

Knight Foundation School of Computing and Information Sciences

Fall 2025 Senior Design Project

Cloud Cost Optimzer Dashboard

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PROBLEM

Cloud users are at a disadvantage by not being able to monitor their cloud service usage. Not monitoring leads to unexpected billing and inefficient resource allocation.

SYSTEM DESIGN

Frontend (React & Vite)

- Real time data fetching
- Charts for cost visualization
- Authentication UI

Backend (Flask)

- RESTful api for cloud usage metrics
- JWT-based authentication
- SQLite database for users

Display

- Month-to-date (MTD) costs
- Live metrics (CPU, instances, service counts)
- Forecasting, recommendations, budgets, and alerts

CURRENT SYSTEM

Cloud billing dashboard are usually limited. They may have some features but not all. Some examples are:

- Real time monitoring
- Forecasting/ anomaly detection
- Role based access
- Simplified views (for non tech

REQUIREMENTS

- User authentication with secure login.
- Display cloud cost and usage metrics.
- Visualize cloud spendings.
- Show alerts, budgets, and recommendations.
- Scalable backend
- Consistent data visualizations
- Responsive and user friendly interface.

VERIFICATION

- Manual testing across major browsers
- API endpoint testing with mock data
- visualization checks for accuracy and readability
- Error-handling test for token expiration

IMPLEMENTATION

- Frontend implementation in React
- Vite dev server supports fast testing
- Flask backend supports authentication
- RESTful deliver spending summaries and metrics.



SUMMARY

The Cloud Cost Optimizer Dashboard provides centralized visibility into a user's cloud spending with real-time metrics, forecasting, role based access, and optimization recommendations. By using a modern interface and a secure backend, the system enables organizations to better manage their costs across cloud services.

REFERENCES

[Flask Documentation](#)

[React Documentation](#)

[Vite Documentation](#)

[Project Repository](#)