

VENDOR PERFORMANCE COMPARISON DASHBOARD

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Abstract

The Vendor Performance Comparison Dashboard is a data-driven system designed to evaluate, compare, and monitor the performance of multiple vendors using a centralized dashboard. Organizations often depend on several vendors for supplying products, materials, services, or other business requirements. Evaluating these vendors manually can be difficult because performance information may be distributed across invoices, purchase records, delivery reports, quality records, and other documents. The proposed dashboard brings these important performance indicators together in a single platform.

The system focuses on key vendor performance metrics such as on-time delivery, product quality, order fulfillment, cost, response time, and overall vendor rating. These metrics are collected from available vendor and procurement records and processed to generate meaningful performance scores. By applying consistent evaluation criteria, the system enables organizations to compare vendors using standardized measurements rather than relying only on manual judgment.

The dashboard presents vendor information through interactive charts, graphs, tables, ranking views, and performance indicators. Users can compare vendors based on individual metrics or an overall performance score. Historical data can also be analyzed to understand whether a vendor's performance is improving, declining, or remaining stable. Filters can be provided for vendor, product category, date range, location, and performance metric to support detailed analysis.

The main purpose of the proposed system is to help procurement managers and business administrators make informed vendor-selection and vendor-management decisions. By identifying reliable and underperforming vendors, organizations can take appropriate corrective actions and improve procurement efficiency. Overall, the Vendor Performance Comparison Dashboard provides a centralized, transparent, and systematic approach to vendor performance evaluation.

I. Introduction

Vendor management is an important activity for organizations that depend on external suppliers for products, raw materials, equipment, or services. The performance of vendors can directly influence an organization's cost, product quality, delivery schedules, and customer satisfaction. Therefore, organizations need an effective mechanism to continuously evaluate vendor performance and identify the suppliers that consistently meet business requirements.

Traditional vendor evaluation is often performed using spreadsheets, manually prepared reports, purchase records, and individual assessments. Although these

methods can provide useful information, they become difficult to manage when the organization works with a large number of vendors. Important information may be stored in different files or systems, making it difficult to obtain a complete view of vendor performance. Manual calculations can also introduce inconsistencies and consume significant time.

A vendor performance dashboard provides a centralized solution for solving these challenges. The system can collect information about purchase orders, deliveries, quality inspections, costs, rejected quantities, and vendor responses. These records can be processed to calculate standardized performance indicators. Managers can then compare vendors based on measurable criteria and identify areas that require improvement.

The proposed dashboard uses data visualization to make vendor performance easier to understand. Graphs can show delivery performance over time, while bar charts can rank vendors according to their overall scores. Tables can provide detailed information about individual vendors, including delivery rate, quality rate, average cost, and order fulfillment rate. Such visual representations allow users to identify performance differences quickly.

The primary objective of the Vendor Performance Comparison Dashboard is to support objective and data-driven vendor evaluation. Instead of depending only on manual observations, organizations can use historical and current performance information to select reliable vendors, negotiate with suppliers, and improve procurement strategies. The system can therefore contribute to better supplier relationships, reduced operational risk, and improved business efficiency.

II. Literature Survey

Vendor performance evaluation has been widely studied in the areas of supply chain management, procurement, and operations management. Organizations generally evaluate suppliers using multiple criteria rather than relying on a single measurement. Common criteria include quality, delivery reliability, cost, flexibility, service, and responsiveness. Research in supplier evaluation emphasizes that using multiple performance factors provides a more comprehensive understanding of supplier capability and reliability.

Delivery performance is one of the most commonly considered factors in vendor evaluation. Timely delivery is important because delays can affect production schedules, inventory levels, and customer commitments. Metrics such as on-time delivery percentage, average delivery delay, lead time, and order fulfillment rate can be used to measure delivery reliability. Historical delivery data can further help organizations identify vendors that consistently meet agreed delivery schedules.

Quality is another major factor in supplier performance evaluation. Poor-quality materials or products can result in rejected shipments, production problems, rework, increased costs, and customer complaints. Quality-related measurements may include defect rates, rejection rates, return quantities, inspection results, and compliance with required specifications. Combining quality measurements with delivery and cost

information allows organizations to evaluate vendor performance more comprehensively.

Cost-based vendor evaluation focuses on purchase prices and the overall financial impact of suppliers. The lowest purchase price does not necessarily indicate the best vendor because additional costs may result from poor quality, delayed delivery, returns, or transportation problems. Therefore, modern vendor evaluation approaches often consider cost together with quality and service performance. A dashboard can help users visualize these factors simultaneously.

Data visualization and business intelligence systems have become increasingly useful for procurement and supply-chain decision-making. Dashboards can transform large volumes of transactional data into charts, rankings, performance indicators, and trend reports. Instead of manually reviewing spreadsheets, decision-makers can quickly identify high-performing and low-performing vendors through visual comparisons. Interactive filtering also allows users to examine specific vendors, categories, or periods.

Based on these approaches, a centralized Vendor Performance Comparison Dashboard can provide an effective combination of performance measurement and visualization. The proposed system brings delivery, quality, cost, fulfillment, and other relevant indicators into a single platform. It provides standardized comparisons and historical analysis, helping procurement teams make more objective decisions and identify opportunities for vendor improvement.

III. System Analysis

The system analysis identifies the requirements and operational processes of the Vendor Performance Comparison Dashboard. The main objective is to collect vendor-related performance information and convert it into measurable indicators. The system receives data such as vendor name, purchase order details, delivery dates, quantities, quality results, costs, and order status. The collected information is validated before being stored in a structured database. The system calculates metrics such as on-time delivery rate, quality score, order fulfillment rate, average cost, and vendor response time. Different performance indicators can be assigned appropriate weights to calculate an overall vendor performance score. The system ranks vendors according to their calculated scores. Users can filter the results by vendor, date, category, location, or performance metric. Charts and tables provide visual comparisons between different vendors. Historical data can be analyzed to identify performance trends and recurring issues. The system should provide accurate calculations and consistent evaluation criteria. The final analysis helps managers identify reliable vendors and vendors that require corrective action.

Existing System

In many organizations, vendor performance is evaluated using spreadsheets, purchase records, invoices, delivery reports, and manually prepared assessments. Different departments may maintain separate records for purchasing, quality inspection, delivery, and payment information. Because the information is distributed across multiple sources, obtaining a complete vendor performance view can be difficult.

Employees may manually calculate delivery percentages, rejection rates, and other performance indicators. Vendor comparisons may depend heavily on individual judgment rather than standardized measurements. Historical performance information may also be difficult to compare when records are maintained in different formats. Generating vendor ranking reports can require significant manual effort. Problems such as delayed deliveries or increasing defect rates may not be identified immediately. Manual systems can also result in duplicate records and calculation errors. When the number of vendors increases, maintaining and analyzing the information becomes increasingly complex. Therefore, organizations require a centralized system that can automatically analyze and visually compare vendor performance.

Disadvantages of Existing System

- Vendor information is distributed across multiple files and systems.
- Manual calculations require considerable time.
- Difficult to compare multiple vendors consistently.
- Higher possibility of human errors.
- Limited real-time performance visibility.
- Vendor rankings may depend on subjective judgment.
- Historical trends are difficult to analyze manually.
- Generating reports can be time-consuming.
- Poor-performing vendors may not be identified quickly.
- Difficult to manage large numbers of vendors.
- Limited visualization of performance metrics.
- Data-driven procurement decisions are more difficult.

Proposed System

The proposed **Vendor Performance Comparison Dashboard** provides a centralized platform for collecting, analyzing, and comparing vendor performance information. The system collects data related to purchase orders, deliveries, product quality, costs, order fulfillment, and vendor responses. The collected information is validated and stored in a structured database for analysis. Performance metrics such as on-time delivery rate, quality rate, fulfillment rate, average cost, and response time are calculated automatically. The system can assign predefined weights to important metrics and generate an overall vendor performance score. Vendors can then be ranked according to their calculated performance scores. The dashboard presents the results through bar charts, pie charts, trend graphs, tables, and performance cards. Users can filter information based on vendor, product category, date range, and individual performance metrics. Historical performance can be compared to identify improvements or declines in vendor reliability. The system helps managers identify high-performing vendors and vendors requiring corrective action. It also provides a transparent and consistent method for vendor evaluation. Overall, the proposed system supports faster, more objective, and data-driven vendor management decisions.

Advantages of Proposed System

- Centralized vendor performance information.
- Automatic calculation of performance metrics.

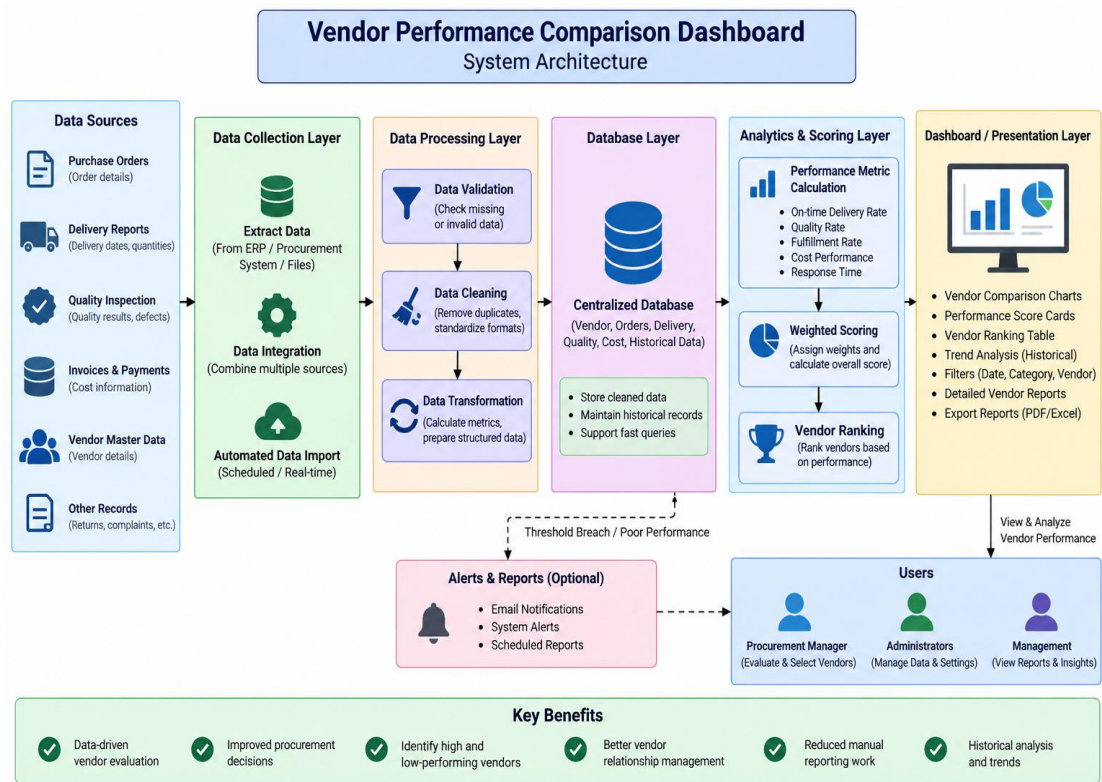
- Easy comparison of multiple vendors.
- Objective and standardized vendor evaluation.
- Provides vendor ranking based on performance.
- Visual representation through charts and graphs.
- Supports historical performance analysis.
- Helps identify underperforming vendors quickly.
- Reduces manual reporting work.
- Improves procurement decision-making.
- Supports better vendor relationship management.
- Can be extended with alerts and predictive analytics.

IV. Methodology

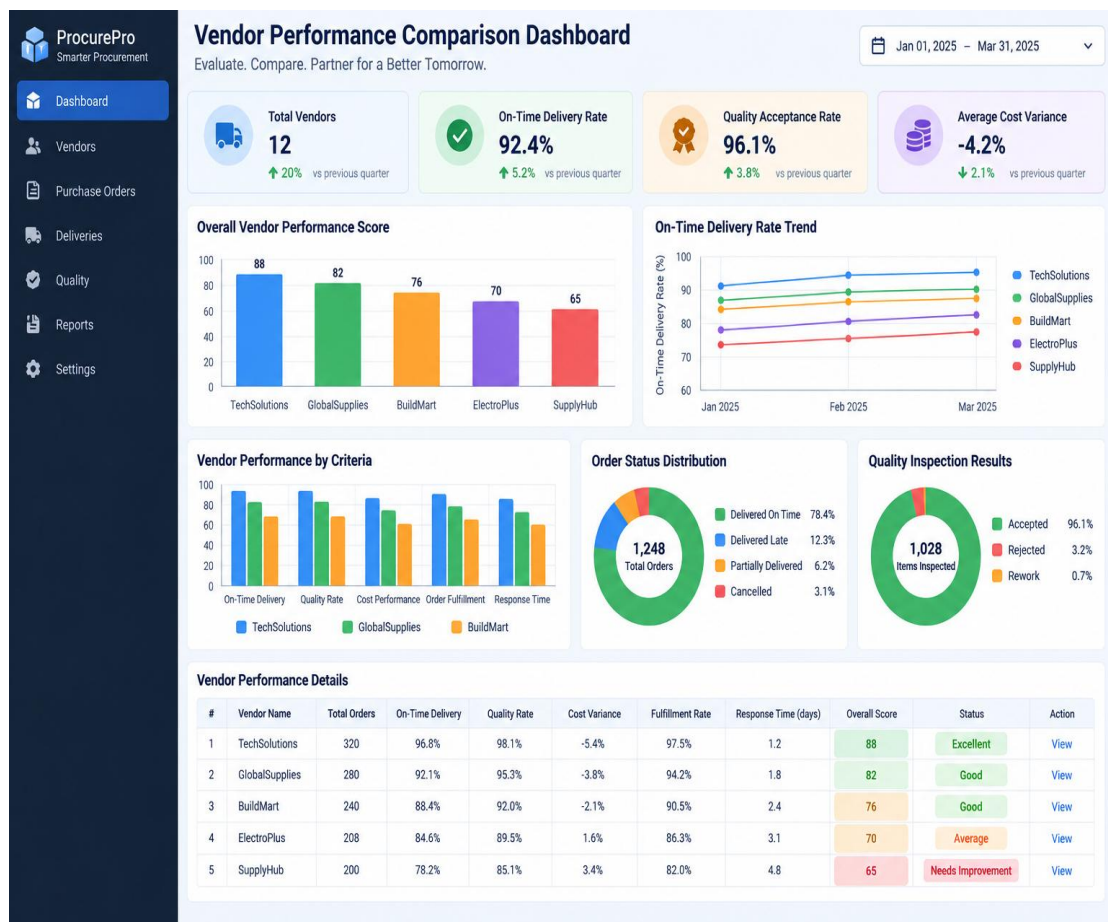
The methodology begins with collecting vendor-related data from procurement records, purchase orders, delivery reports, quality inspections, and other relevant sources. The collected data is first validated to ensure that required fields are available and consistent. Duplicate or invalid records are identified and handled during the preprocessing stage. The cleaned data is stored in a centralized database for further processing. The system calculates individual performance indicators such as delivery rate, quality rate, fulfillment rate, cost efficiency, and response time. Appropriate weights can be assigned to these indicators based on organizational requirements. The weighted metrics are combined to generate an overall performance score for each vendor. Vendors are then ranked according to their calculated scores. The processed information is presented through an interactive dashboard containing charts, graphs, tables, and performance indicators. Users can apply filters to analyze specific vendors, categories, or time periods. Historical data is used to identify performance trends and changes. The resulting information supports vendor selection, performance improvement, procurement planning, and management decision-making.

System Architecture

The system architecture consists of several layers responsible for collecting, processing, storing, analyzing, and presenting vendor performance information. The Data Source Layer contains purchase orders, invoices, delivery records, quality inspection reports, and vendor information. The Data Collection Layer retrieves relevant information from these sources and transfers it to the processing system. The Data Processing Layer validates, cleans, transforms, and standardizes the collected vendor records. The processed information is stored in the Database Layer, which maintains current and historical vendor performance data. The Analytics Layer calculates delivery rate, quality score, fulfillment rate, cost performance, response time, and overall vendor scores. The Vendor Ranking Module compares the calculated scores and generates vendor rankings. The Dashboard Layer displays the results through charts, graphs, tables, rankings, and summary cards. Users such as procurement managers and administrators can interact with the dashboard to filter and analyze vendor information. Historical data can be retrieved to compare vendor performance across different periods. The architecture provides a modular structure that can be extended with alerts, automated reports, and predictive vendor-performance analysis.



V. Result and Output



VI. Conclusion

The Vendor Performance Comparison Dashboard provides a centralized and systematic solution for evaluating and comparing vendor performance. The system collects important information such as delivery performance, quality, order fulfillment, cost variation, and response time, and converts the data into meaningful performance indicators. This reduces the dependency on manual spreadsheets and makes vendor evaluation more consistent and transparent.

The dashboard allows procurement managers and administrators to compare multiple vendors using charts, graphs, rankings, and detailed performance tables. By identifying high-performing and underperforming vendors, organizations can take appropriate corrective actions and improve supplier relationships. Historical performance analysis also helps users understand changes in vendor performance over time.

Overall, the proposed system supports data-driven vendor selection, procurement planning, performance monitoring, and decision-making. It can be further enhanced with automated alerts, predictive vendor-performance analysis, integration with ERP/procurement systems, and automated report generation. Therefore, the Vendor Performance Comparison Dashboard can help organizations improve procurement efficiency, reduce operational risks, and select more reliable vendors.

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