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Topic: Analytics Tool for ecommerce

1. Introduction:
1.1 Overview:
Analysis of Ecommerce involves the process of gathering relevant data to understand the trends of consumer behaviour to make data driven decisions. In today's world, more people shifted from brick and mortar store to ecommerce platform to buy a product. The main advantage of using ecommerce is that people can shop 24x7 anywhere and anytime.

1.2 Purpose:
The purpose of this project is to create data visualization of ecommerce data to stakeholders for making data driven decision.

2. Literature Survey:
2.1 Existing problem:
As the demand for ecommerce has increased, the analysis of such industry is important to get the insights of various metrics which leads to profitability in the business.
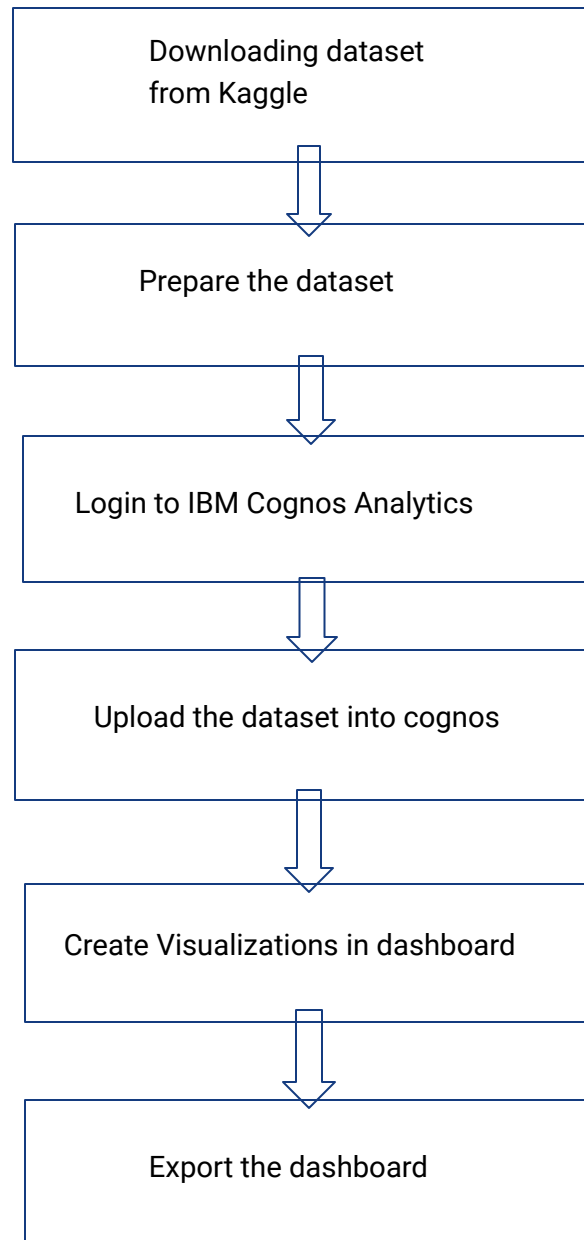
2.2 Proposed Solution:
The proposed solution is that to create Analytical dashboard where owners can better understand the current position and furture growth of business. It includes:
  1) Region-wise order received
  2) Frequency distribution of Quantity ordered
  3) Percentage of sales by different product category
  4) Profitables product names of the past few years.
  5) Products that incurred loss
  6) Type of product that was oredered frequently
  7) State-wise sales
  8) Sales forecasting based on shipping date
  9) Trend in profit and sales over the years

3. Theoretical Analysis:

3.1 Block Diagram:

```
┌─────────────────────────────┐
│     Downloading dataset     │
│       from Kaggle           │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│      Prepare the dataset     │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│   Login to IBM Cognos Analytics │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│   Upload the dataset into cognos │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│  Create Visualizations in dashboard │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│      Export the dashboard    │
└─────────────────────────────┘
```
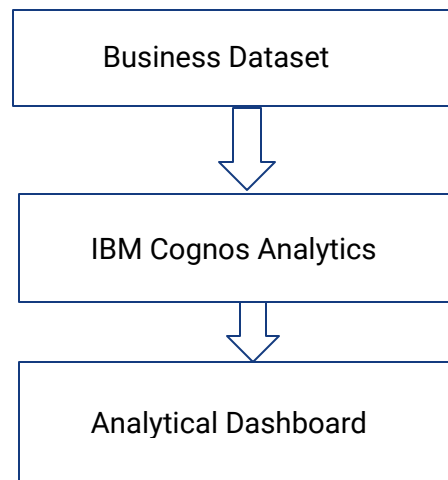
3.2 Hardware and Software design:

Software requirement: IBM Cognos Analytics, Microsoft Excel

Hardware requirement: Laptop/Computer
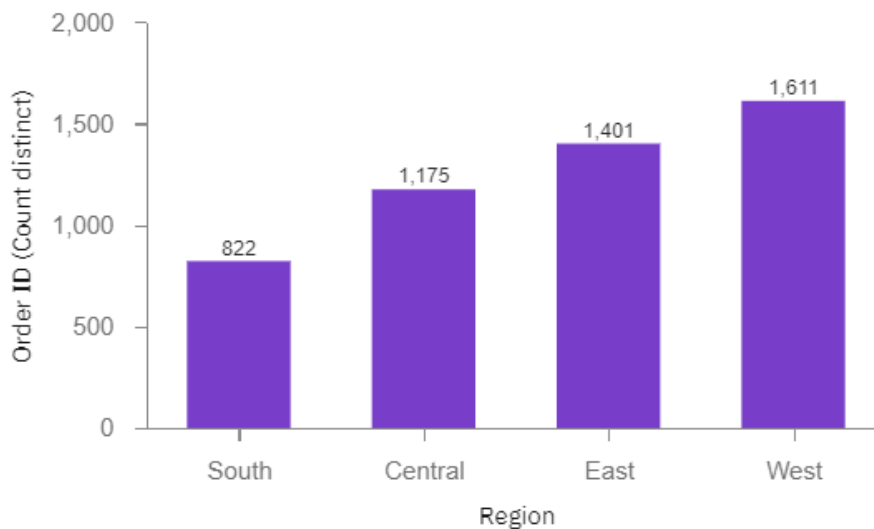
4. Experimental investigation:

      The west region received the maximum number of orders followed by East, Central and South. Most of the sales was happened in technology category. While ordering, consumer prefered the product quantity of 3 followed by 2. Cubify CubeX 3D printer was the most loss-making product which amounts to $26640. So, company should avoid selling this product. Many people ordered binders, papers, furnitures frequently. Thus, company should manage these inventories carefully. The sales is more in California from the year 2014 to 2017. It is estimated that the overall sales will increase upto $459440 in the year 2018. The trend of profit and sales is improving year by year. So, if the same situation continues, the company can generate more profits in the future.

5. Flowchart:

```
┌─────────────────────────────┐
│      Business Dataset       │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│     IBM Cognos Analytics    │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│    Analytical Dashboard     │
└─────────────────────────────┘
```
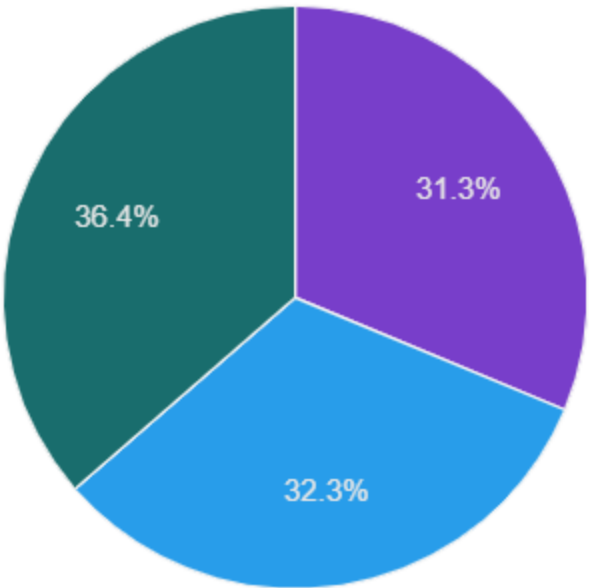
6. Result:

Region-wise orders

% of Sales by Product Category

Category
- Office Supplies
- Furniture
- Technology

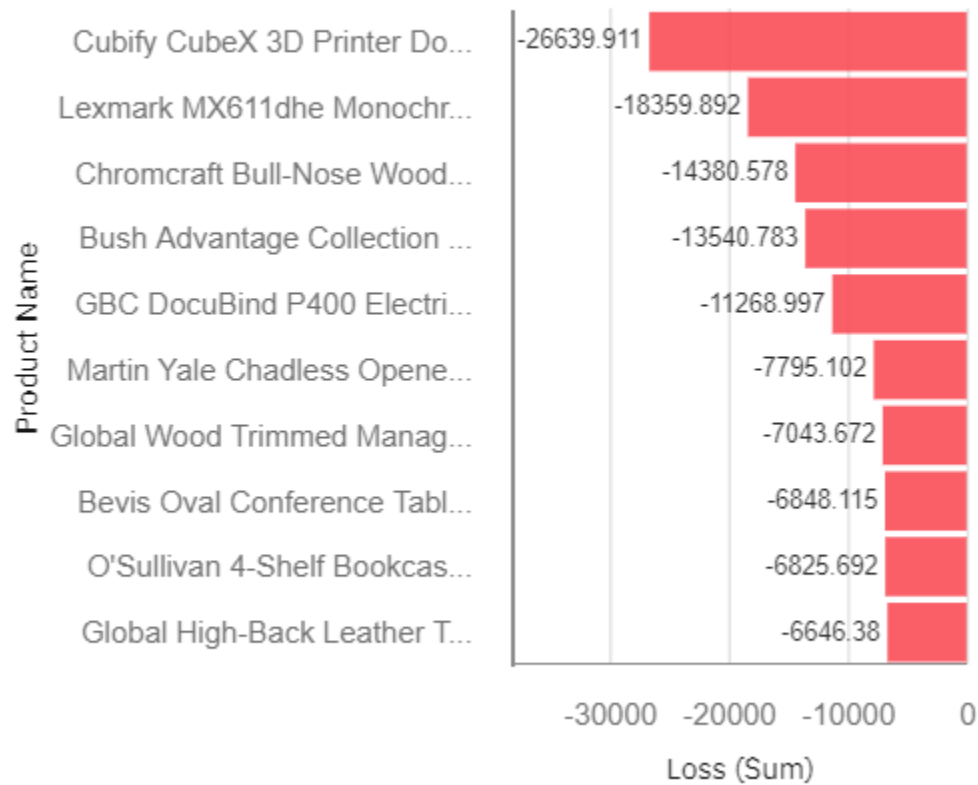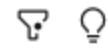| Category	%
Technology	36.4%
Office Supplies	31.3%
Furniture	32.3%

Frequency distribution of quantity ordered

Quantity	Quantity (Count)
1	899
2	2402
3	2409
4	1191
5	1230
6	572
7	606
8	257
9	258
10	57
11	34
12	23
13	27
14	29
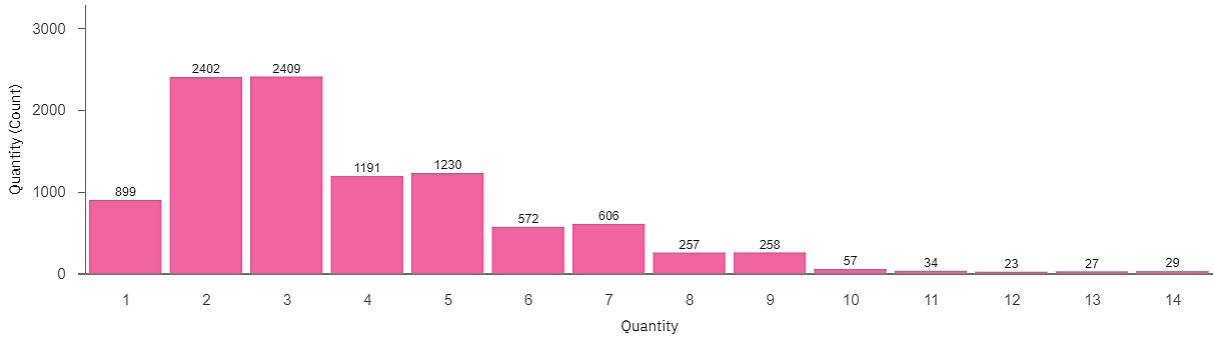
Profitable product name (2014 - 2017)

Year
- 2014
- 2015
- 2016
- 2017

Product Name	Profit (Sum)
Canon imageCLASS 2200 Adv... (2016)	9520
Canon imageCLASS 2200 Adv... (2017)	15680
Fellowes PB500 Electric Punch Plastic C... (2015)	7499
Ibico EPK-21 Electric Binding System (2014)	4630
Hewlett Packard LaserJet 3310 Copier (2016)	2968
Zebra ZM400 Thermal Label Printer (2017)	3624
GBC Ibimaster 500 Manual ProClick Bindi... (2015)	3344
HP Designjet T520 Inkjet Large Format P... (2016)	2800
Canon PC1060 Pers... (2015)	2681

Top 10 Products that incurred losses

Product Name	Loss (Sum)
Cubify CubeX 3D Printer Do...	-26639.911
Lexmark MX611dhe Monochr...	-18359.892
Chromcraft Bull-Nose Wood...	-14380.578
Bush Advantage Collection ...	-13540.783
GBC DocuBind P400 Electri...	-11268.997
Martin Yale Chadless Opene...	-7795.102
Global Wood Trimmed Manag...	-7043.672
Bevis Oval Conference Tabl...	-6848.115
O'Sullivan 4-Shelf Bookcas...	-6825.692
Global High-Back Leather T...	-6646.38

Product type that was ordered greater times

Sub-Category	Count
Binders	1,523
Paper	1,370
Furnis...	957
Phones	889
Storage	846
Art	796
Access...	775
Chairs	617
Applia...	466
Labels	364
Tables	319
Envelopes	254
Bookca...	228
Fasteners	217
Supplies	190
Machines	115
Co...	68
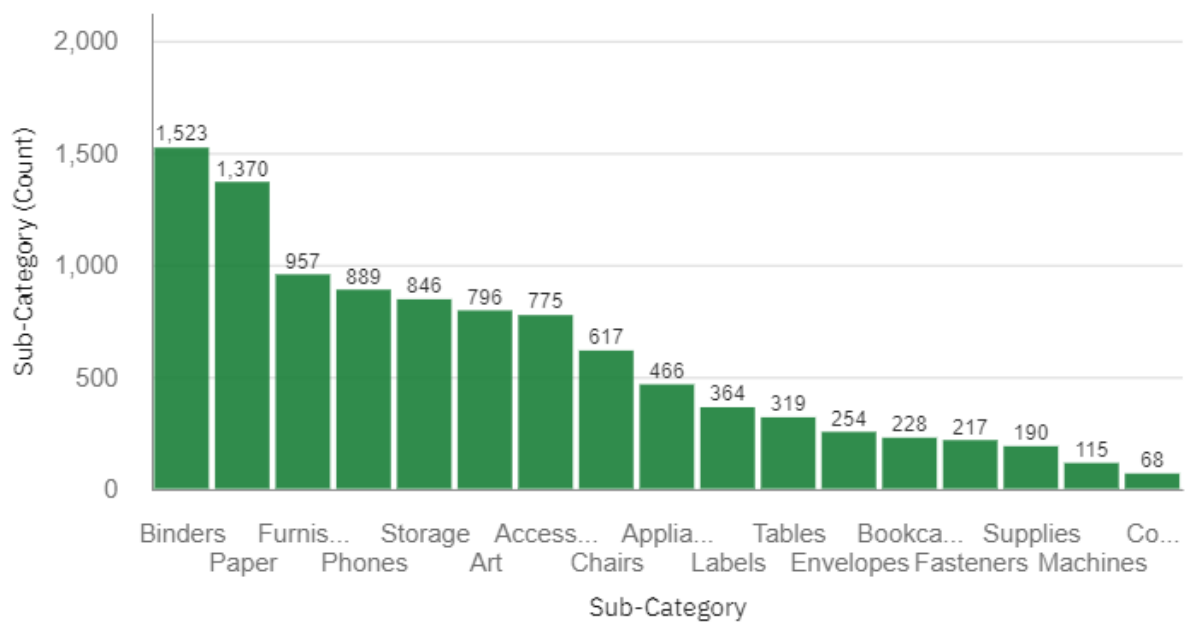
Forecasting future sales according to shipping date
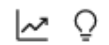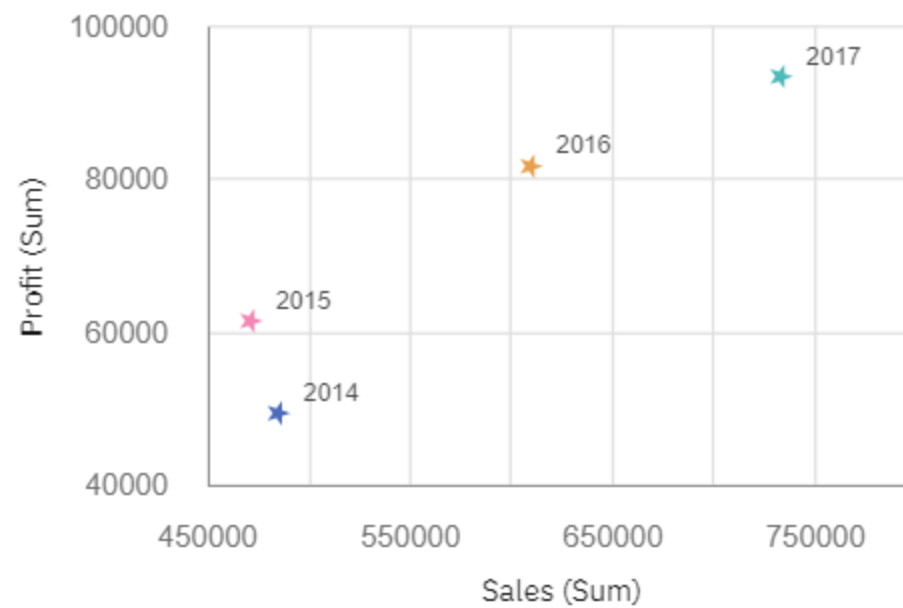
•••• Forecast

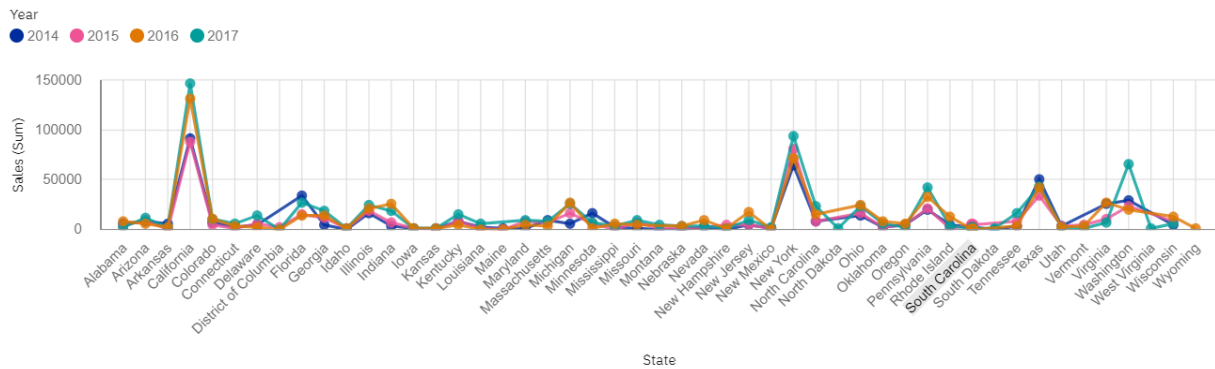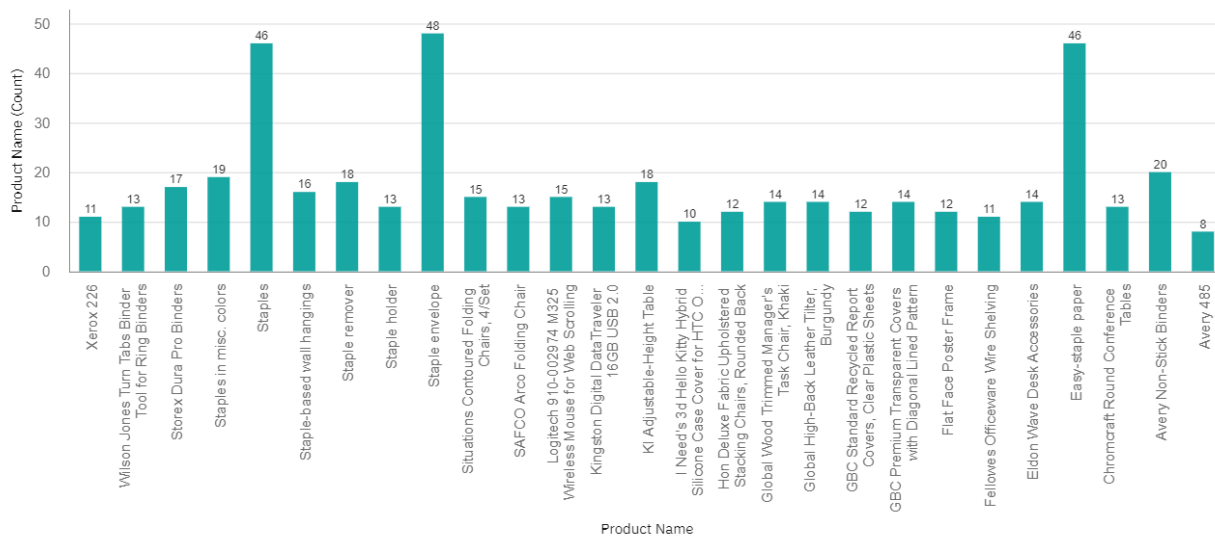## The trend in profit/sales over time

Year
★ 2014 ★ 2015 ★ 2016 ★ 2017

State-wise yearly sales

Top 25 product names ordered frequently

7. Advantage and Disadvantage:

It allows company to easily take decisions based on data.

The company needs to create it frequently to know their current status and customer behaviour.

8. Application:

The proposed solution can be used for any ecommerce platform to analyse their business activities.

9. Conclusion:

Currently, the company is performing well with its business especially in west region of United States. The maximum sales is happening in California. The products in technology category was the highest selling products. The consumers prefer to order 2 or 3 quantities of product and ordered binders, papers and furniture frequently. The company must regularly keep

stock of staples, staple envelope and easy staple paper as these were ordered frequently for many years (2014-2017) which leads to better inventory management. Most of the sales is happening between the months of September to December. This may be due to celebrations like Christmas. So, company can increase the number of products available in their website and offer discounts to delight the customer to purchase during that month.

10. Future scope:

The advancement in Artificial Intelligence will substitute the manual analysis of company.