

RETAIL STORE STOCK INVENTORY ANALYTICS

NALAIYATHIRAN PROJECT BASED LEARNING

On

PROFESSIONAL READINESS FOR INNOVATION, EMPLOYABILITY AND
ENTREPRENEURSHIP

A PROJECT REPORT

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ABSTRACT

Retail inventory management is the process of ensuring you carry products 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. Inventory management is vital for retailers because the practice helps them increase profits. They are more likely to have enough inventory to capture every possible sale while avoiding overstock because too much inventory means working capital costs, operational costs, and a complex operation. Based on the inventory management analysis we can manage how much inventory is required for selling the product based on which they can calculate the profit & losses. The objective of this project is twofold. First, it proposes an analytic model for hospital inventory management commodities, which would be able to predict the future demands of various inventory commodities. The model takes into account previous demand, population and geographic Location and other factors to successfully predict the future demand. Second, the project suggests an optimization model that would minimize the cost involved in supply chain & logistics management so that the required commodities can be made available to the hospitals at the minimum possible cost.

As inventory management deals with huge volume and different varieties of information which seems very complex to handle on a daily basis. Inventory stock should be modified or updated based on the customer retention which changes continues with the change in demand which also adds value to the organization in profits by avoiding wastages in the stock. To update the stock data in the organization one should keep on track with the end user demand time to time which can be done by keep track on goods based on First in first out and Last in First Out stock.

CHAPTER 1

INTRODUCTION

1.1 OVERVIEW OF THE PROJECT

Retail inventory management is the process of ensuring you carry merchandise that customers 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:

- Product locations
- Quantities of each product type
- Which stock sells well and which doesn't, by location and sales channel.
- Profit margin by style, model, product line or item
- Ideal amount of inventory to have in back stock and storage
- How many products to reorder and how often
- When to discontinue a product
- How changing seasons affect sales

It is done by using Data Analytics. Data analytics is the science of analyzing raw data to make conclusions about that information. Many of the techniques and processes of data analytics have been automated into mechanical processes and algorithms that work over raw data for human consumption.

Data analytics is a broad term that encompasses many diverse types of data analysis. Any type of information can be subjected to data analytics techniques to get insight that can be used to improve things. Data analytics techniques can reveal trends and metrics that would otherwise be lost in the mass of information. This information can then be used to optimize processes to increase the overall efficiency of a business or system.

Data analytics can do much more than point out bottlenecks in production. Gaming companies use data analytics to set reward schedules for players that keep the majority of players active in the game. Content companies use many of the same data analytics to keep you clicking, watching, or re-organizing content to get another view or another click.

The process involved in data analysis involves several different steps:

1. The first step is to determine the data requirements or how the data is grouped. Data may be separated by age, demographic, income, or gender. Data values may be numerical or be divided by category.
2. The second step in data analytics is the process of collecting it. This can be done through a variety of sources such as computers, online sources, cameras, environmental sources, or through personnel.

3. Once the data is collected, it must be organized so it can be analyzed.

This may take place on a spreadsheet or other form of software that can take statistical data.

4. The data is then cleaned up before analysis. This means it is scrubbed and checked to ensure there is no duplication or error, and that it is not incomplete. This step helps correct any errors before it goes on to a data analyst to be analyzed.

1.2 OBJECTIVES

By the end of this project we will be able to understand a dataset, able to analyze it with the help of IBM Cognos Analytics

1. Identifying Consumer Demands:

The first task that a retailer has to perform is to identify the consumer need and wants. The retailer does not provide raw materials, but offers finished goods and services in a ready-to-use form that the consumers want. For this, from time-to-time, retailer gathers information about consumers' liking, disliking, tastes and preferences.

2. Management Of Merchandise:

The second task that a retailer performs is the management of merchandise. The retailer performs the function of storing the merchandise and provides when required by the customer.

3. Convenience Of Timing:

The retailer creates time utility by keeping the store open and ready for sale according to consumers' convenience. The new trend in retailing to longer trade hours reflects the socio-cultural changes where over one in ten people work outside normal hours resulting in changing trading hours and place a for small retailers against the cheaper prices of the super stores and other retail chains. By being available at a location that has easy access and convenient to shop, retailer creates place utility. Finally, when selected and bought by customers,retailers create ownership utility.

1.3 BENEFITS

Inventory management is vital for retailers because the practice helps them increase profits. They are more likely to have enough inventory to capture every possible sale while avoiding overstock and minimizing expenses.

From a strategic point of view, retail inventory management increases efficiency. The practice:

- Decreases Inventory Costs
- Minimizes Out-of-Stocks
- Improves Profit Margins
- Prevents Spoilage and Obsolescence
- Improves Multi-Channel and Omnichannel Performance and Order Fulfillment

- Simplifies Processes and Facilitate Growth
- Reduces Shrinkage
- Eases Supply Chain Management
- Improves Customers Satisfaction
- Improves Forecasting

Thus this retail store stock inventory analytics dashboard helps retailers to understand the data easily and work based on the prediction.

CHAPTER 2

IDEATION

2.1 PROBLEM STATEMENT

Retail store stock inventory analytics is implemented to analyze the historical sales data of a Brazilian top retailer. By deeply understanding the dataset, identifying patterns, relationships and connections using IBM cognos analytics and building visualizations of stock inventory to create meaningful dashboards. The final dynamic dashboard helps retailers by providing detailed product listing, easy categorization, inventory reports, satisfying customer needs and meeting variation in product demand.

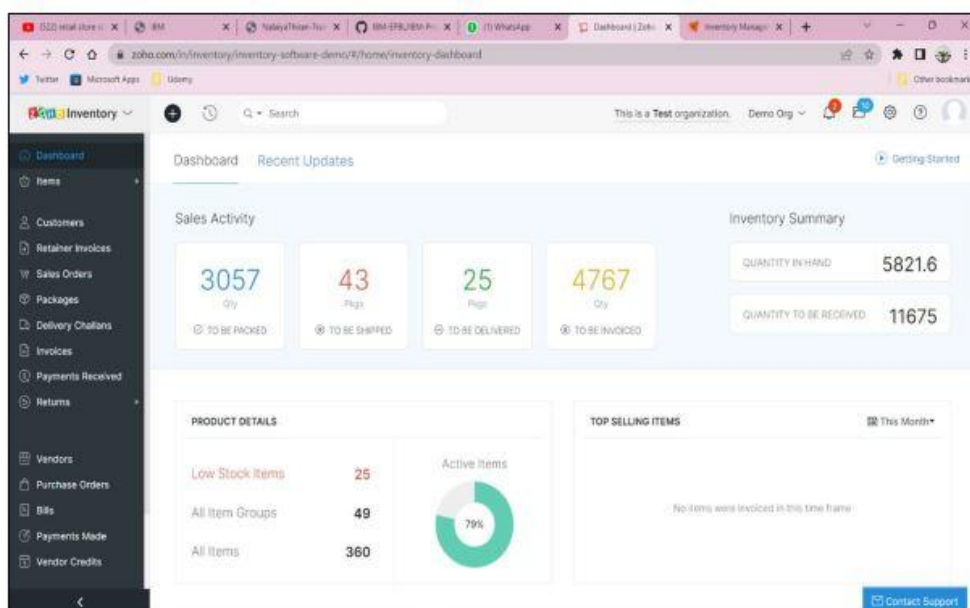
2.2 LITERATURE SURVEY

In recent times, the employment of analytics in all kinds of business sectors, especially the retail sector has proven to increase success in their daily operations. This project aims to prove that, in addition, will identify what factors are actually contributing to this roaring success in the retail sector. Of course, the use of analytics in the business processes has its own pros and cons, but the majority of the organizations feel that the introduction of analytics in their business processes has made things easier for them. Some of the drawbacks of using big data analytics in the retail sector have raised concerns among the customers as well the retailers. Privacy concerns are one of them. Customers feel that their privacy is being snatched away when retailers track their location or store their purchase information for targeting them with personalized advertisements. Although big data analytics help employees to fasten up their work, it also poses a high cost for managing such a huge amount of data. Software needed to sort and analyze this data is very expensive. On the other hand, it requires skilled people to work with them. Data quality decreases because of automation of data gathering, sorting and analyzing them. Some major advantages of using big data analytics in the retail sector are it saves costs, helps in product development, speeds up data management, helps in predicting future, helps in inventory management, helps in price management, helps in micro targeting customers, etc. Overall, the use of analytics decreases the use of man force as it automates all the processes but on the other hand. It helps in product development as analytics can carry out sentiment analysis of a lot of actual and potential customers through social media and find out their preferred types of products, developing their future products accordingly. The use of analytics lets the retailers predict future demands while analyzing their stocks. Micro targeting the customers can be easy when the location of customers can be easily known to the retailers by the use of analytics. Although there are many cons of adapting big

data analytics in the business or retail sector, the pros are more and outweighs all the cons. This aims to prove that.

EXISTING SYSTEM

Inventory data management deals with large collection stock related data in the supply chain management environment. The frequency of data collection is very high in terms of stock volume. Content analysis management plays a vital role in managing the stock data in order to classify and cluster in terms of managing the data. The process of data classification and clustering will keep track of the stock in order to fulfill the customer need on demand. The inventory management with respect to supply chain management involves not only controlling the raw materials of stock as well the cost which is related to the stock in the supply chain environment. This process involves verifying the demand on stock by making use of the concept first in first out(FIFO) and Last in First out(LIFO) techniques in order to verify the demand basis of the end user which helps to control the wastages in stock in inventory Management. The error rate and complexity of huge volumes of data is very high. We need some techniques in order to prevent the issues which are directly related to the volume and variety of data in managing the stock information within an organization.



In this approach, supply chain management and inventory data management deals with the huge assortment of data in terms of both volume and variety using different dimensions.

1. Data Classification
2. Data clustering
3. Content analysis
4. Customer retention
5. Inventory based on LIFO and FIFO.

Supply chain Management and inventory data management using big data analytics In inventory management, we support marketing analysis which helps in identifying the stock in demand with respect to the end user with the change in need. Based on this survey, we can update the stock management with respect to the time and situation of the end user. Analysis of data prediction is based on customer retention which is directly related to the end user satisfaction rate. The increase in data results not only in storage but also in analyzing and processing the flow of information while classifying and clustering the data as per need. There we come up with a concept of content analysis and management which is a major aspect in managing the stock within an organization with raised change in demand.

2.3 EMPATHY MAP



2.4 IDEATION

Conducting a brainstorm

RETAIL STORE STOCK INVENTORY ANALYTICS

1. 15 minutes to prepare
2. 30 minutes to conduct
3. 3-5 people recommended

Customer experience with Meta

Brainstorm Feedback

Problem Statement

PROBLEM
Creating an inventory dashboard for Brazilian retailers to facilitate availability, meet customer demands and improve sales.

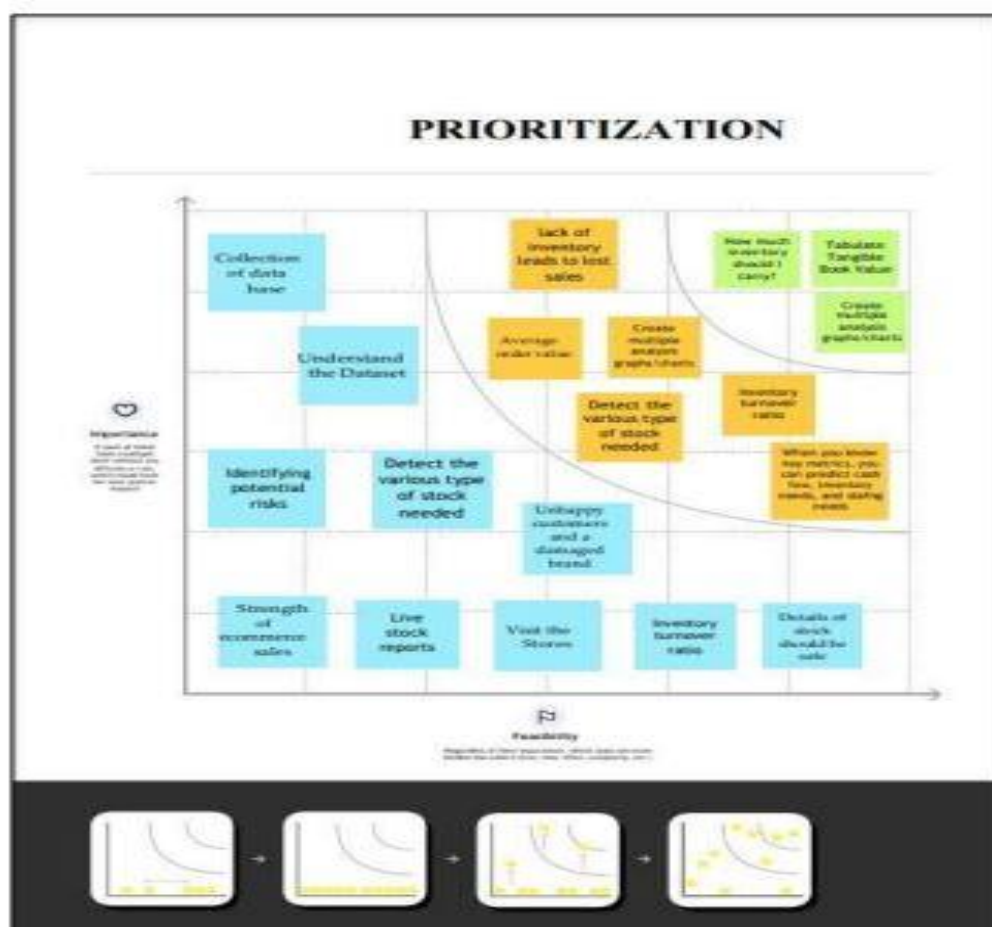
Brainstorm

Person 1
- Depth of stock should be safe
- How much inventory should I have?
- Lack of inventory leads to lost sales
- Create multiple graphs to track
- Detect the various types of stock needed

Person 2
- Collection of data
- Average order value
- Identify target stock
- Define inventory

Person 3
- Understand the Dataset
- How many customers are buying on what
- Identify risks
- Strength of commerce sales
- Live stock reports
- Inventory turnover ratio
- Inventory turnover and a targeted stock

Person 4
- Categorization of stocks based on locations, sales and production type
- Identify verified sellers and locate products
- Track all sales, inventory and purchase purchase and stock control
- Real time dynamic price list and seasonal products
- Product history, tracking and control management



CHAPTER 3

SYSTEM ANALYSIS AND DESIGN

3.1 PROPOSED SOLUTION FIT

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	Due to poor inventory, retailers are not able to provide right goods to consumers right quantity at right place in right time. Through analysis and visualization of stock data, user can meet customer demand without running out of stock or carrying excess supply
2.	Idea / Solution description	<p>Using "Modern inventory systems and analysis" can help to track inventory levels and raise red flags when the stock levels decline.</p> <p>This allows retailers to re-stock before they can run-out-of stock Based on "Analysis of Safety Stock Customer Service Level" can reduce high inventory levels of stocks</p>
3.	Novelty / Uniqueness	Optimal Demand Forecast provides accurate demand forecasts would ensure that the business does not end up with too little or too much stock

4.	Social Impact / Customer Satisfaction	<p>Retailers are able to maintain stocks with neither stockouts nor excess carrying.</p> <p>Customers can satisfied with their demands and met the availability of the products</p>
5.	Business Model (Revenue Model)	Retailers are able to understand the deepest customer needs and adjust their offering to meet shoppers demands. Improve the decision-making process oriented at reducing costs and increasing revenues.
6.	Scalability of the Solution	Ensures obsolete inventory, replenishment optimization, omnichannel retailing and economic order quantity for optimal orders.

3.2 SOLUTION ARCHITECTURE

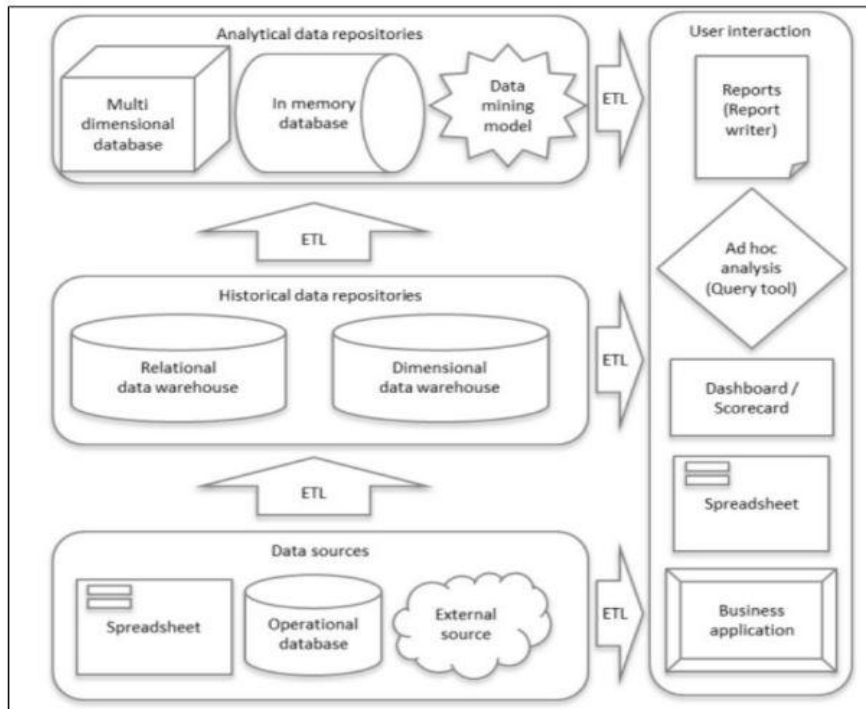
Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions.

Its Goals are to:

- Find the best tech solution to solve existing business problems.
- Describe the structure, characteristics, behavior and other aspects of the

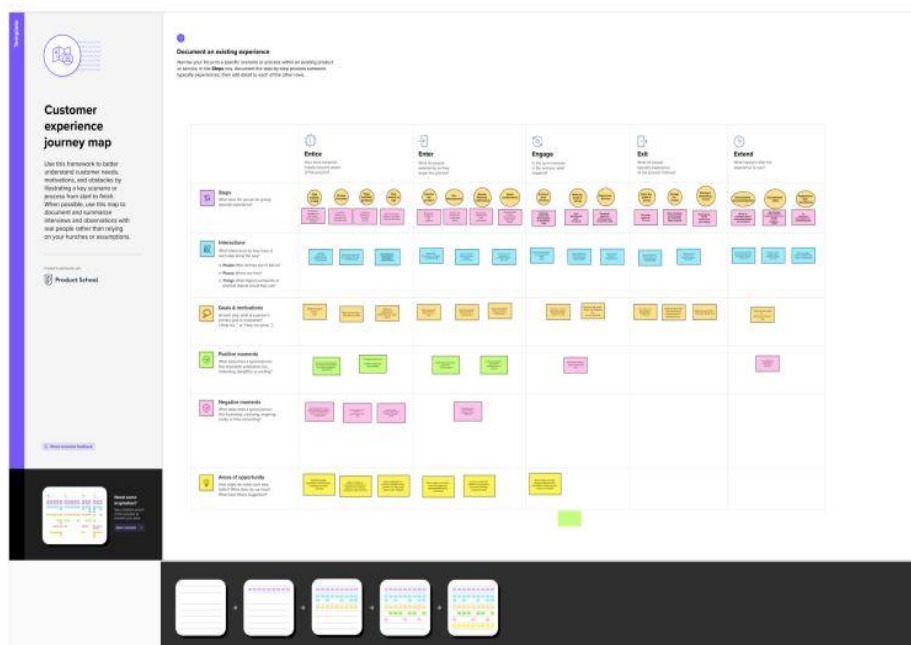
software to project stakeholders.

- Define Features, development phases, and solution requirements.
- Provide specifications according to which the solution is defined, managed, and delivered.



3.3 CUSTOMER JOURNEY MAP

A customer journey map is a visual storyline of every engagement a customer has with a service, brand, or product. The creation of a journey map puts the organization directly in the mind of the consumer, so they can see and understand their customer's processes, needs, and perceptions.



3.4 SOLUTION REQUIREMENTS

FUNCTIONAL REQUIREMENTS

FR No.	Functional Requirement (Epic)	Sub Requirement (Story / Sub-Task)
FR-1	User Registration	Registration through Form Registration through Gmail Registration through LinkedIn
FR-2	User Confirmation	Confirmation via Email Confirmation via OTP
FR-3	User Login	Login using User id Login using Email Login using Password
FR-4	Stock management	Adding or Removing stocks based on the users needs. Analyze the stock details periodically. Generate different barcodes for different products.
FR-5	Billing	Billing will be made easier through barcodes. Receipt Generation.

FR-6	Review	Customers can give reviews on the product.
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NON-FUNCTIONAL REQUIREMENTS:

Following are the non-functional requirements of the proposed solution.

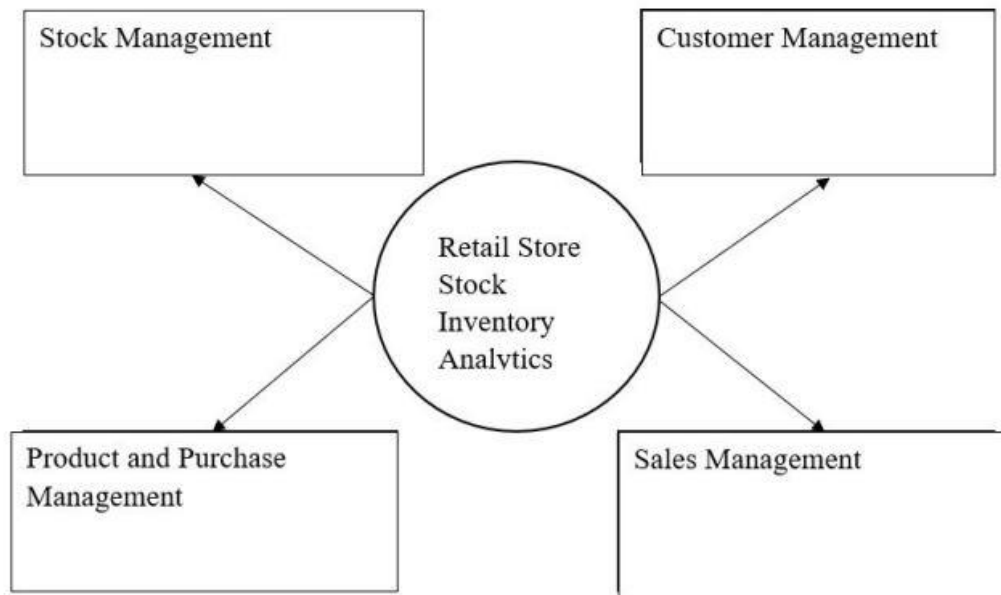
FR No.	Non-Functional Requirement	Description
NFR-1	Usability	An analytics platform helps you understand your customers. It allows you to save on costs. It helps you improve your store's indoor conditions.
NFR-2	Security	Protecting digital information from unauthorized access, corruption, or theft throughout its entire lifecycle.
NFR-3	Reliability	Prevents loss. Helps in stock prediction.
NFR-4	Performance	The solution offers lower request time for any request processed. Receipt Generation.

NFR-5	Availability	Can be used by both retailers and customers for all devices. The solution understands the request made to the server to provide efficient results by prioritizing the request made and load balancing.
NFR-6	Scalability	Proposed solution offers higher compatibility with any kind of working environment. Easier for disk space management and obtaining results. Works with lesser down time when new functionalities are being tested and added to the solution.

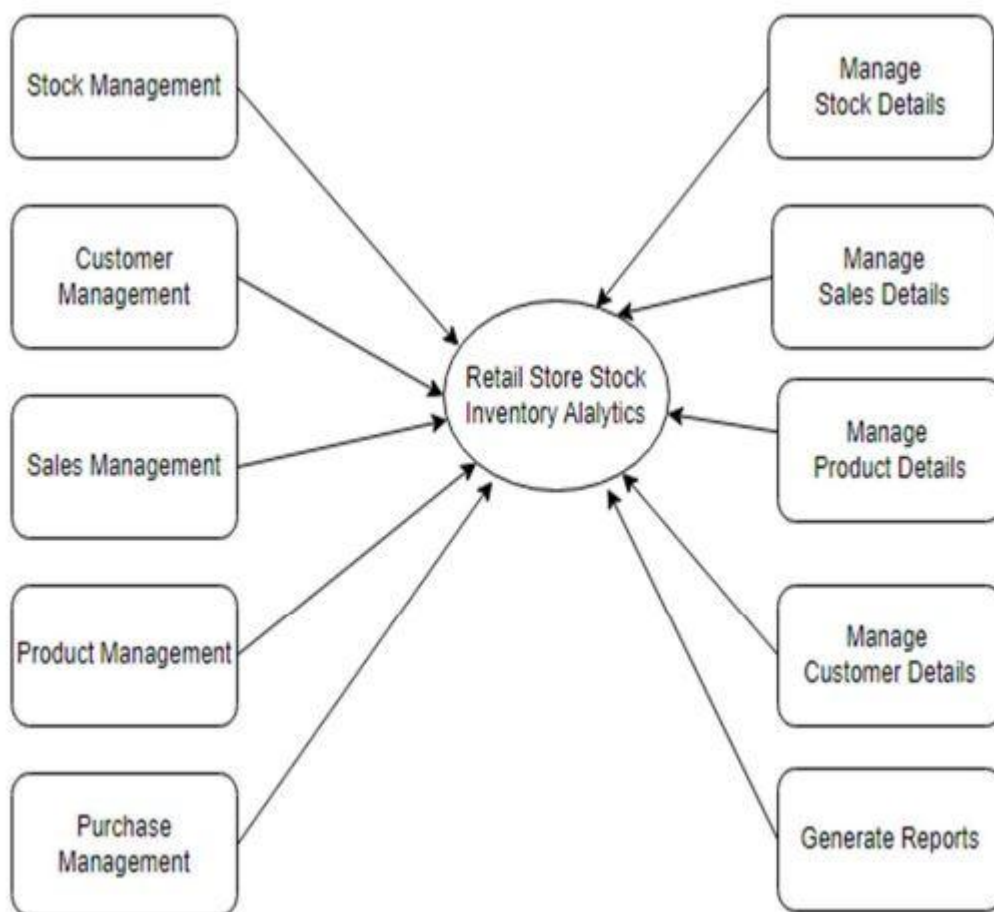
3.5 DATA FLOW DIAGRAMS

A Data Flow Diagram (DFD) is a traditional visual representation of the information flows within a system. 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.

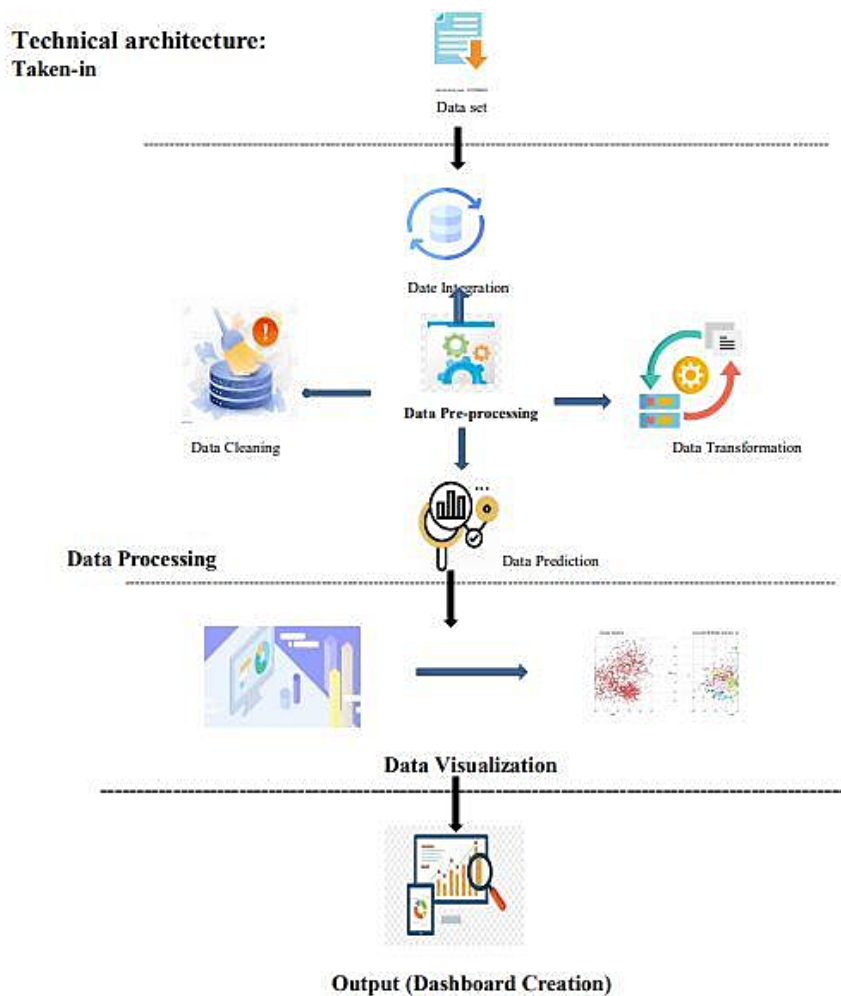
ZERO LEVEL DFD:



FIRST LEVEL DFD:



3.6 TECHNOLOGY STACK



COMPONENTS AND TECHNOLOGIES

S.no	Components	Descriptions	Technologies
1.	User interface	The user interacts with application using web UI	HTML, CSS, JavaScript
2.	Data Processing	The data from the data set is preprocessed	IBM Cognos Analytics
3.	Cloud Database	The clean data set is stored in IBM cloud	IBM Cloud

4.	Data Visualization	The data is visualized into different forms	IBM Cognos Analytics, Python
5.	Prediction	These algorithm techniques are used to predict the proper way to make the stock in store	ML algorithmsLogistics Regressions, Linear Regressions, Random forest, ABC techniques.

APPLICATIONS CHARACTERISTICS

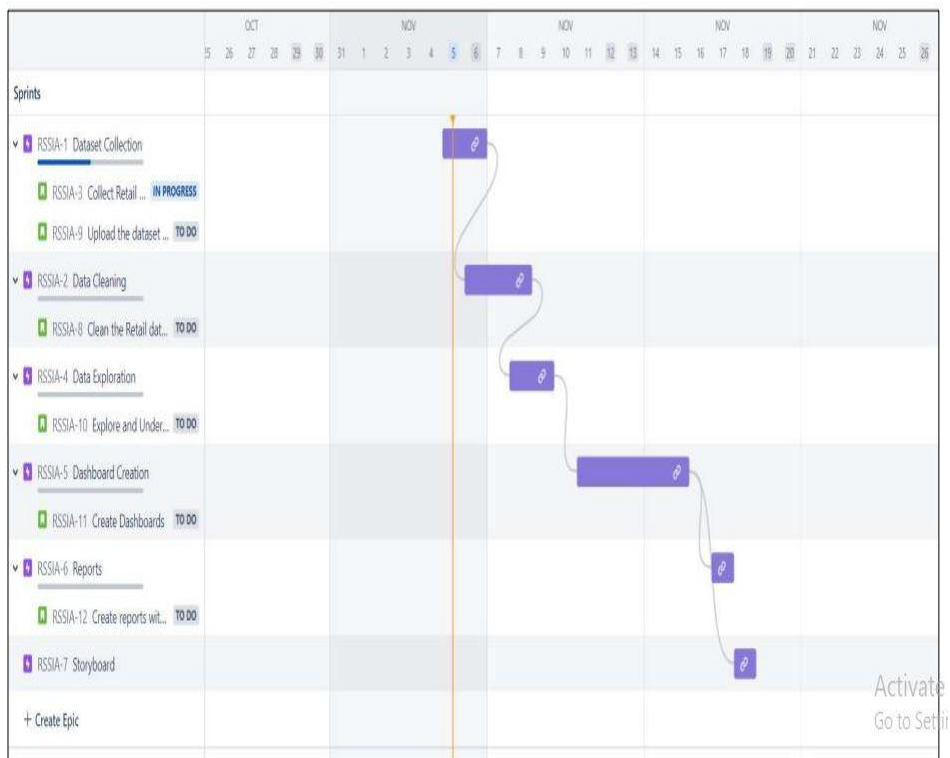
S.no	Components	Descriptions	Technologies
1.	Open source framework	Open source framework is used	IBM Cognos Analytics, Python
2.	Security implementations	Request authentication using encryptions	Encryptions
3.	Scalable architecture	Scalability consists of 3 tiers	Web serverHTML, CSS, JavaScript, Application serverPython, Database Server- IBM cloud

4.	Availability	The application is available for cloud users	IBM Cloud Hosting
5.	Performance	The user can know how to maintain the inventory to increase profits	ML algorithms

CHAPTER 4

SYSTEM ANALYSIS AND DESIGN

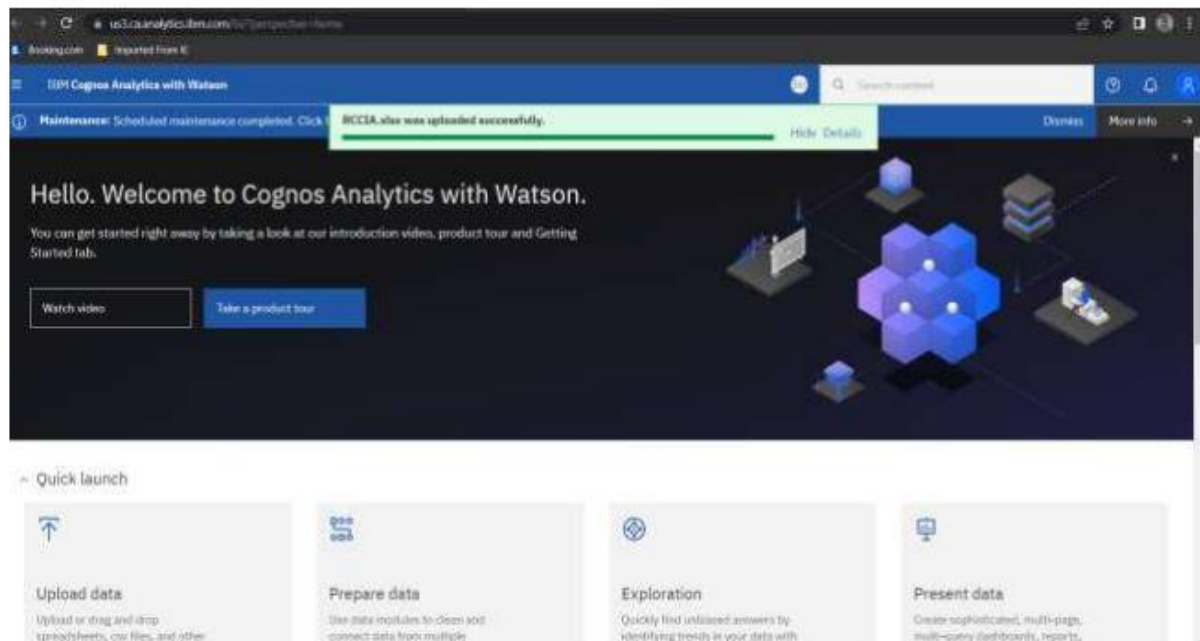
4.1 IMPLEMENTATION OF MODULES



4.1.1 MODULE 1

Data Collection: Download the dataset.

Load the Dataset: Tools used – IBM Cognos

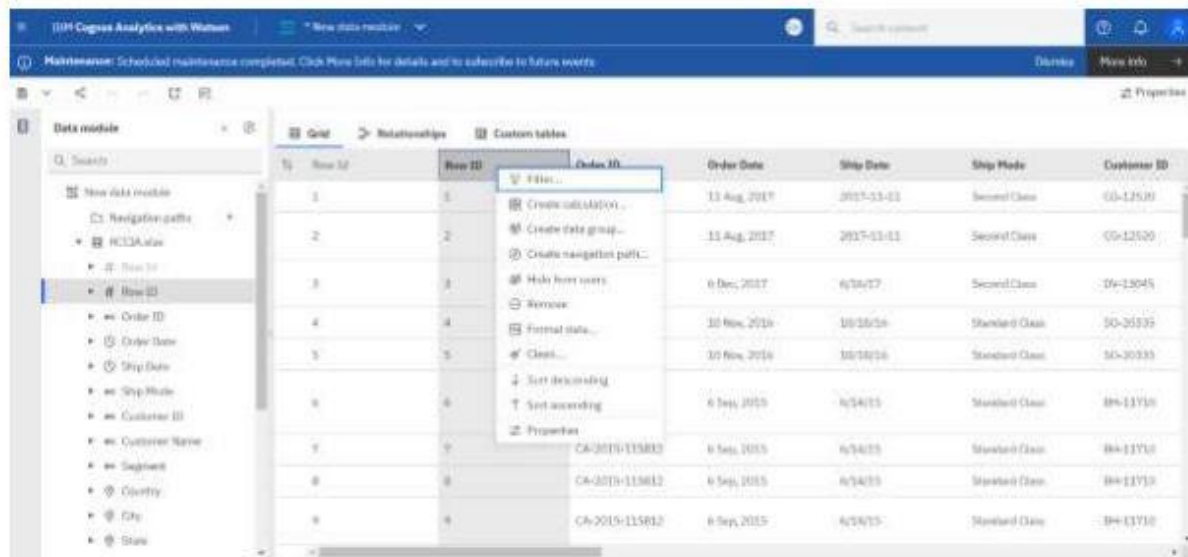


CLEANING ROW ID

The screenshot shows the IBM Cognos Analytics with Watson interface. The main content area displays a data table with the following columns: Row ID, Order ID, Order Date, Ship Date, Ship Mode, and Customer ID. The table contains 8 rows of data. The left sidebar shows the "Data module" with a tree view of the data source hierarchy. The "Row ID" column is highlighted in the table.

Row ID	Order ID	Order Date	Ship Date	Ship Mode	Customer ID
1	CA-2017-102106	11 Aug. 2017	2017-11-11	Second Class	CG-12120
2	CA-2017-157136	11 Aug. 2017	2017-11-11	Second Class	CG-12520
3	CA-2017-110688	6 Sep. 2017	6/5/17	Second Class	DN-11045
4	US-2016-108966	10 Nov. 2016	10/16/16	Standard Class	SO-10335
5	US-2016-108966	10 Nov. 2016	10/16/16	Standard Class	SO-20235
6	CA-2015-113612	6 Sep. 2015	6/5/15	Standard Class	BP-11710
7	CA-2015-113612	6 Sep. 2015	6/5/15	Standard Class	BP-11710
8	CA-2015-113612	6 Sep. 2015	6/5/15	Standard Class	BP-11710

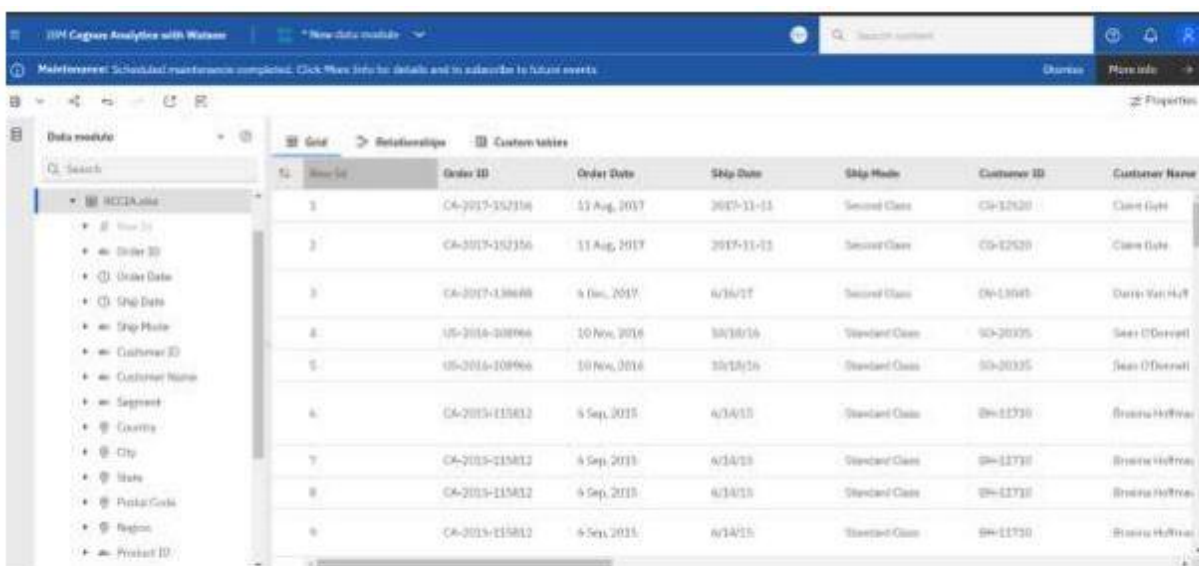
REMOVING ROW ID WITH DUPLICATES



The screenshot shows the IBM Cognos Analytics interface. A data grid is displayed with columns: Row ID, Order ID, Order Date, Ship Date, Ship Mode, and Customer ID. The 'Row ID' column contains values 1 through 9. A context menu is open over the 'Row ID' column, showing options like 'Edit...', 'Create calculated column...', 'Create data group...', 'Create navigation path...', 'Hide from users', 'Remove', 'Format data...', 'Clear...', 'Sort ascending', 'Sort descending', and 'Properties'. The 'Remove' option is highlighted.

Row ID	Order ID	Order Date	Ship Date	Ship Mode	Customer ID
1		11 Aug, 2017	2017-11-11	Second Class	CG-12520
2		11 Aug, 2017	2017-11-11	Second Class	CG-12520
3		6 Dec, 2017	6/16/17	Second Class	CG-12520
4		10 Nov, 2016	10/10/16	Standard Class	SO-20335
5		10 Nov, 2016	10/10/16	Standard Class	SO-20335
6		6 Sep, 2015	6/14/15	Standard Class	BM-11710
7		6 Sep, 2015	6/14/15	Standard Class	BM-11710
8		6 Sep, 2015	6/14/15	Standard Class	BM-11710
9		6 Sep, 2015	6/14/15	Standard Class	BM-11710

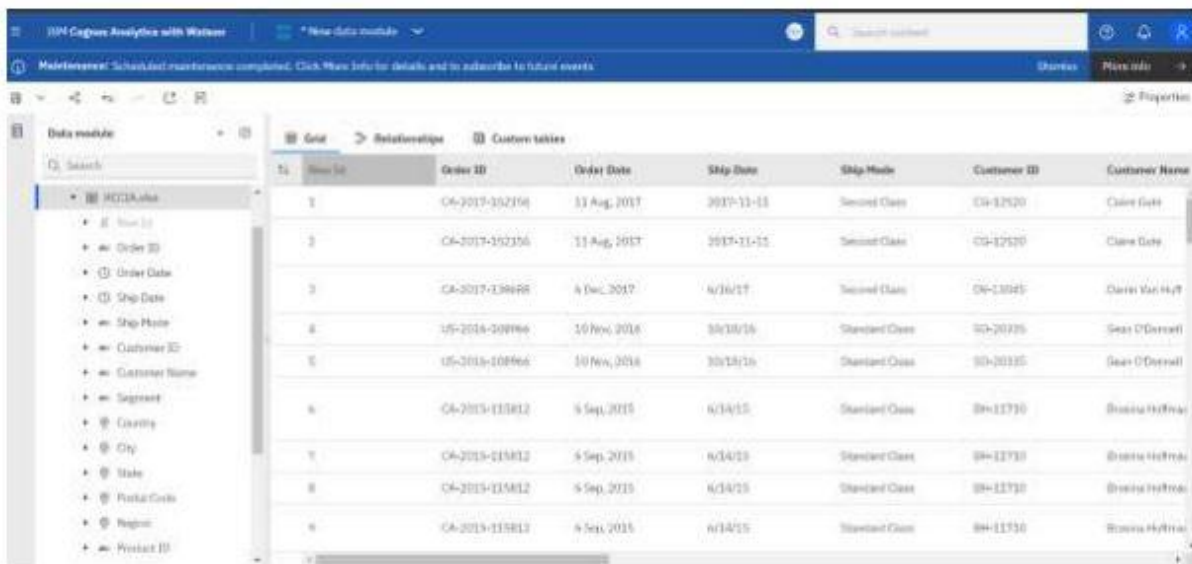
SUCCESSFULLY REMOVED ROW ID



The screenshot shows the IBM Cognos Analytics interface after the 'Row ID' column has been removed. The data grid now has columns: Order ID, Order Date, Ship Date, Ship Mode, Customer ID, and Customer Name. The data is sorted by Order ID.

Order ID	Order Date	Ship Date	Ship Mode	Customer ID	Customer Name
CA-2017-152356	11 Aug, 2017	2017-11-11	Second Class	CG-12520	Clara Lyle
CA-2017-152356	11 Aug, 2017	2017-11-11	Second Class	CG-12520	Clara Lyle
CA-2017-138688	6 Dec, 2017	6/16/17	Second Class	CG-12520	Doris Van Hout
US-2016-108966	10 Nov, 2016	10/10/16	Standard Class	SO-20335	Sean O'Donnell
US-2016-108966	10 Nov, 2016	10/10/16	Standard Class	SO-20335	Sean O'Donnell
CA-2015-115812	6 Sep, 2015	6/14/15	Standard Class	BM-11710	Bronia Hoffman
CA-2015-115812	6 Sep, 2015	6/14/15	Standard Class	BM-11710	Bronia Hoffman
CA-2015-115812	6 Sep, 2015	6/14/15	Standard Class	BM-11710	Bronia Hoffman
CA-2015-115812	6 Sep, 2015	6/14/15	Standard Class	BM-11710	Bronia Hoffman

CLEANING ORDER ID



IBM Cognos Analytics with Watson

Search

Dashboard

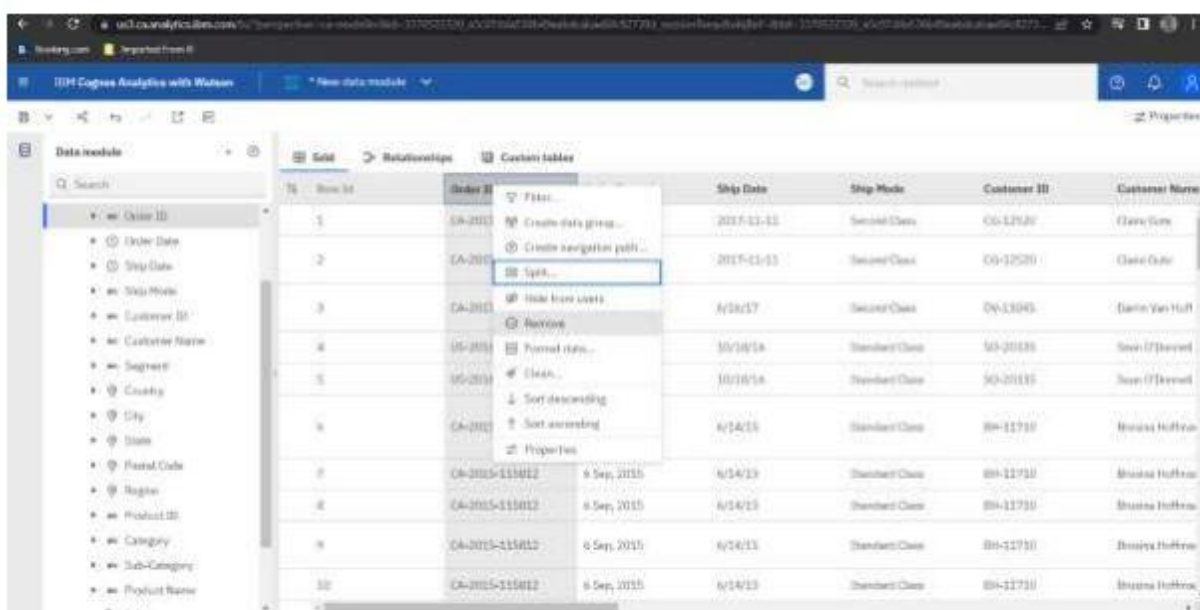
Properties

Data module

Grid Relationships Custom tables

Row ID	Order ID	Order Date	Ship Date	Ship Mode	Customer ID	Customer Name
1	CA-2017-102104	11 Aug. 2017	2017-11-11	Second Class	CG-12520	Clara Gule
2	CA-2017-102106	11 Aug. 2017	2017-11-11	Second Class	CG-12520	Clara Gule
3	CA-2017-139498	4 Dec. 2017	4/16/17	Second Class	DA-13045	Darin Van Huff
4	US-2018-108966	10 Nov. 2018	10/18/18	Standard Class	SG-20135	Sean O'Donnell
5	US-2018-108966	10 Nov. 2018	10/18/18	Standard Class	SG-20135	Sean O'Donnell
6	CA-2015-115812	6 Sep. 2015	6/14/15	Standard Class	BH-11730	Bruce Hoffman
7	CA-2015-115812	6 Sep. 2015	6/14/15	Standard Class	BH-11730	Bruce Hoffman
8	CA-2015-115812	6 Sep. 2015	6/14/15	Standard Class	BH-11730	Bruce Hoffman
9	CA-2015-115813	6 Sep. 2015	6/14/15	Standard Class	BH-11730	Bruce Hoffman

REMOVING ORDER ID



IBM Cognos Analytics with Watson

Search

Dashboard

Properties

Data module

Grid Relationships Custom tables

Row ID	Order ID	Order Date	Ship Date	Ship Mode	Customer ID	Customer Name
1	CA-2017	2017-11-11	2017-11-11	Second Class	CG-12520	Clara Gule
2	CA-2017	2017-11-11	2017-11-11	Second Class	CG-12520	Clara Gule
3	CA-2017	4 Dec. 2017	4/16/17	Second Class	DA-13045	Darin Van Huff
4	US-2018	10 Nov. 2018	10/18/18	Standard Class	SG-20135	Sean O'Donnell
5	US-2018	10 Nov. 2018	10/18/18	Standard Class	SG-20135	Sean O'Donnell
6	CA-2015	6 Sep. 2015	6/14/15	Standard Class	BH-11730	Bruce Hoffman
7	CA-2015-115812	6 Sep. 2015	6/14/15	Standard Class	BH-11730	Bruce Hoffman
8	CA-2015-115812	6 Sep. 2015	6/14/15	Standard Class	BH-11730	Bruce Hoffman
9	CA-2015-115812	6 Sep. 2015	6/14/15	Standard Class	BH-11730	Bruce Hoffman
10	CA-2015-115812	6 Sep. 2015	6/14/15	Standard Class	BH-11730	Bruce Hoffman

REMOVING SHIP DATE

The screenshot shows the IBM Cognos Analytics interface with a data module named 'New data module'. The 'Grid' tab is active, displaying a table with columns: TS, Row ID, Order Date, Ship Date, Customer ID, Customer Name, and Segment. A context menu is open over the 'Ship Date' column, with the 'Remove' option highlighted. The 'Data module' pane on the left lists various fields including Ship Date, Customer ID, Customer Name, Segment, Country, City, State, Postal Code, Region, Product ID, Category, Sub-Category, Product Name, Sales, Quantity, and Discount.

TS	Row ID	Order Date	Ship Date	Customer ID	Customer Name	Segment
1	1	11 Aug. 2017	2017	00-12520	Glenn Gable	Consumer
2	2	11 Aug. 2017	2017	00-12520	Glenn Gable	Consumer
3	3	6 Dec. 2017	6/14/17	09-13045	Bernie Van Hult	Corporate
4	4	10 Nov. 2016	10/18	50-20329	Sean O'Sneill	Consumer
5	5	10 Nov. 2016	10/18	50-20329	Sean O'Sneill	Consumer
6	6	6 Sep. 2015	6/14/15	89-11710	Bronius Hoffman	Consumer
7	7	6 Sep. 2015	6/14/15	89-11710	Bronius Hoffman	Consumer
8	8	6 Sep. 2015	6/14/15	89-11710	Bronius Hoffman	Consumer
9	9	6 Sep. 2015	6/14/15	89-11710	Bronius Hoffman	Consumer
10	10	6 Sep. 2015	6/14/15	89-11710	Bronius Hoffman	Consumer

REMOVING CUSTOMER ID

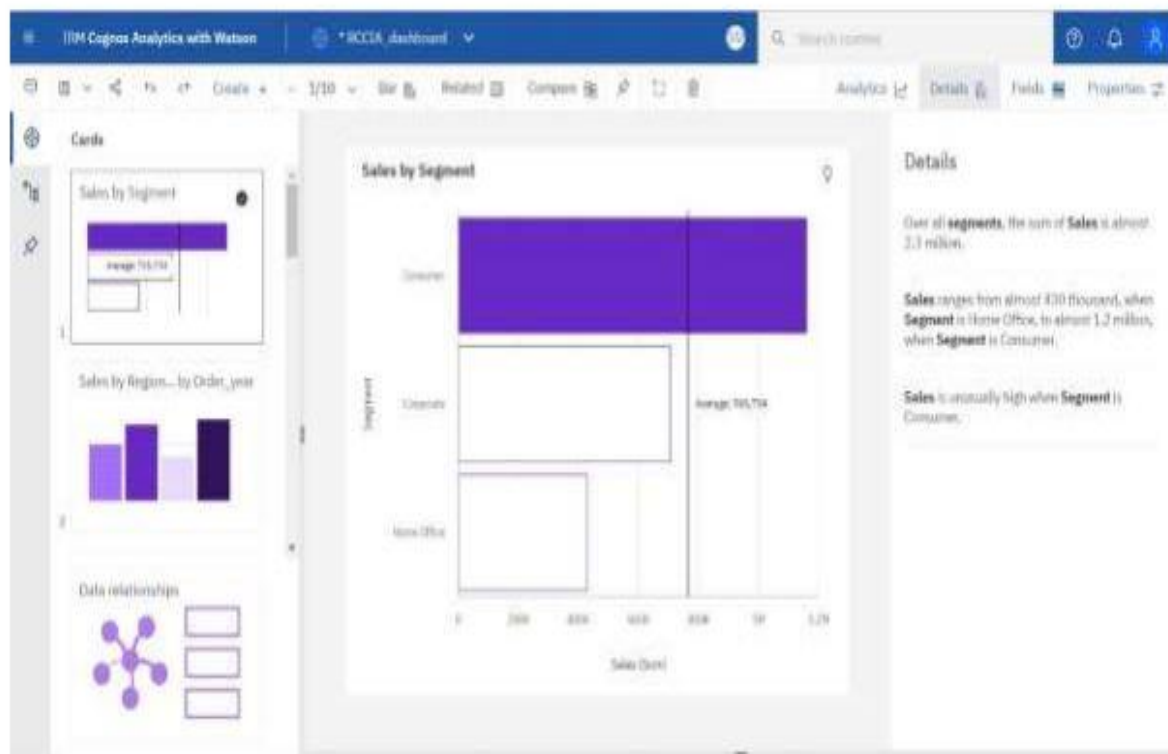
The screenshot shows the IBM Cognos Analytics interface with the same data module. The 'Grid' tab is active, displaying a table with columns: TS, Row ID, Order Date, Ship Mode, Customer ID, Customer Name, Segment, and Country. A context menu is open over the 'Customer ID' column, with the 'Remove' option highlighted. The 'Data module' pane on the left lists various fields including Ship Mode, Customer ID, Customer Name, Segment, Country, City, State, Postal Code, Region, Product ID, Category, Sub-Category, Product Name, Sales, Quantity, Discount, and Profit.

TS	Row ID	Order Date	Ship Mode	Customer ID	Customer Name	Segment	Country
1	1	11 Aug. 2017	Second Class	00-12520		Consumer	United States
2	2	11 Aug. 2017	Second Class	00-12520		Consumer	United States
3	3	6 Dec. 2017	Second Class	09-13045		Corporate	United States
4	4	10 Nov. 2016	Standard Class	50-20329		Consumer	United States
5	5	10 Nov. 2016	Standard Class	50-20329		Consumer	United States
6	6	6 Sep. 2015	Standard Class	89-11710		Consumer	United States
7	7	6 Sep. 2015	Standard Class	89-11710	Bronius Hoffman	Consumer	United States
8	8	6 Sep. 2015	Standard Class	89-11710	Bronius Hoffman	Consumer	United States
9	9	6 Sep. 2015	Standard Class	89-11710	Bronius Hoffman	Consumer	United States
10	10	6 Sep. 2015	Standard Class	89-11710	Bronius Hoffman	Consumer	United States

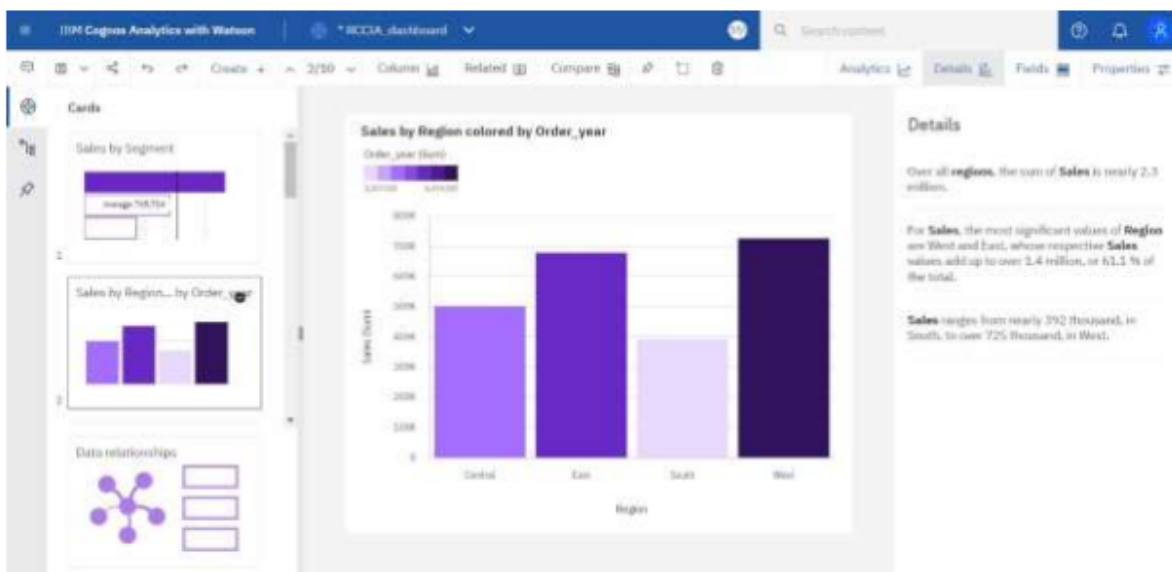
4.1.2 MODULE 2

DATA EXPLORATION

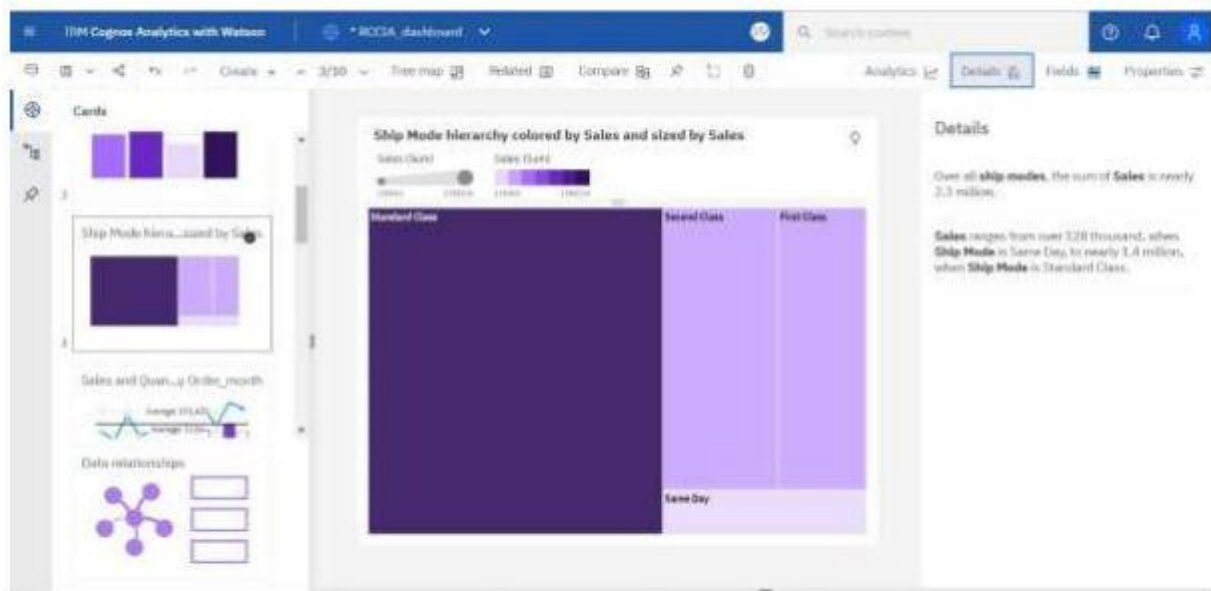
SALES BY SEGMENT



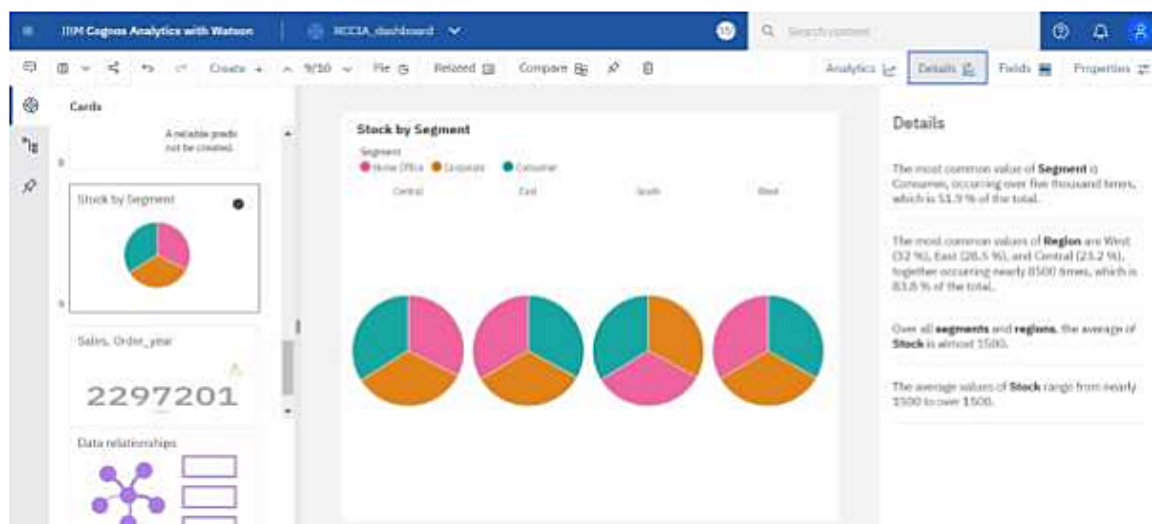
SALES BY REGION COLORED BY ORDER YEAR



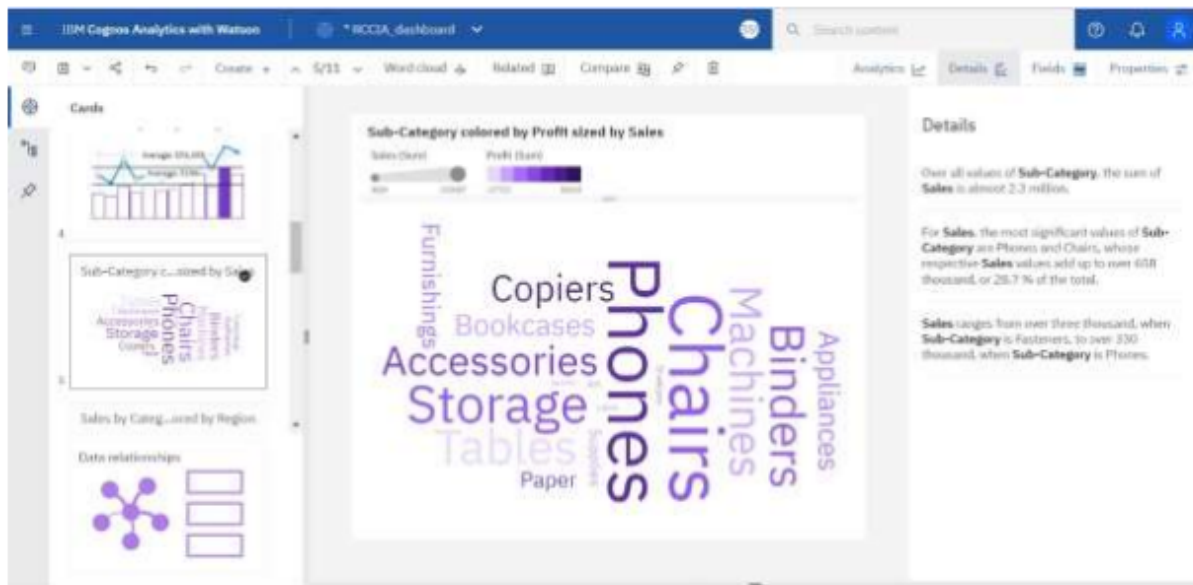
SHIP MODE HIERARCHY COLORED BY SALES AND SIZED BY SALES



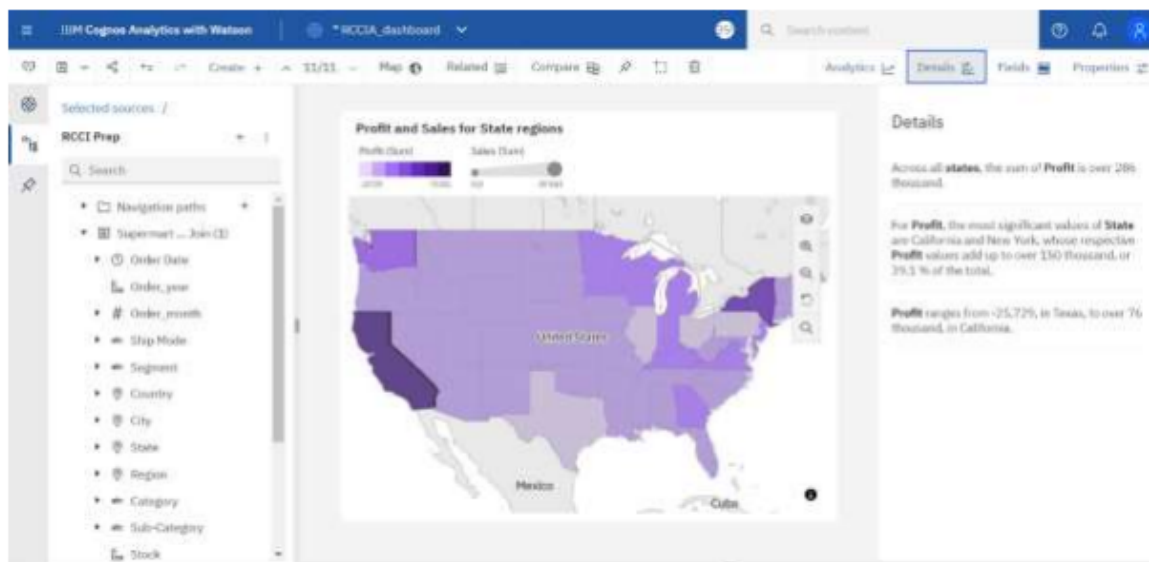
STOCK BY SEGMENT



SUB CATEGORY COLORED BY PROFIT AND SIZED BY SALES



PROFIT AND SALES FOR STATE REGIONS



4.1.3 MODULE 3

DASHBOARD CREATION

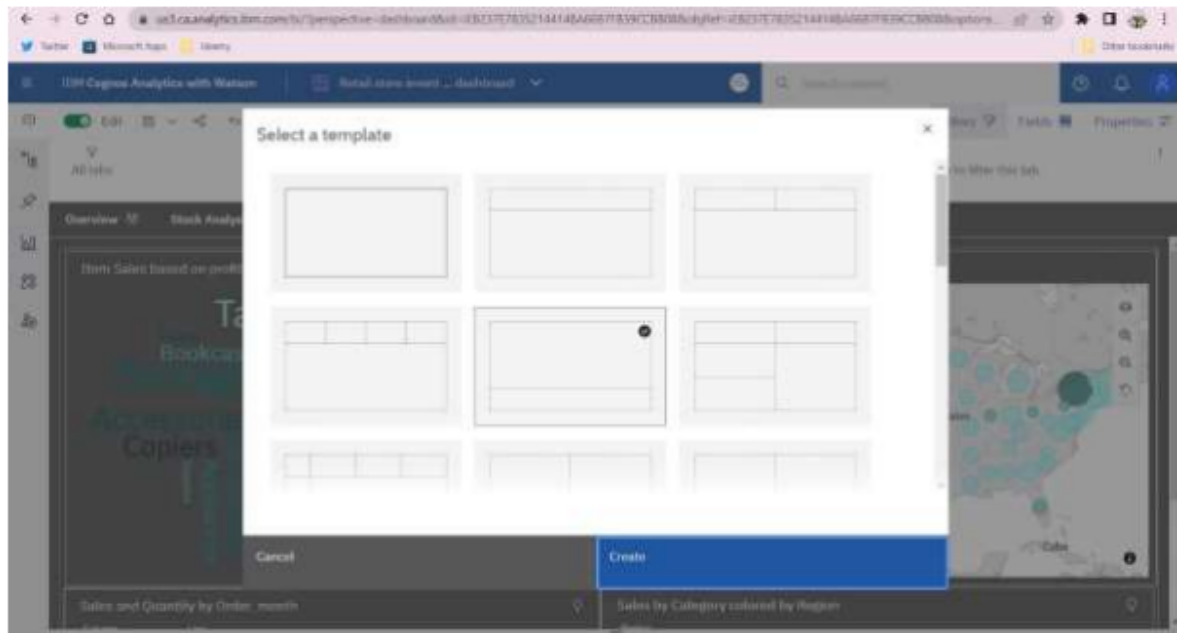
UPLOADED DATASET

Row ID	Order Date	Ship Date	Ship Mode	Segment	State	Region	Category	Sub-Category	Sales	Stock	Quantity	Discount	Profit
1	11-Aug-2017	11-Nov-2017	Second Class	Consumer	Kentucky	South	Furniture	Bookcases	\$261.96	1254	2	0%	\$41.91
2	11-Aug-2017	11-Nov-2017	Second Class	Consumer	Kentucky	South	Furniture	Chairs	\$731.94	749	3	0%	\$219.58
3	6-Dec-2017	16-Jun-2017	Second Class	Corporate	California	West	Office Supplies	Labels	\$14.62	2360	2	0%	\$6.87
4	10-Nov-2016	18-Oct-2016	Standard Class	Consumer	Florida	South	Furniture	Tables	\$957.59	896	5	45%	\$383.03
5	10-Nov-2016	18-Oct-2016	Standard Class	Consumer	Florida	South	Office Supplies	Storage	\$22.37	2355	2	20%	\$2.52
6	6-Sep-2015	14-Jun-2015	Standard Class	Consumer	California	West	Furniture	Furnishings	\$48.86	2305	7	0%	\$14.17
7	6-Sep-2015	14-Jun-2015	Standard Class	Consumer	California	West	Office Supplies	Art	\$7.28	826	4	0%	\$1.97
8	6-Sep-2015	14-Jun-2015	Standard Class	Consumer	California	West	Technology	Phones	\$907.15	1847	6	20%	\$90.72
9	6-Sep-2015	14-Jun-2015	Standard Class	Consumer	California	West	Office Supplies	Binders	\$18.50	791	3	20%	\$5.78
10	6-Sep-2015	14-Jun-2015	Standard Class	Consumer	California	West	Office Supplies	Appliances	\$114.90	1795	8	0%	\$34.47
11	6-Sep-2015	14-Jun-2015	Standard Class	Consumer	California	West	Furniture	Tables	\$1,706.18	1903	9	20%	\$85.31
12	6-Sep-2015	14-Jun-2015	Standard Class	Consumer	California	West	Technology	Phones	\$911.42	701	4	20%	\$68.36
13	15-Apr-2018	20-Apr-2018	Standard Class	Consumer	North Carolina	South	Office Supplies	Paper	\$15.55	1659	3	20%	\$5.44
14	12-May-2017	12-Oct-2017	Standard Class	Consumer	Washington	West	Office Supplies	Binders	\$407.99	1277	3	20%	\$132.59
15	22-Nov-2016	26-Nov-2016	Standard Class	Home Office	Texas	Central	Office Supplies	Appliances	\$68.81	831	5	80%	\$123.86
16	22-Nov-2016	26-Nov-2016	Standard Class	Home Office	Texas	Central	Office Supplies	Binders	\$2.54	1440	3	80%	\$-53.82
17	11-Nov-2015	18-Nov-2015	Standard Class	Consumer	Wisconsin	Central	Office Supplies	Storage	\$665.88	1678	6	0%	\$13.32
18	13-May-2015	15-May-2015	Second Class	Consumer	Utah	West	Office Supplies	Storage	\$55.50	1617	2	0%	\$9.99
19	27-Aug-2015	9-Jun-2015	Second Class	Consumer	California	West	Office Supplies	Art	\$8.56	1757	2	0%	\$2.48
20	27-Aug-2015	9-Jun-2015	Second Class	Consumer	California	West	Technology	Phones	\$213.48	492	3	20%	\$16.01
21	27-Aug-2015	9-Jun-2015	Second Class	Consumer	California	West	Office Supplies	Binders	\$22.72	522	4	20%	\$7.38
22	12-Sep-2017	13-Dec-2017	Standard Class	Corporate	Nebraska	Central	Office Supplies	Art	\$19.46	948	7	0%	\$5.06

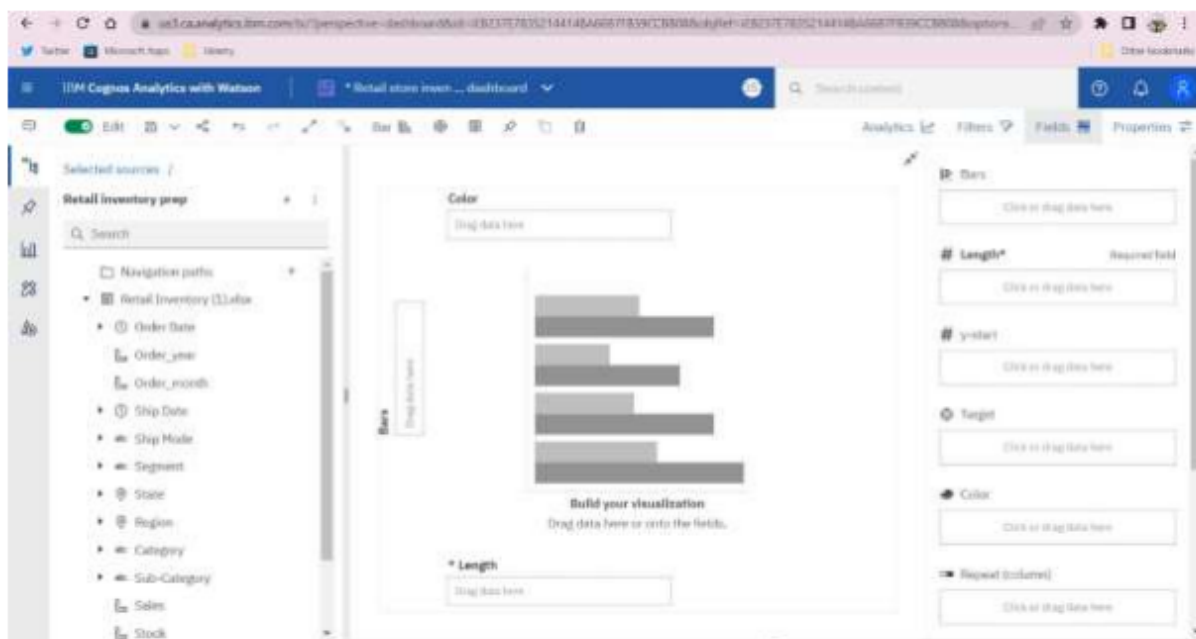
SUB CATEGORY AND SUM OF SALES

Sub-category	SUM of Sales
Accessories	\$167,380.32
Appliances	\$107,532.16
Art	\$27,118.79
Binders	\$203,412.73
Bookcases	\$114,880.00
Chairs	\$328,449.10
Copiers	\$149,528.03
Envelopes	\$16,476.40
Fasteners	\$3,024.28
Furnishings	\$91,705.16
Labels	\$12,486.31
Machines	\$189,238.63
Paper	\$78,479.21
Phones	\$330,007.05
Storage	\$223,843.61
Supplies	\$46,673.54
Tables	\$206,965.53
Grand Total	\$2,297,200.86

TEMPLATE SELECTION



CHOOSE VISUALIZATION TYPE



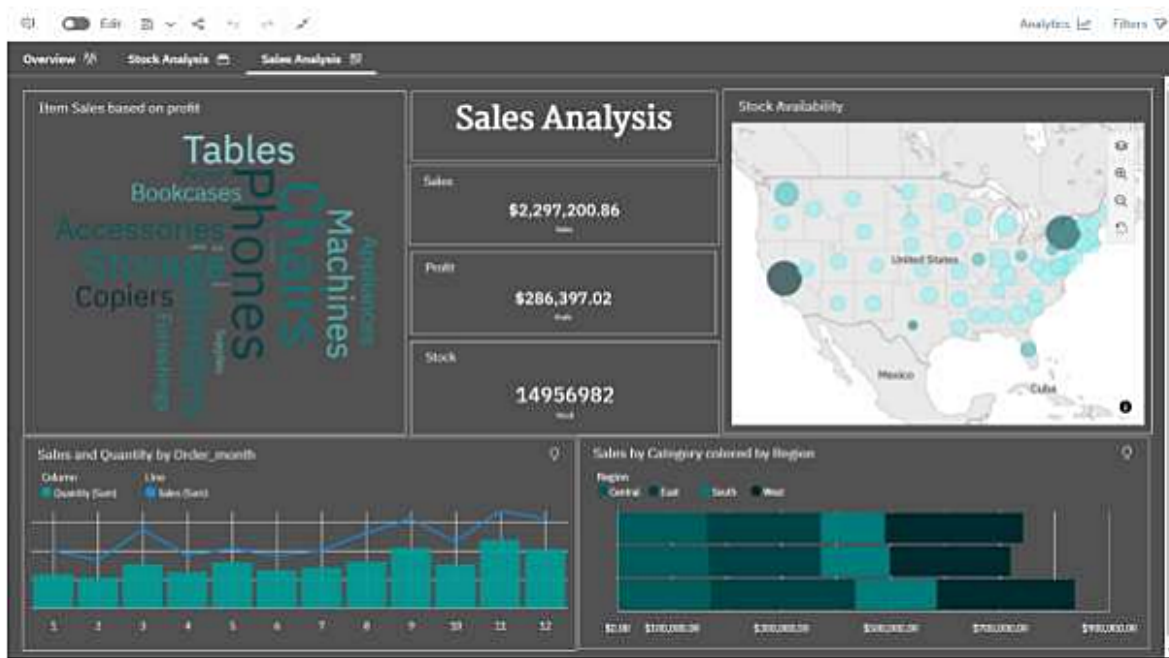
Page No : 34



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SALES ANALYSIS



STORY

My IBM | Create story | Sent Mail - achuavitha123@psn | +

us3.ca.analytics.ibm.com/bi/?perspective=createStory

IBM Cognos Analytics with Watson | Create story

Maintenance: Scheduled maintenance completed. Click More Info for details and to subscribe to future events

Create a story

Select a template for your story

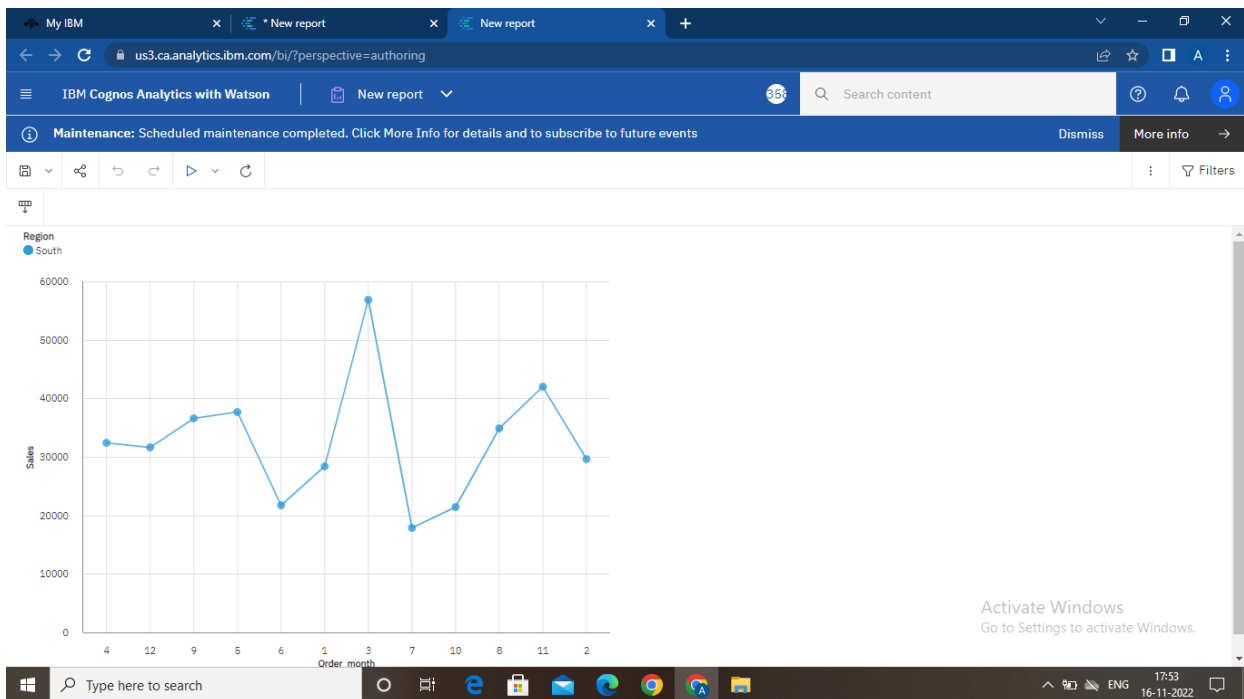
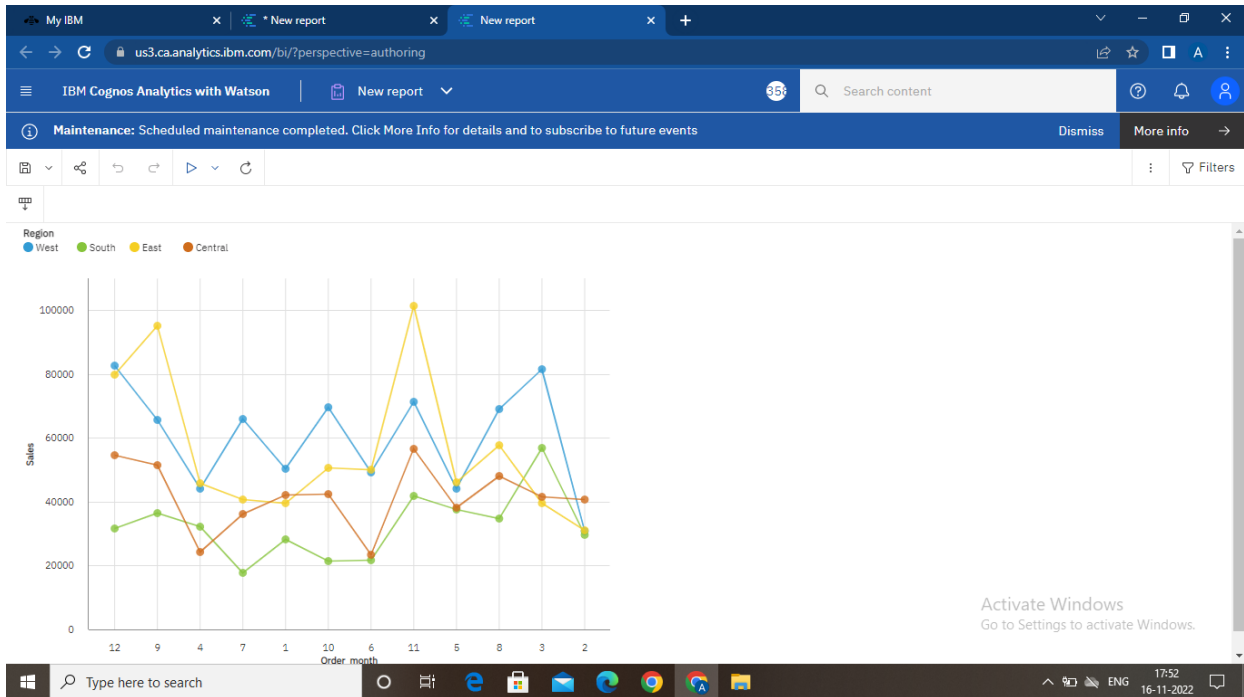
Cancel Create

Guided journey ⓘ

Activate Windows
Go to Settings to activate Windows.

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4.2 TESTING

System testing is the stage of implementation, which aims at ensuring that the system works accurately and efficiently before the live operation commences. Testing is the process of executing a program with the intent of finding errors. A good test case is one that has a probability of finding a yet undiscovered error. Testing is vital to the success of the system. System testing makes a logical assumption that if all parts of the system are correct, the goal will be successfully achieved. The candidate system is subjected to a variety of test-on-line response, security and usability testing. A series of tests are performed before the system is ready for user acceptance testing.

4.2.1 UNIT TESTING

A unit testing focuses verification efforts on the smallest unit of software design. It comprises the set of tests performed by an individual programmer prior to integration of the unit into a larger system. In this testing step, each module is found to be working satisfactorily as regard to the unexpected output from the module. Unit testing of each module is shown below.

4.2.2 INTEGRATION TESTING

Testing is done for each module. After testing all the modules, the modules are integrated and testing of the final system is done with the test data, specially designed to show that the system will operate successfully in all its aspects conditions. Thus the system testing is a confirmation that all is correct and an opportunity to show the user that the system works.

4.2.3 VALIDATION TESTING

The final step involves Validation testing, which determines whether the software functions as the user expected. The end-user rather than the system developer conducts this test for most software developers as a process called “Alpha and Beta Testing” to uncover that only the end user seems able to find. The compilation of the entire project is based on the full satisfaction of the end users. In the project, validation testing is made in various forms. In registration form Email id, phone number and also mandatory fields for the user is verified.

4.2.4 VERIFICATION TESTING

Verification is a fundamental concept in software design. This is the bridge between customer requirements and an implementation that satisfies those requirements. This is verifiable if it can be demonstrated that the testing will result in an implementation that satisfies the customer requirements. Inadequate testing or non-testing leads to errors that may appear a few months later. This will create two problems: Time delay between the cause and appearance of the problem. The effect of the system errors on files and records within the system.

CHAPTER 5

CONCLUSION

5.1 CONCLUSION

For the success of the program, the managers of the retail stores must formulate a modern way of managing the inventory by instituting electronic systems to take care of the resources of the company. This ensures that they can be accounted for and there are proper records available all the time for reference to be made when the need arises. Besides, the retail management system is necessary for ensuring that there is accountability in the way the company handles its stock. It helps in saving time. Retail companies have acquired significant importance within several countries due to their high economic contribution. Therefore, the need to analyze their KPIs becomes highly significant, as well as their different systems, methodologies, and tools used within inventory management and optimization. From the aspects mentioned above, the main trends in inventory management within companies were defined.

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