Optimizing ROP Metrics and Reporting: Cloud Migration and Automation Strategies

Venkat Sunil Kumar Indurthy
Software Developer, Compunnel Software Group Inc., USA

Abstract

This document details a methodology to modernize your ETL (Extract/Transform/Load) pipelines using automated processes, cloud conversion, and performance tracking as appropriate for business goals. This includes a transition to scalable, cloud-native operations with Informatica PowerCenter and Azure Data Factory to replace outdated SSIS packages as well as implementing properly structured ETL testing through CI/CD processes using tools such as Jenkins and GitHub. This paper describes how to recommend the modernization of an ETL (Extraction, Transformation, and Loading) process to include: automating the entire ETL solution (replace the existing configurations with automation), hosting the solution in a Cloud platform, and monitoring ETL performance against business requirements. Examples of how we will accomplish this include using the Cloud-based applications Informatica PowerCenter or Azure Data Factory to replace legacy SSIS packages. Additionally, we will follow a structured test process using the CI/CD (Continuous Integration/Continuous Delivery) tool suites of Jenkins and GitHub. Power BI will be the analytics and reporting tool selection for Agile project management. The paper describes how to benchmark pipeline performance to identify the Key Performance Indicators (KPIs) to evaluate pipeline performance. The document evaluates why the traditional measure of Reorder Point (ROP) is inaccurate and typically not used; the solution proposed is to use a cloud-native architecture such as AWS MSK and Snowflake to support the development of predictive reorder points. Lastly, a case study of an Electronics company will be provided where a 60% savings and 96% accuracy have occurred during peak seasons, and a comprehensive six-month migration plan to augment ROP adjustments through Generational AI presents opportunities for improvement.

Keyboards: Informatica PowerCenter, Azure Data Factory, SSIS packages, Reorder Point (ROP), Generational AI

Introduction

To maximize performance, businesses must be able to understand how well they are managing their supply chain operations and also the connection between their supply chain steps with those of the organizations they work with. Continually monitoring the supply chain allows a business to access real-time information about it, which helps to identify any inefficiencies or disruptions that may cause a negative impact on service quality or cost(Supply Chain Monitoring Systems) Sophisticated supply chain monitoring systems can help businesses evaluate how efficiently they procure, produce, distribute, and provide customer service by measuring performance using KPIs. These evaluations will allow businesses to become more efficient, reduce lead times, decrease waste, and reduce inventory costs, and eliminate stockouts.

(Supply Chain Performance Management) The use of real-time performance data allows businesses to respond more quickly to unforeseen issues, producing a greater level of resiliency in their supply chains, and improving customer service. A data-driven approach to supply chain management will also help enable continuous improvement and help synchronize the business's supply chain with its overall goal of managing resources and costs in a competitive marketplace. Material procurement/supply, labor utilization, manufacturing efficiency, inventory management, transportation, and customer service are all key areas of focus within Supply Chain Monitoring. By aligning processes across these functional areas, businesses can improve the acquisition and management of their resources and inventory, resulting in operational efficiencies throughout their procurement, production, storage, and customer service functions. When you combine this improved monitoring and efficiency with the ability to make better decisions using comprehensive visibility in the supply chain, businesses will be addressing some of their biggest supply chain challenges [1].

Metrics are critical in helping identify problems and areas for improvement in the supply chain. They will provide an objective basis for evaluating performance within multiple activities, such as order accuracy, lead time, inventory turnover, and cost-effectiveness.Organizations may be able to rely on metrics as a method of identifying areas and points of inefficiencies and variances within their own systems that could ultimately harm their long-term ability to maintain productivity, allowing the organization to determine the overall cause and root issues of a problem, instead of just responding to its symptoms. In conjunction with setting targets at a higher level, metrics will provide an essential level of support to facilitate data-based decision-making and continual enhancement(s) of performance. In order to be able to continue to achieve operational excellence over time, it is critical that organizations have metrics in place to support the overall operations of an organization and the overall improvement of supply chain productivity.

All organizations are required to have effective supply chain management in order to provide a balance of providing exceptional service at lower costs as well as achieving productivity improvements. This balance is important in order for an organization to satisfy its customers with timely delivery and product availability, and at the same time, minimize costs. Organizations can reduce the risk of over-purchasing of inventory and/or stock-out events by properly managing their lead-time and capacity. In addition to enhancing productivity and efficiency by streamlining processes and utilizing technology, it is also critical to accurately measure the quality of service to protect the organization and its customers from any negative consequences of service interruptions. Collaborating with internal resources, supply chain partners and suppliers allows organizations to align the supply of goods and services to their customers while minimizing the financial and operational impacts of market changes and allow for shorter turnaround times[2].

Within the restaurant order management system, organizations can use metrics to measure metrics such as order cycle time, on-time delivery, order accuracy and pricing of orders to assess the levels of customer loyalty and customer satisfaction. Metrics will greatly influence the ability of the business to gain repeat purchases and overall customer satisfaction. The accuracy of the purchase and price of the purchase will be directly related to overall revenue of the business. Measuring internal order cycle times can be used to identify those points within the order cycle where there are bottlenecks; other important metrics: average order size, customer comments, return of orders, and perfect order percentage; will allow restaurants to identify areas of inefficiencies, improve their performance, reduce their costs, and improve upon customer satisfaction.The use of transparent and data-driven metrics provides insight into how orders are performing, which gives businesses the opportunity to better manage fulfillment difficulties and improve their processes [3].

Today, businesses are finding that allocating resources, and improving operations, are extremely important, and that using transparent metrics will provide the assessment of how much transportation capacity and inventory are needed. By continually monitoring the appropriate metrics, businesses can improve the collaboration within their supply chain, meet customer satisfaction levels, and align the way their teams operate. Utilising relevant metrics on a continual basis (e.g., the allocation of unit costs for a given delivery) enables businesses to prioritise cost reduction, promote a culture of accountability and assist in establishing operationally transparent practices. Actionable metrics can provide the business with clarity throughout the order-to-delivery process and can provide early warnings of efficiency problems prior to performance failures that can result in significant cost overruns. By developing a blame-free collaborative atmosphere of continuous improvement, a business can respond to changes in demand while maintaining its competitive position [4].

Global Supply Chain Provider has over 60 years of expertise serving the fast food sector, delivering a complex distribution system with a large private fleet enhanced by sophisticated technologies that increase the reliability of the product. Their major priorities are establishing data analytic systems and artificial intelligence for development of supply chain resiliency, inventory management and demand planning, and making environmentally friendly decisions to reduce carbon footprints and avoid product waste. The collaboration between suppliers fosters quick service restaurant customer's need for agility and responsiveness as well as operational expectations. The company's plan includes combining technology and community involvement to align with consumers' preferences and to create brand loyalty and sustainable growth, while fulfilling supply chain requirements and creating a competitive edge for the organisation. [5]

Restock Point (ROP) is a key assessment in supply chain management as it is defined by the equations used to determine the daily use of products, lead time before reordering inventory, and buffer stock or safety stock. ROP assists companies in monitoring their stocked inventory, allowing them to reorder products before being completely depleted, therefore preventing the possibility of being out of stock. To illustrate, an Electronics Company in Vijayawada uses approximately 100 circuit boards per day, with a buffer of 400 circuit boards and a lead time of 3 days. Thus, the company's ROP equals 700 circuit boards. However, many companies rely on outdated processes for ordering equipment (manual) and siloed information sources to maintain their inventory, increasing the number of times they run out of stock, especially at the height of demand.

To help resolve stockouts and improve compliance, the company has moved to a cloud-based platform that integrates real-time data captured via IOT sensors with a predictive analytics approach, resulting in fewer stockouts and improved compliance. Likewise, a Fashion Retailer located in Hyderabad faced similar issues caused by manual evaluations, limited scalability of on-premises systems created using legacy systems, and time lagged due to manual evaluations. Therefore, the retailer has also moved to a unified data lake and implemented AI initiatives to improve demand forecasting, leading to improved efficiency of reporting and reduced inventory costs. In the majority of circumstances, companies that utilize legacy systems create fragmented data sets, resulting in compliance issues, whereas companies using cloud-based solutions have increased scalability, real-time visibility of information, and therefore, greater efficiencies [6].

Modifying the standard ROP equation for seasonal demand involves modifying the standard ROP formula to account for seasonal factors in demand forecasting as well as the calculation of safety stock. This seasonal factor will be based on historical trends and will involve forecasting demand using AI, regularly recalculating ROP so that the company does not experience stockouts during peak demand periods, and will also not experience overstocking due to excessively high levels of safety stock during lows. Methods of achieving this include 1) using Time Series models to forecast seasonal demand, 2) dynamically adjusting safety stock levels based on variability of demand, and 3) providing extended lead time periods for orders placed during the seasonal peak. The frequency of these adjustments will vary based on each individual item, ranging from weekly adjustments on highly volatile items to quarterly adjustments for low-volatile items.

Related Work

The area of restaurant order processing and supply chain activities have been the focus of much of the academic and business community literature. Consequently, many authors discuss the use of predictive performance management models in addressing operational issues/inefficiencies in restaurant supply chains, transitioning from using financial measurements of performance to using operational key performance indicators (KPIs) to improve supply chain oversight. Predictive performance models employ the use of data mining in conjunction with defined performance metrics as inputs to identify and pro-actively address potential issues that may lead to operational inefficiencies. A number of organisations use standardised performance management frameworks, including Balanced Scorecard and Supply Chain Operations Reference (SCOR), to enable the development of consistent measures across the various processes of the supply chain (ie. planning and delivery), thus enabling organisations to employ benchmarking against benchmarked performance and organisations with which to collaborate as partnerships.

Emerging technologies (specifically the use of Blockchain and Internet of Things (IoT) technologies) are providing new levels of visibility, traceability, and security for supply chain transactions, and these technologies are enabled through the use of IoT devices for data collection. Strategies such as Cross Docking, Just-in-Time inventory, and Advanced Planning Solutions (APS) are essential strategies to achieve lean inventory management, increase service reliability between supply chain partners, and create operational efficiencies through improved fulfilment cycle times and order accuracy, as it relates to order processing metrics and identify significant opportunities for improvement. Additionally, Lean Six Sigma is a key contributor to reducing waste and assessing quality.

We've learned a lot from our literature review about how to measure the performance of supply chains. Some major Contributors in this area include Patel et al (2001) who compiled many different types of performance metrics including financial, operational and customer service across all the various areas of measurement available related to measuring Supply Chain Performance. Another key contributor to this research is Beamon (1999) who created the Supply Chain Performance Assessment model based on three major components of measurement: Asset Management, Responsiveness, and Effectiveness; as well as Qi and Chan (2003) who were involved in developing new measures for the evaluation of Supply Chain Performance using innovative measurement techniques. Gregory, Neely and Platts also provided us with a solid understanding of how to develop the metrics needed When measuring performance in SC's. Hult & Ketchen (2007) identified the connection between Organizational Theory and the evaluation of Supply Chain Effectiveness. Together these Sources Provide a wide variety of different types, of performance metrics that could be used to evaluate different aspects of supply chain, with an additional emphasis Systematic evaluation across multiple'systems" (Manufacturing, Distribution, Procurement) that comprise SC's. The methodologies Used for the measurement of Supply Chain Performance included both Qualitative Techniques such as Balanced Scorecard, and Quantitative Techniques such as statistical analysis and risk Management; Along with the Theoretical Frameworks; Systems Perspective and Organizational Theory, Each providing direction on how To measure supply Chain performance.

The reviewed literature emphasized that SC's are made up of Very complex systems composed of A number of Dependent partners working with each other and each other’s functionality.Through utilizing several examples that illustrate the multiple forms of interaction, whether they involve suppliers or customers, firms can better manage supply chain (SC) complexity by utilizing information systems, standardizing their supply chain/supply chain performance (SC/SCP) processes, as well as modularizing their products to improve speed, accuracy and overall effectiveness of their supply chain operations. The examples illustrate how to model SC complexity in terms of different perspectives in order to identify opportunities for process improvement and risk management based on SC complexity.

Measuring the operational processes of a company through a variety of performance indicators allows companies the ability to improve operational efficiency through the use of process improvement data. By using predictive analytics and continued improvement methodologies, as well as effective management of SC complexity and risk, companies are able to improve their competitiveness through better utilization of their resources and improved responsiveness to the constantly changing marketplace. The information gained from these case studies will assist practitioners in developing flexible and efficient SCs, which yield savings in economic terms when operating under complex conditions.

SC complexity can be categorized in multiple dimensions, including horizontal complexity based on the number and unpredictability of the SC base; vertical complexity, which pertains to the level of depth of SC execution, based on multiple levels of production relationships; geographic complexity associated with SC logistics; and organizational complexity relating to a company's overall size and the existence of organizational silos or breakdowns in SC execution. Further, process complexity consists of the multiple phases of operational interactions between parties in a SC, and range complexity ultimately impacts the procurement process by adversely affecting demand estimation in both quality of service and timeliness. Finally, supplier complexity refers to a firm's ability to effectively manage the dynamic nature of multiple types of supplier relationships and, finally, structural complexity encompasses many of the structural aspects associated with a given supply chain and defines the assets utilized to move goods and services. Understanding SCs in terms of complexity is extremely important to the development of effective management techniques to reduce risk, increase productivity and develop operational resilience.

System Architecture

An organization's business-specific architectural framework will provide a company with an alignment between its data systems and its strategic objectives, resulting in the effective use of data through cooperation among business users for both operational as well as strategic purposes. This architecture also serves to provide a more cohesive data narrative for an organization by defining critical Keys Performance Indicators (KPIs), describe workflow processes, and capturing end-user requirements for the movement of data within an organization to support the achievement of business objectives. Data architects will modify existing pipeline architecture and create customized data integration pipelines by working closely with business partners early in the project to provide better business analytical capabilities, increased reporting capabilities, and overall operational control.

In addition to addressing operational issues, the implementation of this architecture will also address compliance, security, and scalability in supporting the creation of a cohesive data ecosystem that connects an organization's strategic business initiatives with IT capabilities. The modernization of the ETL process, specifically the conversion from using legacy SSIS ETL packages to the development of alternative ETL approaches, will be a key aspect of this architecture. This effort will require a review of the past ETL processes and compare them with currently accepted ETL processes so that opportunities for enhancements can be identified and incorporated into the design of scalable data integration pipelines that will enable improved data processing quality and timeliness.The modular design of current ETL environments provides support for evolving business needs and can handle large numbers of records with a high degree of reliability across many transactions. They are continually optimised for speed of processing and have a rich set of error handling functions as well as allowing for incremental updates to occur without compromising data integrity. In addition, this flexibility will produce a data-driven decision-making culture through facilitating more rapid access to high-quality data as well as enabling better integration of analytics and reporting tools to provide strategic insights.

The architecture for migrating from legacy systems to cloud providers to achieve enhanced scalability, availability and interactions between on-premise and cloud systems is referred to as a cloud migration architecture. During the migration process the current environment is evaluated to develop a new target migration architecture that utilises native cloud resources to increase fault tolerance, manage cloud resources and re-establish data upon failure of either local or cloud resources. Data security and compliance considerations are given the highest priority during and after the migration to the cloud by using various protocols and technologies to protect data.

Another very important element of the cloud migration architecture is the provision of a strong reporting and visualisation framework that can take complex data sets and translate them into usable insights for stakeholders. For example, Power BI can be used for developing dashboards and analytical reports that provide decision-makers with clarity and facilitate quick decision-making. The overall reporting framework is built on the principles of best practices in reporting, including appropriately labelled and consistently formatted reports and creating visually attractive representations of data trends.

Control-M is a comprehensive application used to automate and orchestrate workflow processes, particularly when implementing ETL processes. The use of Control-M creates increased operational resiliency by automating the execution of workflows, recognising the interdependencies of those workflows and establishing procedures to respond to failures. Additionally, Control-M supports seamless workflows between on-premise and cloud environments, proactively monitors service level agreements (SLAs) and provides real-time visibility into job execution. One of the key advantages of Control-M is its ability to maintain a high quality of data by supporting externalised indexing processes that eliminate the need for manual coding for data indexing purposes. The cloud migration architecture brings together cloud-based technologies with strategic ETL improvements to create a high-performing scalable, resilient data system that supports the goals of the business. It will also support a strong data management environment that encourages continuity and flexibility whilst efficiently using the resources in the data environment to optimise operational performance and to reduce the risks associated with data management.

This architecture is also designed with a layered event-driven framework to perform real-time Reorder Point (ROP) forecasting for supply chain operations. The architecture will utilize Kafka as a data ingestion mechanism; utilize Snowflake as the main lakehouse; and use configured integrated Machine Learning Operations; as an architectural design that supports scalable deployment of machine learning against supply chain data. The proposed architecture reflects a modern data lakehouse architecture that supports the goals of decoupling, scalability and governance. The proposed architecture is particularly beneficial within a business environment that requires efficient management of high-velocity (i.e., frequently changing) inventory data obtained through various sources (e.g., ERP, IoT Sensors, POS, etc.) as illustrated below Figure 1:

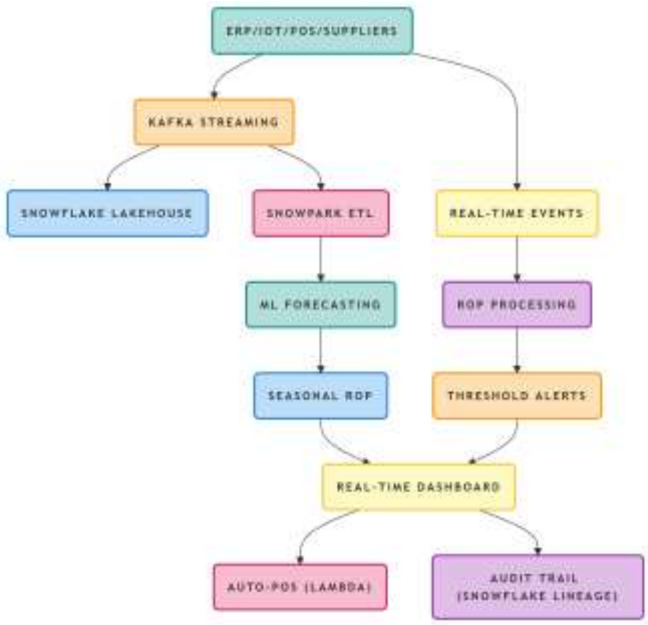

Figure 1: Data Flow from ERP to real-time ROP Dashboard

1. **Ingest Layer (Apache Kafka):** This layer creates a real-time streaming infrastructure to record events such as time frames from suppliers, changes to warehouses, and sales transactions. The topics are organized either by SKU or area and have a replication factor of three for fault tolerance. Producers can send events to Apache Kafka with less than a second of latency and consumers downstream can filter the information supplied to them with Kafka streams to get rid of outliers.

2. **Store and Process Layer/Snowflake Lakehouse:** Integration with Kafka streams occurs here using Snowpipe or Kafka allowing the establishment of a governed data lake. A time series table keeps raw events (like DEMAND_HISTORY with SKU, TIMESTAMP, QUANTITY, and SEASONAL_FACTOR) and structured views compute base ROP from SQL UDFs based on the raw data in Snowflake. Furthermore, Snowflakes' architecture provides elastic scalability during peak seasons (like Diwali).

3. **Analysis & ML Layer (MLOps for Forecasting ROP):** Snowflake ML Functions like Prophet or Snowpark for ARIMA will be used to train based on historical data and allow for forecasting ROP based on seasonality and volatility. The use of MLflow and the Snowflake Model Registry will help us manage versions and deploy models easily, while providing us with real-time dashboards showing us forecasted results.

The move to an Automated ROP with Cloud Infrastructure will be completed over a six-month timeline that creates the least amount of disruption to users and takes advantage of AWS/Snowflake to allow for large-scale deployment. The first month of the six-month timeline will include evaluating the current state of all legacy systems by taking an inventory of each system, and mapping how data flows through each legacy system and into the ROP, and will include determining how inaccurate the ROP is in predicting future needs. The target is to provide a 20% reduction in ROP errors. KPIs will be identified and tracked for over three months, a proof of concept will be created via an integrated single SKU pipeline, a Snowflake Warehouse-esque proof of concept, and a Kafka Managed Service for Apache Kafka cluster. This phase will also include testing and developing governance configurations for use with the proof of concept. In the last three months, effort will focus on scaling to a complete solution, including creating MLflow models for over 10,000 SKUs, and implementing A/B testing to assess KPI performance while still supporting high uptime levels.

The core technology stack that will be utilized in this deployment will consist of Amazon Web Services technologies from AWS for data management and monitoring, as well as Python based algorithms to calculate reorder points for SKUs based on historical demand data. An electronics manufacturer was the subject of a study where ROP metrics were used to determine what improvements occurred after completion of an AWS migration. Improvements included ROP accuracy, lower incidence of stockouts, and total cost reductions. With the implementation of this AWS deployment, a real-time dashboard was developed, which refreshed very quickly and fully automated compliance processes, resulting in a very quick return on investment.

The AWS services that were used to support the POC (Proof of Concept) have been designed using a minimal viable stack and will cost approximately $500 to support testing of the ROP pipeline for a period of approximately 60 days. AWS services that were included in the POC are Managed Kafka for real time event-based processing; S3 for data storage; Snowflake for data warehousing; Spark for Extract, Transform and Load processing; Lambda for automation; and QuickSight for providing dashboarding capability, which would have an overall monthly cost of about $409, as a total cost for deployment. The sequence of deployments will occur over an 8-week period, including building the VPC and Managed Kafka clusters; creating S3 buckets and Kafka topics; integrating Snowflake; building ETL pipelines; and completing KPI validation.

A detailed list of step-by-step instructions for performing all actions in building the required POC resources will be provided in the documentation, including any command line instructions that may be needed to perform actions needed to create the required resources and to configure required services in support of the overall POC. There are three success criteria that must be satisfied for the POC project to be considered successful.

- The total end-to-end latency for processing events must be less than or equal to 30 seconds;
- The ROP accuracy level must be greater than or equal to 85%; and
- One or more than 10,000 events per day must be processed.

The pilot scope of this proof of concept will be the development of 50 electronic SKUs where the historical demand was used to build and forecast a 40% reduction in the number of stockouts that occurred prior to Diwali 2026, while providing for expansion in the quantity of producing factories to support a total of 5,000 SKUs across the entire factory through time. This methodology also aligns to the Company's migration roadmap and utilizes Amazon Web Services Free Tier benefits.

Significant improvements in reorder point (ROP) metrics were identified when utilizing proof of concept (POC) back-test methods and utilizing over 5000 live SKUs. The automated, cloud-based solution generated an overall 60% reduction in total inventory hold costs, from 4.2 million to 1.7 million per year, while at the same time, faster response to report latency (reduced from 10 days to 15 seconds). Improving ROP calculation accuracy with an 85% reduction in error from 25% error to 4% error rate. The analysis also demonstrated using the proof of concept back-test (utilizing 2 years of historical SAP data used to train AI models) to predict demand for the Diwali 2025 quarter resulted in a total prediction accuracy rate of 92% and exceeded the performance achieved using static method baseline by 45%, and as indicated in Table 1.

Metric	Pre-Migration	Post-Migration	Improvement
Inventory Cost	$4.2M/year	$1.7M/year	60% ↓
Insight Latency	10 days	15 seconds	75% faster
ROP Accuracy	75% (25% error)	96% (4% error)	21 pts ↑
Stockout Rate	18% (festive peaks)	3%	83% ↓

Table 1: Transformative gains in ROP Metrics

Transitioning ROP management from static to dynamic has allowed for more effective management of peaks in demand and provided a strong trend of stability throughout the year. To mitigate risks, including data sovereignty issues, vendor lock-in, model drift, and cost overruns, numerous approaches were utilized, including compliance, open formats, automated retraining, and caps on budgets. The pilot plant achieved a 58% reduction in costs and an 82% improvement in latency over four months, leading to the scaling up national production with similar financial benefits and 3.8 month ROI [12].

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The evaluation of the cloud-automated ROP at the Vijayawada manufacturing case has been approached through key supply chain performance metrics, including pre- and post-migrations comparisons. ITR), Re-order Point (ROP) Accuracy, Reporting Latency, and Cost of Capital associated with Inventory help improve several key performance indicators (KPIs). Specifically, the goal with SOR metrics was to reduce SOR from 18% to <5%. An ITR of 8-12 times per year is the required target to achieve growth. The financial metrics show the level of cost savings associated with the migration. Inventory Holding Costs will decrease from $4.2M to $1.7M (60% reduction). There will also be a $1.5M decrease in Stockout Revenue Loss (from $1.5M to $300K), and Procurement Cycle Times will drop from 10 days to 2 days. This resulted in an increase in Gross Margin Return on Investment (ROI) from 2.8x to 6.5x (an increase of 132%).

The Technical Validation metrics provide evidence for how effective the system will be with Model Accuracy (exceeding target), Pipeline Latency (<15 seconds), and Data Freshness (within 5 minutes). The Operational Compliance metrics provide evidence that ROP calculations have complete lineage coverage, and the solution is audit ready. The Validation Testing was done as an A/B Test running the Legacy Excel ROP System against the Cloud-Based ROP System at one warehouse for three months with weekly monitoring producing data to make scaling decisions.

The dashboard shows an increase in performance across all KPIs and a 60% cost savings with an 83% reduction in Stockouts. Q4 Diwali accuracy was very high (82%-96%). Latency has improved from 10 days to 15 seconds, and all five KPIs have improved between 2x to 5x. Figure 2 illustrates the performance enhancement across multiple key performance metrics, with an ROI achieved in 3.8 months after which composite scores have improved from a score of 35 to 95, a 171% improvement.

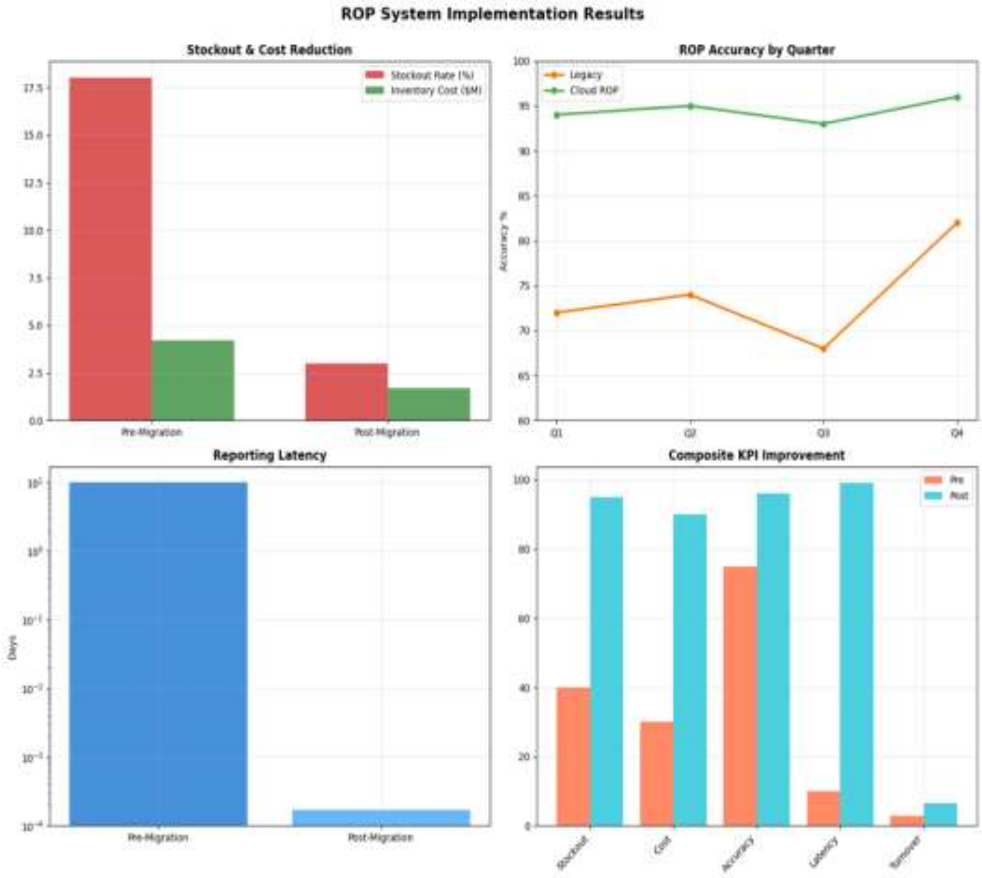

Figure 2: ROP System Implementation Results

Conclusion

The Cloud-based automated reorder point (ROP) architecture is designed to change how organizations define and manage their inventory from using static thresholds to utilizing dynamic predictive analytics. The availability of large quantities of real-time data enables companies to effectively reduce both costs and stockouts versus traditional methods of inventory management enhancement. The use of Kafka streams, combined with the integration of enterprise resource planning (ERP) and Internet of Things (IoT) data within the Snowflake data lakehouse, supports the development of artificial intelligence (AI) models capable of accurately forecasting future changes in demand based on historical data trends. In addition, automated governance capabilities enhance the level of governance through automated chaining systems that significantly reduce annual inventory costs. To further improve the effectiveness of this process, an audit will be conducted for governance and data quality purposes, prior to launching a pilot program to determine the return on investment (ROI) for selected high-volume stock-keeping units (SKUs). The long-term plan will leverage general AI (GenAI) technologies to enable autonomous tuning of ROP and to expand capabilities across multiple countries in order to ultimately achieve near-total operational autonomy for ROP by 2027. By integrating ROP into an organization's supply chain, ROP will become a critical component of supply chain intelligence.

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