



Cleopatra Enterprise

# Project controls in a data driven world

*Stefan Bakker*



## Agenda

- Integrated project controls approach vs. individual disciplines
- The power of reliable cost data and big data analytics
- The latest digital technologies in Cleopatra to drive digital transformation
- Leverage data to improve scoping, work package management, cost estimating, cost control, benchmarking, and more...



## Speaker

### > Stefan Bakker

Senior Vice President of Business for Cleopatra Enterprise

- MSc. Business Economics
- 10+ years of professional experience
- Advises companies in their digital transformation of project controls
- Passion for driving successful change processes in complex environments



## About Cost Engineering Consultancy



Years of experience



Software and  
consultancy solutions



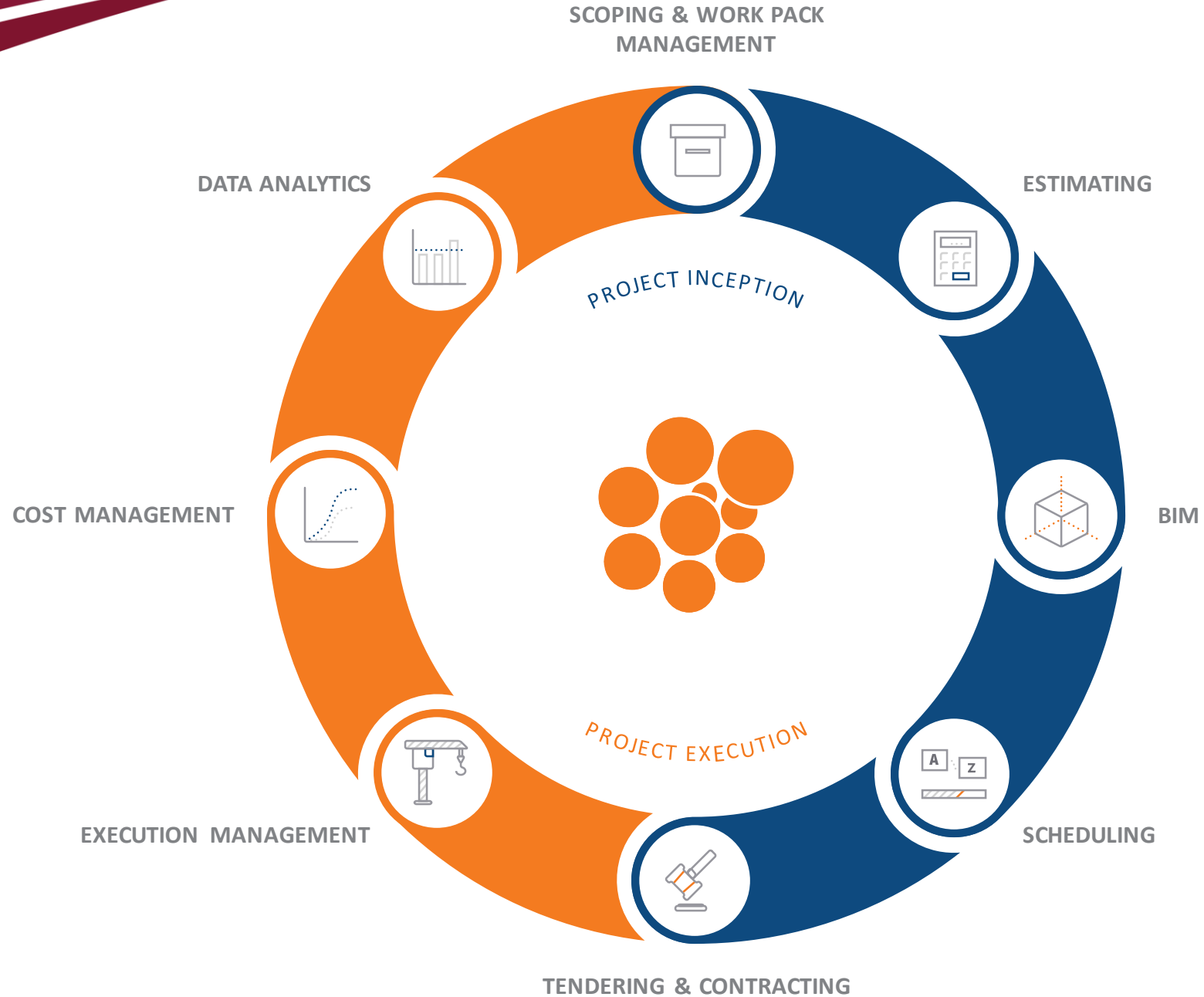
Operating worldwide



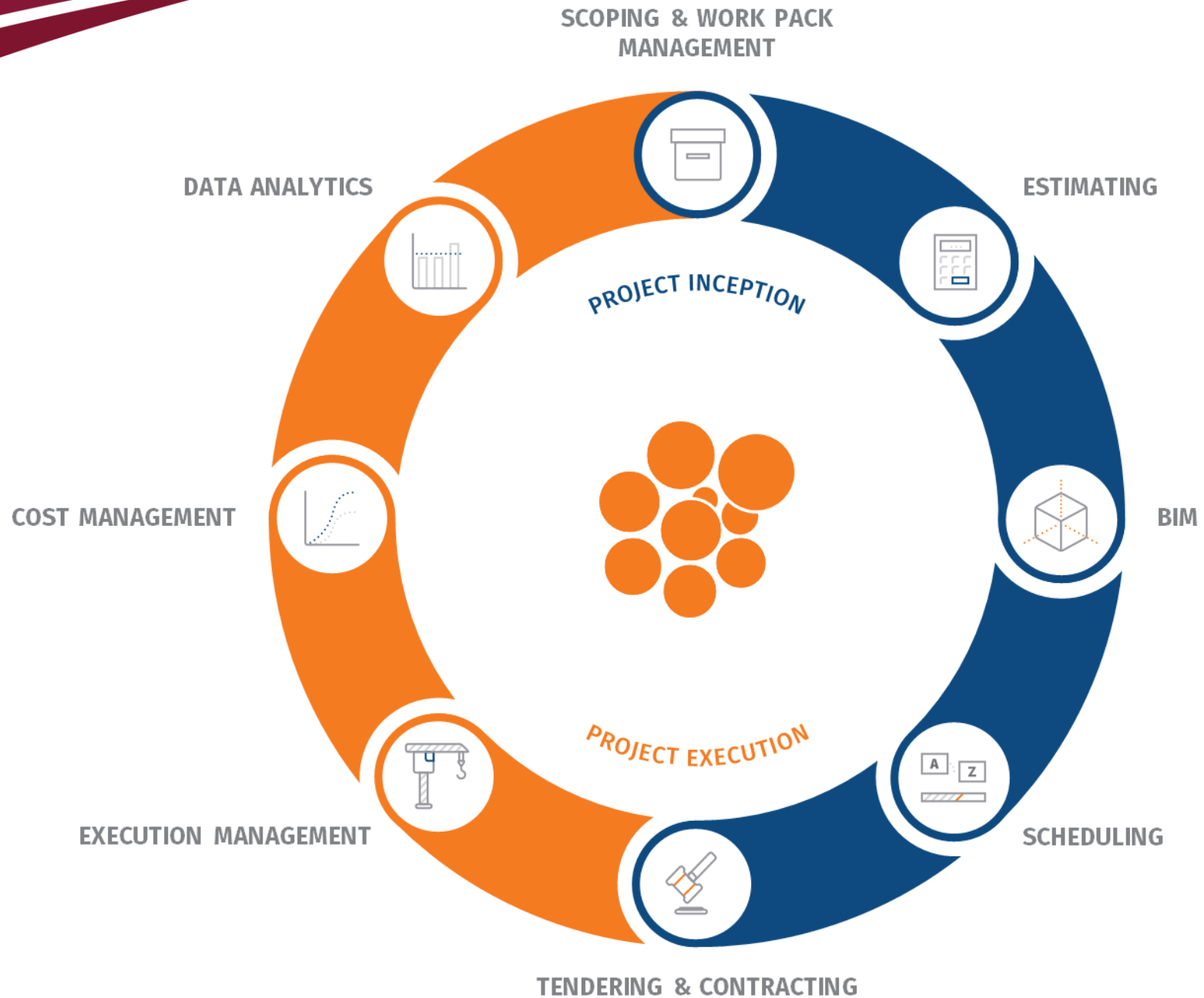
Knowledge Provider



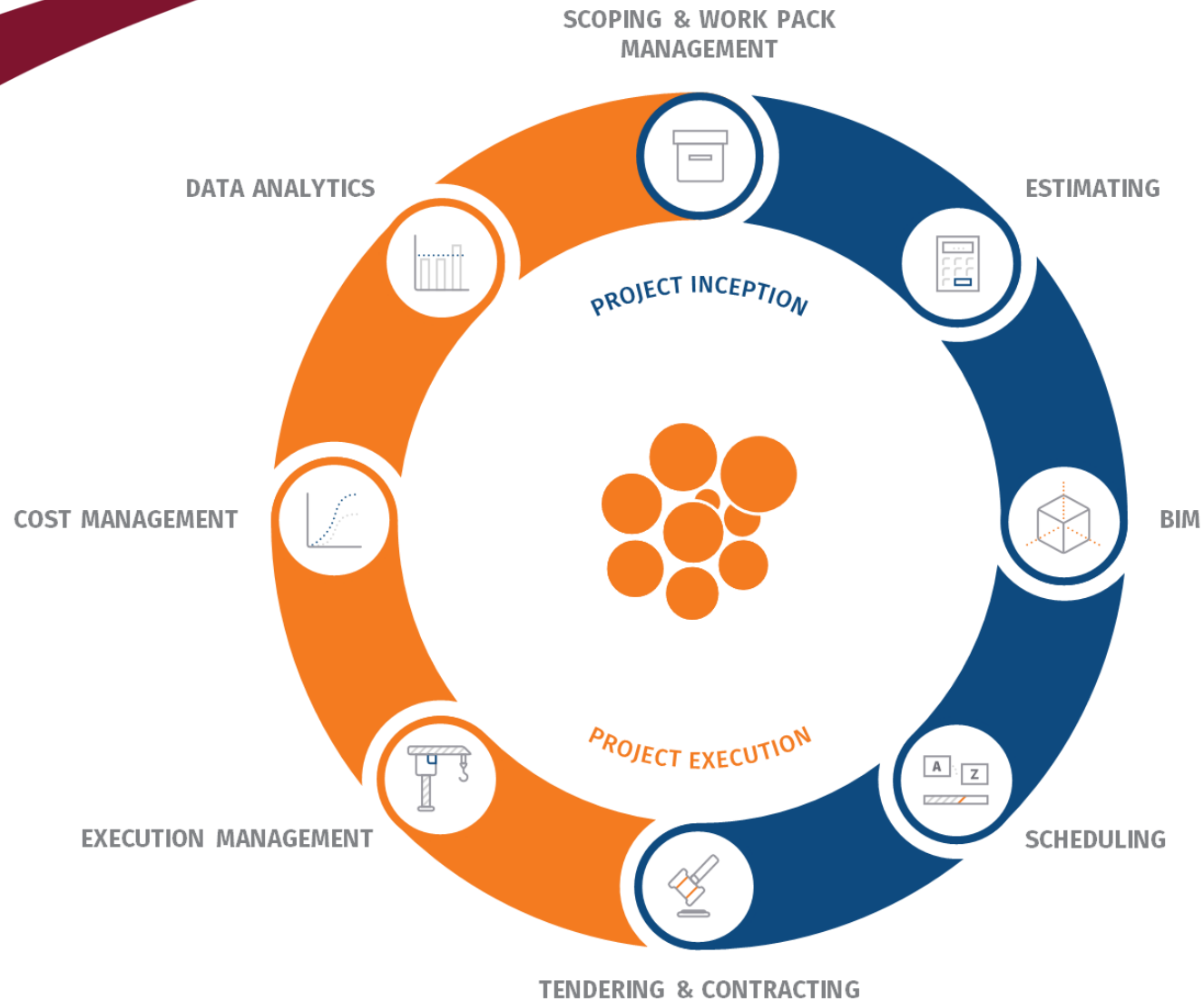
# How to improve the Project Performance?



# How to improve the Project Performance?



# How to improve the Project Performance?



**Cleopatra Enterprise**



**CESK Data**



**Academy**



**Consultancy**

## Proud to have as our clients:



- Bulk storage
- Construction industry
- EPC(M)
- Food and Nutrition
- Infrastructure
- Offshore
- Oil & Gas industry
- Heavy industry
- Pharmaceutical industry
- Petro-/chemical industry
- Power industry
- Mining & Minerals





# Digital Transformation

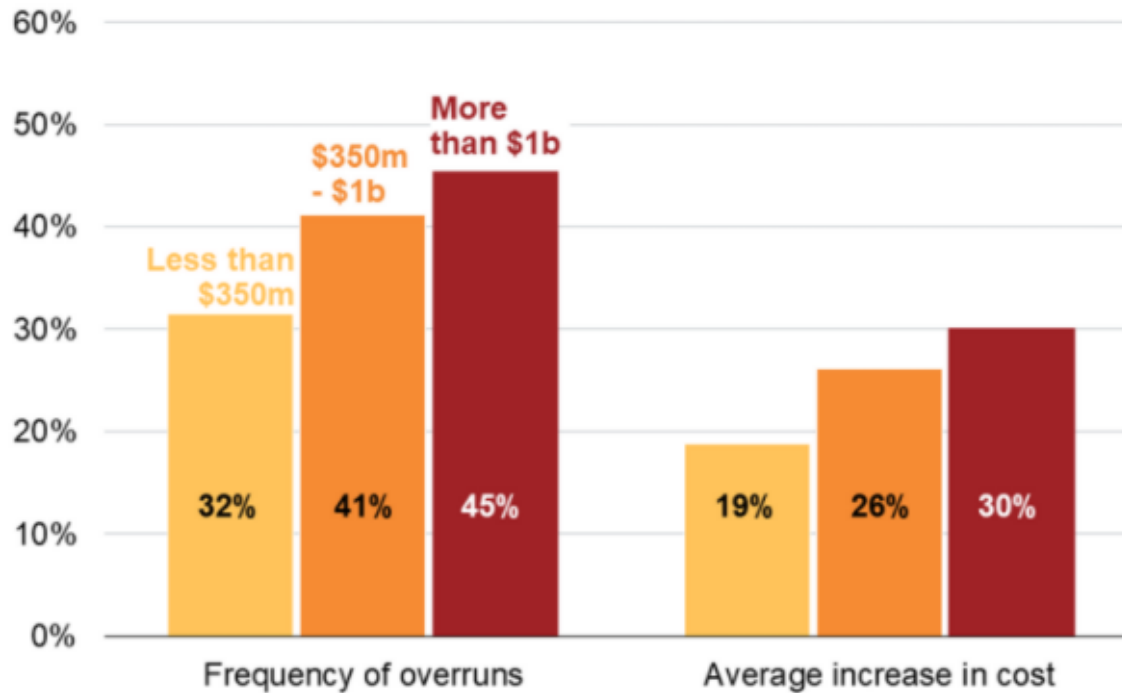
Are we there yet?



# We are talking serious money here...

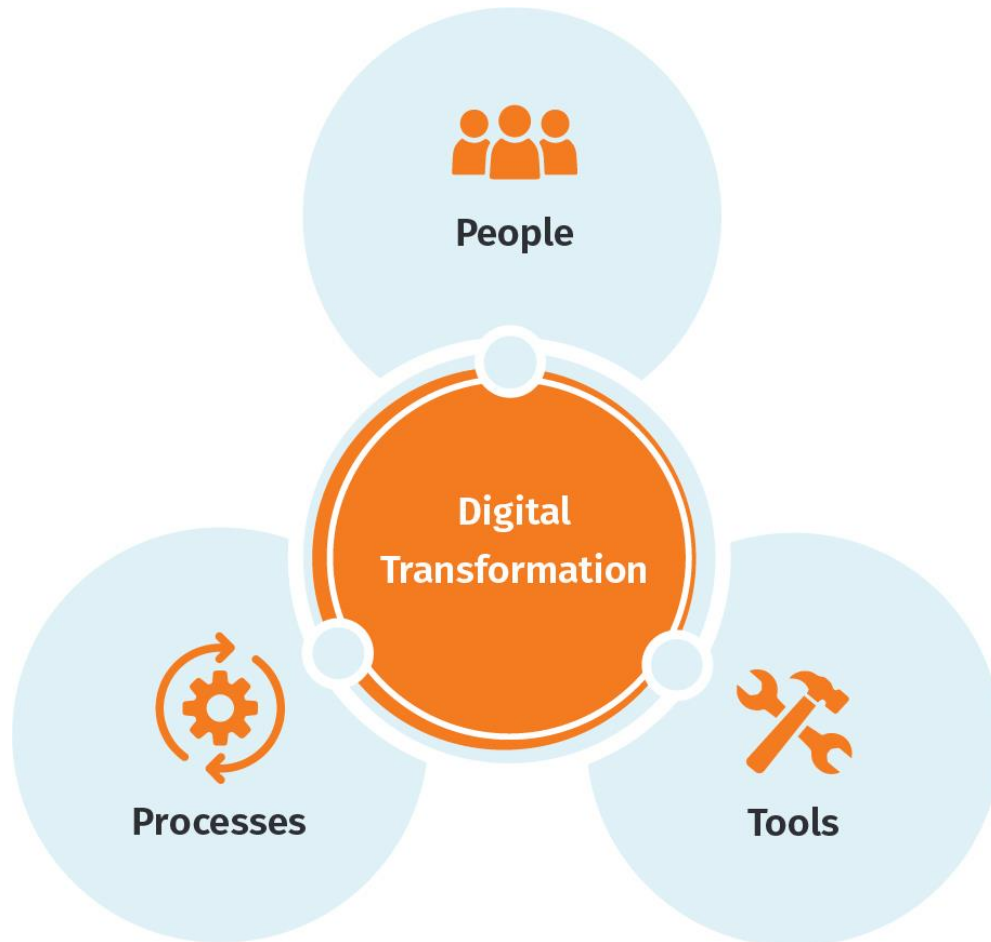
## Bigger projects overrun more often and by more

Frequency of overruns and average increase in cost as a percentage of initial project costs by level of initial cost



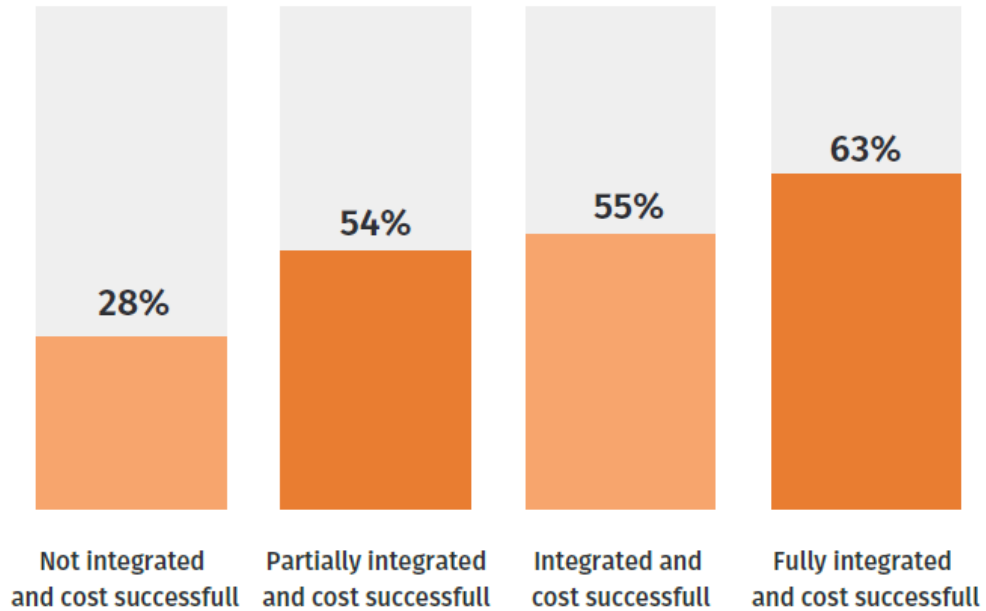
Note: Includes all public road and rail projects costing more than \$20 million that were completed between Q1 2001 and Q1 2020.  
Source: Grattan analysis of Deloitte Access Economics Investment Monitor.

# Digital technologies as a solution?

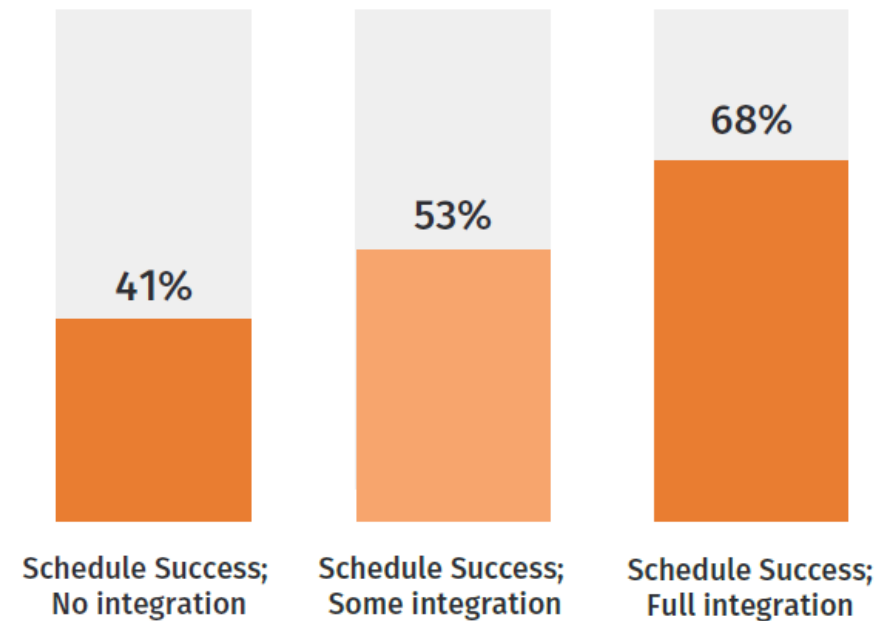


# Integration leads to better project outcomes

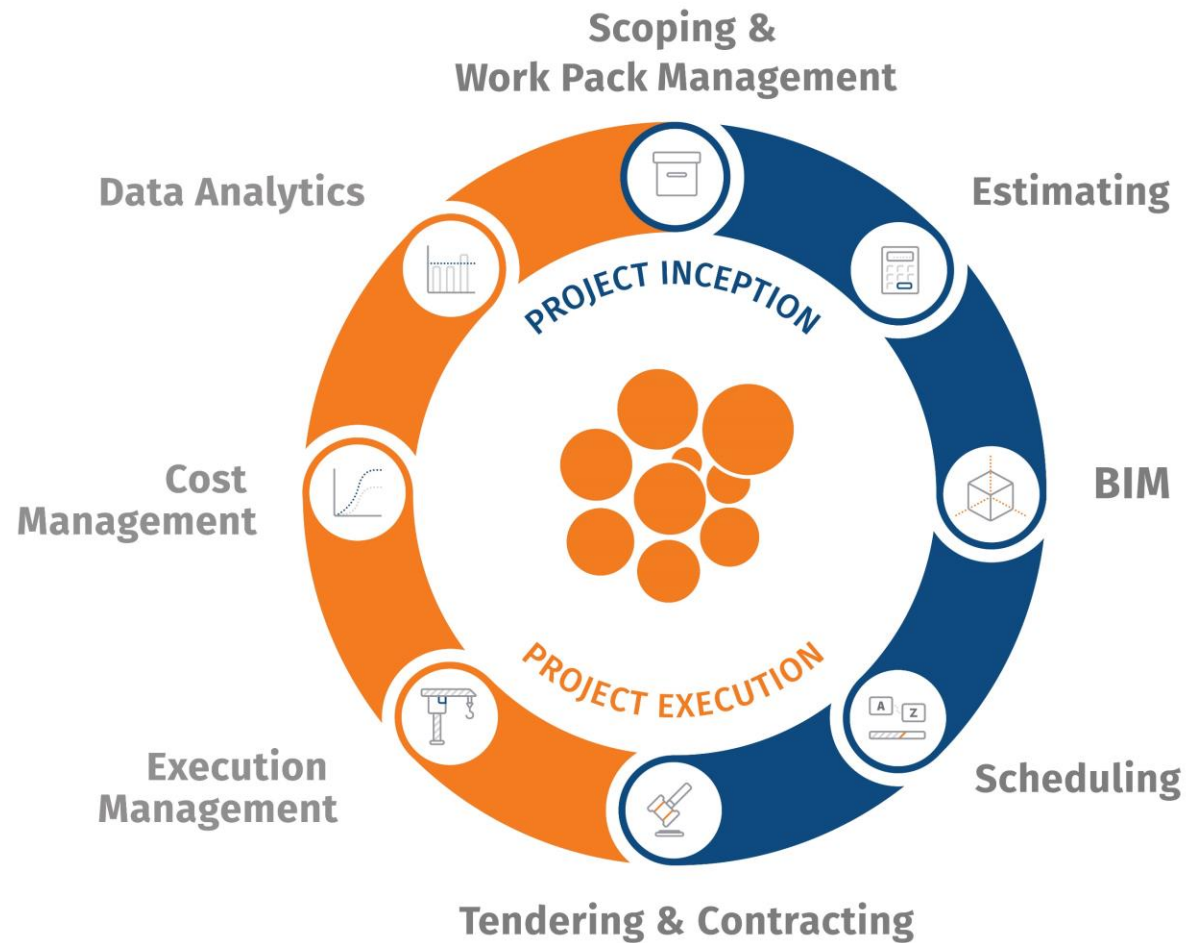
Project success based on integration between **processes**



Project success based on integration between **tools**

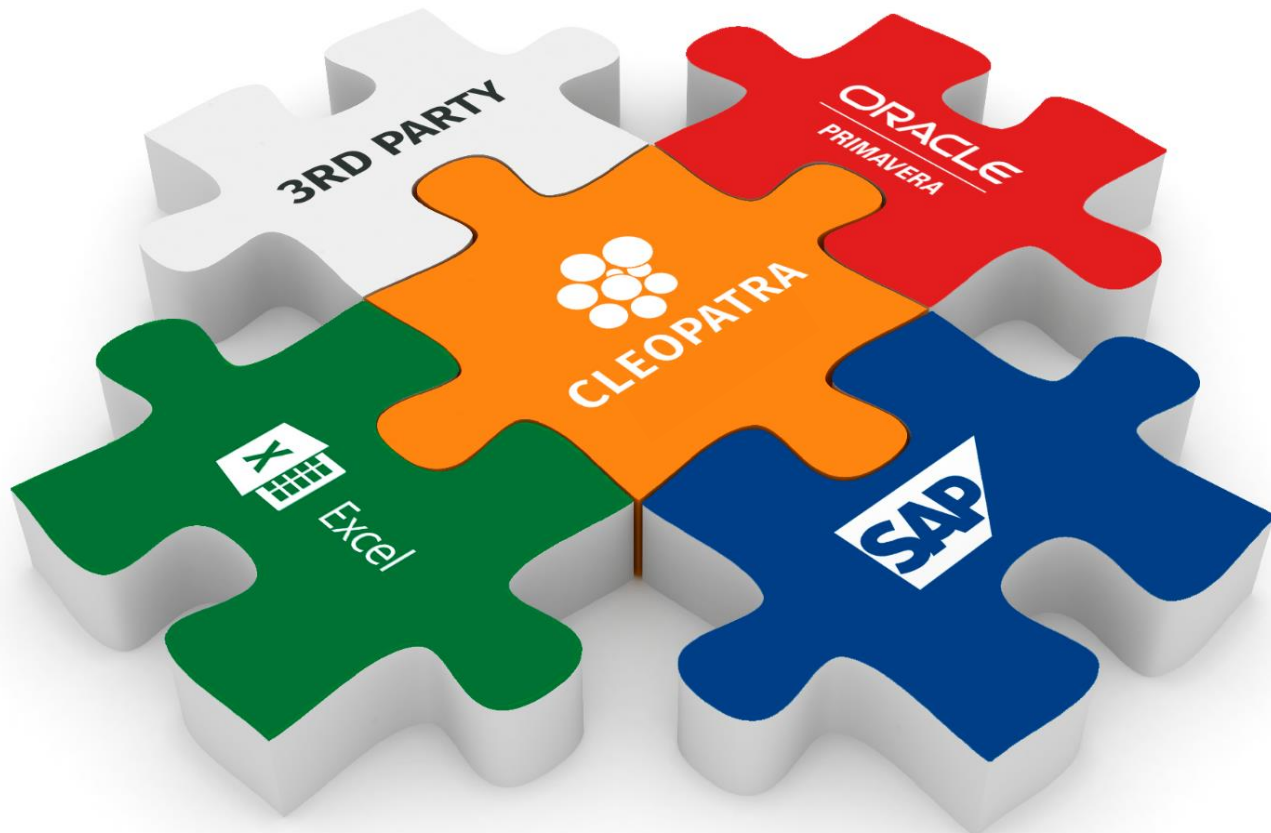


# What does a truly integrated approach mean?



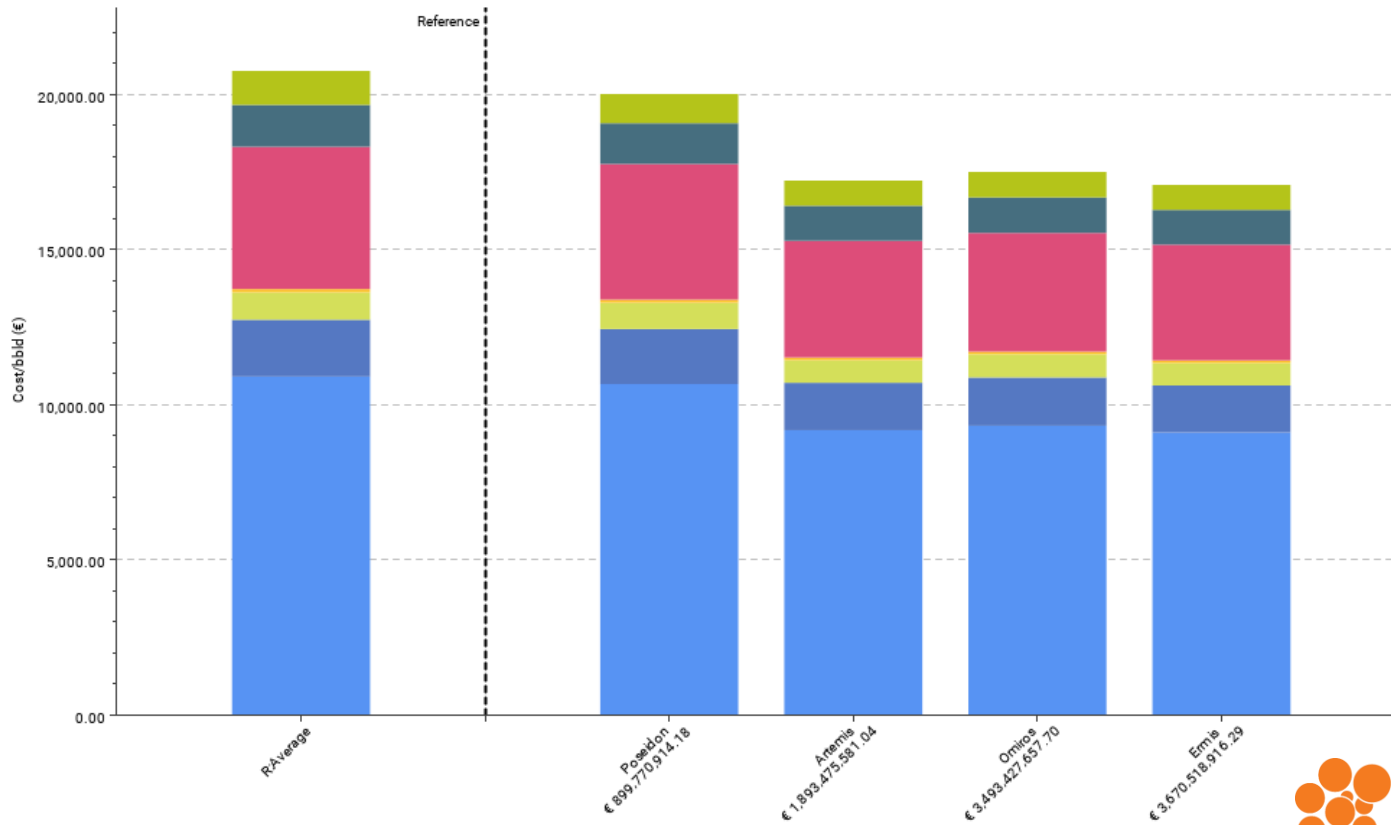
## For example

Don't waste time on manual data exchanges



# For example

Create a feedback loop from execution to future estimates (benchmarking)



# The power of reliable cost data





## Data is at the heart of everything

2.5 quintillion\* bytes of data being created every day, 90% of the world's data has been created in the last two years alone.

A staggering figure.

It is expected that the volume of data is to double every two years.

\* (2.3 trillion gigabytes)



# Data is at the heart of everything

① DATA



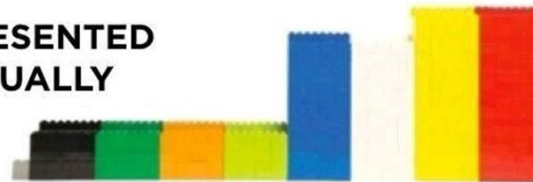
② CLEAN DATABASE



③ ANALYZED



④ PRESENTED VISUALLY



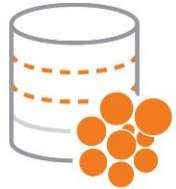
⑤ EXPLAINED IN A STORY



## Data is at the heart of everything

- **Existence** - Does the organization have the data, to begin with?
- **Validity** - Are the values acceptable?
- **Consistency** - When the same piece of data is stored in different locations, do they have the same values?
- **Integrity** - How accurate the relationships between data elements and data sets are
- **Accuracy** - Whether the data accurately describes the properties of the object it is meant to model
- **Relevance** - Whether or not the data is appropriate to support the objective





## CESK Data Global Standard Data Validity, Consistency and Accuracy

**1.500.000**



Over 1.500.000  
cost items

**2.000**



Based on more than 2.000  
real-life projects

**CAPEX**



**OPEX**

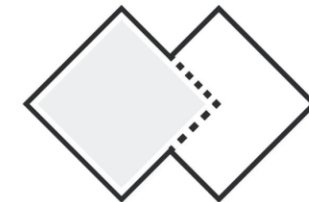
CAPEX/OPEX  
Projects



For all project phases



Applicable for various  
locations



Completely transparent;  
no black box

# Data integrity and relevance matters!

Benchmarking is incredibly valuable to

- assess the work package planning
- assess accuracy of a given estimate
- identify potential risks and issues

It requires a structured and consistent way of collecting project close-out data:

- Project parameters (e.g. type of project, location, capacity, technology)
- Technical data (e.g. equipment used, material types, pressure ratings, size)
- Cost / labor info (e.g. costs, labor hours, quantities)

*How to enable a standardized approach that allows for useful analytics?*



# Cleopatra – Work Package Management

## Data Integrity and relevance

Import work packs from a work pack library

Import work packs

Import work packs from a work pack library

Source document:  Filter:  View:  Breakdown structure:  Breakdown keys:

Available

Title	Priority	Planned activity cost	Planned labour cost	Planned rental cost	Planned material cost	Planned activity labour hours	Planned activity rental hours
Cleaning (dirt and clean inspection)	Normal	1,526.61	0.00	0.00	0.00	348.71	0.00
Clean suction line and header	Normal	2,021.08	0.00	0.00	0.00	413.71	0.00
Overhaul, service and lubrication (6"-900#)	High	437.89	0.00	0.00	0.00	159.45	0.00
Safeguard battery limits	Low	639.20	0.00	0.00	0.00	124.92	0.00
Catalyst change	Normal	126,323.22	0.00	0.00	0.00	4,507.61	0.00
Replace bundle by spare bundle	Normal	14,678.08	0.00	0.00	0.00	536.75	0.00
Remove clamp 6" , pinhole leakage nearby weld 90° elbow	Normal	1,247.12	0.00	0.00	0.00	153.01	0.00
Hydrogen product	High	5,946.35	0.00	0.00	0.00	174.38	0.00
Flare tie-in coldtap	Low	34.76	0.00	0.00	0.00	108.66	0.00
Service and lubrication	High	9,337.50	0.00	0.00	0.00	26.00	0.00



# Cleopatra – Work Package Management

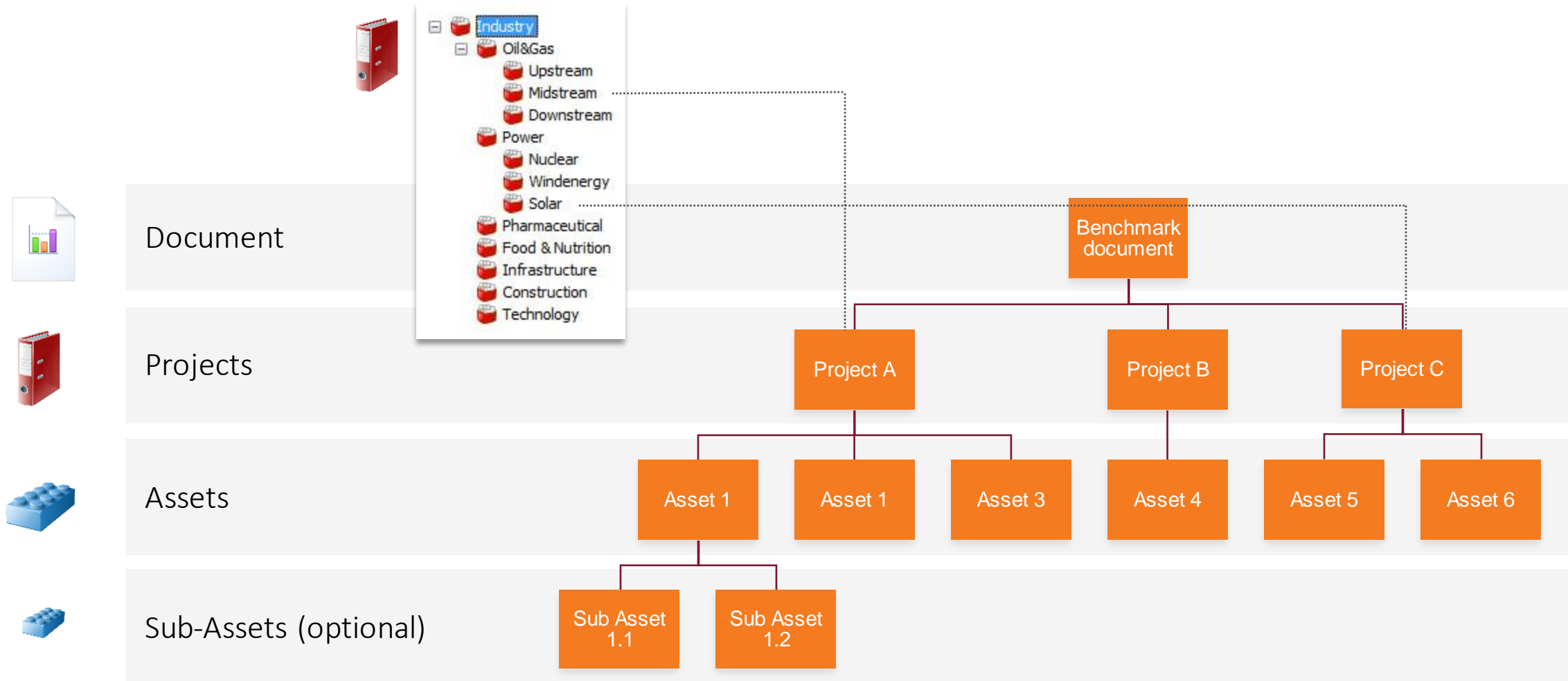
Work pack ID	Title	Description	Work pack owner	Workflow state	Activity owner	Execution team	Lead planning task owner	Priority	Start date	End date
75883	Catalyst change	Catalyst change	Owner Turnaround Team	Ready for execution	Owner Catalyst Supervision	Catalyst Handling	Owner Turnaround Team	None		

Name	Execution team	Assignee	Planned cost	Planned labour cost	Planned material cost
1 Pre-TA Material Reservation	Material Team	Owner Catalyst Supervision	84,236.55	0.00	
2 Place Scaffolding (A001)	Scaffolding contractor	Owner Turnaround Team	600.00	600.00	
3 Install Temporary Electric Power/Light (A005)	Rental company	Owner Turnaround Team	2,000.00	2,000.00	
4 Prepare Breathing Air/N2/Water	Catalyst Handling	Owner Turnaround Team	0.00	0.00	
5 Rig Up, Equipment For Blinding/Hotbolting	Mechanical Contractor B	Owner Turnaround Team	1,200.00	1,200.00	
6 Rig Up, Unloading Catalyst Equipment (A)	Catalyst Handling	Owner Turnaround Team	14,400.00	14,400.00	
7 Loto Electrical Tracing (B015)	Tracing Contractor	Owner Turnaround Team	100.00	100.00	
8 Remove Insulation (B014)	Insulation contractor	Owner Turnaround Team	4,400.00	4,400.00	
9 Remove Tracing (B016)	Tracing Contractor	Owner Turnaround Team	1,100.00	1,100.00	
10 Release By Operation To Start Hotbolting (B)	Owner Operations	Owner Turnaround Team	60.00	60.00	
11 Brushing Lifting Lug Of Top Elbow (B)	Mechanical Contractor B	Owner Turnaround Team	60.00	60.00	
12 MT Exam On Lifting Lug (B)	NDT Contractor	Owner Turnaround Team	150.00	150.00	
13 Hot Bolting (B)	Torquing Contractor B	Owner Turnaround Team	9,380.40	9,380.40	
14 Block Springhangers (C013)	Mechanical Contractor B	Owner Turnaround Team	360.00	360.00	
15 Release By Production For First Blinding, N2 Condition	Owner Operations	Owner Turnaround Team	60.00	60.00	
16 Disassembly Of Steamrings	Mechanical Contractor B	Owner Turnaround Team	423.00	423.00	
17 Special Bolting Disassembly In Safety Phase (Hydr Torq / Bolt Tens.)(C006)	Torquing Contractor B	Owner Turnaround Team	3,250.00	3,250.00	
18 Blinding 20DC-01 Under N2 Conditions	Mechanical Contractor B	Owner Turnaround Team	22,843.12	6,077.40	
19 Special Bolting Assembly In Safety Phase (Hydr Torq / Bolt Tens.)(C017)	Torquing Contractor B	Owner Turnaround Team	2,150.00	2,150.00	
20 Release By Operation For Removing Reactor, Top Elbow	Owner Operations	Owner Turnaround Team	60.00	60.00	
21 Dismount Top Elbow & Inlet Diffuser	Mechanical Contractor B	Owner Turnaround Team	3,150.80	3,150.80	

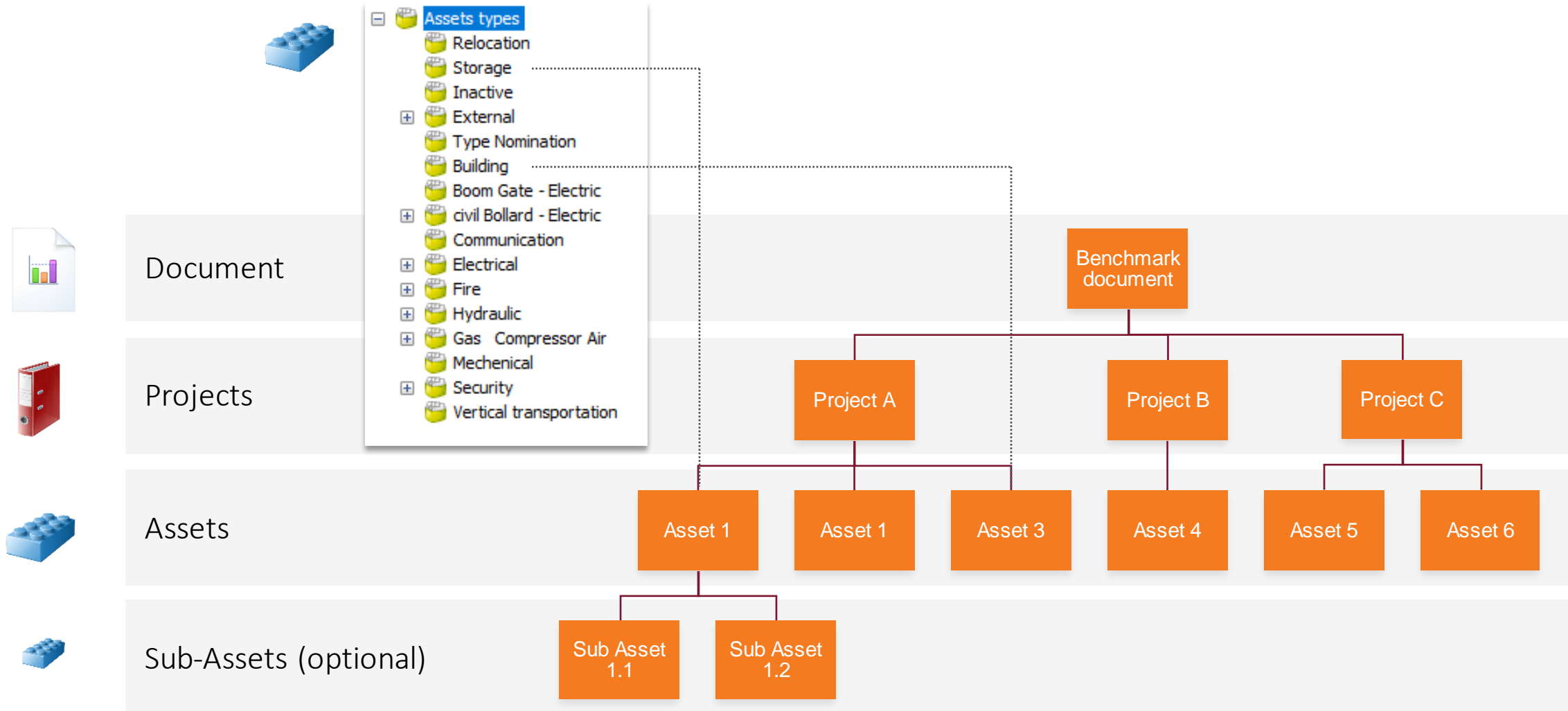


# Project Structures





# Asset Structures



# Capture project data

Projects


	Project name	Project currency	Project status	Default indexation date	Project Name	Direct Mhours %	Indirect man hours %	Escalation%	Const mgmt. cost/Total direct field hours	Const mgmt. hours/total direct field hours	P
1	Charles Kao	Euro	initial	May 2021	Charles Kao	94.91	5.09	4.41	€ 10.75	0.05	
2	Niels Bohr	Euro	initial	Sep 2019	Niels Bohr	74.47	25.53	9.65	€ 3.35	0.34	
3	James Chadwick	Euro	initial	Sep 2019	James Chadwick	82.38	17.62	5.41	€ 11.72	0.21	
4	Rita Levi Montalcini	Euro	initial	Sep 2019	Rita Levi Montalcini	83.36	16.64	4.71	€ 8.29	0.20	
5	Toni Morrison	Euro	initial	Sep 2019	Toni Morrison	83.93	16.07	5.23	€ 1.77	0.19	
6	Rosalyn Yalow	Euro	initial	May 2021	Rosalyn Yalow	83.33	16.67	4.07	€ 16.22	0.10	
7	Gerty Cori	Euro	initial	Sep 2019	Gerty Cori	88.65	11.35	5.93	€ 5.91	0.13	
8	Barry Barish	Euro	initial	Sep 2019	Barry Barish	84.64	15.36	3.02	€ 4.05	0.18	

Project information | Assets | Project location | Schedule | Indexation time phasing

Project information

Project currency: Euro

Project image

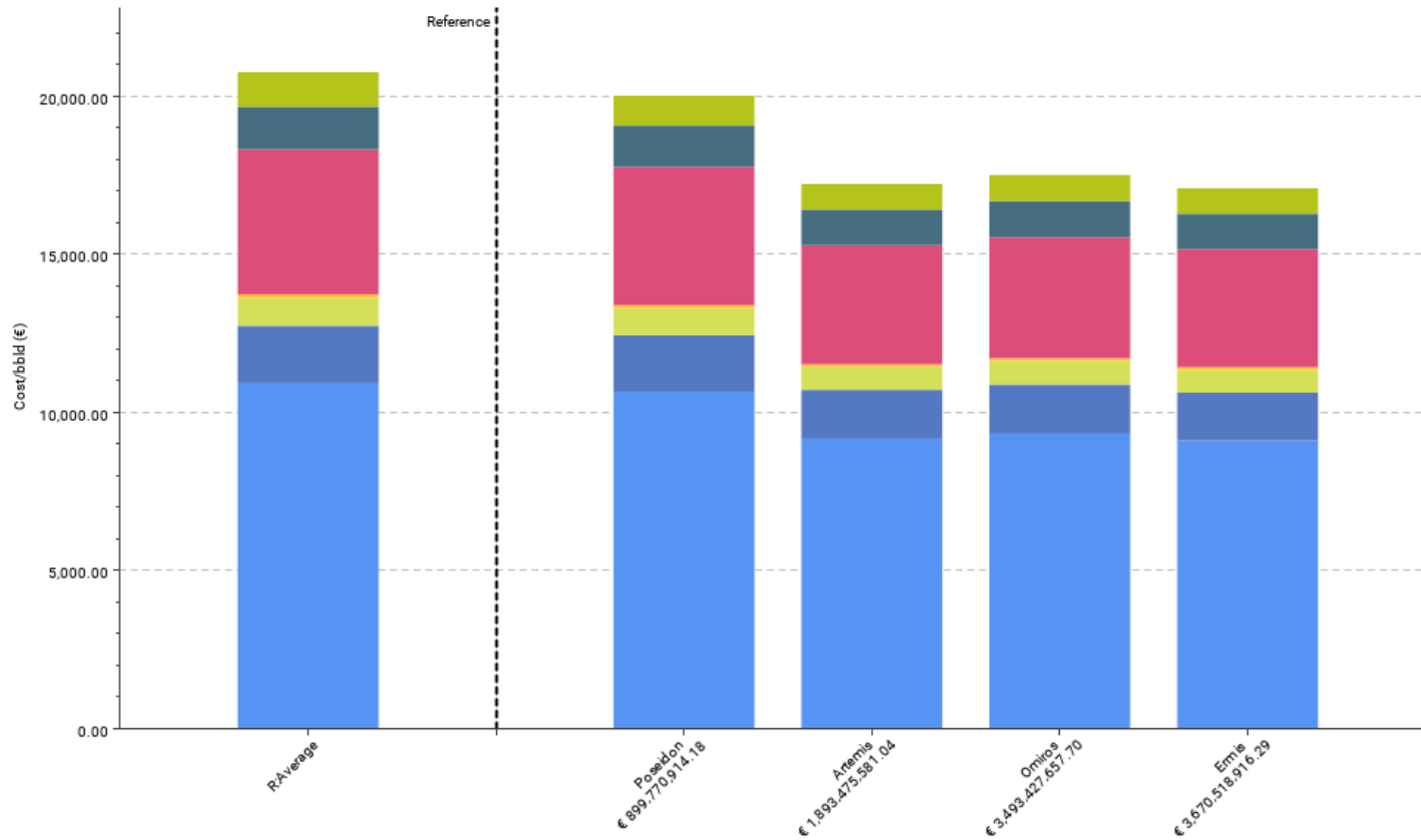


Project properties | Metrics

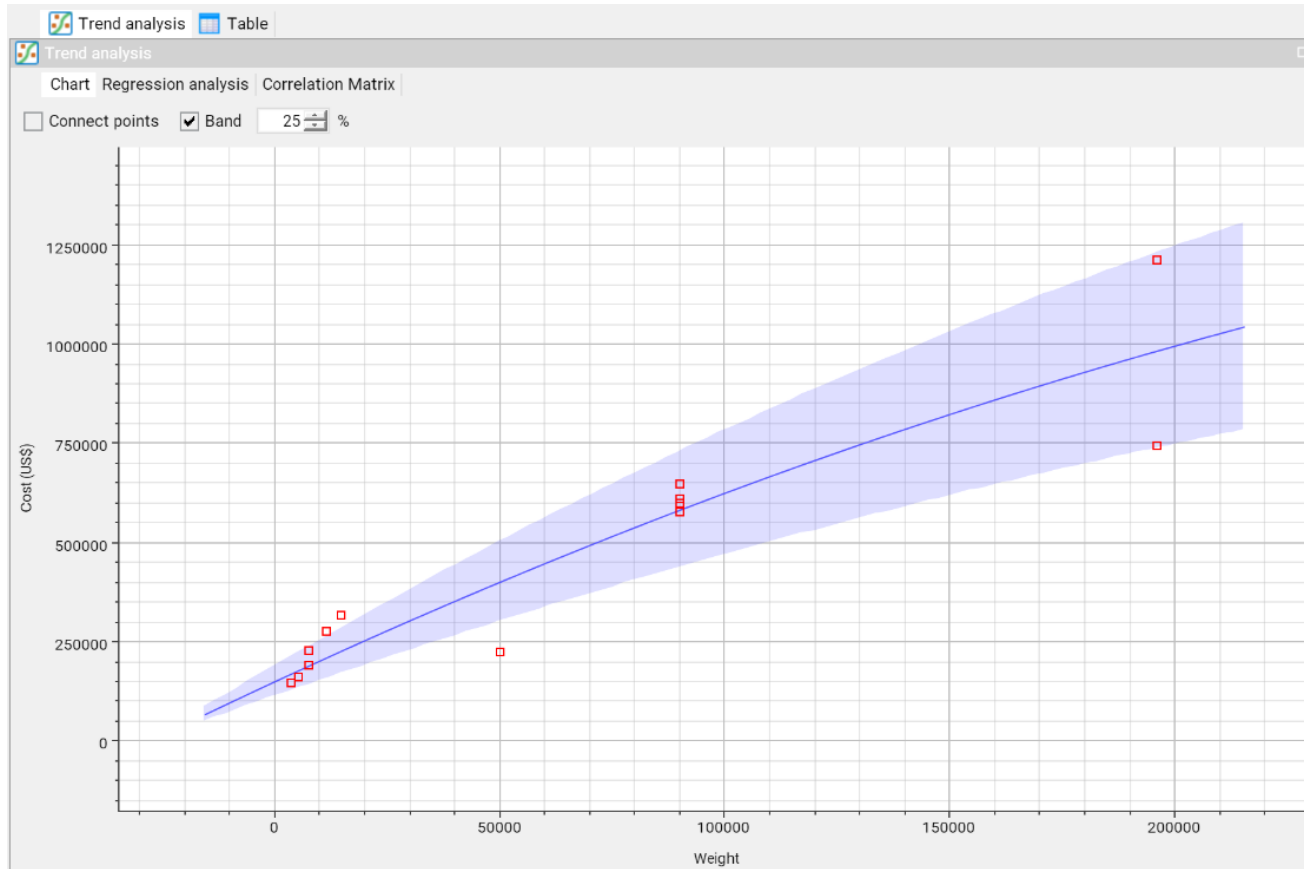
Filters:

Parameter	Value
1 Project Name	Niels Bohr
2 Direct Mhours %	74.47
3 Escalation%	9.65
4 Indirect man hours %	25.53
5 Const mgmt. cost/Total direct field hours	€ 3.35
6 Const mgmt. hours/total direct field hours	0.34
7 Plant Capacity (in Millions per year)	250 metricTon
8 Project lead	Wilson
9 Project total cost	€ 1,103,088.24
10 Escalation total	€ 106,413.48
11 USD per capacity (MMTA)	€ 4,412,352.96

# Benchmark and analyze



# Benchmark and analyze





# Q & A

*Do you want to know more?*

*Schedule a demo on [www.costmanagement.eu](http://www.costmanagement.eu)*



**THANK YOU**

