

Da Vinci Smart Manufacturing

BRD S06.07 Reports Downtime Analysis

Version	Created/Modified by	Description	Date
1.0	Leopoldo Rivera Sahana Badal	S06.07 First draft	6/06/2025

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This document outlines the detailed specifications for the **Downtime Analysis Report** module. The module enables users to configure, generate, manage, and share reports that

analyze downtime events across furnaces. This supports decision-making, efficiency tracking, and auditing through dynamic filters, KPI selection, and export capabilities.

1. Overview

The Report module consists of:

- **Report Configuration Interface** – where filters and KPIs are selected.
- **Report Output View** – where the results are displayed and further actions can be taken.

2. Report Configuration Interface (Setup View)

When entering the configuration interface, users can optionally choose from previously saved report setups known as **variants**. These variants can either be **created by the user**, or **public variants shared by others**.

2.1 Variant Name Selection

- A dropdown labeled “**Variant Name**” is provided at the top.
 - User selects the Variant ID from a single select dropdown
 - Mandatory - No
 - Default value - No
 - Field Type - Single Select Dropdown Values: All Variants saved (Public and Private). **Dropdown Structure:**
 - **My Variants**
 - Private
 - Public (shared icon)
 - **Public Variants (created by others)**
 - Validation - No
 - **Permissions:**
 - Only the creator can edit, delete, or update their variant.
 - Other users can view or clone public variants.
- If no variant is selected, configuration starts blank.
- On selecting a variant, filters and KPIs are auto-populated.
- Only the creator of a variant can edit or delete it.

2.2 Report Filters (Mandatory fields marked with *)

Filter	Type	Description
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Furnace ID*	Multi-select dropdown	Lists all furnaces assigned to user or organization.
Date Range*	Calendar picker	From and To date selectors.
Downtime Type*	Multi-select dropdown	List of Downtime Type for which downtime event/split has been recorded
Equipment*	Multi-select dropdown	List of Equipment for which downtime event/split has been recorded
Reason*	Multi-select dropdown	List of Reasons for which downtime event/split has been recorded

Filter Behaviour:

- Filters cascade based on prior selections (e.g., Downtime Type → Equipment → Reason).
- Default values are empty; required fields must be selected to proceed.
- All Filter drop downs should be sorted alphabetically / numerically
- Filters are editable unless restricted via variant behaviour

2.3 KPI Selection

- KPI checkboxes/toggles are listed for selection.
- Backend provides the available KPIs per report.
- KPIs are not mandatory and report can be generated without selecting any.
- KPI Permissions Logic
 - **Selectable KPIs:** A user can only **select** KPIs for which their role has explicit permission.
 - **Visible but Disabled:** KPIs outside the user's permission scope will still be **visible** in the interface but will appear **disabled**
 - If a previously selected KPI (from a variant) is now unauthorized:
 - It will not be visible
- **Max 3 KPIs can be selected.**
 - If a user selects more than 3, an inline validation appears: "*You can select up to 3 KPIs only.*"
- Each KPI has a **default chart type** (bar, line, pie, etc.) configured by backend.

- In the **generated report screen**, users can change the chart type per KPI using a dropdown.

2.4 Action Buttons

Button	Function
Generate Report	Validates inputs and transitions to Report Output View.
Reset	Clears all filters and KPI selections to default state.

3. Report Output View

Upon clicking **Generate Report**, the system transitions to a new screen with the following sections:

3.1 Header Section

- Format: Downtime Analysis : <Variant Name>
- **Untitled** if no variant is selected
- Variant Name (default: *Untitled* until saved)

- o Min - 1 and Max - 30 characters, alphanumeric, Only '-' and '_' is allowed, Single space is allowed in between the words, No leading spaces allowed.
- o **Edit Icon** (✎):
 - o **Visible** only if the variant belongs to the current user
 - o **Hidden** for public variants not owned by the user
 - o Enables inline editing of Variant Name and Access Modifier (Private/Public).
 - o A **Save** button confirms updates.

3.2. Filters Summary Section

Displays all selected filters and metadata

1. Furnace ID – view only
2. Date Range (From – To) - view only
3. Downtime Type - view only
4. Equipment - view only
5. Reason - view only
6. **Executed On** – *Displayed only in print view; not saved in variant.* view only
7. **Executed By** – *Displayed only in print view; not saved in variant.* view only

3.2 KPI Visualization Section

- KPIs selected are shown in graphical format.

Features:

- KPIs can be **removed** via a close (x) button on hover.
- KPIs can be **reordered** via drag-and-drop.
- KPI metadata and units are displayed.
- Users can **change the chart type per KPI** via dropdown (Card, Gauge, Bar Chart, Line Chart and Pie Chart).
- If the user does not have permission to view a particular KPI at the time of generating the report, it will not be visible on the report generated screen
- Focus
 - o On clicking the three-dots menu of a chart, a menu opens with “Focus” as one of the options.

- o When Focus is selected, the chosen chart opens in a zoomed-in mode for better visibility and analysis of data.
- o Supported chart types (Focus enabled): Line, Pie, and Bar charts.
- o Unsupported chart types (Focus disabled): Card, Gauge, and cases where no data is available.

3.3 Report Data (Tabular Format)

- Data displayed based on filters and granularity.
- It will have the following columns
 - o Date
 - o Furnace ID
 - o Downtime Type
 - o Equipment
 - o Reason
 - o Total Duration (hrs)

Table Features:

- Configurable columns via “Add Columns” menu
- Sorting and rearranging columns via drag-and-drop
- Pagination for large datasets
- Export to Excel (XLSX) File Name “DowntimeReport_DD-MM-YYYY”

Downtime Analysis

Filters

Variant Name Untitled	Furnace ID 11	Date Range 15/10/2024 - 16/9/2024	Downtime Type Planned Stoppage	Equipment Furnace	Reason Electric Failure
Executed by sbadal Sahana Badal	Executed on 15/10/2024 3:15 pm				

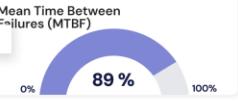
KPIs

Downtime (Hours) or Availability


89 %

Overall Equipment Efficiency OEE (%)


89 %

Mean Time Between Failures (MTBF)


89 %

Report

Date	Furnace ID	Downtime Type	Equipment	Reason Code	Total Duration (Hrs)
1/1/2025	1	Planned Stoppage	Furnace	Electric Failure	12
1/1/2025	1	Planned Stoppage	Furnace	Electric Failure	12
1/1/2025	1	Planned Stoppage	Furnace	Electric Failure	12

Downtime Analysis

Filters

Variant Name Untitled	Furnace ID 11	Date Range 15/10/2024 - 16/9/2024	Downtime Type Planned Stoppage	Equipment Furnace	Reason Electric Failure
Executed by sbadal Sahana Badal	Executed on 15/10/2024 3:15 pm				

KPIs

Downtime (Hours) or Availability


89 %

Overall Equipment Efficiency OEE (%)


89 %

Mean Time Between Failures (MTBF)


89 %

Report

Date	Furnace ID	Downtime Type	Equipment	Reason Code	Total Duration (Hrs)
1/1/2025	1	Planned Stoppage	Furnace	Electric Failure	12
1/1/2025	1	Planned Stoppage	Furnace	Electric Failure	12
1/1/2025	1	Planned Stoppage	Furnace	Electric Failure	12

3.4 Notes Section

- Free-text input area for user insights. All (Including special characters), 100 characters
- Not saved with variant — intended for print inclusion only.

3.5 Navigation – Back to Configuration

- A **Back** button appears in the report view.
- Clicking it returns the user to the **Setup View**, retaining all previous filter and KPI selections.
- Ensures seamless editing without re-entering data.

4. User Flows and Report Actions

Flow 1: No Variant Selected

- User starts with no variant; variant name field remains empty.
- Filters and KPIs are manually selected.
- Report is generated from scratch.
- Output view shows report as “**Untitled**”.
- The following report actions are enabled
 - o **Print**
 - ♣ Exports the entire report as PDF.
 - ♣ **Save**
 - Saves current report configuration, including all filters and KPI settings
 - Required fields:
 - o Report Variant Name
 - o Access Modifier (Private/Public)
 - Only the creator can edit or delete saved variants.
- **Clone** and **Delete** are disabled.

- KPIs can be
 - Reordered
 - Removed
 - Change chart type
- Focus
 - On clicking the three-dots menu of a chart, a menu opens with “Focus” as one of the options.
 - When Focus is selected, the chosen chart opens in a zoomed-in mode for better visibility and analysis of data.
 - Supported chart types (Focus enabled): Line, Pie, and Bar charts.
 - Unsupported chart types (Focus disabled): Card, Gauge, and cases where no data is available.

Flow 2: User Selects Own Variant

- User selects a self-created variant.
- Filters and KPIs are auto-filled and **fully editable**.
- Output view shows the variant name with an **edit icon**.
- The following report actions are enabled
 - **Print**
 - ♣ Exports the entire report as PDF.
 - **Save** – Updates the changes made to the Variant.
 - **Clone**
 - ♣ Saves current report configuration as a new Variant.
 - ♣ Required fields:
 - Report Variant Name
 - Access Modifier (Private/Public)
 - **Delete**
 - ♣ Available for user-created variants.
 - ♣ Delete via dropdown or trash icon with confirmation prompt.
 - “Are you sure you want to delete this variant “Variant Name”?
- KPIs can be
 - Viewed based on permission
 - Reordered
 - Removed
 - Chart types changed
 - Focus

- On clicking the three-dots menu of a chart, a menu opens with “Focus” as one of the options.
- When Focus is selected, the chosen chart opens in a zoomed-in mode for better visibility and analysis of data.
- Supported chart types (Focus enabled): Line, Pie, and Bar charts.
- Unsupported chart types (Focus disabled): Card, Gauge, and cases where no data is available.

Flow 3: User Selects Public Variant Shared by Another User

- Public variant is selected.
- Filters and KPIs are auto-filled and **locked** (read-only).
- Output view shows the variant name **without edit icon**.
- The following report actions are enabled
 - **Print**
 - Exports the entire report as PDF.
 - User selects sections to include:
 - Filter section
 - Notes section
 - Specific pages of data
 - **Clone**
 - Saves current report configuration as a new Variant.
 - Required fields:
 - Report Variant Name
 - Access Modifier (Private/Public)
 - **Save and Delete** are disabled
- KPIs can be
 - Viewed based on permission
 - Chart types changed. The change is **temporary** and does not affect the original Public Variant configuration.
 - **Cannot be removed**
 - **Cannot be reordered**.
-

Downtime Analysis

Filters

Variant Name Variant 1	Furnace ID 11	Date Range 15/10/2024 - 16/9/2024	Downtime Type Planned Stoppage	Equipment Furnace	Reason Electric Failure
Executed by sbadal Sahana Badal	Executed on 15/10/2024 3:15 pm				

KPIs

Downtime (Hours) or Availability



89 %

Overall Equipment Effectiveness (OEE)



89 %

Mean Time Between Failures (MTBF)



89 %

Report

Date	Furnace ID	Downtime Type	Equipment	Reason Code	Total Duration (Hrs)
1/1/2025	1	Planned Stoppage	Furnace	Electric Failure	12
1/1/2025	1	Planned Stoppage	Furnace	Electric Failure	12
1/1/2025	1	Planned Stoppage	Furnace	Electric Failure	12

Clone Report
The cloned version will open in edit mode and must be saved separately.

Downtime Analysis

Filters

Variant Name Untitled	Furnace ID 11	Date Range 15/10/2024 - 16/9/2024	Downtime Type Planned Stoppage	Equipment Furnace	Reason Electric Failure
Executed by sbadal Sahana Badal	Executed on 15/10/2024 3:15 pm				

KPIs

Downtime (Hours) or Availability



89 %

Overall Equipment Effectiveness (OEE)



89 %

Mean Time Between Failures (MTBF)



89 %

Report

Date	Furnace ID	Downtime Type	Equipment	Reason Code	Total Duration (Hrs)
1/1/2025	1	Planned Stoppage	Furnace	Electric Failure	12
1/1/2025	1	Planned Stoppage	Furnace	Electric Failure	12
1/1/2025	1	Planned Stoppage	Furnace	Electric Failure	12

Save Report Variant
Enter Variant Name Public

The screenshot shows the Downtime Analysis module interface. At the top, there's a header with a back arrow labeled 'Downtime Analysis', a user profile for 'Nora James', and a 'Delete Report' button. Below the header are sections for 'Filters' and 'KPIs'. The 'Filters' section includes fields for Variant Name ('Variant 1'), Furnace ID ('11'), Date Range ('15/10/2024 - 16/9/2024'), Downtime Type ('Planned Stoppage'), Equipment ('Furnace'), and Reason ('Electric Failure'). It also shows 'Executed by' information ('sbadal | Sahana Badal') and the execution date ('15/10/2024 | 3:15 pm'). The 'KPIs' section displays three gauge charts: 'Downtime (Hours) or Availability' at 89%, 'Overall Equipment' at 89%, and 'Between Failures (MTBF)' at 89%. A modal dialog titled 'Delete Variant' asks 'Are you sure you want to delete "Variant 1"?'. The 'Expected Behaviour' section of the dialog has a red 'X' and a green checkmark. The bottom part of the interface shows a 'Report' table with columns for Date, Furnace ID, Downtime Type, Equipment, Reason Code, and Total Duration (Hrs). There are three rows of data, all identical, showing values for 1/1/2025, Furnace ID 1, Planned Stoppage, Furnace, Electric Failure, and a duration of 12 hours.

5. Edge Cases & Validations

Scenario	Expected Behaviour
Required filter missing	Prompt user to complete all mandatory fields
Deleting a variant in use	Show confirmation and warn about unsaved changes when traversing to another module
Selecting public variant	Load values in read-only mode unless cloned
No KPIs selected	Section remains empty; no validation error
Selecting > 3 KPIs	Show inline warning and prevent further selections