High Level Design

(HLD)

Customer Lifetime

ValuePrediction

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Contents

Document Version Control

Date Issued	Version	Description	Author
24th June 2023	1.0	First Version of Complete HLD	Sai Charan Jagaleti

Abstract

Calculate the value of your customer's life expectancy for an auto insurer. Where the amount claimed by customers who have an insurance agreement with that company is lower, its revenue will be increased. Bookish definition: The total profit a client derives from its whole relationship with his customers is CLV. CLVs allow marketing executives to gain insight into the structure of the market, financing plans and future consequences. To ensure that marketing spend is maximized to acquire and retain customers, it helps business operators find the most effective way of reaching them.

1 Introduction

1.1 Why this High-Level Design Document?

The goal of this High-Level Design (HLD) Document is to provide the current project description with the additional detail needed to represent an appropriate model for coding. This document can be used as a reference guide for how the modules interact at a high level and is also meant to aid in identifying contradictions before coding.

The HLD will:

Present all of the design aspects and define them in

detailDescribe 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

1.2 Scope

The HLD documentation outlines the system's architecture, including the technology architecture, application architecture (layers), application flow, and database architecture. The HLD uses simple to moderately complex terms that system administrators should be able to understand.

2 General Description

2.1 Product perspective & Problem statement

The Customer Lifetime Value Prediction is a regression model based on machine learning that will assist us in predicting the Auto insurance CLV and taking the appropriate action. The project's goal is to use data visualization techniques to grasp the significance of the data. To understand the data visually, this project will use the business intelligence tool Tableau.

2.2 Tools used

Business Intelligence tools and libraries such as NumPy, Pandas, Seaborn, Matplotlib, Scikit-Learn, Excel, Tableau are used to build the whole framework.

3 Design Details

3.1 Functional Architecture and Model Building

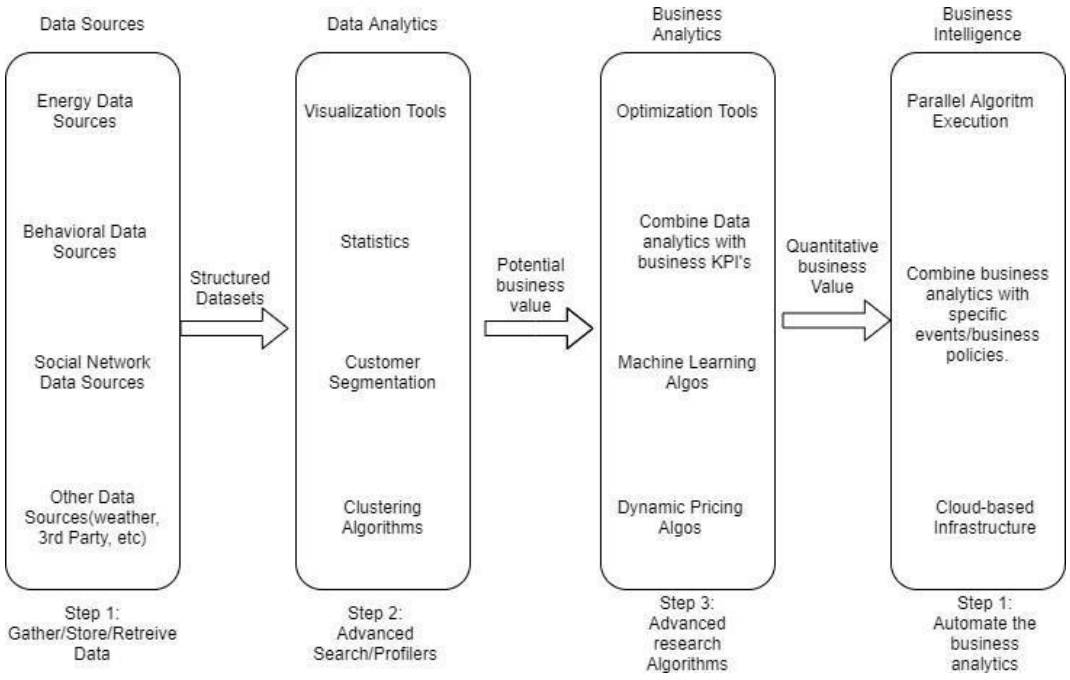
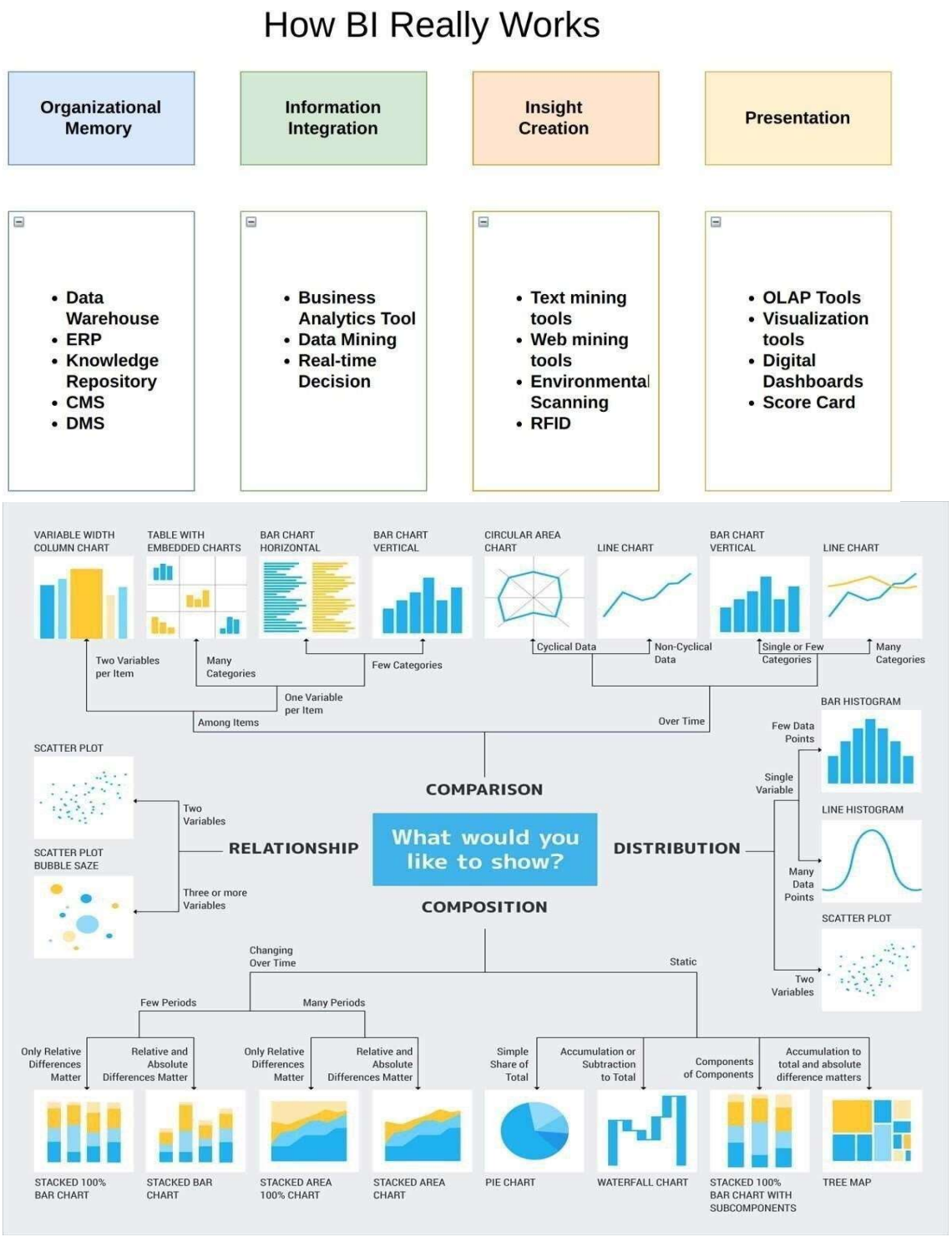
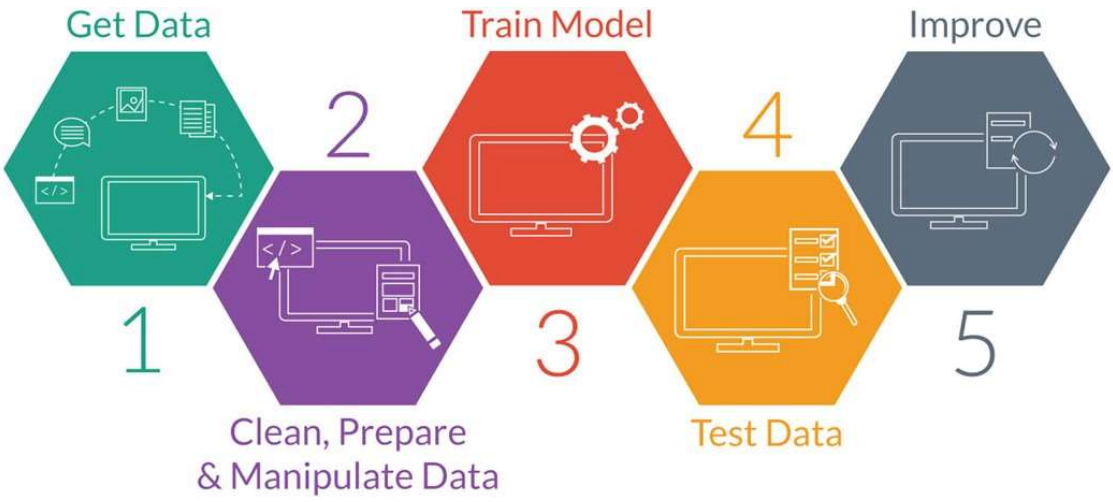


Figure 1: Functional Architecture of Business Intelligence



Model Building



3.2 Optimization

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

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.

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

include 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-of-date filters)

can take advantage of the indexing properties in your database and are faster than discrete date filters.

Use parameters and action filters. These reduce the query load (and work

acrossdata sources).

Optimize and materialize your calculations

Perform calculations in the database reduce the number of nested calculations

Reduce the granularity of table calculations in the view. The more granular thecalculation, the longer it takes.

- Table Calculations - the more marks in the view, the longer it will take tocalculate.

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 entiredomain.

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>Date Time>String

4.KPIs

The implementation of dashboards will show and signal specific KPIs and pertinent indicators for the customer lifetime value. Dashboards will be included as soon as the system begins collecting historical or regular data for a user in order to show progress on various indicators or factors over time.

4.1KPIs (Key Performance Indicators)

Key indicators displaying a summary of the customer lifetime value and its relationship with different metrics

1. Impact of Policy, CLV, No of Complaints on Demographic factors of customers.
2. Impact of CLV on Customer centric factors (income, employment status, vehicle size and class, no of policies)
3. Influence of Business centric parameter on CLV
4. Influence of Customer centric parameter on CLV
5. Influence of Demographic parameter on CLV

5 Deployment

Setting data and analytics as a priority couldn't have come at a better time. No matter their size, businesses are already gathering data, and most likely only using a small portion of it to drive enterprise transformation and solve business issues. The most effective IT organizations of today have shifted their focus to enabling self-service by deploying and operating Tableau at scale as well as organizing, orchestrating, and unifying disparate sources of data for business users and experts alike to author and consume content. This is due to the explosive growth of enterprise data, database technologies, and the high demand for analytical skills.

Deployment Process

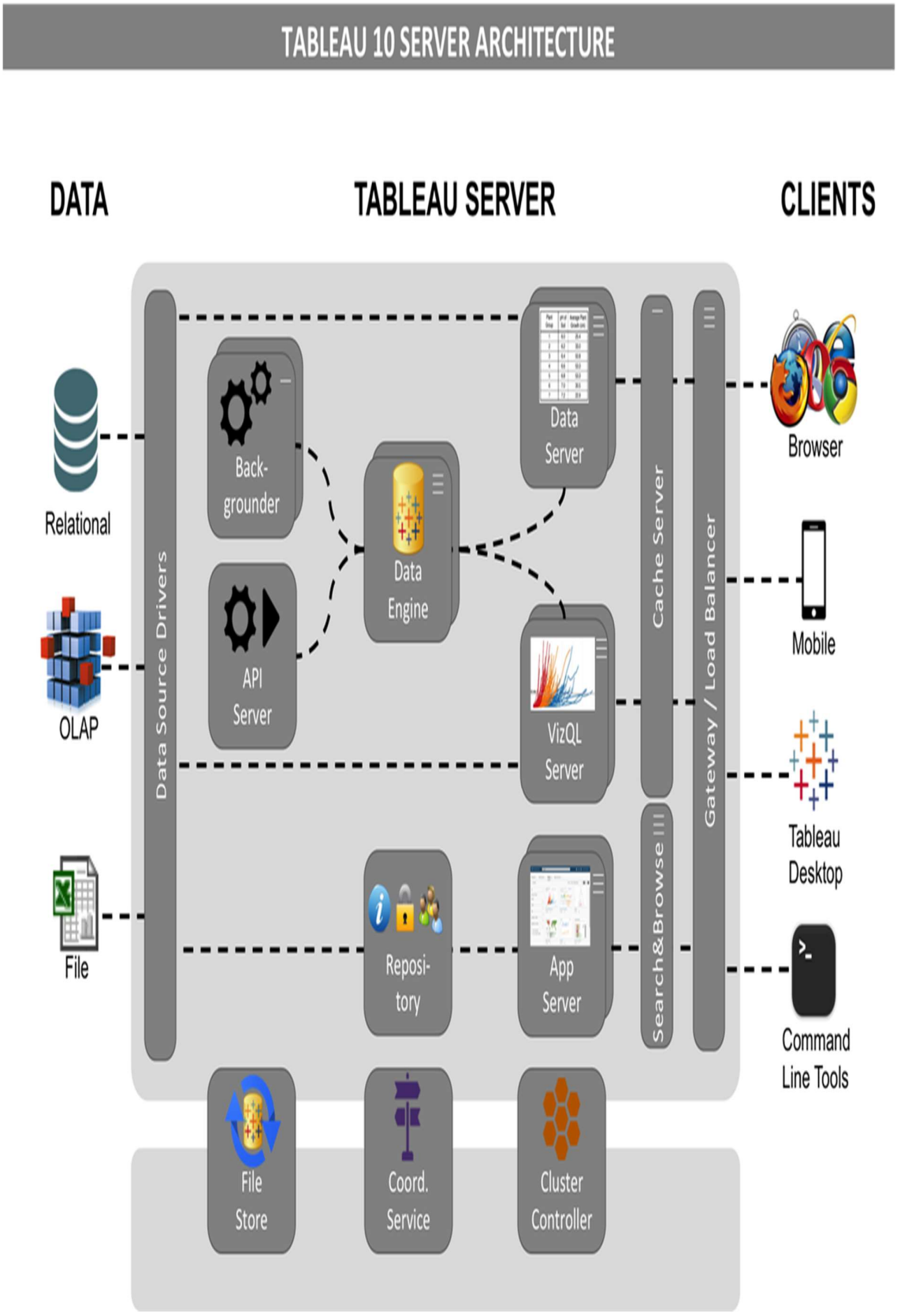


Tableau puts an emphasis on flexibility and choice to fit your enterprise architecture rather than impose its own. To offer your users a self-service, cutting-edge analytics platform, Tableau Server and Tableau Online integrate with your IT infrastructure and take advantage of your current technological investments. There is a version of Tableau that meets your needs, with options for on-premises, cloud, and hosted deployments. A comparison of the three is provided below:

TYPE PROS CONS

Tableau Server - On Premises

- Full control of hardware and software
- Infrastructure and data remain behind your firewall
- Need dedicated administrators to manage hardware and software
- Additional infrastructure needed to access off-network (mobile, external)

Tableau Server - Public Cloud (IaaS)

- Full control of software on managed hardware
- Puts infrastructure in same place as data (for migration to cloud)
- Flexibility to spin up/down hardware as needed
- Need dedicated administrators to manage software
- Additional infrastructure needed to access off-network (mobile, external)

Tableau Online (SaaS)

- Fully hosted solution (hardware, software upgrades)
- Fast to deploy
- Easy for external audience to access
- Single-site in multi-tenant environment
- Cubes are not supported
- No guest account access