



HIGH LEVEL DESIGN(HLD)

Analysing Sales Data

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## 1. Introduction

- Why this High-Level Design Document?

The purpose of this High-Level Design (HLD) document is to add the necessary detail to the current project description to represent a suitable model for coding. This document is also intended to help detect contradictions before coding and can be used as a reference manual for how the modules interact at a high level.

The HLD will:

- Present all of the design aspects and define them in detail
- Describe the user interface being implemented
- Describe the hardware and software interfaces
- Describe the performance requirements
- Include design features and the architecture of the project
- List and describe the non-functional attributes like:

Security, Reliability, Maintainability, Portability, Reusability, Application compatibility, Resource utilization, Serviceability

- Scope

The HLD documentation presents the structure of the system, such as the database architecture, application architecture (layers), application flow (Navigation), and technology architecture. The HLD uses non-technical to mildly-technical terms which should be understandable to the administrators of the system

## 2. General Description

- Product Perspective & Problem Statement

This Project aims to Analyze Amazon Sales from 2017 to 2019 to know more in-depth information about the items that are in high demand, items that are generating high profits which items should not be sold and how much stock we have to maintain for further Sales etc.

- Tools used

Business Intelligence tools and libraries works such as NumPy, Pandas, Seaborn, Matplotlib, MS-Excel, MS-Power BI, Jupyter Notebook and Python Programming Language are used to build the whole framework.

### 3. Design Details

- Functional Architecture



#### STEP 1

Data from source systems is integrated and loaded into a data warehouse of other analytics repository.



#### STEP 2

Data sets are organized into analytics data models or OLAP cubes to prepare them for analysis.



#### STEP 3

BI analysts, other analytics professionals and business users run analytical queries against the data.



#### STEP 4

The query results are built into data visualizations, dashboards, reports and online portals.



#### STEP 5

Business executives and workers use the information for decision-making and strategic planning.

### Functional Architecture of Business Intelligence

- How Bi works

ORGANIZATIONAL  
MEMORY

- Data Warehouse
- Enterprise resource planning (ERP)
- Knowledge Repository
- Content Management System (CMS)

INFORMATION  
INTEGRATION

- Business Analytical Tools
- Data Mining
- Real Time Decision

INSIGHT  
CREATION

- Text Mining Tool
- Web Mining Tool
- Environmental Scanning
- RFID

PRESENTATION

- Online Analytical Processing (OLAP) Tool
- Visualization Tool
- Digital Dashboard
- Score Card

- Optimization

## 1. Your data strategy drives performance

- Minimize the number of fields
- Minimize the number of records.
- Optimize extracts to speed up future queries by materializing calculations, removing columns and the use of accelerated views.

## 2. Reduce the marks (data points) in your view

- Practice guided analytics. There's no need to fit everything you plan to show in a single view. Compile related views and connect them with action filters to travel from overview to highly-granular views at the speed of thought.
- Remove unneeded dimensions from the detail shelf.

Explore. Try displaying your data in different types of views.

## 3. Limit your filters by number and type

- Reduce the number of filters in use. Excessive filters on a view will create a more complex query, which takes longer to return results. Double-check your filters and remove any that aren't necessary.



- Use an include filter. Exclude filters load the entire domain of a dimension while including filters do not. An include filter runs much faster than an exclude filter, especially for dimensions with many members.
- Use a continuous date filter. Continuous date filters (relative and range-ofdate filters) can take advantage of the indexing properties in your database and are faster than discrete data filters.
- Use Boolean or numeric filters. Computers process integers and Booleans (t/f) much faster than strings.
- Use parameters and action filters. These reduce the query load (and work across data sources).

#### 4. Optimize and materialize your calculations.

- Perform calculations in the database.
- Reduce the number of nested calculations.
- Reduce the granularity of LOD or table calculations in the view. The more granular the calculation, the longer it takes.
- LODs - Look at the number of unique dimension members in the calculation.
- Table Calculations - the more marks in the view, the longer it will take to calculate..
- Where possible, use MIN or MAX instead of AVG. AVG requires more processing than MIN or MAX. Often rows will be duplicated and display the same result with MIN, MAX, or AVG.
- Make groups with calculations. Like include filters, calculated groups load only named members of the domain, whereas Tableau's group function loads the entire domain.
- Use Booleans or numeric calculations instead of string calculations. Computers can process integers and Booleans (t/f) much faster than strings. Boolean>Int>Float>Date>DateTime>String.

## 4. KPI

Dashboards will be implemented to display and indicate certain KPIs and relevant indicators for the disease.



As and when the system starts to capture the historical/periodic data for a user, the dashboards will be included to display charts over time with progress on various indicators or factors

- KPIs (Key Performance Indicators)

Key indicators displaying a summary of Sales Data and its relationships with different metrics.

1. Yearly, Quarterly, Monthly Ups and Downs in Sales & Profits.
2. Items That Generated Highest Sales, Profit etc.
3. Top 5 Items that generated highest Sales and Top 5 Items by Quantity.
4. Bottom 5 Items that generated Lowest Sales and Bottom 5 Items by Quantity.
5. Forecasting.

## 5. Deployment

Prioritizing data and analytics couldn't come at a better time. Your company, no matter what size, is already collecting data and most likely Analysing just a portion of it to solve business problems, gain competitive advantages, and drive enterprise transformation.

With the explosive growth of enterprise data, database technologies, and the high demand for analytical skills, today's most effective IT organizations have shifted their focus to enabling self-service by deploying and operating Power BI at scale, as well as organizing, orchestrating, and unifying disparate sources of data for business users and experts alike to author and consume content.

Power BI prioritizes choice in flexibility to fit, rather than dictate, your enterprise architecture. Power BI Desktop and Power BI Service leverage your existing technology investments and integrate them into your IT infrastructure to provide a self-service, modern analytics platform for your users. With on-premises, cloud, and hosted options, there is a version of Power BI to match your requirements

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## SALES ANALYSIS

Select Year &amp; Quarter

✓ ☐ 2017✓ ☐ 2018✓ ☐ 2019

\$7,53,65,752.0

Profits

28,56,611

Quantity

18,14,56,833.11

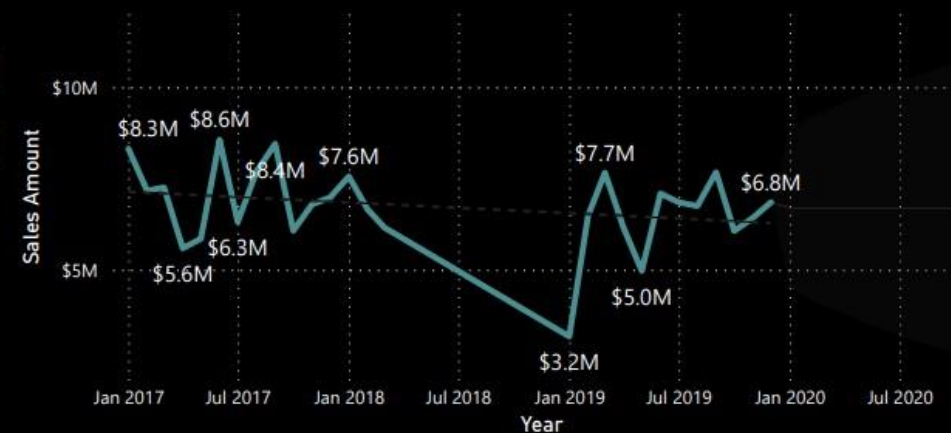
Total Sales

Item	Sales Price	Sales Amount	Profits	Quantity	Profits%
High Top Onions					
Red Spade Pimento Loaf	\$9,490.85	\$1,54,54,172.47	54,59,826.26	5,90,343	54.63%
Better Canned Tuna in Oil	\$1,10,126.16	\$1,33,67,239.65	46,58,792.22	3,76,904	53.50%
Ebony Squash	\$8,742.45	\$57,11,486.45	15,13,691.17	1,63,296	36.06%
Big Time Frozen Cheese Pizza	\$2,169.00	\$56,93,075.12	19,03,351.46	2,66,996	50.22%
Fast Mini Donuts	\$3,86,955.34	\$53,80,727.75	23,36,246.16	10,553	76.74%
Better Fancy Canned Sardines	\$1,99,980.78	\$51,27,171.17	28,26,772.99	27,420	122.88%
Discover Manicotti	\$7,151.38	\$50,09,499.08	26,63,325.66	27,300	113.52%
Landslide White Sugar	\$12,61,748.31	\$49,65,960.97	21,28,392.55	17,581	75.01%
Tell Tale Red Delicious Apples	\$7,65,222.61	\$49,01,139.48	23,81,667.84	7,228	94.53%
Moms Turkey Hot Dogs	\$40,530.35	\$42,82,290.62	20,79,755.46	16,198	94.43%
Landslide French Roast	\$2,500.91	\$40,95,211.34	19,77,923.42	31,120	93.42%

Profits by Year and Quarter



Sales Amount, %GT Sales Amount and Profits by Year, Quarter and Month



## Sales Insights

Year

Select all

2018

2017

2019

Item

Search

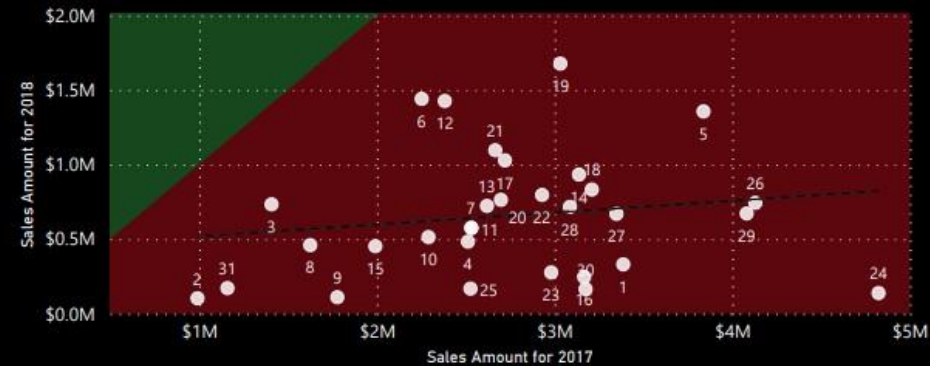
☐ American Beef Bologna
☐ American Chicken Hot Dogs
☐ American Corned Beef
☐ American Pimento Loaf
☐ American Potato Salad
☐ American Roasted Chicken
☐ American Sliced Ham
☐ Applause Canned Mixed Fruit
☐ Atomic Bubble Gum

### Sales



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Sales Amount for 2017 and Sales Amount for 2018 by DayOfMonth

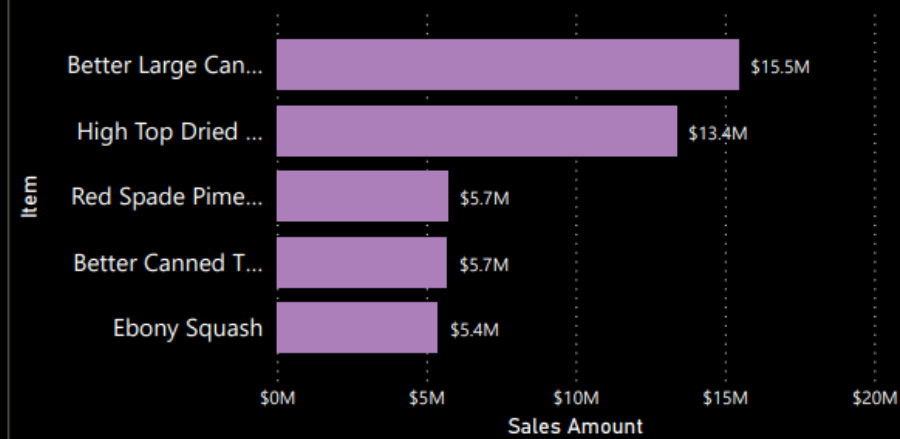


Sales Amount for 2018 and Sales Amount for 2019 by Day

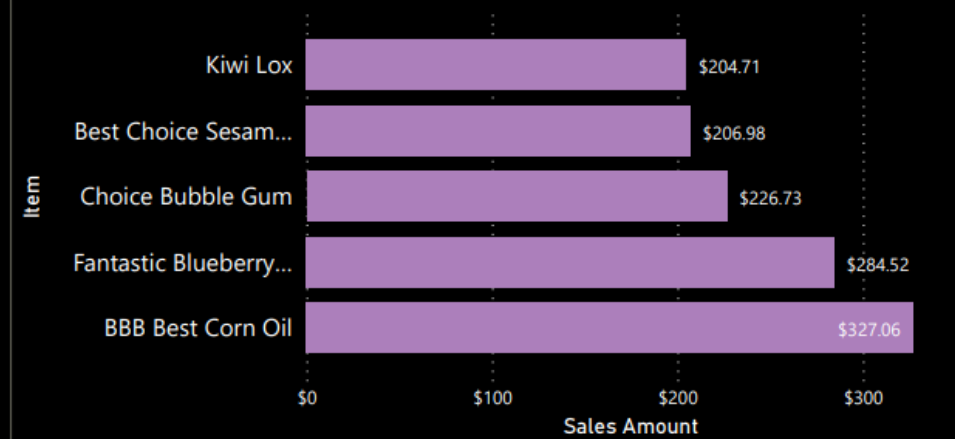


## Item-wise Distribution

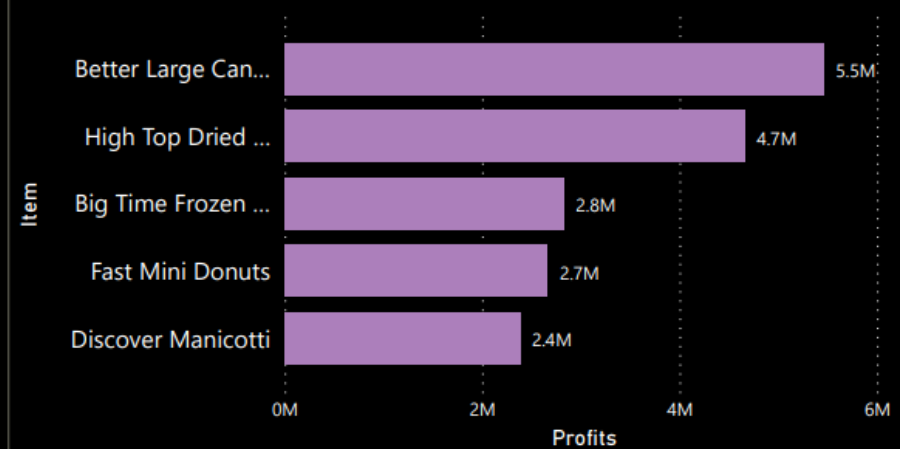
Sales Amount and Quantity by Item



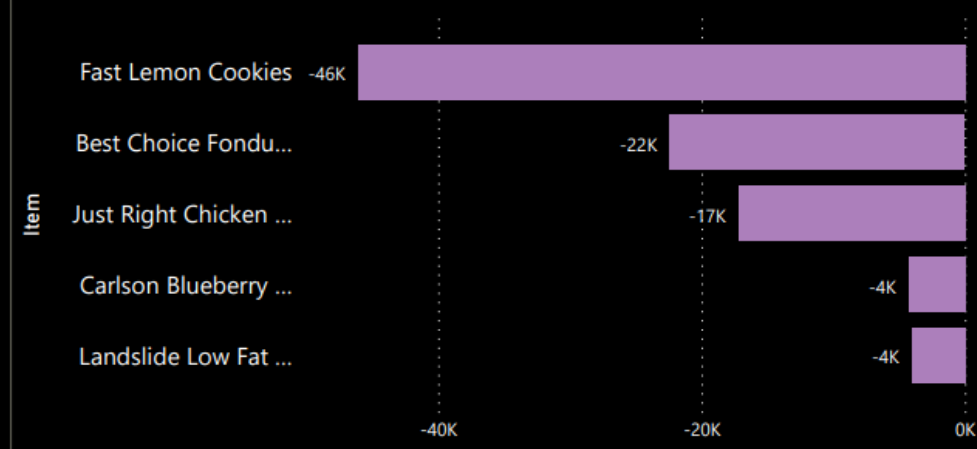
Bottom 5 Items



Profits and Quantity by Item



Bottom 5 Items by Loss





## Profit, Sales & Customer Analysis

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