CHAPTER 1
INTRODUCTION

1.1: Introduction to Process Mining:

Traditional approaches fail to understand the real-life **complexity of processes** and also struggle to provide complete **insights and visibility** given the vast amounts of data that are now available.

Compared to the traditional process mapping approaches, Process Mining technology solves **the complexity and visibility problem.**

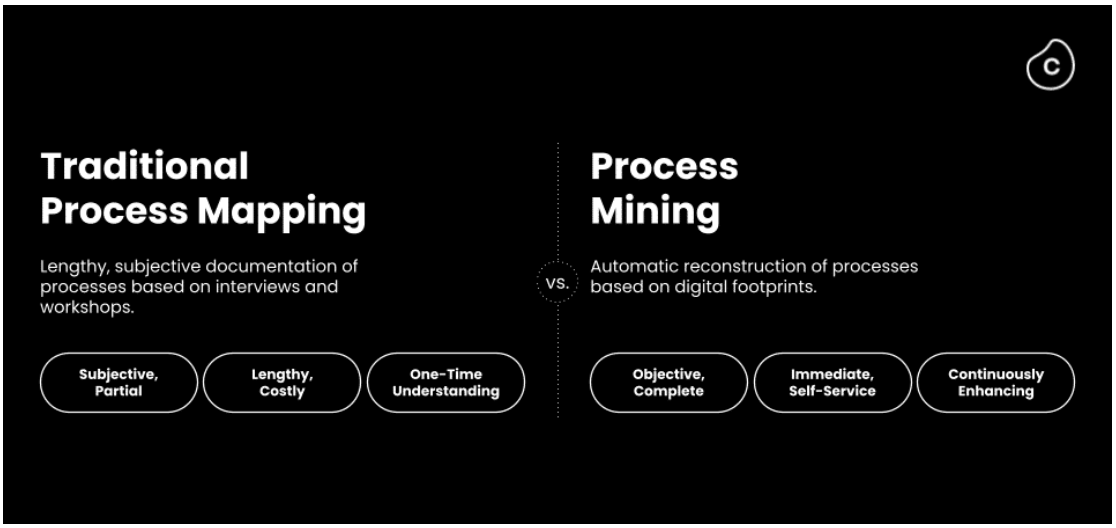

Fig. 1.1: Traditional Process Mapping vs Process Mining

By contrast, **Process Mining** offers a data-driven and therefore more objective and holistic approach to understanding business processes. As a result, Process Mining has come to dominate a large majority of operational excellence, automation and digitalization ambitions within industry.

Process mining is a discipline that focuses on the analysis of business processes using event data collected from various sources within an organization. It provides insights into how processes are actually executed, revealing both their strengths and weaknesses. By analyzing event logs, process mining aims to uncover hidden patterns, bottlenecks, inefficiencies, and opportunities for process improvement.

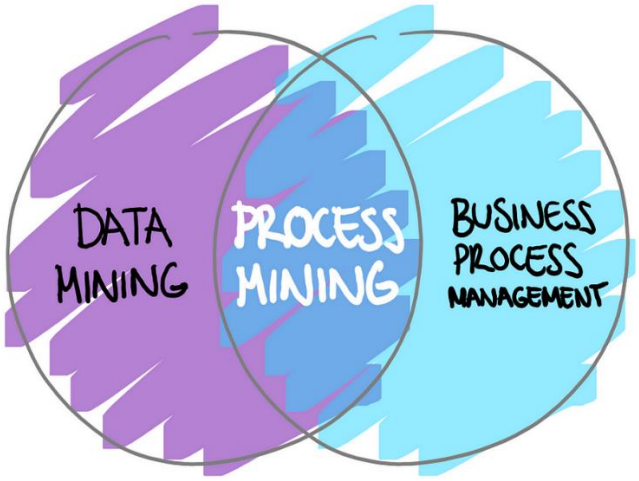

Fig. 1.2: Process Mining Model

The core idea behind process mining is to bridge the gap between the actual processes that take place within an organization and the way these processes are intended to be executed. It helps organizations move beyond relying solely on static process models (such as flowcharts or diagrams) and gain a dynamic, data-driven understanding of how processes operate in the real world.

Process mining typically involves three main steps:

1. **Data Collection**: Event data is collected from various sources such as information systems, databases, applications, and logs. These events represent activities, tasks, or actions performed within a process and are time-stamped to capture the sequence in which they occur.
2. **Process Discovery**: This step involves constructing a visual representation of the process flow based on the collected event data. Process discovery techniques aim to create a process model that best fits the observed data. This model could take the form of a process map, a Petri net, a business process model and notation (BPMN) diagram, or other types of process representations.

3. Process Analysis: Once the process model is constructed, it can be analyzed to uncover insights. Process mining tools and techniques can help identify bottlenecks,

deviations from the intended process, variations in execution paths, and areas for optimization. This analysis can lead to actionable insights for improving process efficiency, reducing costs, enhancing customer experience, and ensuring compliance.

Process mining offers several benefits to organizations, including:

- **Data-Driven Insights**: Process mining provides a factual view of how processes operate, which is based on actual data rather than assumptions or perceptions.

- **Continuous Improvement**: By identifying inefficiencies and bottlenecks, organizations can make informed decisions about process optimizations and continuous improvement initiatives.

- **Compliance and Auditing**: Process mining can be used to ensure that processes adhere to regulations and compliance requirements, providing an objective basis for audits.

- **Root Cause Analysis**: When deviations or problems occur, process mining can help trace back to the root causes and understand why certain issues arise.

- **Performance Measurement**: Organizations can measure process performance using objective metrics derived from actual process data.

- **Process Automation**: Process mining insights can guide the automation of certain tasks or activities, streamlining processes further.

Process mining has applications in various industries, including manufacturing, healthcare, finance, logistics, and more. As technology continues to advance, process mining techniques are evolving to handle larger and more complex datasets, enabling organizations to gain deeper insights into their operations and make more informed decisions.

INTERNSHIP GOALS:

Throughout the course of this internship, I aim to achieve the following goals: Mastering Tools and Techniques: I am excited to familiarize myself with industry-leading process mining tools such as Disco, ProM, and Celonis. By learning various techniques, including process discovery, conformance checking, and data visualization, I aim to become proficient in applying these tools to real-world scenarios. Data Proficiency: I intend to gain hands-on experience in preparing and transforming raw event data into a structured format suitable for analysis. This includes data cleaning, preprocessing, and organizing event logs to ensure accurate insights. Process Discovery and Analysis: One of my primary goals is to grasp the process discovery techniques, enabling me to unveil underlying process models from event logs. I look forward to analyzing these models to identify key process elements,decision points, and variations. Conformance Checking and Improvement: Through conformance analysis, I plan to learn how to compare discovered process models withthe actual execution. This will help me identify discrepancies and areas for process enhancement, ultimately leading to improved efficiency and effectiveness. Data Visualization and Communication: I recognize the importance of clear communication of complex data insights. By honing my data visualization skills, I aim to create informative dashboards and visual representations that effectively convey my findings to various stakeholders.

CHAPTER 2

FOUNDATION OF PROCESS MINING

- Process mining is a set of techniques used for obtaining knowledge and extractinginsights from processes by the means of analyzing the event data, generated during the execution of the process.
- This training track provides both the theoretical and applied foundations aroundProcess Mining.
- Process mining reads this data, converts it into an event log, and then createsvisualizations of the end-to-end process, along with insightful analytics.
- An event log contains each step performed during the process (the activity), thetime at which the event occurred (the timestamp), and for which instance of theprocess (the case ID).
- Using this event log, algorithms generate a process model that shows the processas it really is - including the timing of each step and all variations.

Process: A series of linked steps taken in order to achieve a particular goal.

Case: An item or object you follow through the process.

Activity: Events that take place during a process.

2.1:Get to know celonis analysis:

Process mining is an analytical discipline for discovering, monitoring, and improving processes as they actually are and *not as you think they might be.* Process Mining works by extracting knowledge from event logs (also called digital footprints) readily available in today's information systems, in order to visualize business processes—and their every variation—as they run.

The **Celonis Execution Management System (EMS)** extends process mining by executing on insights automatically and orchestrating your existing technologies.

Beyond uncovering inefficiencies and their root causes using Celonis Analysis, our customers choose to use Celonis tools such as Action Flows (process automation) and Celonis Apps to maximize their organization's performance capacity. In this sense, they don't stop at **Process Mining** and leverage all that the Celonis **Execution Management System (EMS)** has to offer.

The **Review and Interpret Analyses**(opens in a new tab) training track is designed for **data and business analysts**, **process experts**, and **process improvement specialists**. Keep in mind, this track is focused mainly on product know-how and less so on business acumen. If you'd like to complement your own experience in strategically identifying and prioritizing process inefficiencies, and planning for and implementing improvement measures, then we recommend you take a look at the **Deliver Business Value with Celonis**(opens in a new tab) training track after completing this one.

Here's a sneak peak of what you'll experience in the Review and Interpret Analyses training track.

Self-paced Reading and Video Demos:

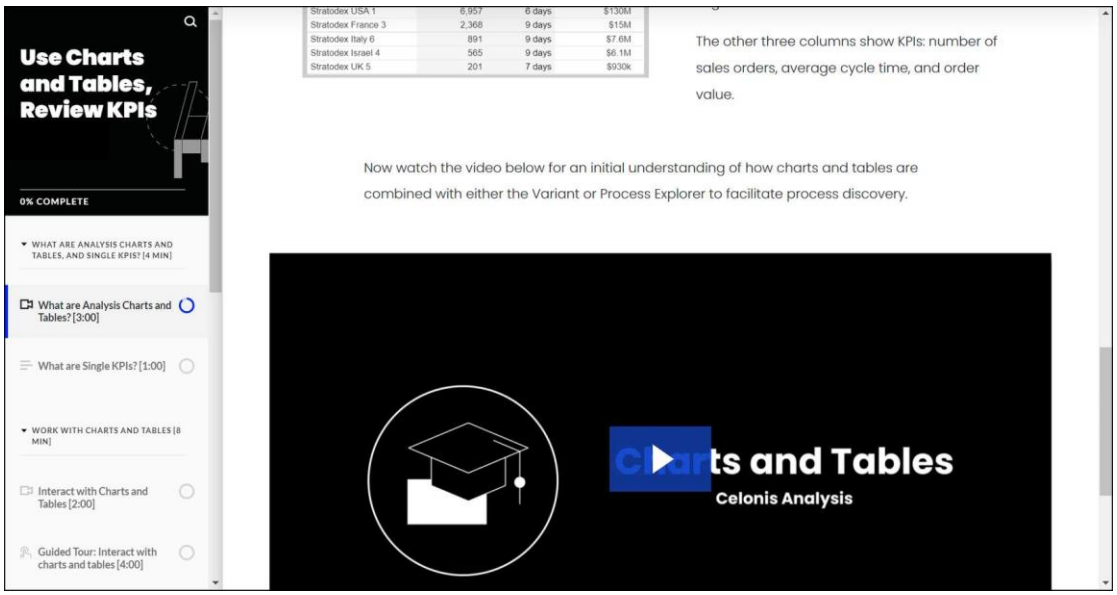

Fig. 2.1 : Module of Use of Charts and Tables KPIs

Guided Learning Tours:

At certain points throughout the courses, you'll be prompted to complete guided tours in a public Analysis demo (no login required) that we've created just for this training. Imagine an onboarding buddy, showing you around Celonis Analysis.

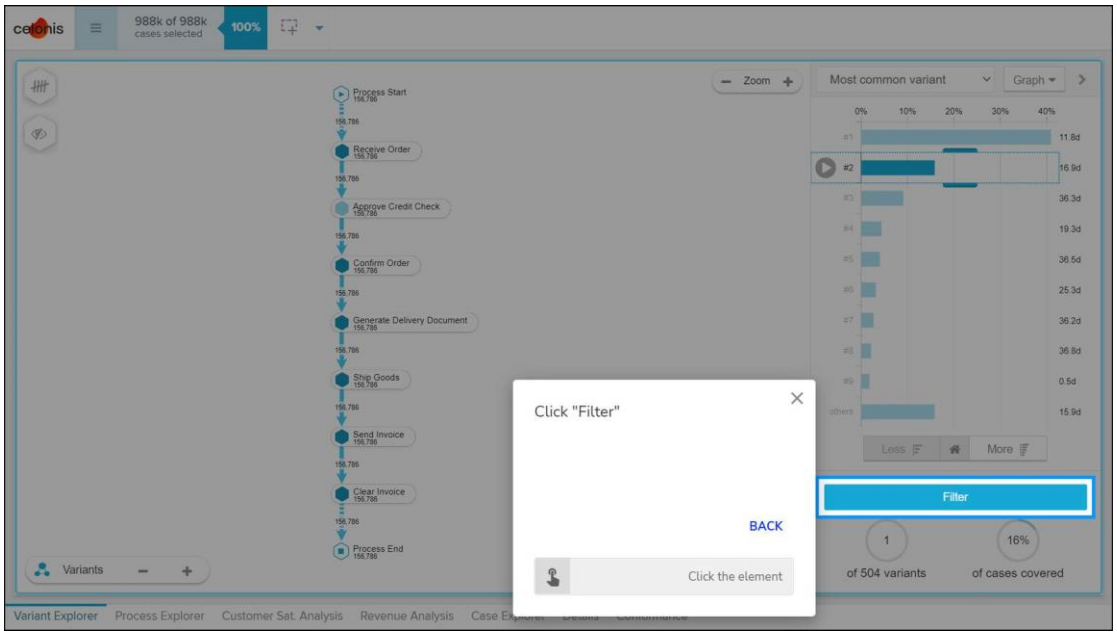

Fig. 2.2: Variant Explorer

Hands-on Exercises:

At the end of most courses, you'll also be asked to answer questions in exercises that require you to reflect on the learning and even interact with the Analysis demo hand-on to answer questions.

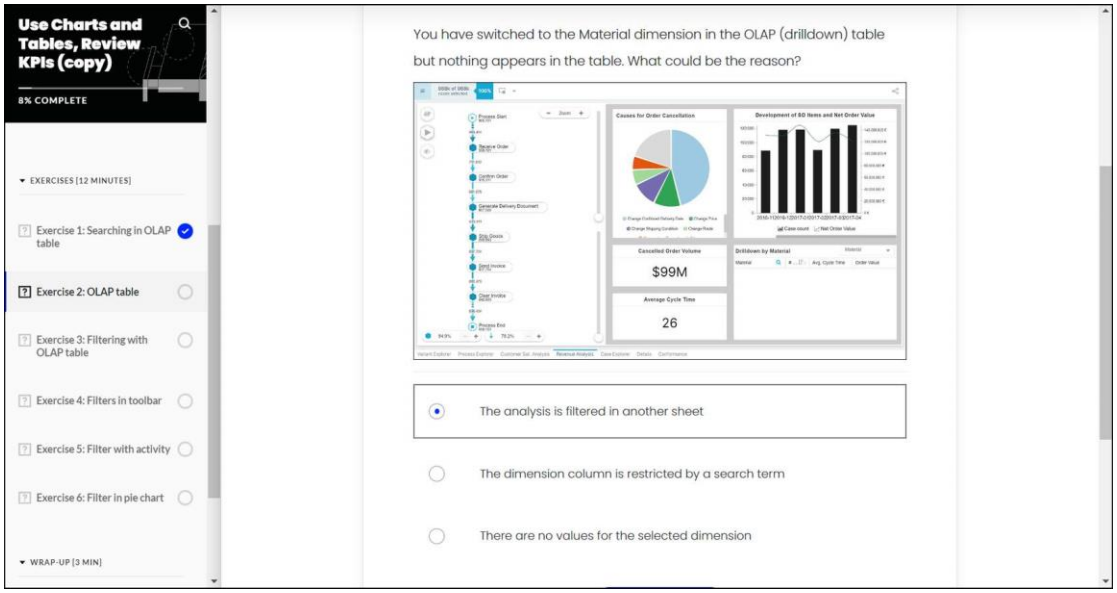

Fig. 2.3: Exercise of Process Mining

2.2: Navigate to an Analysis:

What's in an Analysis?

Once you have accessed the analysis, you may see anywhere from one to several sheets in it. The person building the analyses creates each analysis with the specific user(s) needs in mind.

Example of a leader/executive dashboard with four sheet:

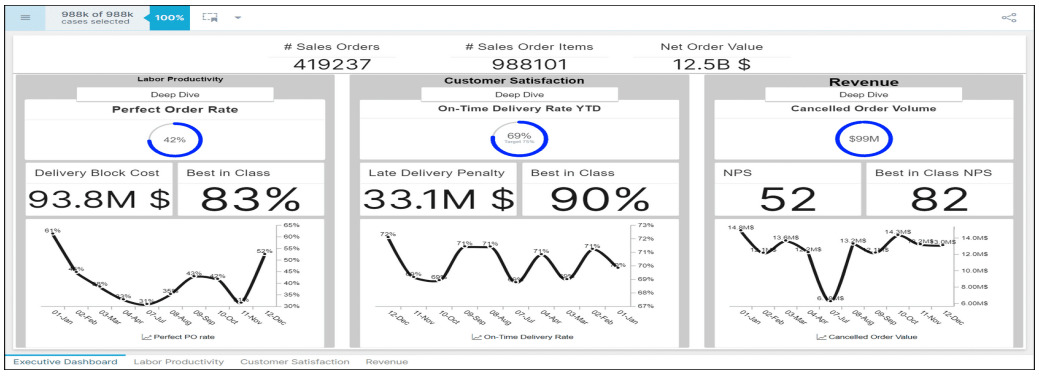

Fig. 2.4: Leader/Executive dashboard

Example of an process expert analysis with seven sheets:

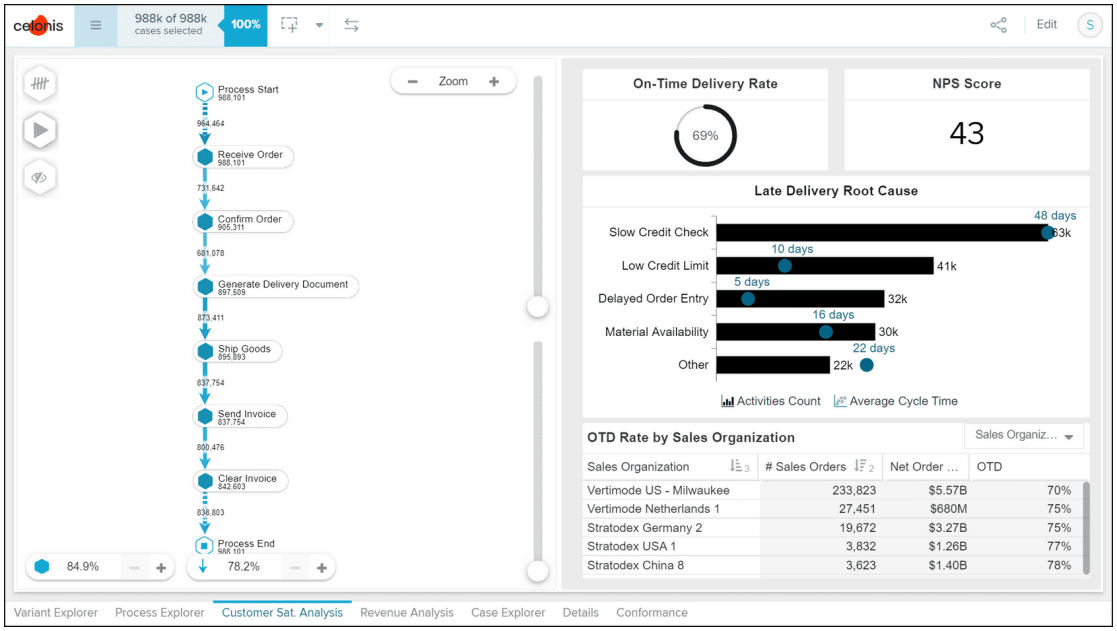

Fig. 2.5: Process Expert Analysis

These two screenshots are from two public Analysis demos. Depending on which training track you're completing, *Review and Interpret Analyses* or *Monitor KPIs in Analysis Dashboards*, you'll actually get to interact with one of these two demos. You can access the one that corresponds to you by clicking the corresponding button below.

2.3: USE VARIANT EXPLORER:

As the name implies, using the Variant Explorer, you can discover all the process variants—that is **all the different ways the process flows in your organization**. The Variant Explorer is one of the Analysis tools to help you take an "exploratory" approach to find out how your process is performing.

Guided Tour: Review individual variants

In the image below, the sorting of the variants is set to "Least common variant.

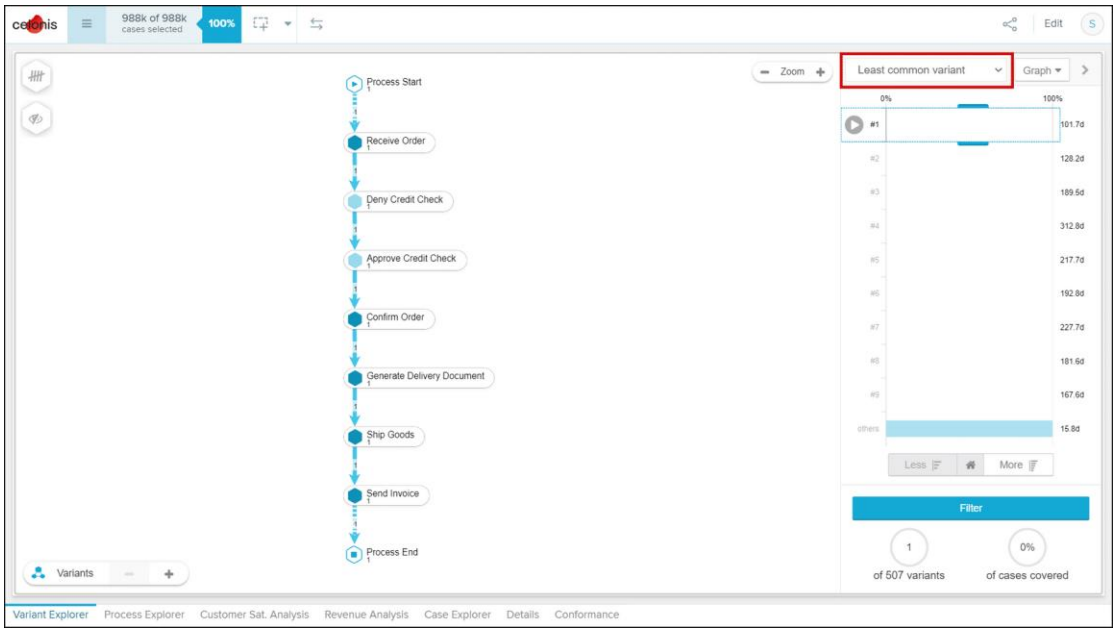

Fig. 2.6: Least Common Variant

2.4: Compare multiple variants:

Sometimes, you might want to review multiple variants at once to gain insights into how they're similar and different. In the Variant Explorer, you can superimpose adjacent and non-adjacent variants (superimposing means placing one thing on top of the other.)

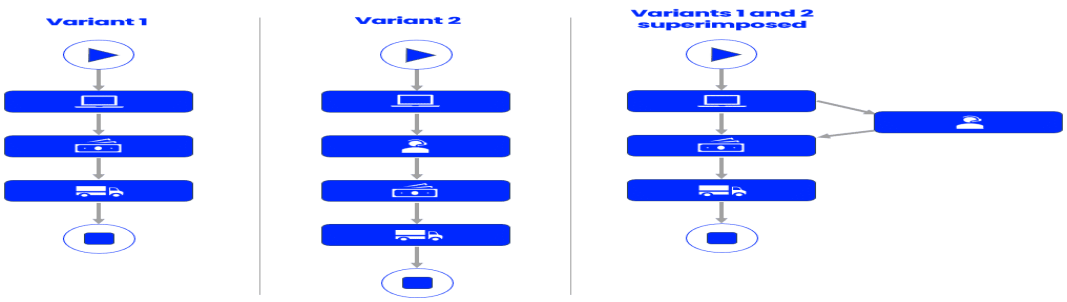

Fig. 2.7: Compare multiple variants

2.5: Display all variants at once:

What would happen if you selected all variants?

You see the full picture of your entire process. If you think this looks like a bowl of spaghetti, you're not the only one! It can be a bit overwhelming, but at times you might find it useful. You can zoom in on an activity and filter on it.

Fig. 2.8.1 & 2.8.2: Displaying all variants once

2.6: USE PROCESS EXPLORER:

Process Explorer is a Celonis EMS Analysis tool that helps you explore how processactivities are connected. Instead of showing us specific process variants,

it shows themost common activities and connections.

Using our road trip analogy again, Process Explorer isn't showing the different routes(variants) that people actually took on a given trip (case). Process Explorer shows us which waypoints (activities) and roads (connections) are the most common along the journey.

Process Explorer is extremely useful for finding infrequent activities, which can be difficult to spot using Variant Explore as these rare activities may not appear in common variants.

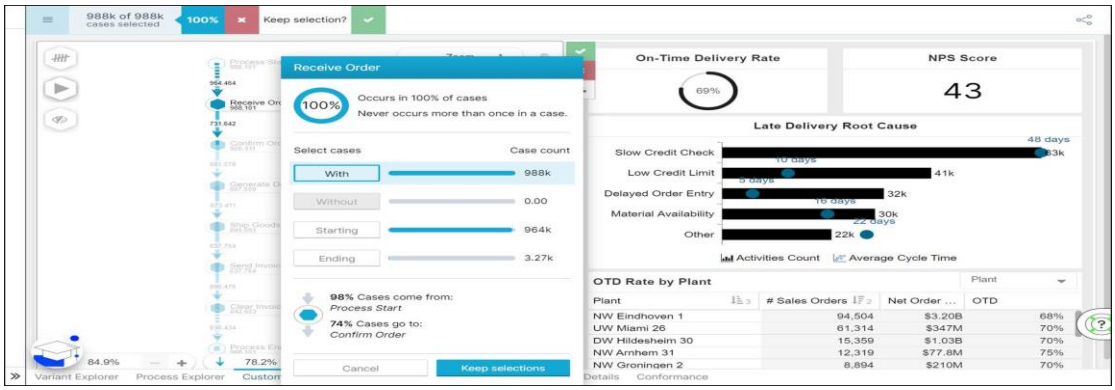

Fig. 2.9: Using Process Explorer

2.7: Interact with Charts and Tables:

Charts and tables are critical components of analyses. They help us understand the process and are the go-to tools to drill down on root causes of process inefficiencies.

In charts, you can **select one or more of the displayed timeframes** to narrow the scope of the analysis.

In an OLAP table, you can **adjust column width** just like in tools like Microsoft Excel or Google Sheets. You can **sort columns** by clicking the column header multiple times you can sort by ascending or descending order and delete the sorting completely. And, you can **seach for specific values**.

This chart shows the development of sales order items (KPI) and the corresponding net order value (KPI) over a period of time (dimension).

The x-axis displays the dimension, the creation date of sales order, grouped by months.

The two y-axes display the KPIs: The columns display the number of sales order items (case count) and the line displays the net order value.

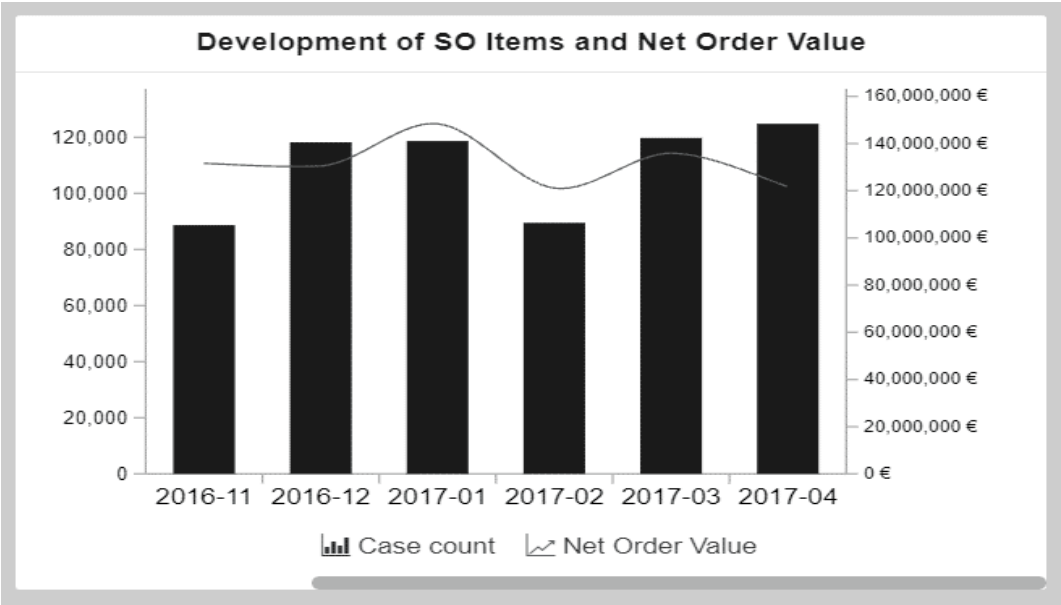

Fig. 2.10: chart representing development of sales order items

This OLAP table is currently displaying three KPIs for all the sales organizations.

The first column displays the dimension, Sales Organization.

The other three columns show KPIs: number of77 sales orders, average cycle time, and order value.

Drilldown by Company Code — Sales Organization

Sales Organization	# Sales ... 1	Avg. C... 3	Order Value 2
Vertimode Germany 2	791,770	10 days	$560M
Vertimode Netherlands 1	120,315	11 days	$68M
Stratodex Germany 2	54,197	9 days	$330M
Stratodex China 8	10,837	9 days	$140M
Stratodex USA 1	6,957	6 days	$130M
Stratodex France 3	2,368	9 days	$15M
Stratodex Italy 6	891	9 days	$7.6M
Stratodex Israel 4	565	9 days	$6.1M
Stratodex UK 5	201	7 days	$930k

Fig. 2.11: Table representing development of sales order items

2.8: USE SELECTION VIEWS:

What are Selection Views?

Selection Views offer a more **comprehensive set of options to filter on cases** as compared to what you can do in the components in analysis sheets.

You can access the six Selection Views from anywhere in the analysis by clicking on the Selection Views button located in the analysis toolbar.

Fig.2.12: Selection through analysis toolbar

Then, you can select one of the six selection types depending on what you're looking for.

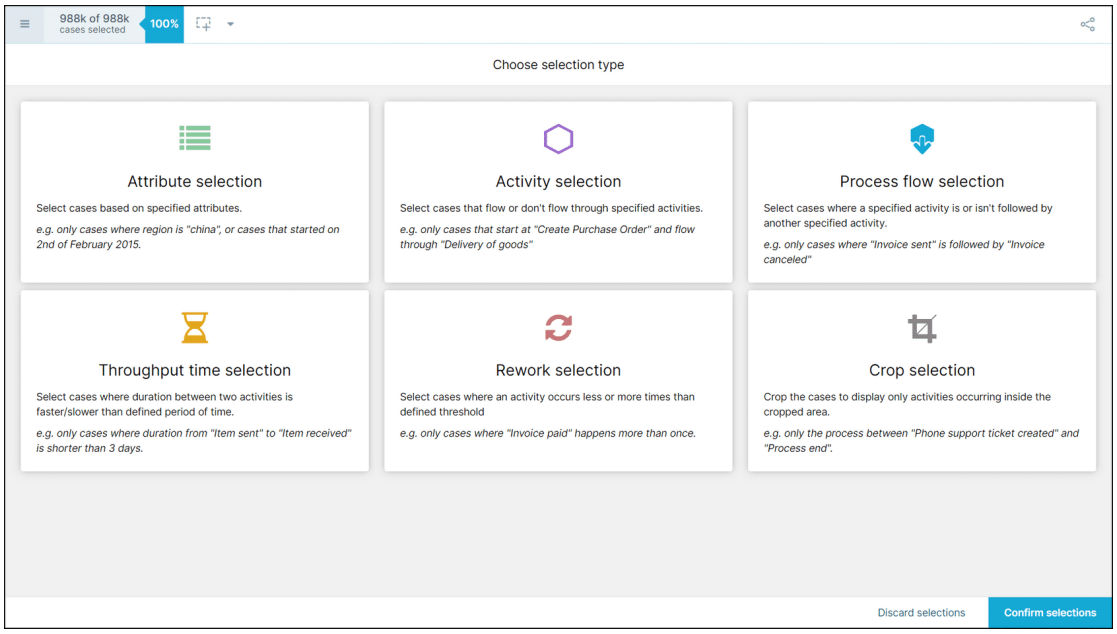

Fig. 2.13: Six Selection Types

2.9: Crop selection:

You can use **Crop Selection** when you want to focus your analysis on all activities and connections between two specific activities. This is especially useful if you are working in a department or team that is only responsible for a certain part of the process.

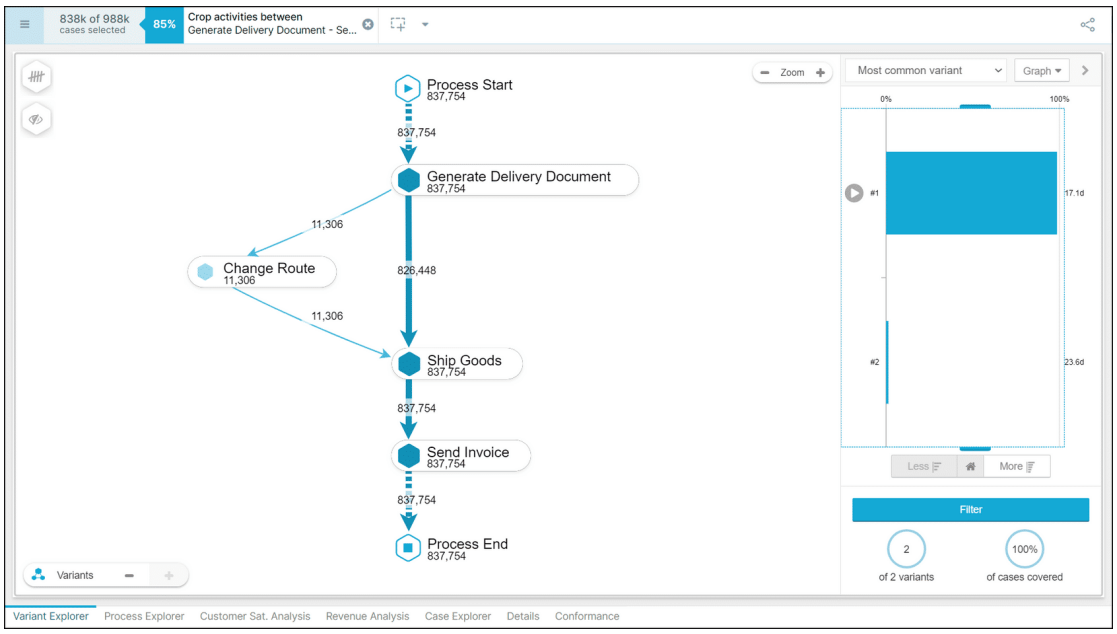

Fig. 2.14: Crop Selection Process

2.10: Save & Share Analysis Selection, Export Data:

Export process visualization and data:

In Celonis Analysis, you can export data and even the process visualization, if enabled by the person building the analysis.

Right-click on the component to see your options as they differ depending on the component.

For example, in the Variant Explorer, you may see options to export the variant(s) as a PNG image (visual graphic) or an XML file. You might also see the option to save

either format to your Process Repository. This is one of the ways by which you can define your to-be process to get automatic insights in the Conformance Checker.

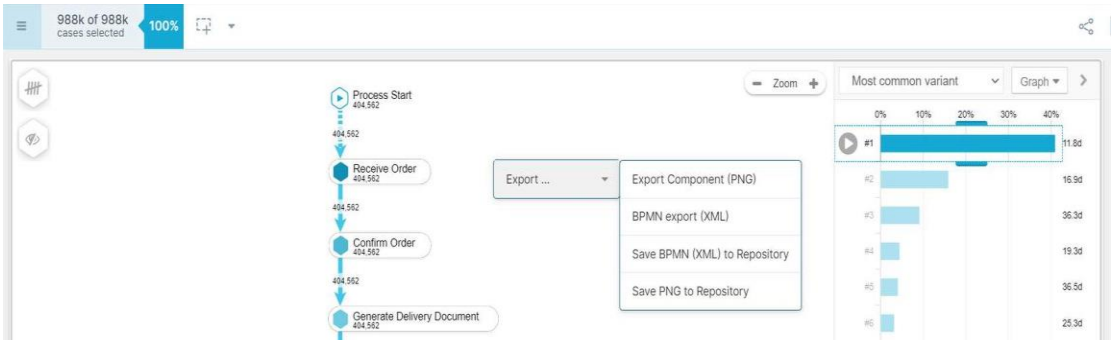

Fig. 2.15: Exporting process

CHAPTER 3

Enhance your analysis building skills and learn to get into Celonis

3.1: Introduction to PQL and the Celonis PQL Engine

A Query Language for Process Mining:

You already heard about something called Celonis PQL and wonder what this has to do with you?

You want to learn more about why Celonis invented and developed this new query language when there are already so many other programming languages out there?

Or have you already done your first steps with our Process Query Language (PQL) and want to learn where all this began?

Executable Queries in Process Mining:

To gain valuable process insights, it is essential for Process Mining users to formalize their process questions as executable queries. For this purpose, we present the Celonis Process Query Language (Celonis PQL), which is:

- a **domain-specific** language
- **tailored** towards a particular process data model and
- designed for **business users**.

It translates process-related business questions into queries and executes them on a custom-built query engine, the Celonis PQL Engine.

Create your first PQL Queries

Where to write PQL:

PQL can be written in a lot of different applications. You can apply it in Analyses, Knowledge Models, Action Flows and so on.

But when it comes to writing queries, you shouldn't be worried about visualization or design. You'd want to write a query, see its output and validate it to see if it is what you expect. And this is where the Data Explorer comes into play.

The Data Explorer is an excellent tool that allows you to easily validate your data and build your first PQL queries. Check out how the **Data Explorer** can help you to write queries.

Navigating the Data Explorer

Can you see how you can add both dimensions and aggregations? The dropdown already shows you some options.

Also, at the top, you can see a filter bar that allows you to filter on specific values in your data.

Give it a try and find the spot where to configure dimensions, aggregations and filters. Once you click on the correct area, you will be able to learn more about that function and if you get it wrong you can continue trying till you get it right! Have fun!

Adjust existing queries:

If you already worked with other query languages like SQL or even programming languages like R, python, etc., you know that mastering it takes time and most of all practice.

Even if you learned a lot of functions on a theoretical level, that doesn't mean you can write the most complex queries in one go.

Most of the time, you **start small, reuse what's already there and step-by-step build up more complex things.**

This is the formula to get all vendors that start with "A":

```
FILTER "vendors"."name" LIKE 'A%'
```

Basic Coding with PQL

Optional: Introduction to P2P and relevant SAP tables

The P2P Process:

Generally speaking, P2P is the process of purchasing goods as a company. After creating a purchase order in the system containing information about the products and the vendor, the company receives the goods and pays the invoice from the vendor.

As we want to analyze the process on a very granular level using Celonis PQL, the cases we are following through the process are **purchase order items**.

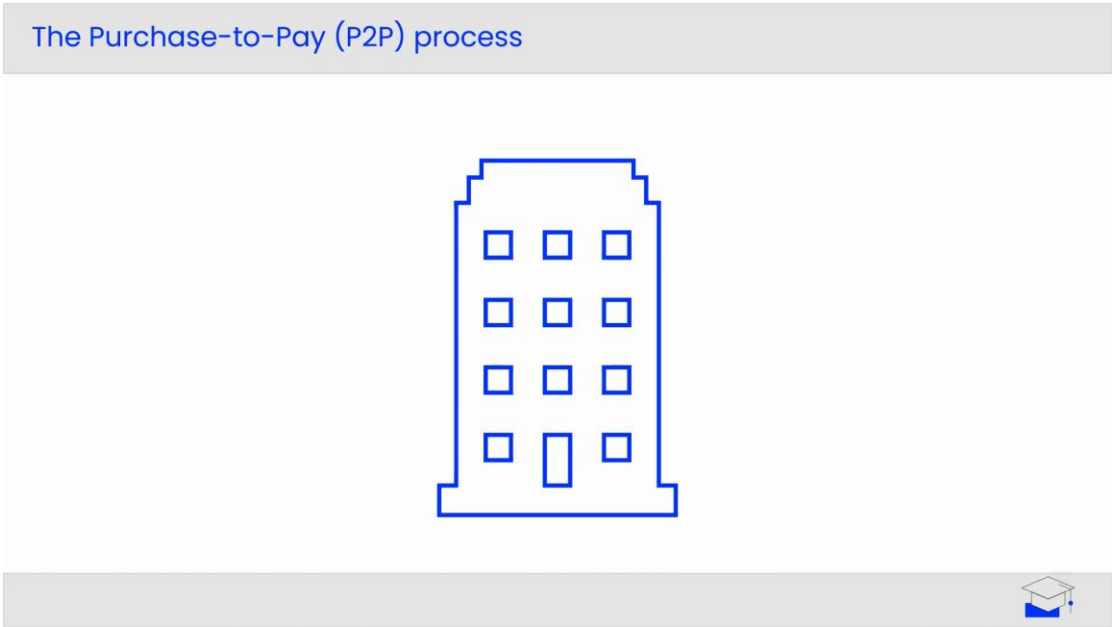

Fig. 3.1: P2P process

3.2: Write PQL Queries:

1.Simplicity:

i. Easy to use from business user to data engineer.

ii. Translates complex process questions into data queries.

iii. Makes process Mining accessible to every celonis user.

2.Flexibility:

i. Set of generic functions and operators.

ii. Combines wide range of combinations.

iii. Formulates any question, regardless of the process.

3.Event log centered:

i. Supports process mining functionalities**.**

ii. Associate cases to event.

iii. Dedicatd process functions operate centered on the given event log.

4.Business Focus:

i. Combines process Mining and Business intelligence capabilities.

ii. augments event data with additional business information.

iii. variety of SQL function.

5.Frontend interaction:

i. Support of a graphical user interface(GUI)

ii. Leads to high acceptance, usage and user adaption.

Celonis PQL Engine:

As you can observe in the graphic below, Celonis PQL is an integral component of theCelonis Software Architecture. All Celonis applications use this language to query data from a data model.

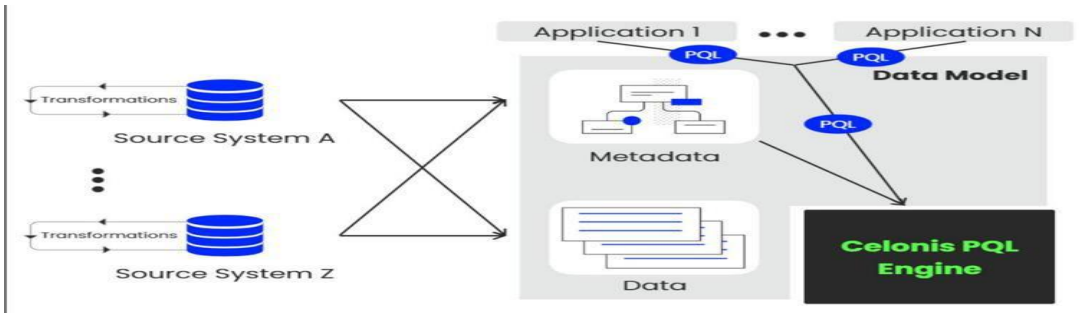

Fig. 3.2: PQL Engine

Software PQL Architecture

SQL VS PQL:

Both are different ,PQL cannot perform data manipulation and data definitionlanguage. Because it designed based on requirements.

PQL satisfies only the Aggregate functions.

3.3: Get Data into the EMS

In this topic we will study about two types they areSet up a data pipeline

Refine your Data Pipeline

In the set up a data pipeline again divide into sub parts they are

1. Data Integration basics
2. Connect to Systems
3. Extract Data
4. Transform Data
5. Load a Data Model

In the Refine your Data Pipeline divide into parts they are

1.Schedule Data Jobs

2.Monitor and validate your Data pipeline

3.Multiple Process and Systems

4.Boost your EMS SQL Transformations

5.Connect Custom processes

6.Quality Assuring your Data Pipeline

1. Data Integration basics

What is Data Integration for?

As a data engineer or analyst working in Data Integration (formerly known as EventCollection), you're responsible for bringing in clean, real-time process data into the EMS. In other words, you build the data pipeline.

2. Connect to Systems

Connecting to source systems is your very first step to pull process data into the Celonis EMS. The EMS utilizes a broad set of technologies like message queues,Restful APIs, Soap APIs, direct database access, or system-specific solutions to connect.

Data Integration in the EMS

Data Integration is where you set up connections and your data pipeline.

The mainways you can bring data into the EMS are:

Process Connectors

Extractors (Data Connections)

Extractor Builder

File Uploads

Data Push API

Celo-extractor

3. Extract Data:

No matter which system you're working with when extracting data, it's a good idea tofirst understand the business process to know exactly which tables you need.

Why don't we extract entire databases and make our lives simple?

For simple reasons—entire database extractions would:

take too long,be taxing on source systems,take up unnecessary cloud storage,and be expensive!

4. Transform Data

The Activity table represents your process and always contains at least these threecolumns that map your process:

The object ID or case key,
the process steps or activities that took place for the different case
keysand the timestamps or event time of each activity
In the Purchase-to-Pay process, the Purchase Order Item Number is the central casekey we follow.
Every Purchase Order Item goes through different activities such as creating the request, creating the item, receiving goods, and paying the invoice. And every activity has a corresponding event time.
In short, every Purchase Order Item has a unique case key that goes through variousactivities at different points in time. Together these three columns build the core of your process flow.

5. Load a Data Model

Just the Activity table on its own in a Data Model is not enough. To be able to drilldown into case information, we need the Case table and other master data tables.
As you know, in Celonis, the Case table is a table containing one row for each case. Inother words, this table contains a row for each "process path" (a path following a case)being analyzed in the application.

By specifying a Case table, you're able to use predefined KPIs in the Celonis analysis,such as a case count. The case count now specifically refers to table “EKPO” and willalways count the number of entries in this table with respect to the applied filters. Thisa screenshot from the Studio showing what is behind the KPI.

Fig. 3.3: KPIs

CHAPTER 4

APPLICATIONS

Celonis:

Explanation: Celonis is a leading process mining platform that helps organizations visualize and analyze their processes using data from various systems. It offers process discovery, conformance checking, and performance analysis.

Features

Process Discovery: Automatically creates process models by analyzing event logs allowing you to visualize how processes are executed in reality.

Conformance Checking: Compares actual process execution with expected models highlighting deviations and compliance issues.

Performance Analysis: Measures process efficiency, identifies bottlenecks, and provides insights for optimization.

Benefits: Celonis enables organizations to streamline operations, reduce inefficiencies, enhance compliance, and make data-driven decisions.

Disco (Fluxicon):

Explanation: Disco is known for its user-friendly interface and offers comprehensive process mining capabilities.

Features

User-Friendly Interface: Designed for ease of use and accessibility, making it suitable for various users.

Process Visualization: Generates process maps and diagrams that visually represent actual process flows.

Root Cause Analysis: Helps identify underlying causes of process deviations and bottlenecks.

Benefits: Disco provides a simple yet powerful toolset for discovering insights from event data and driving process improvements.

PROM

Explanation: ProM is an open-source process mining toolset used in both research and industry.

Features

Plugin-Based Architecture: Offers a wide range of plugins for different process mining tasks, allowing users to choose specific techniques.

Flexibility: Allows customization and experimentation with various process mining algorithms.

ProcessGold:

Explanation: ProcessGold offers process mining solutions with a focus on understanding and optimizing processes.

Features: Advanced Analytics: Combines process mining with advanced analytics for deeper insights and predictive capabilities.

Process Discovery: Automatically creates visual process models from event data, helping organizations understand their operations.

Benefits: ProcessGold empowers organizations to enhance their processes, identify improvement opportunities, and predict future outcomes.

Minit:

Explanation: Minit specializes in simplifying process discovery and analysis for organizations.

Features: User-Friendly Interface: Designed for non-technical users, making it accessible for process analysts and business users. Performance

Metrics: Provides performance indicators and metrics to measure process efficiency.

Benefits: Minit aims to make process mining accessible to a broader audience, enabling process optimization and efficiency gains.

QPR ProcessAnalyzer:

Explanation: QPR ProcessAnalyzer offers process mining combined with advanced analytics capabilities.

Features:

Analytics Integration: Combines process data with advanced analytics to provide in-depth insights and predictions.

Real-Time Monitoring: Monitors processes in real time to identify deviations and opportunities for improvement.

Benefits: QPR ProcessAnalyzer allows organizations to gain a holistic view of their processes, make data-driven decisions, and enhance operational performance. Each of these process mining applications offers unique features and benefits. The choice of the right application depends on factors like your organization's specific goals, technical requirements, and the complexity of the processes you intend to analyze and optimize.

Some more real time applications are

1. Supply Chain Optimization: Process mining can be used to analyze and optimize supply chain processes in real-time. It helps identify bottlenecks, inefficiencies, and deviations from the ideal process flow, enabling organizations to make informed decisions and adjustments on the fly.

2. Healthcare Process Improvement: In healthcare, process mining can be applied to analyze patient treatment pathways, identify variations, and optimize resource allocation in realtime. This can lead to improved patient care and reduced wait times.

3. Manufacturing Process Analysis: Process mining can monitor and analyze manufacturing processes in real-time to ensure that production is running smoothly, detect anomalies or deviations from the standard process, and make immediate adjustments to prevent defects or disruptions.

4. Financial Transaction Monitoring: Process mining can be used in the financial sector to monitor and detect fraudulent activities in real-time. By analyzing

transaction logs, it can identify patterns of suspicious behavior and trigger alerts for further investigation.

5. IT Service Management: Process mining can help IT departments optimize their service management processes by monitoring the flow of IT service requests, identifying bottlenecks, and streamlining incident resolution and request fulfillment.

6. Logistics and Transportation: Real-time process mining can be applied to logistics and transportation operations to monitor the movement of goods, track delivery routes, and optimize the overall supply chain to ensure timely and efficient deliveries.

7. Customer Journey Analysis: Process mining can provide insights into customer interactions and behaviors across various touchpoints in real-time. This information can be used to improve customer experiences and optimize marketing and sales strategies.

8. Energy Management: Process mining can monitor energy consumption patterns in realtime to identify energy wastage, optimize energy usage, and reduce operational costs for industrial facilities and buildings.

9. Emergency Response and Disaster Management: During emergency situations, process mining can help emergency responders analyze data in real-time to allocate resources effectively, optimize response times, and make informed decisions to manage crises.

10. Compliance Monitoring: Process mining can assist organizations in real-time compliance monitoring by identifying deviations from regulatory processes and providing alerts to prevent potential compliance violations.

11. Human Resources Process Optimization: Real-time process mining can be used to analyze HR processes such as employee onboarding, performance evaluations, and leave management. It helps ensure efficient and consistent HR practices.

12. Retail Operations Optimization: Process mining can analyze real-time data from retail operations to optimize inventory management, supply chain operations, and store layouts for better customer experiences and increased profitability. These

are just a few examples of how process mining can be applied in real-time across various industries. The technology continues to evolve, enabling organizations to gain insights, improve efficiency, and make informed decisions based on up-to-date process data.

CHAPTER 5

OUTCOMES

After completing this Training Track, you will be able to:

• Interpret process visualizations and leverage analyses to identify process inefficiencies.

• Conceptualize your process in terms of activities and cases.

• Save an analysis selection for future reference and share it with your team; export visualizations and process data.

• Perform the basic tasks necessary to build Celonis analyses.

• Become familiar with Analysis Settings and Permissions.

• Publish analyses using best practices in version control.

• Put your knowledge about the theoretical foundations of Process Mining into practice.

CHAPTER 6

Conclusion

In conclusion, process mining is a powerful and versatile technology that offers valuable insights into the inner workings of organizational processes. By analyzing event data generated during the execution of processes, process mining uncovers hidden patterns, identifies inefficiencies, and provides actionable recommendations for process optimization. This technology has the potential to drive improvements across a wide range of industries, including manufacturing, healthcare, finance, logistics, customer service, and more.

Process mining's ability to visualize process flows, detect bottlenecks, and pinpoint deviations from the ideal path enables organizations to make informed decisions aimed at enhancing efficiency, reducing costs, and improving overall performance. The real-time applications of process mining are particularly noteworthy, as they empower businesses to respond promptly to changing circumstances, address issues as they arise, and ensure that processes operate at their optimal levels.

As technology continues to advance, process mining techniques are likely to become even more sophisticated and integrated with other data-driven approaches, further enhancing their ability to drive process excellence. However, successful implementation of process mining requires a comprehensive understanding of both the technology and the underlying business processes. Organizations that embrace process mining stand to gain a competitive edge by harnessing the power of data-driven insights to continuously refine their operations and achieve higher levels of efficiency and effectiveness.

COURSE COMPLETION CERTIFICATE:

INTERNSHIP CERTIFICATE:

References:

- Ref website:https://academy.celonis.com/learning-paths/execution-management.
- Execution management link : https://tinyurl.com/2pvuuzmd.
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