Process Mining Virtual Internship

by

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Contents

Course Objective

- The course objectives of a process mining course generally revolve around providing students with a comprehensive understanding of the principles, techniques, and applications of process mining.

- The specific objectives of a process mining course might include:

1. **Understand Process Mining Concepts.**
2. **Learn Data Extraction and Preprocessing.**
3. **Explore Process Mining Algorithms.**
4. **Apply Process Mining Tools.**
5. **Real-World Applications.**
6. **Problem-Solving Skills.**
7. **Future Exploration and Research.**

Introduction:

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Wil van der Aalst pioneered the field of Process Mining in the 1990s.Process mining is a powerful methodology that utilizes data-driven techniques to analyze, visualize, and optimize business processes. It involves extracting valuable insights from event data generated by various operational systems within an organization. These insights help organizations understand how their processes actually operate, identify bottlenecks, inefficiencies, and compliance deviations, and ultimately improve process performance.

In the complex landscape of modern business, processes can be multi-faceted, involving numerous steps, stakeholders, and interrelated systems. Process mining comes to the rescue by rendering these intricate processes more understandable. It employs visualization techniques to map out the flow of activities, decisions, and dependencies, presenting a visual representation that simplifies the complexity of the process and highlights key elements.

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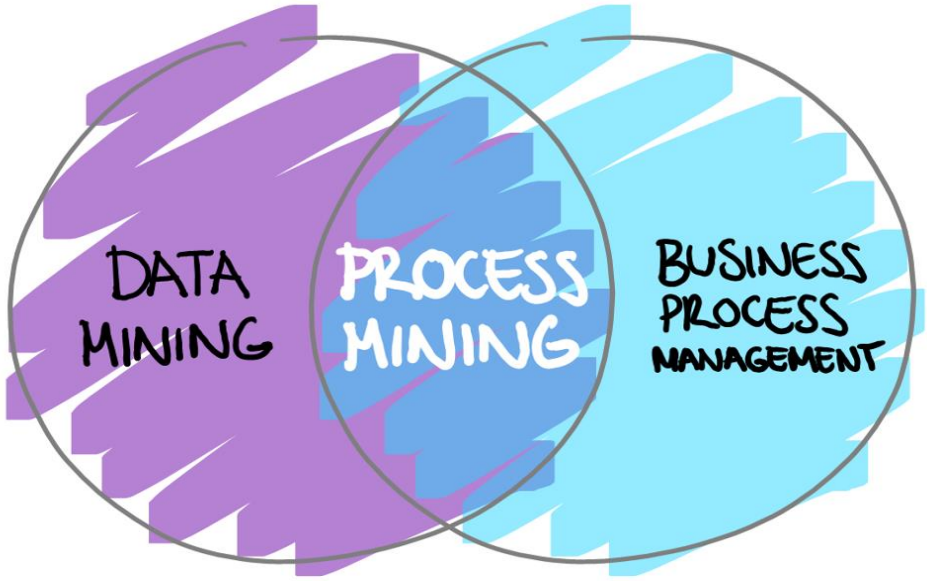
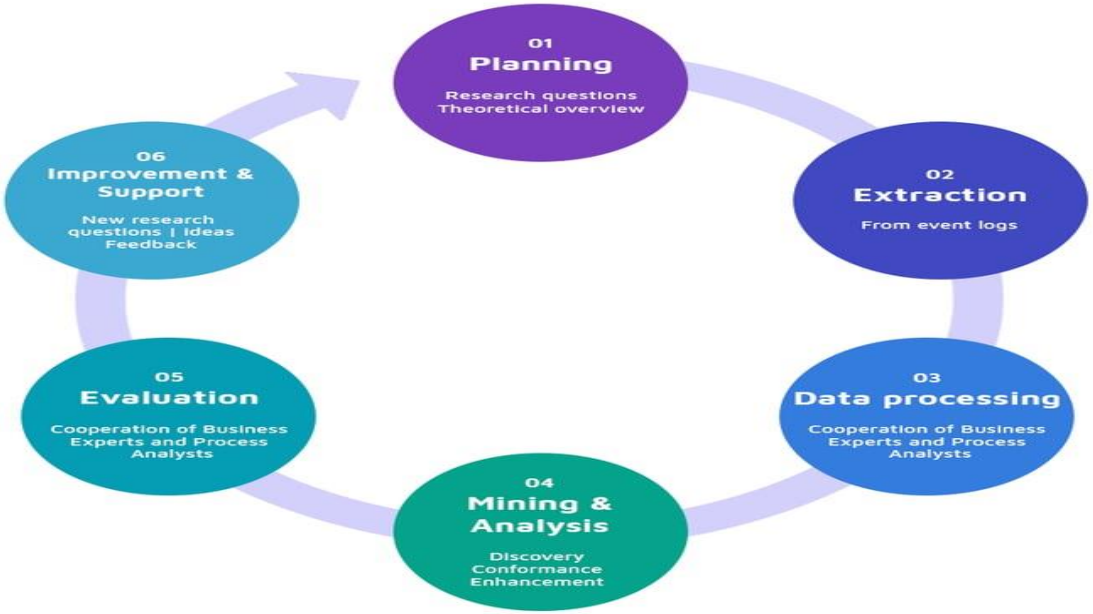
- Process mining sits at the intersection of business process management (BPM) and data mining.



Technology

- **Process mining** involves extracting insights from event data generated by the operational systems of an organization. Here's how process mining is executed using technologies:
  - **Data Collection**
  - **Data Preprocessing**
  - **Data Storage**
  - **Process Discovery**
  - **Conformance Checking**
  - **Performance Analysis**
  - **Data Visualization**
  - **Real-Time Monitoring**
  - **Machine Learning and AI Integration**



Modules:

- ✓Process Mining Fundamentals
- ✓Build Analysis
- ✓Introduction to PQL
- ✓Process Identification
- ✓Data Integration
- ✓Process Automation basics

Process Mining Fundamentals

Process Mining Fundamentals involve three main milestones:

1. Review and Interpret Analyses
2. Build Analyses
3. Case Study

1.Review and Interpret Analyses:

Analysis within the realm of process mining is a pivotal practice that underpins the methodology's transformative potential. It involves a multidimensional examination of event data to extract meaningful insights, allowing organizations to unravel complexities, identify optimization opportunities, and make informed decisions.

Execution Management System (EMS) has to offer:

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

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Activity: Activity is a step that occurs in the process. Process activities are actions that initiate or terminate a process or take place during it. Each activity *consists of one or more tasks* that together are a milestone in the process.

- **Case:** Case is an "item" or "object" you follow through the process. Even for the same business process, the case differs from company to company, depending on how granular they want to get.

Build Analysis

Building analysis within the framework of process mining is a comprehensive process that involves several interconnected steps. This systematic approach allows organizations to uncover valuable insights from event data, enhance processes, and make informed decisions

In software, a "build" typically refers to the process of compiling and linking source code to create an executable or deployable software artifact. "Build analysis" in this context could refer to the examination of the build process, including its efficiency, speed, dependencies, and potential issues that might arise during the process.

Once you've done the preparation work, including gathering user requirements and reflecting on the best visualizations, you can create the analysis asset and start to build the first draft of the analysis.

Introduction to PQL

PQL, or Process Query Language, is a specialized language used in the field of process mining to interact with and query event data. It allows users to retrieve, analyze, and manipulate event data to extract meaningful insights about business processes. Similar to SQL (Structured Query Language) used in relational databases, PQL is tailored specifically for handling the unique characteristics of event logs and process-related information.

Key features and aspects of PQL include:

- 1. Event Log Querying
- 2. Process Analysis
- 3. Complex Event Patterns
- 4. Pattern Matching….

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The Process Query Language (PQL) is a domain-specific language tailored towards a special process data model and designed for business users.

Features of pql:

Process Identification

Process identification, within the context of process mining, refers to the initial phase of discovering, defining, and understanding the underlying structure of a business process using event data. It involves transforming raw event logs into comprehensible process models that illustrate how activities, decisions, and interactions unfold within an organization's operations.

Key Aspects of Process Identification:

- ✓Event Data Collection
- ✓Data Preprocessing
- ✓Process Discovery
- ✓Model Types

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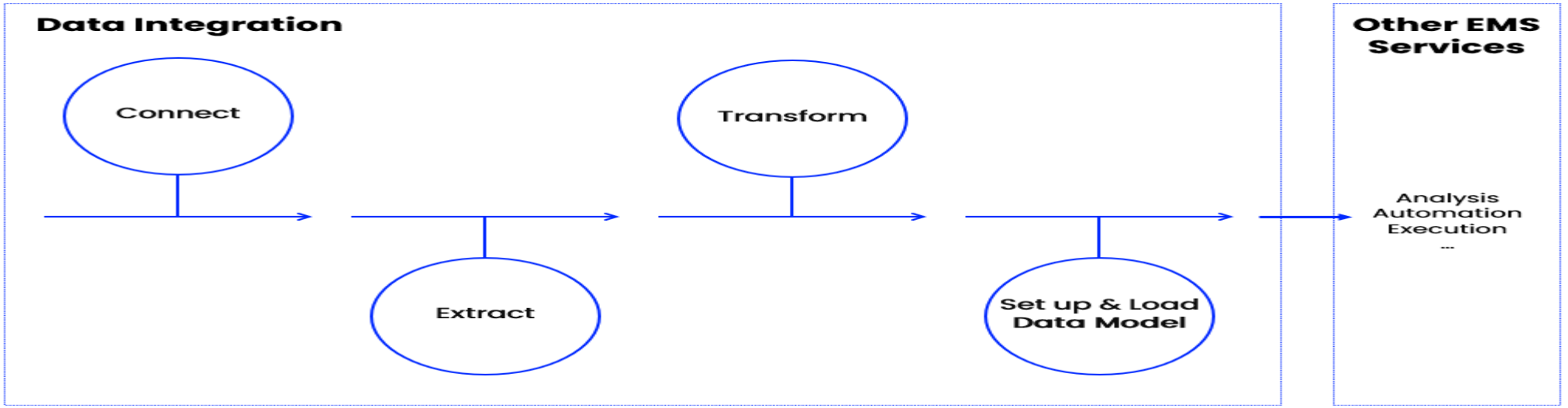
➢Importance of Process Identification:

- **Insight Generation:** It transforms raw event data into understandable visual models, making it easier to interpret the sequence of activities and their relationships.
- **Bottleneck Detection:** Identifies bottlenecks and inefficiencies within the process flow, aiding in optimization efforts.
- **Baseline Understanding:** Offers a baseline understanding of how processes function, which is essential for further analysis and improvement.
- **Data-Driven Decision-Making:** Provides empirical insights that guide informed decision-making, allowing organizations to prioritize areas for optimization.
- **Compliance and Auditing:** Supports compliance monitoring and auditing by revealing deviations from expected processes.

Data Integration

Data integration is a crucial process that involves combining and harmonizing data from different sources, formats, and systems to create a unified and coherent view of information. This integrated data can then be used for analysis, reporting, decision-making, and various other purposes. In the context of process mining, data integration plays a vital role in assembling event data from various operational systems to perform comprehensive analyses of business processes



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Major data integration methods

- **Extract, transform and load (ETL):** Copies of data sets from different source systems are pulled together, harmonized and loaded into a database or data warehouse.
- **Extract, load and transform (ELT):** A variation of ETL – data is loaded as is into a data lake or other big data system and transformed later for specific analytics uses.
- **Change data capture (CDC):** A form of real-time integration. CDC identifies data changes in databases and applies them to a data warehouse or other repository.
- **Data replication:** The data in one database is replicated to others to keep the information they contain synchronized for backup and operational uses.
- **Data virtualization:** Instead of being loaded into a new repository, data from different systems is combined virtually to create a unified view for end users.
- **Streaming data integration:** Different streams of real-time data are integrated on the fly and fed into data stores and analytics systems on a continuous basis.

Process Automation Basics

- a business process is described as “a set of activities that are performed in coordination in an organizational and technical environment.

Process automation is defined as the use of software and technologies to automate business processes and functions in order to accomplish defined organizational goals, such as producing a product, hiring and onboarding an employee, or providing customer service.

Business process automation helps companies fulfil tedious tasks with minimal resources. Companies get faster and more reliable results with lower costs, thus improving efficiency significantly.

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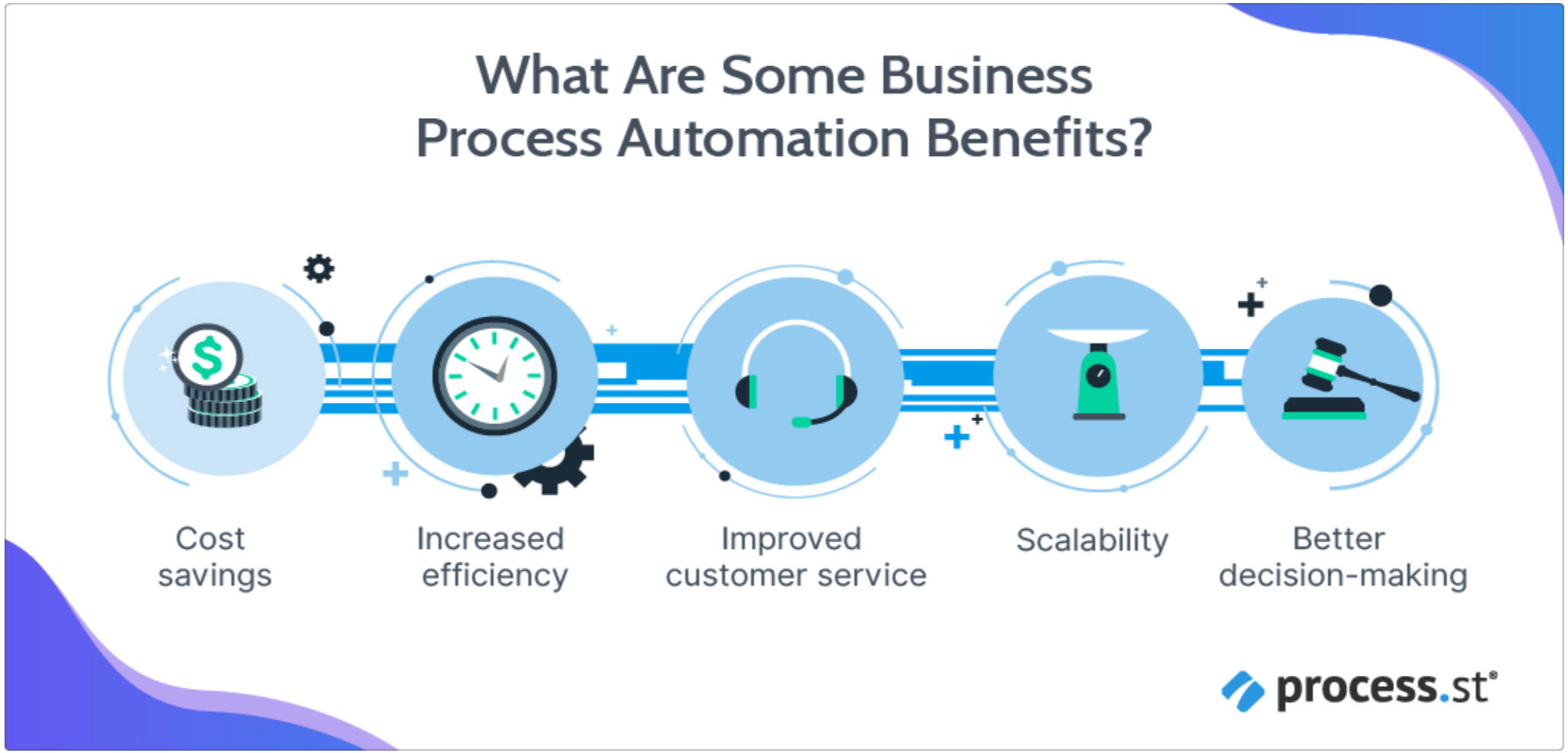
What Are Some Business Process Automation Benefits?
Cost savings
Increased efficiency
Improved customer service
Scalability
Better decision-making
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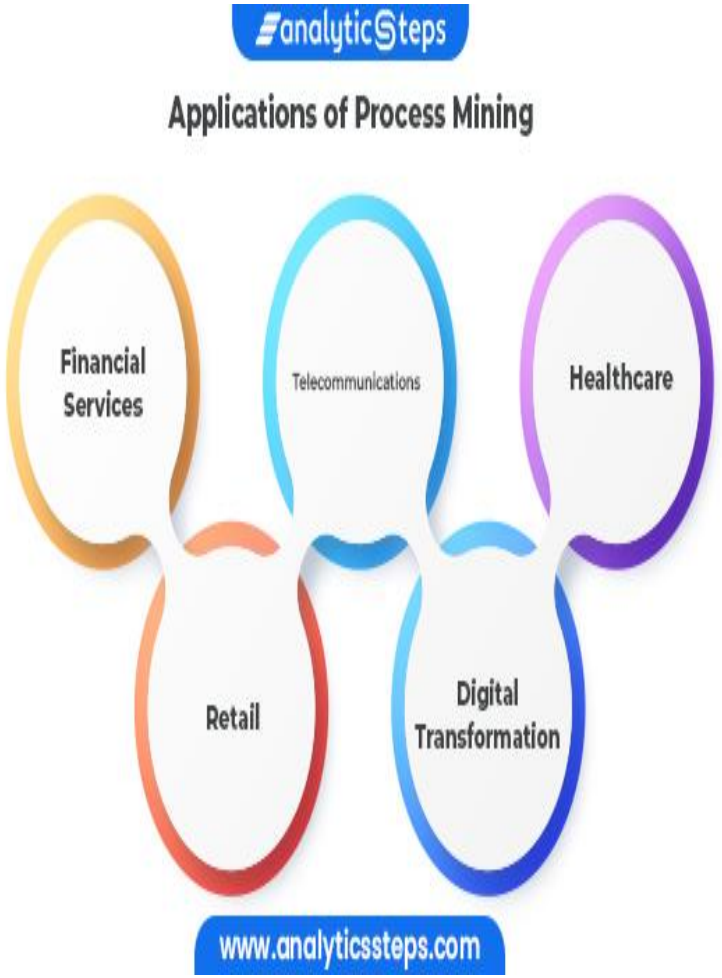
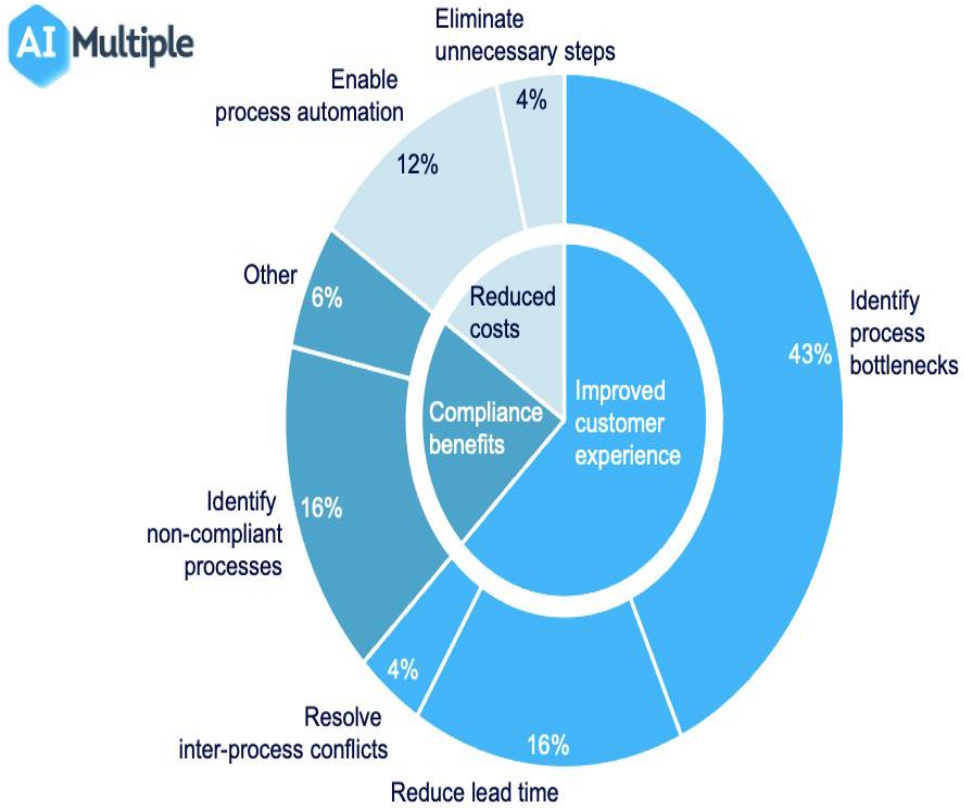
Real Time Applications

- Customer Journey Analysis
- Healthcare Process Management
- Manufacturing Process Enhancement
- Fraud Detection and Prevention
- IT Service Management
- Insurance Claims Processing
- Telecommunications Network Optimization
- Emergency Response Management



Learning Outcomes

- 83% of businesses said they plan to increase their adoption of process optimization technologies.
- Process mining is a useful tool for helping companies gain process intelligence for process optimization.
- Process mining improves and manages processes by:
  - generating general business benefits
  - enabling reduced costs
  - improving customer experience
  - ensuring compliance.



GitHub dashboard

Any Queries?

Thank You!!!