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1. System Workflow Diagram
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8. Project Structure

Mercedes-Benz India Digital Assembly Platform

Version: 1.3.0 | **Date:** December 18, 2025

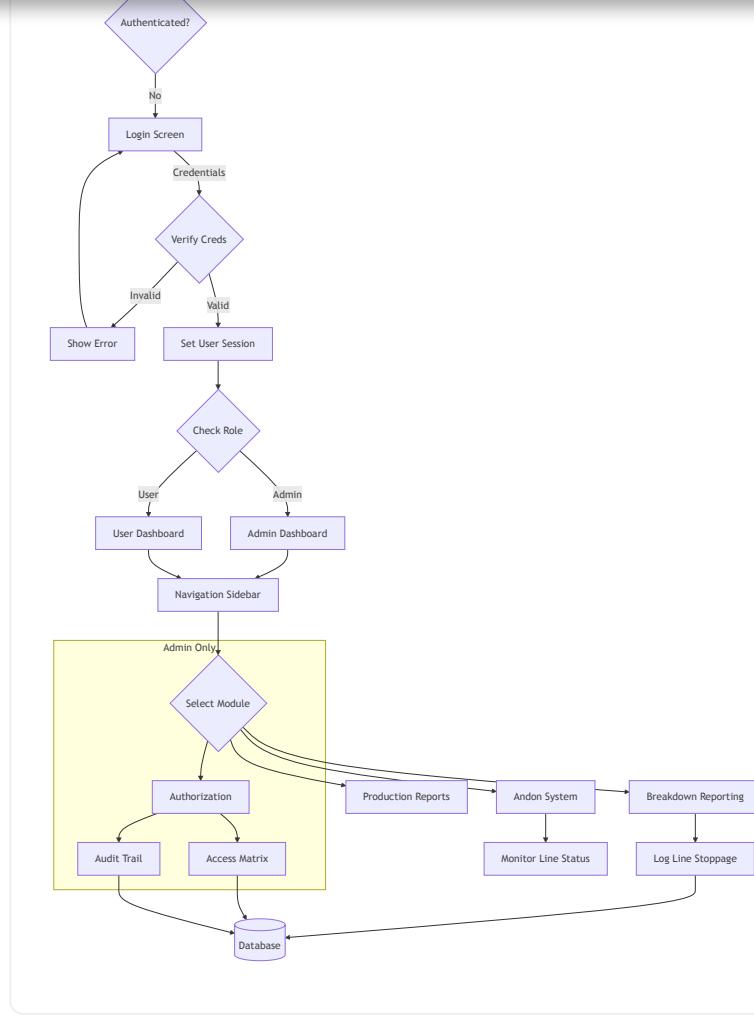
1. System Workflow Diagram

The following flowchart illustrates the user journey through the application, from authentication to role-based access control and module interaction.



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2. Login & Authentication

Authentication Flow

The platform uses a secure, token-based session management system. Access is strictly controlled via the **AuthContext** provider.

- **Validation:** Inputs are sanitized and checked against the backend user registry.



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viewer. This flag determines which sidebar options are rendered.

- **Security:** Failed attempts are logged (optional future feature) and sessions auto-expire after inactivity.

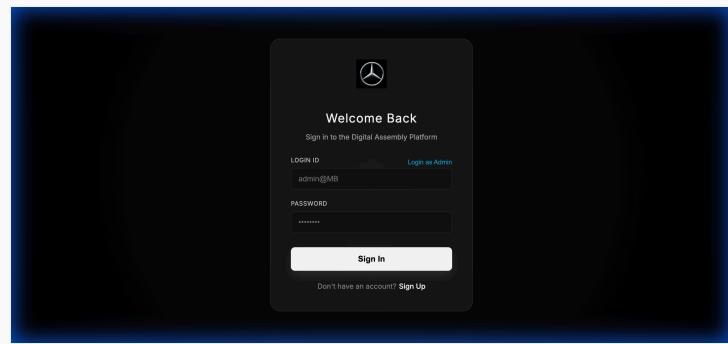


Figure 1: Login Screen. Uses a glassmorphism overlay on a cinematic background.

User Registration

New users can request access via the Signup page. Account creation sends a request to the admin queue, requiring manual approval before login is granted.

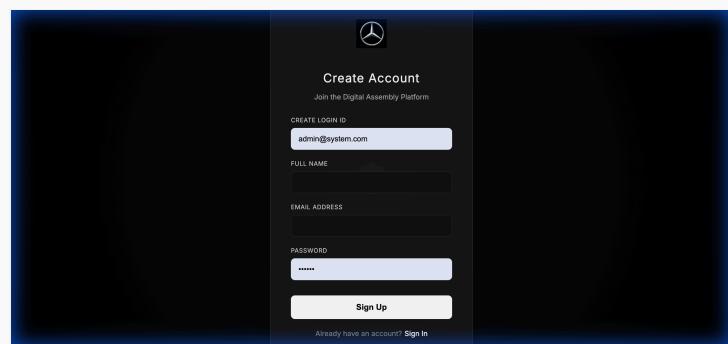


Figure 1.1: Signup Screen. Request a new account.



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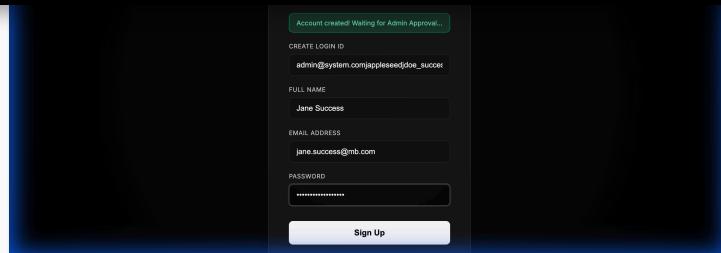


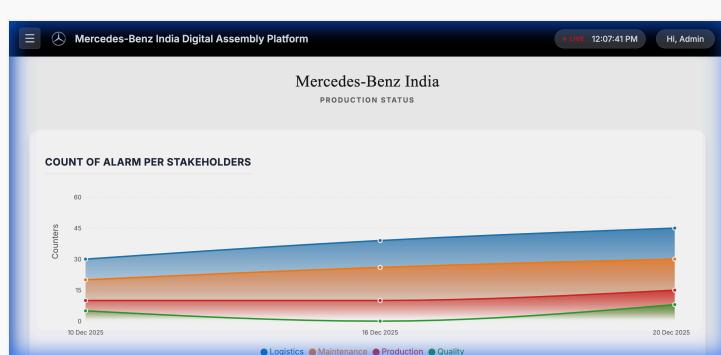
Figure 1.2: Awaiting Admin Approval. Post-registration state where the user must wait for confirmation.

3. Main Dashboard

The Executive Dashboard acts as the central command center. It aggregates data from all Andon stations to provide a plant-wide health check.

Key Metrics Displayed:

- **Alarm Counts:** A visualization of how many alarms/errors have been triggered per department (Stakeholder). This helps identify bottlenecks (e.g., if 'Paint Shop' has high alarms).
- **Downtime Analysis:** "Total Time per Stakeholder" charts clearly show which department is causing the most line stoppages.





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4. Admin Controls (Access Matrix)

The **Access Matrix** is the central hub for managing user permissions and role-based security. This screen is restricted to Administrators only.

Security Level: Critical (Admin Only)

Route: /auth/access-matrix

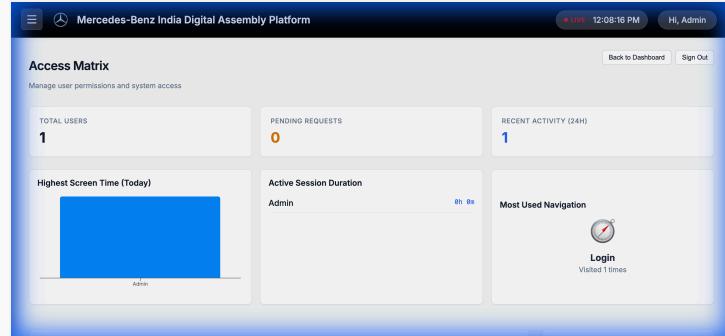


Figure 3: Role-Based Access Control Matrix.

Interface Layout Breakdown

The Access Matrix screen is divided into two main areas: the User Management Table (Left) and the Context Sidebar (Right). Below is a structural text representation of the screen layout.



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Users

[CSV](#)

All Roles ▼ All Statuses ▼ Search users...

User	Role	Status	Permissions
A Admin admin@MB	Admin	Approved	Select a user from the table to manage their permissions.
Koustubh Deodhar k@ats.com	User	Approved	

Interactive Elements Guide

The Access Matrix interface allows admins to manage users via specific action buttons in the "Actions" column. Below is a detailed guide on what each button does.

User Management Controls

- **Settings (Gear)** - Opens permissions panel.
- **View Log (Eye)** - Opens Activity Log Modal.
- **Edit (Pencil)** - Opens Edit User Modal.
- **Approve** - Approves pending users.
- **Reject** - Rejects pending users.



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(Production Monitoring)

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5.1 Overview & Metrics

The Andon system replaces traditional physical light boards with digital, real-time dashboards displayed on large monitors above each assembly line.

- **PLAN (Shift Target):** The goal number of units to be produced in the current shift.
- **ACTUAL (Due Counts):** The current number of units successfully completed.
- **EFFICIENCY:** A calculated percentage: (Actual / Target) * 100. Used to gauge team performance.

5.2 Andon Station Screens

Navigation: The sidebar provides quick links to all major production lines.

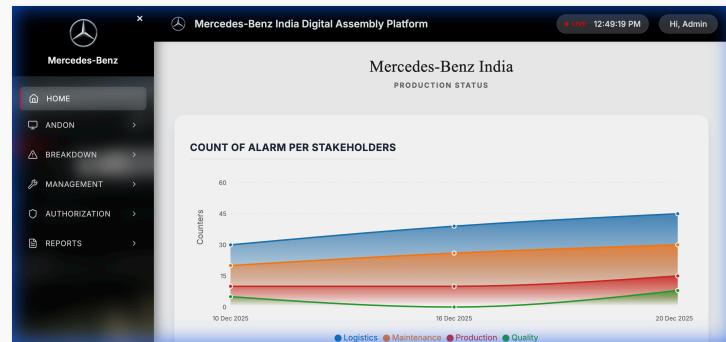


Figure 5.1: Navigation Sidebar.



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SHIFT	TARGET	DUE	ACTUAL
SHIFT 1	0	0	0
SHIFT 2	0	0	0

TAKT (MM:SS)	LEFT TIME	LOST TIME (MM:SS)
00:00	19:20	00:00

SHIFT	TARGET	DUE	ACTUAL
SHIFT 1	0	0	0
SHIFT 2	0	0	0

TAKT (MM:SS)	LEFT TIME	LOST TIME (MM:SS)
00:00	19:20	00:00

SHIFT	TARGET	DUE	ACTUAL
SHIFT 1	0	0	0
SHIFT 2	0	0	0

TAKT (MM:SS)	LEFT TIME	LOST TIME (MM:SS)
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SHIFT 1	0	0	0
SHIFT 2	0	0	0

TAKT (MM:SS)	LEFT TIME	LOST TIME (MM:SS)
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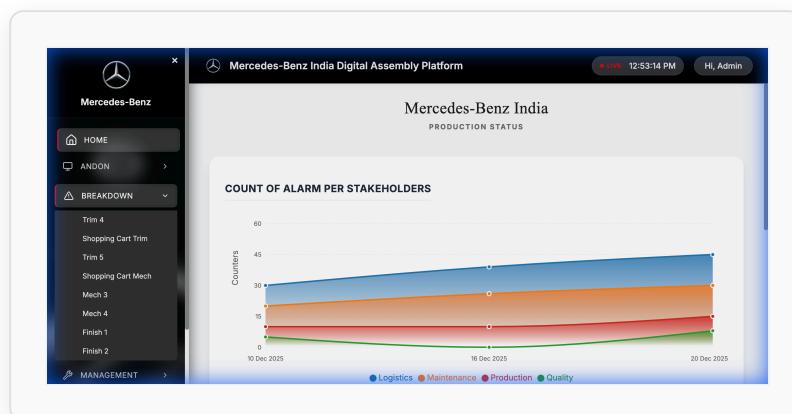
Management

6.1 Reporting Process

Scenario: A line worker notices a hydraulic failure on the Trim 4 line.

1. Worker/Supervisor logs into the tablet at the station.
2. Navigates to **Breakdown > Trim 4**.
3. Enters details: "Hydraulic Leak", Priority "High".
4. **System Action:** The system logs the start time immediately to track "Time to Repair" (MTTR).

6.2 Station Screens



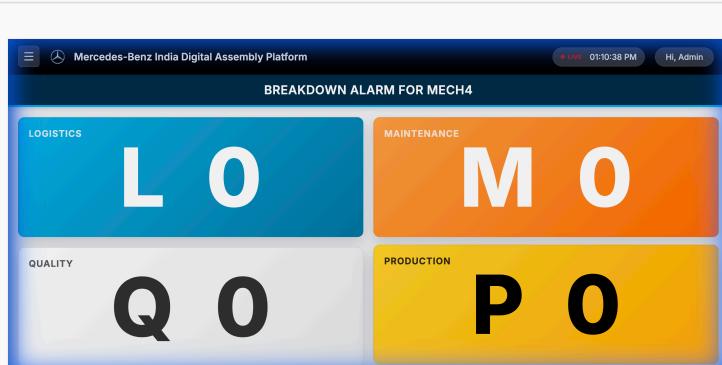
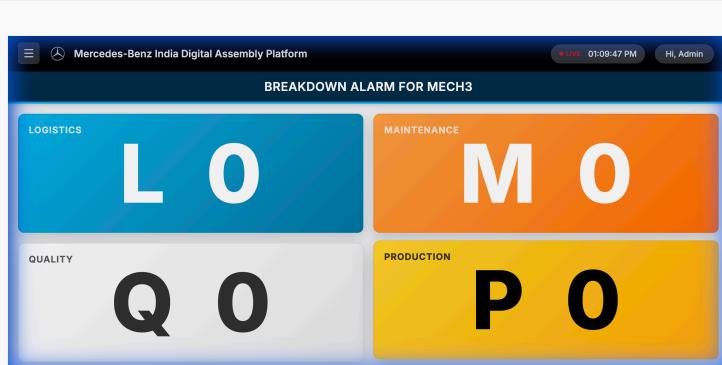
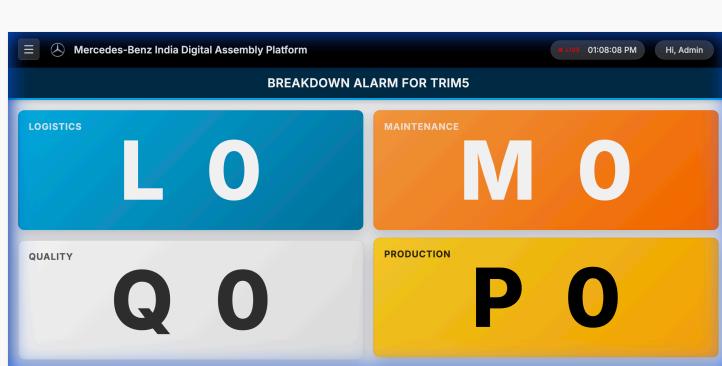


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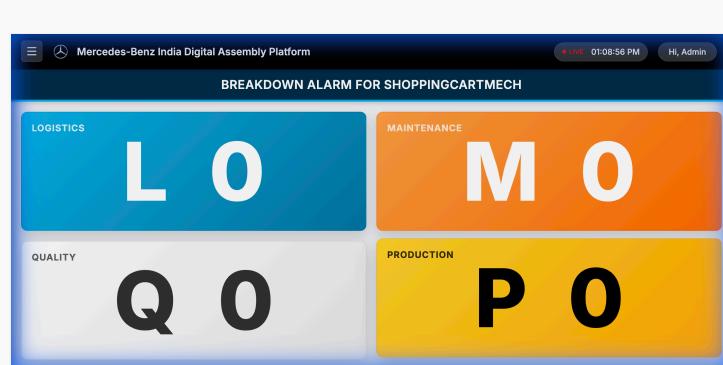
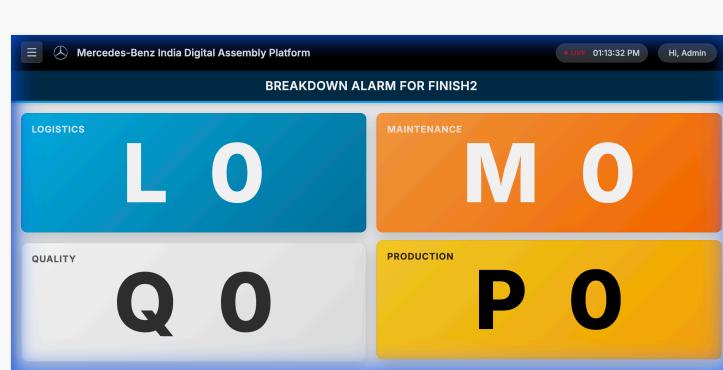


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The Audit Trail records every significant interaction within the system. It ensures non-repudiation and traceability.

Route: /reports/audit-trail

Tracked Events

- **Logins/Logouts:** Session tracking.
- **Data Modifications:** Target changes, etc.
- **Admin Actions:** Approvals/Rejections.

Automated Archiving

Server-side cron job saves logs to JSON/CSV hourly.

TIMESTAMP	USER NAME	EMAIL	ACTION	DETAILS
18/12/2025, 12:07:26	Admin	admin@MB	LOGIN	User logged in successfully

8. Project Structure Technical Overview



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dedicated Node.js Express server for handling file system operations.

File System Hierarchy

```

mercedes-benz-react-app/
  └── server.js                                // Backend: Cron
  Jobs & Audit Persistence
    ├── index.html                               // Entry Point
    └── package.json                            // Dependency
  Manifest
    └── vite.config.js                          // Build
  Configuration
    └── Audit_Trial_Report_AutoSave/           // Local
      └── activityLogs.json
  Database (JSON Logs)
    └── documentation/                         // 📚
      └── Documentation
        ├── PROJECT_DOCUMENTATION.html          // System Manual
        ├── PROJECT_PITCH.html                  // Presentation
        └── assets/                             // Doc Images
    └── src/
      Code
        └── App.jsx                            // Main Route
      Definitions
        ├── main.jsx                           // DOM Renderer
        └── index.css                          // Global Clean
      Styles
        └── context/
          └── AuthContext.jsx                // Session & Role
      Management
        └── layouts/
          └── MainLayout.jsx                 // App Shell
      Components
        └── Header.jsx                        // Top Navigation
        └── Sidebar.jsx                      // Side Navigation
        └── Footer.jsx                       // Bottom Info
        └── LoadingScreen.jsx               // Suspense
      Wrapper
        └── pages/
          └── Auth/
            ├── Login.jsx                     // Application
            └── AccessMatrix.jsx             // Admin User Mgmt
          └── Dashboard/
            └── Dashboard.jsx                // Executive View
          └── Andon/
            └── Finish1Dashboard.jsx       // Line Monitoring
      Fallback
        └── screens/
          └── Dashboard
            ├── Finish2.jsx
            ├── Mech3.jsx
            ├── Mech4.jsx
            ├── ShoppingCartMech.jsx
            ├── ShoppingCartTrim.jsx
            ├── Trim4.jsx
            └── Trim5.jsx
      Logging
        └── Breakdown/                      // Incident
  
```



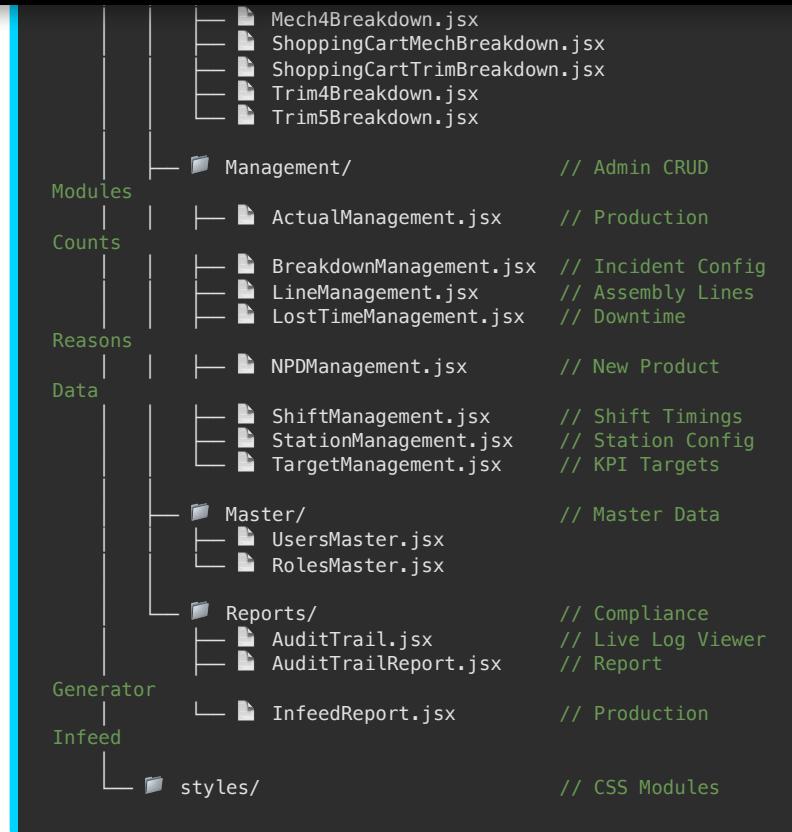
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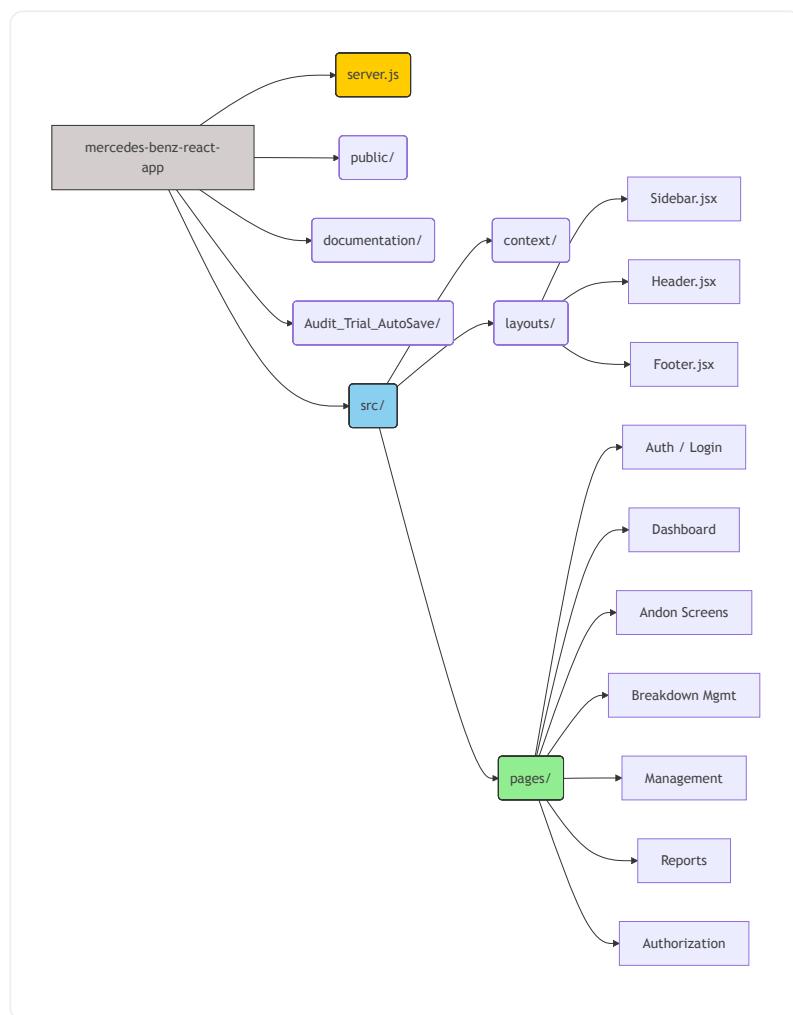
Key Directory Definitions

Path / File	Purpose & Function
<code>server.js</code>	The Node.js backend. It runs concurrently with the React frontend. Its primary job is to execute the Cron Job that takes snapshots of the <code>activityLogs</code> variable and saves them to the disk every hour.
<code>src/pages/</code>	Contains all distinct screens/views of the application. Organized by module (Andon, Management, Reports).
<code>src/layouts/</code>	Reusable UI wrappers like the Sidebar, Header, and standard Page Layouts.
<code>Audit_Trial_.../</code>	The localized "database" folder. It persists critical compliance logs here as

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Visual Architecture (System Level)



Source Code Architecture (Exploded View)



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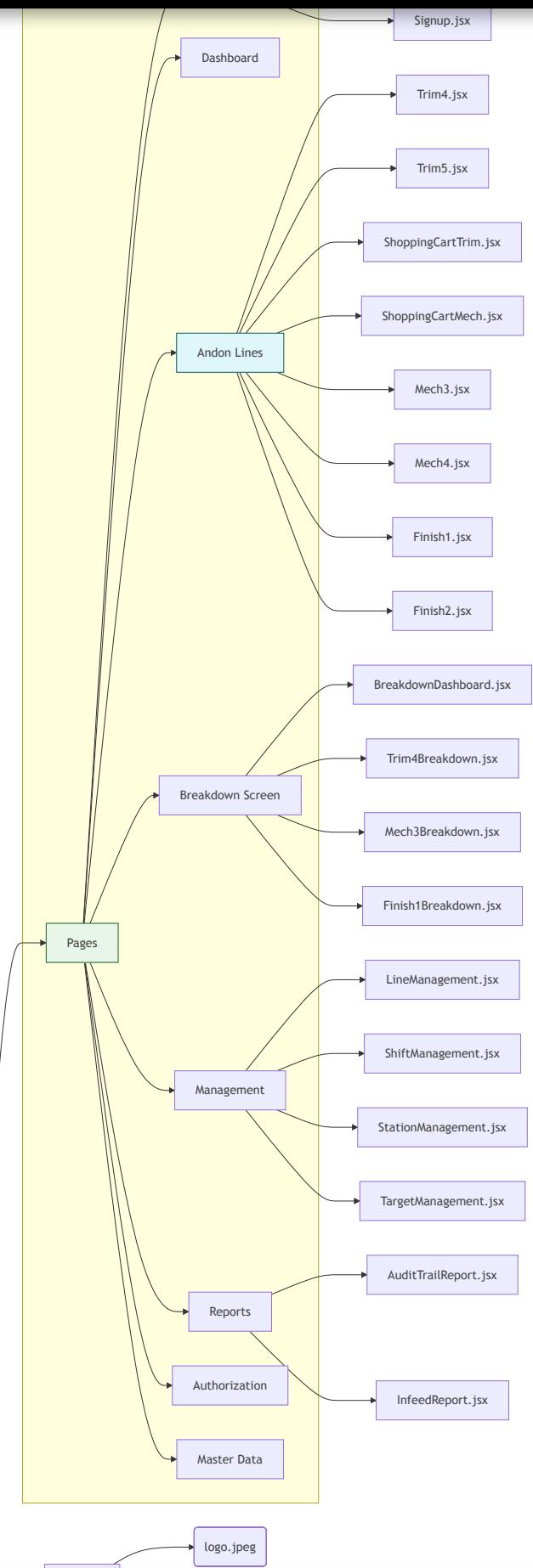
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