Architecture Design

# Amazon Sales Data Analysis

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| **Document Version** | 1.0 |
| **Last Revised Date** | 20 July 2023 |

**DOCUMENT CONTROL:**

|  |  |  |  |
| --- | --- | --- | --- |
| **VERSION** | **DATE** | **AUTHOR** | **COMMENTS** |
| 1.0 | 20-07-2023 | Harshit Kumar Pathak | Introduction and architecture defined |
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**1. Introduction**

**1.1 What is Architecture Design Document?** Any software needs the architectural design to represent the design of the 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:

1. A set of components (e. g: a database, computational modules) that will perform a function required by the system.

2. The set of connectors will help in coordination, communication, and cooperation between the components.

3. Conditions that how components can be integrated to form the system.

4. Semantic models help the designer to understand the overall properties of the system.

**1.2 Scope**  Architecture Design Document (ADD) is an architectural 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**

**2.1 Streamlit Architecture**

Streamlit follows a straightforward and lightweight architecture that enables data scientists and developers to build web applications with minimal effort. Various features are-

* Streamlit is a Python library that makes it easy to create interactive web apps.
* Streamlit apps are written in a declarative style, which means that you simply tell Streamlit what you want to do, and Streamlit takes care of the details.
* Streamlit apps are very high-performance and can render complex UIs in real time.
* Streamlit is extensible, so you can create custom components and add them to your apps.
* Streamlit is open source, so it is free to use and modify.

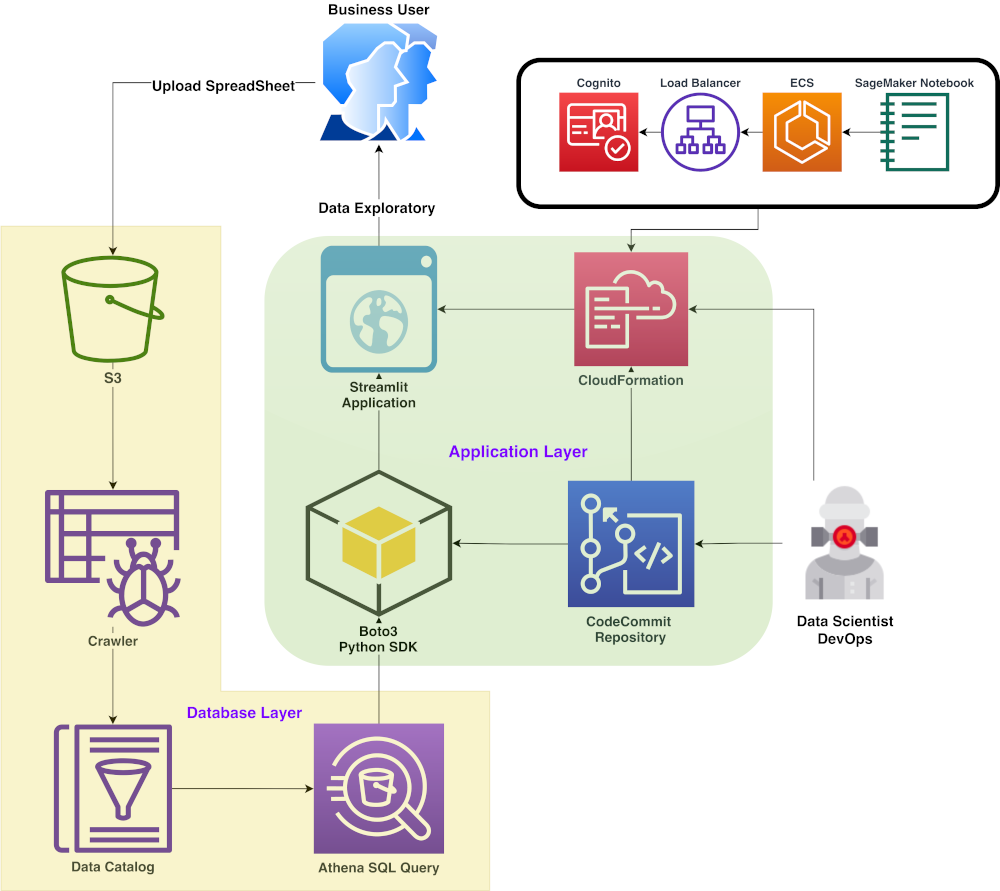


Fig-Streamlit Architecture

**2.2 Components of Streamlit Architecture**

Streamlit follows a straightforward and lightweight architecture that enables data scientists and developers to build web applications with minimal effort. The architecture consists of three main components:

1. **Python Script**: At the heart of a Streamlit application is a Python script. This script contains all the necessary code to load data, perform calculations, create visualizations, and define the user interface. The Python script is where you define your application's logic.

2. **Streamlit Server**: When you run your Streamlit application, a Streamlit server is launched. The Streamlit server reads the Python script, processes it, and converts the code into a web application. The server handles communication between the Python script and the user's web browser.

3. **Web Browser**: The user interacts with the Streamlit application through their web browser. The web browser sends requests to the Streamlit server, and the server responds by executing the corresponding Python code and serving the results back to the browser.

Overall, the user interacts with the web browser, which communicates with the Streamlit server, and the server, in turn, processes the Python script to generate the necessary output

**2.2 Data Flow in Streamlit Architecture:**

* User interacts with the Streamlit application by interacting with the user interface elements.
* The web browser sends the user's input or actions to the Streamlit server.
* The Streamlit server processes the input and executes the corresponding Python code in the script.
* The server generates the output based on the Python script's logic and returns it to the web browser.
* The web browser renders the output, and the user sees the updated user interface or visualizations.

**3. Deployment**

Deployment is the process of making a software application available for use. This involves making the application available on a server or other environment where it can be accessed by users. Deployment process typically includes the following steps:

* Packaging the application: The application is packaged into a format that can be deployed to the target environment. This may involve creating a compressed file, a Docker image, or a virtual machine image.
* Deploying the application: The application is deployed to the target environment. This may involve copying the application files to the server, starting a Docker container, or creating a virtual machine.
* Configuring the application: The application is configured to run in the target environment. This may involve setting environment variables, configuring database connections, or creating users.
* Testing the application: The application is tested to ensure that it is working properly in the target environment.

**3.1 Streamlit Cloud Deployment**

Streamlit Cloud is a hosted deployment service that makes it easy to deploy your Streamlit apps to the web. You can deploy your app for free with the Community Tier, or you can upgrade to the Pro Tier for more features and storage.

**3.2 AWS Deployment**

Amazon Web Services (AWS) is a cloud computing platform that offers a wide range of services, including hosting web applications. You can deploy your Streamlit app to AWS using the Streamlit AWS integration.

**3.3 GCP Deployment**

Google Cloud Platform (GCP) is a cloud computing platform that offers a wide range of services, including hosting web applications. You can deploy your Streamlit app to GCP using the Streamlit GCP integration.