

Sample Super Store Data Analytics using IBM Cognos Analytics

A PROJECT REPORT

Submitted by

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as a part

of

EXTERNSHIP PROGRAM

of

DATA ANALYTICS USING IBM COGNOS



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INTRODUCTION

OVERVIEW

A Super shop is a large retailer who stocks and sells a wide variety of merchandise including groceries, clothing and general supplies, or a large store that sells a massive quantity of goods in one product line such as electronics or shoes. Super shops are considerable supermarkets or shops selling household goods and equipment. Super shops are usually built outside city centers away from other shops. The best example of a superstore is Saravana Stores in Chennai. A superstore is also referred to as a super center or megastore. Super Shop is a special market with different specialty. Many categories of products is sold in a Super Store. The products are allocated with a highly qualified way.

PURPOSE

A Super Shop sell many products from numerous categories. The products also are shipped by transport agencies and ordered by numerous customers. To manage and analyze the data, we use IBM Cognos. We will be visualizing the following details using IBM Cognos Watson.

LITERATURE SURVEY

EXISTING PROBLEM

The traditional techniques for data analysis include:

1. **Descriptive:** Looking at the past data and identifying the pattern present in it.
2. **Diagnostic:** Finding the correlation, navigation of features, data discovery, data mining, etc.
3. **Predictive:** Involves prediction of future results using various algorithms (Regression, Forecasting, Predictive modelling)
4. **Prescriptive:** Involves graph analysis, simulation, complex event processing, etc

These processes needed to be hard-coded which takes time and complexity also increases as the data grows bigger while running in real-life.

PROPOSED SYSTEM

We try to do all these traditional data analysis in IBM Cognos Analytics where we can:

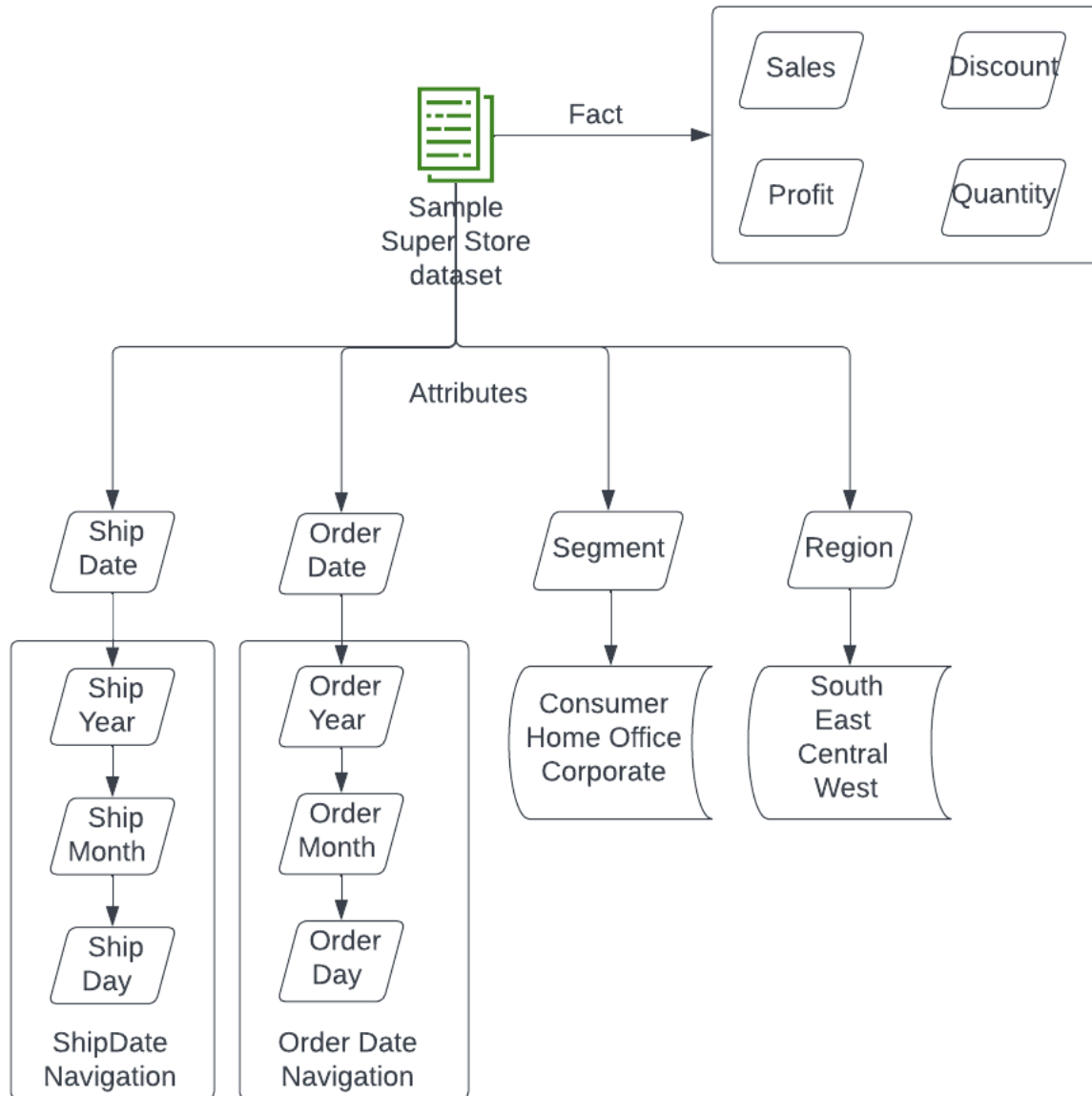
1. **Relevant and Accurate Reporting**
2. **Improve growth patterns**
3. **Time effective**
4. **Improved work efficiency with better accuracy**

We build different presentation modules where we can create a one-time dashboards, a report based dashboard, a story where it gets updated every week, etc.

We build a dashboard for analyzing a Super store data.

THEORETICAL ANALYSIS

BLOCK DIAGRAM



We have 4 facts/Measure (Sales, Profit, Discount, Quantity) in the dataset and 17 attributes. We create 4 navigation paths for Ship Date, Order Date, Product, Region. We also create new measures "Target Sales", "Min Sales", "Max Sales", "Middle Range Sales" by 120%, 90%, 110%, 95% of sales respectively.

HARDWARE USED

Laptop with Windows 7 + installed.

Processor: Intel i5-9300H

RAM: 4GB

SOFTWARE USED

IBM Cognos Analytics

Any web Browser (Google Chrome)

EXPERIMENTAL INVESTIGATION

CALCULATIONS FOR PREPROCESSING

a. Prepare Calculations of Year, Month, Day fields for **Order Dates** and **Ship Dates** and also the related **Navigation paths**.

b. Create Navigation Path of Location as :

Location -> Region, Country / Region, State, City, Postal Code

c. Create Navigation path of Product as :

Product -> Category, Sub-Category, Manufacturer, Product Name

d. Create Few more Calculations:

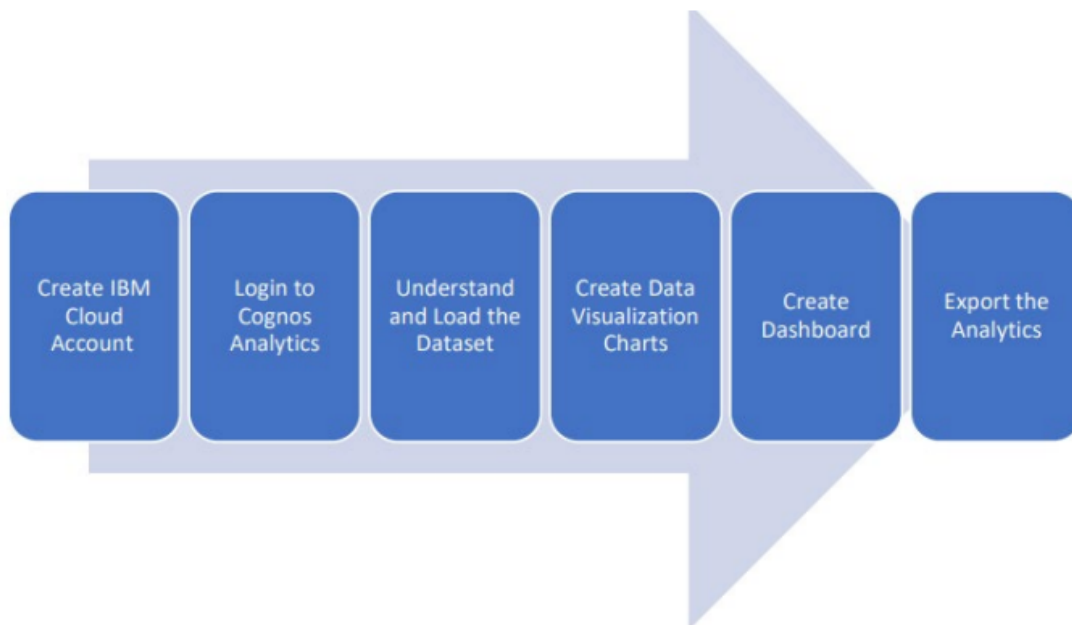
Target Sales = 110 % Sales,

Min Sales = 90 % Sales,

Max Sales = 120% Sales,

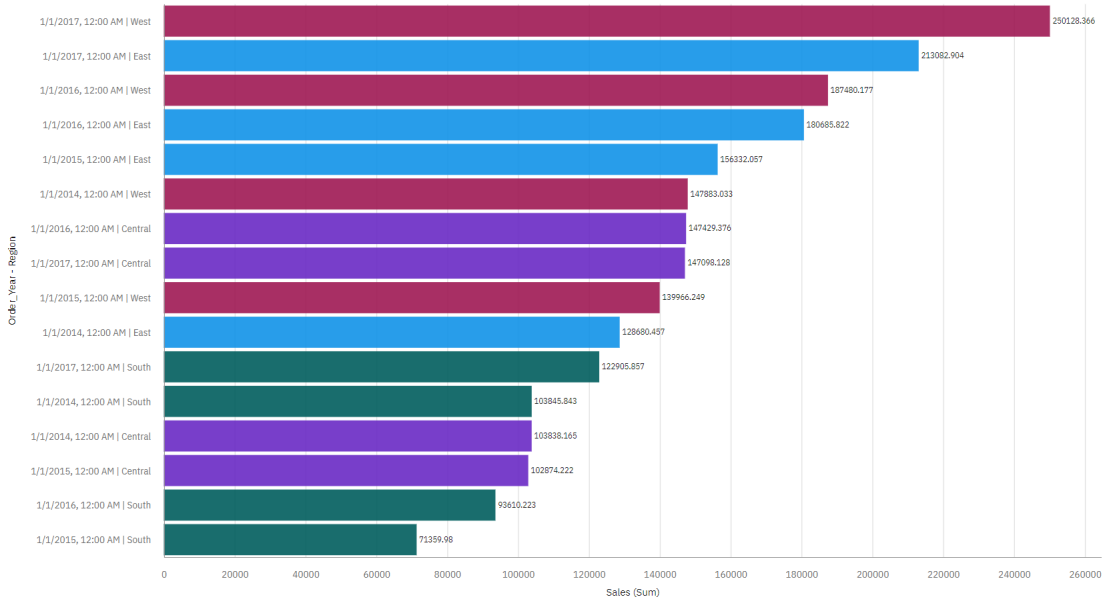
Middle Range Sales = 95% Sales.

FLOWCHART



RESULT

1. Build A Bar Chart Showing The Regional Sales By Year

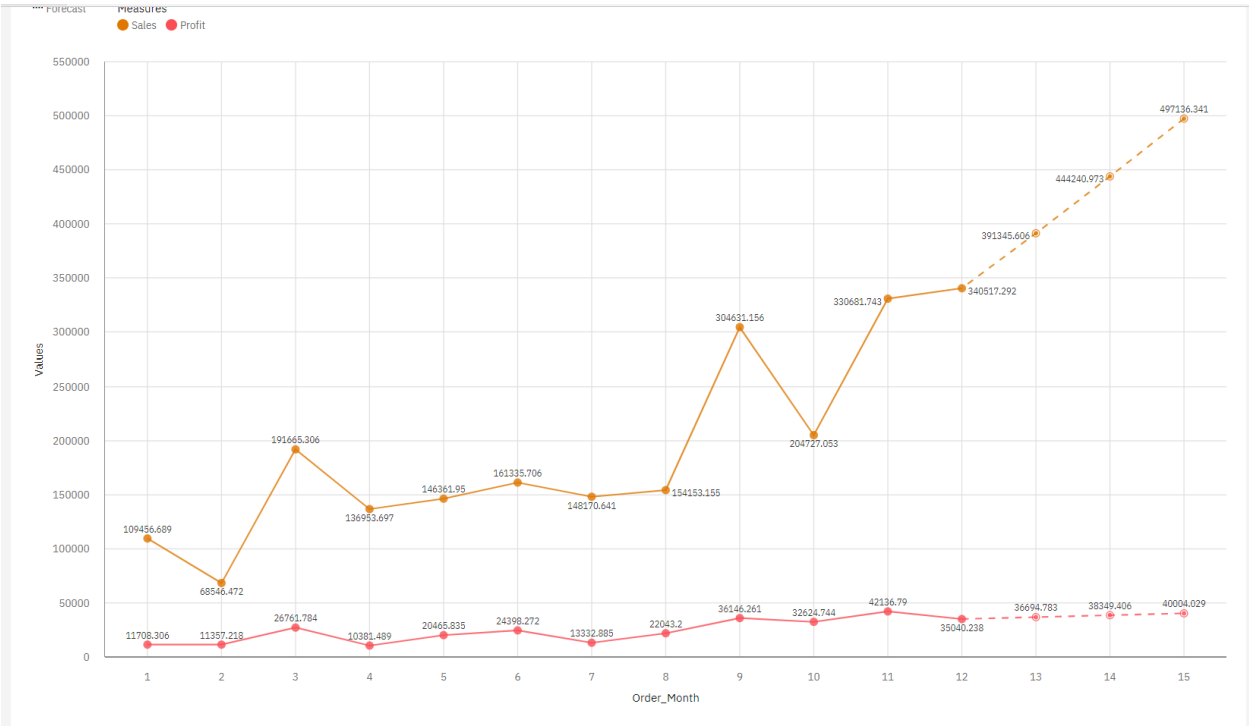


2. Build A Text Table Showing The Regional Sales By Year And Category

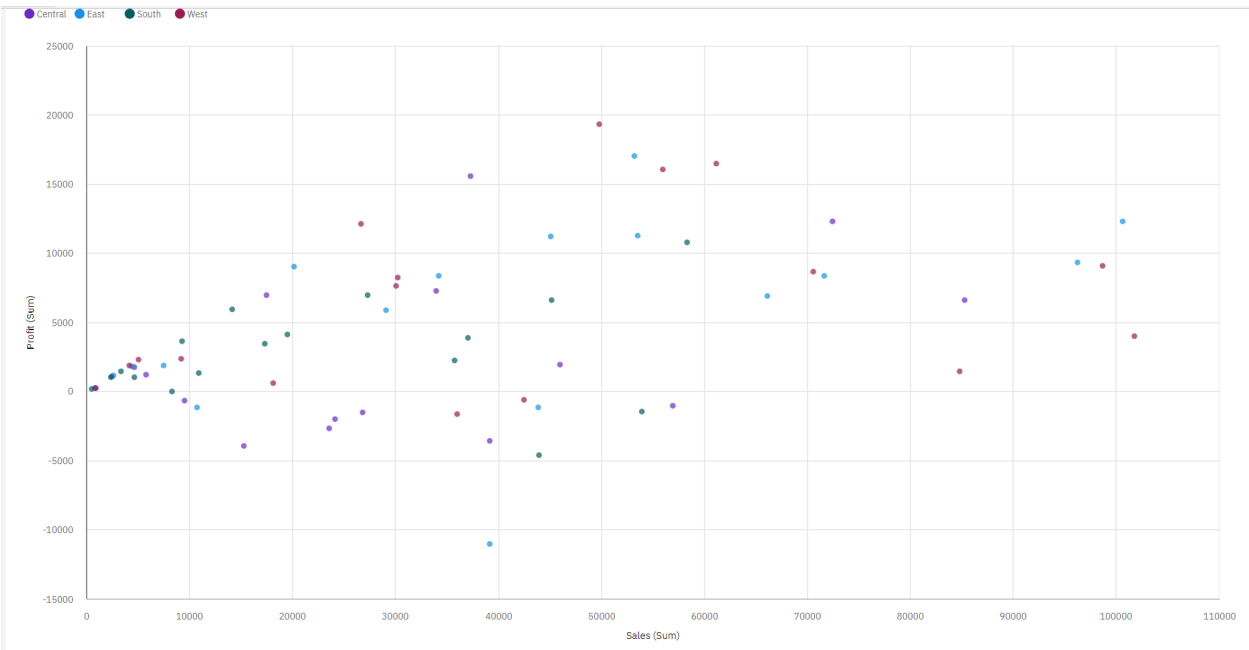
Regional Sales by Order Year and Category

Sales		Central	East	South	West	Summary
2014	Furniture	32909.664	47232.739	26968.003	50082.448	157192.853
	Office Supplies	37001.691	35968.989	25958.878	52846.854	151776.412
	Technology	33926.81	45478.729	50918.963	44953.731	175278.233
	Summary	103838.165	128680.457	103845.843	147883.033	484247.498
2015	Furniture	35592.047	53817.432	24103.814	57004.944	170518.237
	Office Supplies	25461.391	42655.245	31253.295	37863.532	137233.463
	Technology	41820.784	59859.38	16002.871	45097.774	162780.809
	Summary	102874.222	156332.057	71359.98	139966.25	470532.509
2016	Furniture	50773.182	46387.172	27921.441	73819.64	198901.436
	Office Supplies	45792.789	61801.208	28666.628	47679.357	183939.982
	Technology	50863.405	72497.442	37022.154	65981.179	226364.18
	Summary	147429.376	180685.822	93610.223	187480.177	609205.598
2017	Furniture	44522.271	60853.861	38305.425	71705.711	215387.269
	Office Supplies	58770.544	65090.613	39772.512	82463.506	246097.175
	Technology	43805.313	87138.43	44827.92	95959.148	271730.811
	Summary	147098.128	213082.904	122905.857	250128.365	733215.255
Summary		501239.891	678781.24	391721.905	725457.825	2297200.86

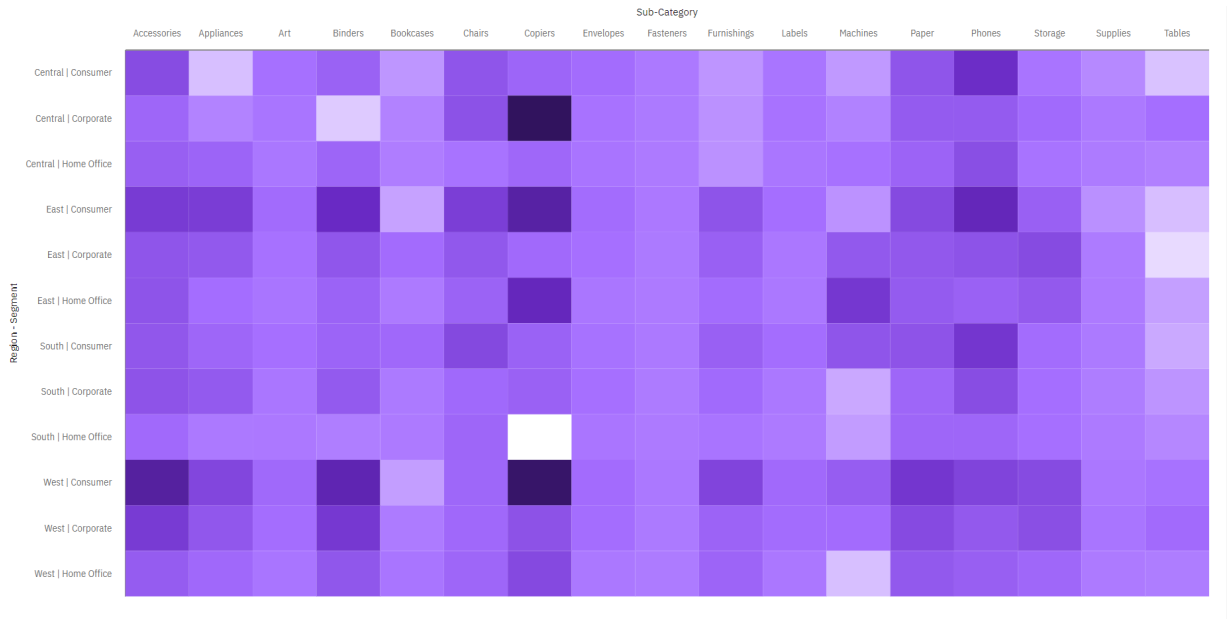
3. Build A Line Chart Showing The Sales And Profit Forecasts



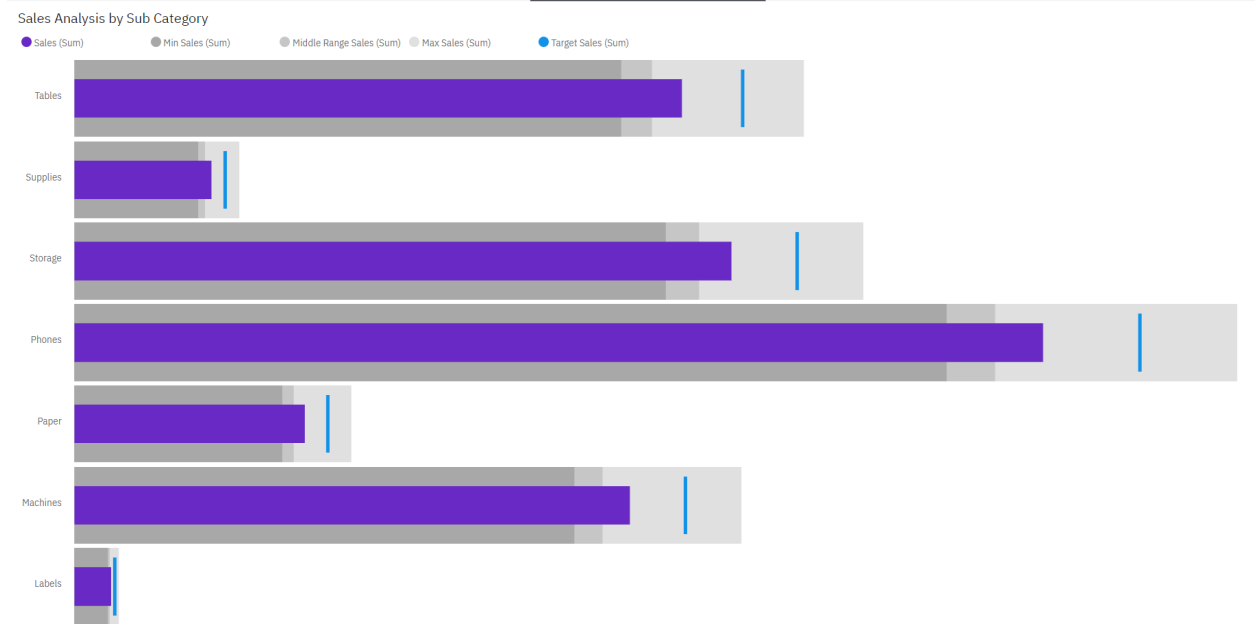
4. Build The Sales Vs Profit Scatter Plot



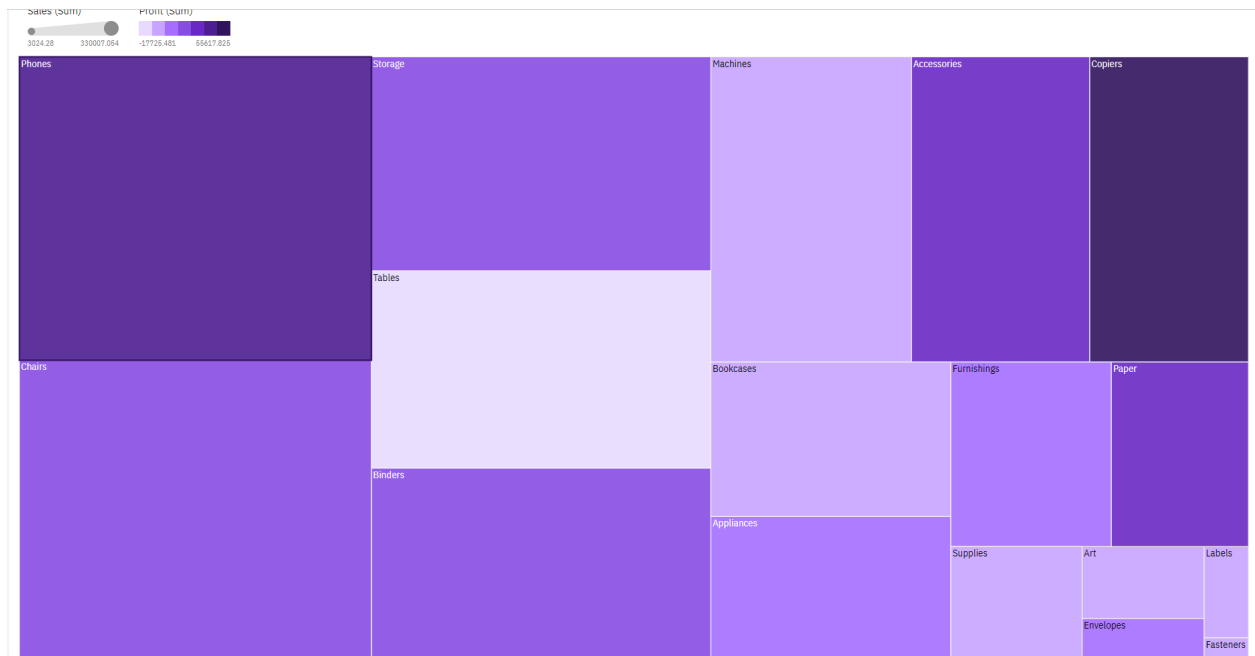
5. Build A Heat Map Showing The Regional, Segment And Sub-Category Wise Profits

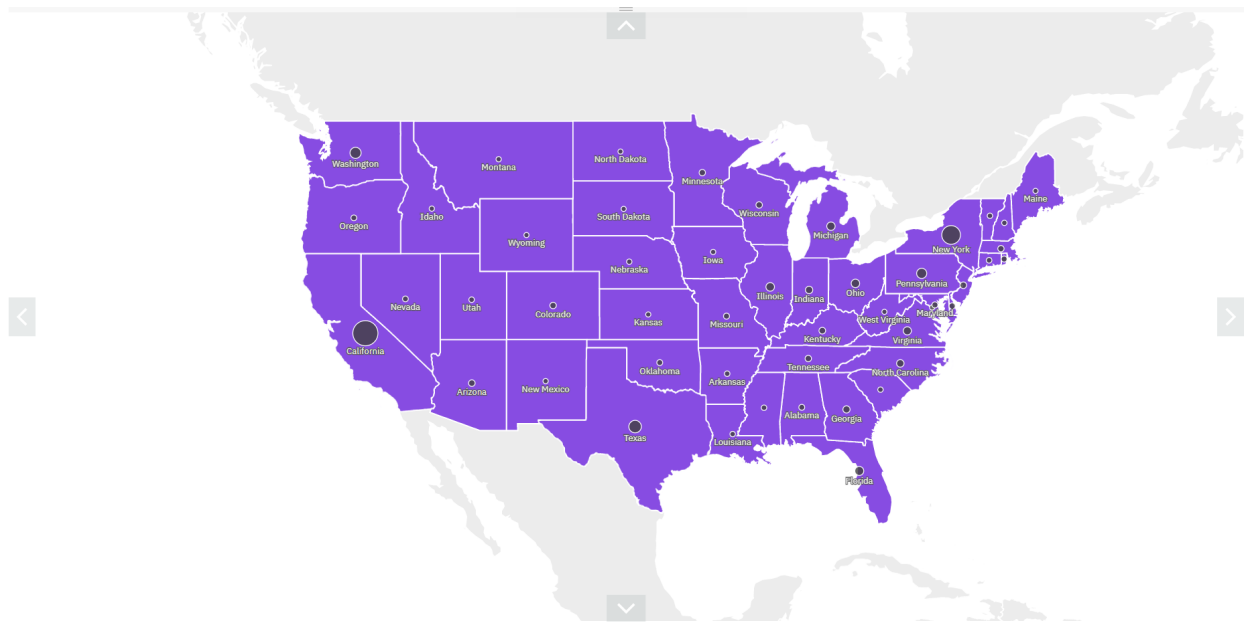


6. Build A Bullet Chart Showing Sales Analytical Values Across Different Sub-Categories

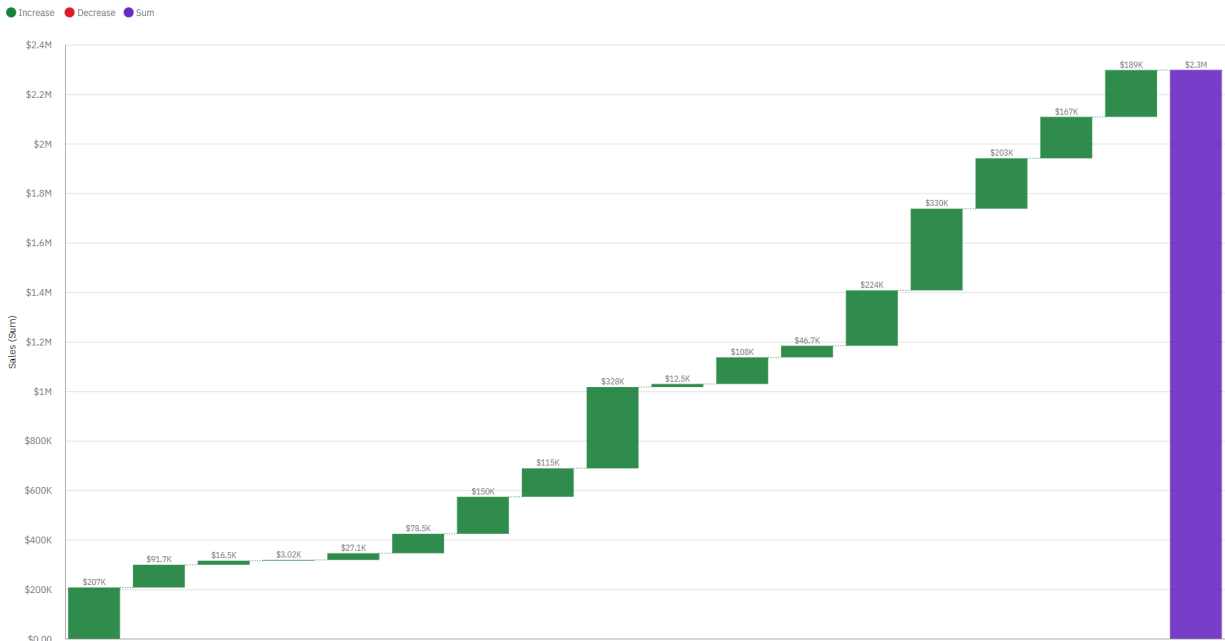


7. Build A Tree Map By Sub-Category Of Sales





10. Build A Waterfall Chart Showing The Sub-Category Wise Sales



11. Build Summary Cards Of Sales, Profit, Quantity And Discounts

\$2.3M

Sales

37.9K

Quantity

15.62%

Discount

\$286K

Profit

Sub-Category colored by Segment sized by Sales



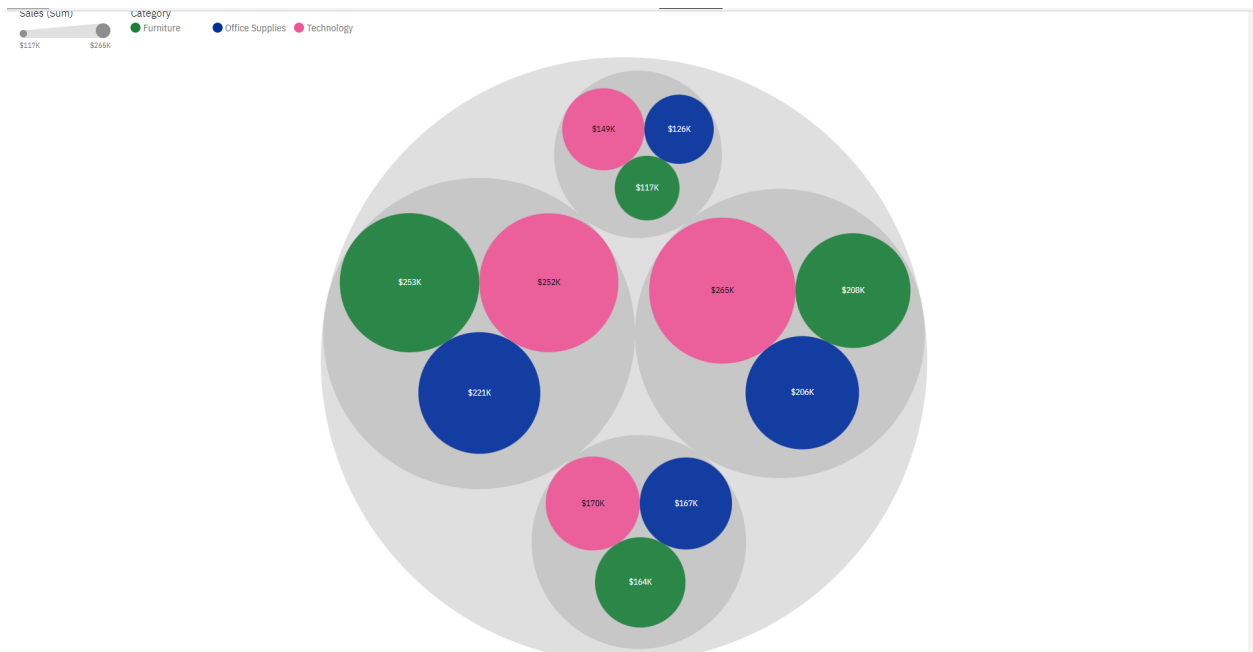
Segment

Segment
Consumer
Corporate
Home Office

Ship Mode

Ship Mode
First Class
Same Day
Second Class
Standard Class

12. Build A Hierarchical Bubble Chart To Show Case Category-Wise Regional Sale



ADVANTAGES AND DISADVANTAGES

ADVANTAGES

1. Fast analysis Intuitive Dashboards
2. Increased organization efficiency
3. Data-driven business decisions
4. Improved customer experience
5. Improved employee satisfaction
6. Trusted and Governed data
7. Increased competitive Advantage

DISADVANTAGES

1. Data Breaches
2. High Prices
3. Difficulty in Analyzing Different Data Sources
4. Poor Data Quality
5. Difficult to adopt the dashboards in personalized software

APPLICATIONS

Analytics tools are applied for:

1. **Sales Intelligence:** Analyzing the sales data and giving out results and suggestions can greatly help the organization
2. **Visualization:** Visualization is always better than viewing numbers data
3. **Reporting:** Periodic reporting of real-life scenarios can be taken care by this tool
4. **Performance Management:** With IBM Cognos, performance management can be done based on pre-defined or customizable time frames.

CONCLUSION

In this project, we have successfully:

1. Created multiple analysis charts and graphs
2. Used and gained insights from the Cognos Analysis tool
3. Saved and visualized the final dashboard in the IBM Cognos Analytics

FUTURE SCOPE

Using IBM Cognos tool will make:

1. **Collaboration:** IBM Cognos tools will become more collaborative facilitating team work
2. **Machine Learning:** AI analyzed the past data to provide insight and forecasting
3. **Data Pro-activity:** Proactivity focused features will respond automatically to inquiries and bring relevant data to users
4. **Integration:** Third-party systems will be increasingly intertwined with BI, simplifying data processing and reacting to actionable insights.

BIBLIOGRAPHY APPENDIX

CALCULATIONS

1. **Max Sales:** $\text{Sales} \times 1.2$
2. **Min Sales:** $\text{Sales} \times 0.9$
3. **Middle Range Sales:** $\text{Sales} \times 0.95$
4. **Target Sales:** $\text{Sales} \times 1.1$