# RETAIL STORE STOCK INVENTORY ANALYTICS

**A MINI PROJECT REPORT**

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***in partial fulfilment for the award of the degree***

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BONAFIDE CERTIFICATE

Certified that this mini project report **"Retail Store Stock Inventory Analytics"** is the bonafide work of Shamini B**(AC19UCS101), Shreyas M (AC19UCS108), (AC19UCS116), Naveena M (AC19UCS150)** who carried out the project work under my supervision.

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| **INTERNAL EXAMINER** | **EXTERNAL EXAMINER** |
|---|---|

## ABSTRACT

- Retail inventory management is stocking products buyers want, pricing and promoting to sell.

- As retail market becomes to optimize on serving business customer satisfying customer .
- Improving customer service by providing more accurate product availability.

- The ability to optimize on serving business processes while satisfying customer expectations has never been more important.

- It has been developed by considering all real time business transactions

- In order to meet the increasing daily demands of customers and reduce the unnecessary cost in retail stores as far as possible
- Those products profitably, and maintaining stock levels that meet demand without over-purchasing.

## CHAPTER -1

## INTRODUCTION

Retail inventory management is the process of ensuring you carry merchandise that shoppers want, with neither too little nor too much on hand. By managing inventory, retailers meet customer demand without running out of stock or carrying excess supply

In practice, effective retail inventory management results in lower costs and a better understanding of sales patterns. Retail inventory management tools and methods give retailers more information with which to run their businesses, including

Today's retailers are facing a bevy of new challenges, including declining sales, fierce competition from online-only stores, and changing consumer preferences. Yet, despite these challenges, some traditional retailers are managing to grow year-over-year, shredding previous sales records.

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Generally, the shopkeepers sell goods—either individually as a sole proprietor or with the help of a few assistants. In the last few years, however, the concept of large departmental stores and malls has come up, which also provide the same products.

Today, supermarkets, departmental stores, hypermarkets, malls and non-store retailing like multilevel marketing and telemarketing, have replaced or co-exist, transacting with the traditional retail businesspersons, such as hawkers, grocers and vendors, etc. There are various levels at which retail businesses operate—ranging from small, owner operated and independent shops to those in the national and international market.

An increase in income levels and the need for new products and services, a rise in standard of living, competition in the market and increasing consumption patterns of customers have contributed to the demand for creation of these type of stores.

# CHAPTER - 2

# LITERATURE SURVEY

In recent years, the correct management of inventories has become a fundamental pillar for achieving success in enterprises. Unfortunately, studies suggesting the investment and adoption of advanced inventory management and control systems are not easy to find.

In this context, this article aims to analyse and present an extensive literature concerning inventory management, containing multiple definitions and fundamental concepts for the retail sector.

A systematic literature review was carried out to de termini the main trends and indicators of inventory management in Small and Medium-sized Enterprises (SMEs). This research covers five years, between 2015 and 2019, focusing specifically on the retail sector.

The primary outcomes of this study are the leading inventory management systems and models, the Key Performance Indicators (KPIs) for their correct management, and the benefits and challenges for choosing or adopting an efficient inventory control and management system.

Findings indicate that SMEs do not invest resources in sophisticated systems; instead, a simple Enterprise Resource Planning (ERP) system or even programs such as Excel or manual inventories are mainly used

Nowadays, organizations, and especially those performing activities in the retail sector, face multiple challenges in the planning and management of their resources. For this sector, having efficient management of human, technological, or material resources refers to the performance that companies characterized by the experience gained in their management could obtain over time.

Therefore, the correct inventory management has become essential, especially in organizations dedicated to retail . The determination of the optimal inventory level is a fundamental part of the life of organizations due to the high investment that it represents at the time of its acquisition, administration, and maintenance.

# . CHAPTER - 3

# SYSTEM ANALYSIS

## 3.1 EXISTING SYSTEM

- Using manual inventory tracking procedures across different software and spreadsheets is time-consuming, redundant and vulnerable to errors.
- Even small businesses can benefit from a centralized inventory tracking system that includes accounting features.

### DISADVANTAGES

- **Works very slow sometimes**

- **No customer support**
- **Lack of real-time updates**

- **3.2 PROPOSED SYSTEM**

- **A neat and clear dashboard is created to reduce the fear of retailers about their stocks.**

- **Using IBM Cognos perform tasks using given datasets and create report and virtualize dashboard**

**ADVANTAGES**

- **Fear of sales reduces**

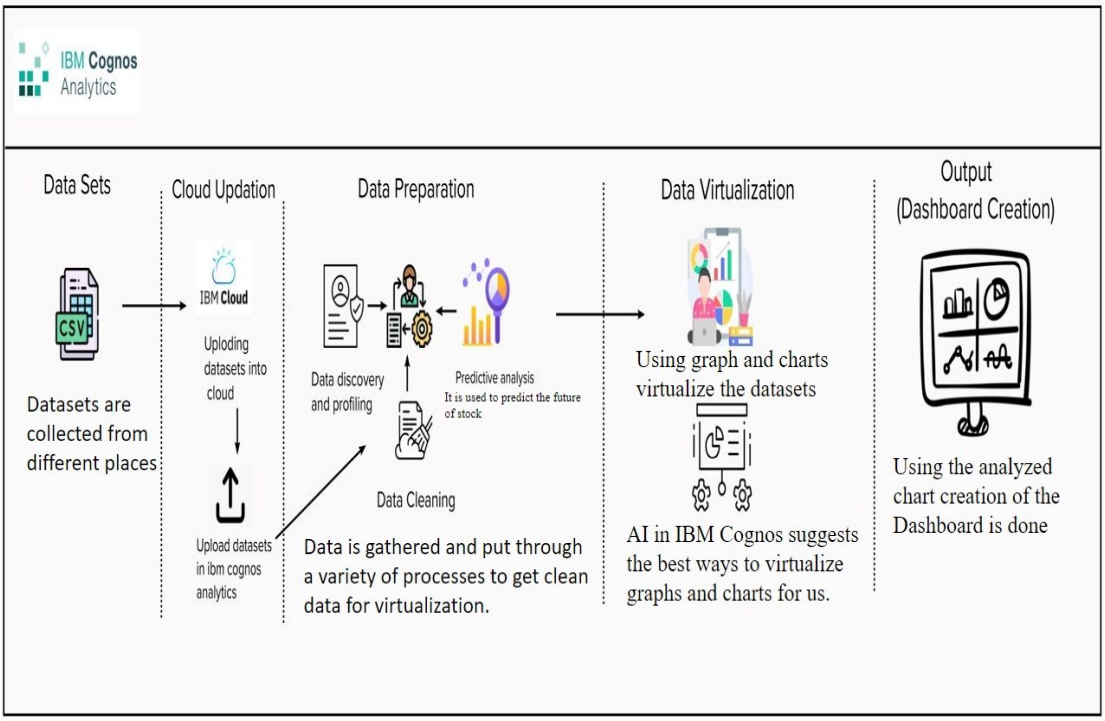
- **Short-term forecasting helps to find demand of stocks**

- **Customer loyalty on stores**

- **3.3 ARCHITECTURE DESIGN**

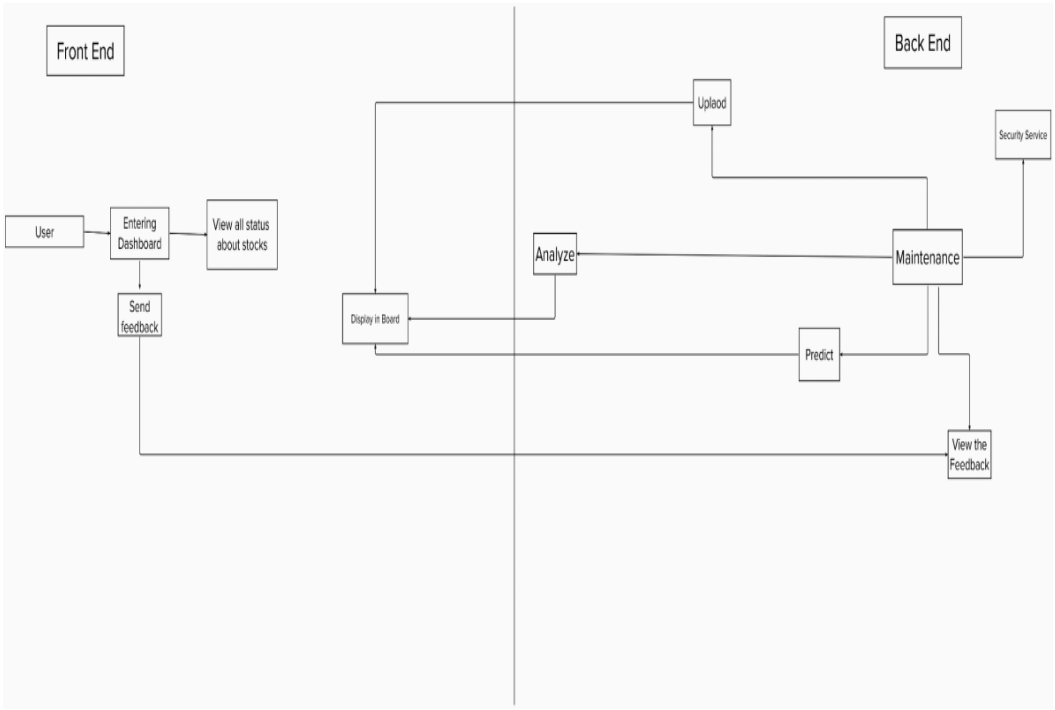
- The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2
- It is comprised of many subprocesses that draw guidance from various enterprise architecture viewpoints.
- Datasets are collected from different place.
- Uploading datasets into cloud.
- Upload datasets in IBM Cognos analytics .

- It is used to predict the future of stock.
- Data is gathered and put through a variety of process to get clean data for virtualization.
- Using graph and charts virtualize the datasets.
- Using the analysed chart creation of the dashboard is done.



## 3.4 Data Flow Diagram

- A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. A neat and clear DFD can depict the right amount of the system requirement graphically.
- It shows how data enters and leaves the system, what changes the information, and where data is stored



# CHAPTER 4

# SYSTEM REQUIREMENTS

## 4.1 HARDWARE REQUIREMENTS

### Barcode Scanner

- **Scanners come in a variety of shapes and sizes.**
- **barcode scanners, while retail stores often prefer small handheld scanners. The functionality is the same, either way.**

### Register Screen

- Once an employee scans a product code, the corresponding product shows up on the register screen.
- Some small businesses use standard PCs for this purpose, while others prefer purpose-built all-in-one devices.

### Payment Terminal

- Credit card payments make up 36 percent of department store purchases.
- Payment terminals come in a variety of shapes and sizes, from simple magstripe readers to touchscreen payment terminals with number pads that let users input their PIN number to verify transactions.

### Cash Drawer

- Secure cash drawers only open in response to a valid transaction signal from the register.
- If you have ever seen a checkout employee open and close a cash drawer when processing a credit card transaction.

### Receipt Printer

- After a checkout employee scans a product barcode, confirms the payment amount on the register, and receives payment from the customer, that employee must generate a receipt.

- Receipt printers automatically generate receipts using the data gathered in the previous steps of the transaction.

## 4.2 SOFTWARE REQUIRED

- Inventory Management
- Inventory Tracking
- Transfer Management
- Purchasing
- Shipping
- Reporting &Analytics

### Inventory Management

- An inventory management system is the simplified process of ordering, storing and tracking goods in the supply chain.
- It automates core processes and helps order, analyse and store inventory data.

### Inventory Tracking

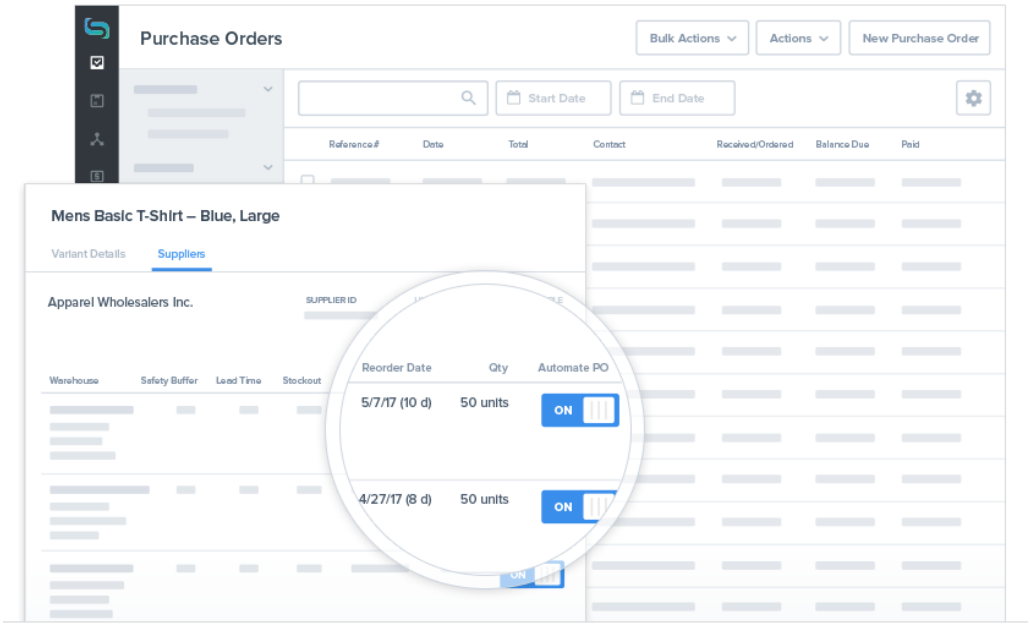
- From accessing updated stock levels and their locations to setting inventory valuation and counting turnover, tracking your inventory
- Inventory tracking helps sync orders, provides complete visibility of your product life cycle, enables multi-location tracking, prevents shortages and promotes efficient inventory forecasting.

### Transfer Management

- the advantage of moving their product to where it's most valuable.
- Transfer management can help guide and direct your workforce to reduce any confusion and streamline their efforts.

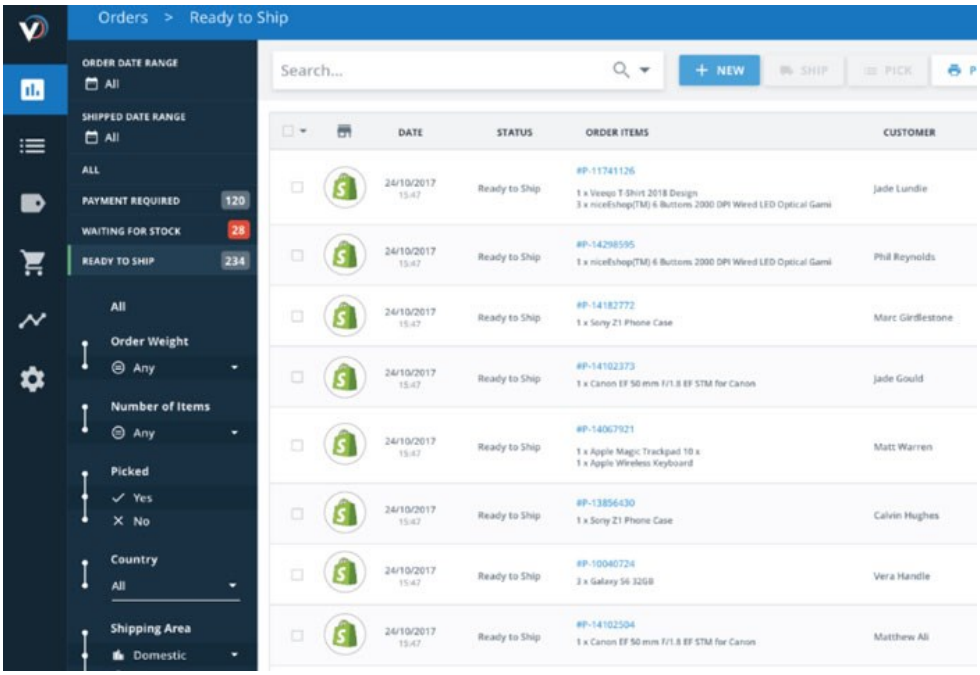
## Purchasing

- Purchasing is an incredibly important feature to any warehouse that heavily relies on vendor goods to produce their own.
- Many systems include templates that automatically populate with existing data from other parts of the system.



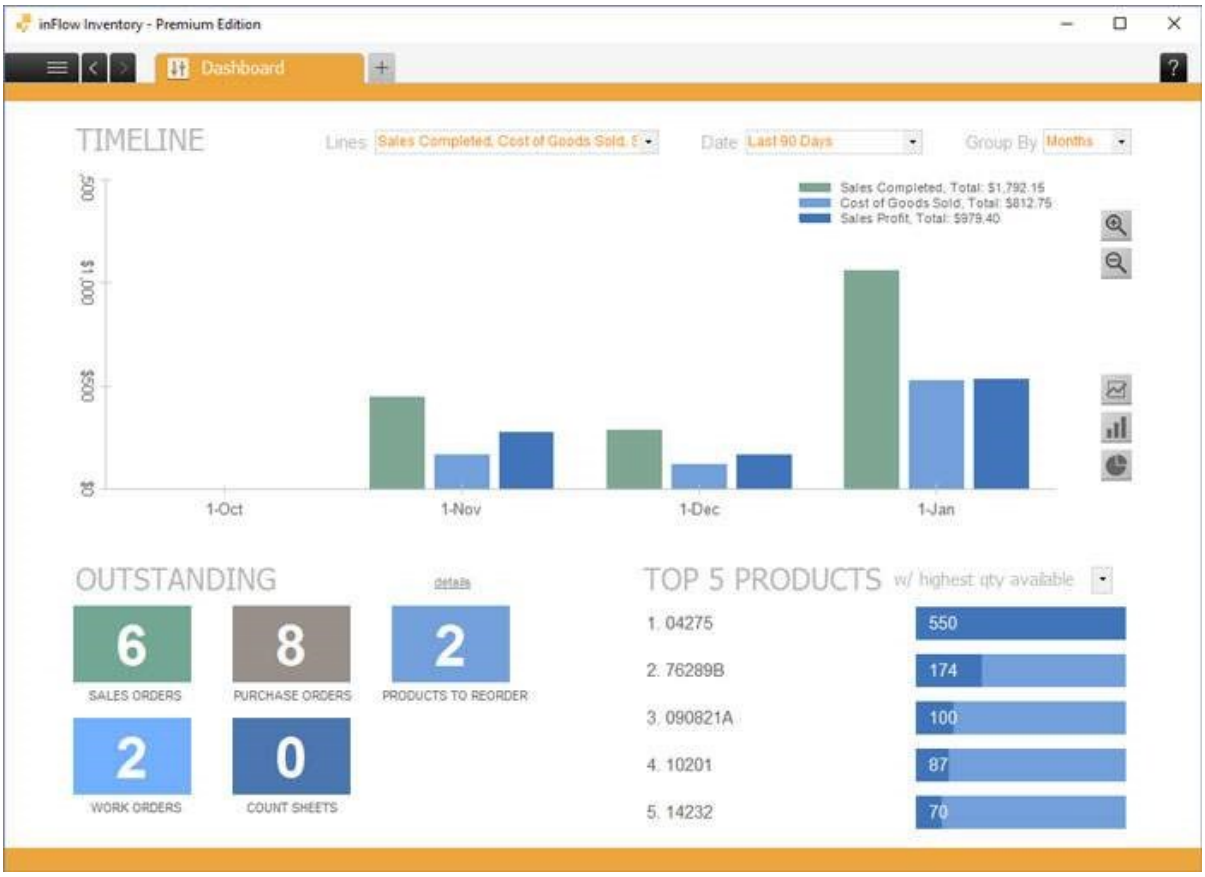

## Shipping

- From labeling to multi-carrier shipping and dispatching orders as multiple shipments, ensure your customers get their in-stock goods quickly with back-ordered items sent at a later time.




## Reporting &Analytics

- Make your business thrive using inventory metrics and KPIs to evaluate patterns in your processes to forecast future demand and sales.
- It is a way to reduce safety stock and carrying costs.




# CHAPTER 5

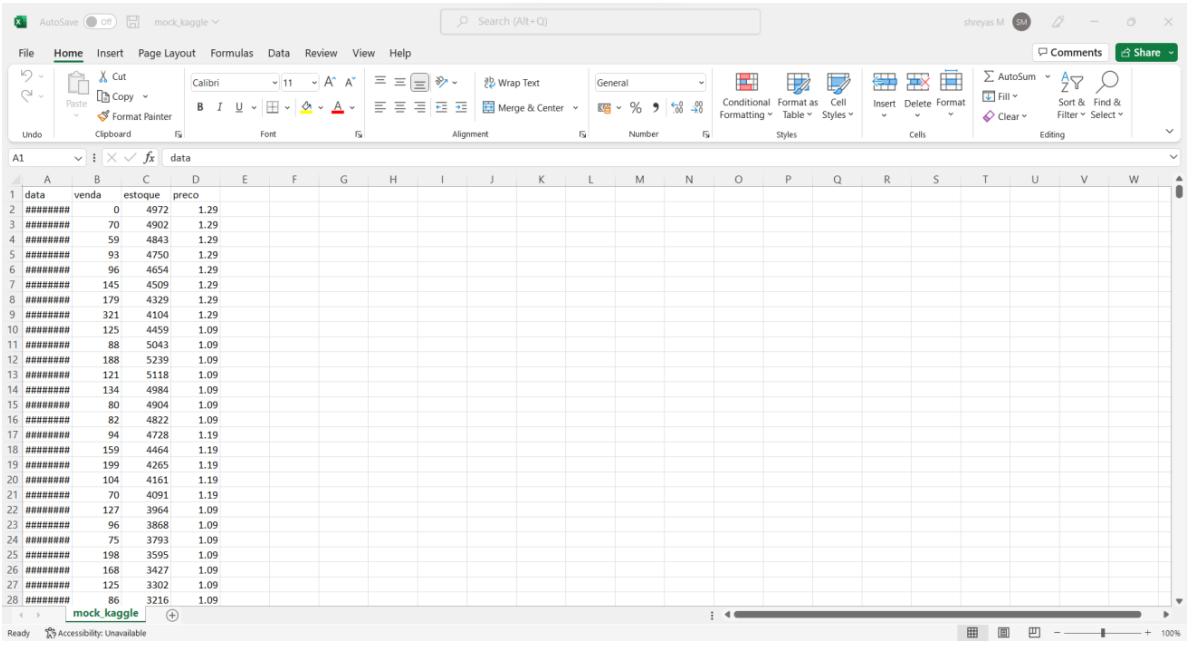
# IMPLEMENTATION

## 5.1 CREATING USER INTERFACE

- Gathering of datasets
- Upload of datasets
- Working with datasets
- Create Dashboard and Report

# Gathering of datasets:

- **Retail data collection is gathering information about your retail store performance as well as your customers and their demographics, behaviours, attitudes, and actions.**
- Retailers can use this data to tailor their purchasing, marketing, and pricing decisions to better meet their customers' needs and drive sales.
- If the dataset is being documented for archiving and internal use only, one may include the raw data as well as the final, fully edited files.
- A Data Set is **a container that holds the data you upload to Analytics**.
- Data sets are also used to store information needed by applications or the operating system .



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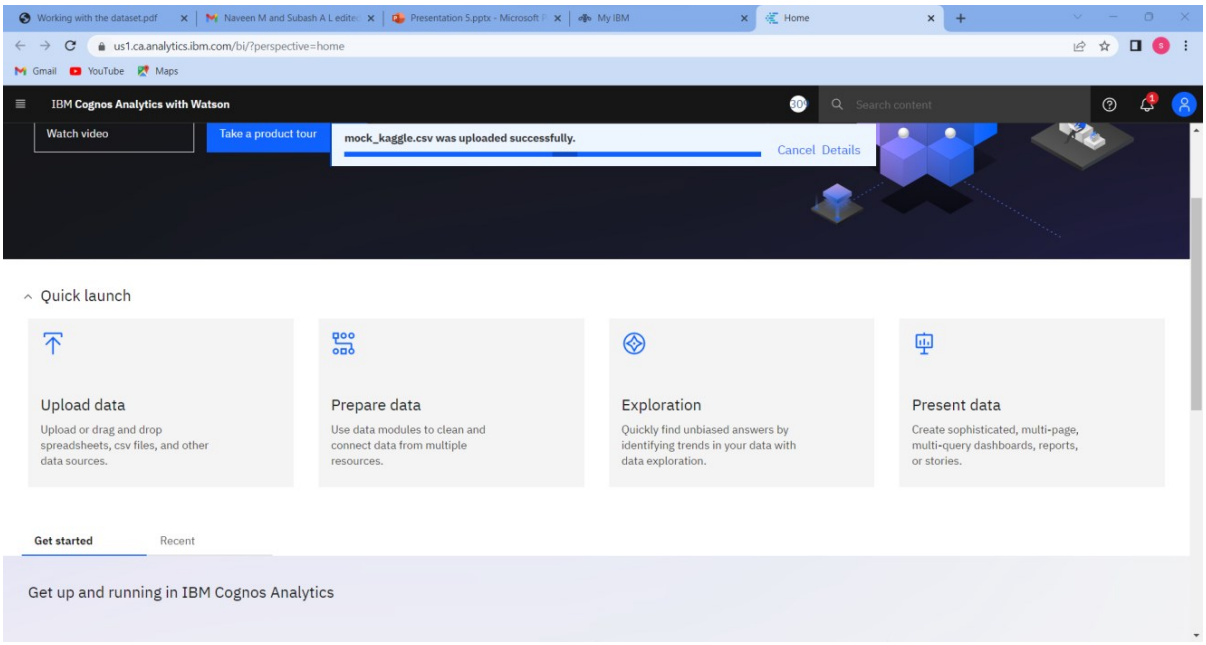
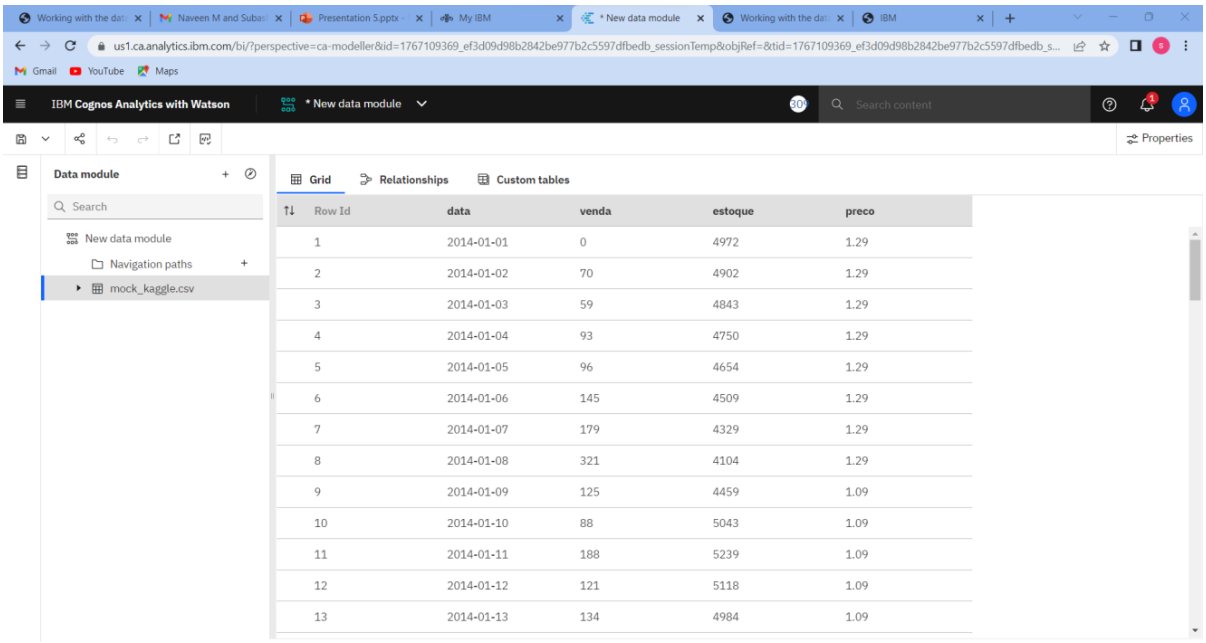
| 25 | ######## | 198 | 3595 | 1.09 |
| 26 | ######## | 168 | 3427 | 1.09 |
| 27 | ######## | 125 | 3302 | 1.09 |
| 28 | ######## | 86 | 3216 | 1.09 |

# Upload of datasets

- A Dataset record is used to upload the dataset file. After the dataset file is uploaded, you can use it to build a model.
- If your dataset doesn't build successfully, use the Error Message field in the dataset's record for more information. To view models that are built using the dataset, use the Vision Models related list.
- Upload or drag and drop spread sheets csv files and other data sources.




# Working with datasets

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| 12 | 2014-01-12 | 121 | 5118 | 1.09 |
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# CHAPTER 6

# CONCLUSION

## 6.1 Conclusion

- After creating a dashboard and report, retailers can easily understand stock circulation and avoid out-of-stock and overstocking in their Data Warehouse.
- It also contributes to the maintenance of a positive relationship between customers and retail store owners.
- Retailers can easily identify forecasting stocks and trend stocks and order large quantities of fast selling stocks.

## 6.2 Future Enhancements

- Creating interactive dashboards for prepared datasets using IBM Cognos.
- Using dashboards create understandable report, reports should be easy understandable of the taken datasets
- After creating the dashboard, upload it to the website and present it.

## APPENDICES

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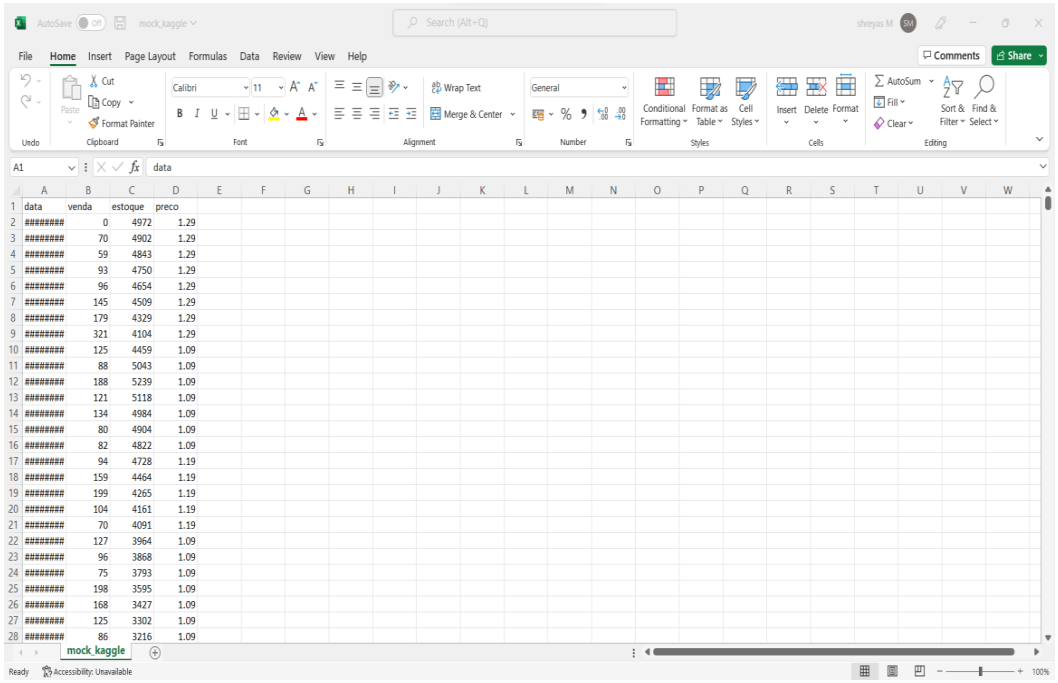
## Screenshots



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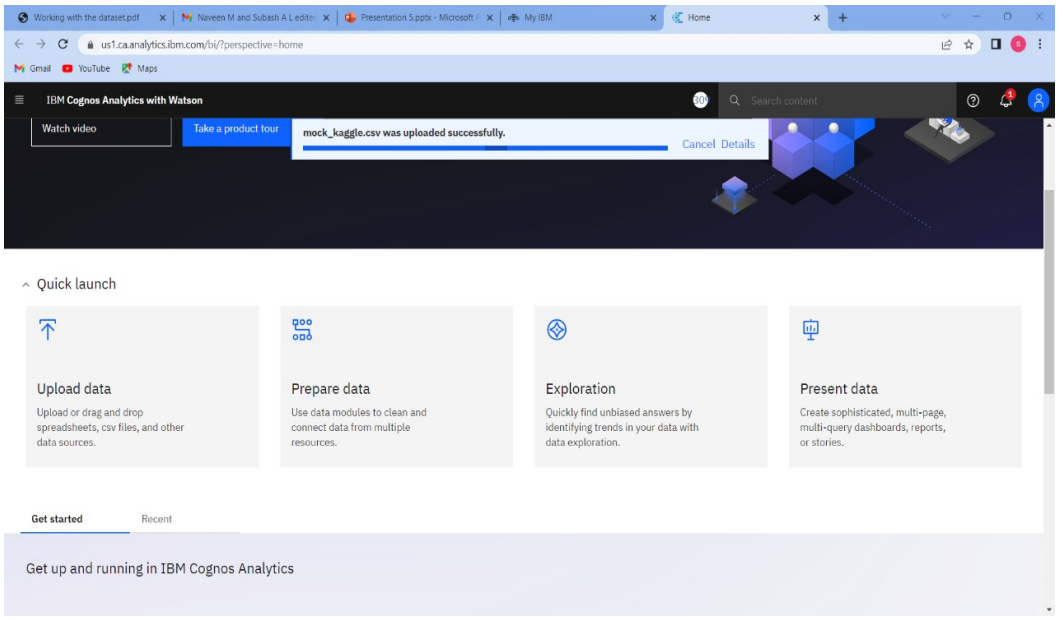

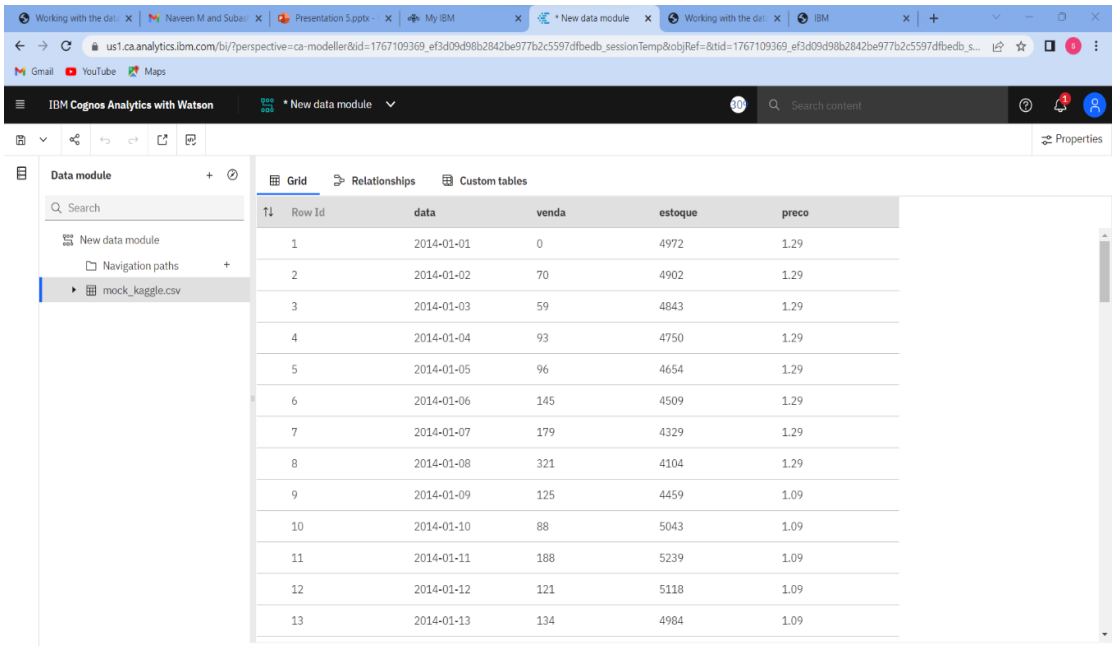


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# Reference

**Analysis of Different Inventory Control Techniques: A Case Study in a Retail Shop:**

https://www.researchgate.net/publication/321050234_Analysis_of_Different_Inventory_Control_Techniques_A_Case_Study_in_a_Retail_Shop

**Selective Inventory Control Using ABC And FSN Analysis in Retail Sector: A Case Study:**

https://www.ijraset.com/best-journal/selective-inventory-control-using-abc-and-fsn-analysis-in-retail-sector

**The Application of Monte Carlo Simulation for Inventory Management: a Case Study of a Retail Store:**

https://docplayer.net/142629572-The-application-of-monte-carlo-simulation-for-inventory-management-a-case-study-of-a-retail-store.html

**A Study of Inventory Management System of Linamar India Pvt. Ltd, Pune:**

https://amity.edu/UserFiles/admaa/9202ePaper%204.pdf