

Automated Retail Sales Monitoring Using UiPath & Power BI (RSM)

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ABSTRACT

Automated Retail Sales Monitoring and Incident Management System is designed to improve retail business operations through automation and data analysis. In traditional retail environments, sales data is often manually entered and analyzed, which can lead to delays, errors, and inefficient decision-making. This project uses UiPath robotic process automation to automate the process of collecting, storing, and analyzing retail sales data. The system allows users to enter sales details such as bill number, product name, category, quantity, price, branch, and date using input dialogs. The entered data is automatically stored in an Excel database where the automation performs various analytical operations. The system calculates total revenue, analyzes category-wise sales performance, and monitors monthly growth trends. If the revenue falls below a predefined target, the system generates alerts and sends automated email notifications. Additionally, the system integrates with ServiceNow APIs to retrieve incident information and store it for monitoring purposes. This automation improves accuracy, reduces manual effort, and enables faster business insights. The proposed system demonstrates how robotic process automation can be effectively applied in retail analytics and incident monitoring environments.

Keywords— Retail Automation, UiPath, Sales Monitoring, Incident Management, Robotic Process Automation, Power BI

I. INTRODUCTION

Retail organizations rely heavily on accurate sales data to evaluate business performance and support strategic decision-making. However, many retail operations still depend on manual data entry and spreadsheet-based reporting systems, which are often time-consuming and prone to human errors. Robotic Process Automation (RPA) has emerged as an effective technology for automating repetitive business tasks and improving operational efficiency. The proposed Automated Retail Sales Monitoring and Incident Management System uses UiPath to automate sales data collection, storage, and analysis. The system records transaction details, performs revenue and category-wise analysis, and monitors monthly sales performance. In addition, it integrates with ServiceNow APIs to retrieve and track incident information. This

automation helps organizations reduce manual workload, improve data accuracy, and gain better insights into retail operations.

II. RELATED WORK

A. Retail Sales Monitoring Systems

Retail sales monitoring tools help businesses track product sales, revenue trends, and store performance. Many organizations still rely on manual spreadsheets to manage sales records. These methods are time-consuming and error-prone, highlighting the need for automated systems that can efficiently collect and analyze sales data.

B. Robotic Process Automation Tools

Robotic Process Automation (RPA) tools such as UiPath are widely used to automate repetitive tasks like data entry and report generation. RPA improves operational efficiency by reducing manual effort and enabling automated interaction with applications, databases, and web services.

C. Incident Monitoring Systems

Incident monitoring systems such as ServiceNow help organizations track and manage operational issues. These platforms allow businesses to record incidents, assign priorities, and monitor resolution processes. Integrating automation with incident management improves response time and operational reliability.

III. PROBLEM STATEMENT

Retail businesses generate large volumes of sales data every day, making it difficult to monitor business performance using manual methods. Many retail stores still depend on spreadsheet-based systems for recording and analyzing sales transactions. These traditional methods require manual data entry, which increases the possibility of human errors and delays in generating accurate reports. In addition, sales data from different branches or product categories is often stored in separate files, making it difficult to perform centralized analysis and monitoring. Incident management is also handled through separate systems, which creates challenges in identifying operational issues quickly. The lack of an integrated automation system limits the ability of organizations to analyze sales performance, track revenue trends, and respond to incidents efficiently. Therefore, an automated retail sales monitoring and incident management system is required to streamline data collection, improve reporting accuracy, and support better business decision-making.

IV. PROPOSED SYSTEM ARCHITECTURE

The Automated Retail Sales Monitoring and Incident Management System is designed using a modular architecture that integrates data collection, storage, automation, and analysis components. The system uses UiPath robotic process automation to capture retail transaction details through user input dialogs. The collected data is automatically stored in an

Excel-based database for structured storage and record management. The automation workflow processes the stored data to perform revenue calculations, category-wise sales analysis, and monthly growth monitoring. Power BI is integrated with the system to visualize sales trends and generate interactive dashboards for business analysis. Additionally, the system communicates with the ServiceNow platform using API requests to retrieve incident information and support operational monitoring. This architecture enables automated data handling, reduces manual workload, and provides better insights into retail business performance. The modular design also improves scalability and allows easy integration of additional automation features in the future.

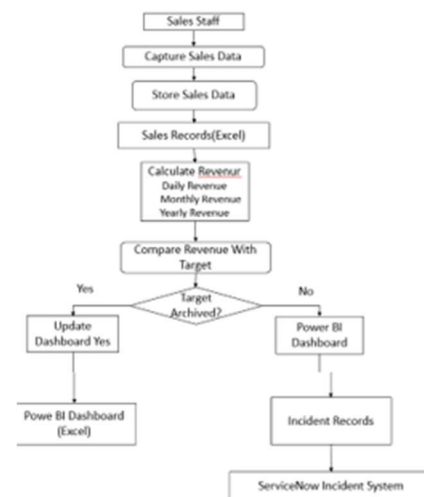


Fig. 1. Automated Retail Sales Monitoring and Incident Management System

A. Data Collection Layer

This layer captures sales transaction information using UiPath input dialogs. Users enter details such as bill number, product name, category, quantity, price, and branch. The automation workflow also generates date, month, and year values automatically for accurate transaction recording.

B. Data Storage Layer

The collected sales data is stored in an Excel file that acts as a centralized database. UiPath automation appends new records to the sheet, ensuring organized storage of transaction details. This allows easy retrieval

of historical sales data for analysis and reporting.

C. Analytics and Monitoring Layer

The analytics layer processes stored sales data to generate insights such as total revenue, category-wise sales, and monthly trends. Power BI dashboards visualize the results, while ServiceNow integration enables monitoring of operational incidents related to retail operations.

D. Integration and Analytics Layer

This layer integrates the automation system with external platforms and analytical tools. UiPath workflows retrieve incident information from the ServiceNow platform using API requests. The collected data is combined with retail sales records and visualized using Power BI dashboards. This integration enables centralized monitoring of sales performance and operational incidents.



Fig. 2. End-to-end workflow of automated retail sales monitoring and incident management system.

E. Complete System Workflow

The complete workflow of the Automated Retail Sales Monitoring and Incident Management System begins with capturing sales transaction information using UiPath input dialogs. The user manually enters details such as bill number, product name, category, quantity, price, and branch information. The automation workflow processes these inputs and automatically calculates the total sales value. Additional fields such as date, month, and year are generated using system date functions to maintain accurate transaction records.

After data collection, the automation appends the transaction details to an Excel file that acts as a

centralized database. The system continuously updates the dataset as new sales records are entered. Once the data is stored, UiPath workflows read the stored records and perform revenue calculations, category-wise sales analysis, and monthly performance monitoring.

The processed data is then connected to Power BI dashboards for visualization and reporting. These dashboards present sales trends, revenue distribution, and performance indicators to support business decision-making. In addition, the system integrates with the ServiceNow platform using API requests to retrieve incident information related to retail operations. This automated workflow enables efficient data management, reduces manual workload, and provides real-time insights into retail business performance.

V. IMPLEMENTATION AND TECHNOLOGIES

A. Technology Stack

The Automated Retail Sales Monitoring and Incident Management System is implemented using robotic process automation and data analysis tools. The core automation is developed using UiPath Studio, which enables the creation of workflows for collecting sales transaction data, processing information, and performing automated analysis tasks. Microsoft Excel is used as the primary data storage system to maintain structured records of retail transactions. The automation workflows read and update the Excel dataset to perform revenue calculations and sales monitoring. For visualization and reporting, Microsoft Power BI is integrated with the system to generate interactive dashboards and analytical reports. In addition, the system communicates with the ServiceNow platform using API requests to retrieve incident information related to retail operations. This technology stack enables efficient automation, structured data management, and real-time business performance monitoring.

B. Security and Data Management

Security and data integrity are important aspects of the automated retail sales monitoring system. The automation workflow

validates user input data before storing it in the Excel database to ensure accuracy and consistency. Each transaction record is appended in a structured format including product details, quantity, price, branch, and time information. Data validation rules are applied within the UiPath workflow to prevent incorrect or incomplete entries. Access to the automation process is restricted to authorized users to ensure controlled data handling. In addition, the system maintains organized records of all sales transactions, allowing secure storage and reliable retrieval of historical sales data for reporting and analysis purposes.

C. Automation Execution Engine

The automation execution engine is responsible for running the UiPath workflows that manage the retail sales monitoring process. The workflow begins by collecting transaction details through input dialogs and processing the data using automation activities. The system calculates total sales values, generates date-related attributes, and stores the information in the Excel database. Once the data is stored, the automation reads the dataset and performs analysis operations such as revenue calculation and category-wise sales monitoring. The processed data is then connected to Power BI dashboards for visualization. This automated execution process ensures efficient data processing, reduces manual workload, and improves the overall performance of the retail monitoring system.

VI. RESULTS AND DISCUSSION

The Automated Retail Sales Monitoring and Incident Management System was evaluated to analyze the effectiveness of automation in retail data processing and monitoring. The system was tested by entering multiple sales transactions using UiPath input dialogs and storing them in the Excel database. Automation workflows processed the data to calculate total revenue, analyze category-wise sales distribution, and monitor monthly performance trends. The integration of Power BI dashboards enabled clear visualization of sales performance and helped in identifying business patterns.

A. Quantitative Analysis

A quantitative analysis was conducted to evaluate the effectiveness of the automated retail

sales monitoring and incident management system developed using UiPath. In traditional retail environments, sales transactions are often recorded manually in spreadsheets and analyzed through manual calculations. This process requires considerable time and effort and frequently results in delays, data inconsistencies, and human errors during data entry and reporting. Manual analysis also makes it difficult for managers to quickly identify sales patterns and performance trends.

The proposed automation system simplifies these operations by capturing sales transaction information through UiPath input dialogs and storing it in a structured Excel database. The automation workflow processes the stored data to calculate total revenue, perform category-wise sales analysis, and monitor monthly performance trends. Experimental observations indicate that the automated workflow significantly reduces the time required for recording and analyzing sales information. Automation eliminates repetitive manual calculations and ensures consistent data processing.

In addition, the integration of Microsoft Power BI dashboards enables interactive visualization of sales performance using charts, graphs, and analytical reports. Managers can easily monitor revenue distribution, product category performance, and monthly growth patterns. The results demonstrate that automation improves reporting accuracy, enhances operational efficiency, and supports better decision-making in retail management. Overall, the quantitative findings confirm that the proposed automation system provides a reliable and efficient approach for monitoring retail sales performance.



Fig. 3. Data flow from retail sales data collection to business intelligence visualization.

B. Performance Evaluation

The performance of the proposed automation system was evaluated to measure improvements in operational efficiency, reliability, and data processing accuracy. The UiPath automation workflows execute tasks such as capturing sales transaction data, calculating totals, updating the Excel database, and performing analytical operations. Compared to manual processes, the automated workflow significantly reduces repetitive tasks and improves the speed of data processing.

The integration with Power BI dashboards enables real-time visualization of retail sales performance. Users can analyze revenue trends, product category performance, and monthly sales growth through interactive reports. This centralized visualization allows managers to quickly interpret business data and identify patterns that support strategic decision-making.

In addition, the system integrates with the ServiceNow platform to retrieve incident information related to operational issues. This capability enables organizations to monitor both sales performance and operational incidents within a unified automation framework. By reducing manual effort and improving data accuracy, the proposed system enhances productivity and supports efficient retail business management.

VII. CONCLUSION

The proposed Automated Retail Sales Monitoring and Incident Management System provides an efficient and scalable solution for improving retail data management and operational monitoring through automation. Retail organizations often face challenges related to manual data entry, delayed reporting, and fragmented analysis across different systems. These limitations reduce operational efficiency and make it difficult for managers to obtain accurate business insights in a timely manner. The proposed system addresses these challenges by integrating automation, data processing, and analytical visualization within a unified framework.

The system utilizes UiPath robotic process automation to capture retail transaction data through structured input dialogs and automatically store the information in an Excel-based database. Automation workflows process the stored data to perform revenue calculations, category-wise sales analysis, and monthly performance monitoring. This automation significantly reduces manual workload and minimizes the possibility of human errors during data entry and analysis.

Another important aspect of the system is its integration with Microsoft Power BI for business intelligence visualization. The dashboards transform raw sales data into meaningful visual insights that enable managers to monitor revenue trends, product performance, and operational efficiency. Additionally, the integration with the ServiceNow platform allows the system to retrieve incident information related to operational issues, supporting better monitoring and faster response to business problems.

Overall, the proposed system demonstrates how robotic process automation combined with data analytics can improve retail business operations. The modular architecture ensures flexibility, scalability, and maintainability, allowing future expansion through cloud integration, advanced analytics, and intelligent automation techniques.

VIII. FUTURE WORK

The proposed automated retail sales monitoring and incident management system can be further enhanced by integrating advanced data analytics and intelligent automation techniques. Future improvements may include the implementation of machine learning algorithms to predict sales trends and detect anomalies in retail transactions. The system can also be extended with cloud-based storage solutions to support large-scale data management and improve system scalability. In addition, real-time integration with multiple retail databases and enterprise systems could enhance operational monitoring capabilities. Mobile dashboard access and automated notification mechanisms may also be incorporated to provide managers with instant updates about sales performance and operational incidents.

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