DataPulse PRD (2026-01-21)

Part 1: Basic Information

Title

DataPulse

Terminology

Term	Definition
Widget	A single visualization component on a dashboard (chart, metric, table)
Data Model	A structured representation of data relationships and calculations
KPI	Key Performance Indicator - a measurable value showing goal progress
Pipeline	Automated data transformation and processing workflow
Threshold	A defined value that triggers an alert when crossed
Connector	Integration component that links external data sources
SLA	Service Level Agreement - performance commitment metrics
Drill-down	Action to view more detailed data within a visualization
Time Series	Data points indexed in chronological order
Aggregation	Combining multiple data points into summary statistics

Project Information

Description

DataPulse is a unified multi-dashboard platform that combines business intelligence, operations monitoring, and analytics in a single interface. The platform enables real-time data synchronization across dashboards with AI-powered anomaly detection and smart alerting capabilities.

Goals

1. Provide a unified platform for business intelligence, operations monitoring, and analytics
2. Enable real-time data visualization with customizable dashboard widgets
3. Support cross-department data sharing with granular permission controls
4. Deliver AI-powered anomaly detection and smart alerting system

User Types

- **Business User**: View dashboards, create custom reports, export data, set personal alerts, bookmark favorites, comment on dashboard items
- **Data Analyst**: All Business User permissions + SQL query access, create/edit data models, build custom visualizations, set up data pipelines, create shareable templates

- **Operations Manager**: View operations dashboard, manage team members, approve workflows, handle escalations, monitor SLAs, view team activity logs
- **System Admin**: Full system access including user management, integration settings, audit logs, system configuration, backup/restore, white-label branding

User Relationships

- System Admin manages all user accounts (1:N)
- Operations Manager oversees Business Users within their department (1:N)
- Data Analysts can share reports with Business Users (N:N)
- All users operate independently within their permission scope

Project Type

- Web Application - React
- Admin Dashboard - React
- Operations Dashboard - React
- Analytics Dashboard - React
- Backend - NestJS

System Modules (Step-by-step Flows)

Module 1 - Dashboard Builder

1. Data Analyst clicks "Create New Dashboard"
2. System displays blank canvas with widget sidebar
3. Analyst drags widget (chart/table/metric) onto canvas
4. System prompts for data source selection
5. Analyst configures data query and visualization options
6. System renders live preview
7. Analyst saves and sets sharing permissions
8. System notifies shared users of new dashboard

Module 2 - Alert Configuration

1. User navigates to Alert Settings
2. System displays current alerts and "Add Alert" button
3. User selects metric to monitor
4. User sets threshold conditions (above/below/change %)
5. User configures notification channels (email/Slack/SMS)
6. System validates and activates alert
7. When threshold triggered, system sends notification
8. User can snooze, acknowledge, or resolve alert

Module 3 - Data Source Integration

1. Admin navigates to Integrations page
2. System shows available connectors (databases, APIs, files)
3. Admin selects connector type
4. System displays connection configuration form
5. Admin enters credentials and connection details
6. System tests connection
7. On success, system syncs metadata (tables, schemas)
8. Data source becomes available for dashboard creation

Module 4 - Report Scheduling

1. Business User opens a dashboard
2. User clicks "Schedule Report"
3. System displays scheduling options
4. User sets frequency (daily/weekly/monthly)
5. User selects delivery time and recipients
6. User chooses export format
7. System confirms schedule
8. System automatically generates and delivers reports

3rd Party API List

- Google OAuth: SSO authentication
- Okta: Enterprise SSO integration
- AWS S3: File storage for exports and backups
- SendGrid: Email notifications and scheduled reports
- Slack: Alert notifications and report delivery
- Twilio: SMS alerts for critical notifications
- Stripe: Subscription billing management

Part 2: User Application PRD

User Types: Business User, Data Analyst, Operations Manager

All users access the platform via web browser. Mobile-responsive design ensures dashboards are viewable on various screen sizes.

1. Common

Splash/Landing Page

- Design: Company branding with login prompt
- Display loading state while checking authentication

Login Page

- **Input**:
  - Email address
  - Password
  - "Remember me" checkbox
- **SSO Options**:
  - Google Workspace login
  - Okta SSO
  - SAML integration
- **Next Action**:
  - Validate credentials against authentication service
  - On success: Redirect to user's default dashboard
  - On failure: Display error message with retry option
  - Lock account after 5 failed attempts

Forgot Password Page

- **Main**
  - Input: Email address
  - Action: Send password reset link
- **Reset Password Page**
  - Input: New password, Confirm password
  - Password requirements: Min 8 chars, uppercase, lowercase, number, special char
  - Link expires after 24 hours

Sign Up Page

- **Input**:
  - Full name (required)
  - Work email (required)
  - Company name (required)
  - Department (required)
  - Phone number (optional)
  - Profile photo (optional)
  - Timezone preference (optional)
- **Rules**:
  - Work email domain validation
  - Email verification required before access
  - Admin approval required for new accounts

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2. Business User

2.1 Navigation Menu

1. Home (Dashboard overview)
2. My Dashboards
3. Reports
4. Alerts
5. Settings

2.2 Page Architecture & Feature Specification

1. Home Tab

Main Page - Dashboard Overview

1. Quick Stats Cards
   - Display assigned KPIs
   - Show trend indicators (up/down arrows)
   - Click card to view detailed chart
2. Recent Dashboards
   - List of recently viewed dashboards
   - Quick access to frequently used views
   - "View All" link to full dashboard list
3. Notifications Panel

    - Recent alerts triggered
    - Report delivery confirmations
    - System announcements

2. My Dashboards Tab

Dashboard List Page

1. Dashboard Grid/List View
    - Thumbnail preview of each dashboard
    - Dashboard name and description
    - Last modified date
    - Owner information
    - Favorite star toggle
2. Filter & Search
    - Search by name
    - Filter by: Owned / Shared with me / Favorites
    - Sort by: Name / Modified date / Created date
3. Actions
    - Open dashboard
    - Duplicate dashboard
    - Export as PDF/PNG

Dashboard View Page

1. Dashboard Canvas
    - Display all widgets in configured layout
    - Widget types: Charts, Tables, Metrics, Text
    - Interactive elements (hover tooltips, click drill-down)
2. Toolbar
    - Date range selector
    - Refresh button
    - Full screen mode
    - Export options (PDF, Excel, PNG)
    - Schedule Report button
    - Share button
3. Widget Interaction
    - Click chart element for drill-down
    - Hover for detailed tooltip
    - Right-click for context menu

Report Scheduling Modal

- Frequency selection: Daily / Weekly / Monthly
- Delivery time picker
- Recipients list (email addresses)
- Export format: PDF / Excel

- Preview option

3. Reports Tab

Reports List Page

1. Scheduled Reports
    - List of configured scheduled reports
    - Next delivery date
    - Recipients count
    - Enable/disable toggle
2. Generated Reports
    - History of generated reports
    - Download links (expires after 30 days)
    - Regenerate option

Report Detail Page

- View report configuration
- Edit schedule settings
- View delivery history
- Download past versions

4. Alerts Tab

Alerts List Page

1. Active Alerts
    - Currently triggered alerts
    - Severity indicator (Critical/Warning/Info)
    - Time since triggered
    - Acknowledge / Snooze / Resolve buttons
2. Alert Rules
    - Configured alert rules list
    - Metric being monitored
    - Threshold conditions
    - Notification channels
    - Enable/disable toggle

Alert Configuration Page

- Select metric to monitor
- Set threshold type: Above / Below / Change %
- Set threshold value
- Configure notification channels:
    - Email
    - Slack channel
    - SMS (critical only)
- Set alert frequency (immediate / digest)

5. Settings Tab

Profile Settings

- Edit profile information
- Change password
- Timezone preference
- Notification preferences

Dashboard Preferences

- Default dashboard on login
- Default date range
- Chart color preferences

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3. Data Analyst

3.1 Navigation Menu

1. Home
2. Dashboards
3. Query Editor
4. Data Models
5. Reports
6. Alerts
7. Settings

3.2 Page Architecture & Feature Specification

1. Home Tab

(Same as Business User with additional quick links to Query Editor and Data Models)

2. Dashboards Tab

Dashboard List Page (Same as Business User)

Dashboard Builder Page

1. Canvas Area
    - Drag-and-drop widget placement
    - Grid layout system
    - Resize widget handles
    - Widget alignment guides
2. Widget Sidebar
    - Widget types:
        - Line Chart
        - Bar Chart
        - Pie Chart
        - Area Chart
        - Table
        - Metric Card
        - Text/Markdown
        - Image

- Drag to add to canvas

3. Widget Configuration Panel
    - Data source selection
    - Query builder / SQL input
    - Visualization options (colors, labels, axes)
    - Drill-down configuration
    - Refresh interval
4. Toolbar
    - Save / Save As
    - Undo / Redo
    - Preview mode
    - Share settings
    - Version history

Share Settings Modal

- Add users/groups
- Permission levels: View / Edit
- Copy share link
- Set link expiration

3. Query Editor Tab

SQL Editor Page

1. Query Panel
    - SQL editor with syntax highlighting
    - Autocomplete for tables/columns
    - Query history sidebar
    - Saved queries list
2. Schema Browser
    - Data source tree view
    - Table list with column details
    - Column data types
    - Preview data option
3. Results Panel
    - Query results table
    - Row count display
    - Export results (CSV, JSON)
    - Create visualization from results
    - Save as data model
4. Query Actions
    - Run query
    - Explain query
    - Format SQL
    - Save query

- Share query

4. Data Models Tab

Data Models List Page

1. Model List
    - Model name and description
    - Tables/views included
    - Last modified
    - Created by
2. Actions
    - Create new model
    - Edit model
    - Duplicate
    - Delete
    - View dependencies

Data Model Editor Page

1. Model Canvas
    - Visual table relationships
    - Join configuration
    - Calculated fields
2. Table Panel
    - Add tables from data sources
    - Define joins (inner, left, right)
    - Create calculated columns
    - Set primary keys
3. Validation
    - Test model queries
    - Performance analysis
    - Error highlighting

5. Reports Tab

(Same as Business User with additional "Create from Query" option)

6. Alerts Tab

(Same as Business User)

7. Settings Tab

(Same as Business User with additional Query Editor preferences)

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4. Operations Manager

4.1 Navigation Menu

1. Operations Dashboard
2. Team
3. Workflows
4. SLA Monitor
5. Alerts
6. Settings

4.2 Page Architecture & Feature Specification

1. Operations Dashboard Tab

Main Dashboard Page

1. Real-time Metrics Panel
    - Active issues count
    - Open tickets by priority
    - Team availability status
    - SLA compliance percentage
2. Activity Feed
    - Real-time updates on team activities
    - Ticket status changes
    - Escalation notifications
    - System events
3. Performance Charts
    - Ticket resolution time trend
    - Team productivity metrics
    - SLA compliance over time
    - Issue category breakdown

2. Team Tab

Team Overview Page

1. Team Member List
    - Member name and role
    - Current status (available/busy/away)
    - Active tasks count
    - Performance metrics
2. Actions
    - Assign tasks
    - View member details
    - Send notification
    - View activity log

Team Member Detail Page

- Profile information
- Current assignments
- Performance history

- Activity timeline

3. Workflows Tab

Workflow Queue Page

1. Pending Approvals
    - Workflow items awaiting approval
    - Requester information
    - Request details
    - Priority indicator
2. Actions
    - Approve / Reject
    - Request more info
    - Reassign
    - Add comment

Workflow History Page

- Completed workflows
- Decision log
- Time to resolution
- Filter by status/date

4. SLA Monitor Tab

SLA Dashboard Page

1. SLA Status Cards
    - Current compliance rate
    - At-risk items count
    - Breached items count
    - Trend indicator
2. SLA List
    - Active SLA definitions
    - Target metrics
    - Current performance
    - Alert thresholds
3. At-Risk Items
    - Items approaching SLA breach
    - Time remaining
    - Assigned team member
    - Escalation actions

5. Alerts Tab

(Same structure with operations-specific alerts)

6. Settings Tab

- Team configuration

- SLA definitions
- Escalation rules
- Notification preferences

Part 3: Admin Dashboard PRD

Admin Dashboard Standard Features

All admin dashboard pages include the following standard features unless otherwise specified.

List Page Standard Features

Feature	Description	Required
Search	Keyword search field (name, ID, email, etc.)	✅
Filters	Status / Date / Category dropdown filters	✅
Column Sorting	Click table header to sort ASC/DESC	✅
Checkbox Selection	Row checkboxes + Select All checkbox	✅
Bulk Actions	Bulk delete / Status change / Export for selected items	✅
Pagination	Page navigation + Items per page selector (10/25/50/100)	✅

Table UI Standard Features

Feature	Description	Required
Loading State	Skeleton or spinner while data loads	✅
Empty State	Message displayed when no data exists	✅
Action Column	Edit / Delete / View Detail buttons per row	✅

Detail/Edit Standard Features

Feature	Description	Required
Detail Drawer/Modal	Click row to open detail panel	✅
Edit Form	Switch to edit mode within detail view	✅
Delete Confirmation	Confirmation dialog before deletion	✅
Audit Log	Track who/when/what was modified	✅

Data Export Standard Features

Feature	Description	Required
CSV/Excel Download	Export current filtered/searched results	✅

Date Range Selection	Period filter for export	✅

Common UI/UX Standard Features

Feature	Description	Required
Toast Notifications	Success/Error feedback messages	✅
Breadcrumb	Current location navigation	✅
Create Modal/Drawer	Form for adding new items	✅

Page Architecture & Feature Specification

Dashboard Home Page

Statistics Cards

- Total Users (by type: Business User, Data Analyst, Operations Manager)
- Active Sessions
- Dashboards Created (today/this week/this month)
- Queries Executed
- Alerts Triggered
- Show increase/decrease percentage compared to previous period

Period Filter

- Today / Last 7 days / Last 30 days / Custom date range

Charts

- User Activity Trend (line chart)
- Query Volume by Hour (bar chart)
- Dashboard Usage Distribution (pie chart)
- Alert Frequency by Type (bar chart)

Recent Activity

- Recently created dashboards
- Recent user logins
- Recent integration changes
- Recent alert triggers

User Management

Business User Management Page

Main Page

1. Top Area:
    - Search: Name, email, department
    - Filters: Status (Active/Inactive/Pending), Department, Created date
    - Create User button → Creation Modal

- Bulk Action dropdown: Delete / Activate / Deactivate / Export

2. Table Component:

   - Checkbox column (with Select All)
   - Name
   - Email
   - Department
   - Status
   - Last Login
   - Created At
   - Action column: View / Edit / Delete

3. Table Features:

   - Column sorting (click header)
   - Pagination with items per page selector

Creation Modal

- Full name (required)
- Email (required)
- Department (required)
- Role assignment
- Send welcome email checkbox
- Create button / Cancel button

Detail Drawer

- Header Info: Name, email, profile photo, department
- Account Actions:
  - Activate / Deactivate account
  - Reset password
  - Change department
  - Assign to Operations Manager
- Dashboard Access: List of accessible dashboards
- Activity Log: Recent login times, dashboards viewed, reports generated
- Timestamps: Created at / Last login / Last modified

Data Analyst Management Page

(Similar structure to Business User with additional fields)

- Additional fields: Assigned data sources, Query permissions level
- Activity includes: Queries run, Models created, Dashboards built

Operations Manager Management Page

(Similar structure with team management fields)

- Additional fields: Team members managed, Department
- Activity includes: Approvals made, Escalations handled

Integration Management

Data Source Connections Page

Main Page

1. Top Area:
    - Search: Connection name, type
    - Filters: Status (Connected/Error/Pending), Type (Database/API/File)
    - Add Connection button → Connection Wizard
    - Bulk Action dropdown: Test All / Delete / Export
2. Table Component:
    - Connection name
    - Type (PostgreSQL, MySQL, REST API, etc.)
    - Status (Connected/Error/Disconnected)
    - Last Sync
    - Tables/Endpoints count
    - Action column: Test / Edit / Delete

Connection Wizard (Multi-step Modal)

- Step 1: Select connector type
- Step 2: Enter connection details (host, port, credentials)
- Step 3: Test connection
- Step 4: Configure sync settings
- Step 5: Review and save

Connection Detail Drawer

- Connection info display
- Sync status and history
- Available tables/schemas
- Edit credentials
- Manual sync trigger
- Error logs

API Keys Management Page

Main Page

- API key list with masked values
- Key name and description
- Permissions scope
- Created by / Created at
- Last used
- Revoke action

Create API Key Modal

- Key name (required)
- Description
- Permission scope selection
- Expiration setting
- Generate button

System Configuration

Branding Settings Page

White-label Configuration

- Logo upload (main, favicon)
- Primary color picker
- Secondary color picker
- Custom CSS input
- Preview panel

System Health Page

Monitoring Dashboard

- Server status indicators
- Database connection status
- API response times
- Memory/CPU usage graphs
- Error rate tracking

Maintenance

- System backup controls
- Restore from backup
- Cache clear
- Database optimization

Audit Log Page

Main Page

1. Top Area:

    - Search: User, action, resource
    - Filters: Action type, Date range, User role
    - Export button

2. Table Component:

    - Timestamp
    - User
    - Action (Create/Update/Delete/Login/etc.)
    - Resource type
    - Resource ID
    - IP Address
    - Details (expandable)

Log Detail Modal

- Full action details
- Before/After values for changes
- User agent information
- Related logs

Billing Management (Stripe Integration)

Subscription Management Page

Overview

- Current plan details
- Billing cycle
- Next payment date
- Payment method

Plan Management

- Upgrade/Downgrade options
- Feature comparison
- Usage limits display

Invoice History

- Invoice list with download links
- Payment status
- Amount and date

Export / Data Download

Data Download

- User data export (all users with activity)
- Dashboard usage reports
- Query logs
- Audit logs
- System analytics

Format: CSV / Excel

Filter Options:

- All time
- Custom date range
- Current filtered results

Additional Questions (Client Confirmation Required)

Required Clarifications - RESOLVED

#	Question	Answer	Implementation Note
1	What specific database types should be supported for data source connections?	**PostgreSQL only** (MVP)	Single DB type simplifies connector development. Other DBs can be added in future phases.
2	What is the maximum file size for data exports?	**50MB**	Standard limit for most export scenarios. Large exports will be split

			into multiple files.
3	Should the Operations Dashboard include real-time collaboration features?	**No** - Refresh-based only	Manual refresh button + auto-refresh every 30 seconds. No WebSocket needed for MVP.
4	What is the data retention policy for audit logs?	**90 days**	Logs older than 90 days auto-deleted. Simple cron job implementation.

Recommended Clarifications - RESOLVED

#	Question	Answer	Implementation Note
1	Should dashboards support embedding in external websites?	**No** (MVP)	Internal use only. Reduces security complexity.
2	Is row-level security needed for data models?	**No** - Department-level only	Users see all data within their department. Simpler permission model.
3	What is the expected query timeout limit?	**30 seconds**	Standard timeout. Long queries should be optimized or run as background jobs.
4	Should the system support scheduled data refreshes for dashboards?	**No** (MVP)	Manual refresh only. Reduces backend complexity. Real-time widgets refresh on 30s interval.

Feature Change Log

Version 1.0 (2026-01-21)

Change Type	Before	After	Source
Initial Creation	-	Full PRD	DataPulse_260121_170910.md

Change Details

Initial PRD Creation

- **Source Document**: DataPulse_260121_170910.md (Training Project)
- **Change Description**: Initial PRD created based on client requirements document

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UX Flow Improvement Suggestions

UX flow issues identified during PRD creation:

Suggestions

#	Current Flow	Issue	Suggestion	Priority
1	Dashboard creation requires navigating to Dashboards tab first	New users may not discover dashboard builder easily	Add "Create Dashboard" button on Home page	Medium
2	Alert configuration is separate from dashboard view	Users must leave dashboard to set alerts on visible metrics	Add inline "Create Alert" option when clicking on metrics	High
3	Query Editor and Dashboard Builder are separate tools	Data Analysts must switch between tools frequently	Add inline query builder within Dashboard Builder widget configuration	Medium
4	Scheduled reports list is buried under Reports tab	Users may forget about scheduled reports	Add scheduled reports widget to Home dashboard	Low

Suggestion Details

Suggestion 1: Quick Dashboard Creation

- **Current**: User must navigate to Dashboards tab, then click Create
- **Issue**: Two-step process for common action
- **Suggestion**: Add prominent "Create Dashboard" CTA on Home page
- **Expected Benefit**: Faster access to core functionality

Suggestion 2: Inline Alert Creation

- **Current**: User views metric on dashboard, navigates away to Alerts, finds same metric
- **Issue**: Context loss and repetitive navigation
- **Suggestion**: Right-click or hover menu on any metric with "Create Alert" option
- **Expected Benefit**: Streamlined workflow, reduced time to configure monitoring

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