**

5. All projects must be submitted and passed in order to successfully complete the year. **Any project/assignment not submitted will be marked as a fail.**

<b>Office Use Only</b>	
Signature:	
Date:	
Penalty Applied (if applicable):	

# Business Analysis for Walmart

Krishnanunni Raju

*MSc Data Analytics*

*National College of Ireland*

Dublin, Ireland

x20232217@student.ncirl.ie

Nivedita Vishwanath Hiremath

*MSc Data Analytics*

*National College of Ireland*

Dublin, Ireland

x21108471@student.ncirl.ie

Pramod Ramu

*MSc Data Analytics*

*National College of Ireland*

Dublin, Ireland

x20205759@student.ncirl.ie

Sai Rajasekhar Reddy Evuri

*MSc Data Analytics*

*National College of Ireland*

Dublin, Ireland

x20250151@student.ncirl.ie

Savin Vishwas Karkada

*MSc Data Analytics*

*National College of Ireland*

Dublin, Ireland

x20184727@student.ncirl.ie

**Abstract**—The main focus of this report to showcase the specification of this project in detail which encompasses background information, project specification and process flow, analytical objectives and requirements, business model and a detailed description of designing the database and its integration. Walmart Corporation was chosen as the business organization. The background information gives an idea on the business domain and the work culture and also the factors which need to be considered to frame the analytical requirements of the project. The buying customers are the target audience for the organization. The project specification and workflow includes the source of the data, the key areas which influence the business and an overview of the workflow of the project. Analytical objectives and requirements encompasses the factors that dictates the organization's business and the main important factors need to be considered to scale up the business. The database design encompasses the database schema, the relationship between the created tables and the integration details of the data.

**Index Terms**—Walmart, Enterprise Resource Planning, Inventory Management, Customer Relationship Management, Amazon RDBMS, Tableau, Microsoft Dynamic 365

## I. BACKGROUND AND SCOPE

This main intention of this write up is to brief about the background information of the company and its business operations. Walmart was established in 1962 by Sam Walton with an objective of hypermarkets, departmental stores and grocery stores in United States of America[1]. Currently the company has more than 10000 stores in different countries. Walmart is one of the largest company in the world with the revenue of more than 500 billion. It is the largest private employer with more than 2 million employees. In 2019 it was one of the biggest retailer of USA with more than 500 billion sales.

Walmart corporation is divided into three business segments Walmart US, Walmart International Sam's Club. Walmart US is the highest revenue and sales generating component of the Walmart. Walmart International supports the organization to scale the business across overseas[2].

Walmart's target audience are the buying customers ,it gives more importance to the customer attention. Along with that more focus is given on cost controls as well as efficiency in

distribution networks[3]. These factors made a positive impact on the organization to reach the position of the largest retailer in USA.

## II. PROJECT SPECIFICATION AND PROCESS FLOW

### A. Project Specification

Walmart has varying sales in the years for which we have data. The analysis is done to identify the major areas which contribute to a negative profit, issues in the supply chain and business process which needs improvement. After identification of the problematic areas a set of solutions are proposed for improving on these areas.

### B. Process Flow

The majority of the data came from Kaggle, and part of it was generated using Mockaroo's help. The Walmart dataset is built and then uploaded to an AWS MySQL RDBMS relational database. Tables can be added to the AWS MySQL RDBMS using python or by connecting to the database server from a locally installed MySQL Workbench.

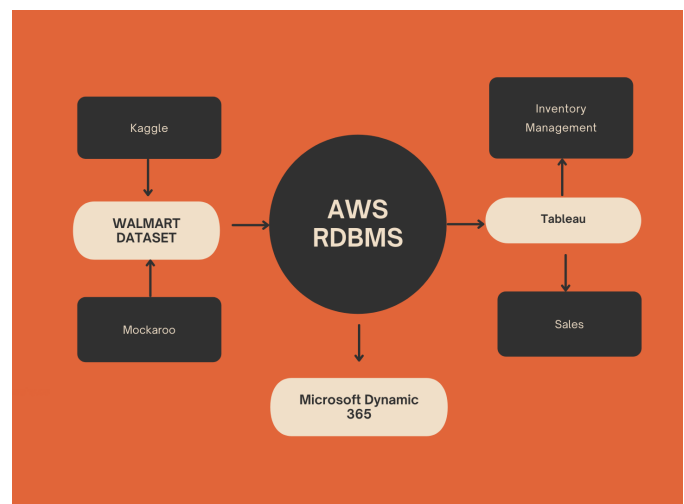


Fig. 1. Process Flow of Walmart

This data is then instantly put into Tableau, where it is used to generate dashboards by the Sales team and Inventory Management. The data from these dashboards is used to conduct gap analysis and provide a comprehensive business solution. For the creation of new customers and the pursuit of existing clients for new sales transactions, Microsoft Dynamic 365 is used to implement a CRM system. This design allows for efficient data sharing among the system's various components. The common database in this system is AWS RDBMS, and it is used by all of Walmart's teams, including Sales, Inventory Management, and CRM.

### C. Data Capture Points

The data is collected from the customer orders billing and inventory system which is further used in the analysis of the business prospective.

## III. ANALYTICAL OBJECTIVES AND REQUIREMENTS

Analytical objectives mainly encompasses analysis of the organizational data to get the proper business insights, a structured plan to be well prepared, in and out flow of stocks for to track end to end business operations and achieving the customer contentment. In order to reach these organizational goals the company should get the a visual story of their business operations, should incorporate an enterprise resource planning, a good inventory management and to establish a good relationship with their customers by integrating customer relationship management system.

### A. Dynamic Visualization

In order to get a real time information regarding the business, the company data must be analysed using dynamic visualization tools like Tableau, Power BI to retrieve information like sales across various regions, cities, states, which helps in calculating the total revenue and track the profit. This analysis help to scale up the business at the required regions with increased profits.

### B. Enterprise Resource Planning

In order to well prepared an organization need to give more focus on the structured planning of the resources. This could be achieved by incorporating Enterprise Resource Planning system. It supports the company in creation of a strategic road map and to accomplish the organization goals.

### C. Inventory Management System

In order to track the in and out flow of products, minimize the costs and to create a good customer experience an organization should encompass an inventory management system. This helps the company to get a proper insights of the business operations.

### D. Customer Relationship Management

It creates an environment where the data of the potential customers has been stored. It helps in managing the interactions with the customers and share the data with the organization. It helps in creating relationship between the customers and the company and has a positive impact on the profits and sales. Microsoft Dynamic 365 CRM, sales force, Pipe drive and many more tools are available in the market for the integration of customer relationship management system.

## IV. BUSINESS MODEL

The Walmart company follows Business to consumer (B2C) business model. Here individual customers are end users of products. It uses its business in digital space where sellers are directly in contact with consumers and make profit by taking cut in the transaction [4]

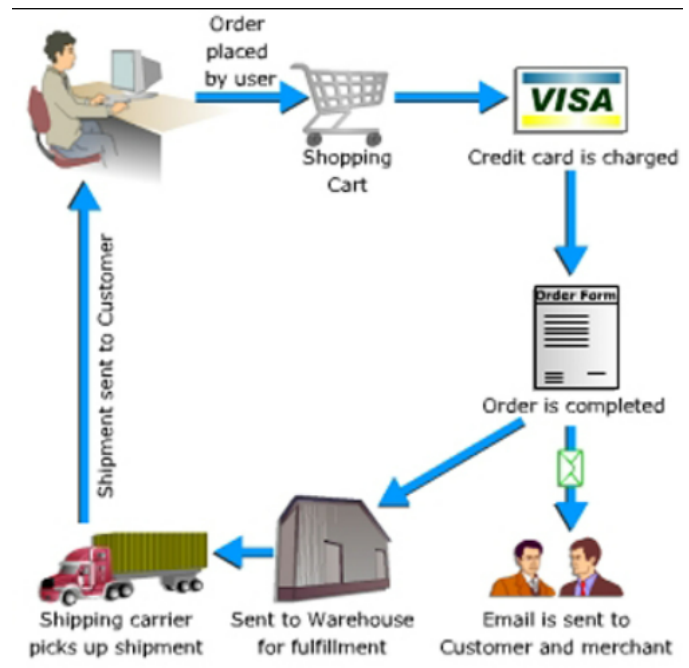


Fig. 2. B2C model

## V. DATA INTEGRATION

The Walmart data related to sales, stores is taken from kaggle and the customer, shipment related data is been generated from Mockaroo. All the data is been pushed to Amazon AWS MySQL relational database and this server is connected to Tableau to do further analysis.

## VI. DATABASE DESIGN

An Entity-Relationship (ER) Diagram is a flowchart that demonstrates how the organization works through entities within a system [5]. It also helps in analyzing relationships between entities. In a company like Walmart, we have several entities like – Customer, Sales Details, Inventory, Inventory Category Type, Shipping Details.

- **Customer** – This entity holds entire customer details of who purchased items from Walmart.
- **Sales Details** – This entity holds details like sales of a product, discount, shipping amount, profit all details regarding sales.
- **Inventory** – This table holds the details of products that are there in the warehouse details like quantity, and amount of quantity on hand, and what quantity needs to be ordered.
- **Inventory Category type** – This holds information of all products category type
- **Shipping Details** – This holds information of shipment details of products.

## VII. DATA TABLES DESCRIPTION

This gives the insight of the columns description and the data types of each entity.

*CustomerID* is a 'PRIMARY KEY' in customer table as it is unique, each customer details can be fetched by other team using *CustomerID*.

*SalesorderID* will be generated once customer make any purchase. This is a 'PRIMARY KEY' constraint on the column. *ProductID*, *CustomerID*, *ShippingID* is a 'FOREIGN KEY' in this as it is required to sales team to track details of which product is purchased by which customer through what mode of transportation.

*ShippingID* is a 'PRIMARY KEY' in *shippingdetails* table as it can be uniquely created for each purchase made by customer and it is kept tracked by sales team.

*ProductID* is a 'PRIMARY KEY' in *Inventory* as each product is uniquely identified by its ID.

*ProductcategoryID* is a 'PRIMARY KEY' in *InventoryCategoryType* each product category has its own value and details can be fetched in inventory.

Attribute Name	Data Type	Description
Customer_id	int	Unique customer number
Customer_name	varchar(100)	Customer Name
Customer_age	int	Age of customer
Customer_region	varchar(100)	Region of customer
Customer_city	varchar(50)	City of customer purchased product
Customer_state	varchar(50)	State of customer purchased product
Customer_segment	varchar(50)	Region of customer purchased segment
Customer_number	varchar(50)	Contact phone number of customer
Customer_address	varchar(50)	Customer address

Fig. 3. Customer Details Description

Attribute Name	Data Type	Description
Sales_order_id	int	Unique sales order number
Product_id	int	Unique product id number
Order_date	datetime	Product ordered by a customer
Customer_id	int	Unique customer-id
No_of_units	int	Number of units ordered by a customer
Amount	float	Sale amount
Priority	varchar	Priority of item to be delivered
Discount	decimal(10,0)	Discount on product
Shipping_id	int	Unique shipping id number
Sales_profit	decimal(10,0)	Sales profit

Fig. 4. Sales Details Description

Attribute Name	Data Type	Description
Shipping_id	int	Unique shipping id
Shipping_mode	varchar	Shipping mode of product delivered
Shipping_cost	float	The shipping cost of the product
Shipping_container_type	varchar(50)	Shipping container type
Shipping_date	datetime	The shipping date of the product

Fig. 5. Shipping Details Description

Attribute Name	Data Type	Description
Product_category_id	int	Unique Product category id
Product_id	int	Unique Product id
Product_name	varchar	Product name
Date_time_received	datetime	Date and Time of product in inventory
Quantity_on_hand	int	Quantity of product in inventory
Unit_cost	decimal(10,0)	The unit cost of product in inventory
Stock_waiting_tobe_received	int	Product waiting to be received in inventory
Cost_price	decimal(10,0)	The cost price of a product

Fig. 6. Inventory Details Description

Attribute Name	Data Type	Description
Product_category_id	int	Unique product category id
Product_category_type	varchar(50)	Products pertaining to different categories
Product_sub_category	varchar(50)	Several products are part of one particular category

Fig. 7. Inventory Category Details Description

## VIII. DATABASE SCHEMA

Database schema used in Walmart is a snowflake schema it is a multidimensional schema that supports advanced analytics. This schema organizes the entities around the central fact and it is connected to further sub-dimension tables[6]. Here in Walmart schema design *SalesDetails* table is a central table that holds details of Sales order, customer details, product details to fulfill these requirements it is sub-connected to other entities in the Database.

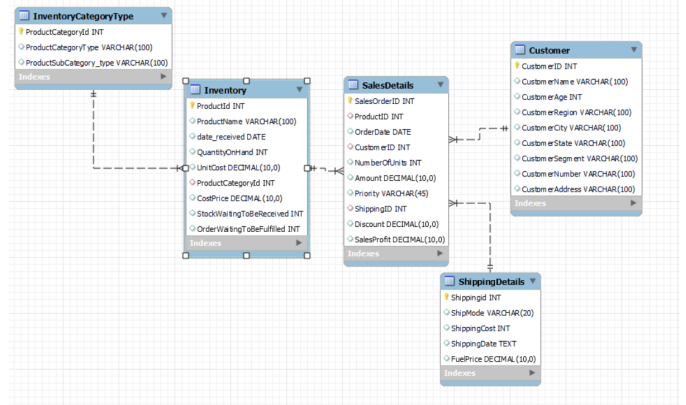


Fig. 8. Database Schema Design

## IX. DATA INTEGRITY

For an effective analysis, it is important to maintain the integrity of the system's entities. To achieve this primary key and foreign key relationship is required to establish the relationship between the entities.

### REFERENCES

- [1] "About;" Corporate - US. <https://corporate.walmart.com/about>.
- [2] A. Pratap, "Business Model of Walmart.",2020  
<https://notesmatic.com/business-model-of-walmart>
- [3] "Walmart American company."Encyclopedia Britannica,2021  
<https://www.britannica.com/>
- [4] T. Tamplin, "Business to Consumer (B2C) Meaning."
- [5] J. Biscobing, "What is entity relationship diagram (ERD)? - Definition from WhatIs.com," SearchDataManagement, 2019.  
<https://searchdatamanagement.techtarget.com/definition/entity-relationship-diagram-ERD>
- [6] D. Kumar, "Data Driven Strategies, Database Management Systems, Database Schema Design."