1 INTRODUCTION

1.1 Overview

With the increase in consumer demand, the E-commerce space has boomed. This also led to an increase in fierce competition in today's online marketplace. The e-commerce industry sells a diverse product line of grocery items and merchandise products, such as food, pharmaceuticals, apparel, games and toys, hobby items, furniture, and appliances. The analysis of such an industry is of great importance as it gives insights into the sales and profits of various products.

1.2 Purpose

The developed Analytical Dashboard where the owner will understand the growth/potential of the business in the market. The features includes,

i. A region that accounts for a greater number of orders
ii. Frequency distribution of quantity ordered
iii. Percentage sales by different product categories
iv. Profitable products or their sub-products in the last few years
v. products that incurred losses
vi. Product type that was ordered greater times
vii. Yearly sales for various states
viii. Forecasting future sales according to shipping date.
ix. The trend in profit/sales over time (years/months/quarters).

2 LITERATURE SURVEY

2.1 Existing problem

There are quite some analytics dashboards available online like Zoho analytics and some reputed brands. The features of the existing solution is Collaborative analytics

Develop and analyze reports together with your content marketing team. Share and embed your visualizations for wider consumption.

Pre-built visualizations- Instantly kick start your analytics journey with over 75 pre-built reports and dashboards on your sales performance.

Seamless integration-Access a full fledged BI tool by automatically syncing your data from various CRMs such as Zoho CRM, Salesforce CRM, Microsoft Dynamics, and more.

Smart forecasting- Make informed decisions from your sales data and in turn manage your cash-flow, workforce and resources. Predict sales revenue, and plan for future growth.

Embedded analytics-Get a powerful BI, reporting, and analytics solution in your own brand name, embedded within your product/application or set up as a standalone portal.

2.2 Proposed solution

The idea suggested by me is creating the dashboard using *cognos analytics* according to the specifications provided in the list. So, basically it’s the customized analytics of the requirements so

that the display would to the point and doesn't have any unnecessary features that the user is not interested in. And we could be cost effective compared to the corporate, that would the solution to the problem.

3 THEORITICAL ANALYSIS

3.1 Block diagram

n/a

3.2 Hardware / Software designing

Cognos Analytics Cloud

IBM Cloud

Dataset: US Superstore data (3.19MB)

4 EXPERIMENTAL INVESTIGATIONS

The reason for the choosing the graph types is justified in the following points,

A region that accounts for a greater number of orders, we have chosen the bar plot and its shown that the region with maximum number of orders is Western region (1600 orders). Since we have the direct relations its easy to plot it on the bar plot

Frequency distribution of quantity ordered , we basically chosen a bar chart (histogram) with the x-axis as quantity and the y- axis with the quantity with applied summary as the "count distinct"

Percentage sales by different product categories, The pie chart is the best chart for showing the percentages. And since the value of sales is raw (i.e, not in a good shape of %) so I have formatted it by multiplying by 100 and Dividing it by total net sales (2297200.86) so that we can fit it into the pie chart well.

Profitable products or their sub-products in the last few years , For this I have chosen treemap as its hierarchical where cell size describes the sales, color gradient describes the profit.

products that incurred losses, we have used waterfall graph since it involves the negative values so that would represent it very good.

Product type that was ordered greater times , It can be beautifully visualized in a WORD CHART by quantity and product types can give the names in the varied size an colour.

Yearly sales for various states, This can be easily plotted in the column chart with X-axis of states and Y axis of sales

Forecasting future sales according to shipping date, we chosen a sunburst chart consists of an inner circle surrounded by rings of deeper hierarchy levels. Mainly used to represent flows in the data, analyse hierarchical data. It has a feature of Exploring a decision tree visualization so that we can forecast sales according to date of shipping. So by using it we can get the values forecasted we see it in the images I have attached below

The trend in profit/sales over time (years/months/quarters), For this we have used the Line chart for this visualization because of the 2 parameters

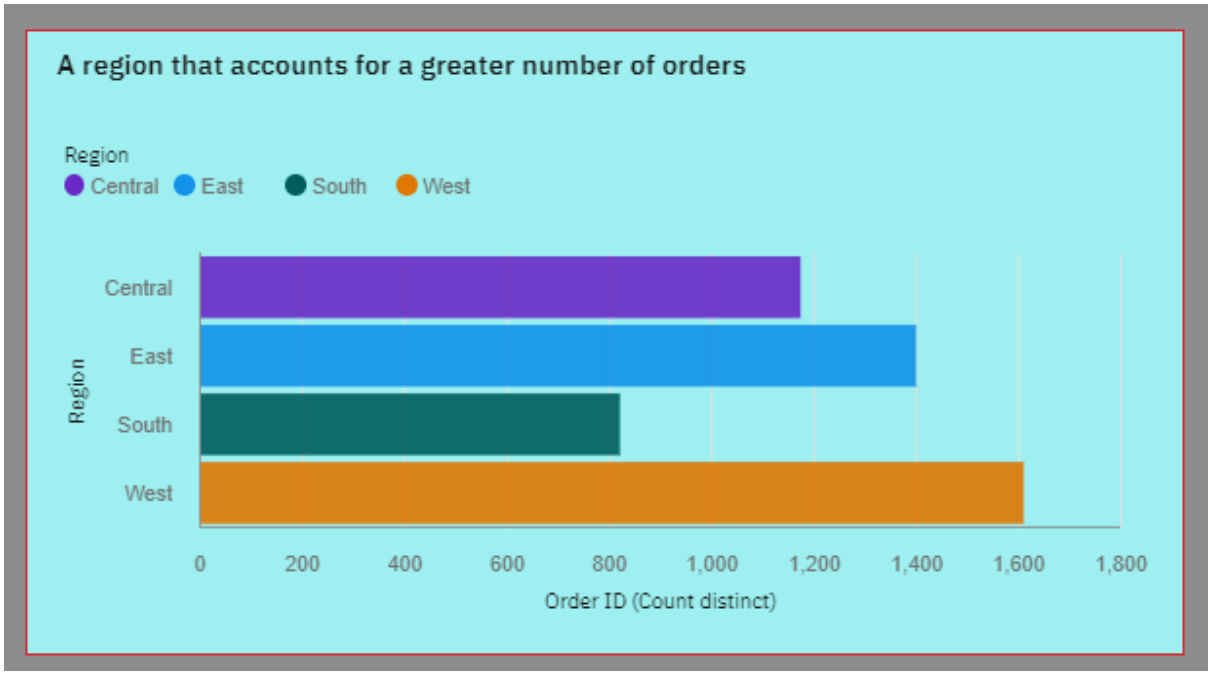
5 FLOWCHART

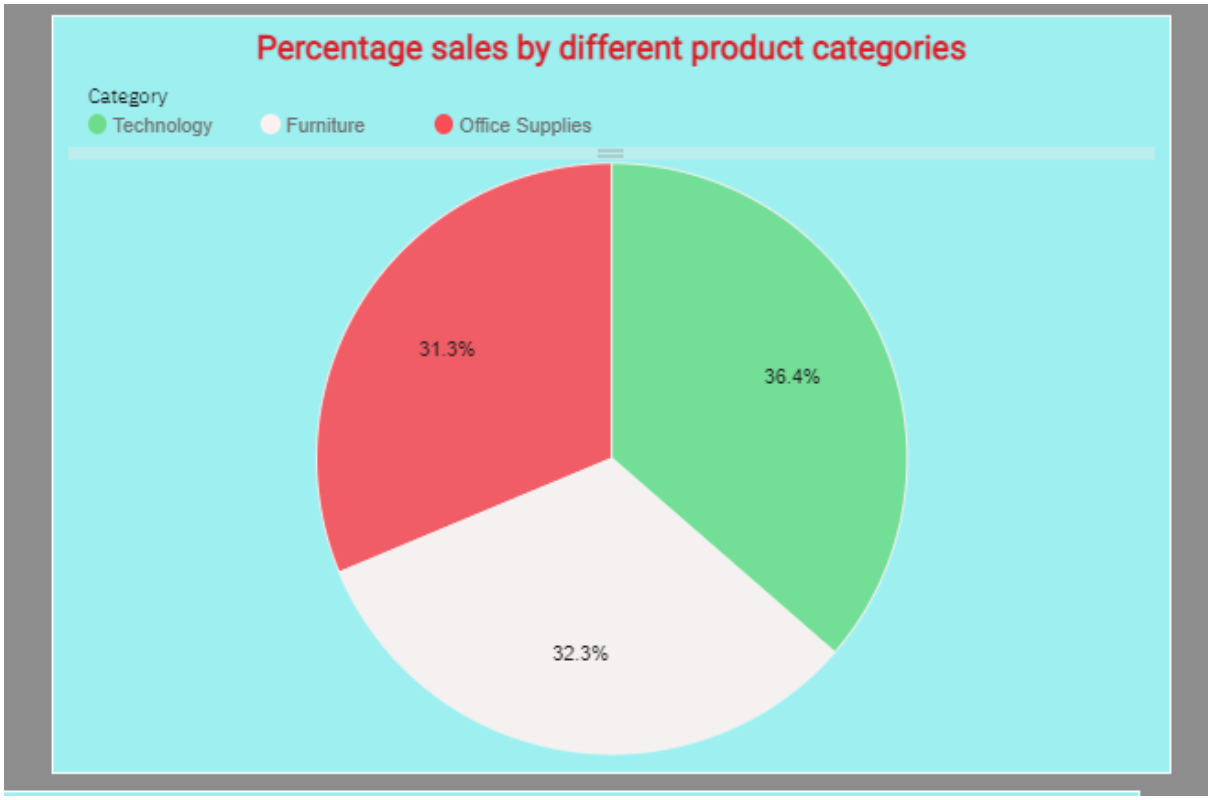
nil

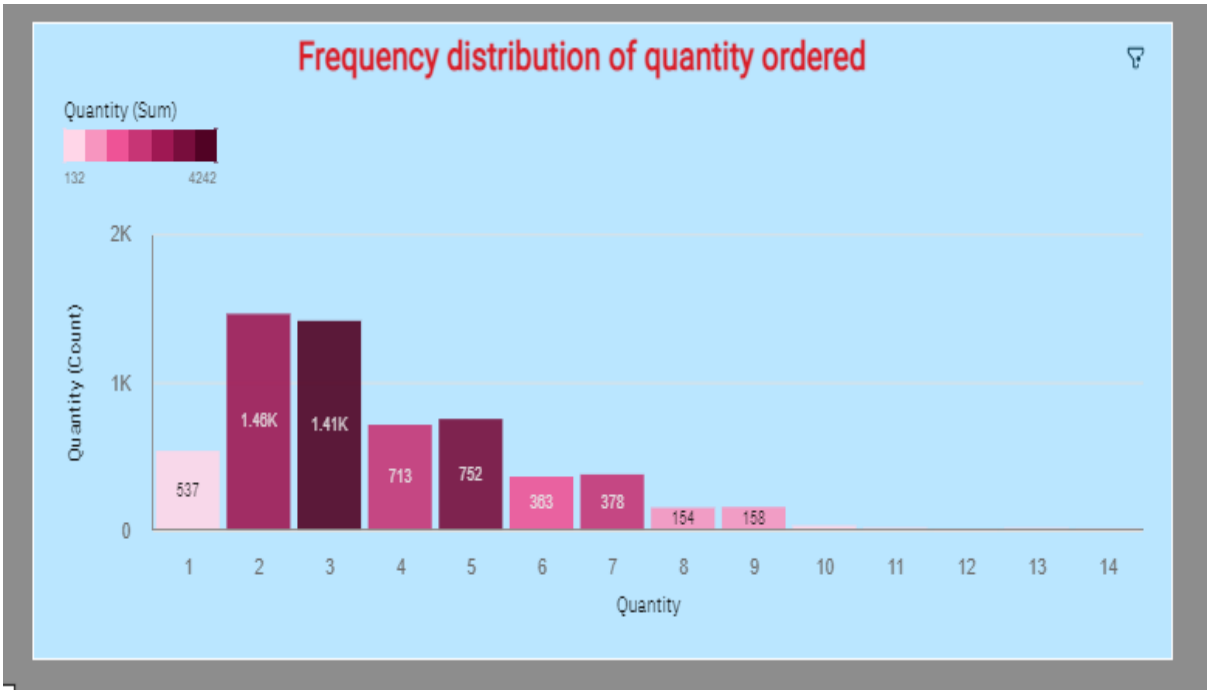
6 RESULT

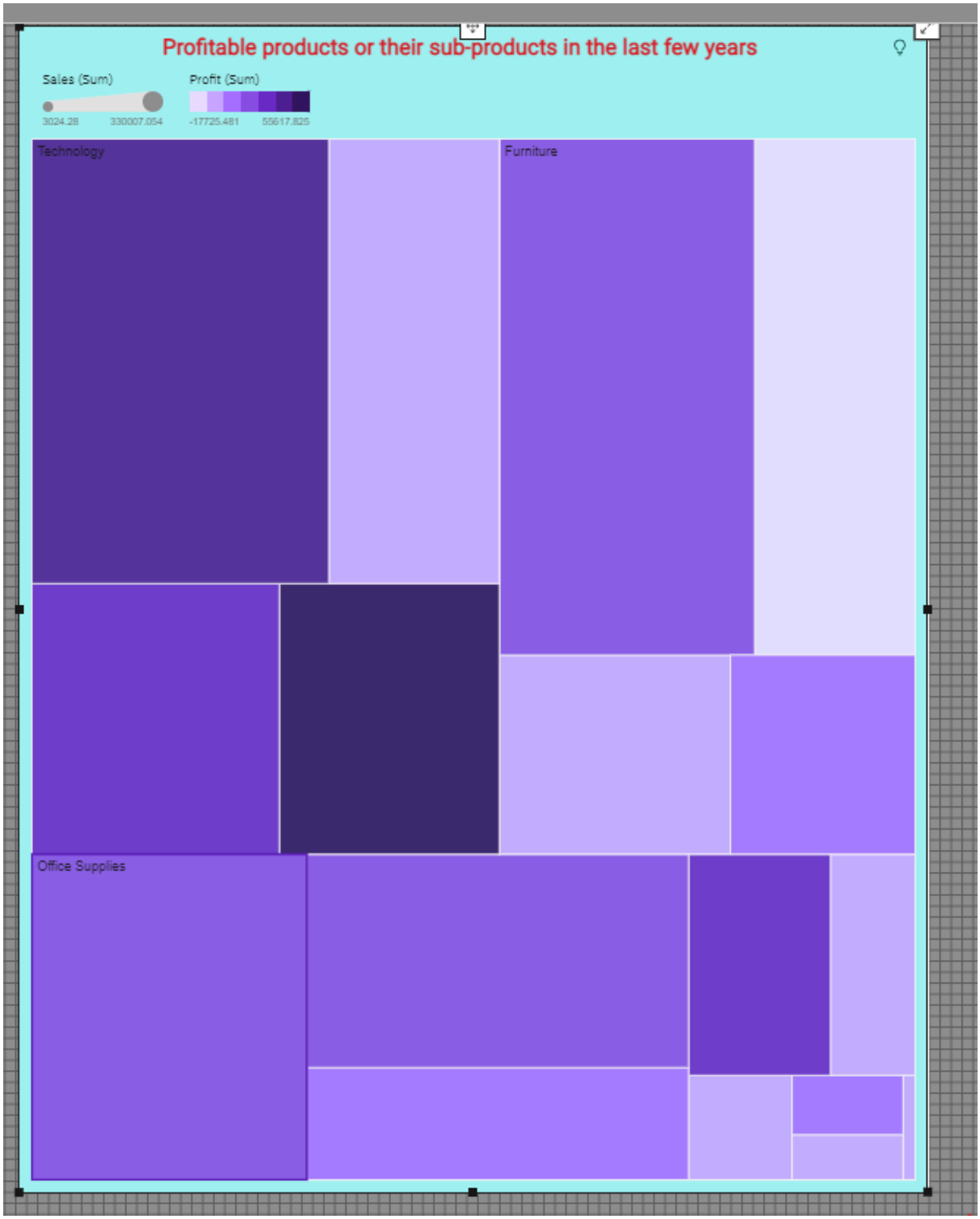
Dashboard:

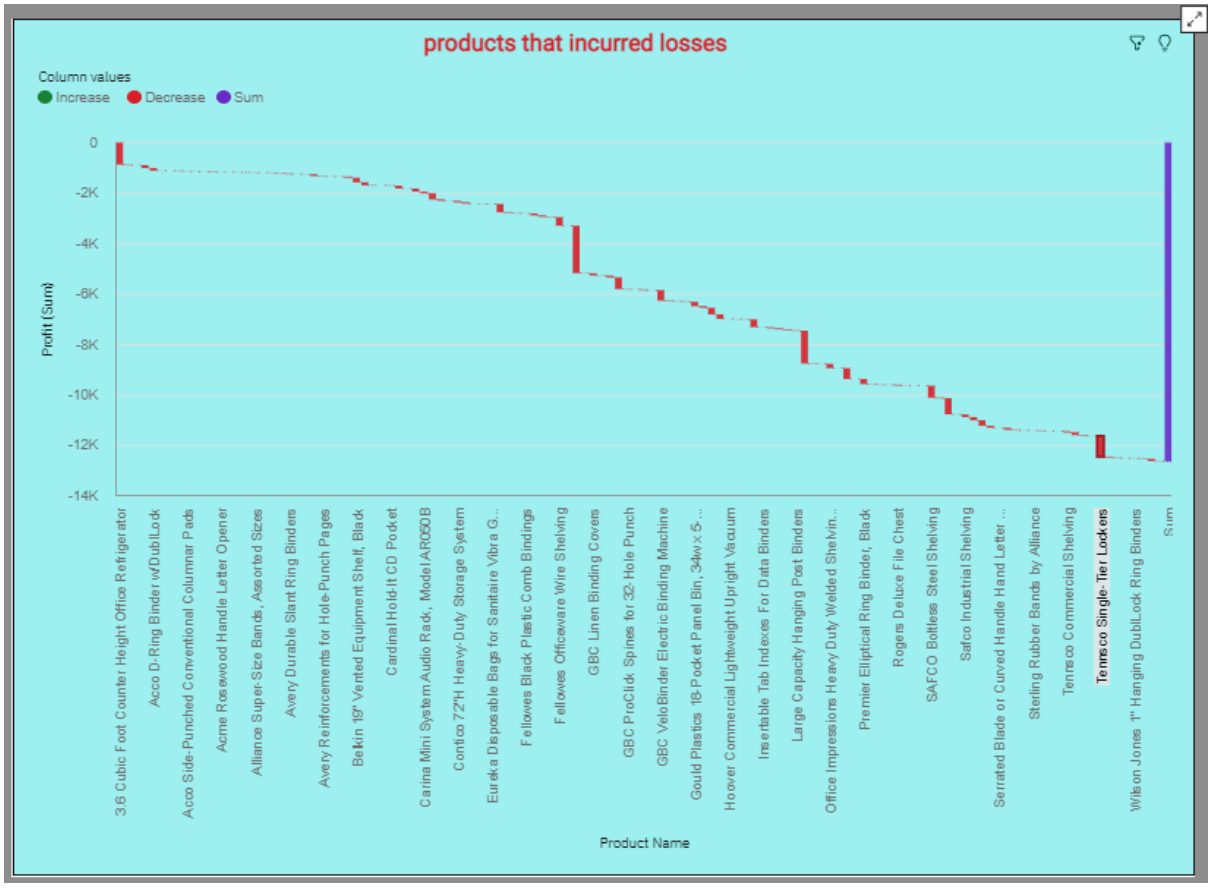
https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.my_folders%2FNew%2Bdashboardxxxxx&action=view&mode=dashboard&subView=model0000017ae3af32af_00000000

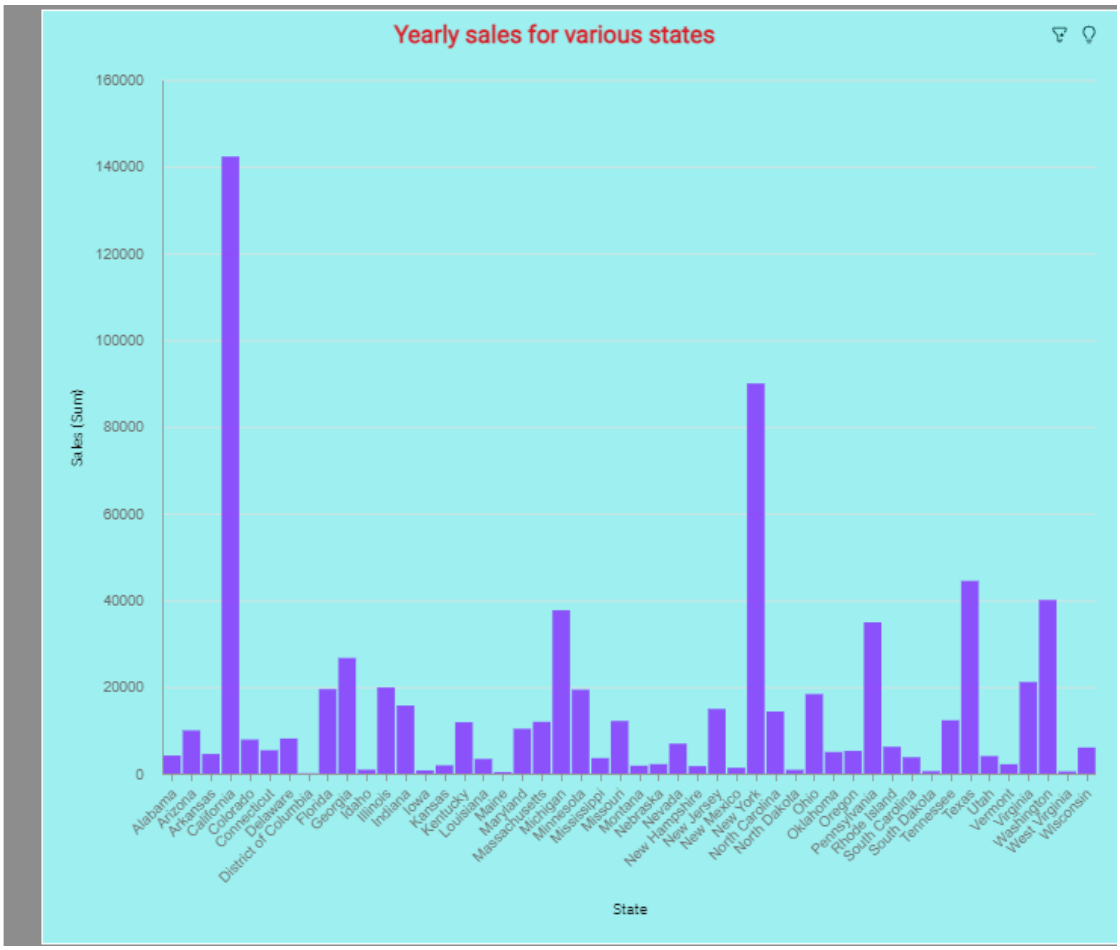


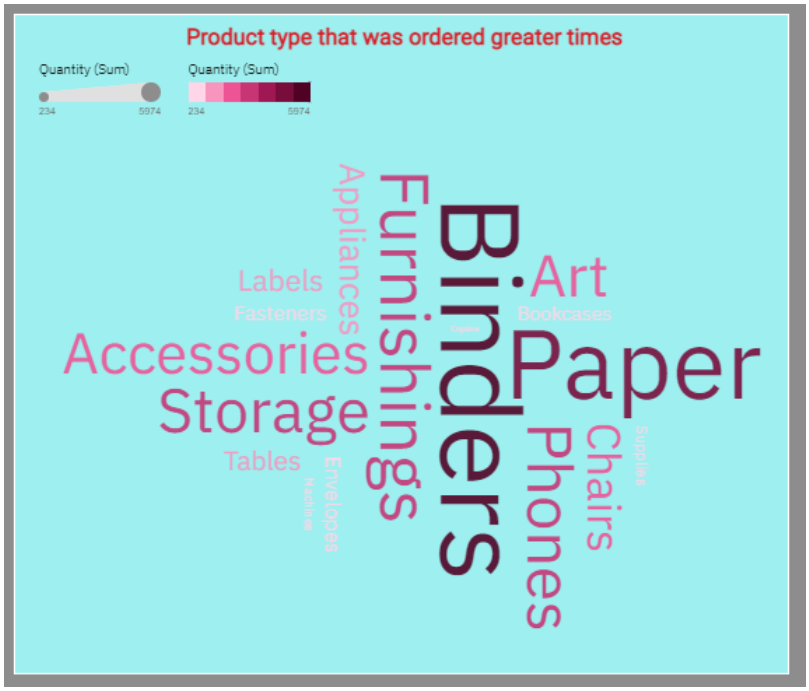


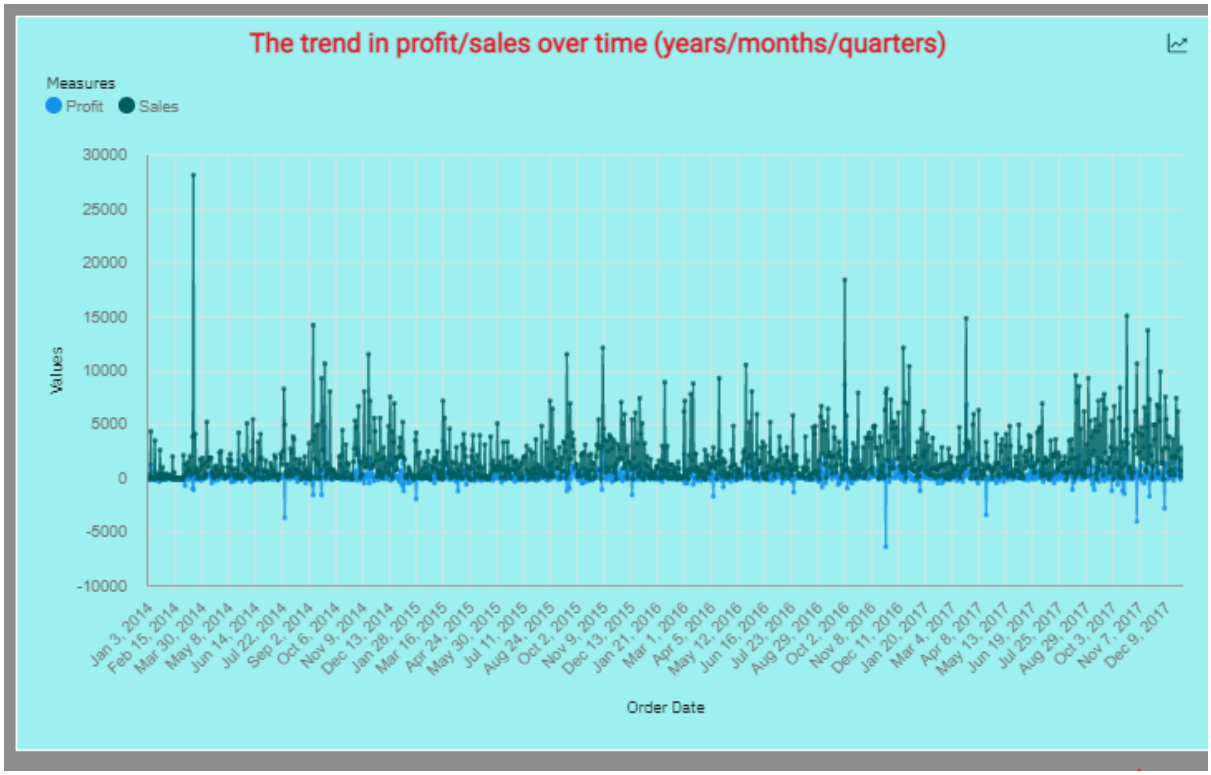

Frequency distribution of quantity ordered
Quantity (Sum)
132
4242
2K
1K
0
Quantity (Count)
537
1.46K
1.41K
713
752
383
378
154
158
1
2
3
4
5
6
7
8
9
10
11
12
13
14
Quantity


Profitable products or their sub-products in the last few years
Sales (Sum)
3024.28
330007.054
Profit (Sum)
-17725.481
55617.825
Technology
Furniture
Office Supplies

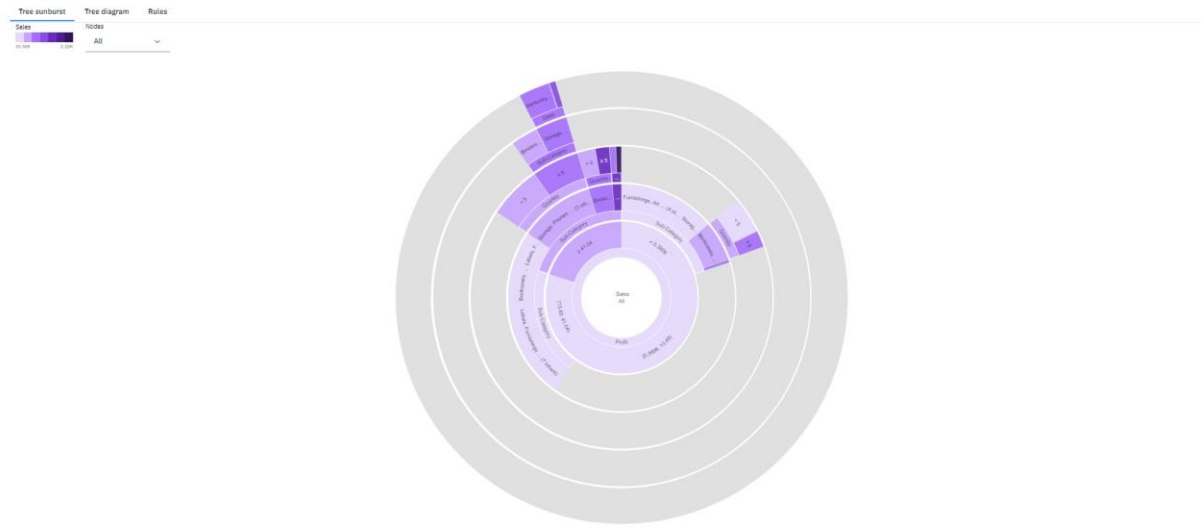

products that incurred losses
Column values
Increase
Decrease
Sum
Profit (Sum)
0
-2K
-4K
-6K
-8K
-10K
-12K
-14K
3.6 Cubic Foot Counter Height Office Refrigerator
Acco D-Ring Binder w/DublLock
Acco Side-Punched Conventional Columnar Pads
Acme Rosewood Handle Letter Opener
Alliance Super-Size Bands, Assorted Sizes
Avery Durable Slant Ring Binders
Avery Reinforcements for Hole-Punch Pages
Belkin 19" Vented Equipment Shelf, Black
Cardinal Hold-It CD Pocket
Carina Mini System Audio Rack, Model ARD50B
Contico 72"H Heavy-Duty Storage System
Eureka Disposable Bags for Sanitaire Vibra G...
Fellowes Black Plastic Comb Bindings
Fellowes Officeware Wire Shelving
GBC Linen Binding Covers
GBC ProClick Spines for 32-Hole Punch
GBC VeloBinder Electric Binding Machine
Gould Plastics 18-Pocket Panel Bin, 34w x 5...
Hoover Commercial Lightweight Upright Vacuum
Insertable Tab Indexes For Data Binders
Large Capacity Hanging Post Binders
Office Impressions Heavy Duty Welded Shelvin...
Premier Elliptical Ring Binder, Black
Rogers Deluxe File Chest
SAFCO Boltless Steel Shelving
Safco Industrial Shelving
Serrated Blade or Curved Handle Hand Letter ...
Sterling Rubber Bands by Alliance
Tenmsco Commercial Shelving
Tenmsco Single-Tier Lockers
Wilson Jones 1" Hanging DublLock Ring Binders
Sum
Product Name


Yearly sales for various states
Sales (Sum)
160000
140000
120000
100000
80000
60000
40000
20000
0
Alabama
Arizona
Arkansas
California
Colorado
Connecticut
Delaware
District of Columbia
Florida
Georgia
Idaho
Illinois
Indiana
Iowa
Kansas
Kentucky
Louisiana
Maine
Maryland
Massachusetts
Michigan
Minnesota
Mississippi
Missouri
Montana
Nebraska
Nevada
New Hampshire
New Jersey
New Mexico
New York
North Carolina
North Dakota
Ohio
Oklahoma
Oregon
Pennsylvania
Rhode Island
South Carolina
South Dakota
Tennessee
Texas
Utah
Vermont
Virginia
Washington
West Virginia
Wisconsin
State

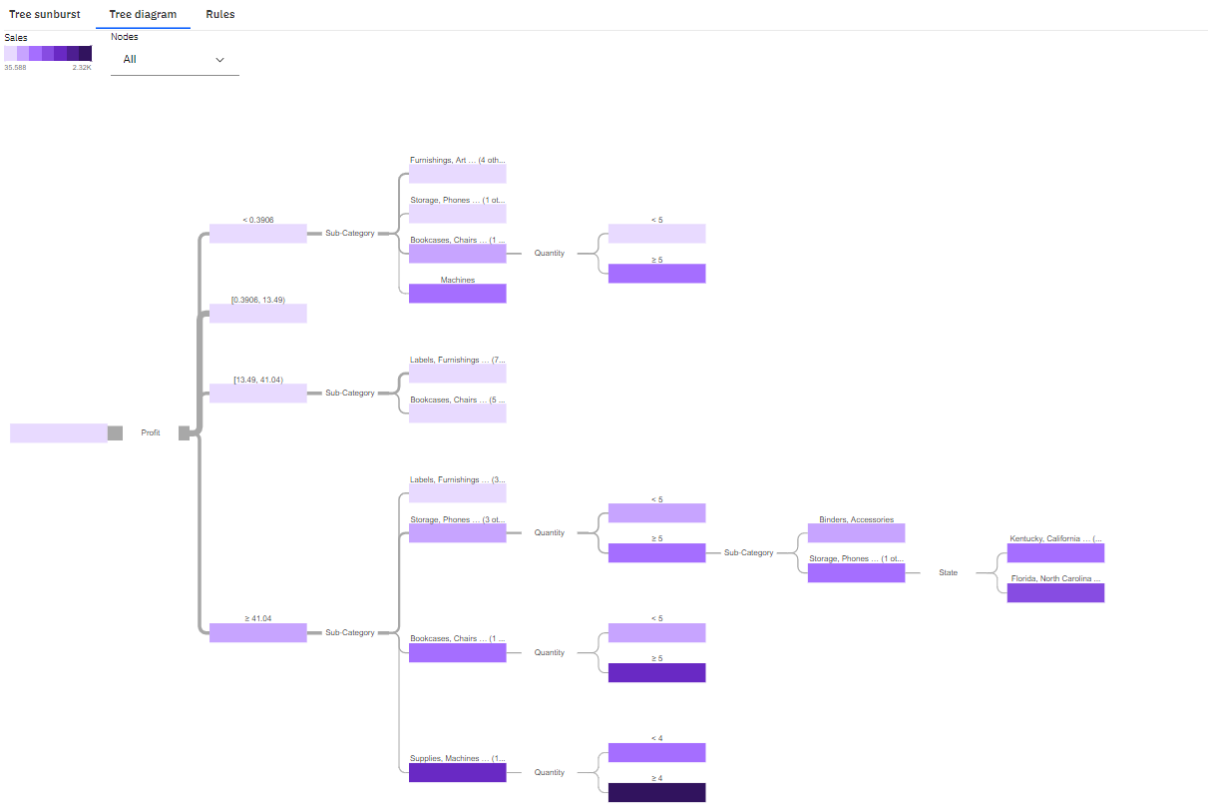

Product type that was ordered greater times
Quantity (Sum)
234
5974
Quantity (Sum)
234
5974
Appliances
Furnishings
Binders
Art
Labels
Fasteners
Bookcases
Accessories
Paper
Storage
Chairs
Phones
Tables
Envelopes
Supplies
Machines

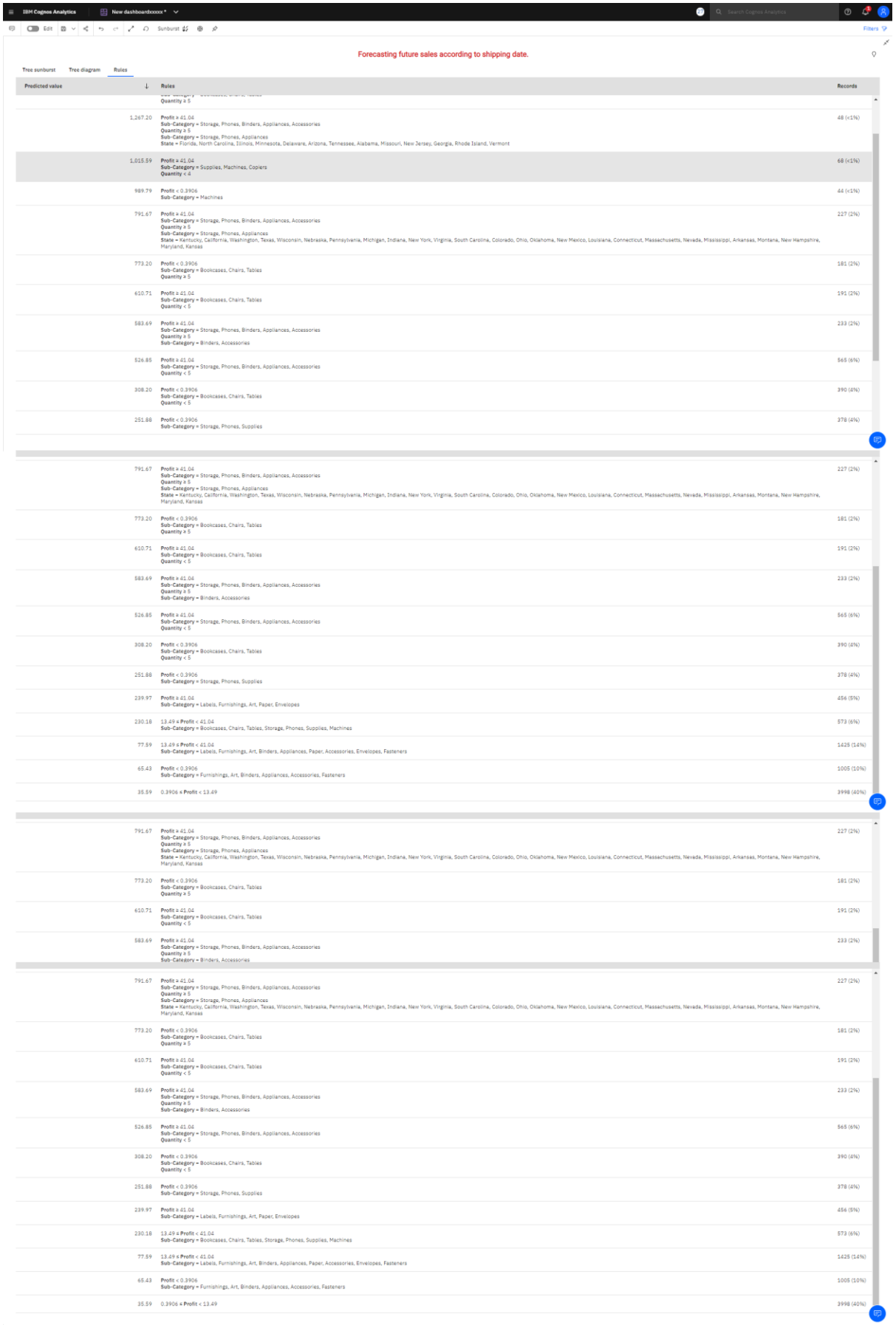

The trend in profit/sales over time (years/months/quarters)
Measures
Profit
Sales
30000
25000
20000
15000
10000
5000
0
-5000
-10000
Values
Jan 3, 2014
Feb 15, 2014
Mar 30, 2014
May 8, 2014
Jun 14, 2014
Jul 22, 2014
Sep 2, 2014
Oct 6, 2014
Nov 9, 2014
Dec 13, 2014
Jan 28, 2015
Mar 16, 2015
Apr 24, 2015
May 30, 2015
Jul 11, 2015
Aug 24, 2015
Oct 2, 2015
Nov 9, 2015
Dec 13, 2015
Jan 21, 2016
Mar 1, 2016
Apr 5, 2016
May 12, 2016
Jun 16, 2016
Jul 23, 2016
Aug 29, 2016
Oct 2, 2016
Nov 8, 2016
Dec 11, 2016
Jan 20, 2017
Mar 4, 2017
Apr 8, 2017
May 13, 2017
Jun 19, 2017
Jul 25, 2017
Aug 29, 2017
Oct 3, 2017
Nov 7, 2017
Dec 9, 2017
Order Date

Forecasting future sales according to shipping date.



Forecasting future sales according to shipping date.




IBM Cognos Analytics
New dashboardxxxxx *
Search Cognos Analytics
Edit
Sunburst
Filters
Forecasting future sales according to shipping date.
Tree sunburst
Tree diagram
Rules
Predicted value
Rules
Records
Quantity ≥ 5
1,267.20
Profit ≥ 41.04
Sub-Category = Storage, Phones, Binders, Appliances, Accessories
Quantity ≥ 5
Sub-Category = Storage, Phones, Appliances
State = Florida, North Carolina, Illinois, Minnesota, Delaware, Arizona, Tennessee, Alabama, Missouri, New Jersey, Georgia, Rhode Island, Vermont
48 (<1%)
1,015.59
Profit ≥ 41.04
Sub-Category = Supplies, Machines, Copiers
Quantity < 4
68 (<1%)
989.79
Profit < 0.3906
Sub-Category = Machines
44 (<1%)
791.67
Profit ≥ 41.04
Sub-Category = Storage, Phones, Binders, Appliances, Accessories
Quantity ≥ 5
Sub-Category = Storage, Phones, Appliances
State = Kentucky, California, Washington, Texas, Wisconsin, Nebraska, Pennsylvania, Michigan, Indiana, New York, Virginia, South Carolina, Colorado, Ohio, Oklahoma, New Mexico, Louisiana, Connecticut, Massachusetts, Nevada, Mississippi, Arkansas, Montana, New Hampshire, Maryland, Kansas
227 (2%)
773.20
Profit < 0.3906
Sub-Category = Bookcases, Chairs, Tables
Quantity ≥ 5
181 (2%)
610.71
Profit ≥ 41.04
Sub-Category = Bookcases, Chairs, Tables
Quantity < 5
191 (2%)
583.69
Profit ≥ 41.04
Sub-Category = Storage, Phones, Binders, Appliances, Accessories
Quantity ≥ 5
Sub-Category = Binders, Accessories
233 (2%)
526.85
Profit ≥ 41.04
Sub-Category = Storage, Phones, Binders, Appliances, Accessories
Quantity < 5
565 (6%)
308.20
Profit < 0.3906
Sub-Category = Bookcases, Chairs, Tables
Quantity < 5
390 (4%)
251.88
Profit < 0.3906
Sub-Category = Storage, Phones, Supplies
378 (4%)
791.67
Profit ≥ 41.04
Sub-Category = Storage, Phones, Binders, Appliances, Accessories
Quantity ≥ 5
Sub-Category = Storage, Phones, Appliances
State = Kentucky, California, Washington, Texas, Wisconsin, Nebraska, Pennsylvania, Michigan, Indiana, New York, Virginia, South Carolina, Colorado, Ohio, Oklahoma, New Mexico, Louisiana, Connecticut, Massachusetts, Nevada, Mississippi, Arkansas, Montana, New Hampshire, Maryland, Kansas
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Profit ≥ 41.04
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526.85
Profit ≥ 41.04
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Quantity < 5
565 (6%)
308.20
Profit < 0.3906
Sub-Category = Bookcases, Chairs, Tables
Quantity < 5
390 (4%)
251.88
Profit < 0.3906
Sub-Category = Storage, Phones, Supplies
378 (4%)
239.97
Profit ≥ 41.04
Sub-Category = Labels, Furnishings, Art, Paper, Envelopes
456 (5%)
230.18
13.49 ≤ Profit < 41.04
Sub-Category = Bookcases, Chairs, Tables, Storage, Phones, Supplies, Machines
573 (6%)
77.59
13.49 ≤ Profit < 41.04
Sub-Category = Labels, Furnishings, Art, Binders, Appliances, Paper, Accessories, Envelopes, Fasteners
1425 (14%)
65.43
Profit < 0.3906
Sub-Category = Furnishings, Art, Binders, Appliances, Accessories, Fasteners
1005 (10%)
35.59
0.3906 ≤ Profit < 13.49
3998 (40%)
791.67
Profit ≥ 41.04
Sub-Category = Storage, Phones, Binders, Appliances, Accessories
Quantity ≥ 5
Sub-Category = Storage, Phones, Appliances
State = Kentucky, California, Washington, Texas, Wisconsin, Nebraska, Pennsylvania, Michigan, Indiana, New York, Virginia, South Carolina, Colorado, Ohio, Oklahoma, New Mexico, Louisiana, Connecticut, Massachusetts, Nevada, Mississippi, Arkansas, Montana, New Hampshire, Maryland, Kansas
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773.20
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Profit ≥ 41.04
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Sub-Category = Storage, Phones, Binders, Appliances, Accessories
Quantity ≥ 5
Sub-Category = Storage, Phones, Appliances
State = Kentucky, California, Washington, Texas, Wisconsin, Nebraska, Pennsylvania, Michigan, Indiana, New York, Virginia, South Carolina, Colorado, Ohio, Oklahoma, New Mexico, Louisiana, Connecticut, Massachusetts, Nevada, Mississippi, Arkansas, Montana, New Hampshire, Maryland, Kansas
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Profit < 0.3906
Sub-Category = Furnishings, Art, Binders, Appliances, Accessories, Fasteners
1005 (10%)
35.59
0.3906 ≤ Profit < 13.49
3998 (40%)

Report of the dashboard:

https://us1.ca.analytics.ibm.com/bi/?pathRef=.public_folders%2Fxx%2FIBM%2BReport%2Bby%2BSai&action=run&format=HTML&prompt=false

ADVANTAGES & DISADVANTAGES

The advantages of our proposed dashboard are,

- Realtime customer analytics
- Performance management
- Optimize sales activity
- Forecasting
- Time Savings
- Increased Productivity

The disadvantages maybe,

- Limited capability
- Difficult to change core metrics

8 APPLICATIONS

It can find its application at the retailers who wish to ,

1. Investing high and add new features to the region with more sales.
2. Reducing stocks that incur loss
3. choosing the prime category with peak sales
4. It can impact the financial situation of the user by knowing what are the prime selling products and focusing on the related products and benefit from our solution, make a intelligent decision.

9 CONCLUSION

We can conclude that “Data is the new oil” it can do magic in the name of analytics and this project is the bright example of the phrase. It can create a lot of benefits as mentioned in the applications

10 FUTURE SCOPE

The enhancements that can be done in future are the additional implementation of some more AI or ML related modules which can make our dashboard smarter and Can improve the accuracy of the predictions and can arrange in a very professional manner for the selling point of view and attractiveness that could be a factor from competitors . I see the scope of this project is infinite!!