

# **INVENTORY MANAGEMENT USING IBM COGNOS ANALYTICS**

## **PROJECT REPORT**

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# **Introduction**

## **Overview**

This dataset contains a lot of historical sales data of a Brazilian top retailer. Basic questions of every retailer: How much inventory should I carry? Too much inventory means working capital costs, operational costs and a complex operation, lack of inventory leads to lost sales, unhappy customers and a damaged brand.

This is why short-term forecasting is so important in the retail and consumer goods industry.

## **Purpose**

The aim of this project is to use one such sales data in order to understand the relation between sales, profit, and stock. We will observe the dependencies of these factors on one another and find out the ways to get maximum profit.

We will use IBM Cognos to refine and analyze the data and answer to the problems of the retailers.

# **Literature Survey**

## **Existing Problems**

### **1. Data Collection:**

Data collection is a major problem, as data is required for the analysis and calculation of the desired results. We need genuine and accurate data in adequate amount for this purpose.

### **2. Cleaning the data:**

The data that we have need to be refined first. We need to remove the duplicate entries and remove the sections not required. Data cleaning is essential as it saves time and confusion while data analysis.

### **3. Analyzing the data**

After we get the required data it is necessary to analyze it properly so that we can derive the right conclusions from it. We need to find the relation between the various fields of the data using various analyzing tools.

### **4. Data representation and conclusion:**

The results that we find from the analysis needs to be presented in a manner that it is easily understandable by others and the conclusions can be derived from it. We also need to forecast the future values in the dataset.

## **Proposed Solutions**

We will be using the IBM Cognos tool for this purposes which will solve almost all of our problems.

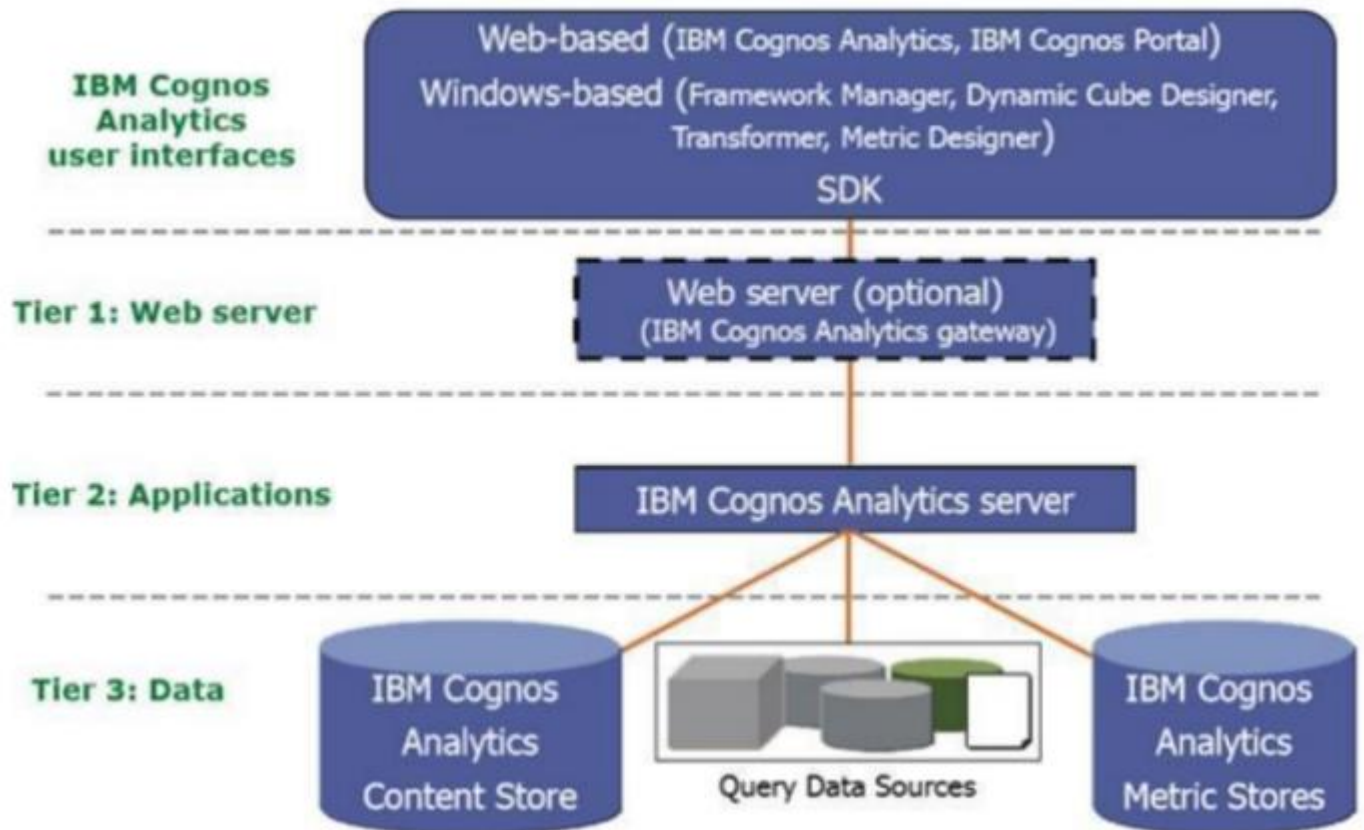
It has the data refining feature where we can clean our data for analyzing purpose.

We can analyze the data properly by using the number of data analytic tools available there and get a clear insight of the data.

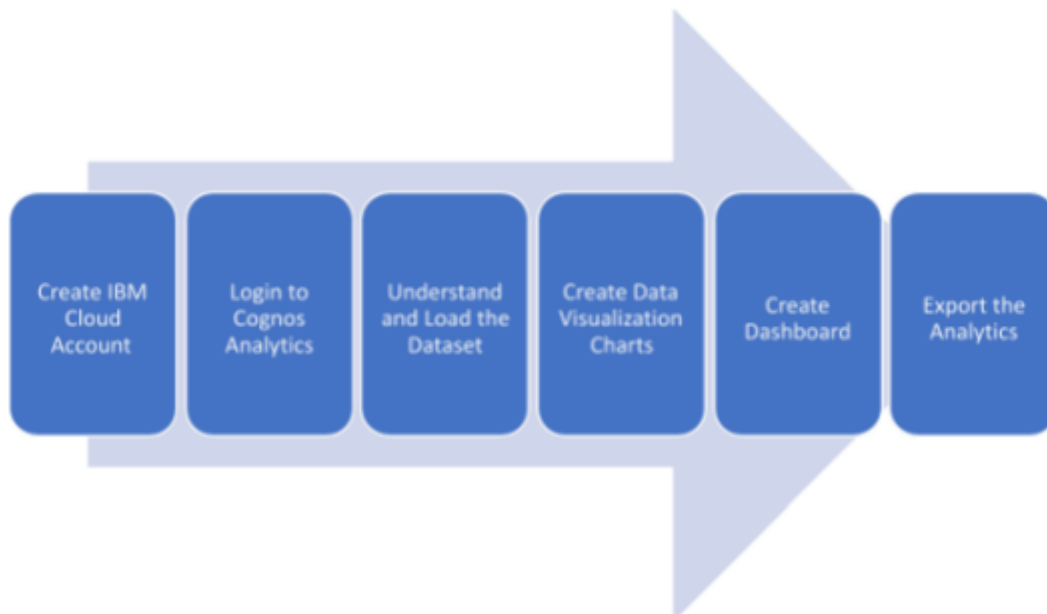
The IBM Cognos tool will also help us to forecast the future from the present data analytics and derive accurate conclusions.

# Theoretical Analysis

## IBM Cognos Analytics architecture (high level)



## Flowchart

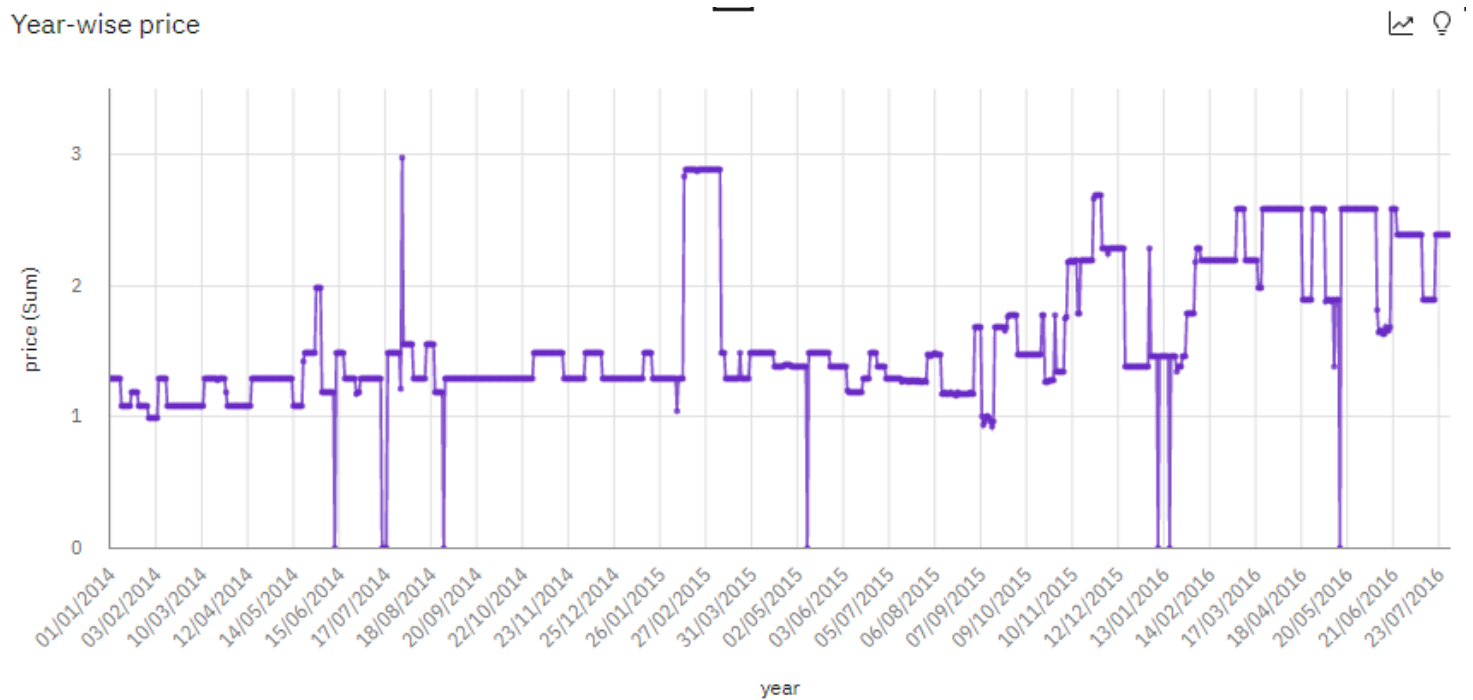


## Result

- **Year Wise Price Using Line Graph**

This plot between year on the x-axis and price on the y-axis shows the fluctuation in the price value with change in date.

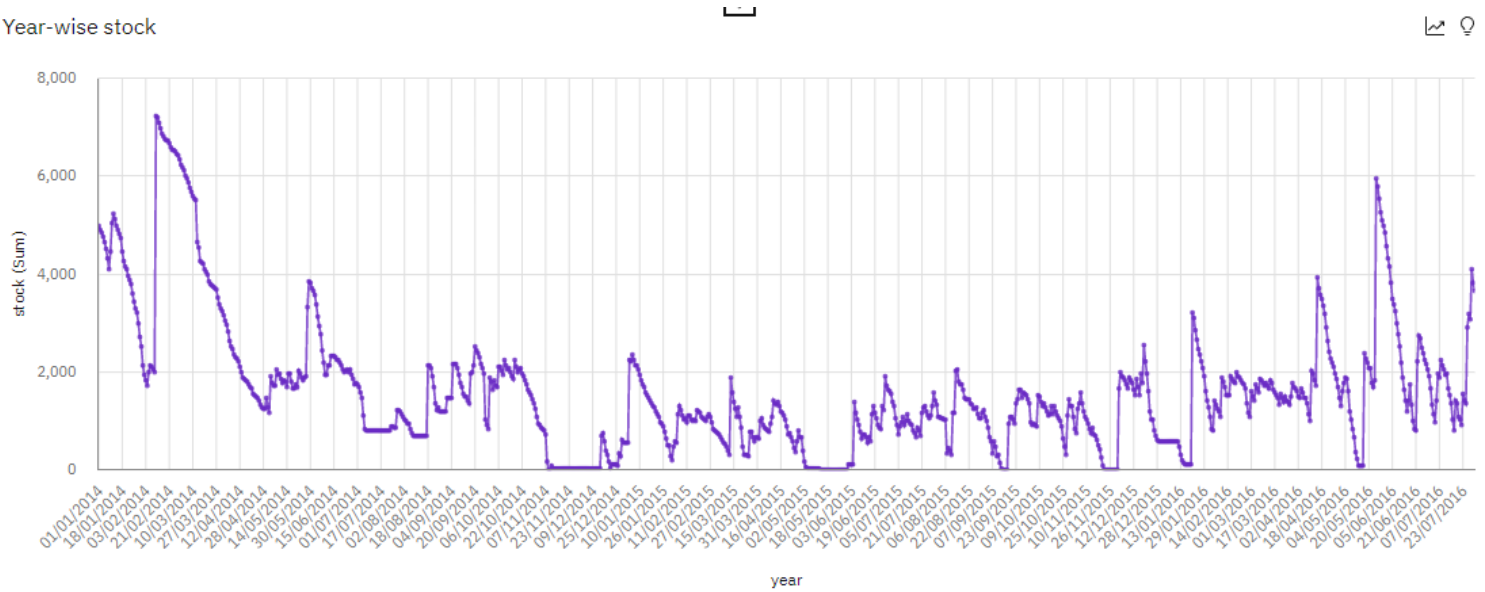
We can see the maximum and the minimum values of price and also the different values of price at different time of the year.



- **Year Wise Stock Using Line Graph**

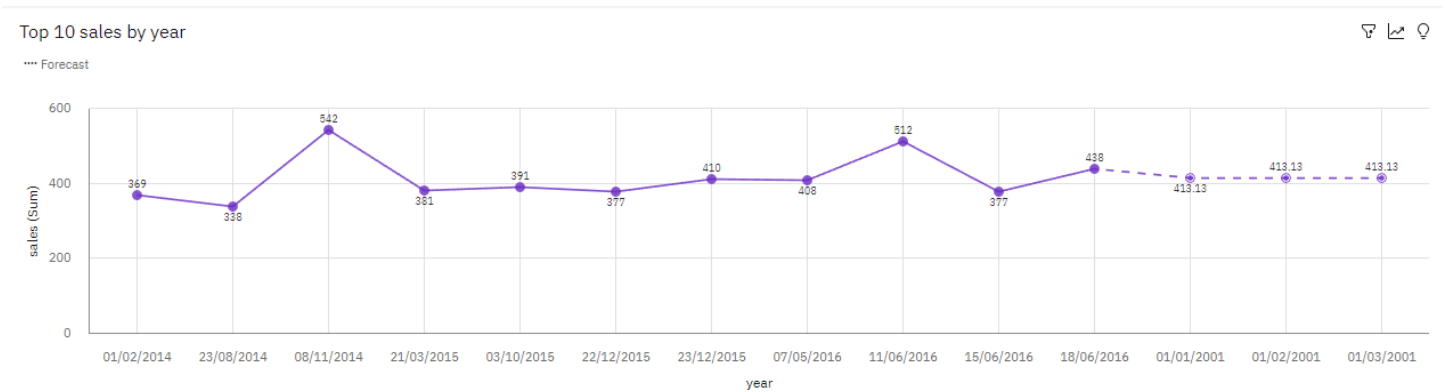
Same as previous graph this graph shows the relation between stock and year. It shows the amount of stock kept during different time periods.

Year-wise stock



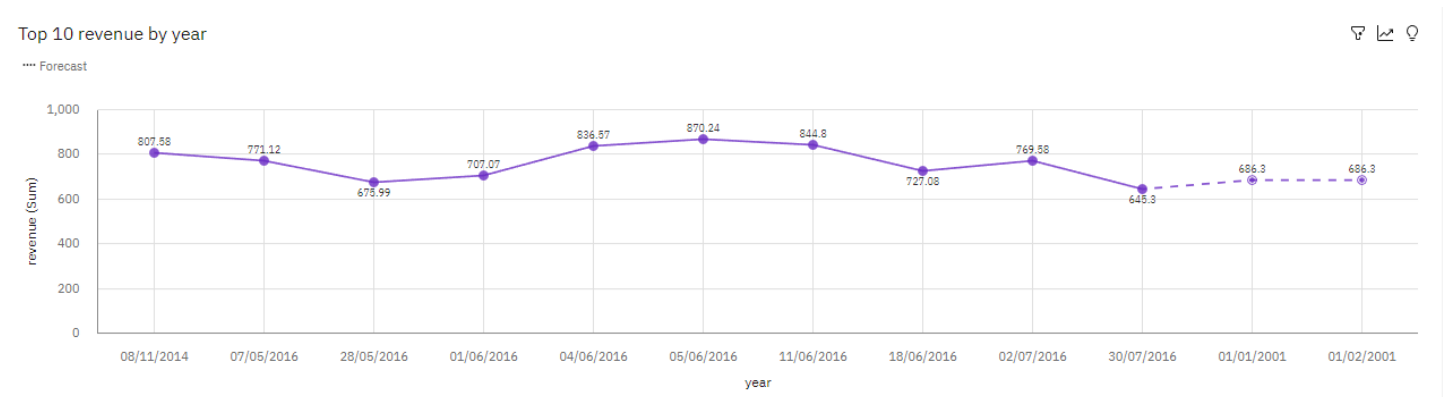
- **Top10 Sales By Year Using Line Graph**

This graph plots the top 10 sales values with date and also predicts the further values.



- **Top10 Revenue by Year Using Line Graph**

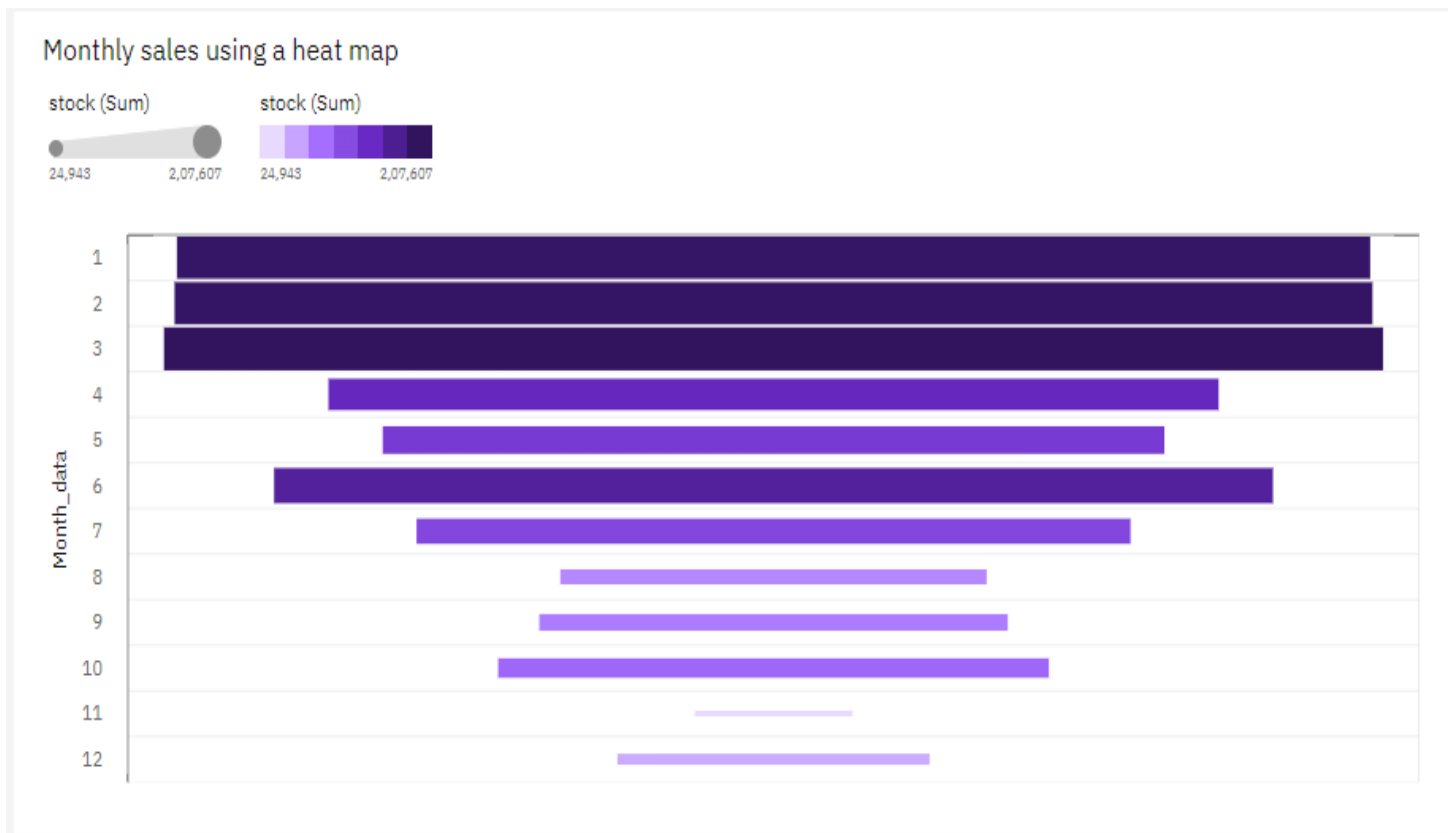
This graph plots the top 10 revenue values with date and also predicts the further values.





- **Monthly Stock Using Heat Map**

Here we have used a heat map to show the amount of stock with respect to the months.

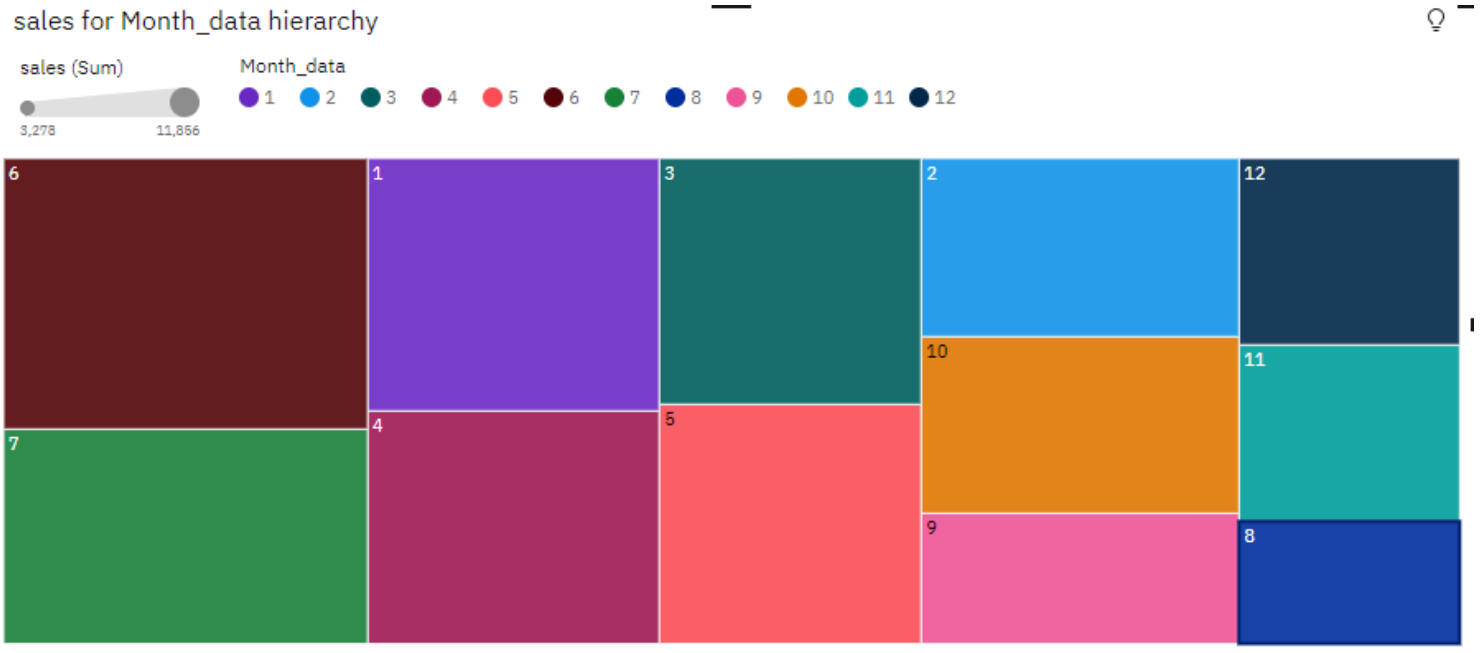


- **Monthly Sales Using Tree Map**

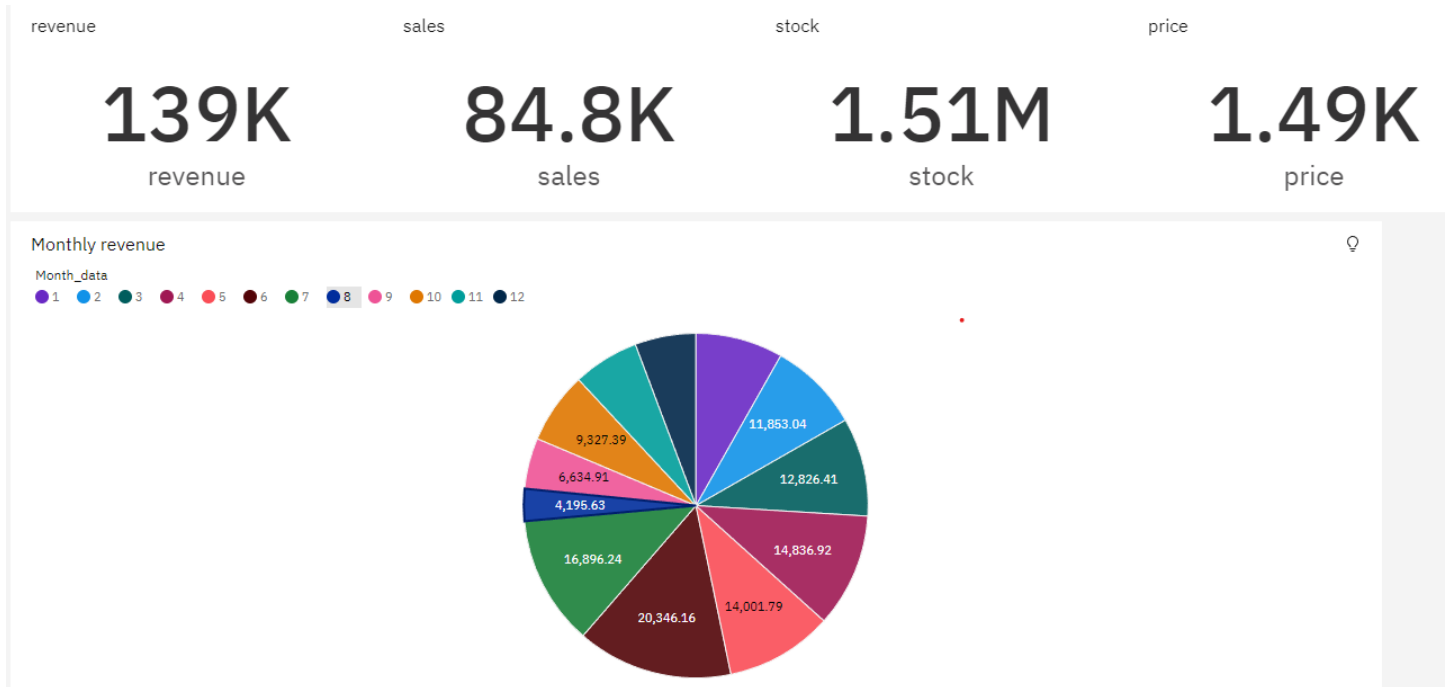
Here the different boxes represent the different amount of sales in the different months.

The results that we obtained here were that

- a) The average values of sales were 7069
- b) And the values of sales is most unusual in the 6 and 8 months.



- **Monthly Revenue by Pie Chart and Summary Cards of Total Revenue, Sales, Stock, Price**



## Dashboard Creation

Here is the link to the dashboard created on the IBM Cognos.

**[https://eu2.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.my\\_folders%2FInventory%2Bmanagement%2Bdashboard&action=view&mode=dashboard](https://eu2.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.my_folders%2FInventory%2Bmanagement%2Bdashboard&action=view&mode=dashboard)**

# Advantages and Disadvantages

## Advantages

### ●Data analytics helps an organization make better decisions

Analytics can help with transforming the data that is available into valuable information for executives so that better decisions can be made. This can be a source of competitive advantage if fewer poor decisions are made since poor decisions can have a negative impact on a number of areas including company growth and profitability.

### ●Increase the efficiency of the work

Analytics can help analyse large amounts of data quickly and display it in a formulated manner to help achieve specific organizational goals. It encourages a culture of efficiency and teamwork by allowing the managers to share the insights from the analytics results to the employees. The gaps and improvement areas within a company become evident and actions can be taken to increase the overall efficiency of the workplace thereby increasing productivity.

### ●Personalization of products and services

Analytics can help companies keep track of what kind of service, product, or content is preferred by the customer and then show the recommendations based on their preferences. For example, in social media, we usually see what we like to see, all of this is made possible due to the data collection and analytics that companies do. Data analytics can help provide targeted services to customers based on their individual requirements.

### ●Improving quality of products and services

Data analytics can help with enhancing the user experience by detecting and correcting errors or avoiding non-value-added tasks.

For example, selflearning systems can use data to understand the way customers are interacting with the tools and make appropriate changes to improve user experience.

## **Limitations**

### **●Lack of alignment within teams**

Data analytics may be done by a select set of team members and the analysis done may be shared with a limited set of executives. However, the insights generated by these teams are either of not much value or are having limited impact on organizational metrics.

The analytics team should be focused on answering the right questions for the business and the results generated by data analytics teams needs to be properly communicated to the right employees to drive the right set of actions and behaviours so that it can have an positive impact on the organization.

### **●Lack of commitment and patience**

Analytics solutions are not difficult to implement, however, they are costly, and the ROI is not immediate. Especially, if existing data is not available, it may take time to put processes and procedures in place to start collecting the data. By nature, the analytics models improve accuracy over time and require dedication to implement the solution. Since the business users do not see results immediately, they sometimes lose interest which results in loss of trust and the models fail.

### **●Privacy concerns**

Certain data collected can also be used against a person, country, or community. Organizations need to be cautious of what sort of data they are collecting from customers and ensure the security and confidentiality of the data. Only the data required for the analysis needs to be captured and if there is sensitive data, it needs to be anonymized so that sensitive data is protected.

## **Applications**

### **Transportation**

Data analytics can be applied to help in improving Transportation Systems and intelligence around them. The predictive method of the analysis helps find transport problems like Traffic or network congestions. It helps synchronize the vast amount of data and uses them to build and design plans and strategies to plan alternative routes, reduce congestions and traffics, which in turn reduces the number of accidents and mishappenings.

### **Logistics and Delivery**

There are different logistic companies like DHL, FedEx, etc that uses data analytics to manage their overall operations. Using the applications of data analytics, they can figure out the best shipping routes, approximate delivery times, and also can track the real-time status of goods that are dispatched using GPS trackers. Data Analytics has made online shopping easier and more demandable.

### **Web Search or Internet Web Results**

The web search engines like Yahoo, Bing, Duckduckgo, Google uses a set of data give you when you search a data. Whenever you hit on the search button, the search engines use algorithms of data analytics to deliver the best-searched results within a limited time frame. The set of data that appears whenever we search for any information is obtained through data analytics.

### **Security**

Data analyst provides utmost security to the organization; Security Analytics deals with online protection zeroed in on the examination of information to deliver proactive safety efforts. No business can foresee the future, particularly where security dangers are concerned, yet by sending security investigation apparatuses that can dissect security occasions it is conceivable to identify danger before it gets an opportunity to affect your framework and main concern.

## **Conclusion**

This way, with the help of diagrams, graphs, and maps we can understand given data. This understanding of data allows us to ask the right questions to reach our desired goals by optimizing methods. With this project, we learned how to upload and prepare data. We also statistical concepts which helped in calculations and plotting of graphs and maps to make a dashboard