

NEMO Release Letter

Version 2023-03-31



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Summary

As of March 31, 2023, proALPHA has released NEMO version 2023-03-31.

NEMO – standing for Natural Enterprise Management Optimizer – is a new breed of AaaS – Analytics-as-a-Service – offering from proALPHA. NEMO analyzes all sorts of event data. In particular NEMO analyzes business processes as performed with proALPHA ERP. The objective of NEMO is to enable better daily decisions by relating operational activities (input factors) with financial results (output factors).

With this version we round out the basic capabilities of our Process Mining by adding tied-up cash numbers as optional arrow label. In essence this number tells you how much cash could theoretically be freed up, i.e. liquidity improved, by optimizing the respective process. The objective is to ease the decision which process to attack first.

Furthermore, we are introducing mass forecasting for part consumption because this was asked for by many of our customers.

In addition, NEMO 2023-03-31 features various error corrections and performance improvements. Also, various housekeeping improvements have been implemented.

Application Signature Features

Natural Performance Index (NPI)

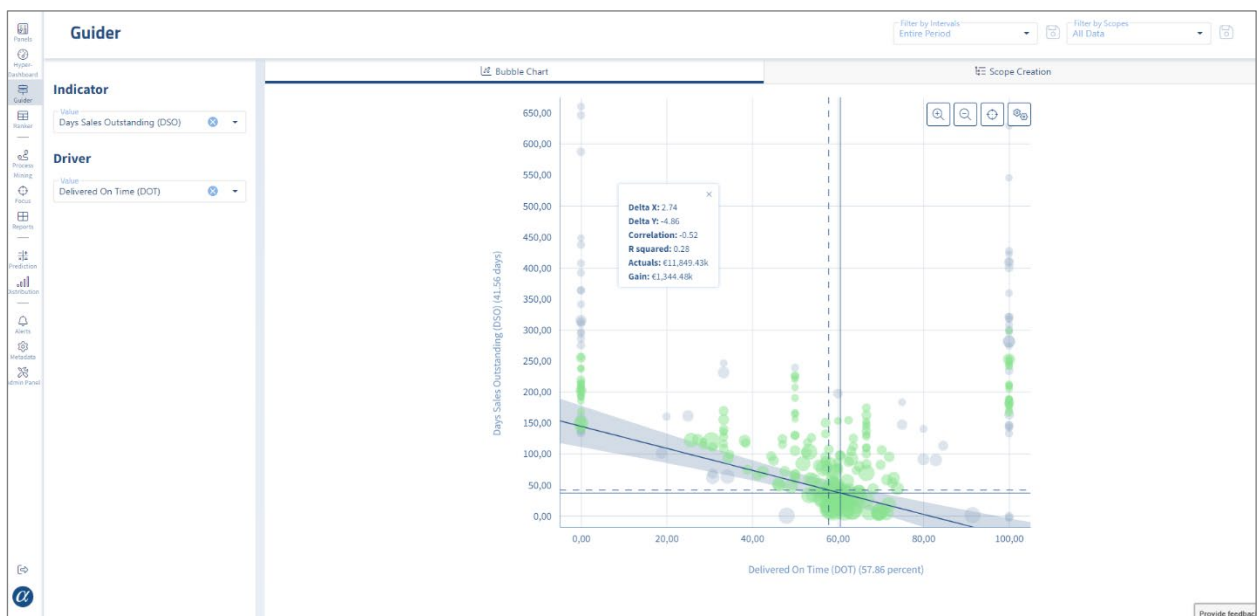
The NPI measures and ranks the fitness of a business. High NPIs indicate a significant improvement potential which is likely to be achieved. They help the user find and decide between the available optimization opportunities and are key to the daily decision support provided by NEMO.

Natural Leverage Index (NLI)

The NLI measures and ranks the degree of efficiency (“Wirkungsgrad”) of a certain operational measure. High NLI indicates a significant leverage which is likely to be achieved. They help the user find and decide between the available opportunities and as such facilitate the daily decision support provided by NEMO.

Unsupervised Learning

Since there is no optimum for business process optimization typical machine learning approaches don't apply. Hence NEMO leverages robust advanced statistics out of the so-called space of unsupervised learning algorithms.



Meta-data Driven

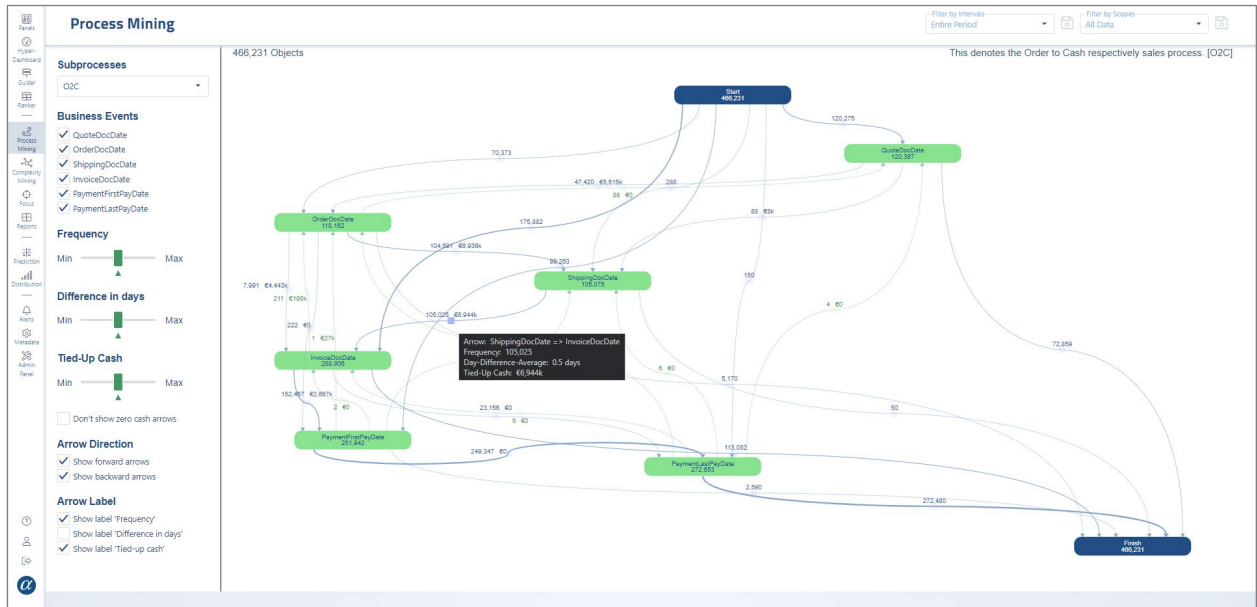
NEMO is not only data- but also metadata-driven. This means that virtually all metrics and scopes can be formed – either manually or automatically.

Hyper-Dashboard

NEMO continuously ranks all business process correlations. This enables dynamic dashboards which are complementing classical dashboards.

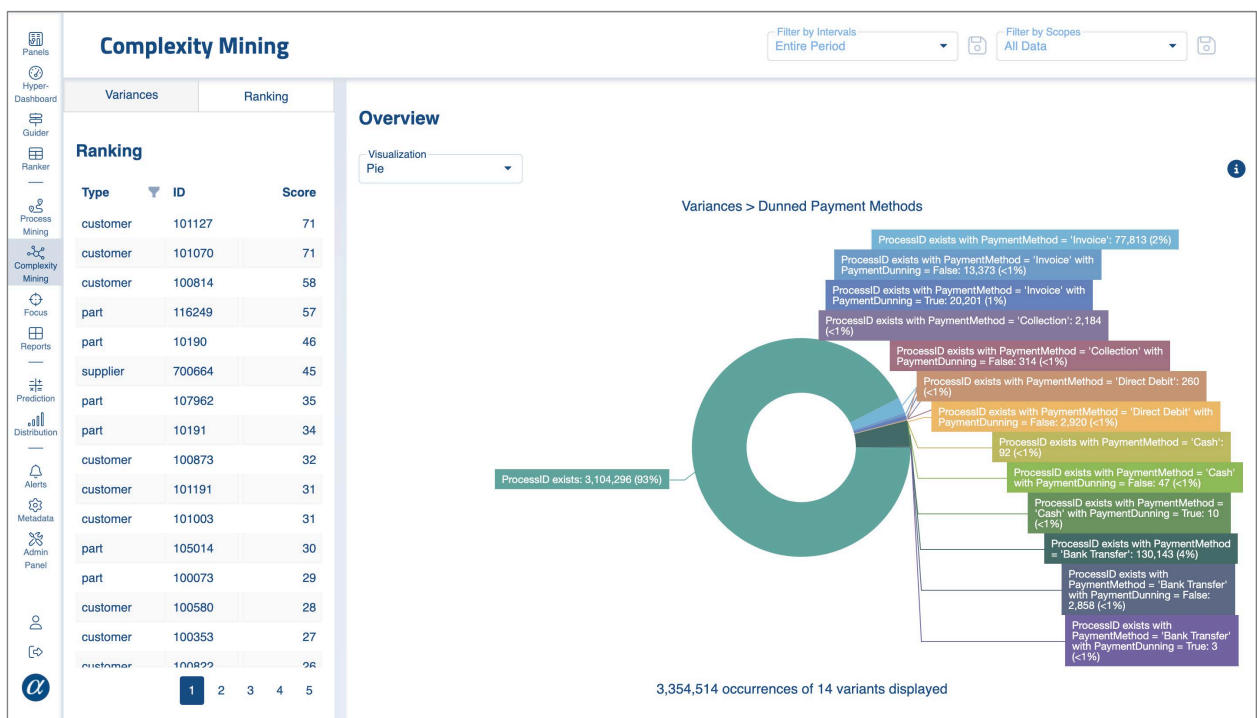
Process Mining

Inherently NEMO discovers all executed business processes. Process Mining visualizes these as so-called process maps. The edges (lines, links) represent business process variants. They can be captured in scopes for further analysis (e.g. Focus and Guider). The nodes (vertices, points) represent the business events which, chained up, represent the executed business activities.



Complexity Mining

Similarly, NEMO detects automatically all executed business process variants. Each and every variant increases the complexity of the respective business. Increasing complexity increases complexity costs. This phenomenon can be analyzed as well.



All Details

NEMO works always on details. There is no need to do any pre-aggregations at all. This means that the user can drill down to the detailed business documents at any point in time and instantaneously.

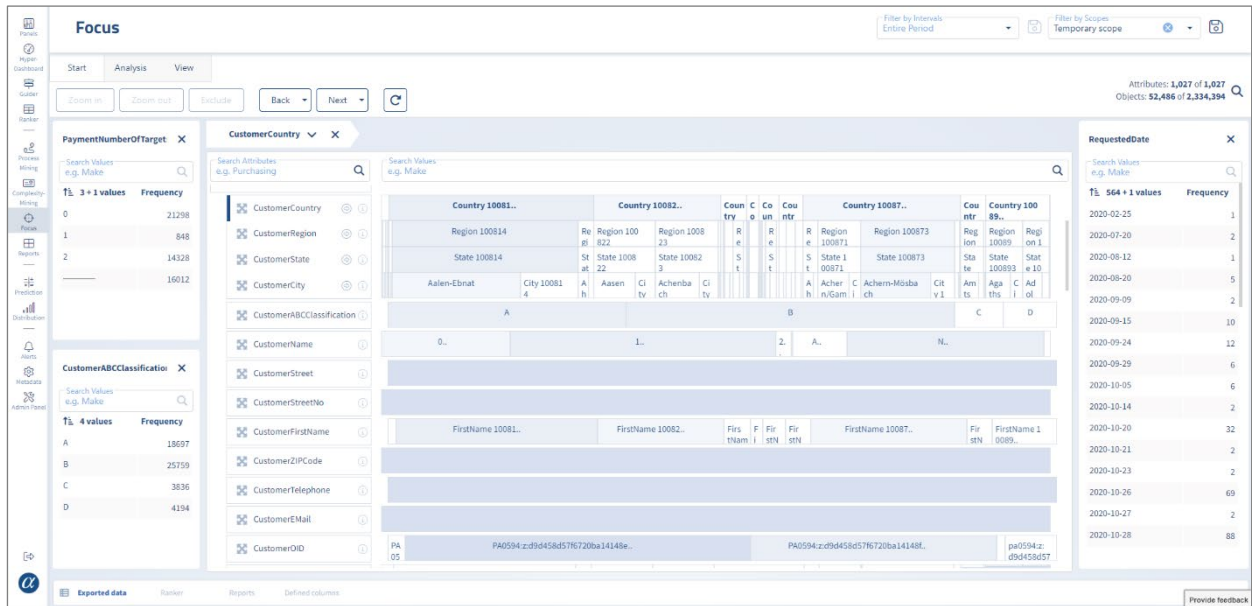
Here an example for the Payment Method Invoice. The Hyper-Dashboard provides an overview of the top measures for process improvements.



The Ranker table gives the details behind the Hyper-Dashboard.

NPI	NLI	Driver	Driver Value	Indicator	Indicator Value	R Squared	Correlation	Actuals	Gain	Scope
1,228,230	150	Delivered On Tim...	49.38%	Days Sales Outst...	46.39 (days)	0.49	-0.70	€8,190.30k	€2,523.89k	[[mvmmt_m_r_p_ar...
1,045,971	140	Delivered On Tim...	47.95%	Days Sales Outst...	48.06 (days)	0.46	-0.68	€7,476.48k	€2,252.74k	[[mvmmt_m_r_p_ca...
951,839	133	Delivered On Tim...	47.78%	Days Sales Outst...	48.00 (days)	0.46	-0.68	€7,176.66k	€2,084.53k	End products
891,949	143	Delivered On Tim...	57.14%	Days Sales Outst...	46.28 (days)	0.43	-0.66	€6,245.62k	€2,053.92k	[[customer_a_b_c...
626,635	146	Delivered On Tim...	49.19%	Days Sales Outst...	56.78 (days)	0.53	-0.73	€4,280.45k	€1,174.27k	[[part_type(61)]]
626,153	146	Delivered On Tim...	49.19%	Days Sales Outst...	56.80 (days)	0.53	-0.73	€4,280.45k	€1,173.68k	[[part_product_li...
561,369	165	Delivered On Tim...	49.76%	Days Sales Outst...	53.35 (days)	0.68	-0.82	€3,405.99k	€827.81k	[[part_id("10190...
554,675	167	Delivered On Tim...	44.88%	Days Sales Outst...	53.40 (days)	0.49	-0.70	€3,318.21k	€1,139.90k	[[mvmmt_m_r_p_ca...
544,680	178	Delivered On Tim...	49.32%	Days Sales Outst...	58.99 (days)	0.39	-0.62	€3,057.86k	€1,410.07k	[[part_product_li...
528,335	63	Delivered On Tim...	53.52%	Days Sales Outst...	46.12 (days)	0.30	-0.55	€8,361.60k	€1,748.98k	Storage Area 100...
503,446	148	Delivered On Tim...	57.14%	Days Sales Outst...	58.93 (days)	0.41	-0.64	€3,407.57k	€1,231.54k	[[supplier_indust...
439,326	197	Delivered On Tim...	39.77%	Days Sales Outst...	72.99 (days)	0.42	-0.65	€2,227.58k	€1,043.02k	[[part_id("11177...
389,940	130	Delivered On Tim...	47.73%	Days Sales Outst...	61.67 (days)	0.41	-0.64	€2,991.62k	€955.86k	[[part_product_li...
388,081	157	Delivered On Tim...	38.06%	Days Sales Outst...	66.90 (days)	0.32	-0.57	€2,478.03k	€1,214.12k	[[part_product_li...
386,742	149	Delivered On Tim...	45.28%	Days Sales Outst...	51.06 (days)	0.46	-0.68	€2,587.24k	€841.74k	[[part_type(5)]]
320,720	204	Delivered On Tim...	36.56%	Days Sales Outst...	74.43 (days)	0.52	-0.72	€1,575.23k	€614.98k	[[part_a_b_c_class...
265,822	22	Delivered On Tim...	57.74%	Days Sales Outst...	46.25 (days)	0.13	-0.36	€11,849.21k	€2,030.06k	[[part_a_b_c_class...
244,851	165	Delivered On Tim...	37.20%	Days Sales Outst...	65.49 (days)	0.32	-0.57	€1,485.17k	€755.03k	[[part_id("11177...
231,143	320	Delivered On Tim...	52.03%	Days Sales Outst...	50.89 (days)	0.58	-0.76	€72.04k	€398.64k	[[part_a_b_c_class...

And the Focus view gives the details behind the Ranker table. And all within seconds.



Dynamic Dashboards

From all details arbitrary dashboards can be derived as well.



Since these so-called Panels are automatically built-in conjunction with Scopes they are correct by nature. Especially there is no dispute about the calculation of metrics and key figures anymore since those are isolated from the Panels.

Instantly Live

NEMO doesn't need any customization. Even chart-of-account or financial calendar are not needed for NEMO to function.

Technology Signature Features

The NEMO technology is characterized by

- Integration
 - All applications leverage and maintain the same data
- Speed
 - Response times should be as fast as possible
 - Development times – customers or us – should be as short as possible

These objectives are achieved by leveraging following unique approaches.

Push rather than Pull Data Copying

All data are regularly pushed from the source system to NEMO.

For our ERP we push all essential order types now:

- Purchase Order
- Production Order
- Sales Order

This means following supply chain processes are covered now:

- Source
 - Purchasing, procurement
- Make
 - Inventory
 - Production
- Deliver
 - Sales
- Return Handling
 - Sales
 - Purchasing
- Finance
 - Accounting Journal

Flat Data Structure

There is only one table in NEMO.

There are no aggregations (cubes) nor indices.

There are no Joins at all.

Process Chains

All data are organized along the performed business processes.

Dynamic Calculations

All calculations are performed in real-time.

There are no data preparation runs.

Metrics Driven

All control data (metadata) are available to all applications rather than being specific to a single application.

All control data are dynamically changeable – by the user or by us.

Metrics are maintained as separate entity rather than specific to each application.

In-memory Columnar Data Management

Our data are particularly suited to this mode of data management.

The resulting compression rates (easily 1:10) are very beneficial to the overall performance.

Upside-down Visualization

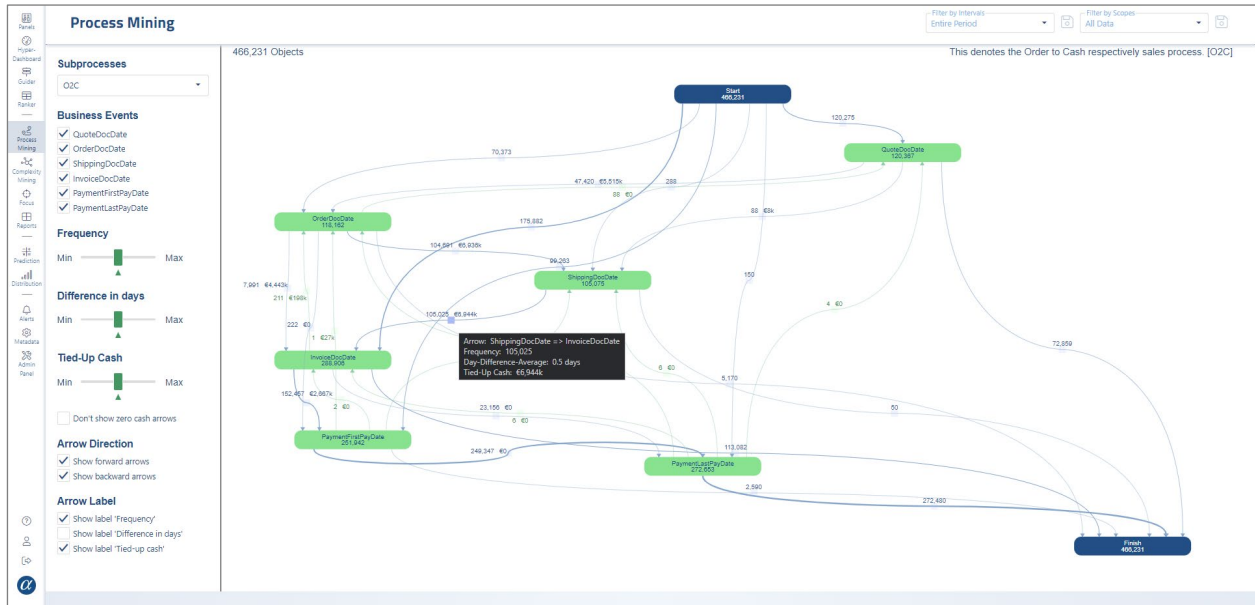
Rows and columns are inverted compared to MS Excel.

This makes patterns (e.g. populations of columns) easier to spot.

New and Changed Capabilities

Process Mining (EXTENDED)

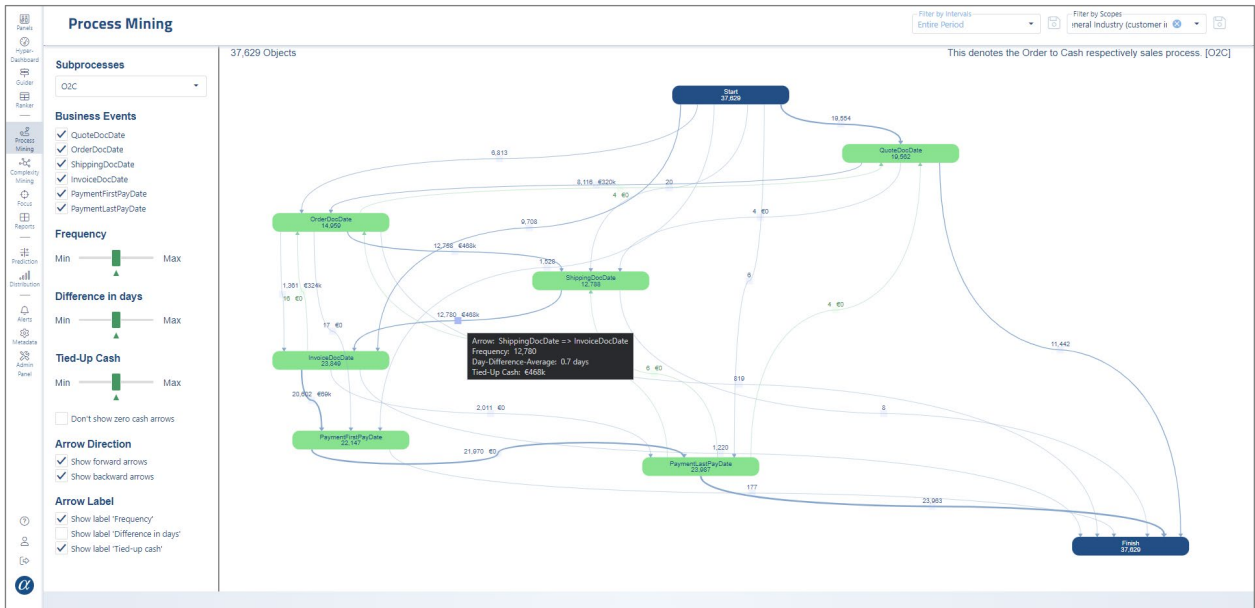
So far, the relevance of a process variant, a select arrow, could be determined by frequency and duration only. Now we have added the tied-up cash as display option.



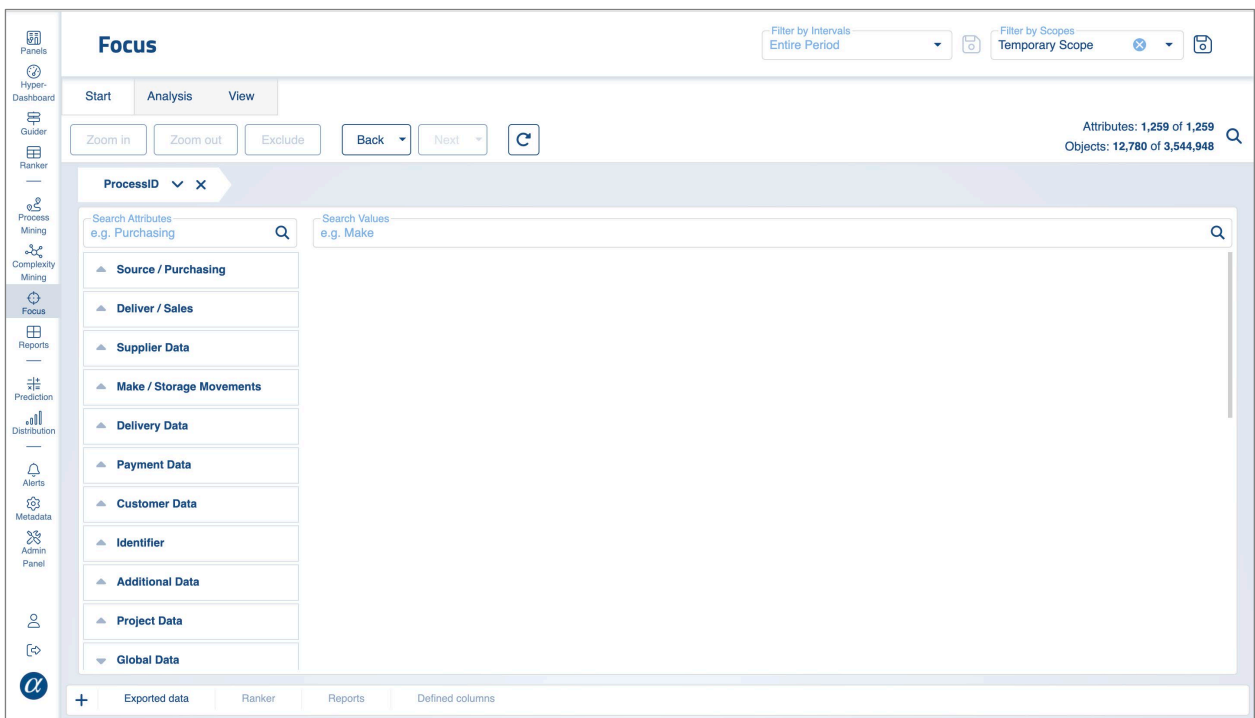
In this case you can see that the process step from shipping to invoice ties up €6,944k capital (though the average duration of this step is less than one day). This means that by optimizing this process step you could free up at most €6,944k cash. This in turn means that you might have this amount of cash earlier in your bank accounts (how much can actually be freed up can be studied further with the simulation in Guider).

We are basing this calculation on how much money customers are owing the company (i.e. DSO). For assessing the respective DIO and DPO values see elsewhere (for example in the Guider or in Panels or Reports).

Subsequent screenshots detail the integration of the various apps with special emphasis on cash (liquidity, working capital).



Here we have the same process step from shipping to invoice showing €468k tied-up cash due to the restriction to the scope "General Industry (customer industry)".



With Focus you can go down to the orders and invoices et al which are creating this effect.

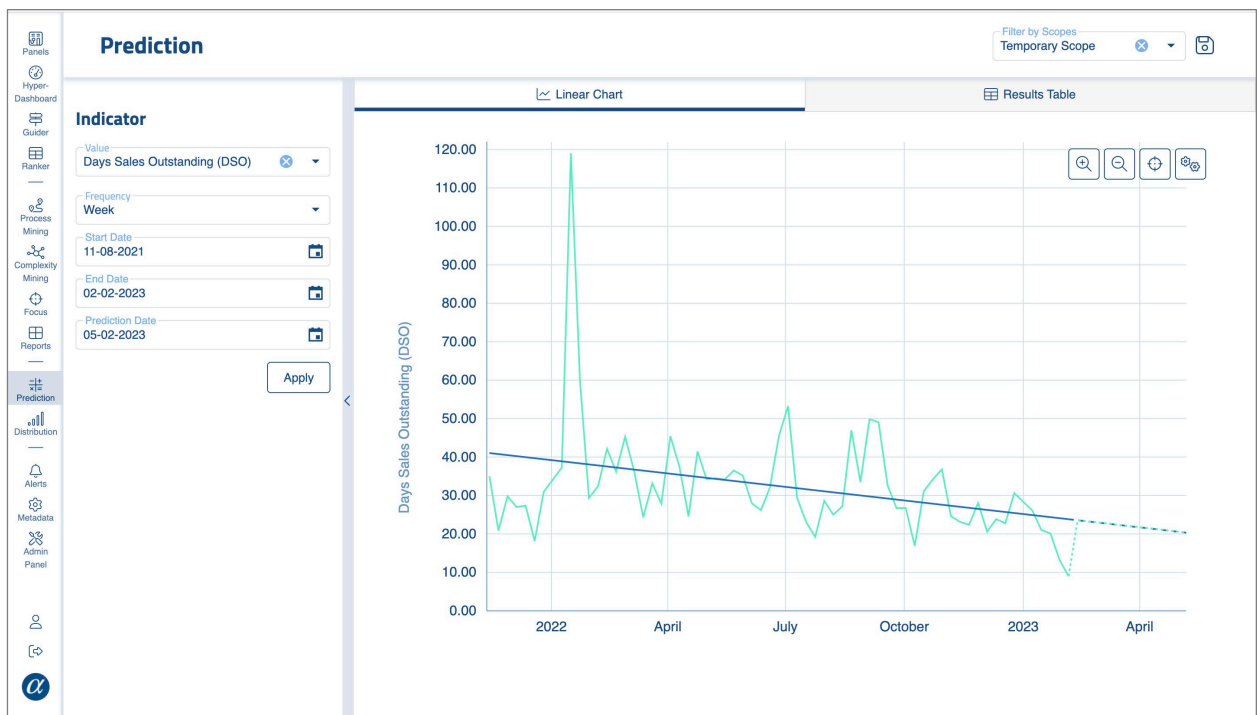
Please note that the number of objects (12,780) in Focus is the same as the frequency in Process Mining (12,780).



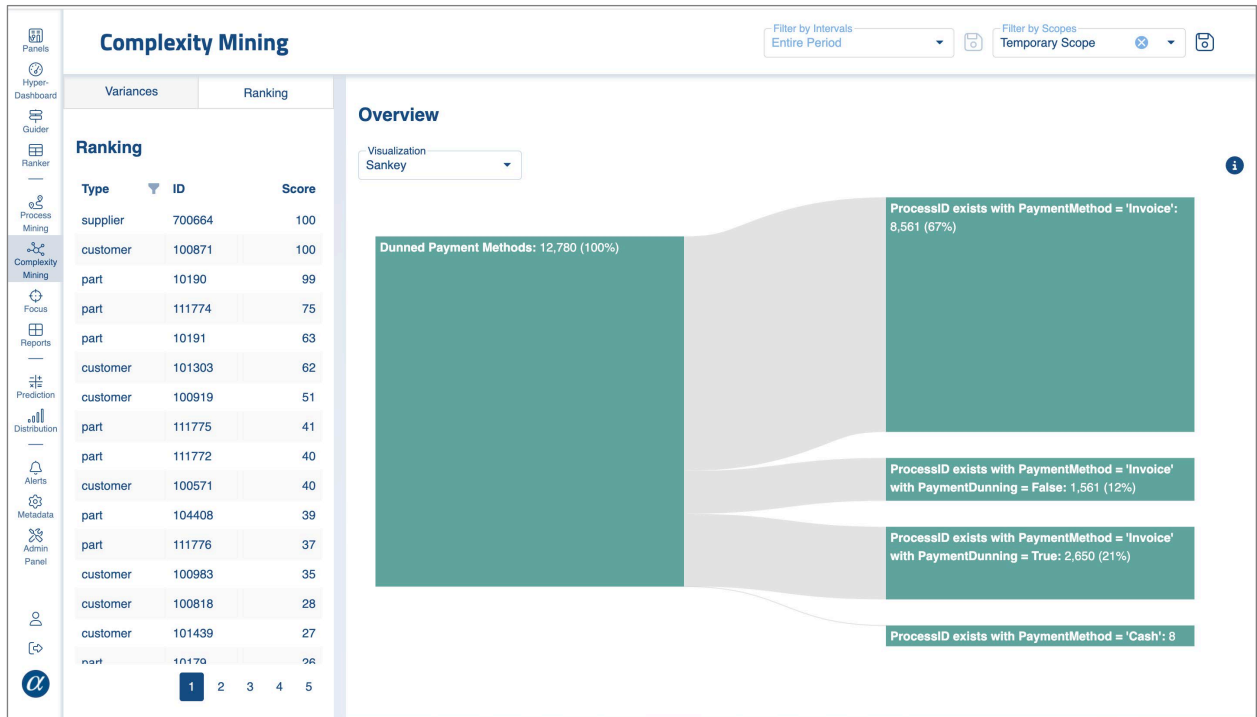
Here you can simulate the potential gain of optimizing the process variants selected via Process Mining with the Guider.

Please note that the Actuals number in the Guider (€467.95k) is the same as in Process Mining (€468k).

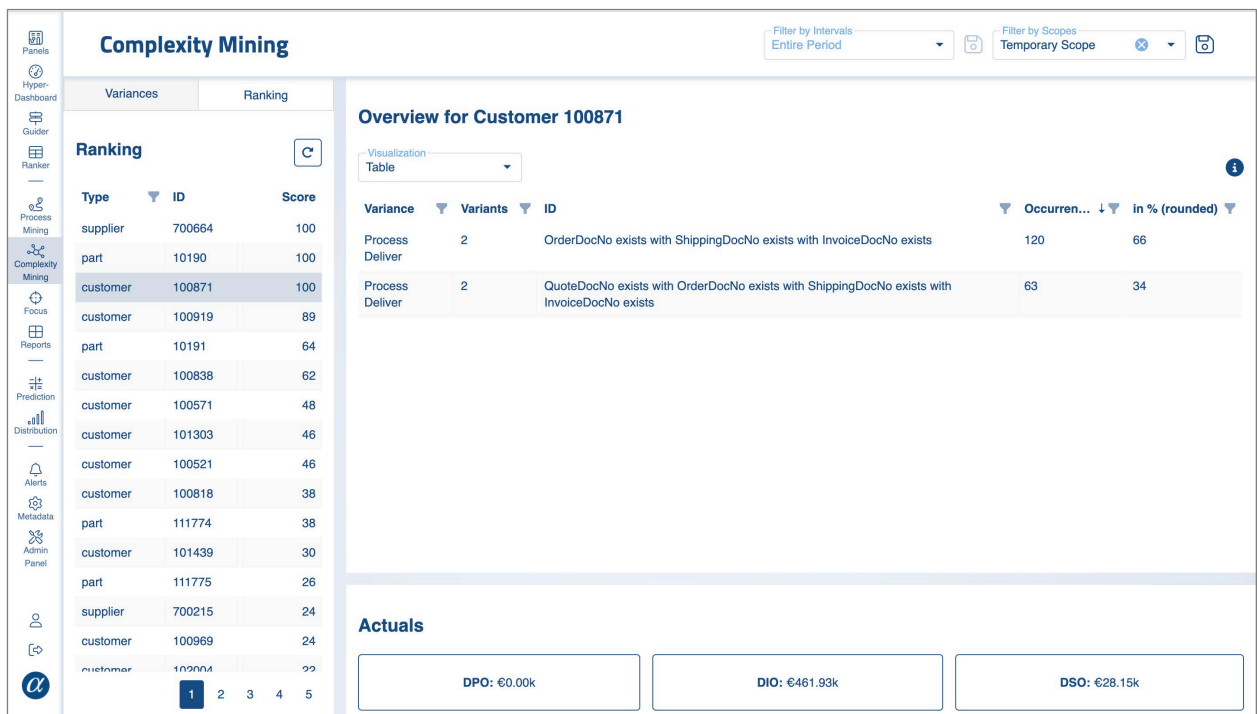
Please note also that the Guider shows the likely cash gain (€223.24k) based on the respective history.



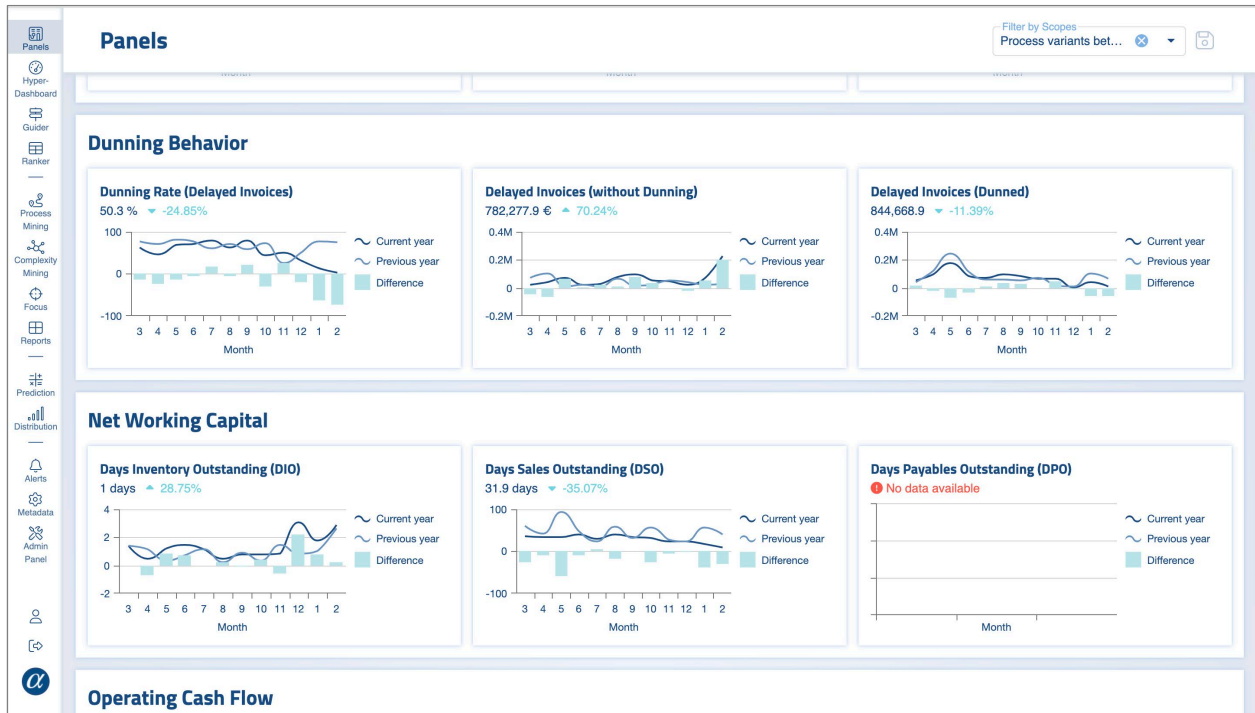
Here you see the monthly DSO trend for the via Process Mining determined process variants subset.



Interestingly enough for these process variants the dunning rate was above 20%. Could this be a meaningful insight?



Here you find out which amount of tied-up cash is related to a certain customer for example.



Of course, Panels can be leveraged as well to understand the development between last and this year for example.

Reports Filter by Intervals: Entire Period Filter by Scopes: Process variants bet...

Reports (SAMPLE) Tied Up Cash

part_id	part_desc1	days_sales_outstanding	days_inventory_outst...
100001	Action Man: Raid on Island X (1999, Atari Europe S.A.S.U., Hasbro Interactive, I	30.33	0.16
100004	Battlestar Galactica (2007, Sierra Online) (Windows, Xbox 360)	96	17.33
100007	Art of Fighting 3: The Path of The Warrior (1996, D4 Enterprise, Inc., SNK Corpo	7	3.29
100008	Alien Disco Safari (2007, Encore, Inc.) (Windows)	113	48
100011	The Adventurers (1992, Core Design Ltd.) (Amiga)	20.99	160.68
100018	BioShock (Limited Edition) (2007, 2K Games, Inc.) (Windows, Xbox 360)	88	3.68
100022	The Duke Nukem Platformer Pack (2013, Interceptor Entertainment ApS) (Macintosh,	28.6	178.74
100023	Alienators: Evolution Continues (2001, Activision Publishing, Inc.) (Game Boy Ad	28.75	328.12
100024	Croc 2 (1999, Fox Interactive, Inc., Interplay Entertainment Corp., KOEI Co., Lt	25	29.14
100028	Eurotour Cycling (2001, Dinamic Multimedia, S.A.) (Windows)	29	2
100030	Dark Vampires: The Shadows of Dust (2006, IncaGold GmbH, IncaGold plc) (Windows)	29.99	2
100032	Microsoft Puzzle Collection Entertainment Pack (2000, Classified Games, Swing! E	28	15
100035	Age of Sail II: Privateer's Bounty (2001, 1C Company, Global Star Software Ltd.,	239.33	7.01
100036	Asea (2005, Reflexive Entertainment Inc., Zone 2 Media GmbH) (Windows)	113	12.75
100040	A Midsummer Daytime's Dream Plus (1990, Bolze) (PC-98)	29	53.5
100050	Addicta Ball (1987, Alligata Software Ltd.) (Amiga, Atari ST, Commodore 64, MSX)	113	732
100051	The Adventurer (1987, Ahoy!/Ion International, Inc.) (Commodore 64)	20.99	347.87

10 25 50 100 1 2 3 4 5 ... 65

And with Reports you could even go down to the individual parts level which are contained in these process variants.

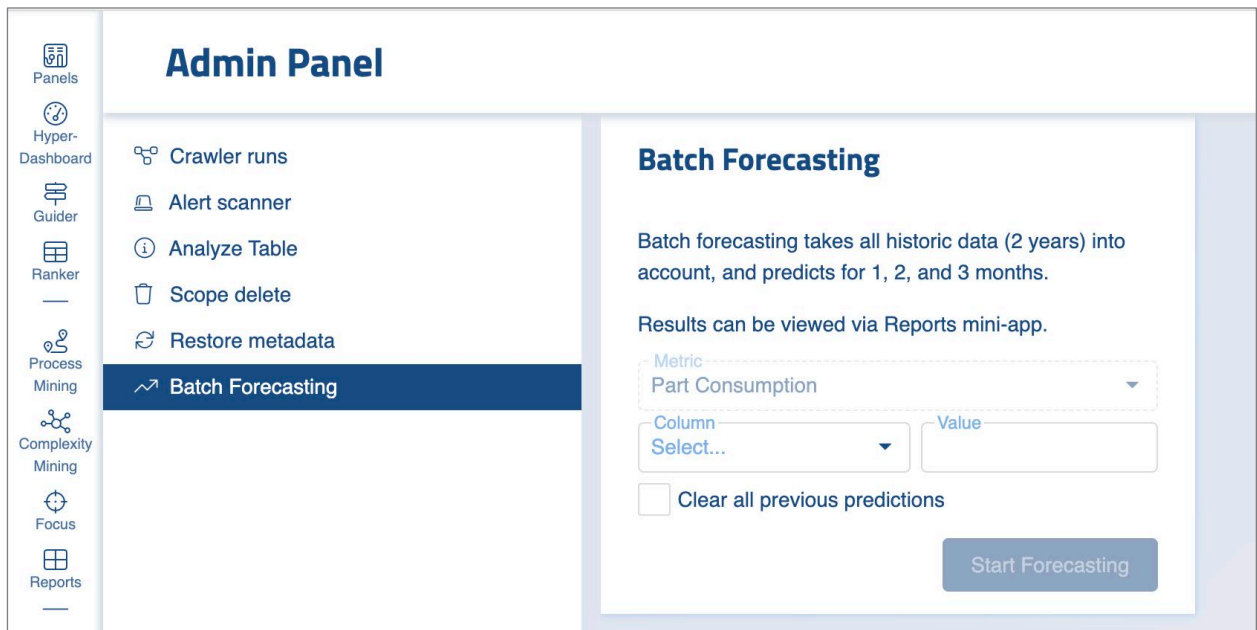
Parts Consumption Mass Forecasting (NEW)

In the context of our customer-co-development initiative STOOOP various new capabilities will emerge over time. These features and functions can be used as-is; i.e. there are no guarantees that they work under all circumstances. In case of further interest don't hesitate to contact us.

With this release we are introducing a mass forecasting capability which runs in background.

Currently it is fixed to the metric "parts_consumption".

It can be launched via the Admin Panel.



The results can be retrieved with the report "(STOOOP) Mass Part Consumption Forecast".

Metadata

Search...

- (SAMPLE) Purchasing Price Analysis
- (SAMPLE) Replenishment Time Analysis
- (SAMPLE) Safety Stock Check
- (SAMPLE) Sales Price Analysis
- (SAMPLE) Slow Moving Parts
- (SAMPLE) Stock Analyzer
- (SAMPLE) Stock Controlled Parts
- (SAMPLE) Supplier ABC Classification
- (SAMPLE) Supplier Aging
- (SAMPLE) Tied Up Cash
- (SAMPLE) Waste Rate Analysis
- (STOOP) Mass Part Consumption Forecast**
- (TILE) Costs
- (TILE) Credit volume
- (TILE) Dunned Invoices
- (TILE) Incoming Orders
- (TILE) Not Dunned Invoices
- (TILE) Order Backlog
- (TILE) Profit
- (TILE) Revenue
- (TILE) Safety Stock
- Changes in Material Price

(STOOP) Mass Part Consumption Forecast

Conflict State: NoConflict

Display Name: (STOOP) Mass Part Consumption Forecast

Internal Name: mass_part_consumption_forecast

Tenant: Global

Description: This report lists the results of the batch forecasting runs.

Query Syntax:


```
select distinct
"GROUP_BY_VALUE" as PartId,
"METRIC",
"HISTORIC_DATA_FILLED",
"HISTORIC_AVERAGE",
"HISTORIC_MIN",
"HISTORIC_MAX",
"SCOPE",
"CATEGORICAL_COLUMN",
"CATEGORICAL_VALUE",
"PREDICTION_1_DATE",
"PREDICTION_1_VALUE",
"PREDICTION_1_UPPER",
"PREDICTION_1_LOWER",
"PREDICTION_2_DATE",
"PREDICTION_2_VALUE",
"PREDICTION_2_UPPER",
"PREDICTION_2_LOWER",
```

The results look like follows.

Reports

Filter by Intervals: Entire Period | Filter by Scopes: All Data

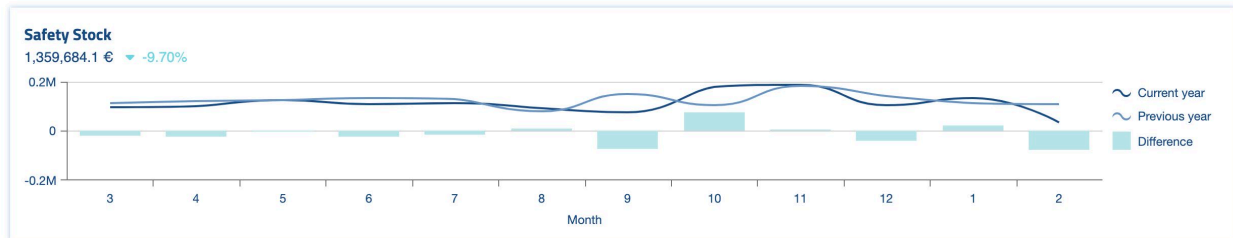
partid	metric	historic_data_filled	historic_average	historic_min	historic_max	scope	categorical_column	categoric
100001	part_consumption	95	34.57	10	132	[[part_type:[4, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19]]]	mvmt_storage_area	100145
100004	part_consumption	45	19.64	8	44	[[part_type:[4, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19]]]	mvmt_storage_area	100145
100005	part_consumption	29	10.29	8	16	[[part_type:[4, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19]]]	mvmt_storage_area	100145
100007	part_consumption	100	278.42	120	556	[[part_type:[4, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19]]]	mvmt_storage_area	100145
100008	part_consumption	54	4.77	4	8	[[part_type:[4, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19]]]	mvmt_storage_area	100145
100010	part_consumption	25	19.33	4	48	[[part_type:[4, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19]]]	mvmt_storage_area	100145
100011	part_consumption	100	264.63	16	620	[[part_type:[4, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19]]]	mvmt_storage_area	100145
100013	part_consumption	37	26.67	20	40	[[part_type:[4, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19]]]	mvmt_storage_area	100145
100015	part_consumption	100	56.67	20	220	[[part_type:[4, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19]]]	mvmt_storage_area	100145
100019	part_consumption	58	41.14	16	128	[[part_type:[4, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19]]]	mvmt_storage_area	100145
100021	part_consumption	79	22.63	4	124	[[part_type:[4, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19]]]	mvmt_storage_area	100145
100022	part_consumption	62	8.33	4	28	[[part_type:[4, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19]]]	mvmt_storage_area	100145
100023	part_consumption	66	8.88	4	32	[[part_type:[4, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19]]]	mvmt_storage_area	100145
100026	part_consumption	54	9.39	4	26	[[part_type:[4, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19]]]	mvmt_storage_area	100145
100029	part_consumption	29	4.86	2	10	[[part_type:[4, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19]]]	mvmt_storage_area	100145
100030	part_consumption	29	5.14	-4	8	[[part_type:[4, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19]]]	mvmt_storage_area	100145
100031	part_consumption	75	18.44	4	32	[[part_type:[4, 6, 7, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19]]]	mvmt_storage_area	100145

10 25 50 100 | 1 2 3 4 5 ... 63

Noteworthy Extensions and Improvements

To keep this release letter short and crisp we are no more outlining every change. But sometimes new developments deem to be interesting to everybody.

This time we want to point a new tile "safey_stock" which shows the development of safety stock in value. A good number of our customers are actually longing for such information.



Also following Reports have been improved:

- (SAMPLE) Part Aging
- (SAMPLE) Belated Customer Invoices
- (SAMPLE) Premature Supplier Payments
- (SAMPLE) Payment Dunning Analysis
- (SAMPLE) Supplier ABC Classification
- (SAMPLE) Tied Up Cash
- (SAMPLE) ABC/XYZ Analysis
- (SAMPLE) Customer ABC Classification

Newly Exported Columns

Most of the added columns have been requested by our customers. They will become available as soon as new data exports and loads have been performed. Based on these data refreshes we will research the feasibility of new default metrics. Those would become available with the next release provided they deem valuable.

Display Name	Description
FAMainPostControlAccount	Control account for booking #ERP-Origin: FB_Buchung.Sammelkonto
FAMainPostControlAccountDesc	Control account (description) for booking #ERP-Origin: S_SammelKontoSpr.Bezeichnung
FAMainPostControlPosting	Shows if control posting is active #ERP-Origin: S_Konto.Sammelbuchung
FAMainPostOIGuidance	Shows if open items must exist for booking #ERP-Origin: S_Konto.OP_Fuehrung
PurStockReclineCheckQM	Shows if stock receipt line has quality check #ERP-Origin: stamm.base.cls.SBCQualityCheckSvc:prpoIn-stance:llsPartQMRelevant
PurStockReclineCheckStateQM	Check state description of stock receipt line #ERP-Origin: ACM_SB_QualityCheckState_desc
PurStockReclineQtyConditional	Conditional quality quantity of stock receipt line #ERP-Origin: dQMQuantities[3]
PurStockReclineQtyNotOK	Not ok quantity of stock receipt line #ERP-Origin: dQMQuantities[2]
PurStockReclineQtyOK	Good quality quantity of stock receipt line #ERP-Origin: dQMQuantities[1]
ResPool	Resource pool id #ERP-Origin: PMM_EmployeePool.PoolResource_ID
ResPoolDesc	Resource pool id (description) #ERP-Origin: M_RessourceSpr.Bezeichnung
ResPoolSequence	Resource pool sequence #ERP-Origin: PMM_EmployeePool.Priority

Compatibility

NEMO is compatible with all ERP releases from 6.1 onwards.

Functional Limitations

Following functionality is restricted as of now:

- Calculations of Driver and Indicators are not based on Intervals yet.
- Stock movements for material withdrawals are not yet exported in Production.
- Warehouse movements for material storage are not yet exported in Production.

Component Status

- N.A.

Known Issues

- Very large temporary scopes created with Process Mining might fail in other apps.

Documentation

Apart from this Release Letter, the following documentation is available.

- NEMO Glossary 2022-02-03 (no update)
- NEMO Data Structure 2022-03-31 (updated)
- NEMO Formula Syntax 2022-03-03 (no update)

Availability

All production environments have been updated already.