

Architecture Design

Ecommerce Analytics Dashboard

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1. Introduction

1.1 What is an Architecture design document?

Any software needs the architectural design to represent the design of software. IEEE defines architectural design as “the process of defining a collection of hardware and software components and their interfaces to establish the framework for the development of a computer system.” The software that is built for computer-based systems can exhibit one of these many architectures.

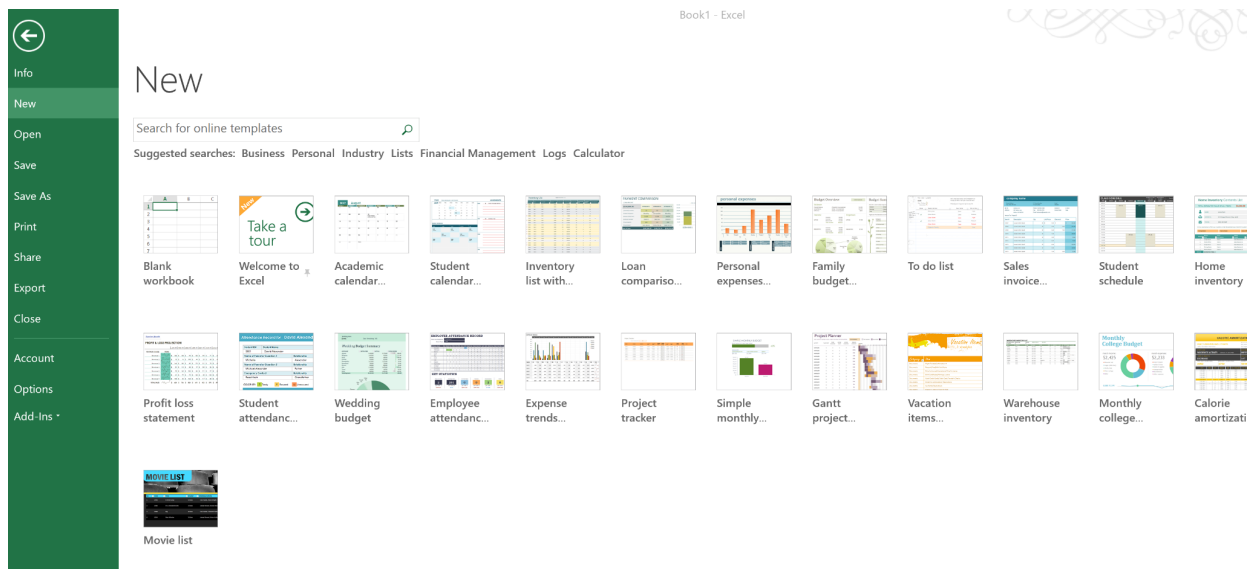
Each style will describe a system category that consists of :

- A set of components (eg: a database, computational modules) that will perform a function required by the system.
- The set of connectors will help in coordination, communication, and cooperation between the components.
- Conditions that how components can be integrated to form the system.
- Semantic models that help the designer to understand the overall properties of the system.

1.2 Scope

Architecture Design Document (ADD) is an architecture 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 design principles may be defined during requirement analysis and then refined during architectural design work.

2. Architecture



Microsoft Excel Architecture

Microsoft Excel is one of the world's most important software tools, relied upon by users worldwide to create, understand, model, predict, and collaborate. As the Excel team works to leverage new areas of computer science – advancements in programming languages, NLP, Artificial Intelligence, Machine Learning – they turn to Microsoft Research both to leverage the incredible work done in the organization as well as to help co-create a vision for what Excel should look like years into the future.

Microsoft Excel is considered the industry standard piece of software in data analysis. Microsoft's spreadsheet program also happens to be one of the most preferred software by investment bankers and financial analysts in data processing, financial modeling, and presentation. This guide will provide an overview and list of basic Excel functions.

1. Formulas:-

In Excel, a formula is an expression that operates on values in a range of cells or a cell. For example, `=A1+A2+A3`, which finds the sum of the range of values from cell A1 to cell A3.

2) Functions :-

Functions are predefined formulas in Excel. They eliminate laborious manual entry of formulas while giving them human-friendly names. For example: `=SUM(A1:A3)`. The function sums all the values from A1 to A3.

3) Charts:-

In Microsoft Excel, a chart is often called a graph. It is a visual representation of data from a worksheet that can bring more understanding to the data than just looking at the numbers.

A chart is a powerful tool that allows you to visually display data in a variety of different chart formats such as Bar, Column, Pie, Line, Area, Doughnut, Scatter, Surface, or Radar charts. With Excel, it is easy to create a chart.

4) Pivot Tables:-

A Pivot Table is used to summarise, sort, reorganise, group, count, total or average data stored in a table. It allows us to transform columns into rows and rows into columns. It allows grouping by any field (column), and using advanced calculations on them.

3. Architecture Description

3.1. Data Description

The company's database keeps track of the following data fields: Brand Name, Company Name, Disease Medical Use, Invoice date, Company code, Shipto-Country, Ship-to-Country Full Name, Sold-to party- Code, Sold-to party Country, Soldto party Country Full Name, Delivery Plant, Payment terms, External Agent, Sales quantity, Price TC /Kg, Revenue, External commissions, Month.

1. Ship Mode: Mode of Shipping
2. Product Category: Major Category of product belonging to
3. Product: Name of the product customer bought
4. Sales: Sales Amount made in that order
5. Quantity: No. of products bought in that order
6. Discount: Discount given by store
7. Profit: Profit made on that order
8. Shipping Cost: Cost beared in shipping the order
9. Address: City, State, Country and Region of Shipping Address
10. Month of year: Month in which the order was placed.
11. Aging : Shipping Days

3.2. Data Transformation

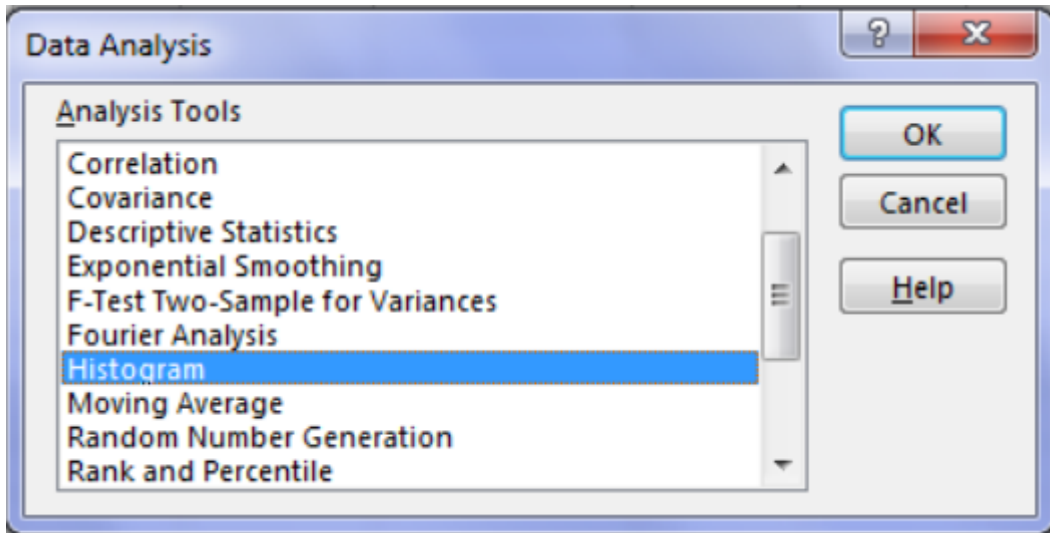
In the Transformation Process, we will convert our raw datasets with other necessary attributes format.

- Prepare a table of Sales and Profit month-wise.
- Prepare the sales table region-wise.
- Create User Control Combo box for Product Category.
- Create a Column Chart of the month-wise table and region-wise table.
- Link the table with a combo box.

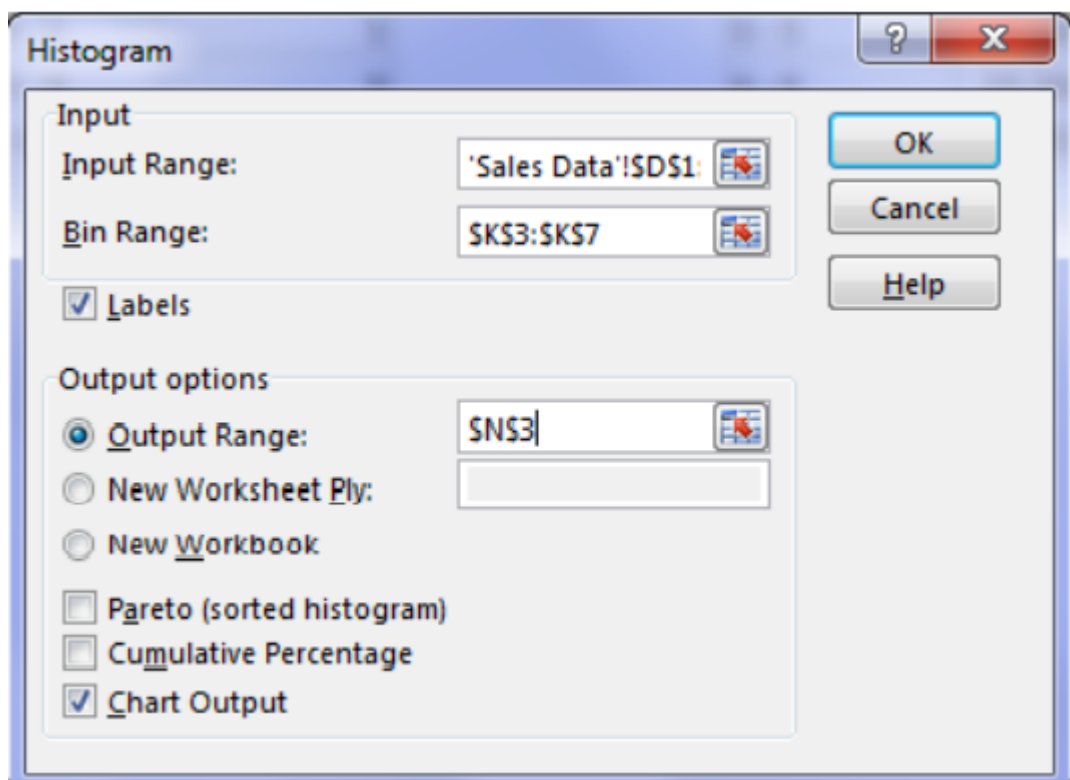
3.3 Create a Dashboard

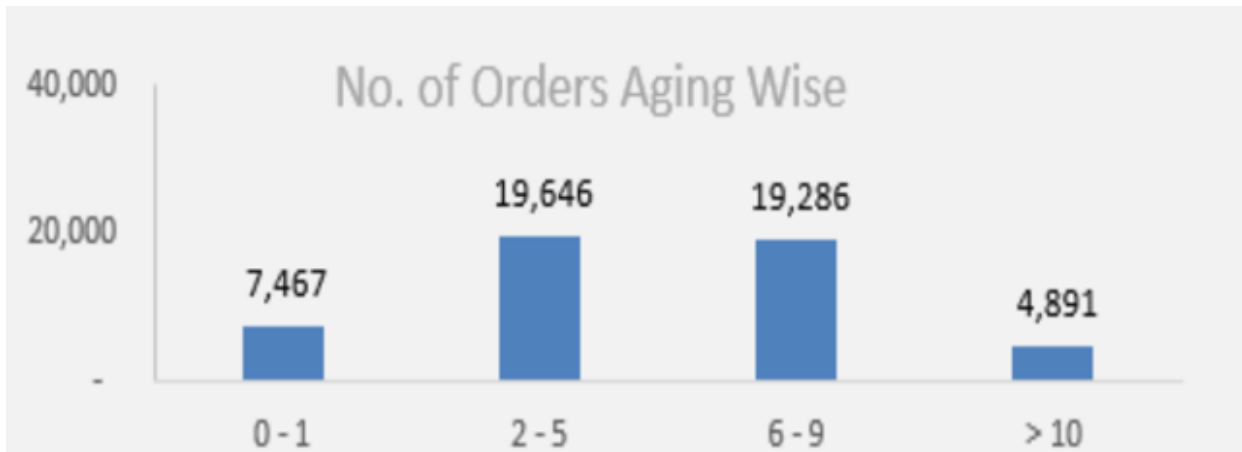
Step 1: Create Histogram for Shipping Days(Aging)

1. To create histogram, click the Data Tab, Under Analysis Group (Right Corner), Click Data Analysis. Now, select Histogram and click ok.
2. A histogram dialog box will appear.



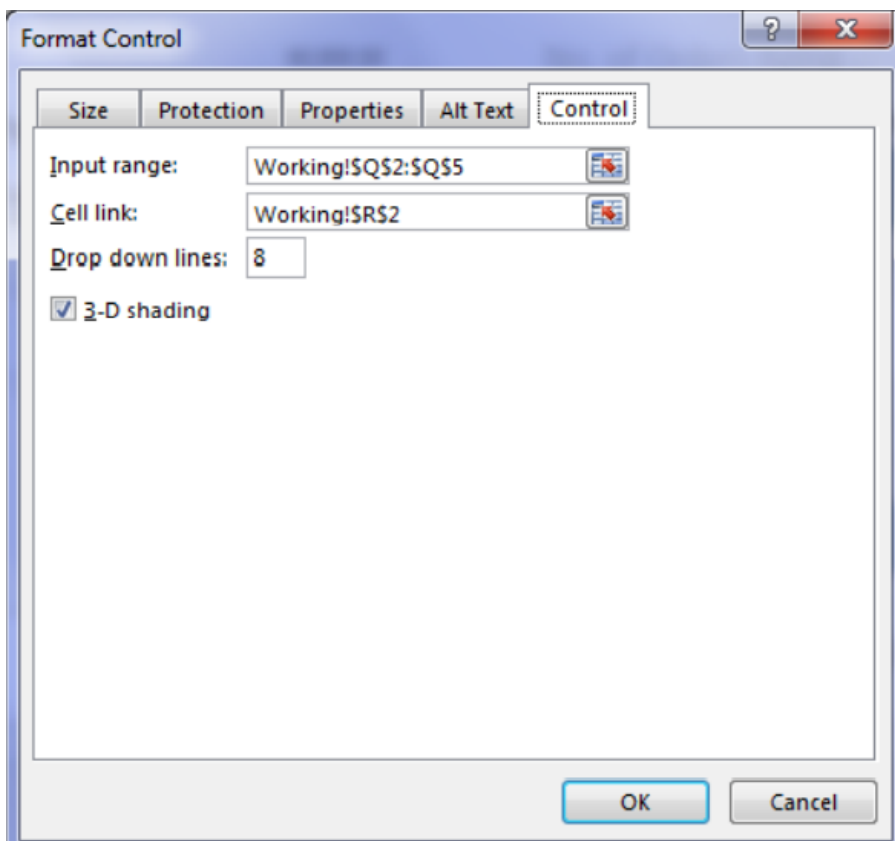
3. In the histogram dialog box, first click the Label's Check box as we have labels in our data.
4. After that, In the Input reference box select the range ("Sales Data!D1:D51291") of our data and in the Bin Range Reference box select ("Working!K3:K7").
5. In the Output section, select range "Working!N3" for the binning table, click the Histogram check box and then ok.





Step2 - Create Combo Box:

1. Insert Combo box for product category list in the Dashboard Sheet.
2. Click Developer Tab > Under Controls Panel > Click Combo box and draw. Pass the Input Range and Cell for the Combo box.
3. Right-click the country list Combo box > Click Format Control > Under Format Control Panel, Pass Input Range "Working!Q2:Q5" and Cell Link "Working!R2" from the working sheet.



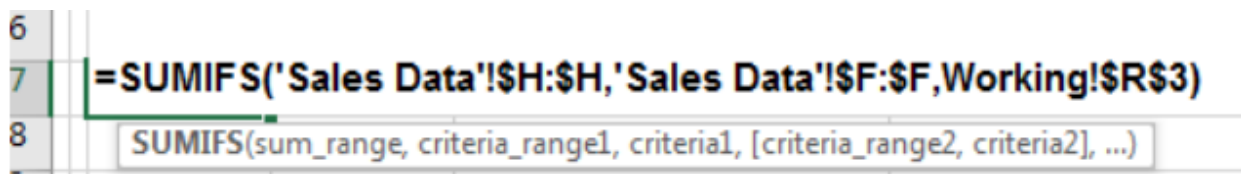
- Now, write the offset function in cell “R3” to fetch the product category based on the selection in the product category Combo box.
- Write the equal sign and then the function name.
- Pass the first argument as Cell “\$Q\$1.”
- In the second argument, select the cell link cell “\$R\$2.”

Step3: SUMIFS formula to calculate Total Sales, Quantity, and Profit

Now, write Sumifs formula to calculate Sales, Quantity, and Profit in the Dashboard sheet.

Enter the formula in Cell C7:

1. Enter the equal sign and then enter the function name and open parenthesis.
2. Pass the first Argument is Sum_Range, select range ‘Sales Data’!\$H:\$H, and then enter a comma.
3. Now, pass the second argument Product Category column “criteria Range1” as ‘Sales Data’!\$F:\$F, enter comma
4. Pass the third argument “criteria1” “Working!\$R\$3”, and enter a comma.\



Perform the same function to calculate the Quantity in Cell G7.

- In G7, write the equal sign, and then enter the function name and open parenthesis.
- The first Argument is Sum_Range, select range ‘Sales Data’!\$I:\$I, and then enter a comma.
- Now, pass the second argument Product Category column “criteria Range1” as ‘Sales Data’!\$F:\$F, and enter a comma.
- Pass the third argument “criteria1” “\$R\$3,” and enter a comma.

For Profit

- In K7, write the equal sign and then enter the function name and open parenthesis.
- The first Argument is Sum_Range, select range ‘Sales Data’!\$K:\$K, and then enter a comma.
- Pass the second argument Product Category column “criteria Range1” as ‘Sales Data’!\$F:\$F, and enter a comma.
- Now, pass the third argument “criteria1” “\$R\$3,” and enter a comma.

Step4: SUMIFS formula to calculate Sales and Profit month wise

Now write the sumifs formula to calculate the Sales and profit month-wise and sales region-wise.

Enter formula in Cell C4:

- Enter the equal sign and then enter the function name and open parenthesis.
- The first Argument is Sum_Range, select range ‘Sales Data’!\$H:\$H, and then enter a comma.
- Pass the second argument month column “criteria Range1” as ‘Sales Data’!\$U:\$U, and enter a comma.
- Now, pass the third argument “criteria1” “\$B\$4,” and enter a comma.
- Pass the fourth argument as Data!\$F:\$F product category column, and enter comma.
- Pass the fifth argument as “\$R\$3.” Now, copy and paste the formula in Range C4:C15.

Enter formula in Cell D4:

- Enter Equal sign then enters function name and open parenthesis
- The first Argument is Sum_Range, select range 'Sales Data'!K:K, and then enter a comma.
- Now, pass the second argument month column "criteria Range1" as 'Sales Data'!U:U, and enter a comma.
- Pass the third argument "criteria1" "\$B\$4," and enter a comma.
- Pass the fourth argument as Data!F:F product category column, and enter comma.
- Enter the fifth argument as "\$R\$3."
- Now, copy and paste the formula in Range D4:D15.

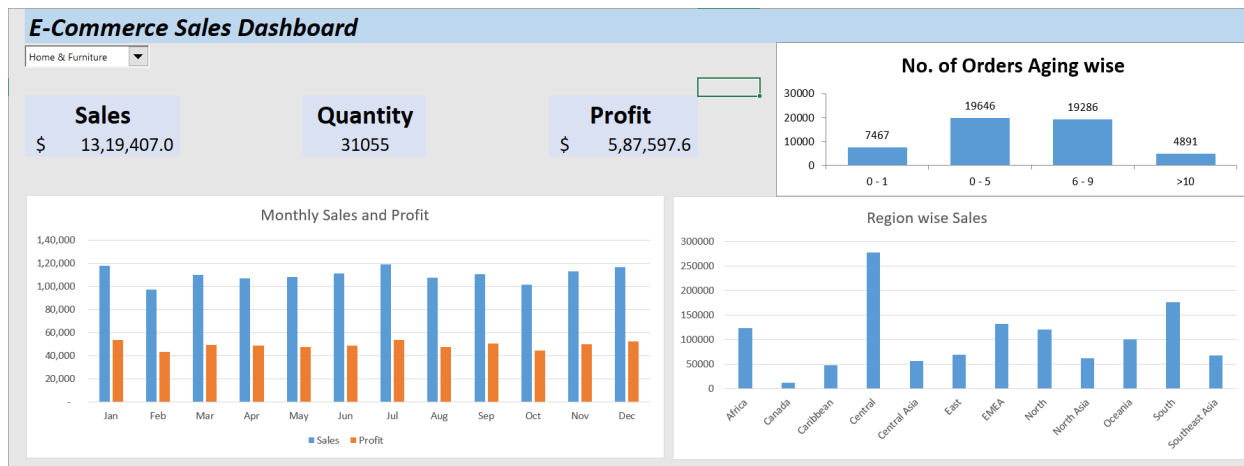
Months	Sales	Profit	Regions	Sales
Jan	=SUMIFS('Sales Data'!\$H\$1:\$H\$65536,'Sales Data'!\$U\$1:\$U\$65536,'Working (2)'!\$B4,'Sales Data'!\$F\$1:\$F\$65536,\$R\$3)			
Feb	29,776		Canada	
Mar	32,800		Caribbean	
Apr	33,417		Central	
May	33,705		Central Asia	
Jun	30,219		East	
Jul	29,644		EMEA	
Aug	34,088		North	
Sep	33,069		North Asia	
Oct	39,240		Oceania	
Nov	32,598		South	
Dec	34,902		Southeast Asia	
			West	

Step5: SUMIFS formula to calculate Sales region wise

- Write the equal sign and then enter the function name and open parenthesis.
- The first Argument is Sum_Range, select range 'Sales Data'!H:H, and then enter a comma.
- Pass the second argument region column "criteria Range1" as 'Sales Data'!T:T, and enter comma
- Now, pass the third argument "criteria1" "\$F\$4,"and enter a comma.
- Pass, the fourth argument as Data!F:F product category column, and enter comma.
- Pass the fifth argument as "\$R\$3." Now, copy and paste the formula in Range G4:G15.

Step 6: Create Column Chart

- Now, create the column chart for both region-wise and month-wise tables.
- Select table (B3:D15), click insert tab > under Charts Panel > Insert column chart.
- Cut and Paste the chart in the Dashboard Sheet. Perform the same steps for other tables to create charts.
- Now, this is our sales Dashboard, we can apply any color in the interior of cells, and data series to format it.



3.4. Export Data

Data Export from Excel - The data can be exported as a xlsx file to be used for Data Pre-processing.

3.5 Deployment.

Once you've completed your dashboard, you can share the xlsx file with stakeholders of the project.

The Analytics team can use the dashboard to analyze the sales based on various product categories.

The user can control the product category and select a category to see the trend month-wise and product-wise accordingly.