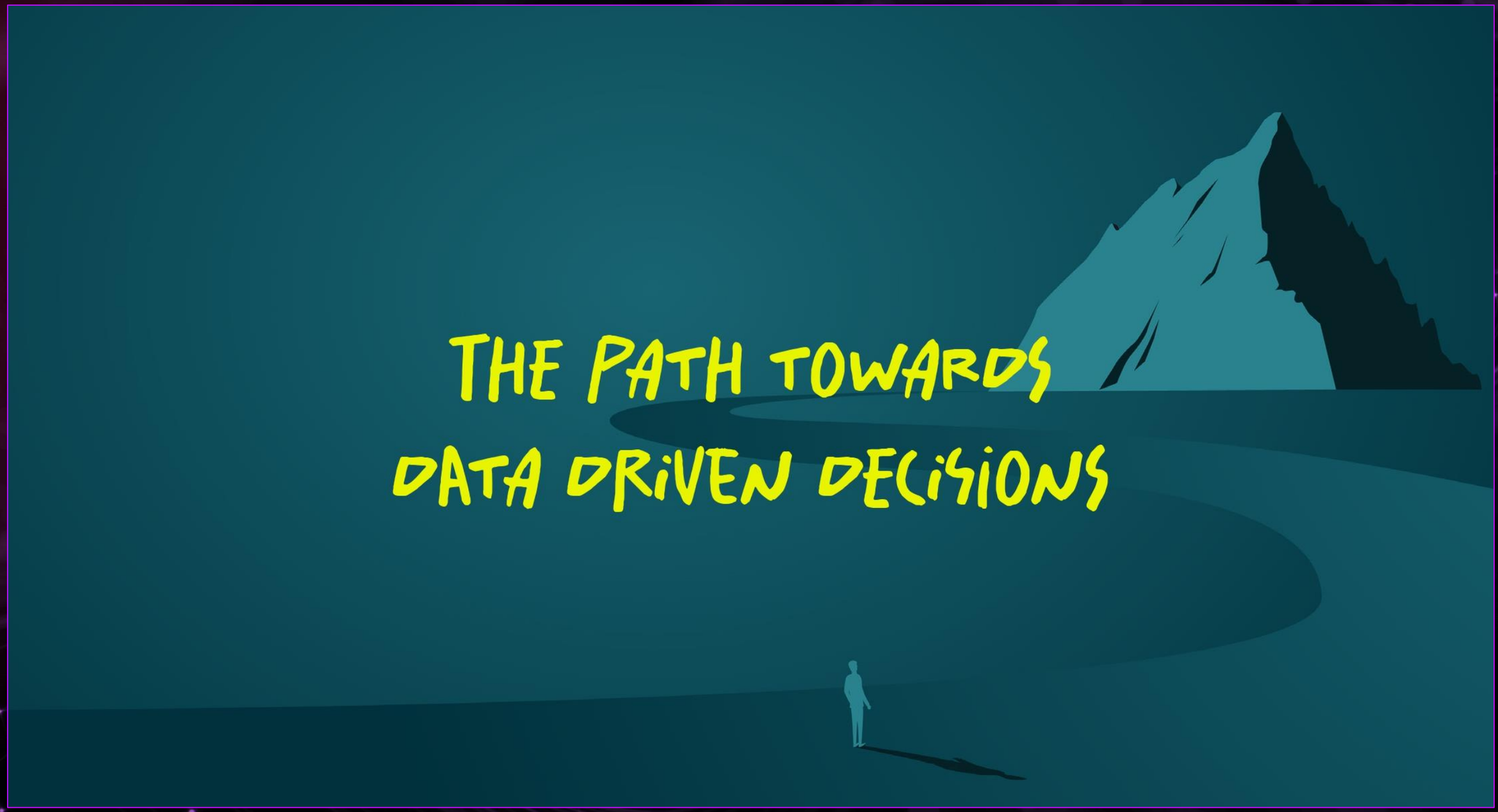
Data driven decisions Port of Antwerp Bruges

Port of Antwerp Bruges

HITCH

timeseer.AI

ASK X CONFERENCE



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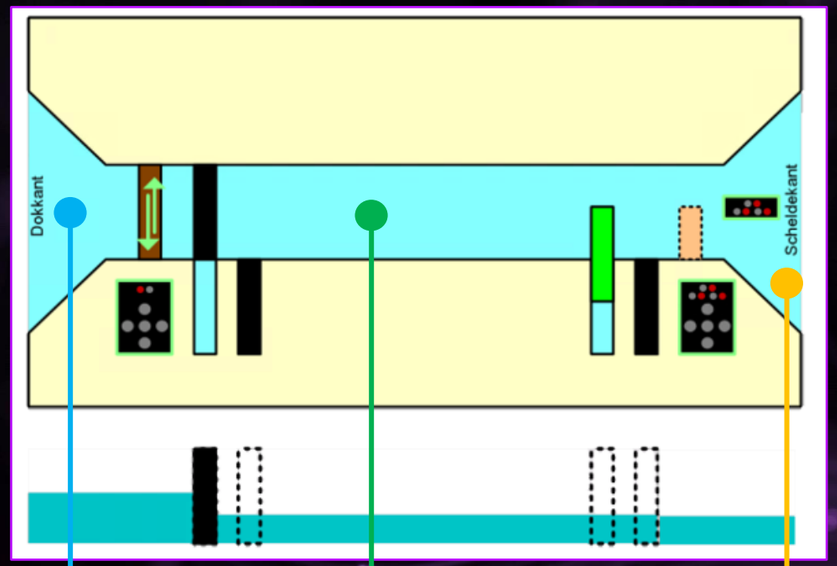
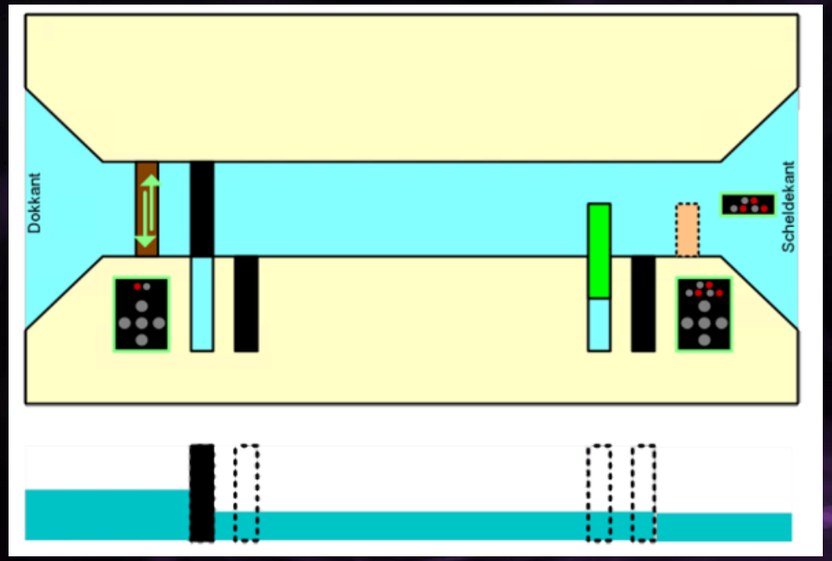
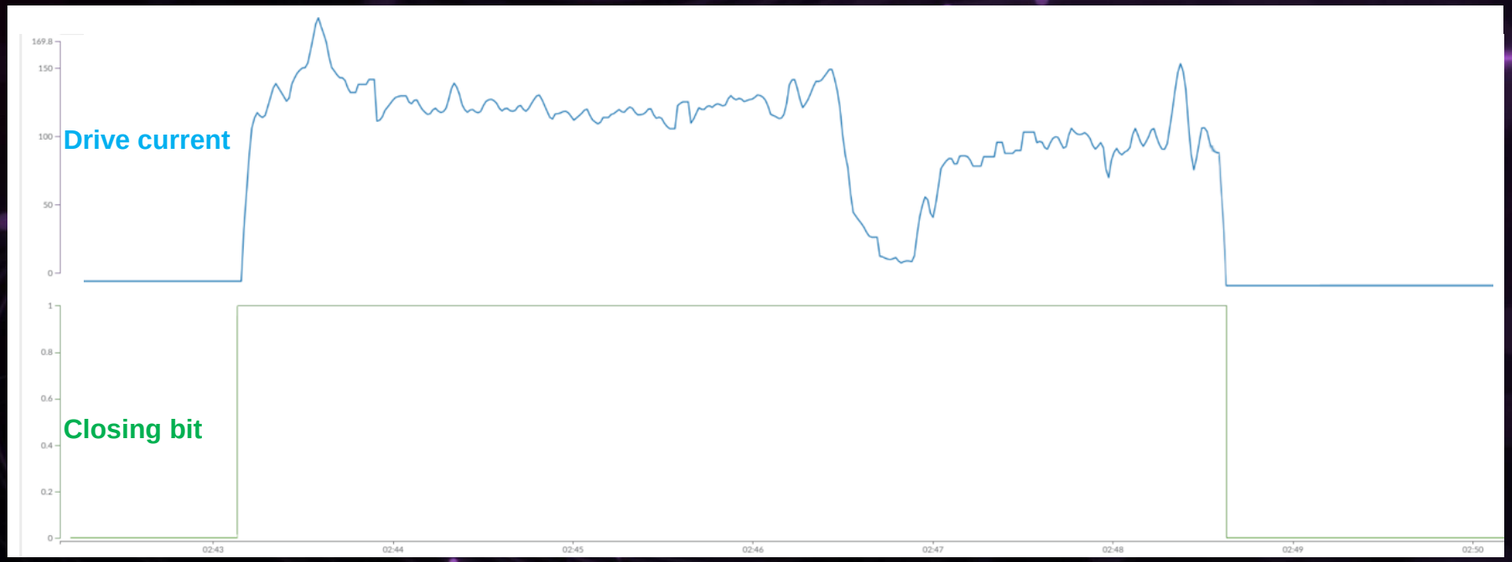

Dokkant
Scheldekant

Dok
Sluis
Schelde
Water level (mTAW)
Time
4/4/2023
11:48:05 PM
± 2 days
4/7/2023
12:03:16


Dokkant
Scheldekant


Drive current
Closing bit
Time

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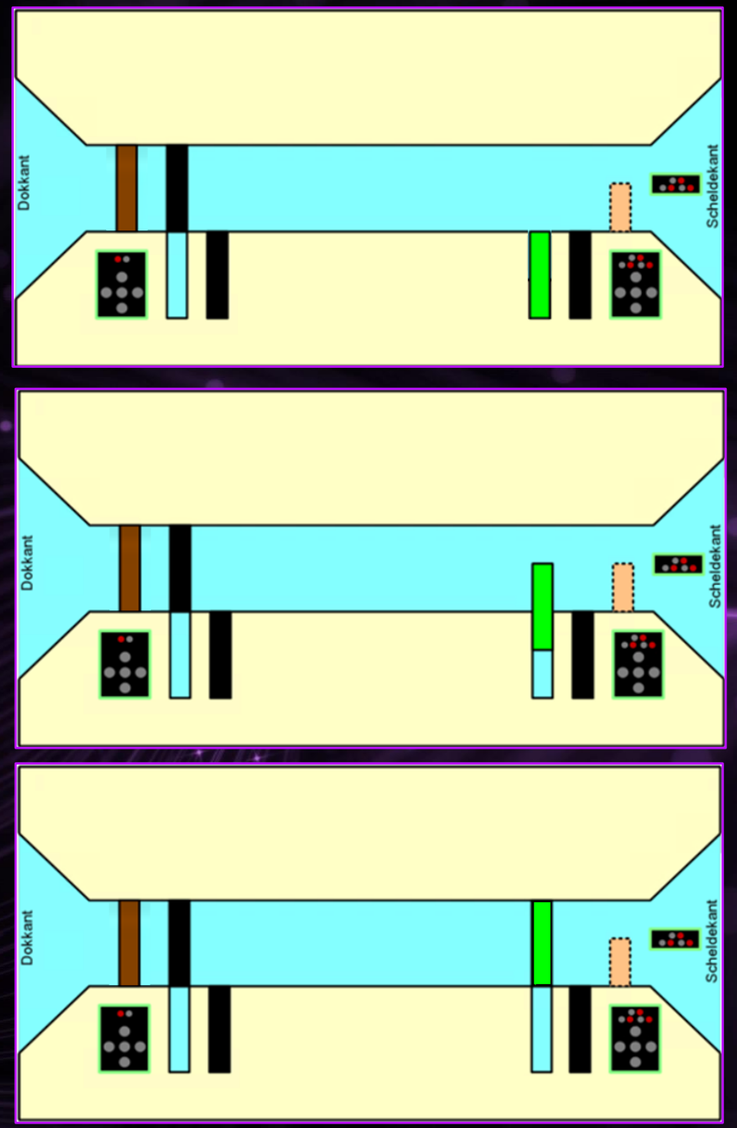
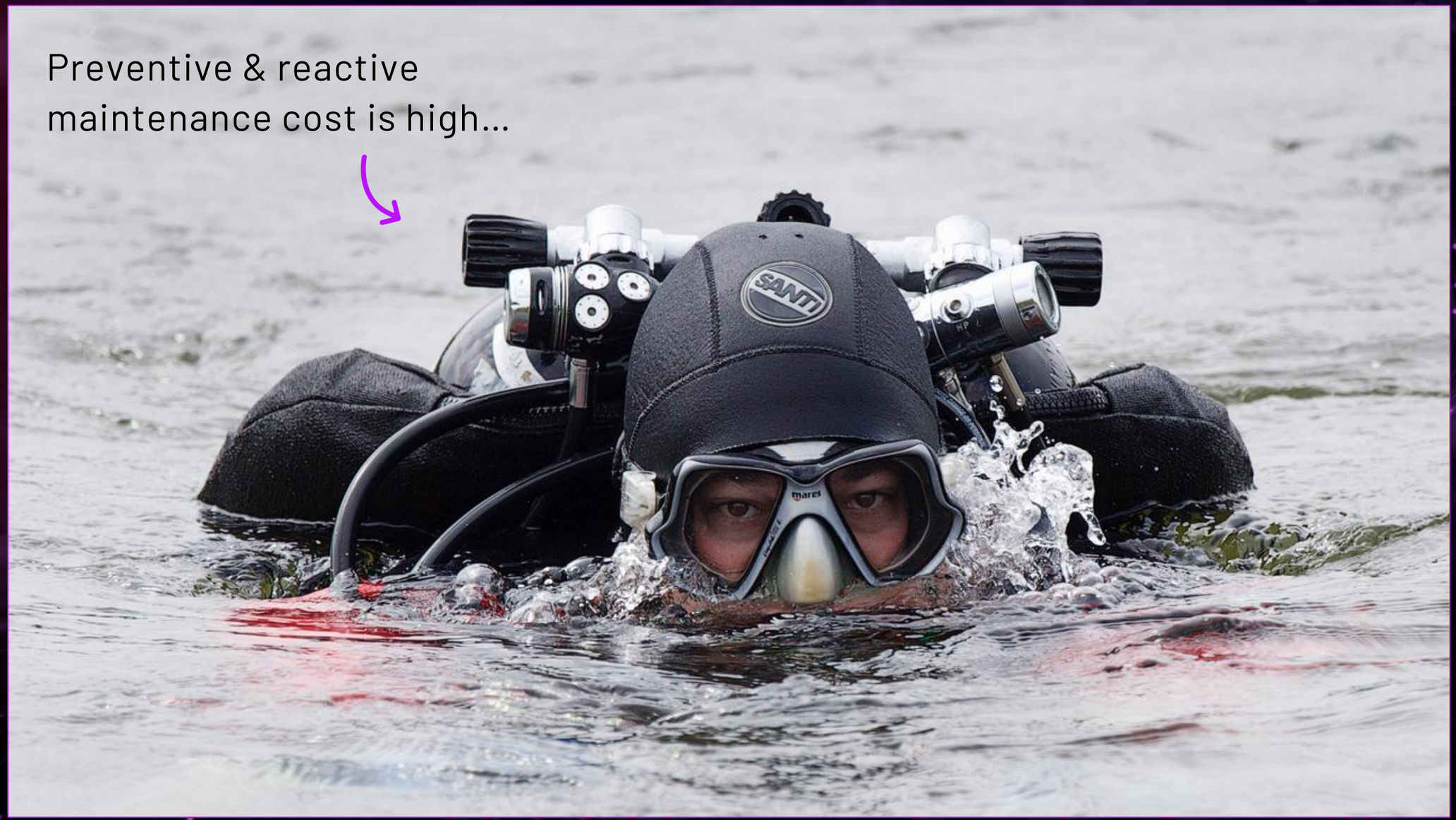


Door open

Door closing

Door closed

Preventive & reactive maintenance cost is high...



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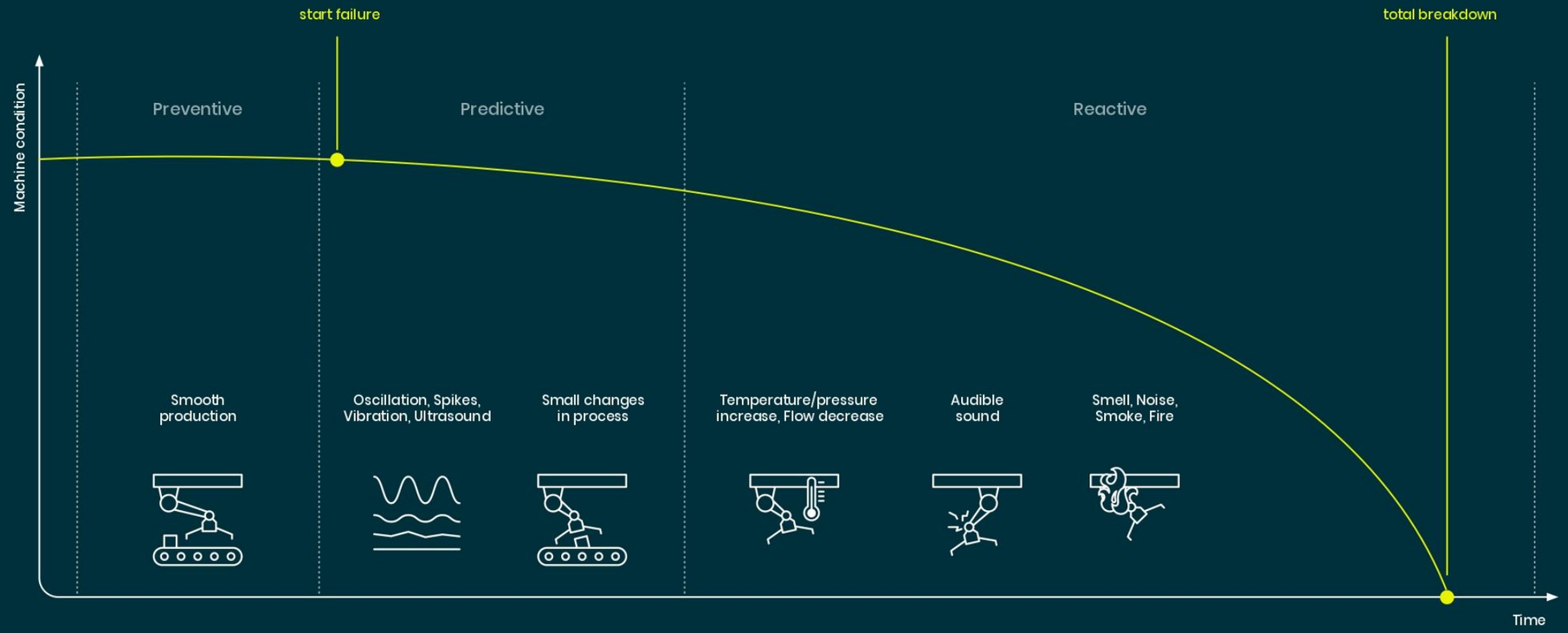
The power of predictive maintenance



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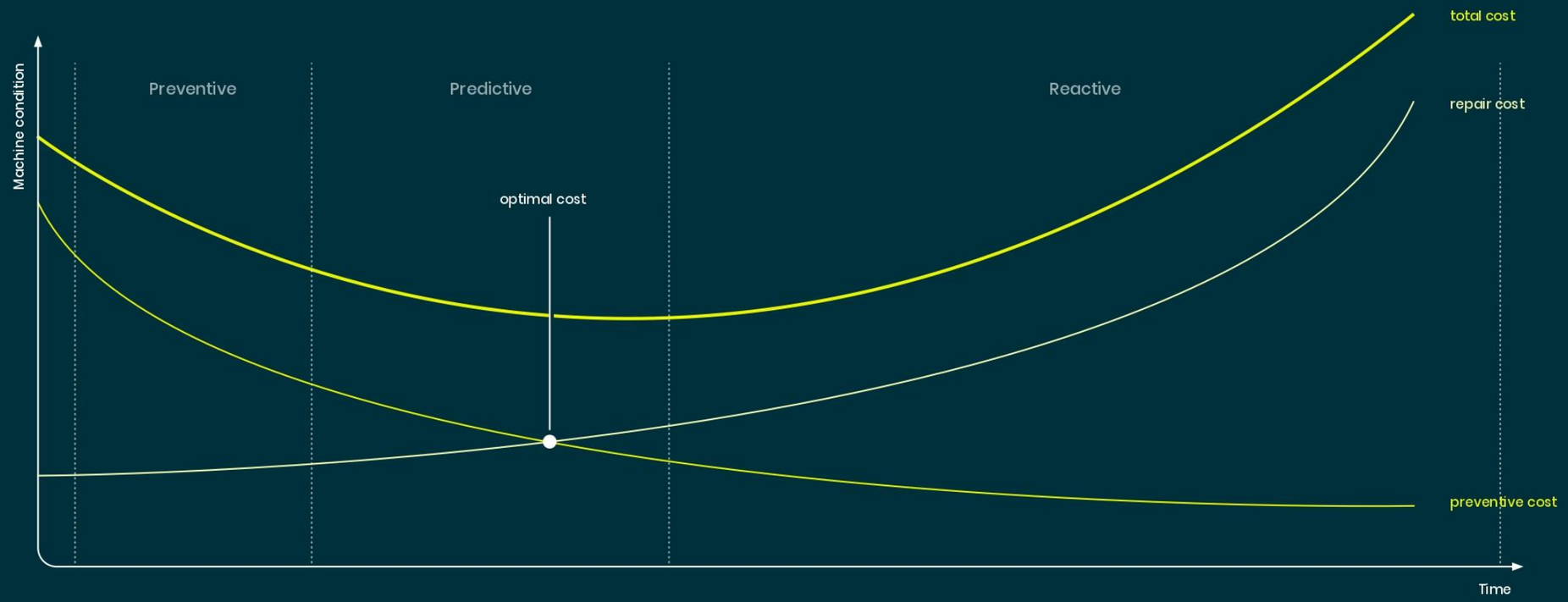
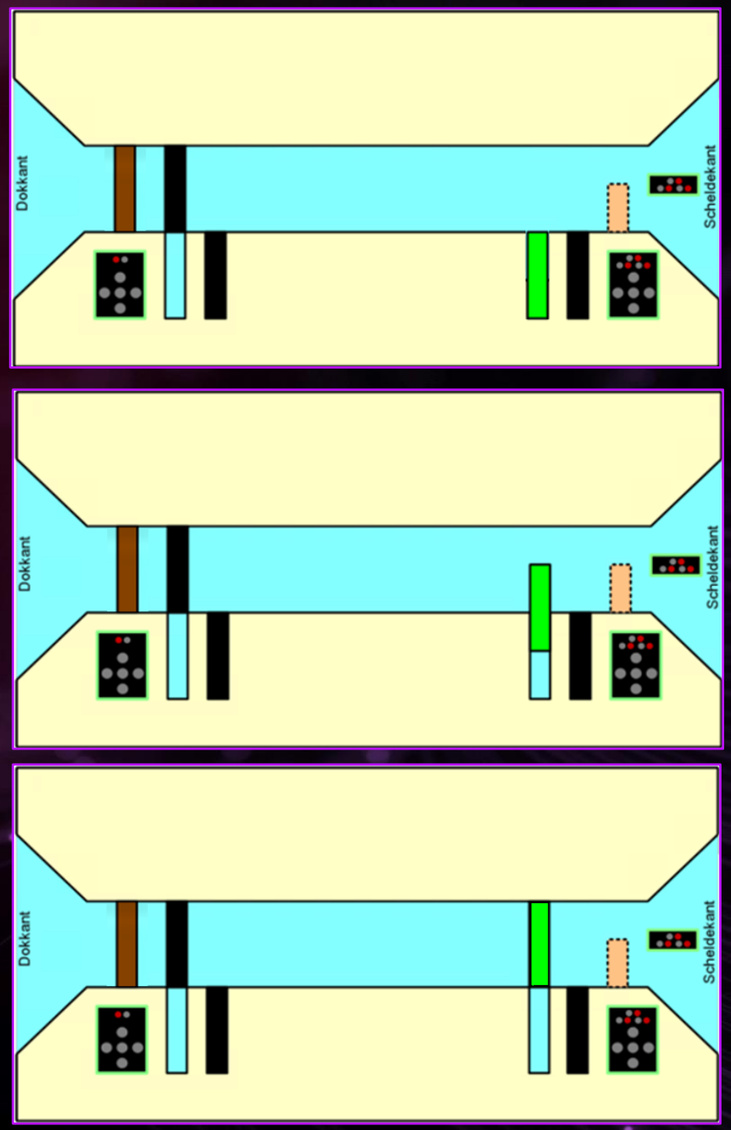
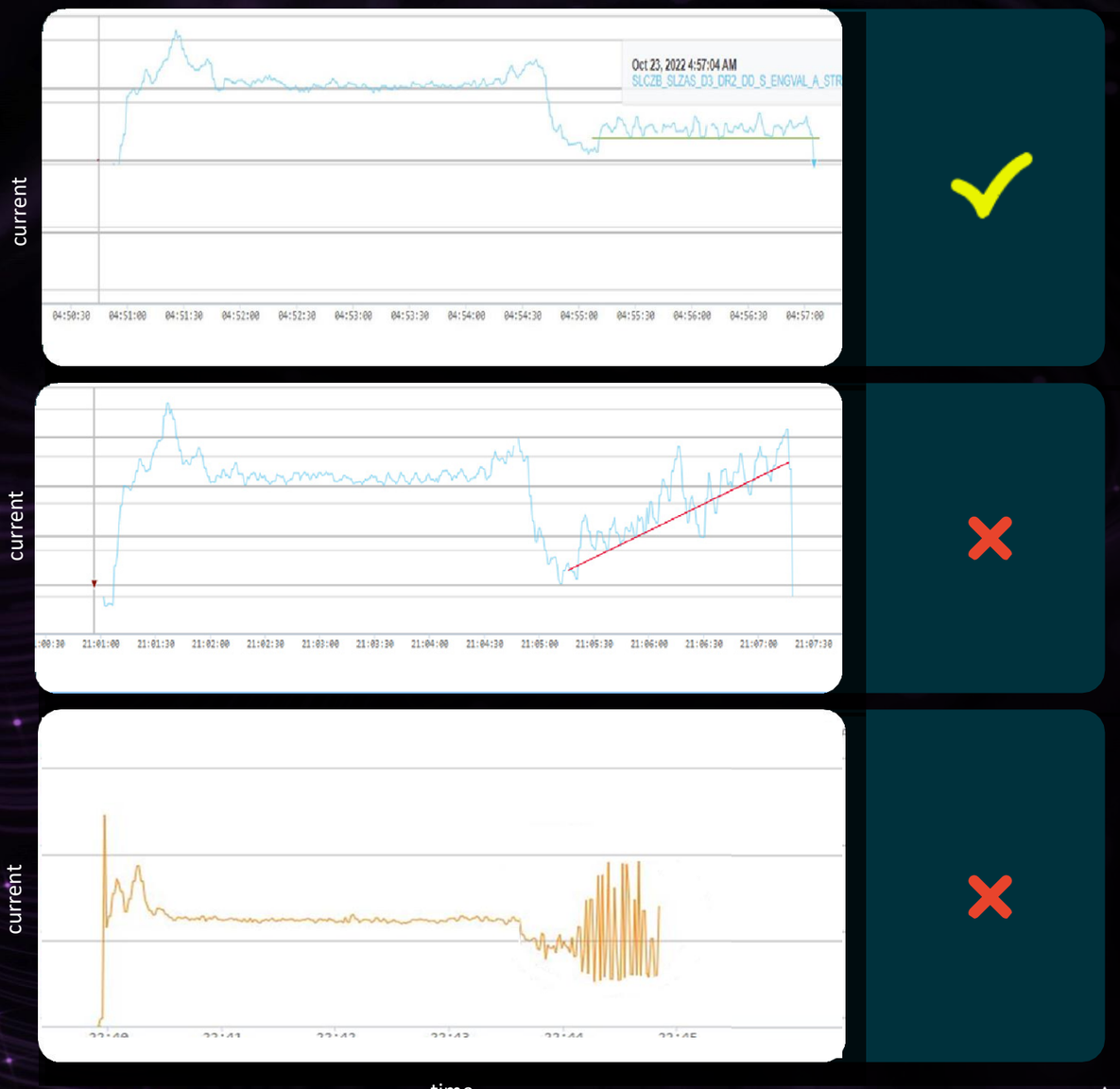
The disadvantage of preventive/reactive maintenance




Dokkant
Scheldekant
Dokkant
Scheldekant
Dokkant
Scheldekant


current
Oct 23, 2022 4:57:04 AM
current
current
time

How?

Data Collection → Data Cleaning → Feature Extraction → Machine Learning → Decisions

- Drive current
- Water level
- Door mass
- Opening/closing bit
- Maintenance records
- Salinity

How?

- Drive current
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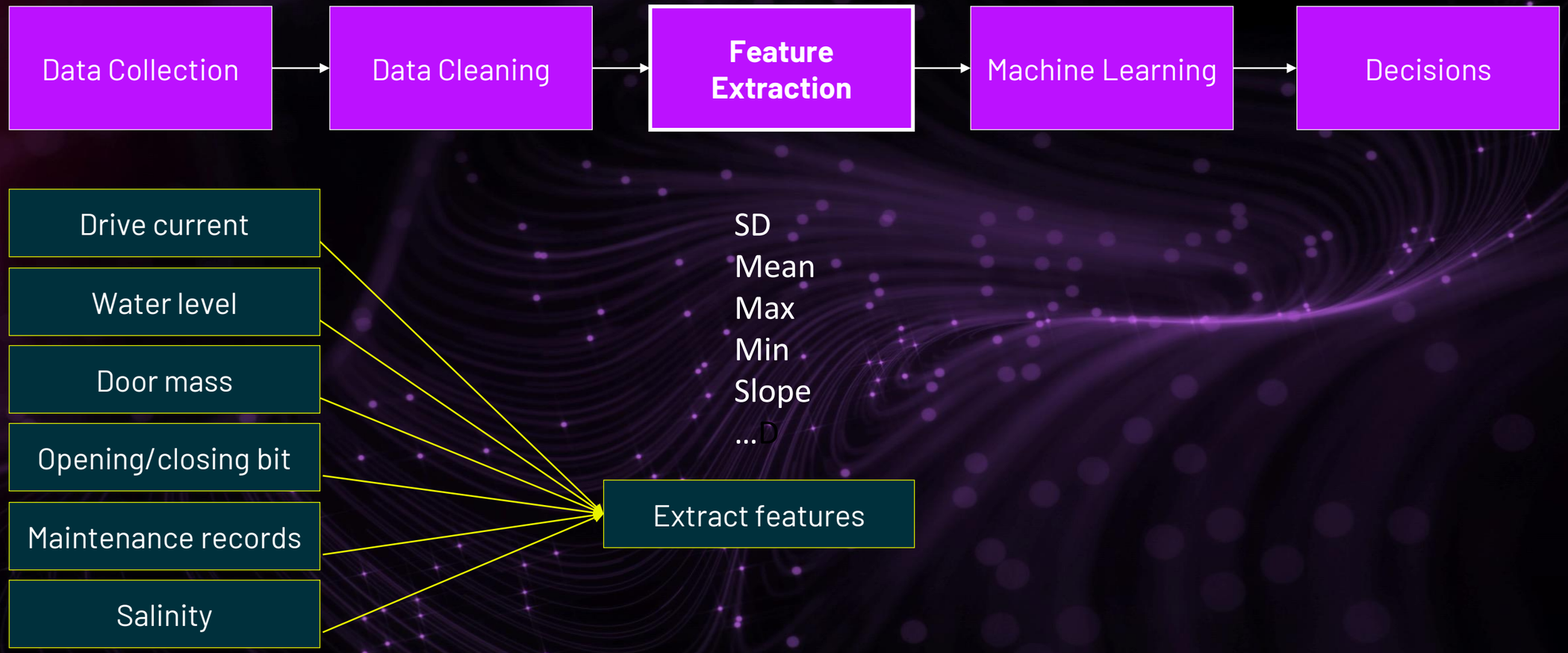
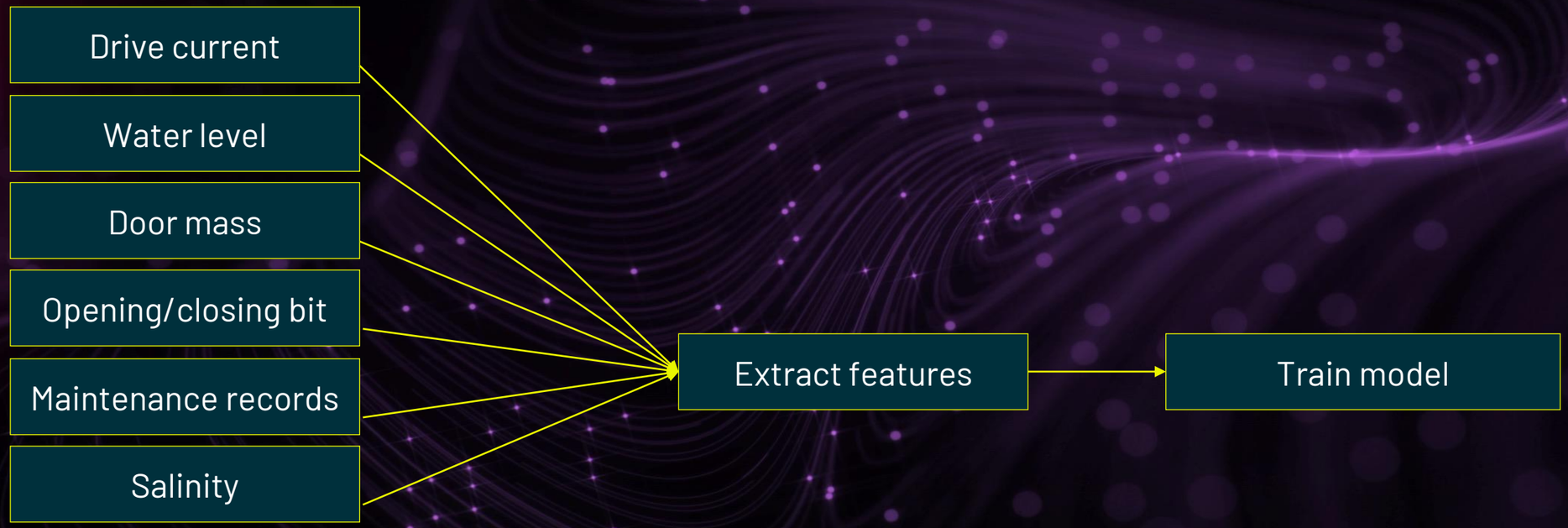
How?


Data Collection
Data Cleaning
Feature Extraction
Machine Learning
Decisions
Drive current
Water level
Door mass
Opening/closing bit
Maintenance records
Salinity
Extract features
SD
Mean
Max
Min
Slope
…D

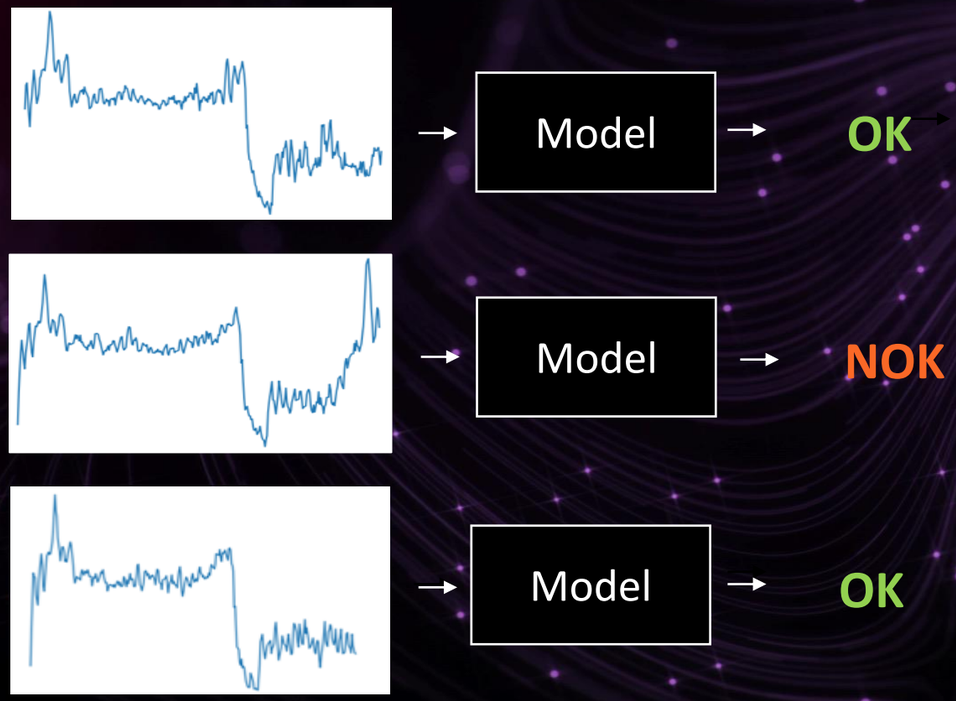
How?

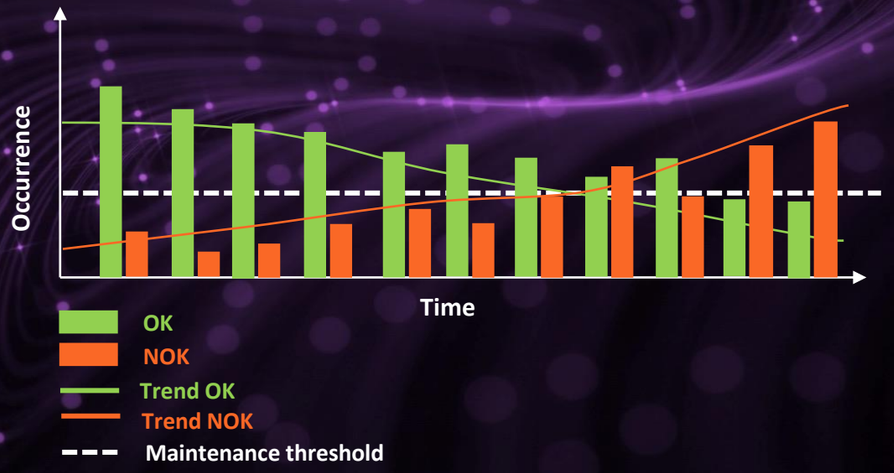
Data Collection
Data Cleaning
Feature Extraction
Machine Learning
Decisions


Drive current
Water level
Door mass
Opening/closing bit
Maintenance records
Salinity
Extract features
Train model

How?

Data Collection → Data Cleaning → Feature Extraction → **Machine Learning** → Decisions





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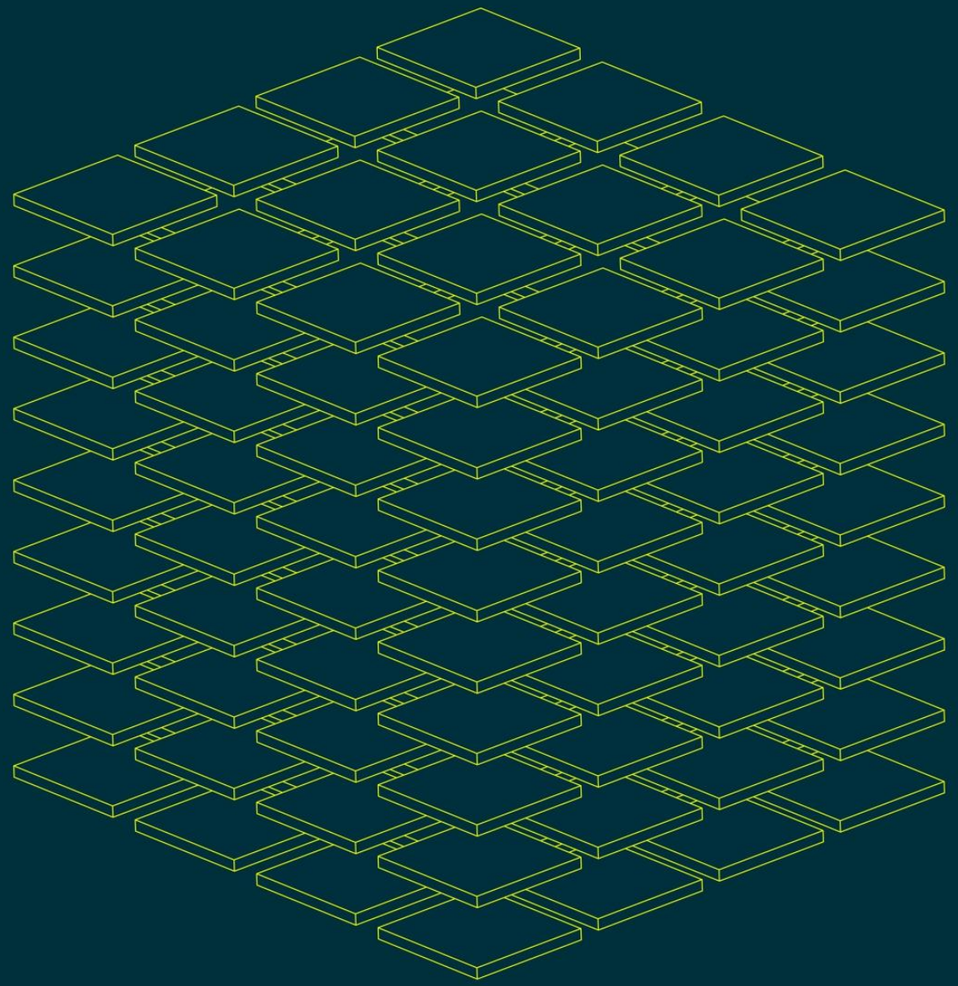
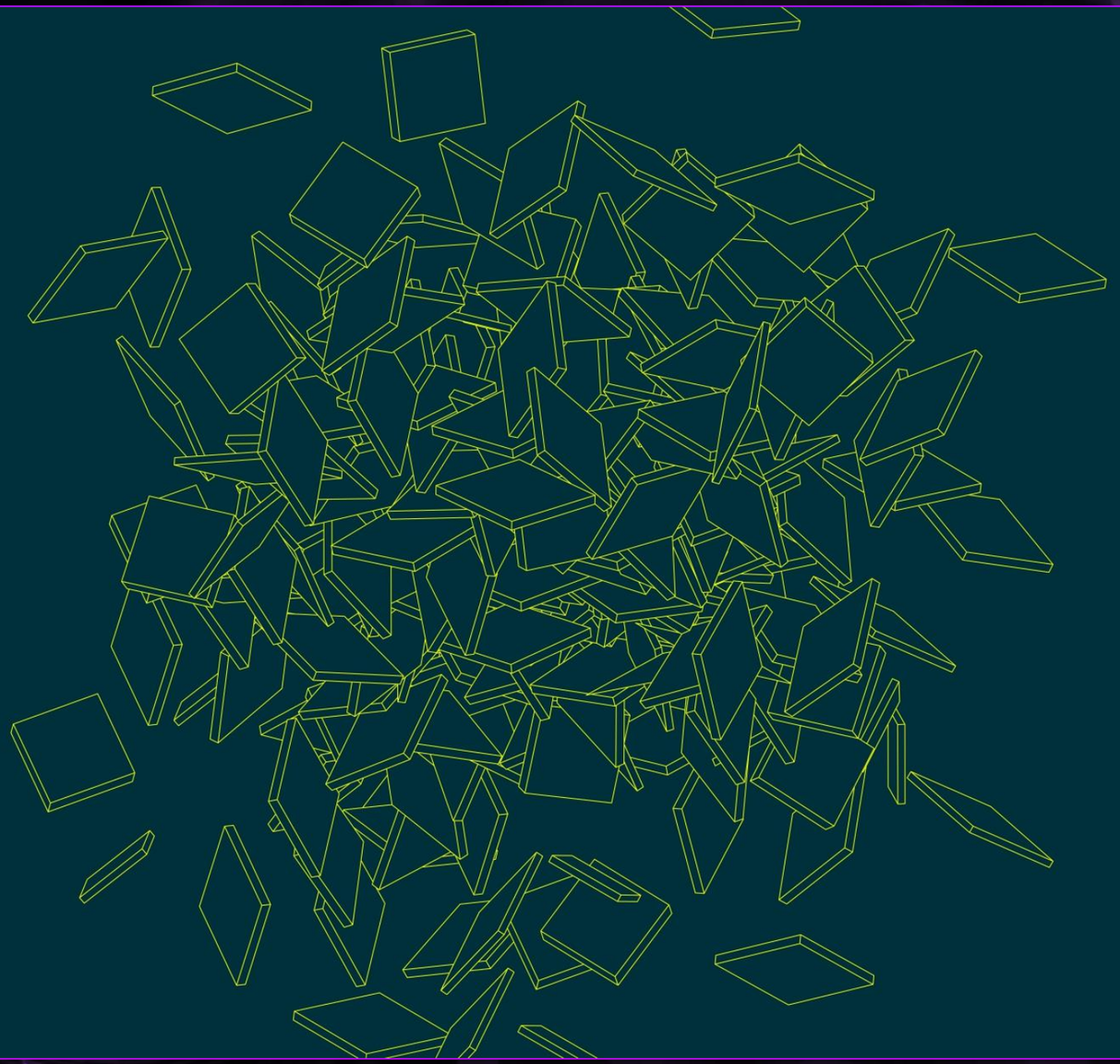
Your data

What you think
it looks like



Your data

What it actually looks like



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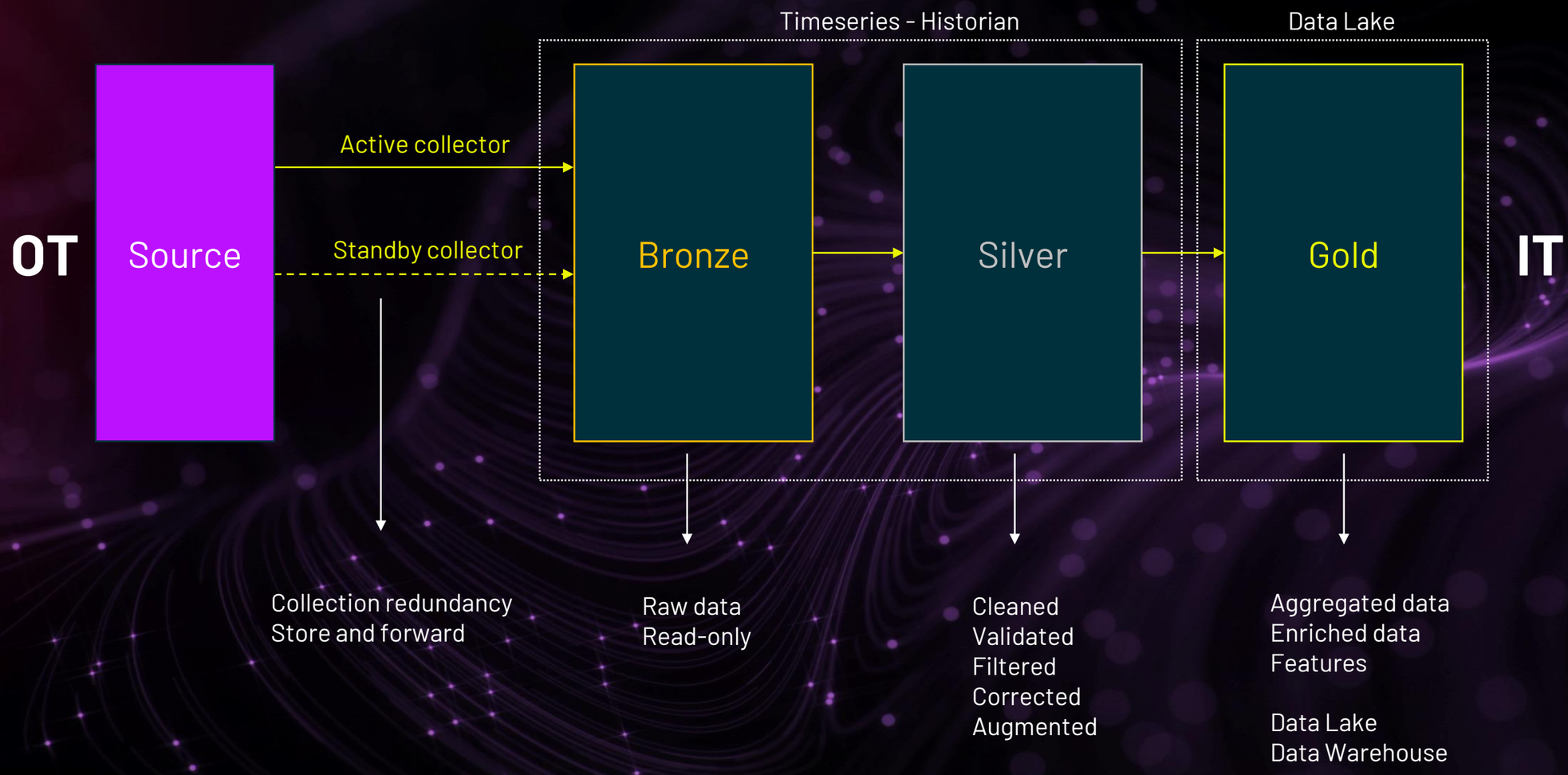
Data Quality: Time series data pipeline



Data Quality: Time series data pipeline

Stale data

Spikes/outliers

Missing values

Sensor malfunction

Data pipeline failure

Redundant system differences

Sequence validation

Bad data quality

Calculations
Stored procedures
[illegible] corrections
Manual [illegible]
Emails
Alarms

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Use cases

The Machine Learning Case,
Reporting,
Day to day operations in OT

3

Sprints

1

Happy Customer

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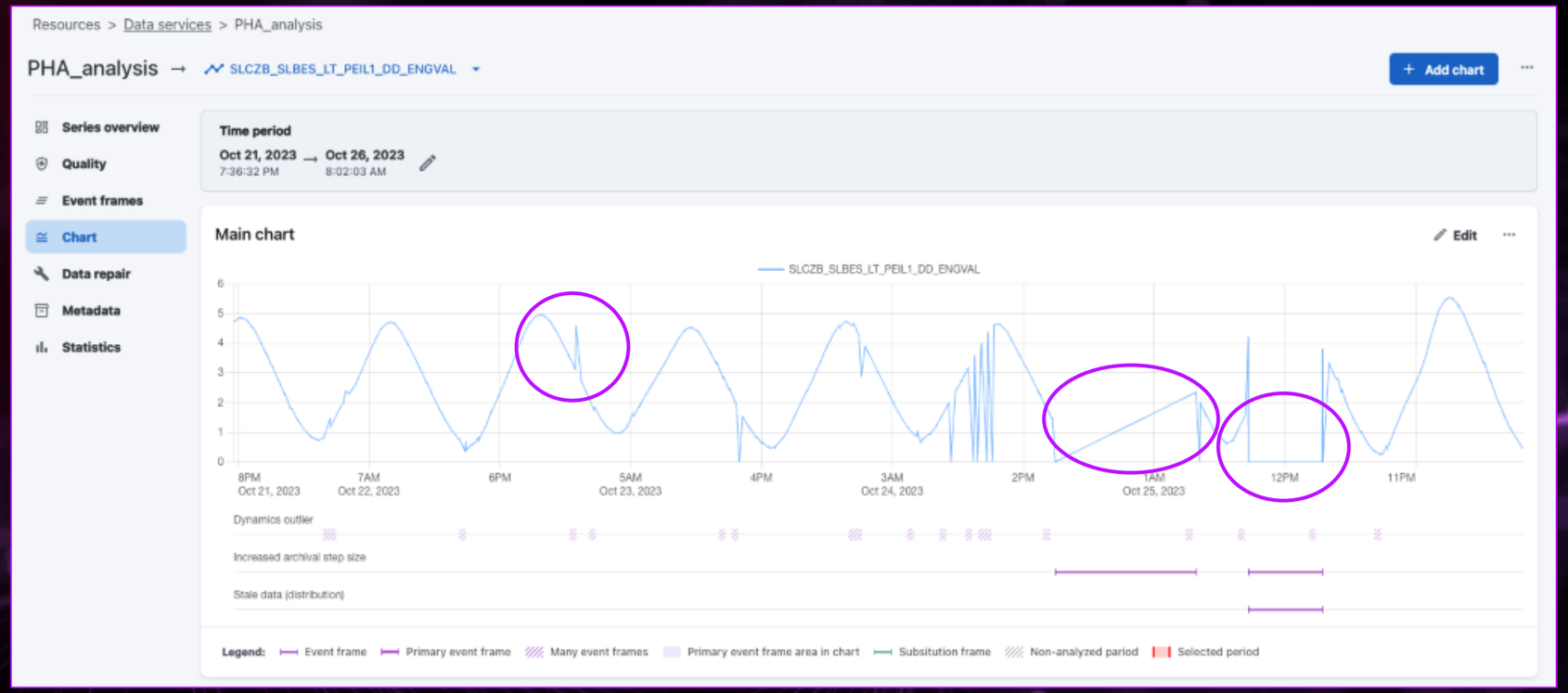
River Level


Resources > Data services > PHA_analysis
PHA_analysis → SLCZB_SLBES_LT_PEIL1_DD_ENGVAL
+ Add chart
Series overview
Quality
Event frames
Chart
Data repair
Metadata
Statistics
Time period
Oct 21, 2023 7:36:32 PM → Oct 26, 2023 8:02:03 AM
Main chart
Edit
SLCZB_SLBES_LT_PEIL1_DD_ENGVAL
6
5
4
3
2
1
0
8PM Oct 21, 2023
7AM Oct 22, 2023
6PM
5AM Oct 23, 2023
4PM
3AM Oct 24, 2023
2PM
1AM Oct 25, 2023
12PM
11PM
Dynamics outlier
Increased archival step size
Stale data (distribution)
Legend: Event frame Primary event frame Many event frames Primary event frame area in chart Subsitution frame Non-analyzed period Selected period

River Level : Monitoring

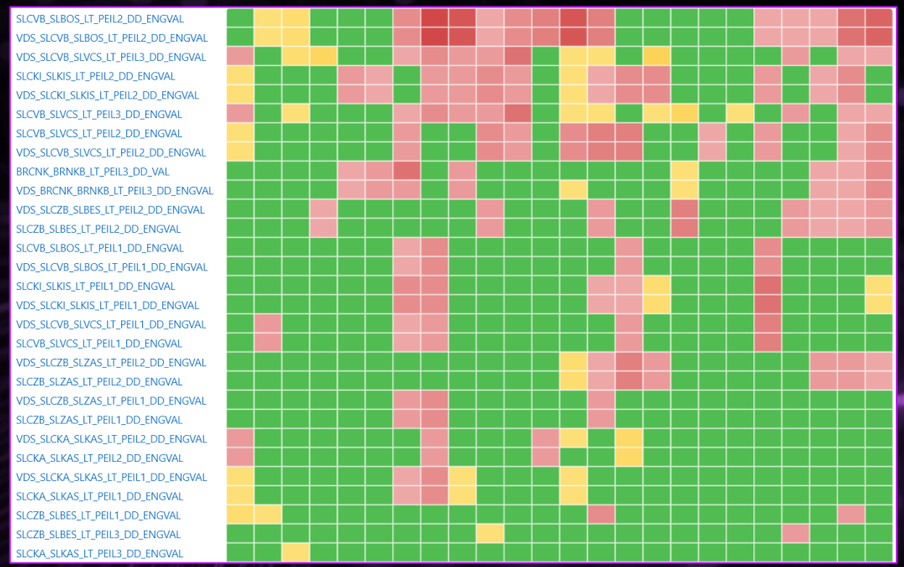
Summary

39 series

Critical	At risk	Healthy	Unknown	Reliability
28	1	10	0	99%

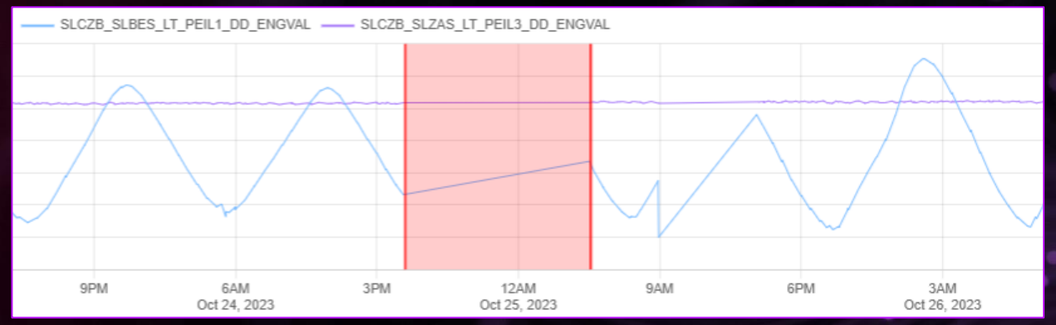
Data quality PoA - Window

Name	Score	Series with issues	Event frames
Availability poa	99 %	28	195
Integrity poa	100 %	0	0
Timeliness	100 %	0	0
Validity poa	99 %	25	203

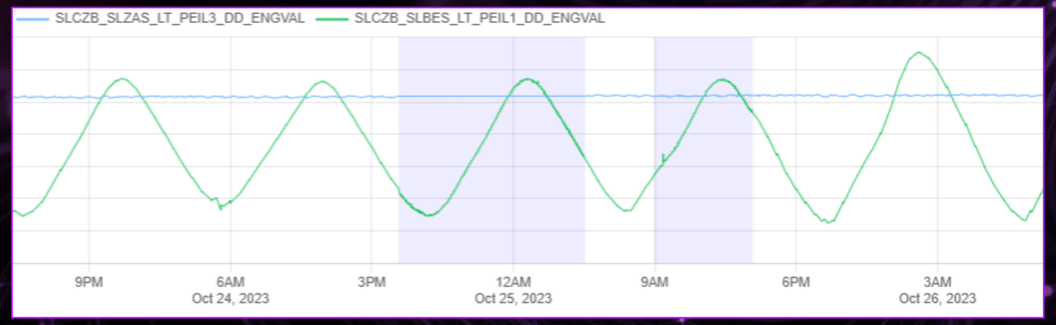


River Level : Cleaning

Before



After



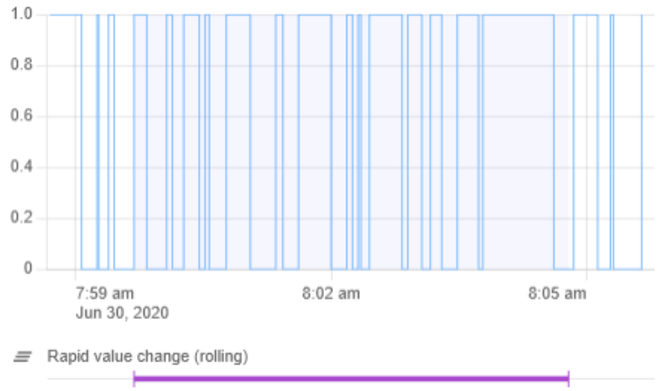
Mexico Bridge: Bad Contact

Rapid value change (rolling)

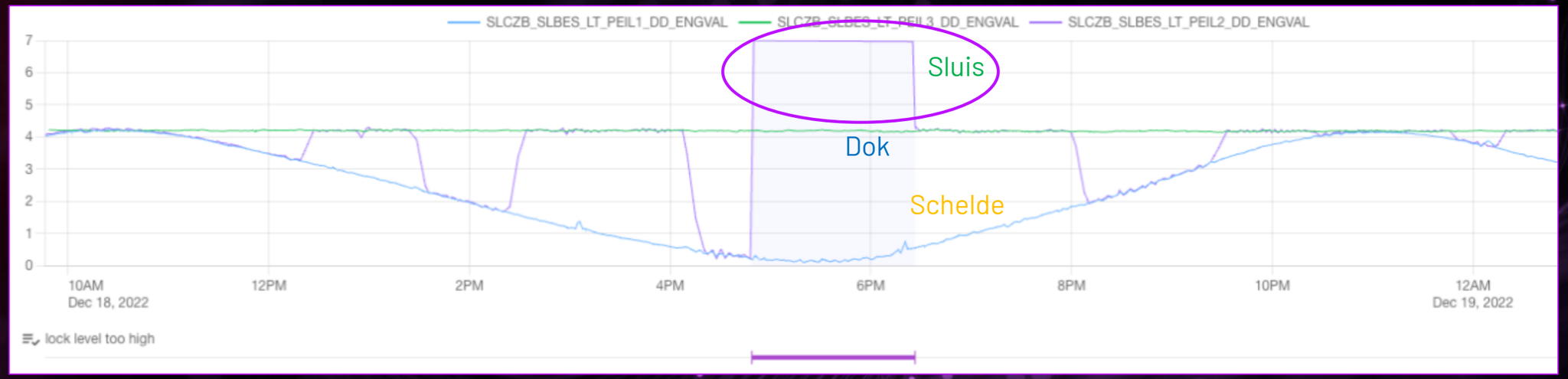
Time range	Jun 30, 2020 7:59:41 AM → Jun 30, 2020 8:04:47 AM
Duration	5 minutes
Status	- No status
Explanation	

Series - Univariate

BRCMX_BRMXB_B1_D_S_NRW



Impossible Readings



Why did we choose Timeseer.AI ?

- ✓ **Monitor** sensor data at scale
- ✓ 100+ sensor data quality checks out of the box
- ✓ Implement sensor data quality SLA's
- ✓ **Fix** sensor data quality issues at scale
- ✓ As part of your OT systems and your IT/OT Data Pipeline
- ✓ Store Raw & Validated data in your Historian
- ✓ Extend with your own custom data quality checks

AI BASED

"Alert whenever a concerning pattern is detected"

MODEL BASED

"Alert when a value falls outside of a predicted range of an automated model"

DYNAMIC RULES

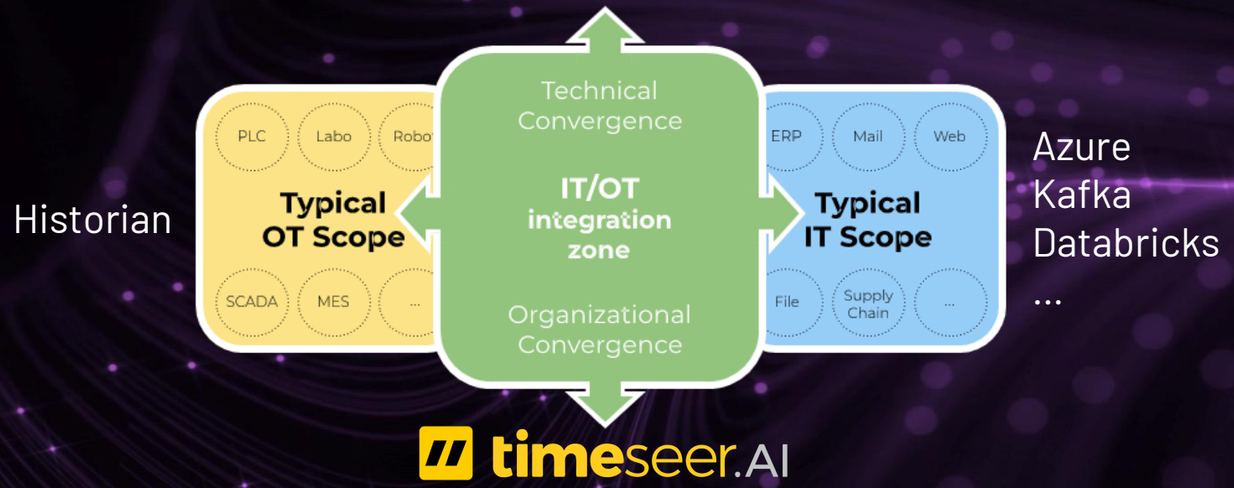
"Alert when a value falls outside a predetermined range specified by the user or defined by the metadata"

STATIC RULES

"Alert whenever a condition is not perfectly satisfied"

Take Away: Data Convergences drives IT/OT Convergence

IT/OT Mind Shift at Port of Antwerp Bruges



Azure
Kafka
Databricks
...

Port of Antwerp Bruges

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