**Technical Design Document: Manufacturing Data Platform (MDP)**

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**1. Introduction**

**1.1. Purpose**

This document provides a detailed technical design for the Manufacturing Data Platform (MDP), covering its components, data management features, integration with Power Apps, and flow explanations. (Page 3)

**1.2. Scope**

The scope includes the web portal, data management, data visualization, and integration with Azure Blob Storage, Power Automate, and Azure Functions. (Page 3)

**1.3. Audience**

This document is intended for developers, system administrators, and other stakeholders involved in the implementation and maintenance of the MDP. (Page 3)

**2. System Overview**

**2.1. Manufacturing Data Platform (MDP)**

The MDP is designed to manage and visualize manufacturing data. It comprises a web portal, data management functionalities, and integration with external tools and storage solutions. (Page 4)

**2.2. Key Components**

* **Web Portal**: Interface for user interaction with the MDP.
* **Data Management**: Handling and updating of reference and actual data.
* **Data Visualization**: Integration with Power BI dashboards. (Page 4)

**2.3. Technologies Used**

* **Azure Blob Storage**: For data storage.
* **Power Apps**: For user interaction.
* **Power Automate**: For automation of data flows.
* **Azure Functions**: For processing and generating PSV files. (Page 4)

**3. Web Portal**

**3.1. User Acceptance Testing (UAT)**

The web portal has successfully passed UAT and is awaiting production deployment. (Page 5)

**3.2. Deployment Status**

Pending production deployment. (Page 5)

**3.3. User Interface**

The web portal includes tabs for data management and data visualization, offering user-friendly navigation and interaction. (Page 5)

**4. Data Management Features**

**4.1. Site Selection**

* Factories and production lines are sourced from SharePoint lists and presented in dropdown menus. (Page 6)

**4.2. Reference Data**

* **Types of PSV Files**: Changeover, Equipment, Items, TOC. (Page 6)

**4.3. Actual Data**

* **Types of PSV Files**: Production Calendar, Loss Categories, Deviation Log. (Page 6)

**5. Power Apps Integration**

**5.1. Landing Page**

The landing page features two tabs:

* **Data Management**: For managing data.
* **Data Visualization**: For accessing Power BI dashboards. (Page 7)

**5.2. Data Management Tab**

Users can select factories and production lines, and manage reference and actual data with options to create new records, reset, or save. (Page 7)

**5.3. Data Visualization Tab**

Redirects to existing Power BI dashboards for FPS and IE tech. (Page 7)

**6. Azure Blob Storage**

**6.1. Storage Structure**

* **Reference Data**: Separate containers for different PSV files.
* **Actual Data**: Containers for manual entries saved as PSV files. (Page 8)

**6.2. Data Types**

* **Reference Data**: PSV files for various reference types.
* **Actual Data**: PSV files for manual entries. (Page 8)

**6.3. File Handling and Validation**

* Files are organized by factory with validation rules applied. (Page 8)

**7. File Handling and Validation**

**7.1. File Storage**

Files are saved in Azure Blob Storage, with folders created for new factories. (Page 9)

**7.2. Validation Rules**

* Mandatory fields are enforced.
* Layouts vary based on the PSV file type. (Page 9)

**8. Power Automate and Azure Functions**

**8.1. Power Automate**

Automates updates to PSV files based on triggers. (Page 10)

**8.2. Azure Functions**

Handles PSV file generation using CSV helper functions. (Page 10)

**8.3. Flow Details**

* **Manual Data Flow**: Triggered by item creation/modification.
* **Reference Data Flow**: Similar to manual data flow but for reference data.
* **Two-Way Data Flow**: Updates from Azure to SharePoint and vice versa. (Page 10)

**9. Manual Data Entry**

**9.1. Data Entry Features**

Users can add, edit, or copy entries. Data is validated based on mandatory fields. (Page 11)

**9.2. Validation**

Data segmentation into PSV files is handled according to predefined columns. (Page 11)

**10. Additional Functionality**

**10.1. Deviation Log**

Captures details of deviations with sequential dropdowns. (Page 12)

**10.2. Excel Uploads**

Links to SharePoint for factories without actual data. (Page 12)

**11. Solution Structure**

**11.1. Containers**

* **Manual Entry**: Contains PSV files for manual data.
* **Reference Data**: Contains PSV files for reference data. (Page 13)

**11.2. Reference Data Layouts**

* **Grid**: For Changeover and TOC.
* **Gallery and Form**: For Equipment and Items. (Page 13)

**11.3. Manual Entry**

Includes three PSV files generated based on SharePoint list entries. (Page 13)

**12. Flows Explanation**

**12.1. Manual Entry Flow**

* **Scenario**: Site selected, values entered, saved, and verified in SharePoint.
* **Flow Details**:
  + Trigger: Item creation/modification.
  + Actions: Send data to Azure Function, create PSV files, update with specific URLs. (Page 14)

**12.2. Reference Data Flow**

* **Process**: Similar to manual entry flow but for reference data. (Page 14)

**12.3. Two-Way Data Flow**

* **Functionality**: Handles updates