D3 Chart Documentation

Used Dependencies

1. "react": "^19.0.0"
2. "d3": "^7.9.0"

Charts Overview

- Gauge Chart
- SCurve Chart
- Grouped Bar Chart - Cost Performance Summary Chart

These charts, when combined, offer a comprehensive overview of a project's performance, enabling timely decisions for corrective actions

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Gauge Chart

Purpose

Gauge charts are used to visually represent key performance metrics on a scale, helping users quickly assess how current values compare to predefined limits or targets.

As per current design we have prepared colorLogic which can be defined like below to give easy Gauge Chart fill colors as per our need.

```
const colorLogic = {
   schedule: () => "#2596be",
   actual: (value) =>
     value > projectInfoData.scheduledPercentage / 100 ? "#28a745" : "#f40400",
   index: (value) => (value >= 1 ? "#28a745" : "#f40400"),
 };
```

1. Schedule Percentage (%)

It displays the percentage of the project schedule completed, compared to the baseline schedule. It helps determine if the project is progressing on time as planned.
Visual: A gauge fills up from 0% to 100%, with a blue gradient indicating progress.

Gradient Colors: #2596be

Props Passed:

- isDarkMode: true/false (determines dark mode).
- title: "Schedule Percentage (%)"

- value: scheduledPercentage / 100
- min: 0
- max: 1
- colorLogic: Determines the gradient color based on value.
- enableNeedle(Optional): Default false
- enableGradient(Optional): Default false

2. Actual Percentage (%)

It displays the percentage of actual work completed in the project relative to the schedule. It allows comparison between planned and actual work completion
Visual: A gauge fills up from 0% to 100%, with a red gradient indicating progress

Gradient Colors: actualPercentage > scheduledPercentage / 100 ? "#28a745" : "#f40400"

Props Passed:

- isDarkMode: true/false (determines dark mode).
- title: "Actual Percentage (%)"
- value: actualPercentage / 100
- min: 0
- max: 1
- colorLogic: Determines the gradient color based on value.
- enableNeedle(Optional): Default false
- enableGradient(Optional): Default false

3. Schedule Performance Index (SPI)

It shows a ratio of earned value to planned value that indicates whether the project is on schedule. It is a crucial indicator for project managers to monitor timeline performance
Visual Cue: Red for SPI < 2 (behind schedule).

Gradient Colors: value >= 1 ? "#28a745" : "#f40400"

Props Passed:

- isDarkMode: true/false (determines dark mode).
- title: "Schedule Performance Index (SPI)"
- value: spi
- min: 0
- max: 2
- colorLogic: Determines the gradient color based on value.
- enableNeedle(Optional): Default false
- enableGradient(Optional): Default false

4. Cost Performance Index (CPI)

It shows a ratio of earned value to actual cost that evaluates cost efficiency in the project. It helps manage the budget and identify cost overruns early.
Visual Cue: Green for CPI < 2 (cost overrun).

Gradient Colors: value >= 1 ? "#28a745" : "#f40400"

Props Passed:

- isDarkMode: true/false (determines dark mode).
- title: "Cost Performance Index (CPI)"
- value: cpi
- min: 0
- max: 2
- colorLogic: Determines the gradient color based on value
- enableNeedle(Optional): Default false
- enableGradient(Optional): Default false

SCurve Chart

Purpose

The S-Curve chart visualizes the progress of planned versus actual work or costs over time. It is widely used in project management to track performance trends. This chart is instrumental in comparing planned versus actual project performance over time and identifying discrepancies early

Chart is visually displayed based on filters selected - Daily, Weekly and Monthly. Default filter is ‘Daily’

Tooltip is shown over this chart to know the Status Date, Planned Cost and Actual Cost of each point.

The S-curve chart includes a dynamic scrolling functionality to toggle between different timeframes: **Daily**, **Weekly**, and **Monthly**. This enhancement enables users to view data insights at varying granularities, ensuring better analysis and decision-making.

- **Daily View:** Displays the cumulative progress for each day within the selected timeframe.
- **Weekly View:** Aggregates and shows the cumulative progress at a weekly level, smoothing out daily variations for broader trends.
- **Monthly View:** Provides a high-level overview of cumulative progress for each month, useful for long-term project planning and review.

Props Passed:

- isDarkMode: true/false (determines dark mode).
- data: JSON data from spread-period.json.
- chartTitle: "S-Curve".
- xAxisTitle: "Start Date".
- yAxisTitleLeft: "Baseline Planned Total Cost (%)".
- yAxisTitleRight: "Physical Progress (%)".
- projectInfoData: Data from project-info.json

[Optional props]

- plannedPointsColor = "#00ff00"
- actualPointsColor= "#2F5233"

Axis:

- X-axis: startDate (Project start dates).
- Y-axis (Left): baselinePlannedTotalCostPercentage (Represents the planned cumulative cost percentage over time).
- Y-axis (Right): physicalProgressPercentage (Represents the percentage of actual physical progress achieved).

The **baseline curve** (light green-#00ff00) shows the ideal progress as planned during the project's inception.

The **actual curve** (dark green-#2F5233) represents the real progress achieved at any point in time.

Data:


```
[
 {
        "objectId": 21613548800,
        "startDate": "2021-02-17T08:00:00.000Z",
        "finishDate": "2021-02-17T17:00:00.000Z",
        "projectType": "UPDATED_PROJECT",
        "sumEarnedValueCost": 152180.79085714286,
        "sumActualCost": 25363.465142857145,
        "cumSumActualCost": 25363.465142857145,
        "cumSumEarnedValueCost": 152180.79085714286,
        "physicalProgressPercentage": 0.0609325429730581
 },
 {
        "objectId": 11643875200,
        "startDate": "2022-02-03T08:00:00.000Z",
        "finishDate": "2022-02-03T17:00:00.000Z",
        "projectType": "BASELINE_PROJECT",
        "sumBaselinePlannedTotalCost": 2663163.68,
        "cumSumBaselinePlannedTotalCost": 249752896.2880003,
        "baselinePlannedTotalCostPercentage": 100.00000000000011
 },
  ...
]
```

Cost Performance Summary Chart

Purpose

It is a grouped bar chart that summarizes the financial progress of a project by comparing planned and actual costs over time. This chart is critical for financial tracking, ensuring the project stays within the allocated budget and identifying areas of cost inefficiency.

Chart is visually displayed based on filters selected - Daily, Weekly and Monthly. Default filter is ‘Daily’

Tooltip is shown on bars and 2 curve to know the Status Date, Planned Cost and Actual Cost

The Grouped bar chart includes a dynamic scrolling functionality to toggle between different timeframes: **Daily**, **Weekly**, and **Monthly**. This enhancement enables users to view data insights at varying granularities, ensuring better analysis and decision-making.

- **Daily View:** Displays detailed comparisons of data for individual days.
- **Weekly View:** Groups the data into weekly summaries, enabling comparisons at a higher level.
- **Monthly View:** Aggregates data into monthly summaries for broader insights

Props Passed:

- isDarkMode: true/false (determines dark mode).
- data: JSON data from spread-period.json.
- chartTitle: "Cost Performance Summary".
- xAxisTitle: "Start Date".
- yAxisTitleLeft: "Sum Cumulative Baseline Planned Total Cost".
- yAxisTitleRight: "Cumulative Sum Actual Cost".
- currencySymbol: Passed currency symbol

[Optional props]

- plannedPointsColor = "steelblue"
- actualPointsColor= "red"
- actualLineColor = "yellow"
- plannedLineColor = "purple"

Axis:

- X-axis: startDate (Project start dates).
- Y-axis (Left): cumSumBaselinePlannedTotalCost (Represents the planned cumulative cost over time).
- Y-axis (Right): cumSumActualCost (Represents the actual cost incurred over time).

The **baseline cost curve** (steelblue) illustrates the budgeted cost expectations for the project.

The **actual cost curve** (red) represents the real cost spent.

Data:


```
[
 {
        "objectId": 21613548800,
        "startDate": "2021-02-17T08:00:00.000Z",
        "finishDate": "2021-02-17T17:00:00.000Z",
        "projectType": "UPDATED_PROJECT",
        "sumEarnedValueCost": 152180.79085714286,
        "sumActualCost": 25363.465142857145,
        "cumSumActualCost": 25363.465142857145,
        "cumSumEarnedValueCost": 152180.79085714286,
        "physicalProgressPercentage": 0.0609325429730581
 },
 {
        "objectId": 11643875200,
        "startDate": "2022-02-03T08:00:00.000Z",
        "finishDate": "2022-02-03T17:00:00.000Z",
        "projectType": "BASELINE_PROJECT",
        "sumBaselinePlannedTotalCost": 2663163.68,
        "cumSumBaselinePlannedTotalCost": 249752896.2880003,
        "baselinePlannedTotalCostPercentage": 100.00000000000011
 },
  ...
]
```