An Internship Report

on

Process Mining Virtual Internship

Submitted in partial fulfilment of the requirements

for the award of the degree of

BACHELOR OF TECHNOLOGY

in

Computer Science and Engineering (Data Science)

by

S.JAHEDA   **214G1A3229**

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
(DATA SCIENCE)

SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY (AUTONOMOUS)

**(Affiliated to JNTUA, accredited by NAAC with 'A' Grade, Approved by AICTE, New Delhi & Accredited by NBA (EEE, ECE & CSE))
Rotarypuram village, B K Samudram Mandal, Ananthapuramu-515701.**

2023 - 2024

SRINIVASA RAMANUJAN INSTITUTE OF TECHNOLOGY (AUTONOMOUS)

(Affiliated to JNTUA, accredited by NAAC with 'A' Grade, Approved by AICTE, New Delhi & Accredited by NBA (EEE, ECE & CSE))
Rotarypuram village, B K Samudram Mandal, Ananthapuramu-515701.

Department of Computer Science & Engineering (Data Science)

Certificate

This is to certify that the internship report entitled "Process Mining Virtual Internship" is the bonafide work carried out by **S.JAHEDA** bearing Roll Number 214G1A3229 in partial fulfilment of the requirements for the award of the degree of **Bachelor of Technology** in **Computer Science and Engineering (Data Science)** for 10 weeks, from May 2023 to July 2023.

Internship Coordinator   **Head of the Department**

Mr. P. Veera Prakash, M. Tech., (Ph.D.),   Dr. P. Chitralingappa, M. Tech., Ph.D.,
Assistant Professor & HOD of CSE   Associate Professor

Date: **EXTERNAL EXAMINER**

Place: Ananthapuramu

ACKNOWLEDGEMENT

The satisfaction and euphoria that accompany the successful completion of any task would be incomplete without the mention of people who made it possible, whose constant guidance and encouragement crowned our efforts with success. It is a pleasant aspect that I have now the opportunity to express my gratitude for all of them.

It is with immense pleasure that I would like to express my indebted gratitude to my internship coordinator **Mr. P. Veera Prakash, Assistant Professor & HOD, Department of Computer Science and Engineering**, who has supported me a lot and encouraged me in every step of the internship work. I thank him for the stimulating support, constant encouragement and constructive criticism which have made possible to bring out this internship work.

I am very much thankful to **Dr. P. Chitralingappa, Associate Professor & HOD, Computer Science and Engineering (Data Science),** for his kind support and for providing necessary facilities to carry out the work.

I wish to convey my special thanks to **Dr. G. Balakrishna, Principal** of **Srinivasa Ramanujan Institute of Technology** for giving the required information in doing my internship. Not to forget, I thank all other faculty and non-teaching staff, and my friends who had directly or indirectly helped and supported me in completing my internship in time.

I also express our sincere thanks to the Management for providing excellent facilities and support**.**

Finally, I wish to convey my gratitude to my family who fostered all the requirements and facilities that I need.

S.Jaheda
(214G1A3229)

PREFACE

Brief overview of the company's history:

Celonis is a German software company founded in 2011 by Bastian Nominacher, Martin Klenk, and Alexander Rinke. The company specializes in process mining, which involves analyzing and visualizing business processes based on data from IT systems. Celonis aims to help organizations improve their operational efficiency, identify bottlenecks, and enhance decision-making by providing insights into their processes. Since its inception, Celonis has gained recognition as a leading player in the field of process mining and has expanded its operations globally.

Company's Mission Statement:

Celonis' mission statement is centered around empowering organizations to unlock the full potential of their processes through advanced data analytics and process mining technology. The company aims to help businesses improve operational efficiency, drive innovation, and make data-driven decisions to achieve transformative outcomes.

Business Activities:

1.Process Mining Software.

2. Consulting and Services

3. Training and Education

4. Research and Development

5. Partnerships

6. Global Expansion

7. Customer Support

INDEX

		Page No.
Contents		

LIST OF FIGURES

LIST OF ABBREVIATIONS

AICTE   All India Council for Technical Education

EMS   Execution Management System

IEEE   Institute for Electrical and Electronic Engineers

KPI   Key Performance Indicators

PQL   Process Query Language

CHAPTER - 1

INTRODUCTION TO PROCESS MINING

The term "Process mining" was first coined in a research proposal written by the Dutch computer scientist Wil van der Aalst. Thus began a new field of research that emerged under the umbrella of techniques related to data science and process science at the Eindhoven University in 1999. In the early days, process mining techniques were often convoluted with the techniques used for workflow management. In the year 2000, the very first practically applicable algorithm for process discovery,

"Alpha miner" was developed. The very next year, in 2001, a much similar algorithm based on heuristics called "Heuristic miner" was introduced in the research papers. Further along the link more powerful algorithms such as inductive miner were developed for process discovery.

As the field of process mining began to evolve, conformance checking became an integral part of it. The year 2004 earmarked the development of "Token-based replay" for conformance checking purposes. Apart from the mainstream techniques of process discovery and conformance checking, process mining branched out into multiple areas leading to the discovery and development of Performance analysis", "" Decision mining" and "Organizational mining" in the year 2005 and 2006 respectively. In the year 2007, the first ever commercial process mining company "Futura Pi" was established.

The "IEEE task force on PM", a governing body was formed in the year 2009 that began to overlook the norms and standards related to process mining. Further techniques were developed for conformance checking which led to the publishing of "Alignment-based conformance checking" in the year 2010. In 2011, the first-ever Process mining book was published. Further along in 2014, a MOOC course was offered by Coursera on Process mining. By the year 2018, nearly 30+ commercially available process mining tools were in the picture. The year 2019 earmarked the first Process mining conference. Today we have over 35 vendors offering tools and techniques for process discovery and conformance checking. Process mining should be viewed as a bridge between data science and process science.

Process mining technology transforms event logs into a process map capable of providing insights to better monitor and improve processes through identifying variants, rework patterns, and bottlenecks based on true data.

Process mining provides results that are**:**

Objective: Process mining removes human error thus empowering organizations with unbiased, as-is process data.

Fast: With a scalable algorithm, process mining quickly analyzes years of process execution data quickly, thus expediting process discovery, process performance analysis, and regulatory compliance checking

Complete: Every past execution of the analyzed process, regardless of its frequency, is completely represented. Common use cases of process mining include discovering the actual process versus the modeled process, simulating the results in a potential process change, and monitoring a process's efficiency and compliance.

1.1 Benefits

A clear path towards improvement within a process starts with identifying the present process by listing information such as which activities are performed, when, by whom, and in which order. Furthermore, the discovered process may monitor process specific key indicators as well as regulatory compliance rules to predict violations. This allows organizations to take quick remedial actions against any violating and conflicting process behaviors. Enhancements and/or fixes may be simulate to estimate the costs, time, and quality of the suggested solution before implementation. In addition, Process mining enables business leaders and decision-makers to: Analyze interactions and working habits of various teams and individuals Identify products or services that are the root cause of congested and/or undesired extra work Eliminate waste by reducing process execution variability thus increasing standardization and efficacy.

1.2 Why is process mining important?

Process mining helps auditors analyze data faster and enables you to predict where compliance issues and risk factors are likely to exist. Since process mining gives you complete insights into your processes, you get a clearer picture of

potential problem areas.

As businesses implement digital solutions, automation, and information technology, the demand for process mining software is increasing. This software understands the operations of a business and assists them in finding inefficiencies and bottlenecks in the operation.

1.3 What is a process?

Mathias Weske, professor of business technology defines business process collection of related, structured activities or tasks that, in a specific sequence, produce a service or product. This basically means that when you are producing something, you have got different activities that lead up to this.

One easy example for that could be a pizza delivery process. It starts with placing the order by calling the pizza company or via their website. Then, the order is assigned to a pizza maker. The pizza maker bake the pizza, the pizza is packaged, a delivery person delivers it to the assigned address and the payment is received. The problem is this is the ideal scenario of pizza delivery process.
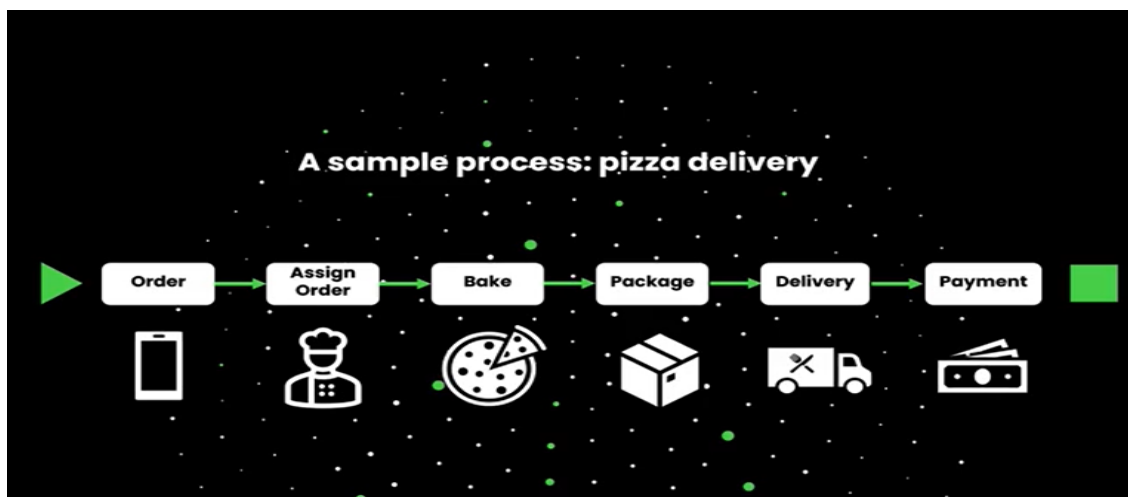
**Fig. 1: A sample process: pizza delivery**

But in practice, there are so many things that can go wrong on the way there. The pizza maker might put the wrong ingredients, the delivery person might go to a different address, or the payment fail. Therefore, we can say processes are the engine of every experience. Understanding these processes and optimizing are crucial for successful businesses.

CHAPTER - 2

TECHNOLOGY

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 the leading new technology when it comes to talking about algorithmic businesses - in other words, businesses that use algorithms and large amounts of real-time data to create business value. This has only become possible through the advent of information systems and administrative tools (e.g. Enterprise Resource Planning or Customer Relationship Management systems) which provide a good data source for process analytics. Process Mining is a solution to costly and time-intense efforts to get data-driven insights into a business, as acknowledged by the industry research firm Gartner.
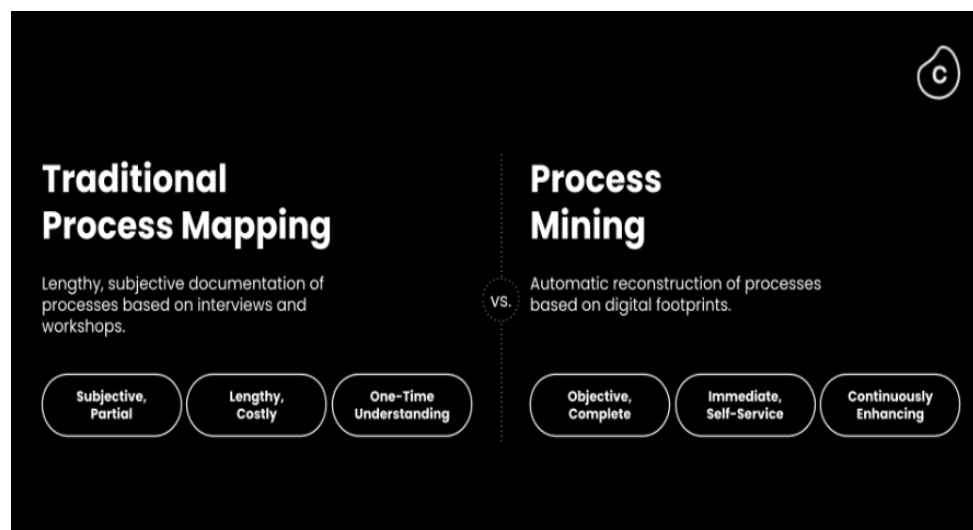
Fig 2.1:Traditional Process Mapping vs. Process Mining

Compared to the traditional process mapping approaches, Process Mining technology solves **the complexity and visibility problem.**It' an x-ray for businesses that gives 100% transparency into processes, eliminating process blind spots, and quantifying the impact of process problems on core KPIs. It leverages data from a business's source systems and user desktops to map the processes, thus eliminating conjecture about how they're running. This allows businesses to better field

competing requests from their stakeholders because they can have **confidence in the data**. And lastly, because it's using the system data in real-time, it provides **a living, breathing view of the processes** that is generated immediately and is always up-to-date, substantially reducing cost and the time to value.

Process Mining is the combination of two disciplines: **Data Science** and **Business Process Management**. Process Mining essentially uses Data Science techniques, such as Big Data and AI, to address Process Science problems such as process improvement and automation.
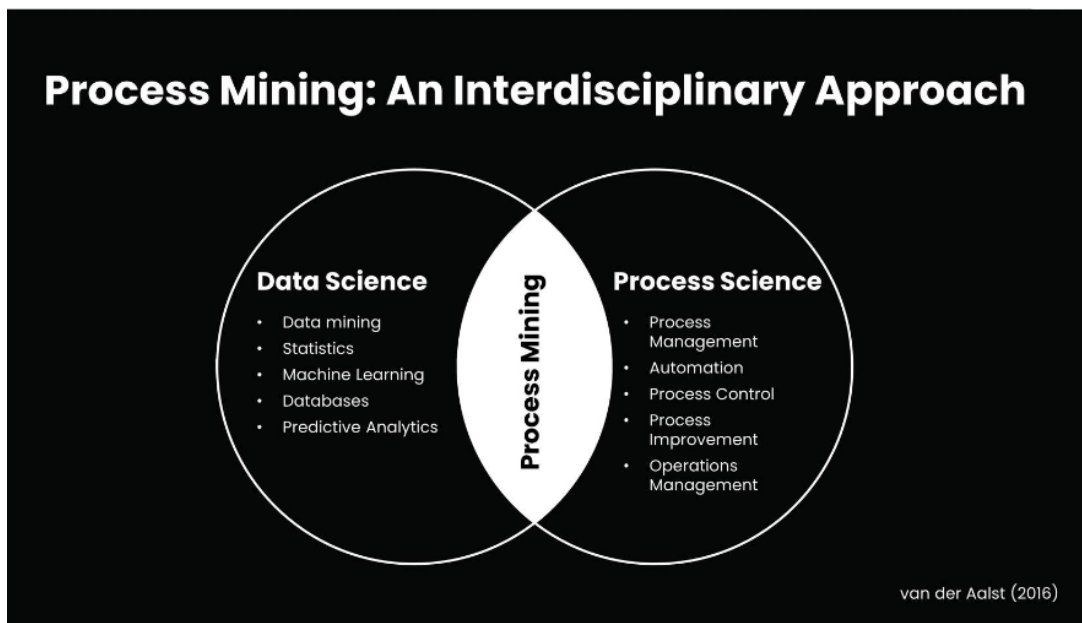
Fig 2.2:Process Mining uses Data Science techniques to address Process Science problems

Process Mining achieves this union by taking the **digital footprints** that are created in IT systems and using them to **reconstruct and visualize process flows**. From here, Process Mining technology can identify patterns and deviations and ultimately eliminate bottlenecks. Now we will take a deeper look at what is required to reconstruct a process in this way.

Process mining starts from event data. Input for process mining is an event log. An event log views a process from a particular angle. Each event in the log should contain (1) a unique identifier for a particular process instance (called case id), (2) an activity (description of the event that is occurring), and (3) a timestamp. There may be additional event attributes referring to resources, costs, etc., but these are

optional. With some effort, such data can be extracted from any information system supporting operational processes.

- Process mining aims to discover, monitor and improve real processes by extracting knowledge from event logs readily available in today's information systems.

- Real process means the process that is actually taking place in an organization. Process mining applies data science to discover, validate and improve workflows. By combining data mining and process analytics, organizations can mine log data from their information systems to understand the performance of their processes, revealing bottlenecks and other areas of improvement. Process mining leverages a data-driven approach to process optimization, allowing managers to remain objective in their decision-making around resource allocation for existing processes.

2.1 Types of process mining:

- ❖ Discovery
- ❖ Conformance
- ❖ Enhancement

2.1.1 Discovery:

Deriving information from some event log without using an a priori model. Based on an event log various types of models may be discovered.

• Process model

• Business rules

• Organizational model

The first step in process mining. The main goal of process discovery is to transform the event log into a process model. An event log can come from any data storage system that records the activities in an organization along with the timestamps for those activities. Such an event log is required to contain a case id (a unique identifier to recognize the case to which activity belongs), activity

description (a textual description of the activity executed), and timestamp of the activity execution. The result of process discovery is generally a process model which is representative of the event log.

2.1.2 Conformance Checking:

An existing process model is compared with an event log of the same process. Conformance checking can be used to make sure reality, as recorded in the log, conforms to the model and vice versa. Helps in comparing an event log with an existing process model to analyze the discrepancies between them. Such a process model can be constructed manually or with the help of a discovery algorithm. For example, a process model may indicate that purchase orders of more than 1 million euros require two checks. Another example is the checking of the so-called "four-eyes" principle. Conformance checking may be used to detect deviations (compliance checking), or evaluate the discovery algorithms, or enrich an existing process model. An example is the extension of a process model with performance data, i.e., some *a priori* process model is used to project the potential bottlenecks.
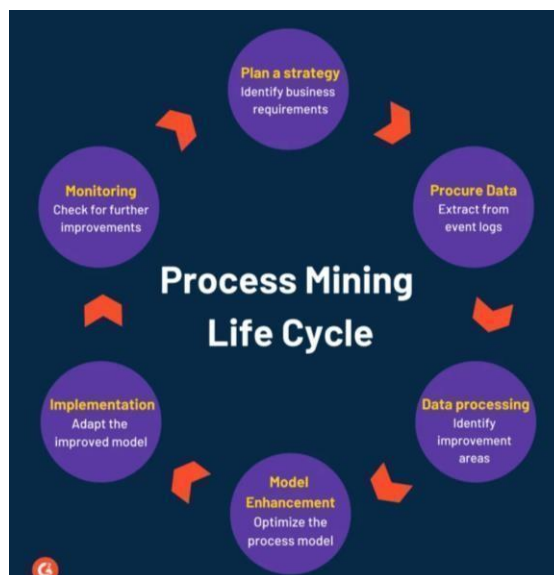
2.1.3 Enhancement:

Improve or extend an existing process model using information about the actual process recorded in some event log.E.g. by using timestamps in the event log one can extend the model to show bottlenecks, service levels, throughout time, frequencies
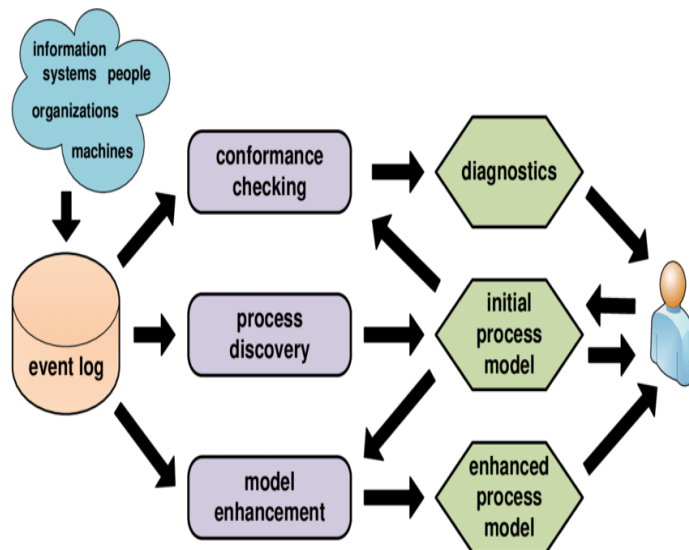
Fig. 2.3: Types of process mining

Process mining life cycle:

Fig 2.4 Process mining life cycle

CHAPTER - 3

APPLICATIONS OF PROCESS MINING

Process mining, while often associated with business and organizational contexts, can also have applications in daily life scenarios:

1. **Personal Time Management**: Process mining can help analyze your daily routines and activities, revealing patterns and inefficiencies that could be optimized for better time management.

2. **Fitness and Health**: By analyzing your exercise and dietary habits, process mining can provide insights into your fitness journey, helping you adjust your routines for better results.

3. **Home Automation**: Process mining can be used to analyze your interactions with smart home devices, enabling you to optimize energy consumption and automate tasks more effectively.

4. **Cooking and Meal Planning**: Process mining can analyze your cooking processes and meal planning habits, helping you streamline your cooking routines and discover new recipes.

5. **Study and Learning**: Process mining can assist in analyzing your study habits, identifying areas for improvement, and suggesting effective learning strategies.

6. **Travel Planning**: By analyzing your travel booking and planning processes, process mining can help you optimize your travel arrangements and discover cost-saving opportunities.

7. **Finances**: Process mining can provide insights into your spending habits, helping you budget more effectively and identify areas where you can save money.

8. **Social Interactions**: Process mining could help you understand your social interactions and communication patterns, aiding in improving relationships and effective communication.

9. **Shopping Habits:** By analyzing your online and offline shopping behaviors, process mining can offer recommendations,improve shopping efficiency, and manage impulse purchases.

10. **Entertainment Choices:** Process mining can help you understand your preferences in entertainment ,aiding in discovering content aligned with your interests.

11. **Health Tracking:** If you use health tracking apps or devices, process mining can analyze your health data and provide insights into your fitness and well-being.

12. **Digital Habits**: Process mining can shed light on your digital habits, such as screen time, app usage, and online activities, helping you maintain a healthier digital lifestyle.

13. **House Chores:** By analyzing your household chores and cleaning routines, process mining can help you optimize your tasks and allocate time more efficiently.
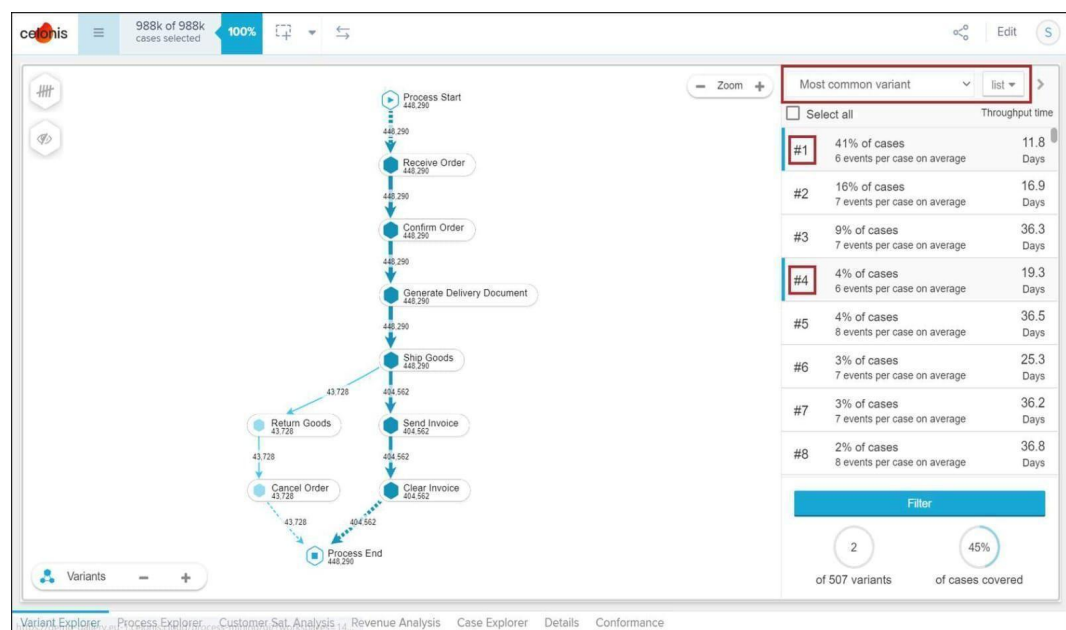
CHAPTER - 4

MODULE EXPLANATION

4.1 Review & Interpret Analyses - I

4.1.1 Variant Explorer

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.

Fig 4.1 Analysis Sheet

4.1.2 Process Explorer

The Process Explorer is another analysis tool to use when taking an exploratory approach. It's especially useful for quickly revealing activities beyond the most common ones. It also allows you to narrow your focus on a single activity, for example an undesired activity, to see which activities cases typically come from and which activities they're going to.

Clicking on an activity in the Process Explorer, you can see a list of the predecessor and successor activities

Process Explorer is the List view of activities and connections. This way, you

can quickly scroll through a list of the most common activities and connections. And from there, you can even reveal the predecessor and successor activities.

4.1.3 Charts,Tables & KPIs:

- **A dimension** is a category of attributes; for example, the dimension "customer name" is a category for individual customer names. Other examples of dimensions, depending on the nature of the process, can include vendor name, sales organization, region, and material group.

- **Key Performance Indicators (KPIs)** are used to calculate and add aggregated values; for example, case count, order value, invoice value, throughput time, and automation rate.

- KPIs may also appear as standalone numbers as seen below with the On-Time Delivery and Net Promoter Score (NPS) examples; we call these analysis components "Single KPIs."
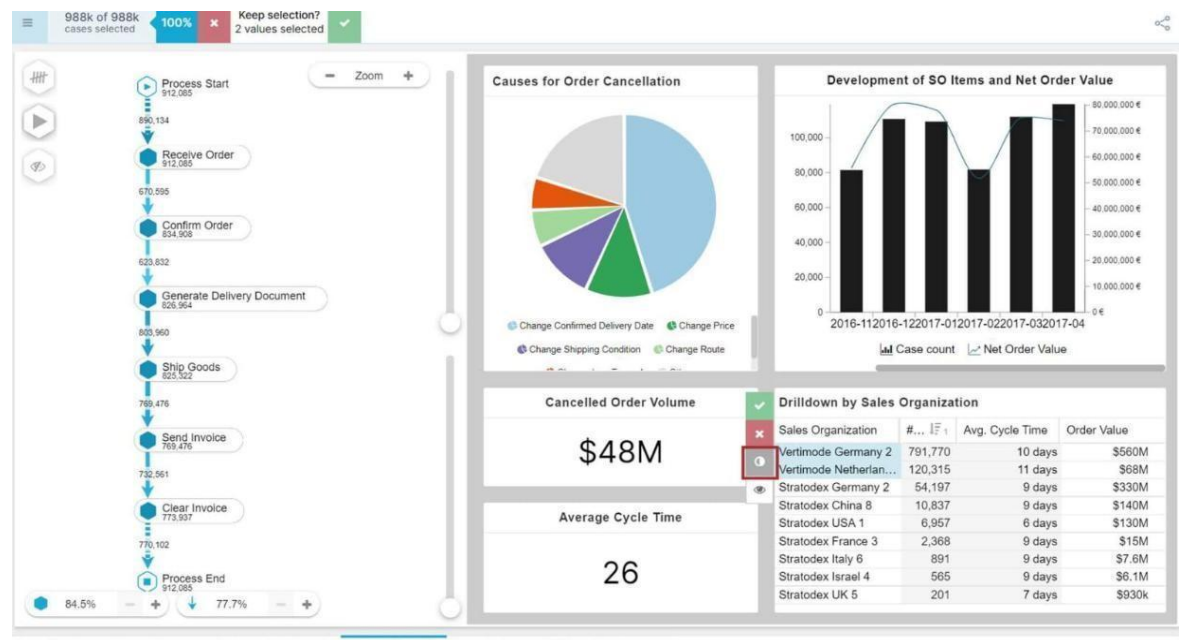

Fig 4.2 Revenue Analysis

4.2 Review & Interpret Analyses - II

4.2.1 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.
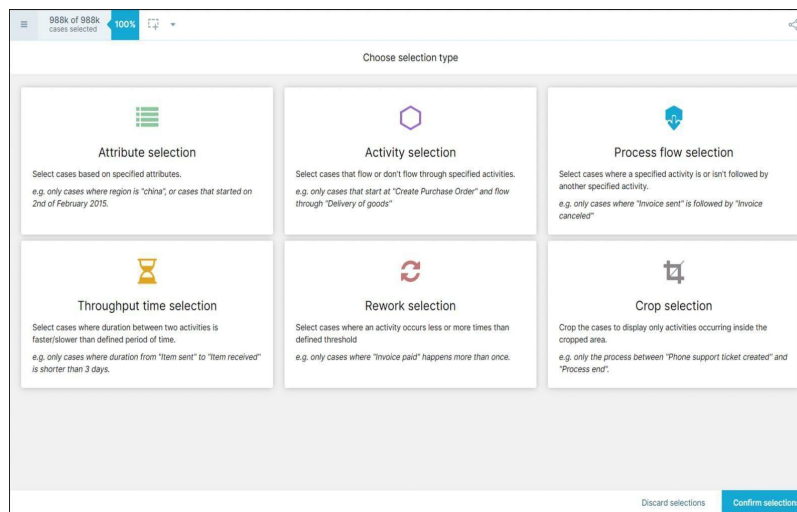
Fig4.3 Selection views

4.2.2 Case Explorer

The Case Explorer is useful once you've narrowed down the analysis to a few cases that you want to investigate further. You can view specific case details such as timestamp of activities, user type (manual or automatic), possibly even user name (depending on your setup), and other useful pieces of info.

4.2.3 Conformance Checker

The Conformance checker evaluates each case against the process model your organization has specified to determine whether it conforms to it or not**.**
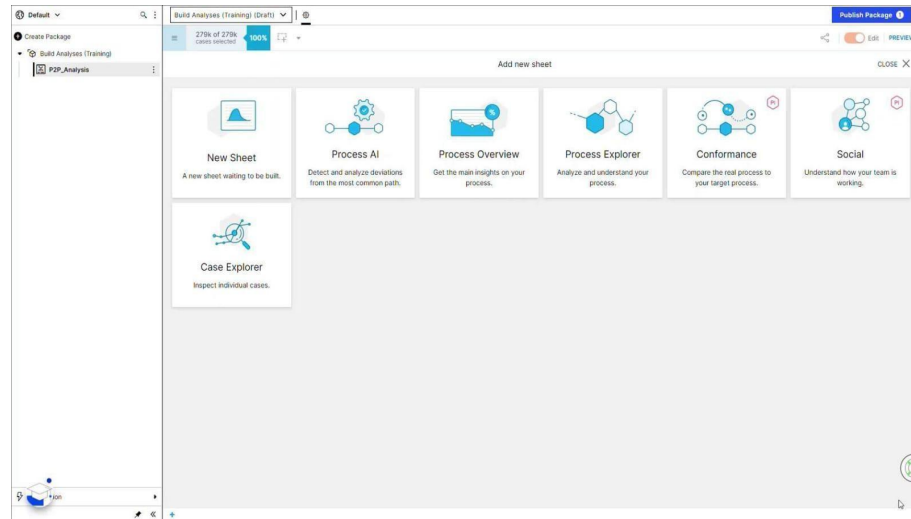
Conformance Check takes into account two types of criteria in the Violations list:

- Activities not reflected in the process model

- Order of activities not reflected in the process model.

4.3 Build Analyses

4.3.1 Analysis Sheet :

You'll build analyses in Studio and users will view the published analyses in apps

Fig 4.4 Analysis Sheet Options

4.3.2 Configure Tables, Charts &KPIs

Three data tables we used to configure

- OLAP Tables

- Column and Line Charts,

- Pie Charts.

Anytime you add a table or chart to the analysis, you'll need to select the dimension(s) and KPI(s) to display.

Celonis Analysis includes four types of single KPI components. The most common use cases for the single KPI component include the case count and net value.

Aside from the Number, you might choose other Single KPI components such as Gauge, Fill, and Radial, depending on what you need to display.

4.3.3 Background Filters
Background filters can be applied at three levels:

➢ A component (such as a Process Explorer or an OLAP Table)

➢ A sheet

4.4 Rising Star Technical

4.4.1 PQL Queries

Celonis PQL is an integral component of the Celonis Software Architecture.All Celonis applications use this language to query data from a data model.

Celonis PQL follows four language features:

- First, operators usually create and return a **single column** that is either added to an existing table (e.g., the case or activity table) or to a new, temporary result table.

- Second, the **supported data types** comprise STRING, INT, FLOAT, and DATE.

- Third, **Boolean values** are not directly supported, but can be represented as integers.

- Fourth, each data type can hold **NULL values**. Celonis PQL operates.
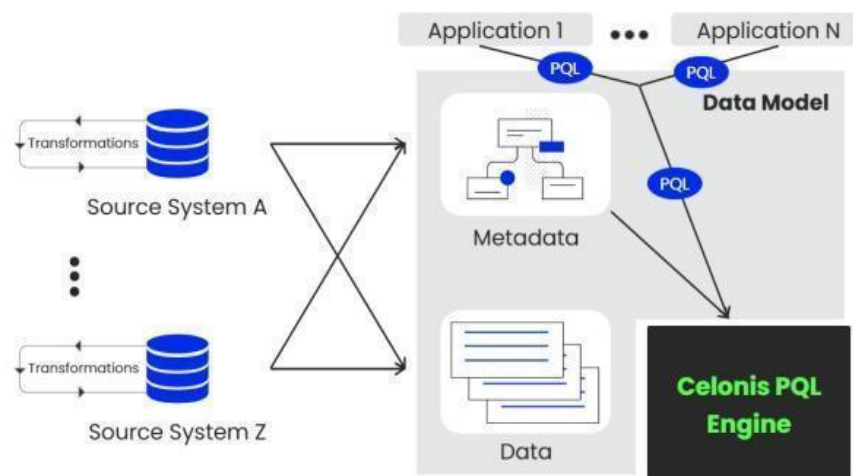
Fig 4.5 Celonis PQL Engine

The Data Explorer is an excellent tool that allows you to easily validate your data and build your first PQL queries.

Standard Aggregation Functions

- Counting COUNT()

- Evaluating includes AVG(),MIN(),MAX(),SUM(),MEDIAN()

- QUANTILE(),VAR(),STDEV()

Data Flow Functions

- CASE WHEN
  COALESCE

- REMAP_VALUES

String modifications comprise a set of powerful functions including combinations, transformations and cropping to get the most out of your Celonis queries.

- LOWER,UPPER,REVERSE

- LEFT,RIGHT,LTRIM,RTRIM,SUBSTRING

Data Type conversions

Different types (e.g. integer, float, string or date).

4.4.2 Get Data into EMS

Data Integration in the EMS :

Data Integration is where you set up connections and your data pipeline. The main ways you can bring data into the EMS are:

1. Process Connectors

   Process Connectors are the fastest and most common way for you to connect and cover the most established process use cases.

2. Extractors (Data Connections)

   Extractors are blank data connections with no reference to a process. With Extractors, you connect to source systems and then have to build your data pipeline from scratch—i.e. your extractions, transformations, and Data

Model.

3. Extractor Builder

This tool helps you quickly build an Extractor using REST API and supports the O Data V2 and V4 standards as well. It allows you to quickly connect to source systems and extract the data you need.

4. File Uploads

1. For additional static data

2. For a list of translation terms

3. For a list of permissions outside of your source systems

4. For historical data that you know will never change

5. For one-time uploads

1 Data Push API

The Data Push API uses micro batching (data chunks) to provide a scalable and reliable integration point and allows Parquet and CSV file formations.

2 Celoxtractor

The Celoxtractor is a Python package designed to let you develop your own EMS Extractor easily. It gives you:

- complete control over your data feature parity to native Celonis extractors,and full flexibility in adjusting all aspects of your extractions.

4.4.3 Refine Data Pipeline

Schedule Data Jobs

- Extractions and Transformations and Data Model Loads in a **continuous manner**.

- For a continuous and automated data load you can use the scheduling functionality. Schedules allow you to sequentially execute Data Jobs on a regular basis.

4.4.4 Troubleshoot & Monitor

- It's important for you to know the ins and outs of troubleshooting your Data

Pipeline from the moment you connect to source systems to when you set up your Data job schedules or replications using the Replication Cockpit.

- If your Data Pipeline is set up end to end, then it is theoretically time for you to sit back and enjoy the beauty of your work. That said, you should make sure to keep an eye on things to ensure everything keeps running smoothly.

4.4.5 Extract Necessary Data

An optimized data pipeline extracts and transforms **only necessary data.** Skipping an optimization of your extractions can have very detrimental effects on your data pipeline. It leads to:

- Higher storage needs (affects your license's APC)

- Heavier consequences of bad practices in transformations (e.g. SELECT *)

- Negative performance impact on load times in extractions and transformations.

Four important points to consider when defining data requirements.

- **Activity Data** - Used as the main ingredient for process mining to generate an event log.

- **Dimensions** - Show the process/metrics for specific attributes such as vendors and product categories.

- **Key Metrics** - Allow us to align on the most important calculations prior to data extraction.

- **Translation & Name Mappings** - Convert certain technical terms into meaningful text fields.

Finally ,run a **quality assurance check on your Data Pipeline** before it goes live. The checklist is based on project best practices and currently used in implementations.

CHAPTER - 5

ADVANTAGES OF PROCESS MINING

Process mining can be applied in multiple business areas in the financial services industry, such as Purchase-To-Pay, audit, and accounts payable to increase business efficiency and gain a comprehensive overview of business processes to implement and monitor digital transformation strategies.

1. Increase process efficiency by discovering bottlenecks

Process mining can be applied to different financial processes that generate event logs such as account payables (AP), receivables (AR), and procurement to visualize process execution and identify bottlenecks. Process Mining can provide strategies and recommendations to eliminate process inefficiencies. For example, in claims settlement, mining can identify root causes by measuring the average amount of time to settle a claim.

2. Compile checking

Process mining enables financial institutions to monitor and log process improvement overtime to ensure that their processes are audit-ready. Process mining also provides conformance check and root cause analysis, allowing financial institutions to compare their processes against rules and regulations and analyze the reasons behind the deviations

3. Discover automation opportunities

Leveraging process mining provides insights about processes that can benefit from automation. For example, process mining allows financial organizations to discover the possibility of automation in transactions such as:

- purchase-to-pay processes that take longer due to mistakes and manual interventions can be enhanced by implementing automation solutions such as RPA.

- Invoice processes where automation can enable quicker and less costly

invoicing by automating repetitive tasks such as data extraction from PDF.

4.Maverick buying in purchase-to-pay

Banks can leverage process mining in purchase-to-pay, which refers to a company's entire purchasing process. For example, Process mining can help reduce maverick buying (i.e. purchases of employees without informing the procurement department). Process mining enables the user to check the necessary steps in a P2P process, including:

- Generating a receipt after a purchase order (PO)

- Matching the PO to a contract: There should not be a PO without a contract (especially if the amount of orders is large in quantity and regular).

5.Risk mitigation

Process mining helps financial service providers to avoid potential risks when they innovate or modify processes in their systems by constantly monitoring processes and providing data- driven insights and optimization opportunities .
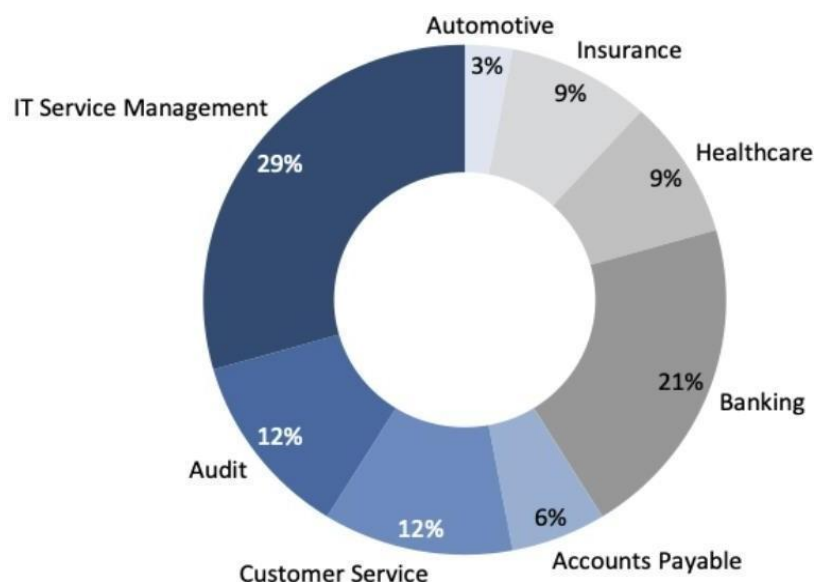
Fig 5.1 Use cases

As people (and software) interact with business IT systems, their actions are captured by these systems and can then be transformed into event logs and visualized with the help of process mining. That's how it happens.
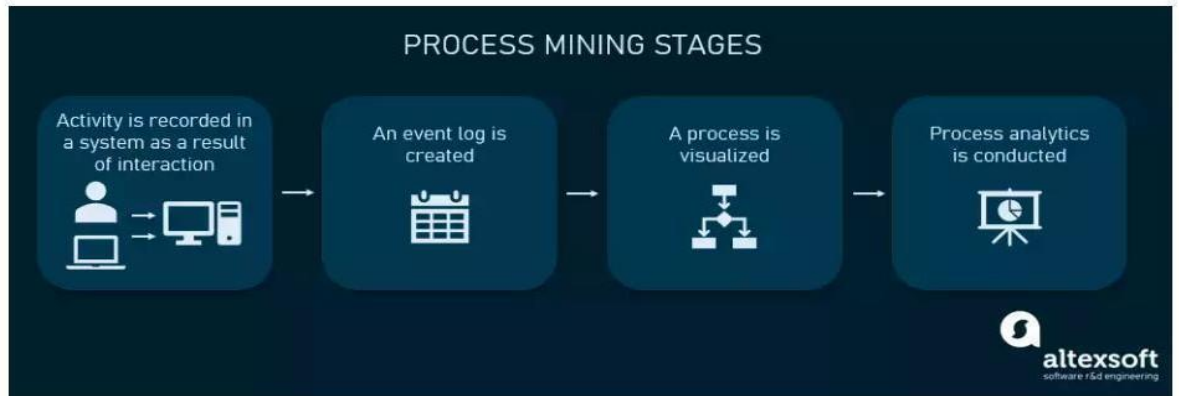
Fig 5.2 Process mining stages

CHAPTER - 6

LEARNING OUTCOMES

After you complete this training, you should be able to:

- Understood what process mining is and the basics of how it works.

- Identified business use cases for process mining.

- Learnt how to find training courses to get started.

- Understood how to discover, analyze, and improve business processes using data driven techniques.

- learnt to identify bottlenecks, inefficiencies, and opportunities for optimization.

- And also, you will learnt to extract to create visual representations of processes to aid decision making and process improvement efforts.

- Also gained skills in using process mining tools and interpreting the results to enhance organizational efficiency and effectiveness.

CONCLUSION

Process mining can be a powerful tool for improving the efficiency and effectiveness of business processes,and is increasingly used by organizations to drive process improvement efforts.It offers objective, fact-based insights, derived from actual data, to help you audit, analyze, and improve your existing business processes. Process mining aims to extract information from event logs, which are recorded from running business processes.

Process Mining is achieved by taking the digital footprints that are created in IT systems and using them to reconstruct and visualize process flows. From here, Process Mining technology can identify patterns and deviations and ultimately eliminate

References

[1] https://www.processmining.org

[2] https://www.celonis.com/process-mining/what-is-process-mining

Internship certificate

Certificate of Virtual Internship

This is to certify that

JAHEDA SHEIK

Srinivasa Ramanujan Institute of Technology

has successfully completed 10 weeks

Process Mining Virtual Internship

during May - July 2023

Supported By **celonis**

Jerome Geyer-Klingeberg
Head of Academic Alliance
Celonis

Shri Buddha Chandrasekhar
Chief Coordinating Officer (CCO)
NEAT Cell, AICTE

Dr. Satya Ranjan Biswal
Chief Technology Officer (CTO)
EduSkills

Certificate ID :646e2c8c2c7d79f9c30560998e0dd765
Student ID :STU622f601f9573416472711967

Virtual Internship Completion Certificate

This is to certify that

JAHEDA SHEIK

has successfully completed 10 weeks

Process Mining Virtual Internship

during May - July 2023

Supported By **celonis**

Prof. K. Hemachandra Reddy
Chairman, Andhra Pradesh State
Council of Higher Education

Jerome Geyer-Klingeberg
Head of Academic Alliance
Celonis

Dr. Satya Ranjan Biswal
Chief Technology Officer (CTO)
EduSkills

Certificate ID :5b8862f4f7d1aba499f9298587831f3f

v