CHAPTER - 1

INTRODUCTION TO PROCESS MINING

Process mining is a powerful approach that offers organizations a deep and data-driven understanding of their business processes. By analyzing event data recorded in digital systems, process mining sheds light on how processes truly unfold in real-world scenarios. It uncovers the actual sequence of activities, decisions, and interactions that shape these processes, revealing both the expected paths and the deviations that might occur. This methodology employs various techniques to construct visual process models, detect inefficiencies, and ensure compliance. Ultimately, process mining empowers organizations to optimize their processes, enhance operational effectiveness, and make well-informed decisions based on concrete evidence rather than assumptions.

1.1 What is Process Mining

Process mining is a data-driven approach to analyzing and understanding business processes within an organization. It involves extracting insights and knowledge from event logs or data generated during the execution of various processes. The primary goal of process mining is to gain a clearer and more objective understanding of how processes are actually executed, identifying inefficiencies, bottlenecks, variations, and opportunities for improvement.

Fig. No. 1.1: Companies of Process Mining

Many companies offer process mining solutions and services.some prominent companies in the field of process mining include:

- **Celonis:** Celonis is one of the leading companies in process mining. They offer a platform that uses event data to analyze and optimize business processes. Their platform provides process visualization, conformance checking, performance analysis and other process improvement features.
- **Signavio:** Signavio offers a suite of tools that includes process modeling, process mining, and workflow automation. Their process mining capabilities help organizations discover, analyze, and improve their processes.
- **ProcessGold:** ProcessGold specializes in process mining and offers a platform for analyzing and visualizing process data to optimize operations.
- **Disco (Fluxicon):** Disco is a process mining tool developed by Fluxicon. It provides process visualization, analysis, and reporting features to help organizations uncover inefficiencies and improve their processes.

Fig.No.1.2: Celonis of Process Mining

1.2 How Process Mining work

It's all about event logs. When humans and software robots work with IT systems, their activities are recorded by those systems. Process mining reads this data, converts it into an event log, and then creates visualizations of the end-to-end process, along with insightful analytics.

An event log contains each step performed during the process (the activity), the time at which the event occurred (the timestamp), and for which instance of the process(the case ID). using this event log, algorithms generate a process model that shows the process as it really is - including the timing of each step and all variations in

process flow, process deviations, and exceptions - bottlenecks, workarounds, and inefficient workflows - rather than as it is perceived to be.Other data science methods can be applied to further improve this model. The result is then used for process discovery, conformance testing and process improvement. The visualization capabilities built into advanced process mining tools help companies focus on what should be optimized, how to do it, and what the return on their efforts will be. Organizations are able to immediately understand the impact of proposed process changes or automation - including the cost saved and effort required.They can easily build and prioritize their automation pipeline or process optimization efforts. Advanced process mining solutions continuously monitor and measure results, so companies immediately know if they are on track or off base. They also get a complete audit trail for compliance purposes.

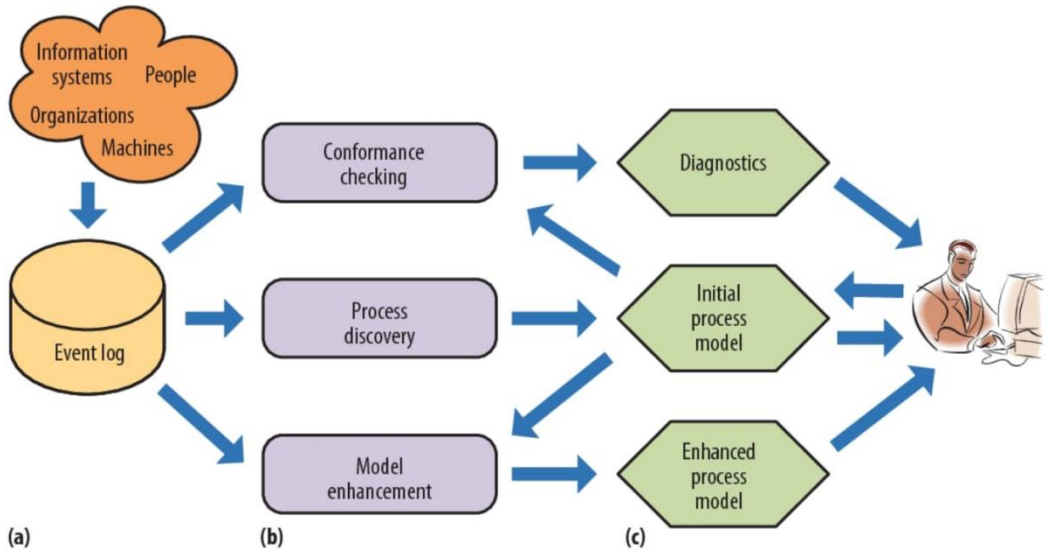

Fig.No.1.3:Working of Process Mining

- **Data Collection:** The first step involves collecting event data from various sources such as enterprise software systems, databases, and logs. These events represent specific activities or actions taken within a process. Each event is typically associated with attributes like timestamps, case identifiers, activity names, and user IDs.
- **Event Log Preparation:** The collected event data is organized into event logs. Each event log contains a chronological sequence of events related to one or more process instances. A process instance refers to the execution of a process from start to finish.

- **Process Discovery:** In this step, process mining algorithms analyze the event logs to create process models. These models visualize the sequence of activities, decisions, and their relationships as a process flow. There are several techniques for process discovery, including alpha-algorithm, heuristic mining, and more advanced methods like Petri net discovery.
- **Conformance Checking:** The generated process models are then compared to the actual event data to identify deviations or variations between the expected process flow and the real execution. This step helps uncover discrepancies, exceptions, and non-compliance instances.
- **Enhancement and Optimization:** With insights gained from the process models and performance analysis, organizations can make informed decisions about how to optimize their processes. This could involve redesigning parts of the process, reallocating resources, or redefining specific procedures to improve efficiency and effectiveness.

1.3 History of Process Mining

The first attempts to establish process mining as an independent technology for the analysis of business processes came from the Netherlands. More precisely, from Dr. Wil van der Aalst, also referred to by many as the "Godfather of Process Mining". He started studying at Eindhoven University of Technology (TU/e) in the late nineties. During his studies, he learned about workflow and business workflow management, exploring the possibilities of automated process discovery based on event logs. His approach combines the strengths of process- and data-oriented analytics. For him, the technology bridges the gap between traditional model-based process analysis and data-centric analytics techniques, such as machine learning and data mining. Wil van der Aalst first used the term 'process mining' in a research proposal he wrote in 1998. In 2011, van der Aalst published his first book on the subject, called 'Process Mining: Data Science in Action.' Until 2011, when the Munich-based company Celonis was founded, Wil van der Aalst's approach had little practical relevance.

Fig.No.1.4: History of Process Mining

The history of process mining dates back to the late 1990s and early 2000s, with the development of techniques and concepts that laid the foundation for the field.

- **Workflow Management Systems:** In the late 1990s, workflow management systems became more prevalent in organizations. These systems aimed to automate and manage business processes. Researchers started exploring ways to analyze the data generated by these systems to gain insights into process execution.
- **Discovery Algorithms:** In the early 2000s, researchers began developing algorithms to automatically discover process models from event logs. The "alpha-algorithm" was one of the earliest methods used for process discovery. This algorithm aimed to create process models by examining the frequency and order of events in event logs.
- **Continued Research and Innovation:** The field of process mining continues to evolve, with ongoing research and innovation focusing on addressing new challenges and applying process mining techniques to emerging technologies and domains.

CHAPTER - 2

FOUNDATIONS OF PROCESS MINING

Process mining is grounded in the foundations of data mining, business process management, and formal process modeling. At its core are event logs that capture the chronological activities, timestamps, and outcomes of business processes. These logs serve as the basis for uncovering insights. Process models, represented using formal notations like BPMN and Petri nets, depict the expected process flow. Leveraging data mining techniques, process mining utilizes discovery algorithms to automatically generate these models from event logs, and conformance checking methods to compare them against real data, identifying deviations and inefficiencies. This discipline aligns with business process management principles, offering data-driven insights for process improvement. Performance analysis extracts quantitative metrics for resource efficiency and cycle times. Ensuring data quality through preprocessing and effective visualization techniques further underpin the accuracy and communication of insights. Through its algorithmic foundations and interdisciplinary approach, process mining empowers organizations to enhance their operations through evidence-based decision-making and process optimization.

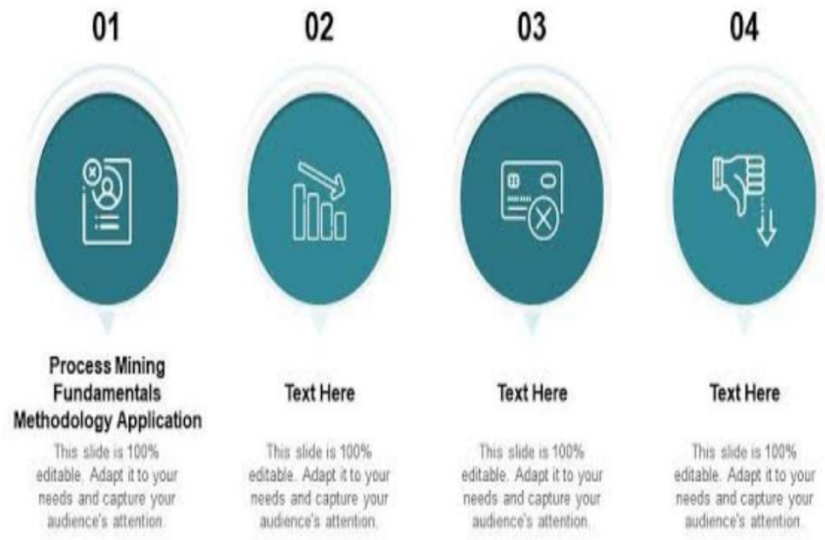

Fig.No.2.1: Foundations of Process Mining

2.1 Data Preprocessing and cleaning

Data preprocessing and cleaning are critical steps in the process of applying process mining techniques to event data. High-quality data is essential for accurate and meaningful process analysis.

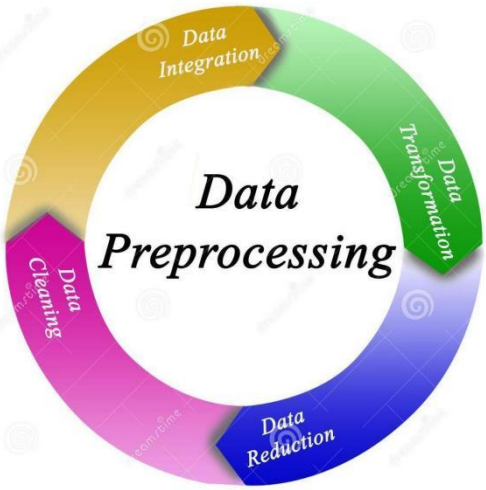

Fig.No.2.2: Data Preprocessing

Here's an overview of the key aspects of data preprocessing and cleaning in process mining:

- **Data Integration:** Data integration in process mining involves combining, harmonizing, and transforming data from various sources into a unified format. This unified dataset is then used for process analysis. Key steps include identifying sources, collecting data, aligning timestamps, handling duplicates, ensuring data quality, joining data based on common identifiers, and maintaining data security and privacy. Effective data integration ensures accurate, comprehensive, and reliable insights for process improvement.
- **Data Transformation:** Data transformation in process mining refers to converting raw data into a suitable format for analysis. This involves actions like standardizing activity names, aggregating data, aligning timestamps, handling missing values, and ensuring consistent data quality. Transformation makes the data ready for process mining tools, enabling accurate process discovery, analysis, and optimization.

- **Data Reduction:** Data reduction in process mining is the process of simplifying and condensing large datasets to focus on relevant information. This involves techniques like aggregation, filtering, and sampling to reduce the volume of data while retaining essential process characteristics. Data reduction improves analysis efficiency, reduces computational load, and enhances the interpretability of process mining results.
- **Data Cleaning:** Data cleaning in process mining is the process of identifying and correcting errors, inconsistencies, and anomalies in event data. It involves tasks like removing duplicates, handling missing values, correcting timestamps, and standardizing data formats. Data cleaning ensures the accuracy and reliability of process mining analyses by ensuring that the data accurately reflects the real-world processes.

2.2 Data Quality and Data Enrichment

Data Quality: Data quality is paramount, as the accuracy and reliability of insights hinge on the integrity of the event data. Data quality encompasses factors such as accuracy, completeness, consistency, and reliability. Accurate event data that precisely mirrors real-world activities is essential, as incomplete or erroneous data can distort process analysis and conclusions. Consistency and reliability prevent discrepancies between different data sources, guaranteeing accurate identification of patterns and anomalies.

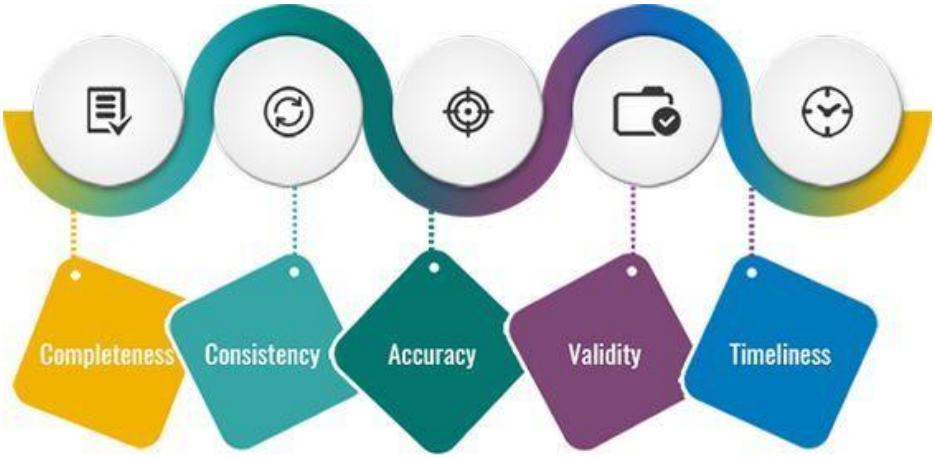

Fig.No.2.3: Data Quality

- **Completeness Issues:** Incomplete event data can lead to gaps in process understanding. Missing events or process steps can result in inaccurate process

models and incorrect analysis. This can happen if events are not properly recorded or if certain process instances are not captured in the event log.

- **Consistency Issues:** Consistency problems occur when the same event or case is recorded differently across different sources or systems. This can lead to difficulties in merging event logs from multiple sources and can result in confusion when analyzing the process.
- **Accuracy Issues:** Accuracy problems arise when the recorded data does not reflect the actual activities that occurred. Incorrectly recorded timestamps, wrong activity names, or incorrect attribute values can all lead to inaccuracies in process models and analysis.
- **Validity:** Validity in process mining data quality refers to the accuracy and correctness of the recorded events and attributes, ensuring they truly represent the real process. Invalid data can lead to misinterpretations and inaccurate process models.
- **Timelines:** Timelines pertains to the accuracy of timestamps in event data. Precise timestamps are essential for understanding the order of events and process durations.Inaccurate timestamps can distort process analysis and hinder the identification of bottlenecks and inefficiencies.

Data Enrichment: Data enrichment amplifies the depth of analysis by supplementing event data with pertinent additional information. This additional context can entail attributes like customer details, product information, or geographical data, which illuminate the factors influencing process variations. Enriching event data with case-related information empowers the segmentation of analysis for different scenarios, leading to nuanced insights. Incorporating external data sources such as weather conditions or economic indicators aids in discerning correlations between external factors and process performance. Furthermore, enriching data with timestamps and time-related attributes facilitates time-based analysis, enabling the identification of bottlenecks and optimization opportunities. By harmonizing data quality and enrichment efforts, process mining practitioners can derive more accurate insights, attain a profound understanding of processes, and facilitate informed decision-making to enhance organizational efficiency.

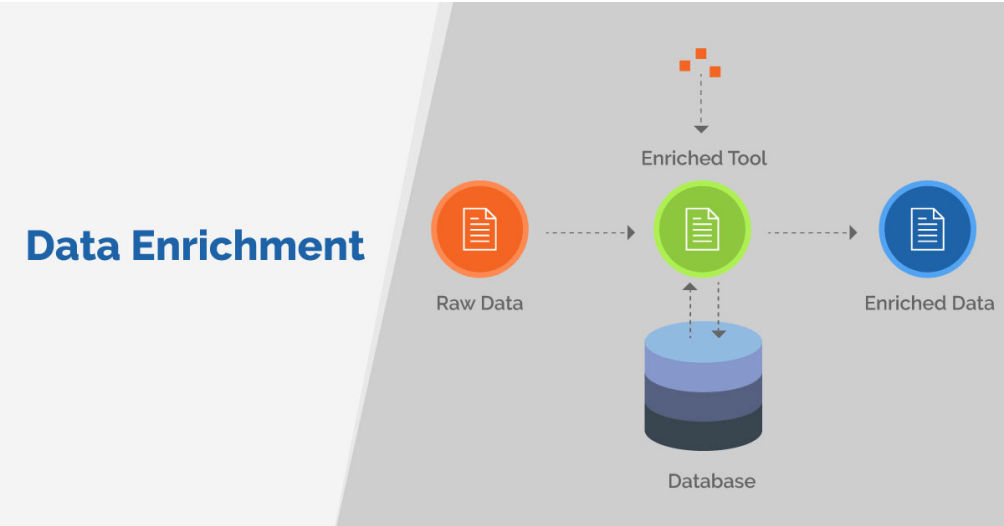

Fig.No.2.4:Data Enrichment

2.3 Types of Process Mining

Process mining encompasses various techniques for extracting insights from event data to analyze and optimize business processes. There are three main types of process mining: ofprocess :

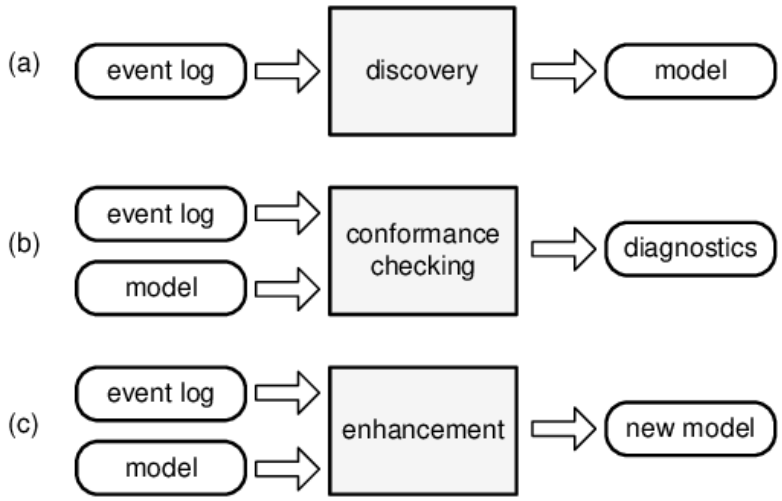

Fig.No.2.5:Types of Process Mining

- **Discovery (Process Discovery):** This type focuses on creating process models from event data without a predefined understanding of the process. It aims to uncover the actual sequence of activities, decisions, and interactions that constitute the process. The resulting models, often represented as process flowcharts or Petri nets, provide a visual representation of how the process is executed. The most

common techniques used for process discovery are Alpha Miner, Heuristic Miner, and Inductive Miner.

- **Conformance (Process Conformance or Compliance Checking):** Conformance analysis involves comparing the observed behavior in event logs to a predefined process model (often a reference model or a normative model) to identify deviations, non-compliance, and variations. It helps to identify discrepancies between the intended process and the actual execution, highlighting areas where the process is not followed as expected. This type of analysis is particularly useful for ensuring regulatory compliance and quality control.
- **Enhancement (Process Enhancement or Extension):** Enhancement techniques use event data to enrich existing process models with additional information or insights. This type of process mining aims to improve the initial understanding of the process by adding attributes, performance data, or resource information to the models. It can help in identifying bottlenecks, inefficiencies, and areas for optimization. Enhancement techniques often involve data enrichment and the incorporation of contextual information.

It's worth noting that these types of process mining are not mutually exclusive and can be used in combination to gain a comprehensive understanding of a business process. Additionally, process mining is often integrated with other methodologies such as data analytics, machine learning, and business process management to provide deeper insights and drive process improvements.

CHAPTER - 3

RISING STAR - TECHNICAL

It consists of two parts. They are:

1) PQL Queries

2) Get data into EMS

3.1 PQL Queries

Process Query Language is a specialized language used in process mining to formulate queries that retrieve specific information or patterns from event log data. Process Query Language allows users to interact with process mining tools and platforms in a structured way to gain insights into their processes. However, the specific syntax and capabilities of Process Query Language can vary depending on the process mining tool you're using.

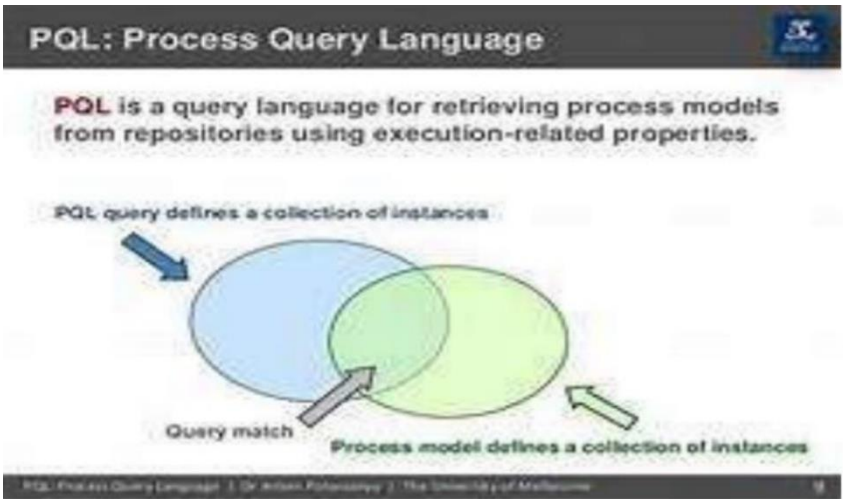

Fig.No.3.1: PQL Queries

- **Query Formulation:** Using Process Query Language, you formulate queries to retrieve specific information from event log data. These queries can range from simple requests for specific event types to complex queries that involve patterns, sequences, and conditions.
- **Pattern Matching:** PQL allows you to define patterns you're interested in, such as sequences of activities, repeated patterns, or specific combinations of events.

- **Conditions and Filters**: You can apply conditions and filters to your queries to narrow down the results. For example, you might want to retrieve cases that meet certain criteria or instances where specific activities occurred.
- **Aggregation:** PQL often supports aggregation functions to summarize data. This can be helpful for calculating average process times, frequency counts, or other metrics.
- **Visualization:** The results of PQL queries can be visualized in various ways, such as charts, graphs, or tables, depending on the capabilities of your process mining tool.
- **Real-Time Monitoring:** Some process mining tools support real-time monitoring through PQL queries. This allows you to monitor ongoing processes and receive alerts based on specific conditions.

Fig.No.3.2:PQL Queries Badge

3.2 Get Data into EMS

EMS (Event Management System) plays a crucial role in process mining as it serves as the central repository for process data. Get data into EMS involves integrating data from various sources such as ERPsystems, databases, log files, and other data formats. It is important to ensure data accuracy, completeness, and consistency. Efficient data management in EMS includes data collection, cleansing, transformation, and storage to enable effective process mining analysis.

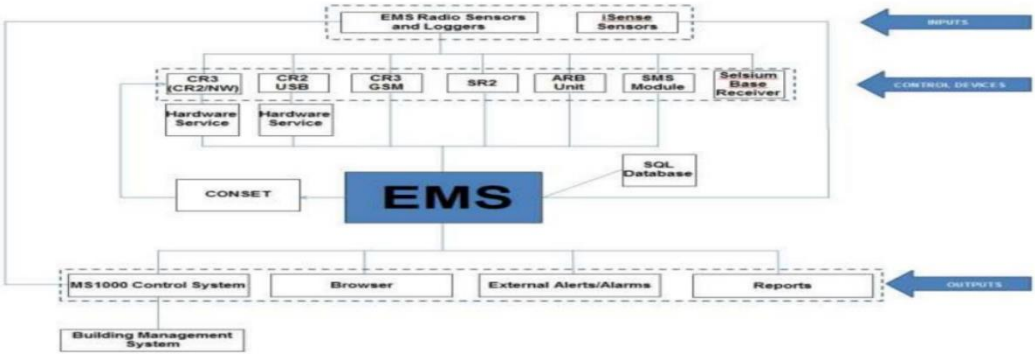

Fig.No.3.3:Event Management System

Getting data into an Event Management System (EMS) involves a structured process aimed at capturing and harnessing valuable event data for monitoring and analysis. Beginning with the identification of relevant event data sources, bysetting up seamless connections or APIs to facilitate the flow of event data into the EMS. Getting data into an Event Management System (EMS) involves a structured process aimed at capturing and harnessing valuable event data for monitoring and analysis. Beginning with the identification of relevant event data sources, which could encompass applications, systems, devices, and sensors, integration is established by setting up seamless connections or APIs to facilitate the flow of event data into the EMS.

Fig.No.3.4:EMS Flowchart

Data mapping aligns event data attributes with the corresponding EMS fields to ensure accurate interpretation. For enhanced context, data enrichment can be applied before transmission. Deciding between real-time or batch integration further refines the approach, with real-time setups requiring advanced configurations. Quality is upheld through pre-integration validation, while security measures encompass encryption, authentication, and access controls to safeguard data. Comprehensive monitoring and logging mechanisms are implemented to track the integration process and promptly detect any anomalies. Rigorous testing is conducted to validate the precise capture and storage of event data. Once integrated, the EMS's analytical capabilities are harnessed for querying, visualization, and reporting, providing insightful perspectives that enable informed decision-making. Ultimately, the process of getting data into an EMS hinges on meticulous planning, systematic integration.

Fig.No.3.5: Celonis RISING STAR - TECHNICAL Badge

CHAPTER - 4

FUTURE TRENDS IN PROCESS MINING

The future of process mining promises to be dynamic and transformative. As organizations increasingly recognize the value of process optimization and data-driven decision-making, several trends are shaping the field. Firstly, there will be a more profound integration of process mining with artificial intelligence (AI) and machine learning (ML), enabling predictive analytics and automation. This will usher in an era of proactive process improvement, anomaly detection, and optimized operations. Additionally, explainable AI will gain prominence, ensuring that the insights and recommendations derived from AI-driven process mining are transparent and trusted. Real-time process mining is on the horizon, allowing organizations to monitor and react to process deviations instantly. Cross-organizational process mining, using secure data sharing, will become crucial as business ecosystems grow more complex. The integration of blockchain technology for data integrity and the rise of hybrid process analysis, combining process mining with other techniques, are also expected. Advanced data privacy measures will address regulatory concerns, and industry-specific process mining solutions will cater to unique sector needs. Human-centric process mining will focus on understanding and improving processes involving human activities. User-friendly visualization and ethical considerations will continue to evolve. To stay at the forefront of process mining, professionals should remain adaptable and informed about these emerging trends.

4.1 Emerging Technologies and Trends

process mining was experiencing significant growth and innovation. Emerging technologies and trends were shaping the field. Here are some of the key emerging technologies and trends in process mining:

- **Artificial Intelligence (AI) and Machine Learning (ML) Integration:** AI and ML are increasingly being integrated into process mining to enable predictive analytics, anomaly detection, and automated process optimization. These technologies enhance the ability to discover insights and optimize processes proactively.

- **Real-time Process Mining:** Organizations are moving towards real-time process mining, which allows for the continuous monitoring and analysis of processes as they occur. This provides the agility to identify and address issues promptly.
- **Explainable AI in Process Mining:** To ensure transparency and trust in AI-driven process mining models, explainable AI techniques are gaining importance. They provide understandable explanations for the decisions made by AI algorithms.
- **Hybrid Process Analysis:** Combining process mining with other analytical techniques, such as simulation, optimization, and data analytics, is becoming more common. This hybrid approach provides a more comprehensive understanding of processes.
- **Process Mining as a Service (PMaaS):** Cloud-based process mining solutions are on the rise, making it easier for organizations to access and deploy process mining capabilities without the need for extensive on-premises infrastructure.
- **Industry-Specific Solutions:** Process mining is becoming more tailored to specific industries, with solutions designed to address the unique needs of sectors like healthcare, manufacturing, finance, and more.
- **Ethical and Responsible Process Mining:** As data privacy regulations become stricter, ethical considerations in process mining are gaining importance. This includes data anonymization, privacy-enhancing techniques, and ensuring fairness in analyses.
- **Advanced Visualization and User Experience:** Process mining tools are focusing on improving user interfaces and visualization capabilities, making it easier for non-technical users to interpret and utilize process mining insights effectively.
- **Human-Centric Process Mining:** Understanding and optimizing processes involving human activities and interactions, such as customer journeys and employee workflows, is becoming a key area of focus.
- **Cross-Organizational Process Mining:** As business ecosystems become more complex, there is a growing need for cross-organizational process mining, involving secure data sharing and collaboration among multiple entities.

4.2 Predictions for the Future of Process Mining

The future of process mining appears promising and dynamic, driven by advancements in technology and the growing recognition of its transformative potential. Predictions suggest that process mining will increasingly harness artificial intelligence and machine learning to provide automated and predictive insights, enabling organizations to proactively optimize their operations. Real-time process monitoring will become the norm, allowing for immediate detection and correction of process inefficiencies or deviations. Blockchain integration will enhance data security and transparency, especially in sectors where data integrity is paramount. Cross-organizational process mining will gain traction, fostering collaboration across complex business ecosystems. Process Mining as a Service (PMaaS) will democratize access, making it easier for organizations to adopt. Industry-specific solutions will emerge, focusing on tailoring process mining to unique sector needs. Human-centric process mining will prioritize improving customer experiences and employee workflows. Ethical considerations will guide responsible data handling. Enhanced user interfaces and process automation integration will make process mining more accessible and impactful. Ultimately, process mining is poised to become a foundational practice, driving operational excellence and innovation across industries worldwide.

CHAPTER - 5

APPLICATIONS, USES & ADVANTAGES

5.1 The Applications of Process Mining

Process mining finds applications in various industries and business areas due to its ability to provide valuable insights into how processes actually work. Some of the key applications of process mining include:

Fig.No.5.1: Applications of Process Mining

- **IT Service Management:** Process mining can be applied to IT Service Management (ITSM) applications in several ways. By analyzing event logs and data from IT systems, process mining can provide insights into the actual execution of IT processes, identify bottlenecks, and help improve the efficiency and effectiveness of IT service delivery.
- **Healthcare:** Process mining in healthcare refers to the application of process mining techniques and tools to analyze and optimize various processes within healthcare organizations. It involves extracting insights from event logs generated by healthcare systems to understand how processes are executed, identify inefficiencies, bottlenecks, and opportunities for improvement.
- **Customer Service:** When it comes to customer service, process mining can be a powerful tool for improving the customer experience and optimizing service delivery. By analyzing event logs and data from various customer service systems, process mining can provide insights into the actual execution of customer service

processes, identify bottlenecks, and help organizations enhance their customer service practices.

- **Retail:** Retailers use process mining to analyze customer journeys. They track how customers move through the store, identifying popular paths and areas with high dwell times. This insight informs store layout and merchandise placement.
- **Insurance:** Insurance companies use process mining to analyze and improve their operations. In the context of insurance applications, process mining involves analyzing the data generated by various processes within the company, such as claims processing, underwriting, and customer service.

5.2 Benefits of Process Mining

Process mining offers a multitude of benefits that make it a valuable tool for organizations aiming to enhance their operational efficiency, compliance, and overall performance. Firstly, it brings unparalleled transparency to an organization's processes, providing a clear and comprehensive view of how these processes function in practice. This level of insight goes beyond what traditional methods can offer, exposing hidden variations and inefficiencies.

Furthermore, process mining is inherently data-driven, leveraging event data to uncover valuable insights into process performance, bottlenecks, and deviations. By doing so, organizations can make informed decisions and prioritize improvements based on real facts rather than assumptions. This data-driven approach is instrumental in reducing operational costs and improving resource allocation, as it helps identify and eliminate redundant steps, reduce rework, and minimize resource waste.

Process mining also plays a crucial role in quality enhancement and compliance assurance. It enables organizations to pinpoint the root causes of quality issues and ensure that processes adhere to regulatory requirements and internal policies. By providing real-time monitoring and alerts, it helps organizations avoid compliance violations and associated penalties.

Fig.No.5.2: Benefits of Process Mining

Moreover, process mining is a powerful tool for risk mitigation. It offers real-time process monitoring and anomaly detection, allowing organizations to detect and mitigate risks, such as fraud, security breaches, and operational risks, before they escalate into major issues.

Additionally, process mining supports performance monitoring by enabling organizations to track key performance indicators (KPIs) continuously. It provides insights into how processes are performing over time, helping organizations meet their strategic objectives.Process mining also contributes to process standardization by helping organizations enforce best practices and reduce variability in process execution. It empowers decision-makers with data-driven insights, facilitating more informed and timely decisions. Furthermore, it aids in root cause analysis, making it easier for organizations to identify and address issues promptly, preventing similar problems from reoccurring.Ultimately, process mining is a valuable asset for organizations striving to enhance customer satisfaction by optimizing customer-facing processes. It enables higher customer satisfaction and loyalty by improving the quality and efficiency of these processes. Lastly, process mining supports resource allocation by revealing resource utilization patterns and helping organizations allocate resources more efficiently. These collective benefits empower organizations to become more agile, responsive, and competitive in today's rapidly evolving business landscape.

5.3 Advantages of Process Mining

Process mining offers several advantages to organizations seeking to understand, analyze, and optimize their business processes. Here are some key advantages:

- **Objective Process Insights:** Process mining provides an objective view of how processes are actually executed, based on real event log data. This eliminate biases and assumptions that might arise from manual observations.
- **Transparency:** Process mining brings transparency to complex processes by visualizing process flows, deviations, and variations. This transparency helps stakeholders understand processes comprehensively.
- **Data-Driven Decision-Making:** By analyzing actual process data, organizations canmake informed decisions based on concrete evidence rather than relying on intuitionor incomplete information.

OUTCOMES

Engaging with process mining yields a spectrum of valuable learning outcomes that equip individuals and organizations with insights and capabilities crucial for process optimization and informed decision-making. Firstly, learners gain a deep understanding of how business processes truly unfold through the utilization of actual event log data, dispelling assumptions and providing an objective view. This comprehension leads to the identification of inefficiencies, bottlenecks, and deviations within processes, fostering the skills to strategically enhance workflows and resource allocation

Improved Process Efficiency: By analyzing event logs and process data, process mining can identify bottlenecks, inefficiencies, and deviations in business processes. This information can help organizations optimize their processes and improve overall efficiency.

Process Discovery: Process mining techniques can automatically discover and visualize the actual process flows based on event logs. This helps organizations gain a better understanding of their processes, identify process variants, and uncover hidden patterns or deviations

CONCLUSION

In conclusion, process mining within Celonis represents a transformative approach to understanding, optimizing, and innovating business processes. By harnessing realtime event log data, Celonis enables organizations to unveil hidden insights, streamline operations, and drive informed decision-making. Through visualization and analysis, process mining empowers users to identify bottlenecks, inefficiencies, and compliance gaps, paving the way for targeted improvements. Celonis's Process Explorer and Variant Explorer provide intuitive interfaces to navigate and analyze process flows, enabling users to uncover patterns, root causes, and optimization opportunities. With Celonis's advanced capabilities, process mining emerges as a vital tool for organizations aspiring to achieve operational excellence and competitive advantage in today's dynamic business landscape. process mining is a powerful technique that enables organizations to analyze and improve their business processes.

1. Process mining fundamentals include data extraction, data transformation, and data visualization. These foundational elements are essential for effectively applying process mining techniques and deriving actionable insights from process data.
2. Rising star technical topics in process mining, such as PQL Queries and getting data into EMS, further enhance the capabilities of process mining.
3. PQL Queries enable analysts to ask specific questions and extract meaningful insights from process data.

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