

Khono Analysis Toolkit

USER MANUAL – DEMO VERSION

EKhono Project Control Services

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1. Overview

Undertaking analysis is one of the responsibilities of the Project Control team in the assisting the project managers. That assistance comes in forms of warnings as regards the potential risks that might hinder the Project in achieving its objectives. Analysis could also provide excellent insights through what-if scenarios for better decision making. There are tools and techniques that could be used to undertake the analysis. Some of them are basic whilst others are complex and require huge amounts of data. As a result, the output of the basic one's is not very receptive whilst the output of the complex tools is rigid or not easy to develop what-if scenarios from.

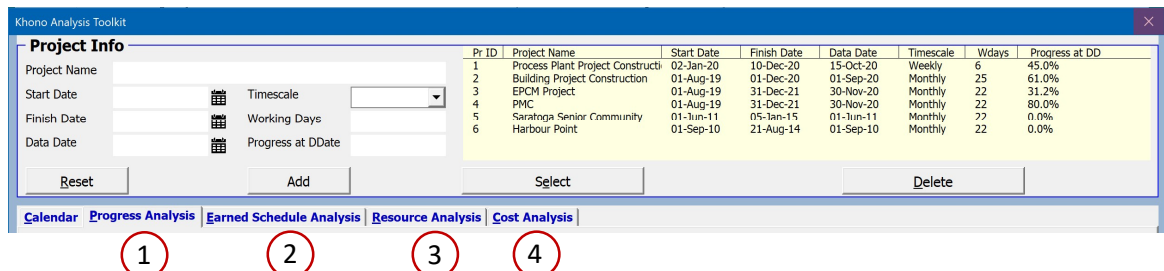
The Khono Analysis Toolkit (KAT) has been developed to perform some powerful analysis with small amounts of data that is usually readily available on most Projects. Some of the required data are: progress reports, schedule forecast dates, S-Curve data, etc.

For a smooth operation, the Toolkit has been tested through many scenarios and examples and has many error handling features. However, if it fails to provide correct results or issues an error message that is not clear what the reason could be, then send an email with the screenshot of the error and the data that caused the issue to: info@khonopc.com

Note: The current version is a demo and therefore, it has only the Progress Analysis Tab.

1.1. Project Info Tab

The Project Info Tab is used to add the project's info that the screenshot below illustrates. Once the info is added, it will be reflected on the right hand side table. Four analysis tabs have been developed that are linked to the projects.



Pr ID	Project Name	Start Date	Finish Date	Data Date	Timescale	Wdays	Progress at DD
1	Process Plant Project Constructi	02-Jan-20	10-Dec-20	15-Oct-20	Weekly	6	45.0%
2	Building Project Construction	01-Aug-19	01-Dec-20	01-Sep-20	Monthly	25	61.0%
3	EPCM Project	01-Aug-19	31-Dec-21	30-Nov-20	Monthly	22	31.2%
4	PMC	01-Aug-19	31-Dec-21	30-Nov-20	Monthly	22	80.0%
5	Saratoga Senior Community	01-Jun-11	05-Jan-15	01-Jun-11	Monthly	22	0.0%
6	Harbour Point	01-Sep-10	21-Aug-14	01-Sep-10	Monthly	22	0.0%

1.2. Analysis Tabs:

- 1- Progress Analysis:** It uses the historical actual progress data to calculate the three probabilistic completion dates. There are no limits on the No. of analysis per project.

Progress Analysis

Input Data

Package Name

Progress at DD

Reset

Select

Data Date

Target Progress

Add

Delete

NID	Package Name	Data Date	Progress at DD	Target Progress	PrID
4	Piping	1-Dec-20	25%	95%	1
5	Electrical	1-Dec-20	15%	95%	1
6	C&I	1-Dec-20	0%	95%	1
7	mechanical	1-Dec-20	0%	100%	1
8	test	14-Dec-20	0%	90%	3

Output

Average Progress

Slow Down Progress

STD of Progress

Slow Down Ratio

Reset

Add

Delete

Select

AnID	Av. Progress	STD Progress	SD Progress	SD Ratio	P20	P60	P80	AID
1	2.00%	0.90%	90%	40%	16-Sep-21	8-Oct-21	21-Oct-21	4
2	2.50%	1.00%	90%	40%	24-Aug-21	10-Sep-21	20-Sep-21	5
3	3.00%	1.00%	90%	50%	16-Aug-21	30-Aug-21	9-Sep-21	6
4	2.50%	0.90%	90%	40%	26-Jul-21	12-Aug-21	21-Aug-21	4
6	3.00%	1.00%	90%	40%	18-Sep-21	5-Oct-21	14-Oct-21	7
7	20.00%	10.00%	90%	40%	29-Jan-21	6-Feb-21	10-Feb-21	8
8	50.00%	10.00%	90%	40%	13-Jan-21	17-Jan-21	20-Jan-21	8

Analysis

No of Iteration

Run Analysis

Packages Charts

Project Charts

Export the Results to Excel

Output

P20 Date

P60 Date

P80 Date

Analysis Charts

- 2- Earned Schedule Analysis:** It calculates three probabilistic completion dates based on the two techniques. The 1st technique uses the forecast dates of the schedule that has to be available after every schedule update. The 2nd technique uses the progress curves (Plan & Actual) data which the user should load onto the application through few simple steps.

Earned Schedule Analysis

Package's Data

Package Name

Start Date

Finish Date

Data Date

Reset

Add

Delete

Select

ESID	Package Name	Start Date	Finish Date	Data Date	P20	P60	P80	Ave. RF	STD RF
1	civil	1-May-20	31-Dec-22	1-Feb-21	24-Apr-23	29-Jun-23	8-Aug-23	85%	5%

Input Detail Data

Data Date

Finish Date

DateID

Data Date

Finish Date

ESID

Reset

Add

Delete

Load Progress Data

Ave. PF

STD. PF

Reset

PgID	Av. SPI	STD SPI	ESID
1	85.0%	5.0%	1
2	80.0%	5.0%	1

Add

Select

Delete

Analysis

No of Iteration

Run Analysis (Date)

Run Analysis (Prog)

Package Charts

Project Charts

Export the Results to Excel

Output

P20 Date

P60 Date

P80 Date

Ave. Schedule Reliability Factor

STD. Schedule Reliability Factor

Analysis Charts

- 3- Resource Analysis:** The developed features in this tab gets used to calculate three probabilistic completion dates based on Quantity, No. of resources, working days and production rate/day. Also, if the number of resources, production rate and working days get changed during execution, it could be added to the analysis.

Resource Analysis

Sub-project Data
 Package Name:
 Data Date:
 Target Quantity:
 Slow Down Point:
 Slow Down Ratio:

Reset
 Add
 Select
 Delete

ReID	Package Name	Data Date	Target Quantity	S.D. Point	S.D. Ratio	P20	P60	P80	Pr ID
1	Testing the date	4-Jan-21	23000	90%	40%	21-Feb-22	7-Mar-22	17-Mar-22	1
2	Testing the date	4-Jan-21	23000	90%	40%	10-Mar-21	18-Mar-21	22-Mar-21	1
3	Civil	05-Jan-15	320000	85%	40%	26-Jun-16	19-Jul-16	01-Aug-16	4
4	Piping	05-Jan-15	120000	90%	40%	06-Dec-15	05-Jan-16	14-Jan-16	4
5	Steel Structure	05-Jun-15	12000	90%	40%				

Input Dates
 No of Resource: Ave. Produc/Day:
 Effective Date: STD. Produc/Day:
 WDays/TScale: Effective Date:
 Effective Date:

Reset
 Add
 Delete

AnID	No. of Res	Effect. Date	WD/ TScale	Effect. Date	Ave Prod/Day	STD Prod/Day	Effect. Date	ResID
1	10	4-Jan-21	6	4-Jan-21	4	1	4-Jan-21	1
2	20	24-Jan-21	6	24-Jan-21	4	1	24-Jan-21	1
3	50	05-Jan-15	6	05-Jan-15	6	2.2	05-Jan-15	3
4	100	02-Mar-15						3
5	160	04-May-15						3
6	30	05-Jan-15	6	05-Jan-15	10	3	05-Jan-15	4

Analysis
 No of Iteration:
 Run Analysis
 Combined Probability Charts

Output
 P20 Date:
 P60 Date:
 P80 Date:

Analysis Charts

4- Cost Analysis

In this analysis, instead of probabilistic dates, probabilistic Estimate at Completion (EAC) gets calculated. The inputs for analysis are package name, Budget at Completion (BAC) and for analysis, average CPI, SPI and standard deviations (STD). The range to calculate the average CPI and STD could be based on the user preference or based on the trends. The range could be i.e. since inception, last 4 months, last 6 months, etc.

Cost Analysis

Package's Data
 Package Name:
 Package BAC:

Reset
 Add
 Delete
 Select

CID	Package Name	Package BAC	P20	P60	P80	PrID	TEAC
1	Test Analysis	20000	26 380.000	29 456.000	31 084.000	1	Yes
2	Boiler	320000	407 977.000	436 762.000	453 683.000	2	Yes
3	Turbine	650000	728 750.000	809 211.000	849 358.000	2	Yes
4	Engineering	500000.98	590 760.588	634 378.588	658 240.588	3	Yes
5	Procurement	400000.65	428 960.390	494 850.390	546 200.390	3	Yes
7	Construction	900000.43	914 280.258	1 000 440.258	1 044 090.258	3	Yes
8	Construction12	760 000.430	757 590.258	759 902.258	759 493.258	3	Yes
9	Construction123	760 000.430	872 705.258	895 476.258	910 516.258	3	Yes

Input Detail Data
 Ave. CPI: STD. CPI: Ave. SPI: STD. SPI:

CAID	Ave. CPI	STD. CPI	Ave. SPI	STD. SPI	P20	P60	P80	CID	EAC
2	83.00%	4.00%	90.00%	4.00%	24870	27635	29244	1	
4	75.00%	4.00%	93.00%	4.00%	26950	29632	31350	1	Yes
5	83.00%	3.00%	90.00%	2.30%	407977	436762	453683	2	Yes
6	83.00%	3.00%	90.00%	2.30%	408051	435790	449972	2	
7	93.30%	3.40%			676611	701274	715333	3	
8	93.30%	3.40%	88.20%	4.50%	728750	809211	849358	3	Yes
9	90.30%	3.40%	88.20%	4.50%	757266	835266	872633	3	
10	78.00%	4.00%	93.00%	4.00%	25901	28347	30787	1	

Reset
 Delete
 Add
 Select

Select for overall EAC calculation ☐ Yes

Analysis
 No of Iteration:
 Run Analysis
 Package Charts
 Calculate Overall EAC
 Export the Results to Excel

Output
 P20 Estimate At Completion:
 P60 Estimate At Completion:
 P80 Estimate At Completion:
 Ave. Cost Performance Index:
 Ave. Schedule Performance Index:

Analysis Charts

1.3. Calendar Tab

No analysis is being done on this tab but it is necessary to improve the analysis output by introducing the holidays. Each project should have its own calendar with its specific holidays.

Calendar

Calendar Name

Delete

Reset

Add

Select

Copy/Paste

CalID	Project ID	Calendar Name
1	1	Test Calendar 1
2	1	Power station construction
4	3	6days, pipeline calendar
5	2	EPC Building Calendar

Holidays

Non-working Days

Delete

HID	Project ID	Holiday	CalID
1	1	16-Jun-16	1
2	1	08-Aug-16	1
3	1	24-Sep-16	1
10	1	15-Dec-16	1
11	1	16-Dec-16	1
12	1	17-Dec-16	1
13	1	18-Dec-16	1
14	1	19-Dec-16	1
15	1	20-Dec-16	1
16	1	21-Dec-16	1
17	1	22-Dec-16	1
18	1	23-Dec-16	1
19	1	24-Dec-16	1
20	1	25-Dec-16	1
21	1	26-Dec-16	1
22	1	27-Dec-16	1
23	1	28-Dec-16	1
24	1	29-Dec-16	1
25	1	30-Dec-16	1
26	1	31-Dec-16	1
27	1	01-Jan-17	1
28	1	02-Jan-17	1
29	1	03-Jan-17	1
30	1	04-Jan-17	1
31	1	16-Mar-17	1
32	1	17-Mar-17	1
33	1	21-Apr-17	1
34	1	22-Apr-17	1

1.4. Select Button

The information that the Select button in the Project info filters and displays is dependent on the analysis tab that is open / activated. The button is dependent on the active tab. Therefore, it displays two sets of data:

- The data of the project that is clicked / highlighted, in the Project Info table.
- Filters the selected project's packages in the active analysis or calendar tab. So, to select a package in any tab, the Select button has to be clicked.

1.5. Delete Button

The Delete button in the Project Info, will delete the project's info and all the packages and analysis data from all the tabs. This tab should be used with great caution.

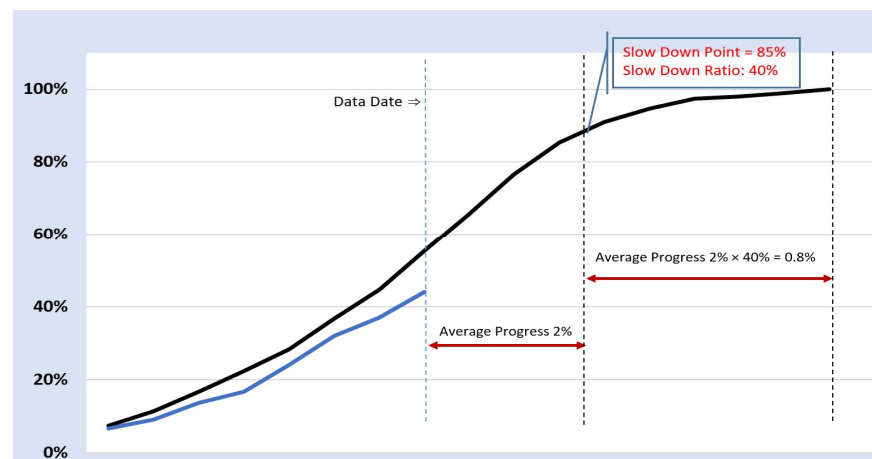
1.6. Important Notes:

Buttons functionality in all tabs: The functionality of the buttons is almost the same in all the tabs. They are as follows:

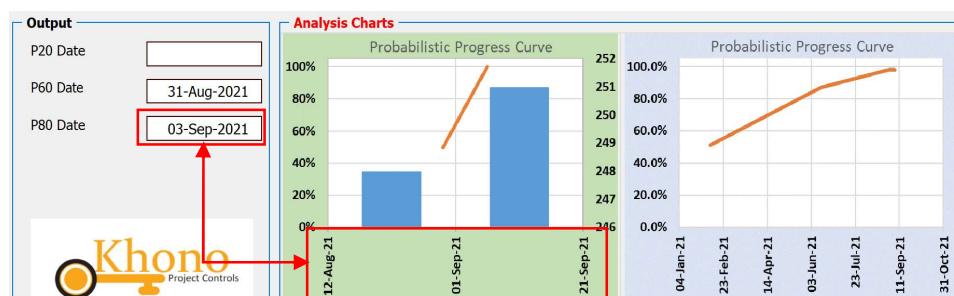
- **Reset:** It clears the data from the cells and removes the filters. The Reset button in Project Info will reset the Project's data as well as the active tab's data.
- **Add:** Once the data has been entered in cells, by clicking on Add, the data will be saved in the related table.
- **Delete:** It will delete the selected row from the table, analysis data and if there is a sub-table, it will delete the data from the sub-table that is related to the selected row.
- **Select:** It will take the selected row's data in a table into the cells. If analysis has been done for the selected row, the analysis data including chart(s) will be displayed.

Few Terminologies: There are few (perhaps new) terminologies that have been used for analysis. They are as follows:

- **Slow Down Point/Progress:** It is the point (closer to the end) in the S-Curve from which the progress earning trend gets slower than average. This point will be specific to each project based on the S-Curve's shape and could be at 80%, 85%, 90%, 92%, etc.
- **Slow Down Ratio:** After the Slow Down point, the progress earnings ratio will be a fraction of the Average Progress e.g. 60%, 50%, 40%, 30%. For example, if the average progress is **2.0%** per week, slow down progress point is at 85% and Slow Down ratio is **40%**, it means, after 85% completion, the average progress per week will be 0.8% ($2.0\% \times 40\% = 0.8\%$).



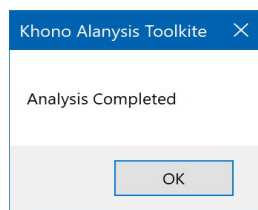
Standard Deviation (STS): For the small STD figures (close to zero), the P20 and P60 dates would be blank. Also, the P80 date might show an incorrect date.



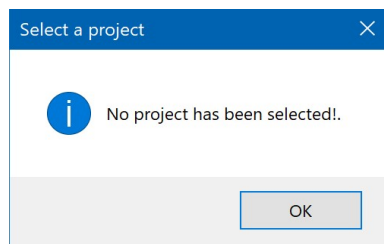
Opening another Excel file with Toolkit:

- If the user works with other Excel files, while working with the Toolkit, an error message might appear. The message indicates that the Toolkit is not the active Excel file at the moment therefore, fails to run the VBA codes. To resolve the issue, close the error message then click on the Analysis Sheet next run the Form again.
- If a user opens another large Excel file that has many formulas, it is recommended to close it or change the calculation of the formulas to Manual. Otherwise, it will slow down the Toolkit during running analysis.

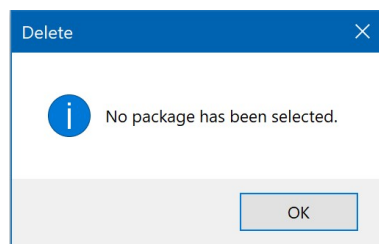
Analysis Completion: The Analysis will be completed once the message below pops up.



No Project has been selected: It means; no project has been selected in the Project Info. To **delete** or **select** a package from the tabs, a Project has to be selected.






No package has been selected: It means; no package has been selected in the active tab. to **delete** or **select** a row from the Input detail data table, a package has to be selected.



2. Project Info

2.1. Add a Project

The following info should be added as project info:

Project Info			
Project Name	<input type="text"/>		
Start Date		Timescale	<input type="text"/>
Finish Date		Working Days	<input type="text"/>
Data Date		Progress at DDate	<input type="text"/>

- **Project Name:** The name of the project that could be any name and there is no rule.
- **Start Date:** If the project has been started then it should be the Actual Start. If not, then it should be the Planned Start Date.
- **Finish Date:** It could be baseline or forecast finish date. The Finish Date cannot be earlier than Start date.
- **Data Date:** This is latest data date that the project's schedule and/or progress reports have been updated. The data date has to be between Start and Finish dates otherwise a warning message will be displayed.
- **Timescale:** It is the cycle that schedule/progress reports get updated, either Weekly or Monthly.
- **Working Days:** Is the working days in the selected timescale. For Weekly, more than 7 days will not be allowed. For Monthly, the max number has to be less than 31 days.
- **Progress at DD:** Progress at Data Date should be the latest updated cumulative actual complete progress. the number should be in percentage form and must entered as such, otherwise the App will display an error message.

Note: all the above cells must be filled; blank / empty cells are not allowed.

Note: To enter the dates, click on the calendar icon then select the date.

Note: The Project Info stays fixed on the top of the form and does not get changed by selecting the Analysis tabs.

After entering the project' info, click on the Add button. The data will be saved and displayed in the right hand side table.

3. Calendar Tab

Once the data for a project gets added, to improve the accuracy of the analysis, a calendar should be assigned through the Calendar tab. Each project should be assigned with only one calendar. In the calendar tab, there are no working hours per day because calculations for the analysis are based on Days.

3.1. Assign Calendars and Holidays

To assign a calendar to a project:

- Select the Calendar tab
- Select the project on the Project Info. (click on the project's row on the project info table then click on the Select button).

- Enter the calendar name in the cell then click on Add.
- The calendar will be added to the table:

- To add holidays, click on the Calendar name in the table then click on the Select button.
- On the Holiday section, click on the icon. The Calendar window will be displayed. Select a none-working day then click in the Holiday button.

Note: In the calendar, Saturday and Sunday columns are greyed out which do not mean holidays. Number of working days in a week/month should be entered in Project Info section.

- The none-working day / holiday will be added to the holidays table:

Holidays

Non-working Days 06 - Jan - 2021

HID	Project ID	Holiday	CalID
241	2	01-Jan-2021	5
242	2	04-Jan-2021	5
243	2	05-Jan-2021	5
244	2	06-Jan-2021	5

- Select the Holidays one by one and add them to the table.

Note: The non-working days (holidays) should be selected and added one by one, multiple selection is not permitted.

Note: When a calendar gets selected, the non-working days related to the selected calendar will be filtered and displayed in the Holiday table.

3.2. Copy /Paste

If a project shares the same holidays with another project, then instead of adding the holiday for the project again, Copy/Paste button could be used. The process is as follows:

- Select a project then its calendar (Building project calendar). This calendar will be copied to other project. Next, click on the Copy/Paste button:

Calendars

Calendar Name Building Project Calendar

CalID	Project ID	Calendar Name
1	1	Test Calendar 1
4	3	6days pipeline calendar
5	2	Building Project Calendar

Holidays

Non-working Days

HID	Project ID	Holiday	CalID
241	2	01-Jan-2021	5
242	2	04-Jan-2021	5
243	2	05-Jan-2021	5

- The window will be opened. Enter the ID of the project that the calendar will be assigned for it (Pipeline Project). The Project ID is the number in the 1st column of Project Info Table.

Pr ID	Project Name
1	Power station X
2	Building project
3	Pipeline
4	Highway
5	Metro project

Copy a Calendar


Enter the Project ID

- After adding the Project ID, another window will be opened. Enter the name and then click Ok.

Copy a Calendar


Enter the Calander Name

- A new calendar (Pipeline Calendar) including all the Holidays of the Building project's holidays will be added.
- Select the project then its calendar (Pipeline Calendar). The holidays will be filtered out and displayed in the table.

Calendars			Holidays			
Calendar Name Pipeline Calendar			Non-working Days 			
Delete Reset Add Select Copy/Paste			Delete			
CalID	Project ID	Calendar Name	HID	Project ID	Holiday	CalID
4	3	6days, pipeline calendar	244	3	01-Jan-2021	6
6	3	Pipeline Calendar	245	3	04-Jan-2021	6
			246	3	05-Jan-2021	6

3.3. Delete a Calendars and Holidays

To delete a Calendar: select the project, click on the calendar name in the table, then Click on Delete. The calendar with all its holidays will be deleted, after confirmation. To delete a non-working day from the holiday list, find the date in the table, click on it then, click on the Delete button.

Calendars			Holidays			
Calendar Name Building Project Calendar			Non-working Days 			
Delete Reset Add Select Copy/Paste			Delete			
CalID	Project ID	Calendar Name	AnID	HID	Project ID	Holiday
5	2	Building Project Calendar	241	2	01-Jan-2021	5
			242	2	04-Jan-2021	5
			243	2	05-Jan-2021	5

4. Progress Analysis

There are three sections in this tab and data should be selected / entered on the sections:

- 1- In the Project's info, on the top, select a project. The project's data will be used for analysis.
- 2- In the Package' Data section, add data for a packages (or discipline, contract, etc.). There is no limit in the number of the packages and could be added as many as required. (One-to-Many)
- 3- In the Detail Data and Output section, analysis data (scenario's data) for the packages should be entered. There is no limit in the number of the scenarios per packages and could be added as many as necessary. (One-to-Many)

Project Info

Pr ID	Project Name	Start Date	Finish Date	Data Date	Timescale	Wdays	Progress at DD
1	Power station X	08-Jan-18	31-Dec-21	01-Dec-20	Weekly	6	35.0%
2	Building project	01-Jan-19	31-Dec-21	13-Dec-20	Weekly	6	10.0%
3	Pipeline	01-Dec-20	31-Dec-20	14-Dec-20	Weekly	5	1.0%
4	Highway	05-Jan-15	06-Jan-18	05-Jan-15	Weekly	6	0.0%
5	Metro project	03-Jan-21	31-Jan-22	02-Feb-21	Weekly	6	0.0%

Package's Data

NID	Package Name	Data Date	Progress at DD	Target Progress	PrID
4	Piping	1-Dec-20	25%	95%	1
5	Electrical	1-Dec-20	15%	95%	1
6	C&I	1-Dec-20	0%	95%	1
7	mechanical	1-Dec-20	0%	100%	1
8	test	14-Dec-20	0%	90%	3

Detail Data and Output

AnId	Av. Progress	STD Progress	SD Progress	SD Ratio	P20	P60	P80	AtD
1	2.00%	0.90%	90%	40%	16-Sep-21	8-Oct-21	21-Oct-21	4
2	2.50%	1.00%	90%	40%	24-Aug-21	10-Sep-21	20-Sep-21	5
3	3.00%	1.00%	90%	50%	16-Aug-21	30-Aug-21	9-Sep-21	6
4	2.50%	0.90%	90%	40%	26-Jul-21	12-Aug-21	21-Aug-21	4
6	3.00%	1.00%	90%	40%	18-Sep-21	5-Oct-21	14-Oct-21	7
7	20.00%	10.00%	90%	40%	29-Jan-21	6-Feb-21	10-Feb-21	8
8	50.00%	10.00%	90%	40%	13-Jan-21	17-Jan-21	20-Jan-21	8

4.1. Progress Analysis

To undertake Progress Analysis:

- Select a Project
- Add a package to the project with the following Data:
 - **Package Name:** It could be discipline name, package, contract, sub-contract, etc.
 - **Data Date:** The latest data date of the package whose schedule/report has been updated. This data date, cannot be earlier than project's start date and later than project's finish date.
 - **Progress at DD:** The progress of the package at the Data Date. The number in this cell has to be in percentage form with "%".
 - **Target Progress:** It is the progress that package should reach to be considered as completed or substantially completed. It could also be, the package's progress at certain milestone completion. It could be 90%, 95%, 98% or 100%. The number in this cell has to be in percentage form with "%".
 - Click on the Add button. For example, Civil works data has been added as the screenshot below demonstrates.

Project Info

Project Name: Building project
 Start Date: 01-Jan-2019
 Finish Date: 31-Dec-2021
 Data Date: 13-Dec-2020
 Timescale: Weekly
 Working Days: 6
 Progress at DD: 10%

Package's Data

Package Name: Civil Works
 Data Date: 13-Dec-2020
 Progress at DD: 40%
 Target Progress: 95%

Pr ID	Project Name	Start Date	Finish Date	Data Date	Timescale	Wdays	Progress at DD
1	Power station X	08-Jan-18	31-Dec-21	01-Dec-20	Weekly	6	35.0%
2	Building project	01-Jan-19	31-Dec-21	13-Dec-20	Weekly	6	10.0%
3	Pipeline	01-Dec-20	31-Dec-20	14-Dec-20	Weekly	5	1.0%
4	Highway	05-Jan-15	06-Jan-18	05-Jan-15	Weekly	6	0.0%
5	Metro project	03-Jan-21	31-Jan-22	02-Feb-21	Weekly	6	0.0%

NID	Package Name	Data Date	Progress at DD	Target Progress	PrID
13	Civil Works	2020/12/13	0.4	0.95	2

- Add detail date of the package in the “Detail Data and Output” section:
 - Select the package (Civil Work)
 - **Average Progress:** calculate the average weekly/monthly progress for a time period (inception to date, last 8 weeks/months, last 4 weeks/month, etc.) from the progress reports.
 - Note: Every package could be assigned with many detail data/scenario. Therefore, there could be one scenario for average progress from inception to DD, another one average of last 12 weeks, last 8 weeks or any other desired percentage.*
 - **STD of Progress:** The Standard deviation of the time period progresses.
 - **Slow Down Progress:** Identify the slow down point on the S-Curve and enter it. The format has to be in percentage with “%”.
 - **Slow Down Ratio:** Enter the slow down ratio in percentage form with “%”.
 - Click on Add button.

The screenshot below illustrates the 3 sets of data (scenarios) that have been assigned to the Civil Works.

Package's Data

Package Name: Civil Works
 Data Date: 13-Dec-2020
 Progress at DD: 40%
 Target Progress: 95%

Detail Data and Output

AnID	Av. Progress	STD Progress	SD Progress	SD Ratio	P20	P60	P80	NID
20	2.4%	0.9%	88%	40%				13
21	2%	0.9%	88%	40%				13
22	1.5%	0.9%	88%	40%				13

Added scenarios

- Run the analysis through the following steps:
 - Select one of the scenarios
 - Select the No. of Iteration from the Analysis section.
 - Click on Run Analysis
 - Repeat the same for other two scenarios

Detail Data and Output

Average Progress	2.4%	Slow Down Progress	88%
STD of Progress	0.9%	Slow Down Ratio	40%

Reset
Add
Delete
Select

AnID	Av.Progress
20	2.4%
21	2%
22	1.5%

Analysis

No of Iteration
500

Run Analysis

Packages Charts
Project Charts

Export the Results to Excel

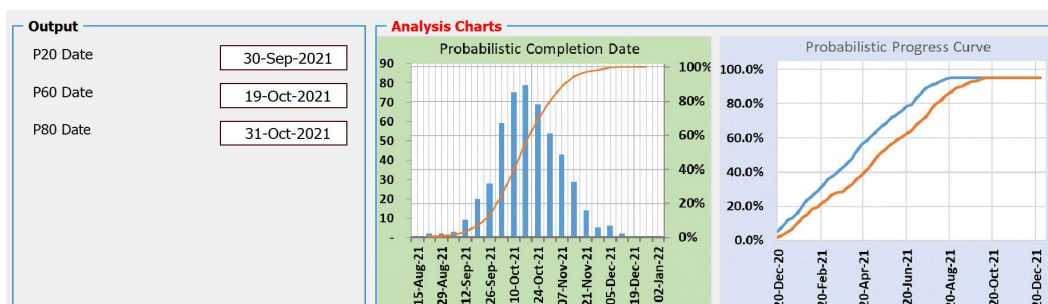
Output

P20 Date

P60 Date

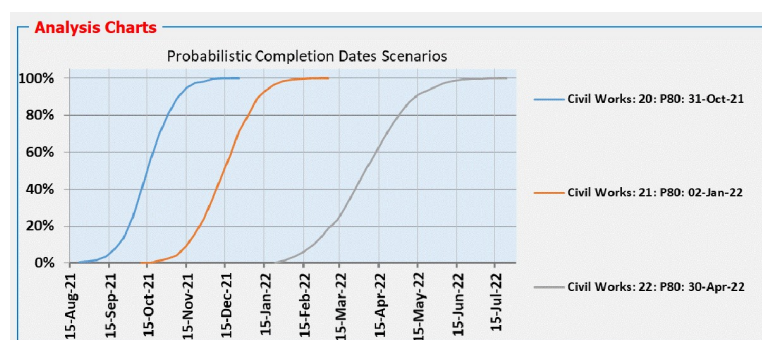
P80 Date

- Analysis Output:** After completion of the analysis, the following results will be displayed:
 - P20 Date
 - P60 Date
 - P80 Date
 - Analysis Charts



4.2. Packages Charts

After completion of the analysis for all the scenarios, click on the **Packages Charts** The following chart will be displayed.



Through the above chart (results of 3 scenarios for Civil works), the project team could figure out what the possible date could be based on the scenarios and progress trends. Then, they could make an appropriate decision about which scenario is better option for the civil work. It should be noted that more scenarios could be added for better analysis, if necessary.

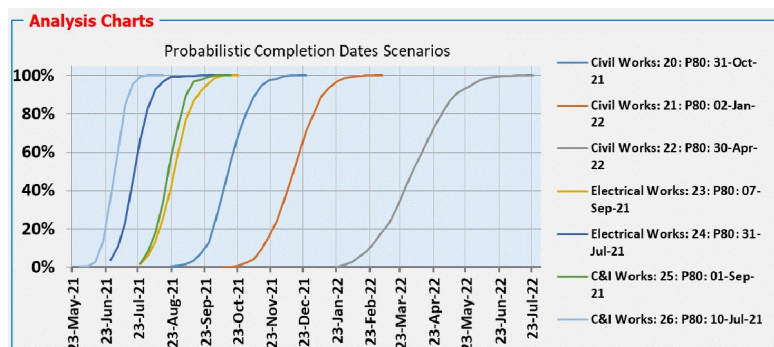
Note: If an analysis gets selected in the “Detail Data and Output”, the chart above will be replaced with the Analysis charts.

4.3. Project Charts

The Project Charts, will display the analysis results for all the packages and scenarios in one single chart. For example, for the building project Electrical and C&I work have been added with 2 scenarios for each, as the screenshot below displays:

Package's Data				Detail Data and Output								
Package Name	C&I Works	Progress at DD	30%	Reset	Select	NID	Package Name	Data Date	Progress at DD	Target Progress	PrID	
Data Date	13-Dec-2020	Target Progress	95%	Add	Delete	13	Civil Works	13-Dec-2020	40%	95%	2	
						14	Electrical Works	13-Dec-2020	35%	95%	2	
						15	C&I Works	13-Dec-2020	30%	95%	2	
Average Progress	3.5%	Slow Down Progress	90%	AnID	Av. Progress	STD Progress	SD Progress	SD Ratio	P20	P60	P80	NID
STD of Progress	0.9%	Slow Down Ratio	50%	25	2.8%	0.9%	90%	50%				15
				26	3.5%	0.9%	90%	50%				15
Reset	Add	Delete	Select									

After running the Analysis for the packages, click on the **Project Charts** , the following chart will be displayed:



4.4. Export the Results to Excel

If required, to develop better formats of charts, the analysis data could be exported to another Excel file. In order to export, click on the then save the file. The results will be similar to the screenshot below:

	A	B	C	D	E	F	G	H	I	J	K	L
1	2	13	20	13-20	Civil Works	0	0	1	2	0	0	0
2	9/30/2021			13-20		20-Dec-20	27-Dec-20	03-Jan-21	10-Jan-21	17-Jan-21	24-Jan-21	31-Jan-21
3	10/19/2021			13-20								
4	10/31/2021			13-20								
5				13-20		5%	8%	12%	13%	16%	20%	24%
6				13-20		2%	3%	5%	7%	10%	13%	15%
7	2	13	21	13-21	Civil Works	0	0	1	2	0	0	0

where:

- The numbers in the green row; from column A to C; are: Project No, Discipline No and Analysis Number.
- The dates in column A are, P20, P60 and P80 dates.
- The results of the analysis are between blue and green rows

Note: To export the correct data, 1st click on the Packages Charts or Project Charts. Otherwise, incorrect data or blank sheet might get saved.

5. Earned Schedule Analysis

There are four sections in Earned Schedule analysis. These sections are as follows:

- 1- **Project' Info:** The same projects that have been entered will be available to use.
- 2- **Packages Data:** In this section (same as Progress Analysis), packages data should be entered. For each project, as many packages as required could be added.
- 3- **Inputs:** There are two sub sections to allow for two types of analysis:
 - Data Dates and Finish Date
 - Progresses Data

Package's Data: Enter the package's data through the following steps:

- Open/select the Earn Schedule Analysis tab
- In the Project Info, select a Project (Building project as example)
- Add a package with the following Data:
 - **Package name:** It could be a package, discipline, contract, sub-contract, etc.
 - **Start Date:** It should be the actual start date of the package
 - **Finish Date:** It should be BL finish or forecast finish date of the package
 - **Data Date:** latest data date that the package's schedule and/or progress report has been updated.
 - Click on Add button. The package's data will be displayed in the table
 - Add more packages, if necessary.

Note: The Data date has to be between package start and finish dates. Also, Data Date cannot be earlier than the Project's Start Date or later than Project's Finish Date.

The screenshot below illustrates the three packages that have been added:

Calendar

Progress Analysis

Earned Schedule Analysis

Resource Analysis

Package's Data

Package Name

Civil Works

Start Date

01-Jan-2019

Finish Date

31-Jul-2021

Data Date

13-Dec-2020

Reset

Add

Delete

Select

ESID	Package Name	Start Date	Finish Date	Date Date	P20	P60	P80	Ave. RF	STD RF
6	Electrical Works	01-Jan-2019	30-Sep-2021	13-Dec-2020				0%	0%
7	C&I Works	01-Jan-2019	31-Oct-2021	13-Dec-2020				0%	0%

5.1. Analysis Based on Dates

To undertake the analysis based on the dates, forecast completion date of the package's updated schedule in several data dates is required. Then, the process is as follows:

1. Select a package (Civil Works)
2. In the Input Section, enter the 1st data date and forecasted completion date of the schedule in that data date.

Note: The date for Date dates should be between package start and Data Date. Data dates later than package's data date is not allowed.

3. Click on Add
4. Repeat the steps 2 and 3 and add more data dates and forecast dates. The results should be similar to the screenshot below:


Package's Data

Package Name

Civil Works


Start Date

01-Jan-2019




Finish Date

31-Jul-2021



Data Date


13-Dec-2020



Inputs


Data Date

01-Dec-2019



Finish Date

25-Oct-2021



DateID	Data Date	Finish Date	ESID
10	01-Jul-2019	10-Aug-2021	5
11	01-Aug-2019	31-Aug-2021	5
12	01-Sep-2019	21-Sep-2021	5
13	01-Nov-2019	05-Oct-2021	5
14	01-Dec-2019	25-Oct-2021	5

Note: Once the dates are entered, if any date gets deleted, the date row as well as the analysis data will be deleted. The analysis could be done with the remaining data.


5. Select No of Iteration then click on “Run Analysis (Date)”

Analysis

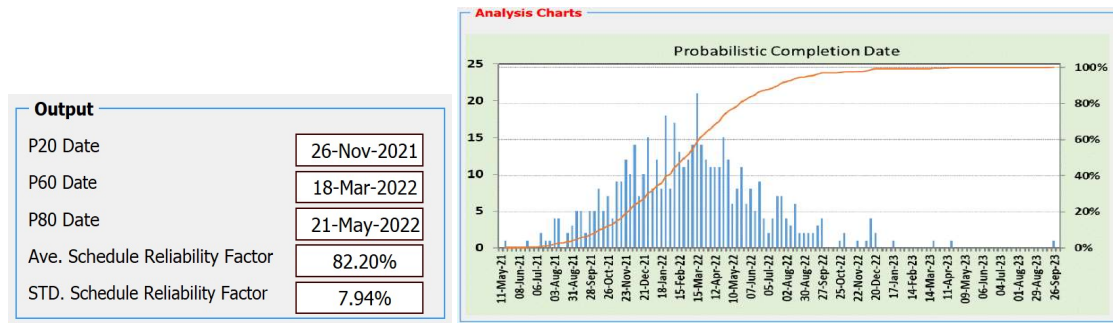
No of Iteration

Run Analysis (Date) **Run Analysis (Prog)**

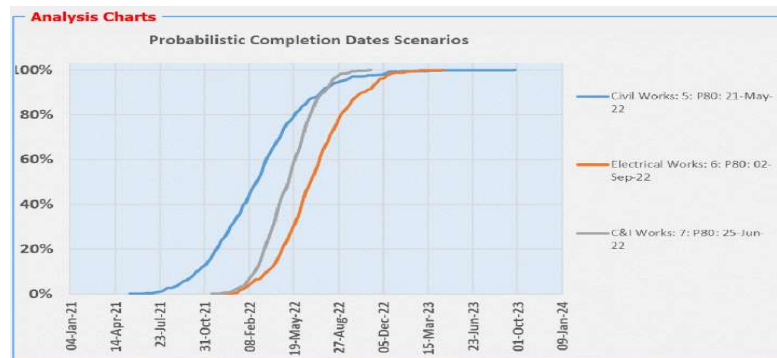
Package Charts **Project Charts**

Export the Results to Excel 

- After completion of the analysis, the result will be displayed in the Output section and the Analysis chart:



- Repeat the process for other packages.
- Click on the “Combined Probability Charts”. The results will be as follows:



As per the analysis, P80 date of Electrical works is later than Civil and C&I or performance of the Electrical works might be the driver of the project finish date. Therefore, performance of the Electrical works should be improved. Also, because the P80 date of the three packages are later than the Project Finish date then, the project, with the same performances, would not finish on time.

- Click on the Excel icon  to export and save the date in another file.

Note: After running analysis, if a new date row (Data date and Forecast) gets added or deleted, the analysis results will be deleted as well. Then the analysis should be re-run again.

5.2. Analysis Based on Progress Data

To perform the analysis based on the Progress could be done either through loading the Report (S-Curve) data and /or through entering the SPI_(t) average and STD. For analysis based on the S-Curve data, follows the steps below:

- Select a project (Building project), then select a package (Civil Works).

Package's Data				
Package Name	Civil Works	Reset		
Start Date	01-Jan-2019	Add		
Finish Date	31-Jul-2021	Delete		
Data Date	13-Dec-2020	Select		
ESID	Package Name	Start Date	Finish Date	Data Date
5	Civil Works	01-Jan-2019	31-Jul-2021	13-Dec-2020
6	Electrical Works	01-Jan-2019	30-Sep-2021	13-Dec-2020
7	C&I Works	01-Jan-2019	31-Oct-2021	13-Dec-2020

- In the Input section, click on the “Load Progress Data”.

- A new sheet, named “ProgressCurve” will be opened:

	A	B	C	D	E	F	G	H	I	J
1	Submit Data				Cancel					
2										
3										
4										
5										

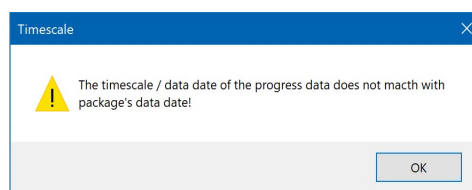
- Open the S-Curve file. Then, in the 2nd row, copy the S-Curve’s timescale, in the 3rd row, copy the Cumulative Planned Progress and in the 4th row, copy the Cumulative Actual complete progress

	A	B	C	D	E	F	G
1	Submit Data				Cancel		
2	Timescale	12-Dec-17	19-Dec-17	26-Dec-17	2-Jan-18	9-Jan-18	16-Jan-18
3	Cum Plan (Baseline)	0.0%	1.0%	2.5%	3.4%	5.3%	8.5%
4	Actual Progress	0.0%	0.0%	0.0%	0.4%	0.9%	1.8%
5							

Note: The last date of the Actual Cum. Progress has to be same as the package’s data date. Otherwise, a message will pop up. For example, in the screenshot below, the last date of the Actual progress is 10-Jul-18 while the Civil Works data date is 13-Dec-20.

	A	B	C	D	E	F	G	AC	AD	AE	AF	AG	AH	AI	AJ	AK
1	Submit Data				Cancel											
2	Timescale	12-Dec-17	19-Dec-17	26-Dec-17	2-Jan-18	9-Jan-18	16-Jan-18	19-Jun-18	26-Jun-18	3-Jul-18	10-Jul-18	17-Jul-18	24-Jul-18	31-Jul-18	7-Aug-18	14-Aug-18
3	Cum Plan (Baseline)	0.0%	1.0%	2.5%	3.4%	5.3%	8.5%	63.1%	65.3%	67.6%	69.3%	70.8%	71.8%	72.8%	73.8%	74.9%
4	Actual Progress	0.0%	0.0%	0.0%	0.4%	0.9%	1.8%	48.7%	51.7%	53.7%	56.7%					
5																

Once “Submit Data” clicked, following message appears:



The progress data should be same as below, which Civil works data date and last progress updated date are the same (13-Dec-20)

	A	B	C	D	E	F	G	AC	AD	AE	AF	AG	AH	AI
1	Submit Data				Cancel									
2	Timescale	17-May-20	24-May-20	31-May-20	7-Jun-20	14-Jun-20	21-Jun-20	22-Nov-20	29-Nov-20	6-Dec-20	13-Dec-20	20-Dec-20	27-Dec-20	3-Jan-21
3	Cum Plan (Baseline)	0.0%	1.0%	2.5%	3.4%	5.3%	8.5%	63.1%	65.3%	67.6%	69.3%	70.8%	71.8%	72.8%
4	Actual Progress	0.0%	0.0%	0.0%	0.4%	0.9%	1.8%	48.7%	51.7%	53.7%	56.7%			
5														

5- The click on the Submit data

6- The Application will calculate the average $SPI(t)$ and STD of $SPI(t)$ then displays the results:

Load Progress Data

Ave. PF 57.6% STD. PF 9.2%

Reset

Calculated $SPI(t)$ →

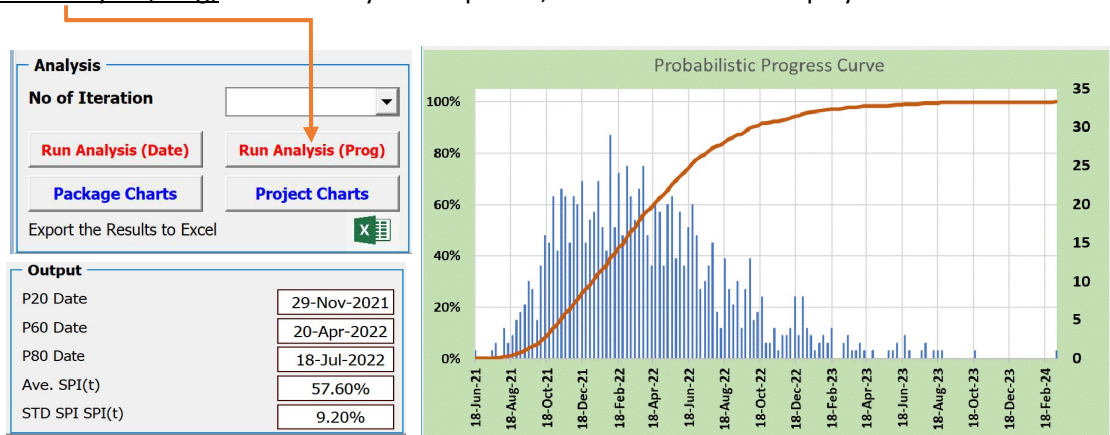
PgID	Av.SPI	STD SPI	ESID
4	57.6%	9.2%	2

Add

Select ←

Delete

7- Select the calculated results, then select the No. of Iteration. Next, click on the “Run Analysis (Prog)”. Once analysis completed, the results will be displayed:



Note: if the calculated $SPI(t)$ is low (less than 50%) then the calculation might not provide any results or the charts might look very neat!

8- If required, for What-if scenario purpose, enter Performance factors (average and STD) in the cells. Then run analysis based on the progress. For example, if project runs based on 80% performance what would be the probabilistic completion dates?

Ave. PF 80% STD. PF 5%

Reset

PgID	Av.SPI	STD SPI	ESID
4	57.6%	9.2%	2
5	80%	5%	2

Add

Select

Delete

Output

P20 Date 24-Jun-2021

P60 Date 07-Aug-2021

P80 Date 01-Sep-2021

Ave. SPI(t) 80.00%

STD SPI SPI(t) 5.00%

Note: There is no limit on the number of scenarios for what-if analysis.

9- Click on the “Package Charts” to see all the packages analysis together or click on the Project Charts to see all the scenarios for the project.

10- Click on the Excel icon to save the analysis data in another Excel file.

6. Resource Analysis

The Resource Analysis feature has been developed to calculate the probabilistic completion dates of a Quantity of construction works that has to be installed/constructed/erected based on resource mobilization plan, No. of working days and production rate. The features could assist the Project managers to estimate the required resources even without having detail schedule or when there is no detail info (early days of the project) is available.

6.1. Resource Analysis

For the resource analysis follow the steps below:

- 1- Open the Resource Analysis tab
- 2- Select a project from the Project Info.
- 3- Add a package with the following data:
 - **Package Name:** It could be a package, discipline, contract, sub-contract, etc.
 - **Data Date:** The latest data date the package's schedule or progress report has been updated. It could be the same as the Package start date.
 - **Target Quantity:** The Planned quantity of the work/commodity that should be installed, constructed, erected, welded, etc. If the project has started, it could be the remaining quantity at the data date.
 - **Slow Down Point:** The point that installation of quantity gets slowed down. The slow down point should be entered in percentage i.e. 80%, 90%, etc.
 - **Slow Down Ratio:** The ratio of average quantity installation rate after Slow Down point. It could be 30%, 40%, 50%, etc.
 - Click on Add. The data will be added to the application and will be displayed in the right side table. The screenshot below illustrates the Civil works that has been added.

PacID	Package Name	Data Date	Target Quantity	S.D. Point	S.D. Ratio	P20	P60	P80	PrID
8	Civil Works	13-Dec-2020	200000	85%	35%				2

Note: Add more packages with quantity as required

- 4- Select the added package then add detail data for resource analysis in "Input" section through the following steps:
 - **No of Resource:** It is the number of resourced that would be available to work on the package. (refer to the note below)
 - **Effective date:** It is the date that the above No. of resources will be available
 - **WDays/TSale:** It is the Working days in the timescale. It could be equal or less than the project's working days. If due to whether, climate, etc. working days get changed in a certain period, it could be added here.
 - **Effective date:** The date for the WDays/TSale will be effective

- **Ave. Prod/Day:** It is average production rate per day for the resource
- **STD Prod/Day:** it is the standard deviation of production rate per day
- **Effective date:** It is effective date of the average and standard deviation.
- Repeat the above steps as per the resource mobilization plan or if the requirements are to change the working days or Average production rate, etc.

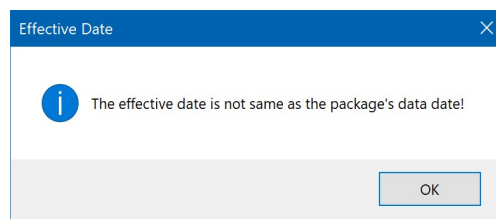
The screenshot below shows the added data for Civil works:

AnID	No. of Res	Effect.Date	WD/ Tscale	Effect.Date	Ave Prod/Day	STD Prod/Day	Effect.Date	PacID
10	50	13-Dec-2020	5	13-Dec-2020	6	1.3	13-Dec-2020	8
11	100	01-Mar-2021	6	01-Mar-2021				8
12	150	01-Jun-2021						8
13	100	01-Nov-2021						8

As per the screenshot, there will be 50 resources from 13-Dec-20 then it will increase to 100 from 1-Mar-21, after that from 1-Jun-21 there will be 150 and finally the resources will be demobilized to 100 from 1-Nov-21.

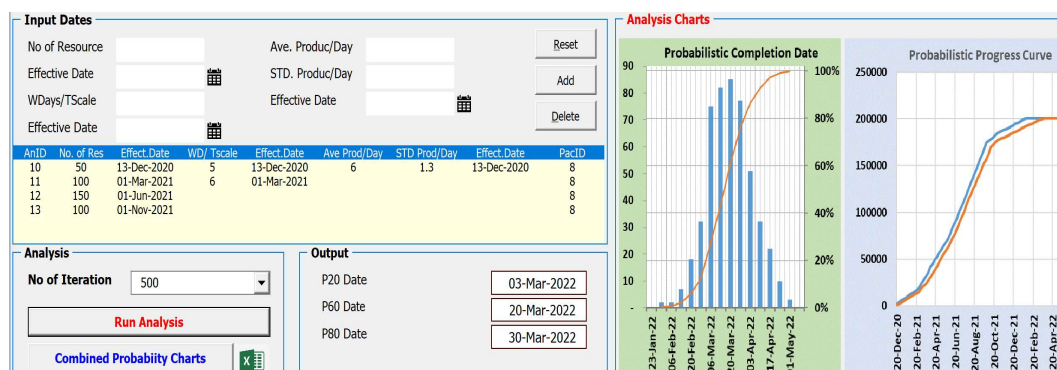
Note: The 1st row of the table for every package must be completed.

Note: The effective dates in the 1st row have to be same (equal) to the package's Data date otherwise, the following message will pop up.



Note: The Number of resources is for the main resource that is required to work on the quantity. For example, if the quantity is Piping welding then the resource should be the Welder, for cable laying should be cable puller, for rebaring should be still fixer, etc.

- 5- Select No. of Iteration and then click on the “Run Analysis”. The analysis results will be displayed as follows:



Note: If the results are not desirable then another scenario (as new packages) with revised data could be added and analysed. For example, the Civil Works-2 with separate data has been added. The analysis result is as follows:

Package's Data
 Package Name: Civil Works-2
 Data Date: 13-Dec-2020
 Target Quantity: 200000
 Slow Down Point: 85%
 Slow Down Ratio: 35%

Reset
 Add
 Select
 Delete

PacID	Package Name	Data Date	Target Quantity	S.D. Point	S.D. Ratio	P20	P60	P80	PRD
8	Civil Works	13-Dec-2020	200000	85%	35%	03-Mar-2022	20-Mar-2022	30-Mar-2022	2
9	Civil Works-2	13-Dec-2020	200000	85%	35%	13-Apr-2022	05-May-2022	17-May-2022	2

Input Dates
 No of Resource:
 Effective Date:
 WDays/TScale:
 Effective Date:
 Ave. Produc/Day:
 STD. Produc/Day:
 Effective Date:

Reset
 Add
 Delete

AnID	No. of Res	Effect.Date	W/ Tscale	Effect.Date	Ave Prod/Day	STD Prod/Day	Effect.Date	PacID
14	100	13-Dec-2020	5	13-Dec-2020	5	1.3	13-Dec-2020	9
15	250	15-Mar-2021	6	15-Mar-2021				9
16	100	01-Aug-2021						9

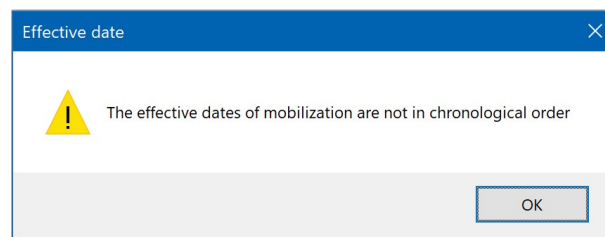
Analysis
 No of Iteration: 500
 Run Analysis
 Combined Probability Charts

Output
 P20 Date: 25-Dec-2021
 P60 Date: 30-Jan-2022
 P80 Date: 12-Feb-2022

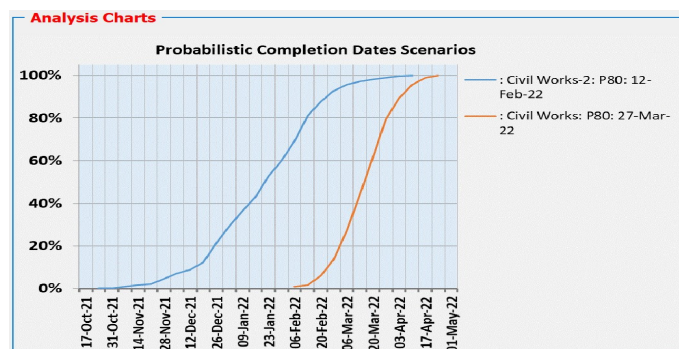
Analysis Charts

Note: After running analysis, if a new row gets added or deleted to / from the table, the analysis results will be deleted as well. Then the analysis should be re-run again.

Note: Effective dates has to be in chronological order otherwise error message will appear.



6- Click on the “Combined Probability Charts” to display the results of the scenarios together.



7. Cost Analysis

The analysis in this tab is based on the Estimate At Completion (EAC) of the EVM. The following formulas are used to calculate the EAC:

- $$EAC = \frac{BAC}{CPI}$$
- $$EAC = \frac{BAC}{CPI \times SPI}$$

So, to calculate the EAC for each scenario, the BAC and CPI are required. Also, If SPI is available, the analysis could be done based on the second formula above.

7.1. EAC Analysis

The process to undertake the cost analysis is as follows:

- 1- Select a project from the Project Info.
- 2- Add a package (or contract or cost code, etc.) with name and BAC. Add more packages if data is available. If there is only one cost code is available for project, then for package name add "Overall Project" and enter the overall project's BAC.

In the screenshot below, seven (7) cost codes has been added to PMC project.

The screenshot shows the 'Project Info' tab with the following details:

- Project Name: PMC
- Start Date: 01-Aug-2019
- Finish Date: 31-Dec-2021
- Data Date: 30-Nov-2020
- Timescale: Monthly
- Working Days: 22
- Progress at DDate: 80%

The 'Package's Data' tab shows the following packages:

Package Name	Package BAC	P20	P60	P80	PrID	TEAC
Sub contracts	10 124.000					
Procurement Support	4 540.000	4 549.000	4 801.000	4 938.000	4	Yes
Construction Support	4 590.000	4 328.000	5 029.000	5 537.000	4	Yes
ADL	27 265.000	35 446.000	40 115.000	42 908.000	4	Yes
Engineering	10 533.000	9 790.800	11 522.800	12 988.800	4	Yes
Site Engineering	11 453.000	15 108.800	18 982.800	22 246.800	4	Yes
Site Overhead	1 030.000	997.000	1 090.000	1 191.000	4	Yes
Sub contracts	10 124.000	8 589.400	10 028.400	11 005.400	4	Yes

A red bracket on the right side of the table indicates that 7 cost codes have been added.

Note: The value of BAC should be only between 1000 and 1 000 000. Therefore, any BAC outside of this range should be converted to fall within this range.

- 3- Enter scenario(s) to each cost code including CPI (average CPI) and Standard deviation. For example, as per the image below three scenarios have been added to the Procurement Support cost code.

The screenshot shows the 'Package's Data' tab with the following details:

- Package Name: Procurement Support
- Package BAC: 4540

The 'Input Detail Data' tab shows the following scenarios:

Av. CPI	STD. CPI	Av. SPI	STD. SPI	P20	P60	P80	PrID	TEAC
46	105.00%	14.90%		3 876.000	4 533.000	4 969.000	11	Yes
48	98.00%	4.90%		4 925.000	5 390.000	5 511.000	11	Yes
49	95.00%	4.90%		4 637.000	4 823.000	4 967.000	11	Yes

The 'Analysis Charts' tab is also visible on the right side of the screen.

Note: The values for CPI, SPI and STDs should be in percentage with "%" next to it.

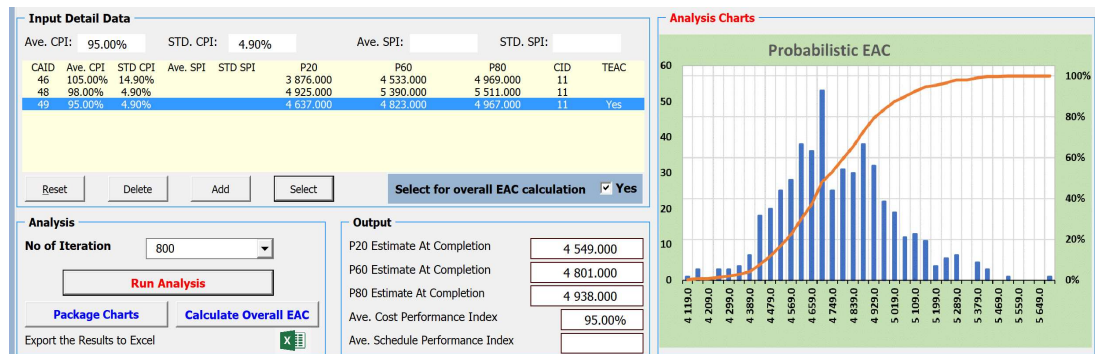
Note: CPI and SPI higher than 150% and STD higher than 15% is not allowed to enter.

- 4- To run analysis, select one of the scenarios, choose number of iteration then click on Run Analysis button.

Analysis
No of Iteration

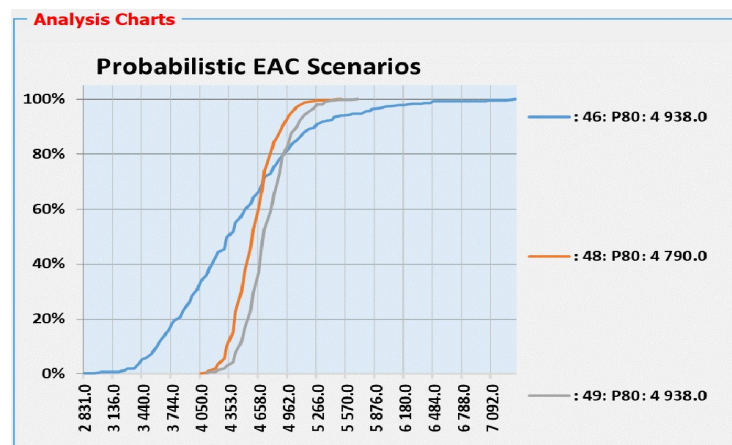
Export the Results to Excel

- 5- Once the analysis has been completed; the results will be displayed in the Output and Analysis Charts sections.



7.2. Package Charts

When multiple scenarios get analysed for any package, analysis results of all scenarios could be displayed in a single chart. This feature allows the user to identify which one(s) scenario(s) could be applicable or which one(s) is not applicable or not acceptable. In order to display the charts, after selecting a package, click on the Package Charts button in Analysis section. The results will be displayed on the Analysis Charts, same as the screenshot below.



The chart displays the probabilistic EAC curve for each CAID (Cost Analysis ID) and the P80 EAC of each analysis.

7.3. Calculate Overall EAC

This feature calculates the Overall EAC (P20, P60 and P80) especially for the multi-package or multi-cost code projects. To calculate the overall EAC and display the table, steps below should be followed:

- Select a project from the Project Info tab/ section on the top
- Select a package / cost code from the Package' Data
- Add a scenario for a selected package then run the analysis. If required add more scenario, then run analysis.
- Once the analysis completed, the results (P20, P60 and P80) will be displayed on the table. Click on the scenario.

Package's Data

CID	Package Name	Package BAC	P20	P60	P80	PtID	TEAC
11	Procurement Support	4 540.000	4 925.000	5 390.000	5 511.000	4	Yes
12	Construction Support	4 590.000	4 328.000	5 029.000	5 537.000	4	Yes
13	ADL	27 265.000	35 446.000	40 115.000	42 908.000	4	Yes
14	Engineering	10 533.000	9 790.800	11 522.800	12 988.800	4	Yes
15	Site Engineering	11 453.000	15 108.800	18 982.800	22 246.800	4	Yes
16	Site Overhead	1 030.000				4	Yes
20	Sub contracts	10 124.000	8 589.400	10 028.400	11 005.400	4	Yes

Input Detail Data

CAID	Ave. CPI	STD. CPI	Ave. SPI	STD. SPI	P20	P60	P80	CID	TEAC
62	91.00%	9.50%			1 032.000	1 161.000	1 226.000	16	

Analysis Charts

Scenario

Packag

Select for overall EAC calculation ☐ Yes

- After clicking on the scenario, click on the “Yes” tick box. The “Yes” will be appeared on the TEAC column. The “Yes” means, this scenario has been selected to be part of the Total EAC. If “Yes” tick box gets clicked one more time, the Yes will be disappeared.

CAID	Ave. CPI	STD. CPI	Ave. SPI	STD. SPI	P20	P60	P80	CID	TEAC
62	91.00%	9.50%			1 032.000	1 161.000	1 226.000	16	Yes

Select for overall EAC calculation ☒ Yes

- As soon as the scenario gets selected for the Total EAC, the analysis results (P20, P60, P80) and “Yes” get added to the package in the Package’s Data table.

CID	Package Name	Package BAC	P20	P60	P80	PtID	TEAC
11	Procurement Support	4 540.000	4 925.000	5 390.000	5 511.000	4	Yes
12	Construction Support	4 590.000	4 328.000	5 029.000	5 537.000	4	Yes
13	ADL	27 265.000	35 446.000	40 115.000	42 908.000	4	Yes
14	Engineering	10 533.000	9 790.800	11 522.800	12 988.800	4	Yes
15	Site Engineering	11 453.000	15 108.800	18 982.800	22 246.800	4	Yes
16	Site Overhead	1 030.000	1 032.000	1 161.000	1 226.000	4	Yes
20	Sub contracts	10 124.000	8 589.400	10 028.400	11 005.400	4	Yes

Input Detail Data

CAID	Ave. CPI	STD. CPI	Ave. SPI	STD. SPI	P20	P60	P80	CID	TEAC
62	91.00%	9.50%			1 032.000	1 161.000	1 226.000	16	Yes

Analysis Charts

Select for overall EAC calculation ☒ Yes

Note: When tick box of “Yes” gets removed; the analysis results (P20, P60, P80) will be removed from the Package’s Data table.

Note: If there are multiple scenarios for a package, any of them could be selected by clicking on “Yes” tick box.

Note: Only one scenario per package can be selected (with Yes”) to be part of the Overall EAC.

Package's Data
 Package Name:
 Package BAC:

CID	Package Name	Package BAC	P20	P60	P80	PrID	TEAC
11	Procurement Support	4 540.000	4 925.000	5 390.000	5 511.000	4	Yes
12	Construction Support	4 590.000	4 328.000	5 029.000	5 537.000	4	Yes
13	ADL	27 265.000	34 997.000	39 632.000	42 576.000	4	Yes
14	Engineering	10 533.000	9 790.800	11 522.800	12 988.800	4	Yes
15	Site Engineering	11 453.000	15 108.800	18 982.800	22 246.800	4	Yes
16	Site Overhead	1 030.000	1 032.000	1 161.000	1 226.000	4	Yes
20	Sub contracts	10 124.000	8 589.400	10 028.400	11 005.400	4	Yes

Input Detail Data
 Ave. CPI: STD. CPI: Ave. SPI: STD. SPI:

CAID	Ave. CPI	STD. CPI	Ave. SPI	STD. SPI	P20	P60	P80	CID	TEAC
57	62.00%	8.20%			39 122.000	44 930.000	48 624.000	13	
59	70.00%	8.20%			34 997.000	39 632.000	42 576.000	13	Yes
64	70.00%	8.20%	80.00%	6.00%	41 842.000	51 152.000	56 972.000	13	

Analysis Charts
 ☒ Select for overall EAC calculation ☒ Yes

2nd scenario has been selected for Total EAC calculation

- Repeat the above steps for each package. Once completed, each package should have “Yes” in last column / TEAC.

Resource Analysis

Cost Analysis

	CID	Package Name	Package BAC	P20	P60	P80	PrID	TEAC
Reset	11	Procurement Support	4 540.000	4 925.000	5 390.000	5 511.000	4	Yes
	12	Construction Support	4 590.000	4 328.000	5 029.000	5 537.000	4	Yes
Add	13	ADL	27 265.000	34 997.000	39 632.000	42 576.000	4	Yes
	14	Engineering	10 533.000	9 790.800	11 522.800	12 988.800	4	Yes
Select	15	Site Engineering	11 453.000	15 108.800	18 982.800	22 246.800	4	Yes
	16	Site Overhead	1 030.000	1 032.000	1 161.000	1 226.000	4	Yes
	20	Sub contracts	10 124.000	8 589.400	10 028.400	11 005.400	4	Yes

- Click on the Calculate Overall EAC button. The table will be displayed on the Analysis Chart section.

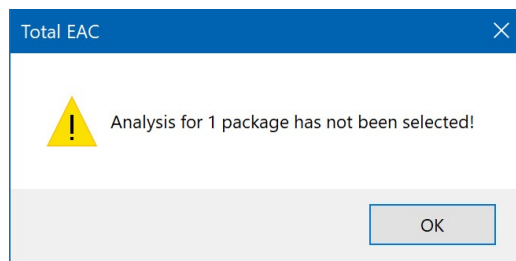
Analysis
 No of Iteration:

The screenshot below is the Total EAC based on the all package’s preferred/ selected scenarios.

Analysis Charts					
Process Plant/ Project Construction	Package Name	BAC	Overall P20	Overall P60	Overall P80
PMC		69 535.00	78 863.00	91 778.00	101 231.00
	Procurement Support	4 540.0	4 925.00	5 390.00	5 511.00
	Construction Support	4 590.0	4 481.00	5 116.00	5 667.00
	Engineering	10 533.0	9 790.80	11 522.80	12 988.80
	ADL	27 265.0	34 997.00	39 632.00	42 576.00
	Site Engineering	11 453.0	15 108.80	18 982.80	22 246.80
	Site Overhead	1 030.0	1 032.00	1 161.00	1 226.00
	Sub contracts	10 124.0	8 528.40	9 973.40	11 015.40

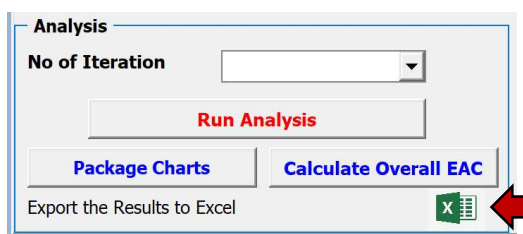
Note: The above table could be regenerated if another scenario gets selected for a package(s).

Note: In order to generate the table; all the packages must have at least one scenario with analysis and must have "Yes" in the last column. Otherwise, a message similar to the following screenshot will be displayed.



7.4. Export to Excel

To export the analysis result and data, click on the Excel icon in the Analysis section.



Once clicked, all the analysis results of the selected project will be copied in an Excel file and the following window will be displayed. Save the file on your laptop.

