Architecture Design Document

Bangalore Swiggy Analysis Project

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1. Introduction

1.1 Purpose

The purpose of this Architecture Design Document is to provide a comprehensive overview of the architecture and design of the Bangalore Swiggy Analysis project using Power BI. It outlines the key components, data sources, data processing, visualization, deployment, and other relevant aspects of the project's architecture.

1.2 Scope

This document covers the architecture and design of the Power BI-based solution for analyzing Swiggy data in the Bangalore region. It encompasses the technical details of the project, including data sources, data processing pipelines, visualization dashboards, deployment options, and security considerations.

2. Architecture Overview

2.1 High-Level Architecture

The architecture of the Bangalore Swiggy Analysis project is designed to enable efficient data collection, processing, and visualization. At a high level, it consists of the following components:

- Data Sources: Restaurant data, and other relevant datasets.

-Data Processing: ETL (Extract, Transform, Load) pipelines to clean, transform, and aggregate data for analysis.

-Power BI: Power BI Desktop and Power BI Service for creating interactive dashboards and reports.

- Database: A backend database (e.g., SQL Server) for storing processed data.

- Web Server: A web server for hosting Power BI reports and dashboards.

- User Interface: A web-based interface for end-users to access and interact with visualizations.

2.2 Components

Detail the specific components and their roles in the architecture. For example:

- ETL Process: Python scripts for extracting data from various sources, performing data transformations, and loading data into the database.

- Database: SQL Server database for storing cleaned and aggregated data.

- Power BI Desktop: Used by data analysts to create report templates.

- Power BI Service: Cloud-based service for publishing, sharing, and collaborating on Power BI reports.

- Web Server (IIS/Apache): Hosting Power BI reports and providing access to end-users.

- End-User Devices: Devices (e.g., desktops, tablets, smartphones) used by end-users to access reports.

2.3 Data Sources

Outline the data sources used in the project, including Swiggy transactional data, external data sources, APIs, etc. Provide details on how data is retrieved from these sources.

2.4 Data Processing

Explain the data processing pipeline, including data cleansing, transformation, and aggregation steps. Mention the tools and technologies used for data processing.

2.5 Data Visualization

Describe how data is visualized using Power BI. Include details on report templates, dashboards, and interactivity features.

3. Deployment

3.1 Hardware Requirements

Specify the hardware requirements for deploying the Power BI solution. This may include server specifications, storage requirements, and network considerations.

3.2 Software Requirements

List the software components and versions needed for the project, such as Power BI Desktop, SQL Server, web server software, etc.

3.3 Deployment Diagram

Provide a deployment diagram that illustrates how different components are deployed in the project architecture. Include information about server locations, databases, and user access points.

4. Data Flow

Create a data flow diagram that visually represents the flow of data from sources to the final visualization. Highlight the major data processing steps.

5. Security Considerations

Discuss the security measures in place to protect data integrity and user access. This may include user authentication, data encryption, and role-based access control.

6. Scalability and Performance

Explain how the architecture is designed to handle scalability and performance requirements. Discuss any load balancing or caching strategies.

7. Maintenance and Monitoring

Outline the procedures for maintaining the system, including data updates, software updates, and regular monitoring of performance.

8. Conclusion

Summarize the key points of the Architecture Design Document and emphasize the importance of the chosen architecture in meeting project objectives.