**Project Design Phase**

**Solution Architecture**

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| Date | 15 February 2025 |
| Team ID | PNT2025TMID02756 |
| Project Name | Power BI Inflation Analysis: Journeying Through Global Economic Terrain. |
| Maximum Marks | 4 Marks |

**Solution Architecture:**

* Solution architecture is a **complex process** that bridges the gap between **business problems and technology solutions**. The goal of this architecture is to create an **efficient, scalable, and interactive system** that enables users to **analyze global inflation trends using Power BI**.

### **Goals of the Solution Architecture**

- **Find the best tech solution** to solve inflation analysis challenges.  
- **Describe the structure and behavior** of the software for stakeholders.  
- **Define features, development phases, and solution requirements** for implementation.  
- **Provide clear specifications** for managing and delivering the solution.

### **2. Solution Overview**

The **Power BI Inflation Analysis** project provides a **structured, automated, and interactive** way to analyze **global inflation trends**. It enables **economists, policymakers, and businesses** to make **data-driven decisions** through **interactive dashboards, real-time filtering, and dynamic reports**.

### **3. System Components & Workflow**

✔ **Users** – Economists, Analysts, Policymakers interact with the dashboard.  
✔ **Data Sources** – Kaggle dataset (CSV/Excel) containing inflation rates.  
✔ **Processing Layer** – Power Query (cleans, transforms, and structures data).  
✔ **Storage Layer** – Power BI Data Model (stores processed data).  
✔ **Visualization Layer** – Power BI Desktop (provides interactive charts & reports).

📌 **Workflow Process:**  
1 **Users import the Kaggle dataset into Power BI.**  
2 **Power Query cleans & structures the data (handling missing values, unpivoting, etc.).**  
3 **The cleaned data is stored in the Power BI Data Model.**  
4 **Users create visualizations (bar charts, line graphs, maps) for analysis.**  
5 **Filters & slicers enable interactive exploration of inflation trends.**  
6 **Reports are exported in PDF/PPT formats for stakeholders.**

### **4. Solution Requirements**

* **Functional Requirements:**
* Import inflation datasets from **CSV/Excel (Kaggle)**.
* Provide **real-time filtering & slicing** for data exploration.
* Generate **interactive visualizations** (charts, graphs, and maps).
* Allow **report exporting** in multiple formats (PDF, PPT).
* **Non-Functional Requirements:**
* **Security:** Role-Based Access Control (RBAC) for restricting dashboard edits.
* **Scalability:** Can integrate **live data APIs (IMF, World Bank)** in the future.
* **Performance:** Optimized **Power Query transformations** for efficient data handling.

### **5. Solution Architecture Diagram**

The system follows a structured flow from **data ingestion to visualization**.

**Users** → Interact with Power BI Dashboard  
 **Data Sources** → Kaggle dataset (CSV/Excel)  
 **Processing Layer** → Power Query (cleans & structures data)  
 **Storage Layer** → Power BI Data Model (structured storage)  
 **Visualization Layer** → Power BI Desktop (interactive reports)

* **Architecture Diagram** (Refer to the System Architecture Diagram created earlier.)

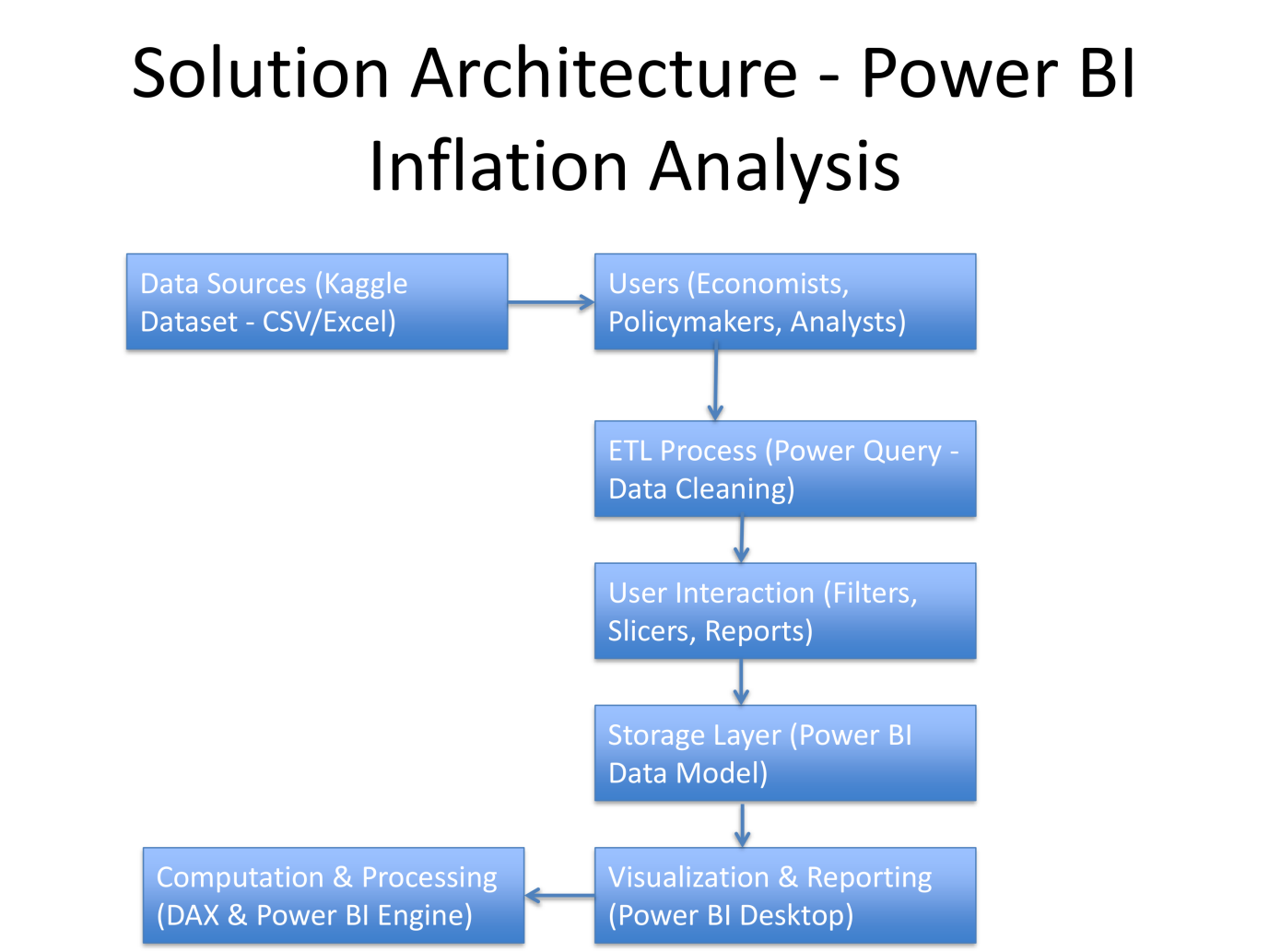
### **6. Features & Development Phases**

✔ **Phase 1:** Data Cleaning & Transformation (Power Query).  
✔ **Phase 2:** Data Modeling (Power BI Data Model).  
✔ **Phase 3:** Visualization & Dashboard Development (Charts, Graphs, Maps).  
✔ **Phase 4:** Interactive Features (Filters, Slicers, Custom Reports).  
✔ **Phase 5:** Exporting & Report Generation (PDF, PPT, Excel).

### **7. Expected Outcomes & Business Value**

✅ **Automated Data Analysis** – Reduces manual effort in inflation tracking.  
✅ **User-Friendly Dashboards** – No technical expertise required for usage.  
✅ **Real-Time Insights** – Users can compare inflation trends dynamically.  
✅ **Scalable for Future Use** – Can integrate **more economic indicators (GDP, Interest Rates etc.)**.

**Solution Architecture Diagram:**

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