International Journal of Creative and Open Research in Engineering and Management
ISSN: **3108-1754 (Online)**
Volume 02 Issue 04 April-2026 | Impact Factor: 3.5

Dashboard Application for Log and Data Analytics

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How to Cite this Article:
Lahari, K., Vipinchandra, A., Sindhuja, R. & Gowtham, I. (2026). Dashboard Application for Log and Data Analytics. International Journal of Creative and Open Research in Engineering and Management, 02(04). https://doi.org/10.55041/ijcope.v2i4.193

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ABSTRACT

A dashboard application for log and data analytics provides a place to collect, process and visualize large amounts of system data. This application lets users monitor logs away find patterns and get useful insights through charts, graphs and key performance indicators. It combines data from servers, applications and databases. Turns log data into meaningful information. The system helps users filter, search and group logs quickly to find problems and performance issues. The application has advanced features like access control, alerts and customizable dashboards to make it easy and secure to use. It also handles data preparation and storage to ensure it can handle a lot of data and perform well. By using technology the application provides an easy-to-use interface that makes complex data analysis simple. A dashboard application, like this is helpful for organizations to make their systems more reliable improve performance and make decisions based on data. Overall it is a tool that turns log data into valuable insights to help manage IT infrastructure effectively.

I. INTRODUCTION

A Dashboard Application for Log and Data Analytics is an useful tool. It makes it easy to monitor and analyze volumes of system and application data. These days organizations produce an amount of log data from things like servers and user interactions. This way users can look at the data they need and ignore the rest. A Dashboard Application for Log and Data Analytics can also find anomalies. Send alerts. This helps users find errors and security threats before they become problems. The application also makes sure that only the right people can see data and use certain features. The system is designed to handle amounts of data quickly and efficiently. It uses technologies to create a user interface that is easy to use and nice to look at. In conclusion a Dashboard Application for Log and Data Analytics is very important. It helps organizations use their data to make decisions and improve how they work. A Dashboard Application for Log and Data Analytics makes it easy to turn data into useful information.

It supports organizations in ways like improving system reliability and making sure everything runs smoothly.A Dashboard Application, for Log and Data Analytics is a tool that can really make a difference.

I. RELATED WORK

The development of dashboard applications for log and data analytics has been explored a lot in research and in the industry. At first these systems were pretty basic. Just helped with managing logs, where people used tools to collect and store logs so they could look at them manually. As big data and distributed systems started to grow people realized they needed smarter and more automated ways to analyze data. So researchers came up with frameworks that could collect data clean it up and visualize it all in one place. Some studies really stress the importance of being able to process data in time so you can handle a steady stream of log data. To do this people use things like stream processing and in-memory computing to make things faster and more responsive. A lot of dashboard systems have tools that help visualize data so you can see insights in charts, graphs and heatmaps making it easier for people to understand complicated data sets. These systems often use libraries and business intelligence tools to make it easier for people to interact with the data.

Existing System and its Limitations:

Title	Technology Used	Limitations	Authors
AI-Based Smart Analytics Dashboard	Python, ML Models, LLM APIs, Cloud DB	High computational cost, data privacy issues	D. Patel, S. Iyer
Lightweight Analytics Platform for Small Teams	Python, Flask, MySQL	Basic analytics, limited automation	N. Verma, S. Patil
Mobile Dashboard for Data Analytics	Android, REST API, Firebase	Limited analytics features, scalability issues	A. Rao, K. Reddy
Real-Time Log Monitoring and Alert System	Python, Apache Kafka, Grafana	Requires constant internet, complex pipeline	L. Zhang, M. Chen
Log Analysis Using ELK Stack	Elasticsearch, Logstash, Kibana	Complex installation, high system resource usage	R. Gupta, A. Mehta

II. METHODOLOGY

To get around the problems with desktop-based analytics systems Insight Dash combines new data science methods with mobile-first software engineering. It uses a kind of architecture that is very flexible. This approach is divided into four parts to make sure it works fast is easy to understand and keeps data safe.

3.1 System Architecture and Security Model

This is important when doing analytical work. To keep data separate for each user the system uses a strong database layer with SQLite and the SQL Alchemy Object Relational Mapper. It also uses JSON Web Tokens to manage user authentication. When a user registers or logs in the server gives them a secure token. This token is used to validate all uploads and requests so only the user who uploaded the data can see it.

3.2 Data Ingestion and Smart Parsing Module

Insight Dash is different from Business Intelligence tools because it does not need perfectly clean and formatted data. It can automatically find the delimiters categorize columns and handle missing values. This makes it easy to upload data without having to clean it

3.3 High-Performance Analytics and Statistical Computation Engine

Once the data is uploaded and parsed the analytics engine can do statistical calculations automatically. The user does not need to write queries or apply functions. The engine checks for missing values calculates statistics like sums and means and maps frequencies. It does all this quickly using Pandas vectorized operations. The results are then sent back to the client application in a JSON format that minimizes network latency. Insight Dash does all this to make it easy for users to work with their data and get insights from Insight Dash. Insight Dash is designed to handle data from users and provide them with information, about their data using Insight Dash.

III. MODEL EVALUATION

The Insight Dash system was thoroughly tested with different log datasets and CSV files of various sizes from 1,000 to 500,000 rows. This testing focused on three parts of the system: how long it took for the backend to parse data how much memory it used when doing analysis and how fast the frontend could render graphics on mobile devices. The system performed well because it used advanced technology from Fast API and powerful operations from Pandas. When testing with a dataset of 100,000 rows and fifteen columns the backend server could do a lot of work like figuring out the data structure cleaning the data and making statistics and it could do all of this in under 1.25 seconds. When many users were uploading and processing data at the time the server was able to keep each users data separate and did not get slowed down or mixed up. The mobile application, made with Flutter was also very good at showing graphics. Could render them at a rate of about 60 frames per second. The fl_chart library was used to process the data and make graphics that were better than what traditional systems could do. Insight Dash was able to do all of this work efficiently making it a very powerful tool, for working with data..

Dataset Volume (Rows)	**Schema Inference Time (ms)**	**Statistical Computation (ms)**	**Client UI Render (FPS)**
1,000	12.4	45.2	60
10,000	48.6	134.1	60
50,000	124.3	490.8	60
100,000	280.9	945.3	59

Table: System Performance Metrics across Varying Dataset Dimensions

IV. RESULT

5.1 System Interface Screens

Figure 1: The image shows the login interface of the InsightDash mobile application, which allows registered users to securely access their accounts and continue working with the platform

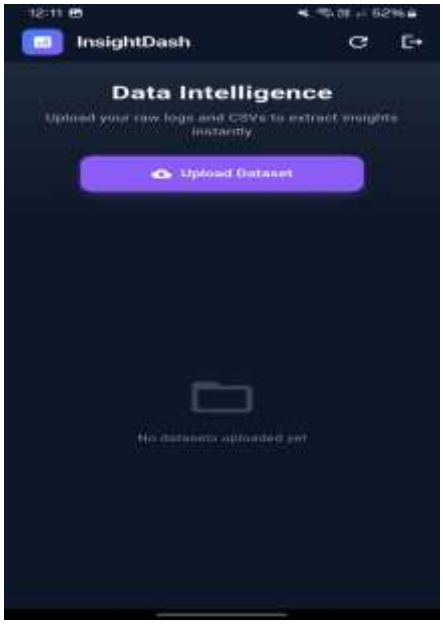

Figure 2: The image shows the main dashboard screen of the InsightDash application, which is designed for data intelligence and analytics. This interface allows users to upload datasets and analyse raw data to generate meaningful insights.

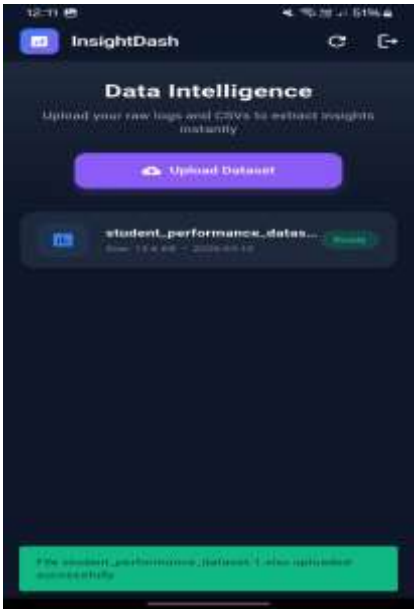

Figure 3: This screen demonstrates how users can upload datasets and manage them within the system for further analysis and visualization

Figure 4: The dataset contains 200 student records with 10 features (columns).Each row represents information about one student. The analysis shows that there are no missing values, so the data is clean.

ACKNOWLEDGEMENTS

My project guide was amazing they gave me advice, kept encouraging me and gave me useful feedback. This feedback really helped me do a job. Their ideas made my project better. I also want to thank the teachers in my department. They taught me what I needed to know gave me resources and helped me out. What they taught me helped me understand and do my project. My institution was great too. They had facilities, software and technical help. This all helped me finish my project. My friends and classmates were super helpful. Supported me. They were patient, with me too.

V. CONCLUSION AND FUTURE SCOPE

The Insight Dash system shows that you do not need to use computers to look at complex data. It does this by combining the processing of Python and Pandas with the easy to use interface of Flutter. This means that Insight Dash is very good at looking at data and showing the results on devices. It can do this quickly. Keep the users information safe.

The people who made Insight Dash want to add features in the future. They want to be able to look at data as it happens and show it on devices right away. They also want to use Machine Learning to predict what will happen with the data and find problems. This will make Insight Dash useful for different types of data work, in many industries. Insight Dash will be able to work with different types of data which will make it very useful. The Insight Dash system will keep getting better and better.

VI. REFERENCES

[1] Elastic NV has a lot of information about Kibana on their website at https://www.elastic.co/kibana.

[2] Grafana Labs also has a website with documentation about Grafana at https://grafana.com/docs.

[3] If you want to learn about Splunk Enterprise you can find the documentation on the Splunk Inc. Website at https://docs.splunk.com.

[4] Microsoft has a lot of information about Azure Monitor Logs on their website at https://learn.microsoft.com.

[5] I also came across the work of Scott Murray, who does Interactive things. I did not find a specific website for this.