**Solution Requirements**

In any data analytics project, especially one focused on Strategic Product Placement Analysis, clearly defining solution requirements is vital. These requirements ensure that the final solution not only meets business expectations but also remains scalable, user-friendly, and impactful in real-world scenarios.

Functional Requirements

These specify the core features and behaviours the system must support to achieve the project's analytical goals.

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| FR No. | Functional Requirement (Epic) | Sub Requirement (Story / Sub-Task) |
| FR-1 | Data Collection and Import | - Enable import from CSV, Excel, or SQL.- Apply automated validation rules for format and integrity checks. |
| FR-2 | Data Cleaning and Transformation | - Normalize fields such as product categories and customer demographics.- Add calculated fields like "Sales per Shelf". |
| FR-3 | User Authentication and Security | - Secure login page in Flask.- Define user roles: Analyst, Admin, Viewer.- Protect dashboards from unauthorized access. |
| FR-4 | Data Segmentation | - Allow filtering by time period, region, product type, or placement type.- Enable grouping by shelves, aisles, endcaps. |
| FR-5 | Dynamic Visualization | - Build multiple chart types (bar, pie, scatter, heatmap).- Provide tooltips and hover interactions for deeper insight. |
| FR-6 | Dashboard Customization | - Enable users to build or modify dashboards in Tableau.- Drag-and-drop layout management for flexible view configurations. |
| FR-7 | Storyline Presentation | - Compile charts into a Tableau Story to convey key insights step-by-step.- Annotate important trends and outliers. |
| FR-8 | Stakeholder Communication | - Automate report emailing.- Schedule daily or weekly summary dashboards with SMTP configuration. |
| FR-9 | Embedding and Internal Deployment | - Embed Tableau dashboards within Flask-based internal web pages.- Add authentication middleware for internal use only. |
| FR-10 | Iteration and Feedback Integration | - Collect user feedback for improvements.- Allow analysts to make revisions without impacting live dashboards immediately. |

These functional requirements ensure a comprehensive lifecycle from data ingestion to decision-making support. They are centered on usability, real-time insight generation, and clear stakeholder communication.

**Non-Functional Requirements**

These requirements define how the system performs under various conditions, ensuring stability, scalability, and user trust.

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| NFR No. | Non-Functional Requirement | Description |
| NFR-1 | Usability | Dashboards should be intuitive, requiring no training for business users while offering advanced options for analysts. |
| NFR-2 | Performance | Visuals and filters must render within 2–3 seconds even with 100k+ records in use. |
| NFR-3 | Security | Use Tableau’s permissions and Flask’s login control to restrict data access at object and row levels. |
| NFR-4 | Availability | Ensure that dashboards remain accessible during working hours (minimum 99% uptime via hosted service or server). |
| NFR-5 | Maintainability | Dashboards, flows, and filters must be easy to update in response to evolving business KPIs or marketing strategies. |
| NFR-6 | Auditability | Log major changes (filters, fields, views) with version control to enable rollback and traceability of insights. |
| NFR-7 | Scalability | Architecture should allow future integration of more stores, product lines, or regions with minimal performance drop. |
| NFR-8 | Integration Compatibility | Must be embeddable within existing ERP or intranet using HTML, JavaScript, or Flask endpoints with secure access protocols. |

These non-functional aspects guarantee long-term adoption of the analytics tool, making it reliable and responsive for strategic decision-makers.