**Sales Analysis**

**Low Level Design Document  
Time frame: 2010 - 2017**

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1. **Introduction**
   1. **Why this Low-Level Design Document?**

The goal of the LDD or Low-level design document (LLD) is to give the internal logic design of the Sales dashboard.

**1.2 Scope**

Low-level design (LLD) is a component-level design process that follows a step-by-step refinement process. The process can be used for designing data structures, required software architecture, source code and ultimately, performance algorithms. Overall, the data organization may be defined during requirement analysis and then refined during data design work.

**2. Architecture**

**Power BI Architecture**

The architecture consists of four steps to explain the process from data sourcing to the creation of reports and dashboards.

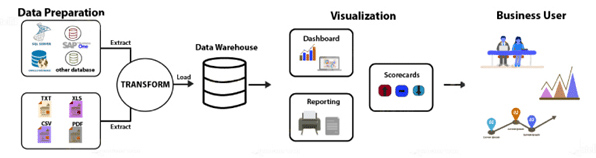
* **Sourcing of data**
  + Power BI extracts data from various servers, excel sheets, csv files.
  + The extracted information can be directly imported to Power BI, or a live service link is established to receive it. If you directly import the data in Power BI, it will only be compressed up to 1 GB.
* **Transforming the data**
  + Before visualizing the data, cleaning and pre-processing should be done. This means removing useless or missing values from rows or columns. Following that, certain rules will be applied to transform and load the datasets into the warehouse.
* **Report** 
  + After cleaning and transforming the data, reports will be created based on requirements. A report is a visualization of the data with different filters and constraints presented in the form of graphs, pie charts, donut charts, heat maps and other figures.
* **Create dashboards and Publish**
  + Dashboards are created by pinning individual elements or pages of live reports. Dashboards are created after you have published your reports to the BI service. When the reports get saved, the visual maintains the filter settings chosen so that the user can apply filters and slicers.

1. **Working of Power BI architecture**

The architecture is mainly divided into two parts:

* On-cloud,
* on-premises services.

Below is a Power BI data flow Diagram that helps one understand the flow of data from On-premises to On-cloud server applications.



Data sources such as web browsers, Excel sheets, and other sources feed the information to various Power BI components. Power BI has various data sources, including direct connections, in-house servers, cloud databases, and more. Best practices of Power BI architecture helps to create stunning reports for better business analytics.

1. **Why Power BI was used a tool for analysis?**

* **We can Access data in different formats:**Power BI can view, analyse, and visualize vast amounts of data in different formats, including Excel, XML, JSON, CSV, etc.
* **Secure Data Analytics:**Power BI keeps your business data secure by providing features such as sensitive labels, data loss prevention, the oversight of sensitive data with service tags, Azure Private Link etc
* **BI is free to use:**Microsoft provides BI desktop for free and the Power BI Pro version at a very low price so that anyone can access Power BI’s cost-effective tools for their business growth.
* **Interactive AI features to build dashboards:**It helps non-technical individuals as well to build reports and find quick insights into their business from both structured and unstructured data, including text and images.
* **Easy to share:** With the power BI service account, you can share the report with external users as well.

1. **Dataset Description**

The dataset contains information in following columns:

1. Region: It broadly gives idea about different regions of the world where products are delivered.
2. Country: It further divides region into countries belonging to that specific region.
3. Item type: Different product categories of the company
4. Sales channel: Mentions two distribution channels i.e., Offline and Online
5. Order priority: Provides Order priority as Critical (C), Medium(M), Low(L), High(H)
6. Order Id: Provides order IDs
7. Units sold: Provides numeric data of quantity sales
8. Unit price: Provides price per one quantity
9. Unit cost: Provides cost per one Unit
10. Total revenue: Revenue is the multiplication of units sold and units price
11. Total cost: Cost is the multiplication of units sold and unit cost
12. Total profit: Total revenue - total cost
13. Order date: Provides purchase date in different formats
14. Ship date: Provides ship date in different formats
15. **Data Transformation**

The dataset is transformed using power query to convert order date and ship date in to single date format so that it is easier to perform further calculations.

Data with improper values which doesn’t make sense were removed.

1. **Data insertion into database**

The dataset is provided in a CSV format and is directly imported to Power BI using Excel Connector.

1. **Deployment**

Once the reports are created. We publish it to power Bi service using the Publish button available on the home page.

Sign in to the Power BI Account.

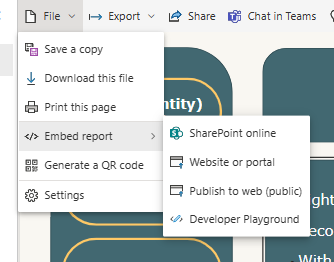
Select the Workspace available on Power BI Service which is the cloud server of Power BI.

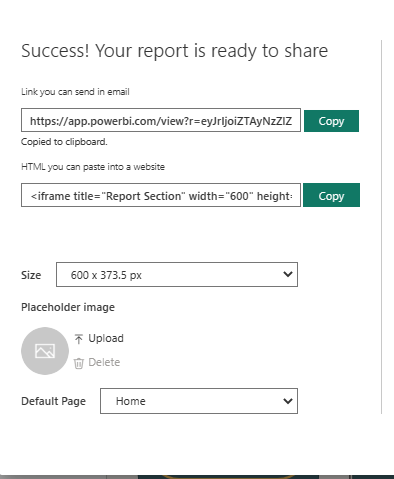
Now the reports are published to Power BI Service which will be available for other users to view and take the insights.

By default, the reports available in My workspace are available on to owner of the report, hence to share it with others with in the organization, access has to be provided to them explicitly.

In case the report to be available to people outside of organization, report has to be embedded as shown in the figure below,

Now it will provide a Link/URL using which anyone on the internet can access the report.





1. **Unit Test Cases**

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| --- | --- |
| **Test Case** | **Expected Results** |
| Year Slicer | When selected, Should filter the data as per year selected. Multi-select is allowed manually as well as with a select all button |
| Month Slicer | When selected, Should filter the data as per month selected for all the years. Multi-select is allowed manually as well as with a select all button |
| Year & Month Slicer | When both filters are selected, Should filter the data as per year & month selected. Multi-select is allowed manually as well as with a select all button |
| Country filter | when clicked, should show a dropdown of countries the business is present in. when selected, should filter all visuals with data pertaining to the country/countries selected |
| Sales, Revenue, Profit growth in KPI chart | Default to show latest year data and growth compared to previous year |
| Trend line on hovering on Category wise Sales analysis | On hovering the data bars available, a tool tip visual should pop up showcasing the trend line |
| Quarter Slicer | When selected, should filter the data for the selected quarter and the measures calulating the Lat year data for the same period should filter correct data. |
| Conditional Formatting on Contribution table in P&L report | A green color gradient has to be applied on the cell background dynamically based on the values of the cell |
| Conditional Formatting on YOY %Change in P&L report | A green/light red background color & Icons has to be displayed dynamically based on the values of the cell |