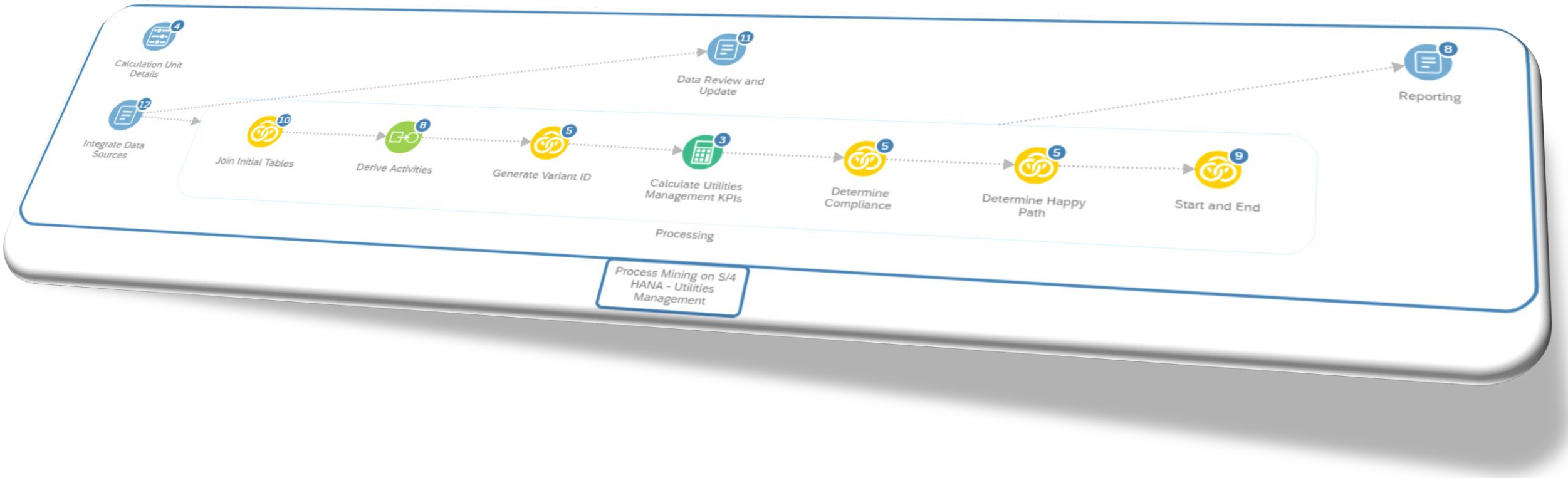
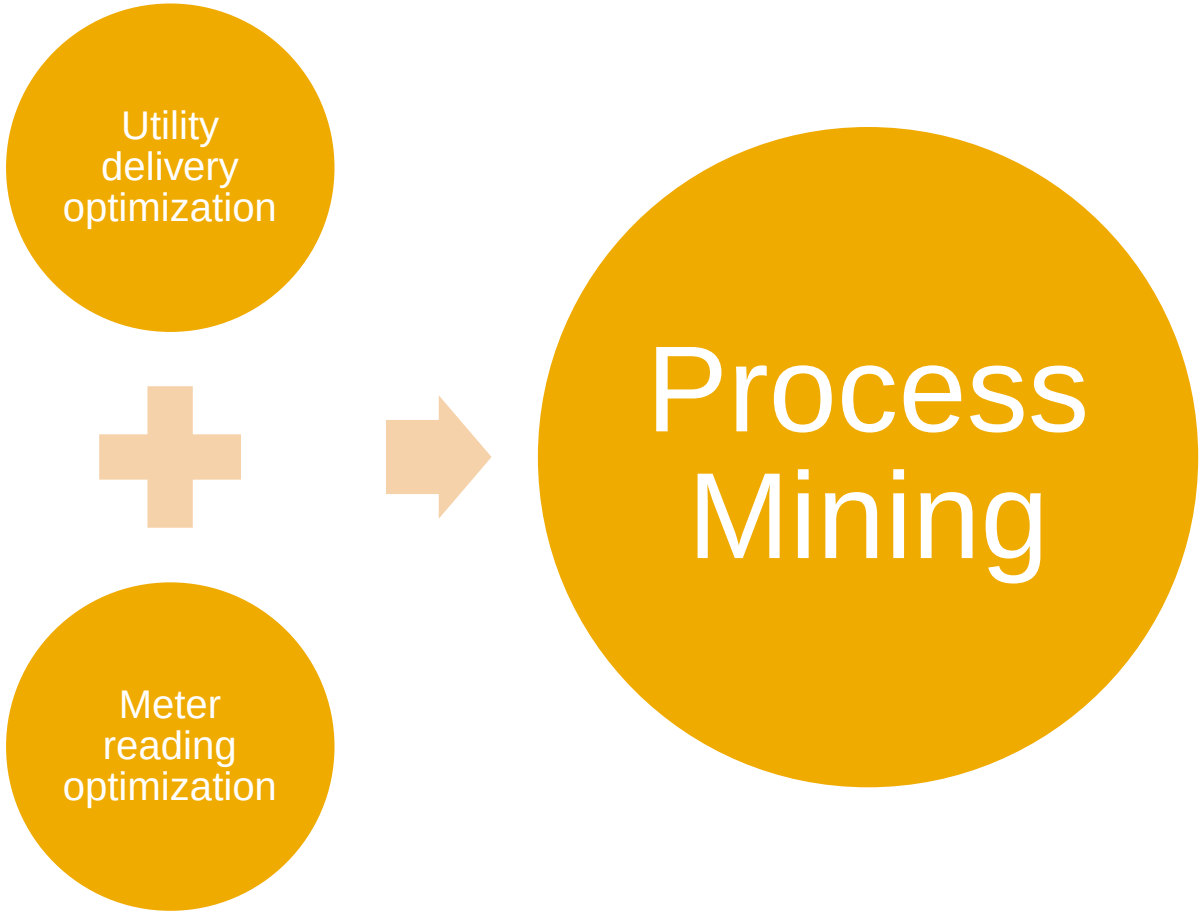


SAP Profitability and Performance Management

Process Mining on S/4 HANA – Utilities Management – Details

THE BEST RUN SAP

Utility delivery and meter reading optimization drives process mining



Discover, analyze and optimize:

- Utility delivery process efficiency
- Meter readings
- Outstanding Billings

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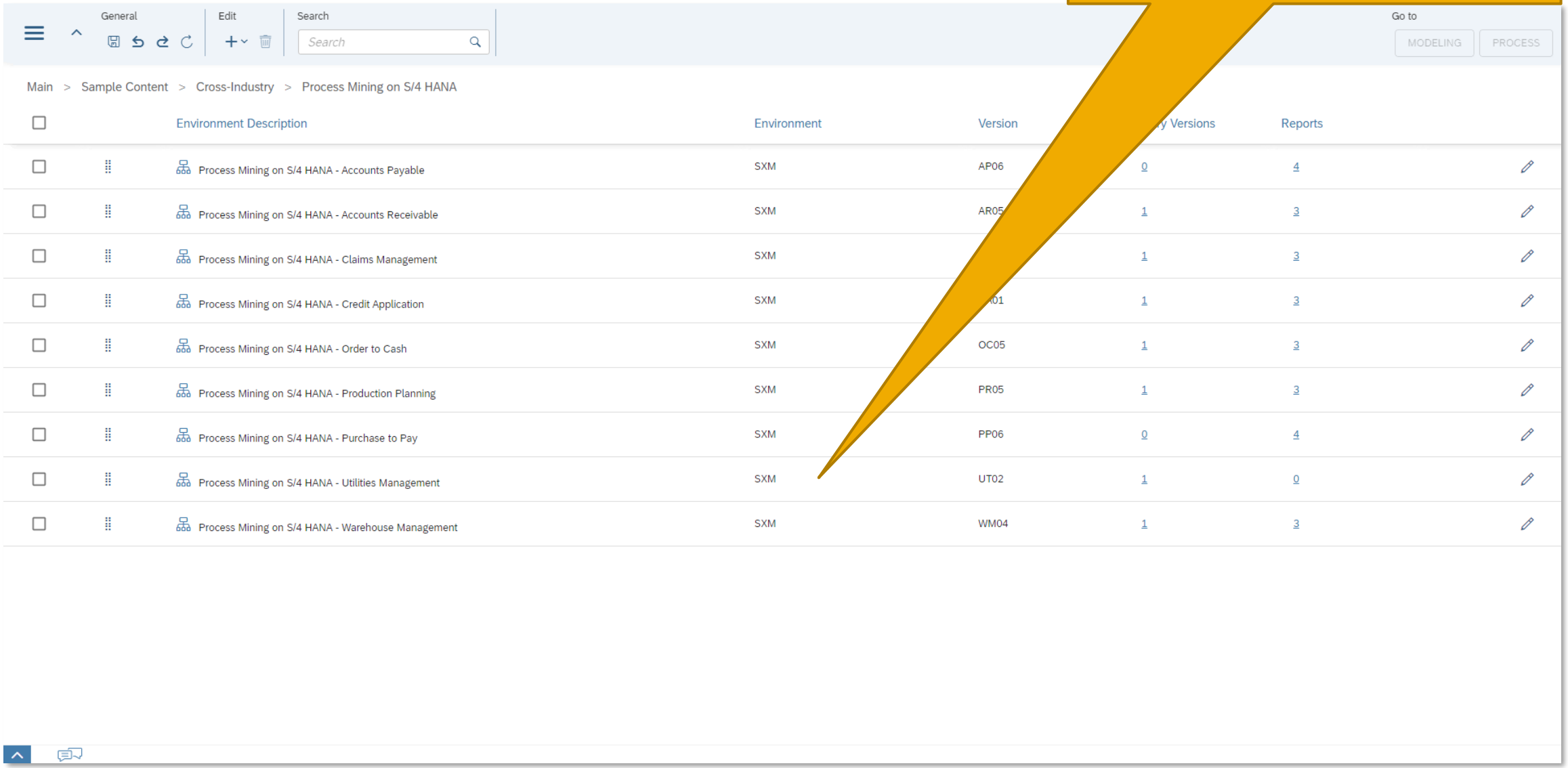
Process Mining – Available Processes

All contents include predefined connections to SAP ERP and SAP S/4 HANA



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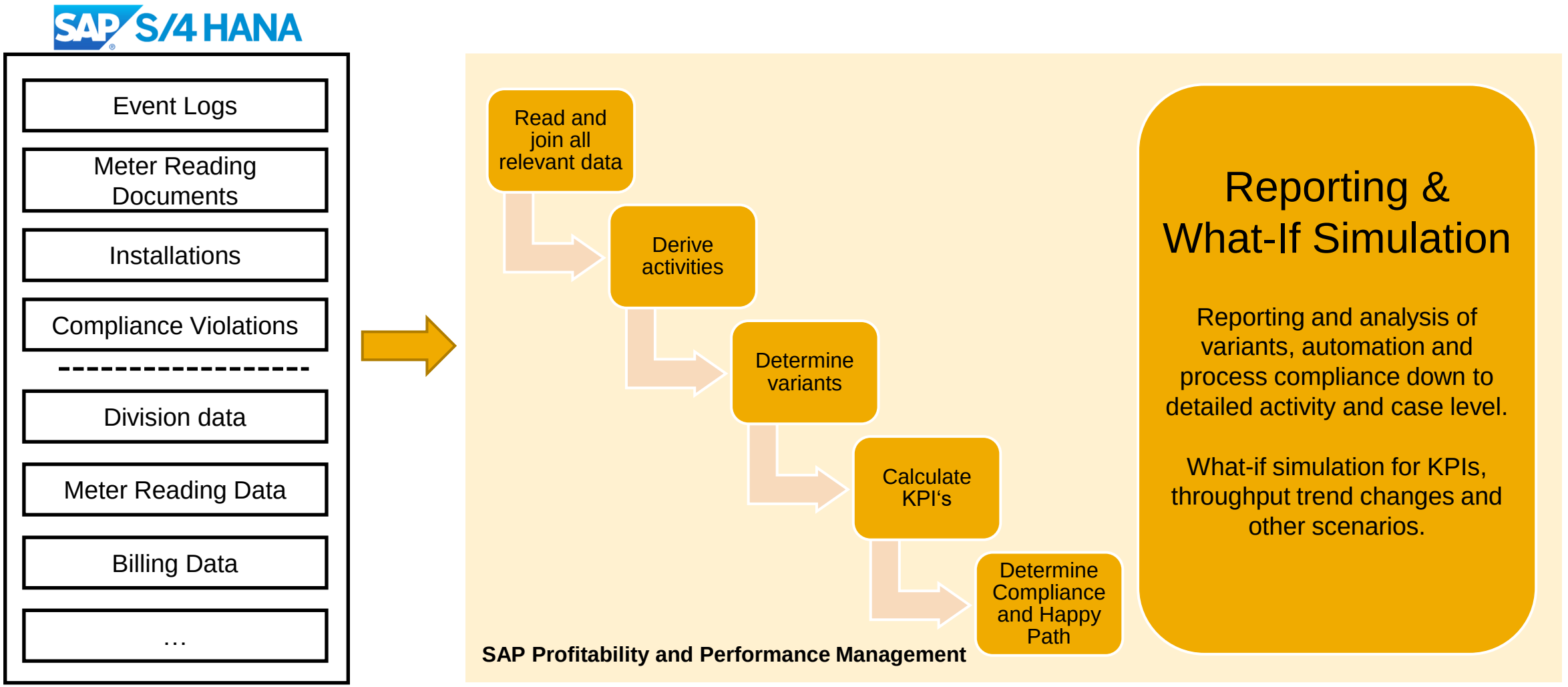
Overview – Process Mining on S/4 HANA – Utilities Management data sources, processing and reporting



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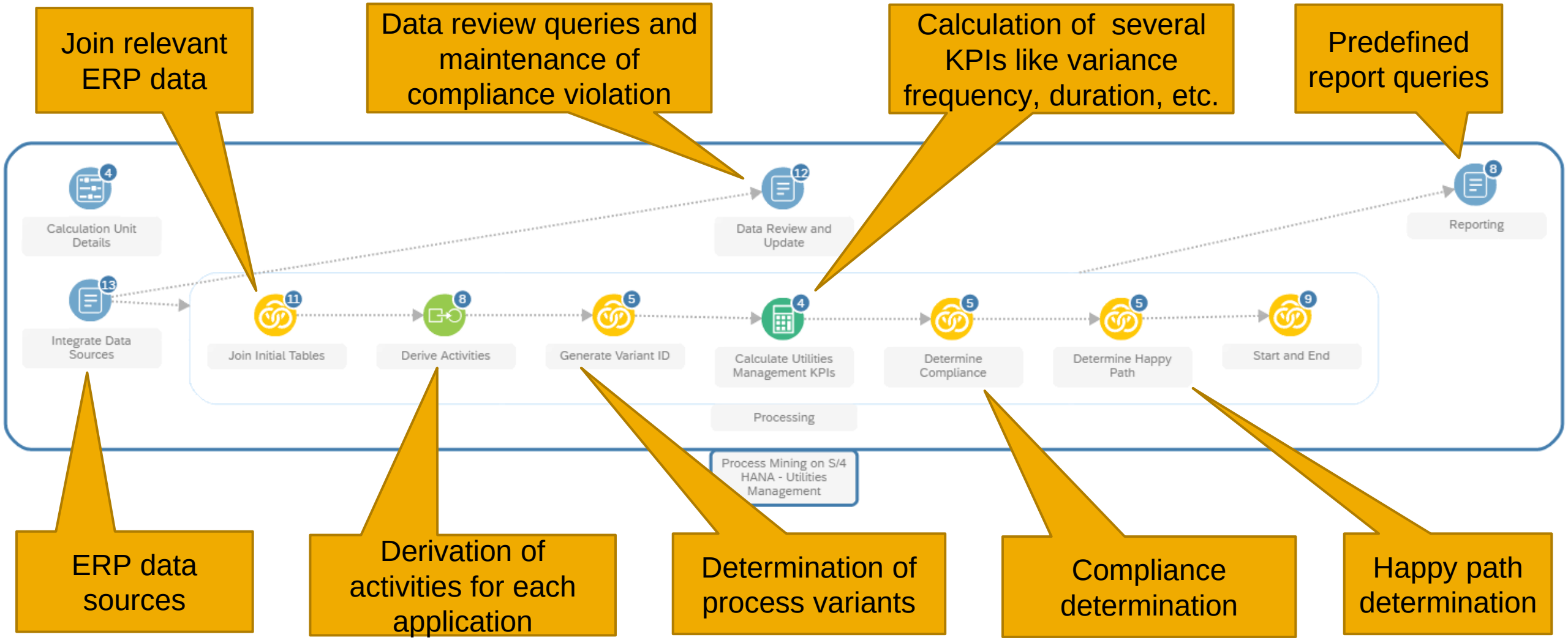
Calculation model of Process Mining on S/4 HANA – Utilities Management



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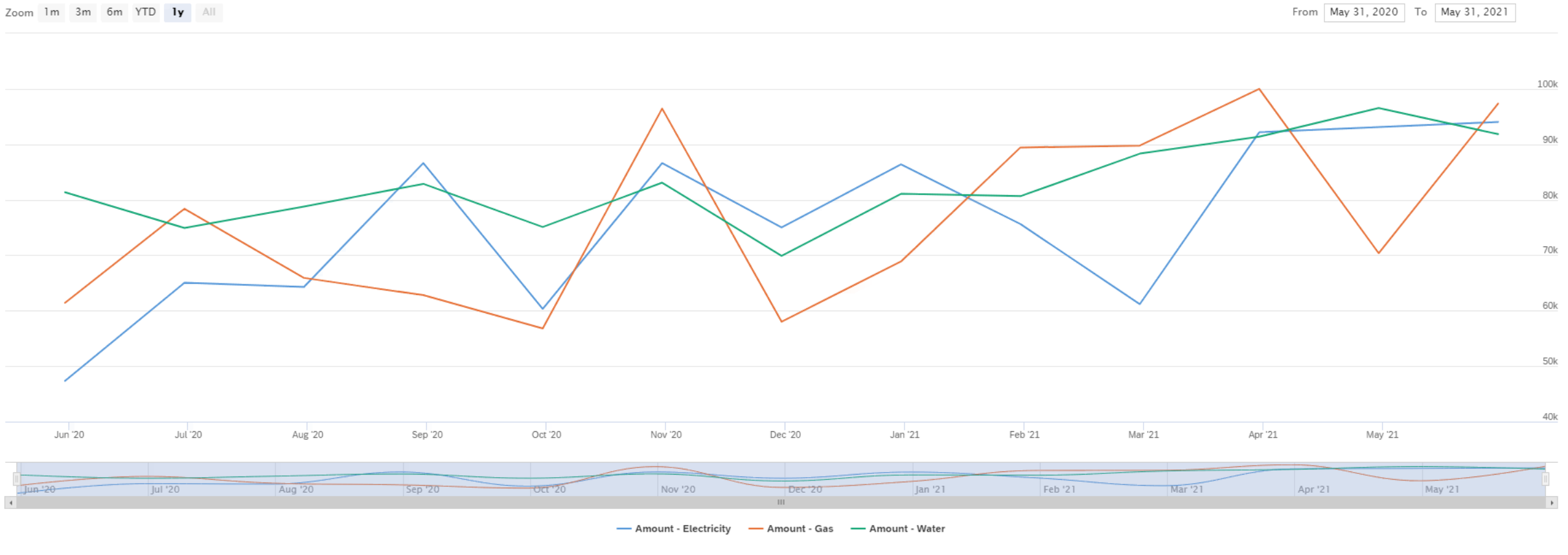
Collection Trend

Trending Overview

Collection Trend for Electricity Gas and Water

Below is shown the collection trend for electricity, gas and water utility services for 13 month period. Immediately can be noticed that water is showing more stable trends compared to electricity and gas which both have more oscillations. November 2020 and March 2021 have the most collections and highest rise indicating that these two months deserve further inspection to determine such cause. At the end of timeline, May 2021, results are significantly better comparing to the same month in previous year.



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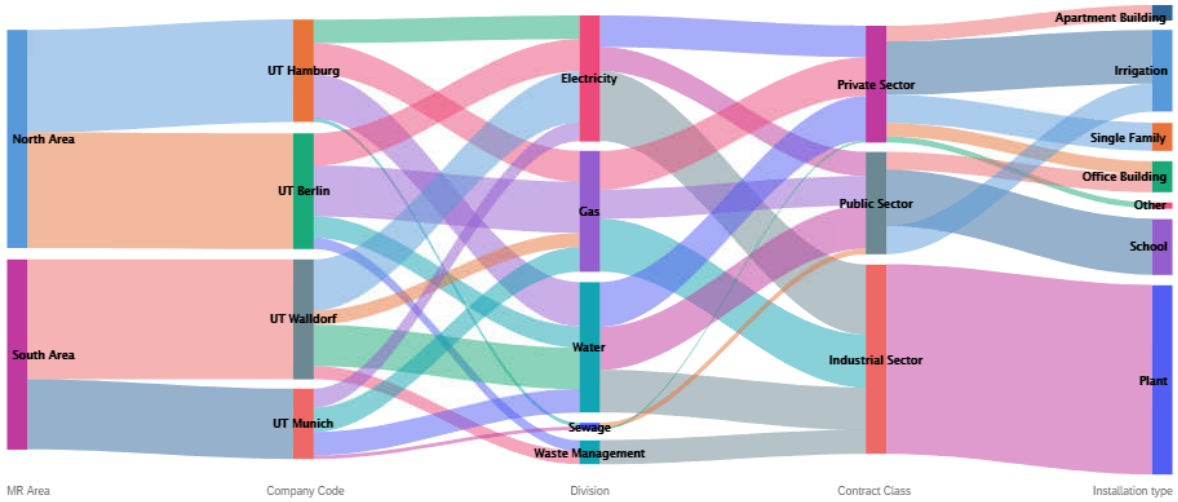
Billing Overview

Billing Overview

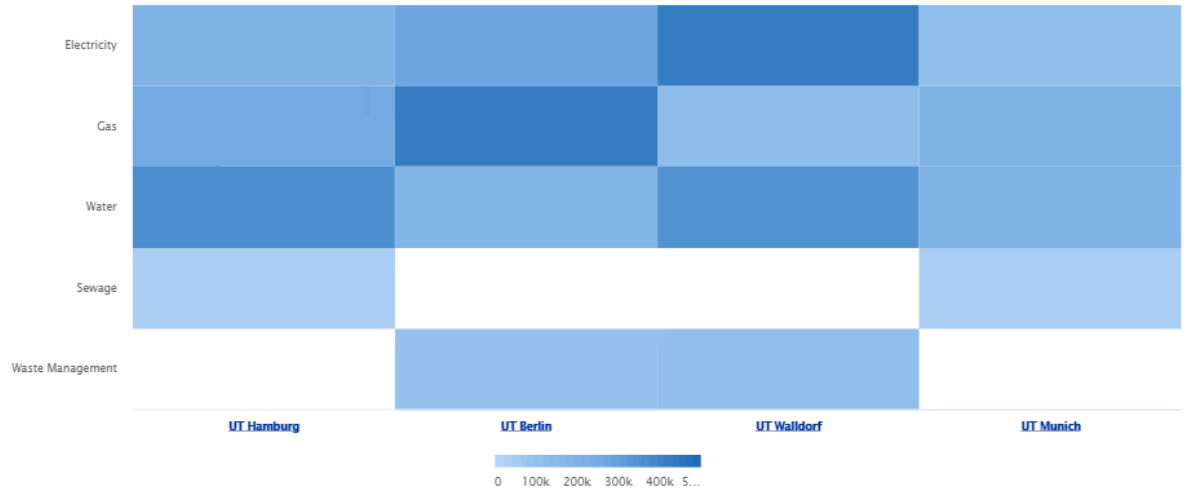
From MR Areas to Installation

Sankey diagram provides high level insights for fast billing analysis from meter reading areas over utility companies, divisions, sectors all the way to the installation types. Thicker flow lines indicate higher billing amounts. The most dominant division is water with €1.076M billings. Looking at sectors, industrial with only plant installation type, is generating almost the same billing amount as private and public combined.



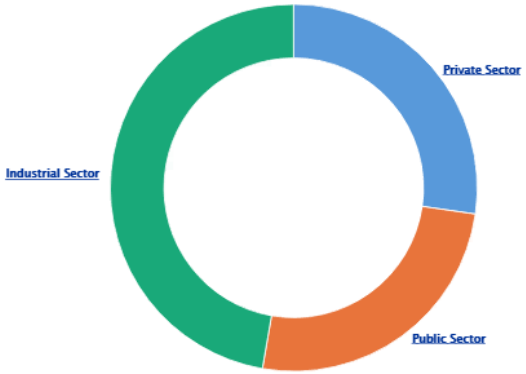
Billing by Division and Company

Heat map shows total billings for each company by division. Darker color shades indicate more billings, while the white fields indicate that certain company didn't provide certain service. Most billings as expected come from electricity, gas and water, but provided from different companies. UT Walldorf electricity and UT Berlin gas division have the highest amounts, coincidentally almost the same around €421K. Drilldown shows MR units and installation types for specific company and specific division.



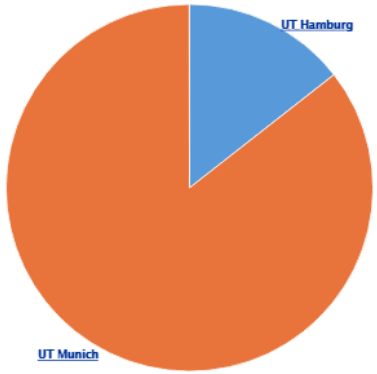
Billing by Sector

Below is shown collected billing distribution by sector. Almost half of all billings come from industrial sector €1,56M followed by private with €904K and somewhat less public sector with €843K. Drill down options provide information about installation type and division. In private sector the most billings are from irrigation, while in public from installation type school.



Outstanding Billing

Only 2 companies have an outstanding billings, UT Hamburg €8,3K and significantly more UT Munich with €49K. Mouse tooltip provides more information for number of cases and utility consumption. Drilldown shows outstanding billing by certain division. For UT Munich all outstandings are from electricity division.



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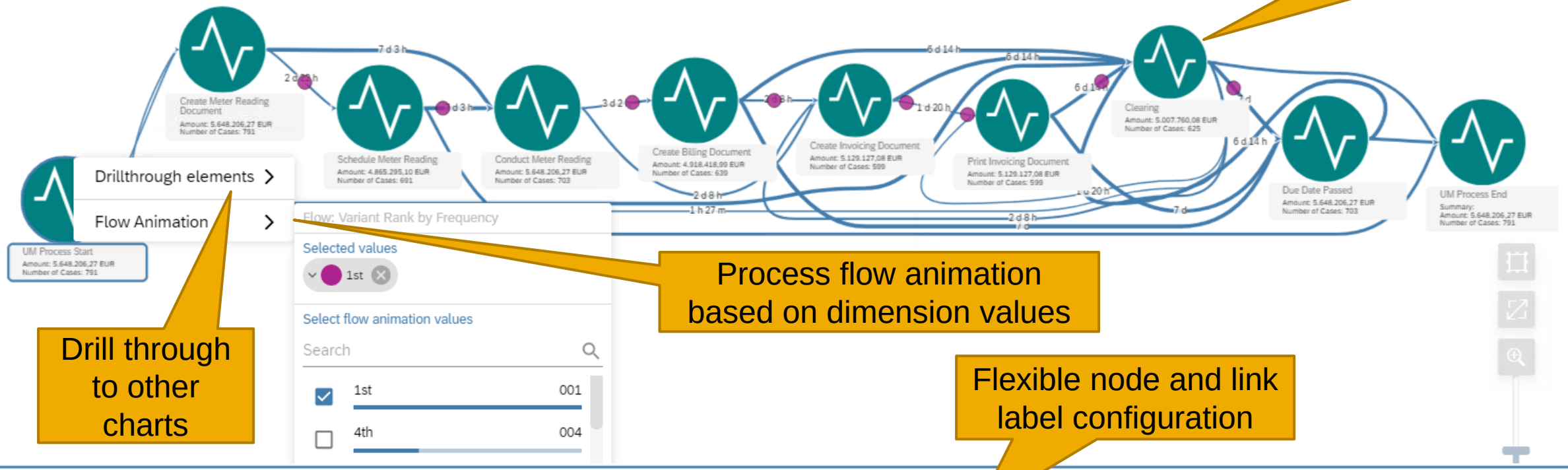
Process Diagram

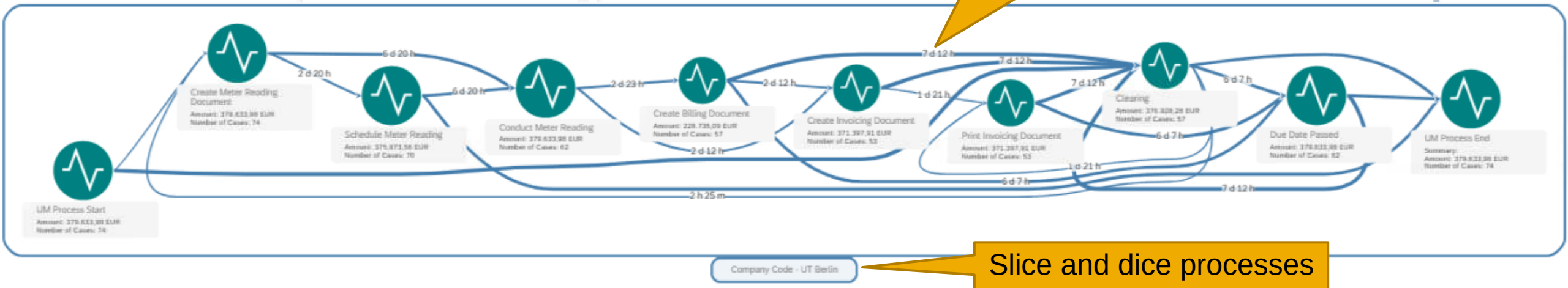


Node and link size can depend on KPI values

Drill through to other charts

Process flow animation based on dimension values

Flexible node and link label configuration



Slice and dice processes by any dimension

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Simulation

Standard Process Mining KPIs

KPI Simulation Dashboard

Note
To use KPI Dashboard What-If simulation, first expand the property panel on the right side: There are parameters "Auto Rate Change (%)" and "Compliance Rate Change (%)" available.
1. Drag the handle on the slider range to set a numeric value for this parameter. When your desired value is beyond the slider range, you can also directly type a value in the input box under the handle.
2. Click on "Apply" Button on the bottom of property panel to confirm your configuration.
3. Click on "Simulate" Button of "Tools" group on the top menu.
Now the simulation is initialized. As soon as a green message shows that the simulation is done, the table of What-If scenario will be updated accordingly. Then the simulation's effect can be verified by comparing the results below with the Baseline scenario.

KPI Forecast	Average Case Throughput (Days)	Average Automation Rate	Average Compliance Rate	Average Happy Path Rate
Baseline Scenario	19,58	49,01	83,27	45,00
What-If Scenario	19,58	49,01	83,27	45,00

I_AUTO_RATE_CHANGE Auto Rate Change (%)

I_COMPL_RATE_CHANGE Compliance Rate Change (%)

Automation and Compliance Parameters

Client-side Simulation

Throughput Trend

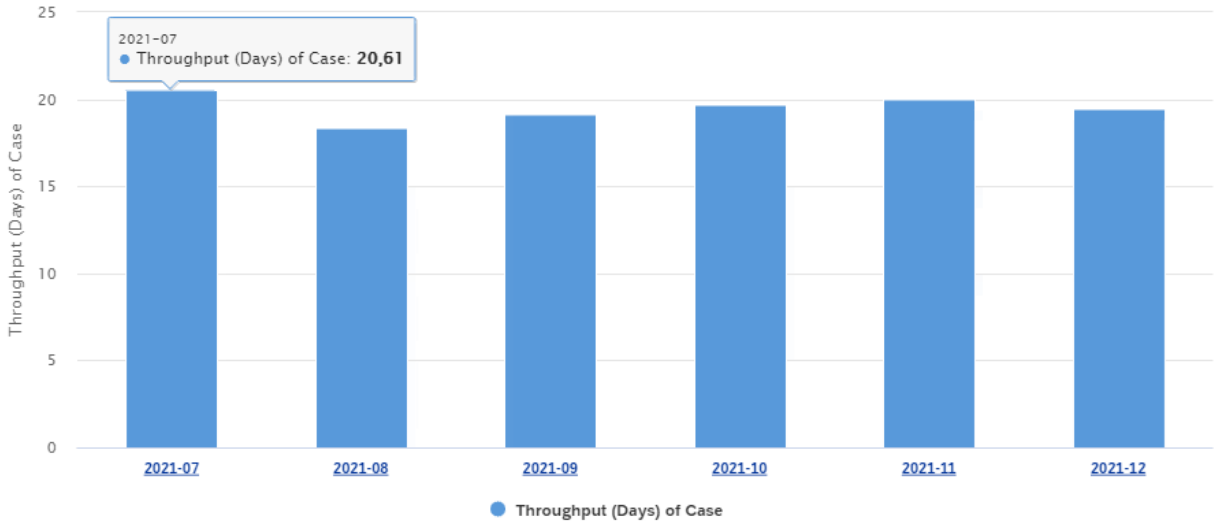
Throughput time reflects the efficiency of a company on processing customers' order. No matter what scale the business is working on, knowing this number well is a good way of plotting how the company is doing in its order to cash process. Once there is a slowdown, company can react immediately and speed up the process. The charts below also provide drill-down function for information on quarter and customer level.

Predefined Reports

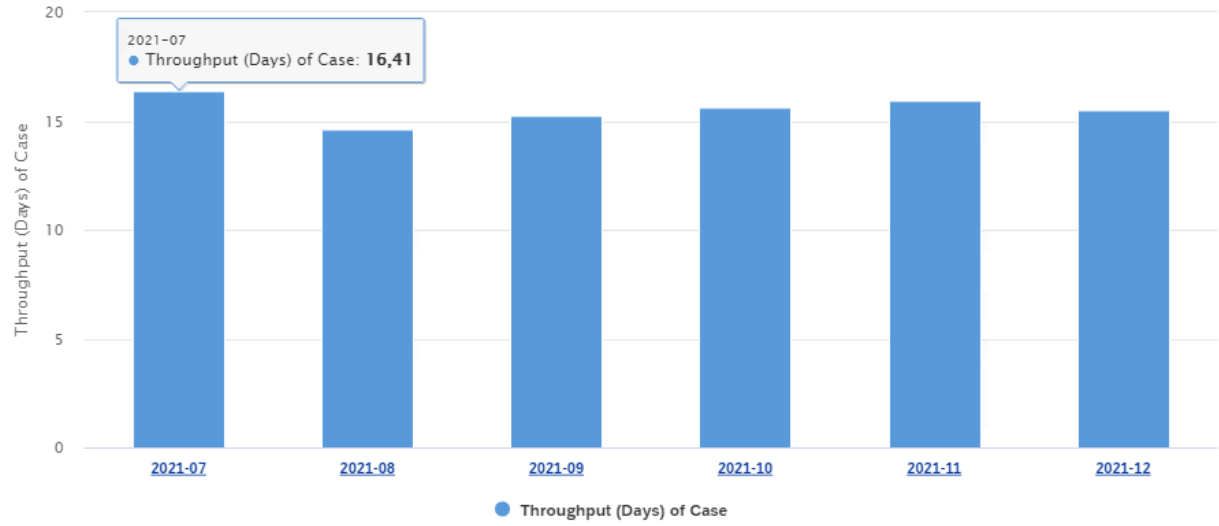
Various Scenarios

Note
To use Throughput Trend What-If simulation, first expand the property panel on the right side: There are parameters "Auto Rate Change (%)" and "Compliance Rate Change (%)" available.
1. Drag the handle on the slider range to set a numeric value for this parameter. When your desired value is beyond the slider range, you can also directly type a value in the input box under the handle.
2. Click on "Apply" Button on the bottom of property panel to confirm your configuration.
3. Click on "Simulate" Button of "Tools" group on the top menu.
Now the simulation is initialized. As soon as a green message shows that the simulation is done, the right chart of What-If scenario will be updated accordingly. Then the simulation's effect can be verified by comparing the right chart to the left one of Baseline scenario.

Throughput Trend Forecast (Baseline Scenario)



Throughput Trend Forecast (What-If Scenario)



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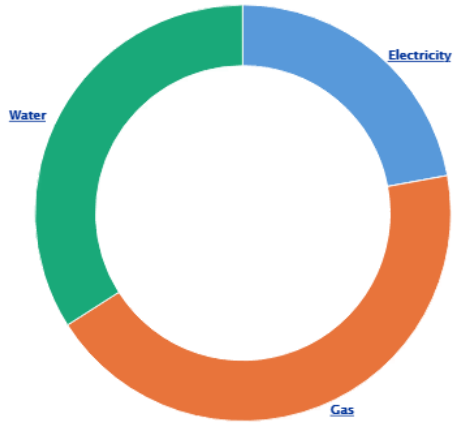
Residential Billing

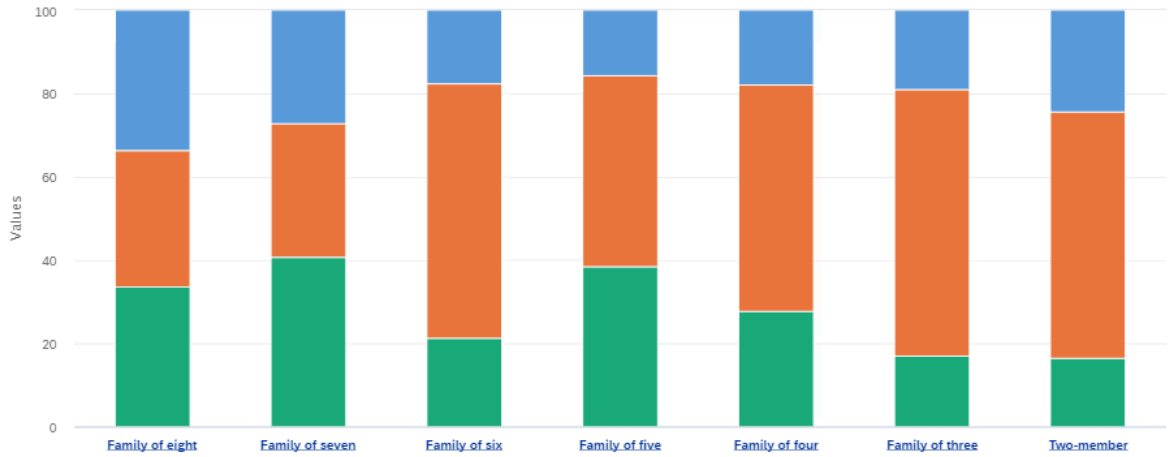
Residential Billing by Division

As residents are considered installation types single family and building apartments. Highest amount comes from providing gas, indicating that residents have the highest need for this utility service. Residents also pay more for water than electricity. Drilldown shows details for premise types.



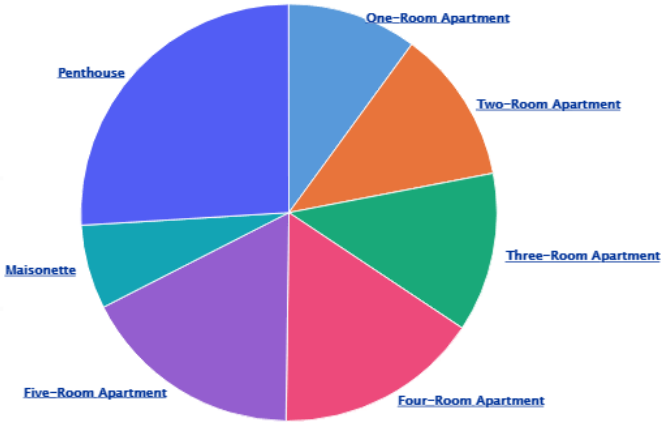
Residential Billing by Family Size

Different family sizes have different structure of expenses for utility services. Surprisingly gas and water are more required than electricity for this type of installation, with around 80%-90% of total utility costs. Families with fewer members mostly require gas, while biggest families have higher needs for electricity and water. Drilldown provides information for quarter and period.



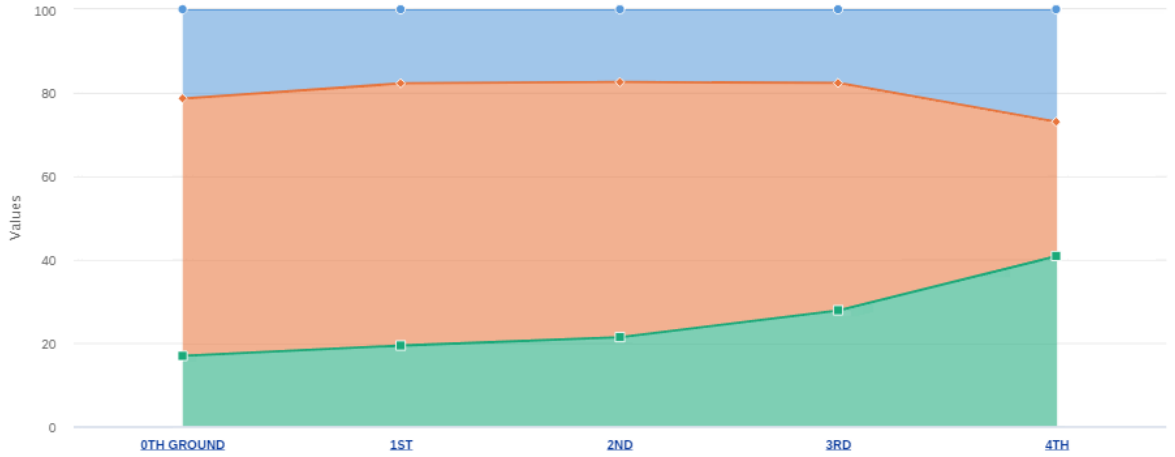
Billing by Apartments

Different apartment types have different utility services needs. Below are shown total billings and total utility consumptions by different apartments. Bigger apartments generate higher billing amounts, penthouse the most, one-room apartment the least. Drilldown shows further details for utility division, quarter and period.



Utility Consumption by Building Floor

Lower building levels have higher needs for gas, while water needs increase on higher ones. When comparing 3rd and 4th level, billings for electricity and water are almost doubled on 4th, while the transition between other levels seems more smooth. Drilldown shows details for quarter and period.



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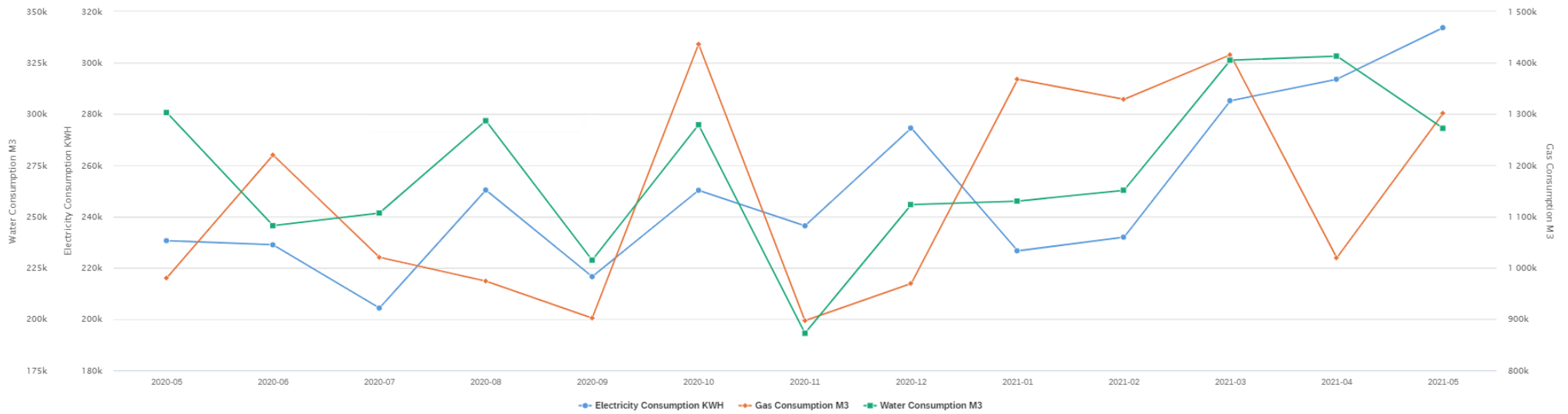
Consumption Trend and Analysis to Individual Customer Level

Periodic Consumption for Electricity Gas and Water

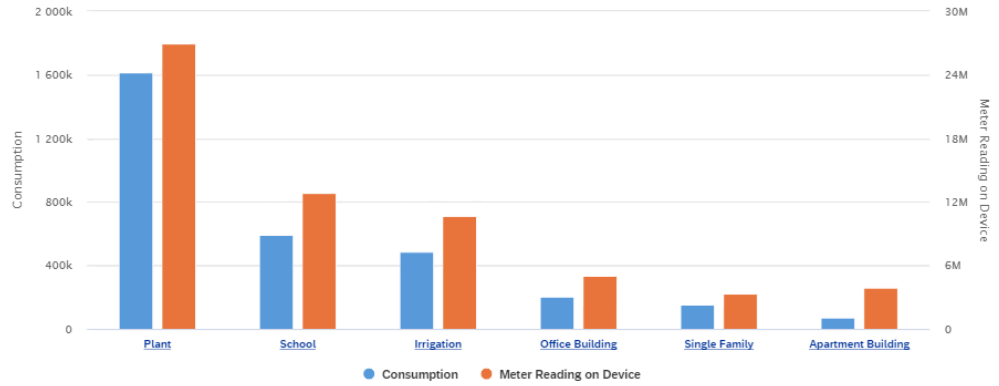
Below are total consumption trends for electricity, gas and water. Lines on the chart cannot be compared with each other because all three services are based on different consumption units. It doesn't seem to be any particular consumption pattern for any service, rather there are significant oscillations especially for gas where the highest consumption was in October 2020 - 1,436M and lowest in the next month, 897K cubic meters. Looking at electricity, consumption significantly increased at the end of timeline, May 2021, 314K kw/h compared to the same month in previous year when it was 231K kw/h.



Periodic Meter Reading and Consumption to Individual Customer Level

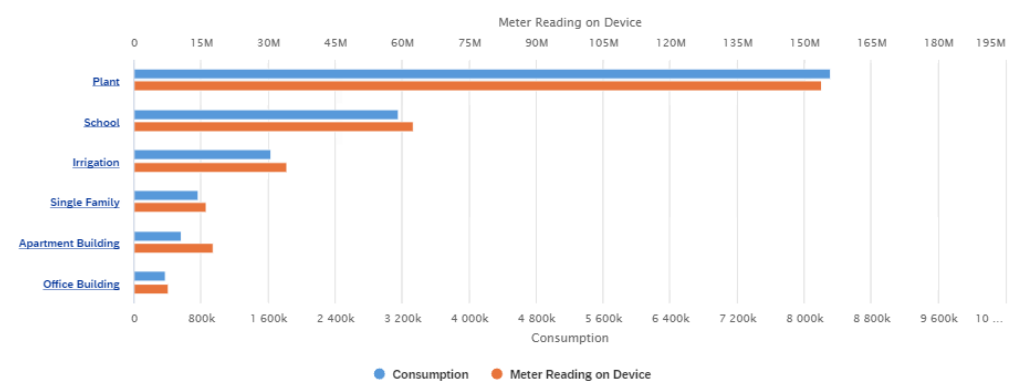
Electricity

On the initial chart is shown total consumption by different installation types, on the other hand MR number on this level is not sensible. With the drilldown to the last level it is possible to observe monthly consumption as well as actual MR numbers read from actual MR device for selected individual customer. The highest total electricity consumption was from plant, 1,620M kw/h.



Gas

Same situation with gas, meter reading number is sensible only when observed on the last drilldown level for selected individual customer. Total gas consumption has been almost three times more for plant 8,317M compared to the second ranked school with 3,166M cubic meters of gas consumed.



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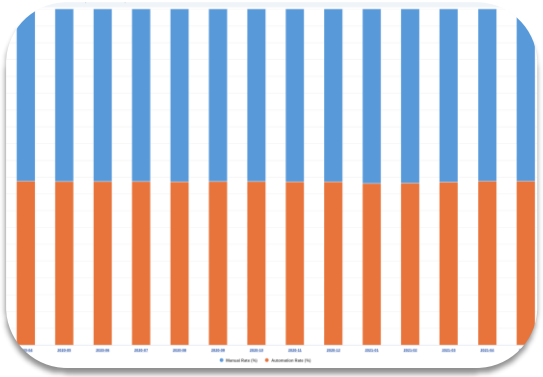
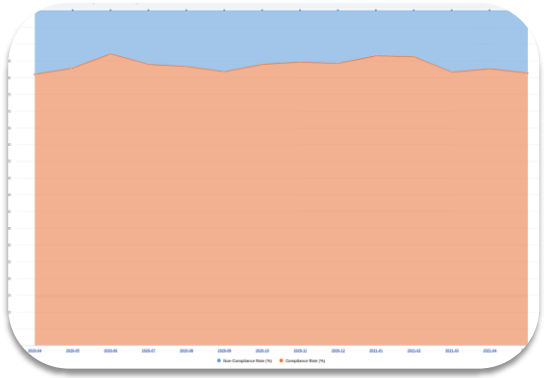
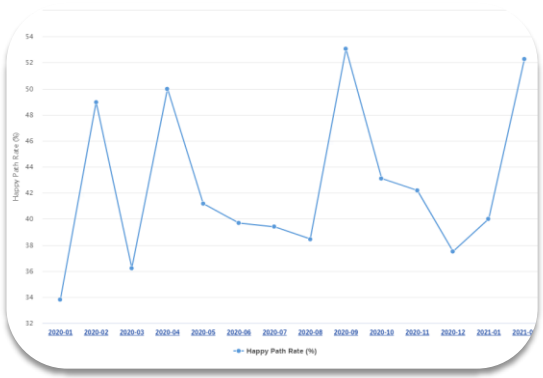
Comprehensive List of KPI’s Content



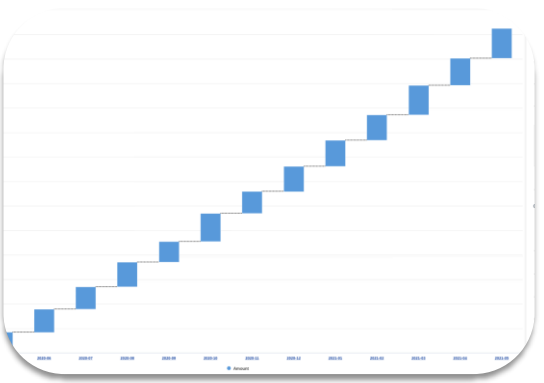
Automation Rate



Compliance Rate



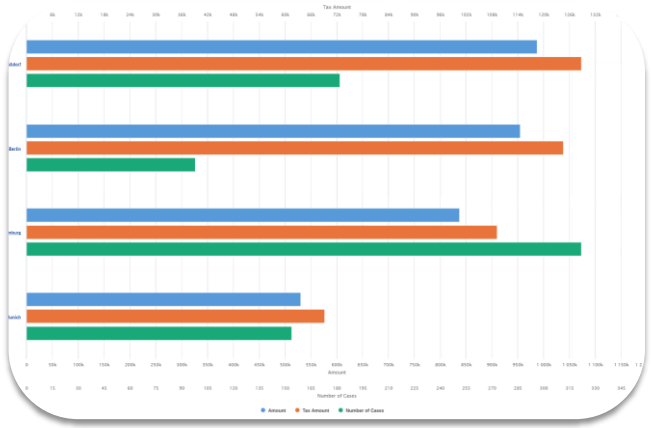
Happy Path Rate



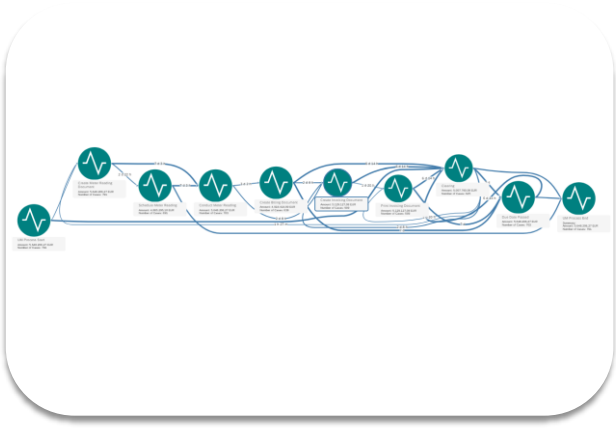
Collection Trend



Billing Distribution



Top X Lists



and many more

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