**Week- 12 Deliverable: Traceability\_Matrix\_and\_Charter\_Validation**

Master’s Research project-05

Strategic Planning for Medical Equipment Allocation

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# Traceability Matrix and Project Validation

## 1. Traceability Matrix

The table below outlines the traceability matrix derived from the updated project charter titled 'Medical Device Utilization'. It maps each user requirement to the necessary data, method of delivery, and method of validation to ensure accurate information delivery to the healthcare administrator.

| Requirement | Information Needed | Method of Output | Method of Validation |
| --- | --- | --- | --- |
| Devices Used | Distinct DEVICE DESCRIPTION from devices table | Numeric KPI card | Compared with raw data using DISTINCTCOUNT |
| Procedures Performed | Count of ENCOUNTER from procedures table | Numeric KPI card | Count verified against procedures table rows |
| Healthcare Facilities Count | Distinct NAME from organizations table | Numeric KPI card | Confirmed using DISTINCTCOUNT on NAME |
| Device Utilization Overview | DEVICE DESCRIPTION vs Count of ENCOUNTER | Bar chart | Compared with grouped table summary |
| Device Demand by Procedure | PROCEDURE DESCRIPTION vs Count of ENCOUNTER | Bar chart | Validated using joined procedures and device filters |
| Device Usage by Facility | LAT/LON and NAME from organizations | Map visual | Validated plotted points using raw org table |
| Average Device Usage Time | DeviceUsageTimeDays from devices | Line chart | Validated DAX/AVG logic on the field |
| Slicer/Drillthrough Functionality | Filter visuals by selected DEVICE DESCRIPTION | Interactive slicer + drillthrough | Verified drillthrough filters and cross-page sync |
| Procedures Performed with Device | DESCRIPTION vs Count of ENCOUNTER (filtered) | Bar chart | Cross-checked with grouped filtered procedures |
| Gender Distribution by Device | GENDER and Count of ENCOUNTER | Pie chart | Verified with linked patients table |
| Facilities Using Selected Device | NAME grouped by ENCOUNTER | Bar chart | Filtered and grouped by orgs using device filter |
| Device Demand Forecast | START year vs Count of ENCOUNTER | Line chart with forecast enabled | Verified START year usage and forecast settings |

## 2. Project Charter Review and Validation

Yes, the traceability matrix and visual dashboard components have been directly derived from the updated project charter, which focuses on 'Medical Device Utilization'. The intended user, a healthcare administrator, can leverage this dashboard to monitor device demand, usage trends, procedure performance, and facility-based distributions.  
  
The entire dataset is based on synthetic healthcare records generated using the Synthea database. As shown in the data model (with tables such as devices, procedures, encounters, patients, organizations, etc.), all insights and visuals are built solely on Synthea-compliant data models. This guarantees both data provenance and alignment with the original specifications.  
  
All outputs are validated using Power BI’s visualization fields, filters, slicers, and aggregation logic, ensuring that the information presented is accurate, actionable, and tailored to the user’s needs.