Low Level Design

Ecommerce Sales Prediction

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DOCUMENT CONTROL

Change Record:

VERSION	DATE	AUTHOR	COMMENTS
0.1	7- July - 2022	Tejas Gupta	Introduction and architecture defined
0.2	7 - July - 2022	Tejas Gupta	Architecture & Architecture description appended and updated.

Reviews:

VERSION	DATE	REVIEWER	COMMENTS
0.2	8- July - 2022	Tejas Gupta	Unit test cases to be added

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VERSION	REVIEW DATE	REVIEWED BY		APPROVED BY	COMMENTS

Contents

1. Introduction

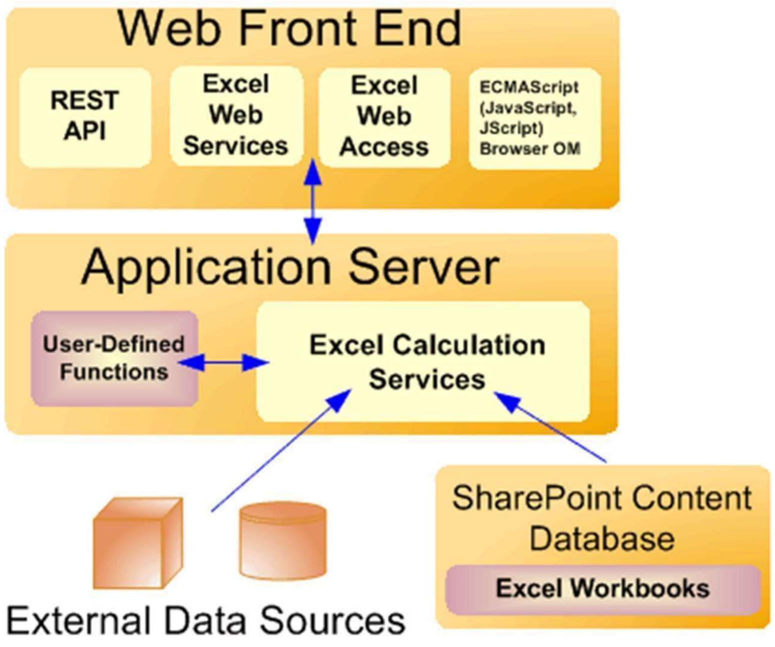
1.1 What is Low-Level design document?

The goal of the LDD or Low-level design document (LLDD) is to give the internal logic design of the actual program code for the House Price Prediction dashboard. LDD describes the class diagrams with the methods and relations between classes and programs specs. It describes the modules so that the programmer can directly code the program from the document.

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



1. Web front-end servers and back-end application servers

The Excel Web Access, Excel Web Services, UDFs, JavaScript, the REST service, and Excel Calculation Services components can be divided into components on the Web front-end server and components that live on a back-end application server. The Web front end includes Excel Web Access, JavaScript, the REST service, and Excel Web Services. The Excel

Calculation Services component resides on the back-end application server, alongside any UDF assemblies that an administrator has added.

2. Excel web access

Excel Web Access is a viewer page and an Excel Services web part that you can add to any web parts page in SharePoint Server 2010. Excel Web Access renders (in other words, creates the HTML for) live Excel workbooks on a webpage, and enables the user to interact with those workbooks and explore them. Excel Web Access is the visible Excel Services component for the user.

3. Excel web services

Excel Web Services is the Excel Services component that provides programmatic access to its Web service. You can develop applications that call Excel Web Services to calculate, set, and extract values from workbooks, and to refresh external data connections. By using Excel Web Services, you can incorporate server-side workbook logic into an application, automate the updating of Excel workbooks, and create application-specific user interfaces around server-side Excel calculation.

4. User-defined functions (UDFs)

Excel Services UDFs enable you to use formulas in a cell to call custom functions that are written in managed code and deployed to SharePoint Server 2010.

5. ECMAScript (JavaScript, JScript)

The JavaScript object model in Excel Services enables developers to customize, automate, and drive the Excel Web Access web part control on a page. By using the JavaScript object model, you can build mashups and other integrated solutions that interact with one or more Excel Web Access web part controls on a page or an iframe with script on the page. It also enables you to add more capabilities to your workbooks and code around them.

6. REST API

The REST API in Excel Services enables you to access workbook parts or elements directly through a URL. The URL contains a "marker" path, which is the entry point to an .aspx page, to the workbook file location, and to the path to the requested element inside the workbook.

The discovery mechanisms built into the Excel Services REST API enables developers and users to explore the content of a workbook manually or programmatically.

7. Excel calculation services

The role of Excel Calculation Services is to load workbooks, calculate workbooks, call custom code (UDFs), and refresh external data. It also maintains the session state for interactivity. Excel Calculation Services maintains a session for the duration of interactions with the same workbook by a user or caller. A session is closed when the caller explicitly closes it or when the session times out on the server. Excel Services caches the opened Excel workbooks, calculation states, and external data query results, for improved performance when multiple users access the same set of workbooks.

8. Load-Balancing

In multiple-server configurations, Excel Services load-balances requests across multiple Excel Calculation Services occurrences in a farm configuration. If your installation includes multiple application servers, Excel Services will balance the load in an attempt to help ensure that no single application server is overloaded by requests.Administrators can configure the load-balancing behaviour.

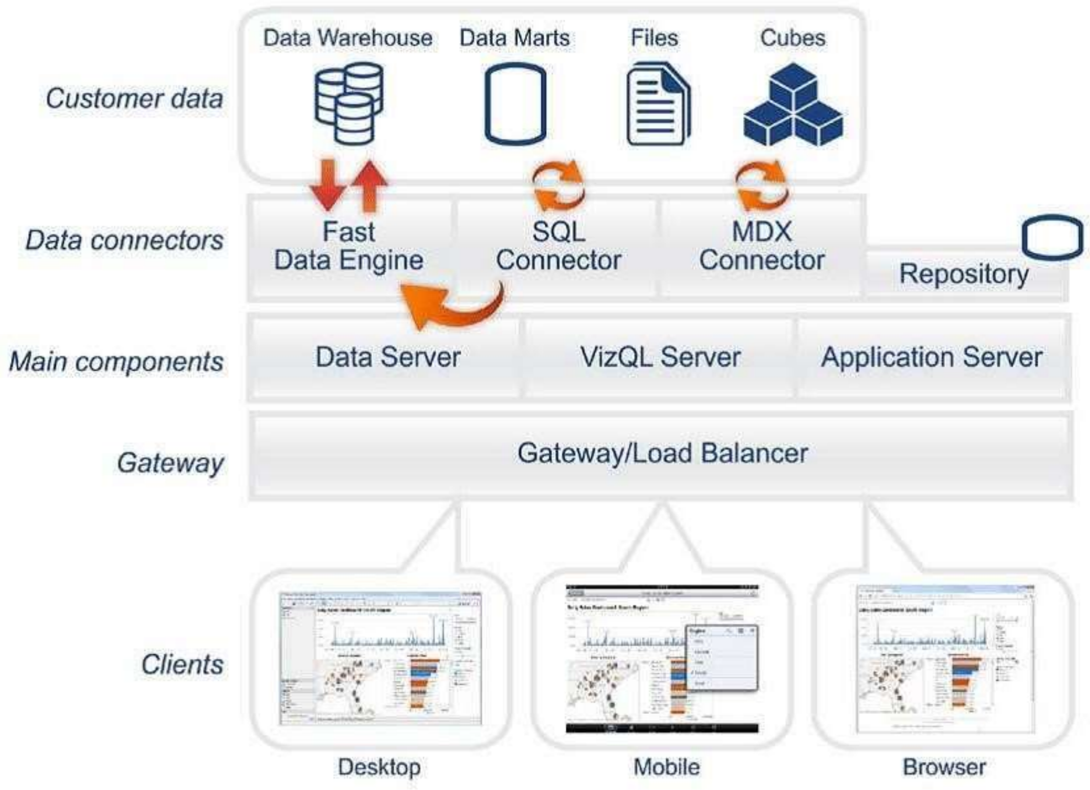


Tableau Server Architecture

Tableau has a highly scalable, n-tier client-server architecture that serves mobile clients, web clients and desktop-installed software. Tableau Server architecture supports fast and flexible deployments.

The following diagram shows Tableau Server's architecture:

Tableau Communication Flow

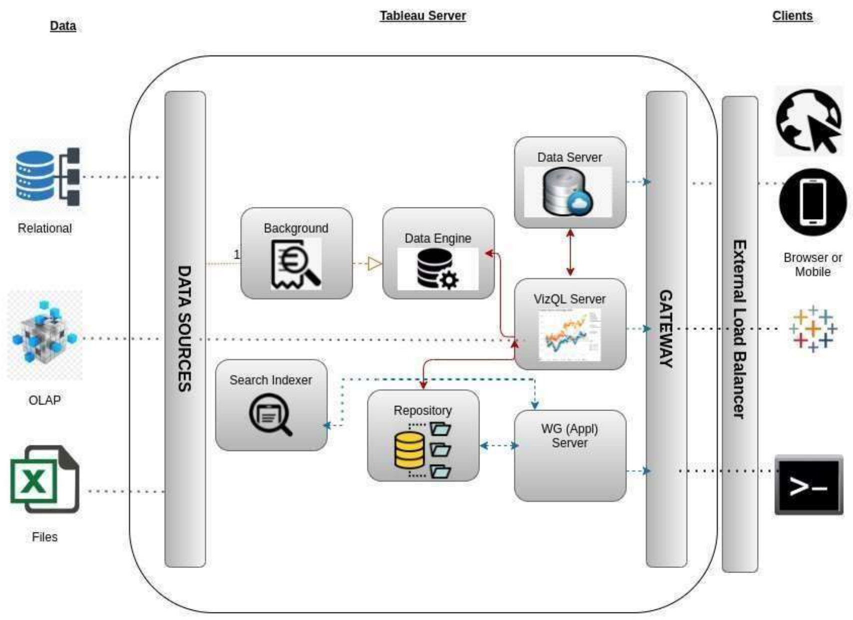


Tableau Server is internally managed by the multiple server processes.

1. Gateway/Load Balancer

It acts as an Entry gate to the Tableu Server and also balances the load to the Server if multiple Processes are configured.

2) Application Server:-

Application Server processes (wgserver.exe) handle browsing and permissions for the Tableau Server web and mobile interfaces. When a user opens a view in a client device, that user starts a session on Tableau Server. This means that an Application Server thread starts and checks the permissions for that user and that view.

3) Repository:-

Tableau Server Repository is a PostgreSQL database that stores server data. This data includes information about Tableau Server users, groups and group assignments, permissions, projects, data sources, and extract metadata and refresh information.

4) VIZQL Server:-

Once a view is opened, the client sends a request to the VizQL process (vizqlserver.exe). The VizQL process then sends queries directly to the data source, returning a result set that is rendered as images and presented to the user. Each VizQL Server has its own cache that can be shared across multiple users

5) Data Engine:-

It Stores data extracts and answers queries.

6) Backgrounder:-

The backgrounder Executes server tasks which includes refreshes scheduled extracts, tasks initiated from tabcmd and manages other background tasks.

7) Data Server:-

Data Server Manages connections to Tableau Server data sources

It also maintains metadata from Tableau Desktop, such as calculations, definitions, and groups.

3. Architecture Description

3.1. Data Description

The Dataset contains information of the product ordered as well as of the customer.

1. Order ID : Unique ID of orders (String)
2. Order Date : Date when these products were ordered (Date)
3. Ship Date : Date when these orders were shipped (Date)
4. Aging : An integer between 1 to 10 depicting shipping days (Number(whole))
5. Ship Mode : Mode of the products ordered (Same Day, First Class, Second Class, Standard Class) (String)
6. Product Category : There are 4 categories – Auto & Accessories, Electronic, Fashion, Home & Furniture (String)
7. Product : There are total 42 products (Apple Laptop, Bed Sheets, Beds, Bike Tyres, …) (String)
8. Sales : Sales made by each product (Number(whole))
9. Quantity : No. of times a product is ordered at a time (Number(whole))
10. Discount : Discount on a product (Number(decimal))
11. Profit : Profit made by a product (Number(decimal))
12. Shipping Cost : Cost of shipping (Number(decimal))
13. Order Priority : Priority of order (Critical, High, Low, Medium) (String)
14. Customer ID : Unique ID of customer (String)
15. Customer Name : Name of the customer (String)
16. Segment : There are 3 segments – Consumer, Corporate, Home Office (String)
17. City : City from which the product is ordered (String)
18. State : State from which the product is ordered (String)

19. Country : Country from which the product is ordered (String)

20. Region : Region from which the product is ordered (String)

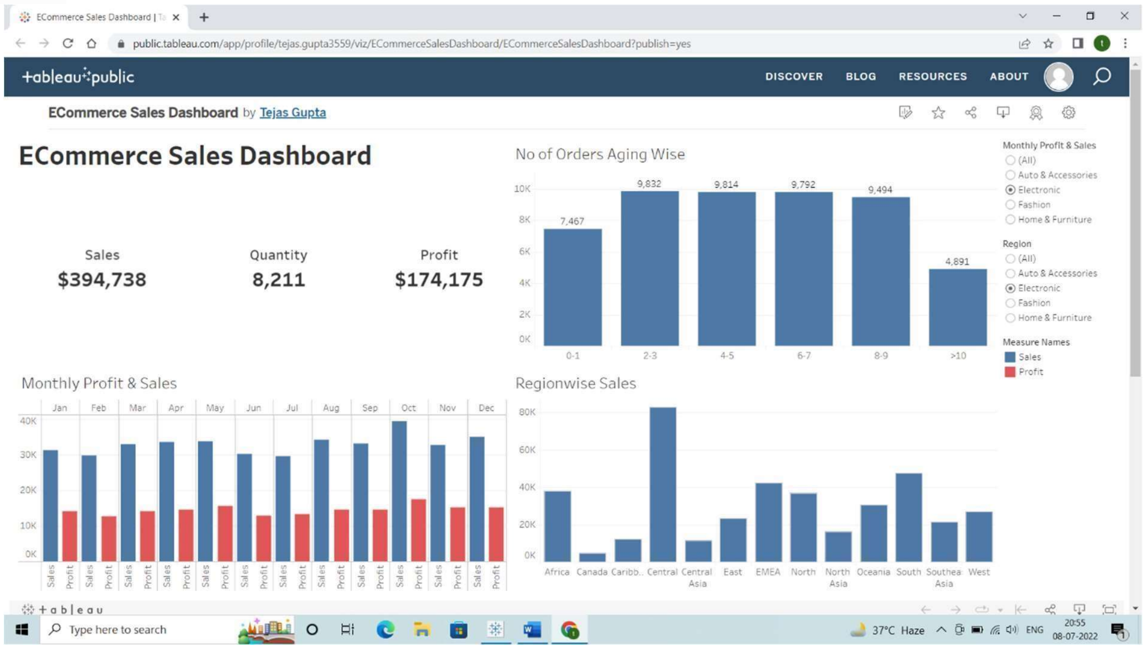
21. Months : At which month the product is ordered (String)

3.2 Deployment.

Once you've completed your dashboard, follow these steps:- Server, Tableau Public, Save to Tableau Public As
You may be prompted to log into your Tableau Public profile first if this is your first time publishing.

Next, fill out the title you want your viz to have and click "save".

Here in the below screenshot, we can see that out workbook has been published to tableau public.


public.tableau.com/app/profile/tejas.gupta3559/viz/ECommerceSalesDashboard/ECommerceSalesDashboard?publish=yes

ECommerce Sales Dashboard by Tejas Gupta

ECommerce Sales Dashboard

Sales $394,738 | Quantity 8,211 | Profit $174,175

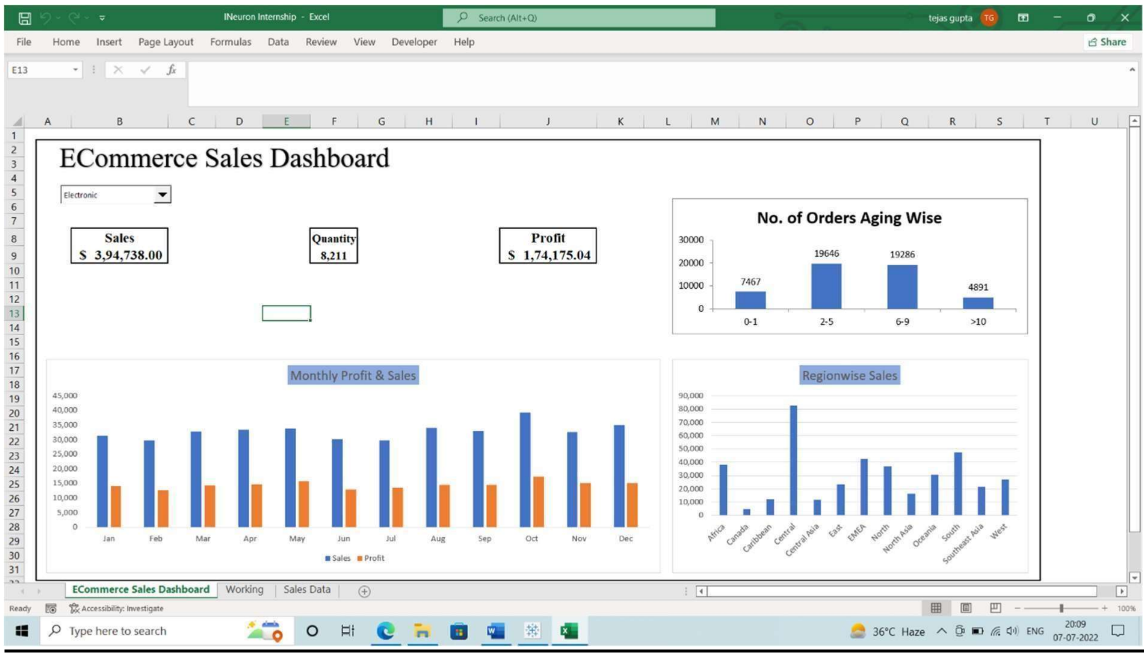
Monthly Profit & Sales: ( ) (All), ( ) Auto & Accessories, [✓ Electronic], ( ) Fashion, ( ) Home & Furniture

Region: ( ) (All), ( ) Auto & Accessories, [✓ Electronic], ( ) Fashion, ( ) Home & Furniture

Measure Names: 🟦 Sales, 🟥 Profit

<u>In Excel :</u>

Once you have completed your dashboard, follow these steps :- press Ctrl+S or click the Save icon on the top left corner. If you are saving for the first time, you need to give name and location of the excel file.



ECommerce Sales Dashboard

Electronic

Sales $ 3,94,738.00

Quantity 8,211

Profit $ 1,74,175.04

4. Unit Test Cases

TEST CASE DESCRIPTION	EXPECTED RESULTS
Product Category combo box	When clicked on the combo box, a dropdown should occur which has various categories of product
Relation Between Orders and Aging	Here a histogram is shown of Orders VS Aging data.
Monthly Profit and Sales	A table is created using SUMIFS formula, resulting in a clustered bar chart

Regionwise Sales	A table is created using SUMIFS formula, the visual should show a bar chart of total sales region wise
Total sales, total quantity, total profit according to product category	This is an important visual which shows the total sales, quantity and profit of the product category selected, made using SUMIFS formula