



A High AI-Q[™]
Company



Data Analytics and Automated Reporting Solution for Psychiatric Services

Transforming fragmented psychiatric service data into actionable business intelligence using a high-performance Pentaho BI data warehouse.

Overview

QBurst developed a comprehensive business intelligence tool featuring an integrated data warehouse and an automated reporting layer powered by Pentaho BI. The solution extracts data from multiple application sources, processes it through scheduled ETL jobs, and presents it via an interactive dashboard with drill-to-detail capabilities. This transformation allows administrators to move from manual data gathering to instant, sub-two-second report generation, significantly improving strategic decision-making.

- **Predictive Insights:** Enabled the client to forecast psychiatric service trends and provider availability through advanced data modeling.
- **Operational Efficiency:** Automated the daily extraction and loading of fact and dimension tables, eliminating the need for manual interference in reporting.



Client Profile

The client is a specialized healthcare services provider in the United States. They focus on delivering high-quality psychiatric care and professional clinicians to a network of hospitals and mental health centers, requiring precise tracking of provider metrics and patient service locations.

Challenges: Data Fragmentation and Rigid Reporting

Before the BI implementation, the client struggled to gain a clear view of their clinical operations and market trends.

- **Manual Reporting Overload:** Generating routine charts and metrics required significant human effort to pull data from disparate application databases.
- **Lack of Trend Visibility:** There was no robust mechanism to understand or forecast business shifts, making long-term strategic planning difficult.

- **Inflexible Dashboards:** Existing tools lacked the ability to filter data dynamically by specific aspects such as location, provider, or date range.
- **Security & Role Constraints:** The client needed a system where data visibility would automatically adjust based on the specific role of the user, which the legacy setup could not support.

Solution: Automated Data Warehouse and BI Suite

We engineered a multi-layered BI architecture using the Pentaho BI Suite 6.0 and a Postgres 9.5 data warehouse. The solution follows a structured flow: data is pulled into an integration layer, processed into fact and dimension tables, and finally pushed to a high-performance reporting layer.

- **Automated ETL Orchestration:** Developed and scheduled ETL jobs using Java and Ruby to ensure the data warehouse is updated daily without manual triggers.
- **High-Speed Reporting Layer:** Built a dedicated reporting layer on top of the warehouse that optimized query performance, resulting in report load times of less than 2 seconds.
- **Interactive Visualization:** Implemented a dashboard with "drill-to-detail" options, allowing users to toggle between donut charts and line trend graphs for deep-dive analysis.
- **Ad-Hoc Reporting Engine:** Integrated a "mix-and-match" filter system that empowers business users to generate their own custom reports without developer assistance.

Key Features and Technical Highlights

The platform prioritizes performance and user-specific data security:

- **Role-Based Access Control (RBAC):** Ensures that clinicians, hospital admins, and executives see only the data relevant to their specific permissions.
- **Multi-Parameter Filtering:** Dashboards can be filtered by provider, product, location, and specific date ranges to pinpoint operational bottlenecks.

- **Scheduled Exports:** Automated delivery of custom reports and charts in various formats as per stakeholder requirements.
- **Scalable Data Schema:** A robust Postgres-based warehouse designed with dimensions and fact tables to accommodate growing psychiatric service records.

Impact

- **Strategic Decision-Making:** The ability to predict business outcomes and understand current trends directly influenced the client's growth strategy.
- **Instant Accessibility:** With reports loading in under 2 seconds, business users can now analyze real-time data on-demand during critical meetings.
- **Resource Optimization:** 40-60% reduction in manual reporting effort enabled the administrative team to focus on clinical quality and provider recruitment.
- **Improved Transparency:** Role-based dashboards standardized how data is consumed across the organization, ensuring consistency in performance metrics.