Gain Real-Time Financial Insights From Encrypted Data in Google Cloud

Unlock insights and drive profits for financial services with OmniIndex Dropblock & Google Cloud

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White Paper

Challenges

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Use Case Overview

Considerations & Tradeoffs

Solutions

Security

Speed

Simplicity

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Securing the path to compliance with Web3 data storage and encrypted analytics

Dropblock enables users to drive profit and optimize their business operations by adding valuable data to Google Cloud without compromising governance or compliance requirements.

This is possible because OmniIndex's unique Web3 file system enables you to store data in your own blockchain file system instead of Google Drive, and then use your fully encrypted data in your workflow without risk of exposure.

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Use Case: Utilizing Dropblock to Maximize the Security and Profitability of Financial Data

The financial sector has struggled to capitalize on its vast pools of customer information due to strict data regulations.

While there are a number of components to consider around compliance, one of the biggest issues preventing valuable financial data from being added to the cloud is third-party access to decrypted data.

This is a problem because data has to be exposed to multiple parties in order for insights to be generated. This includes employees across multiple departments, and the cloud provider. In this use case: Google.

This White Paper shows how OmniIndex Dropblock with its decentralized data storage and fully homomorphic encryption (FHE) enables financial organizations to gain real-time insights from encrypted data in Google Cloud without risking third-party access or exposure.

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Secure and Fast Insights from Fully Encrypted Data

Secure!

Dropblock is the only file storage system enabling analytics of your fully encrypted data. This technology is protected by an international patent in 'secure database searching' and ensures user's data is never exposed as it remains encrypted at rest, in transit, and in use.

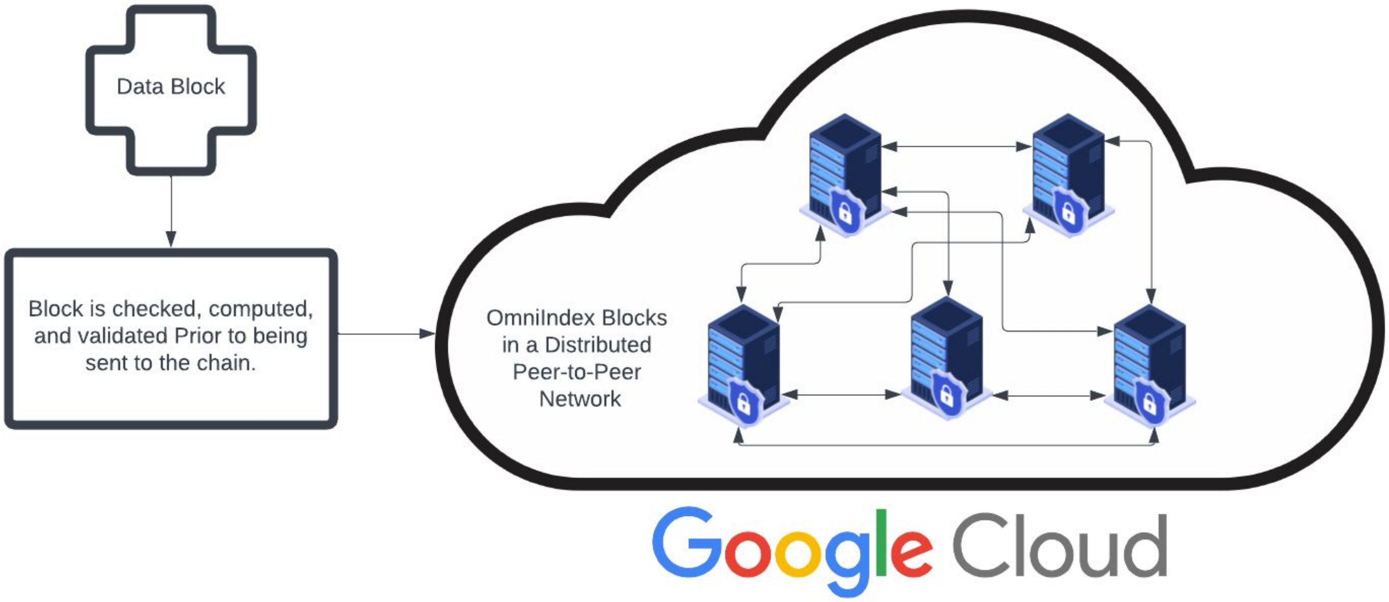
The encrypted files and data are stored in the user's own blockchain with the blockchain stored either on Google Cloud, or another location of the customer's choosing. Crucially, only the user is able to decrypt that data – not OmniIndex nor Google.

Two key security and privacy benefits of OmniIndex's blockchain data storage are that it ensures no unauthorized access to the data, and that all stored data is immutable. This means neither OmniIndex nor any other third-party is able to access data without permission, and that nobody is able to edit the data.

What's more, each user's files and data is 'sandboxed' into their own chain with any customer data then also sandboxed. This means it is impossible for one user within an organization to accidentally or deliberately access another's data with zero-trust access controls.

Finally, because files and data are stored across multiple nodes instead of being in one location, data is not lost if there is a corruption or issue with one of those nodes because the others will automatically reshare the data to secure the network once more.

Dropblock's unique combination of blockchain and FHE technology ensures the threat of ransomware attacks is eliminated with full ransomware inoculation. This is because an attacker cannot access the data unless they have been given permission, and the immutable data cannot be encrypted with an attacker's own encryption and held to ransom.


Data Block
Block is checked, computed, and validated Prior to being sent to the chain.
OmniIndex Blocks in a Distributed Peer-to-Peer Network
Google Cloud

Fast!

Dropblock unlocks real-time insights on fully encrypted data inside your Google Workspace workflow.

For example, an AI risk assessment of our in-house logs holding over 1.5 million encrypted records pulling back 200,000 rows can be done in under 400 milliseconds.

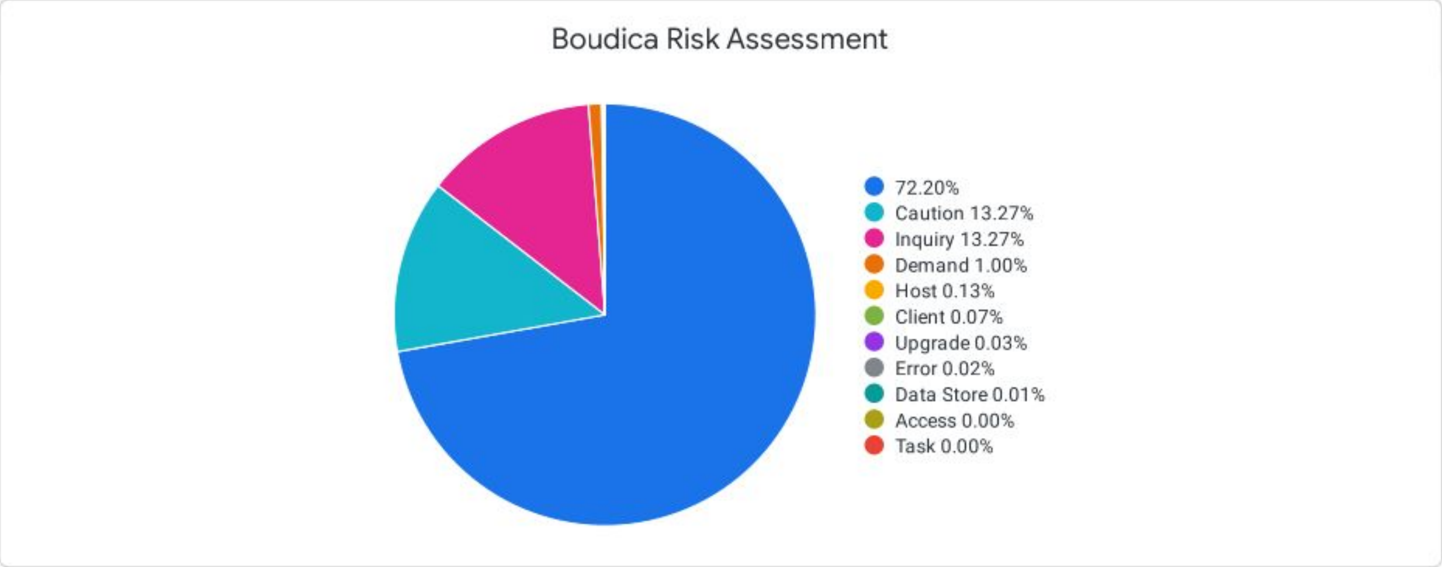
The query scans the encrypted data and categorizes it into 3 separate pots based on the encrypted data's contents and decrypts the records before outputting the results in a JSON format.

This is a standard OmniIndex report, enabling users to securely and quickly access system log data in order to understand what current threat vectors are and where the system needs hardening. And, as can be seen from the 'messageencrypt' key in the following query, all log data is automatically encrypted to prevent unauthorized access:

```
“SELECT pgbc.search_block_data('SELECT
messageencrypt, ai_1, ai_1a, ai_2 FROM
.seednode_syslog WHERE LENGTH(ai_1a) > 1 AND
LENGTH (ai_2) > 1 LIMIT 200000;');”
```

```
{"results" : [
  {"ai_1" : " Demand","ai_1a" : " Host","ai_2" : "
Technological","messageencrypt" : "Starting GCE
Workload Certificate refresh..."},
  {"ai_1" : " Demand","ai_1a" : " Error","ai_2" : "
Reputational","messageencrypt" : "20240119
02:06:08: Error getting config status workload
certificates may not be configured: HTTP 404"},
```

This speed enables Dropblock to provide automated and live threat intelligence for users of their Dropblock Google Cloud. Aiding in compliance as well as ensuring security.



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Simple!

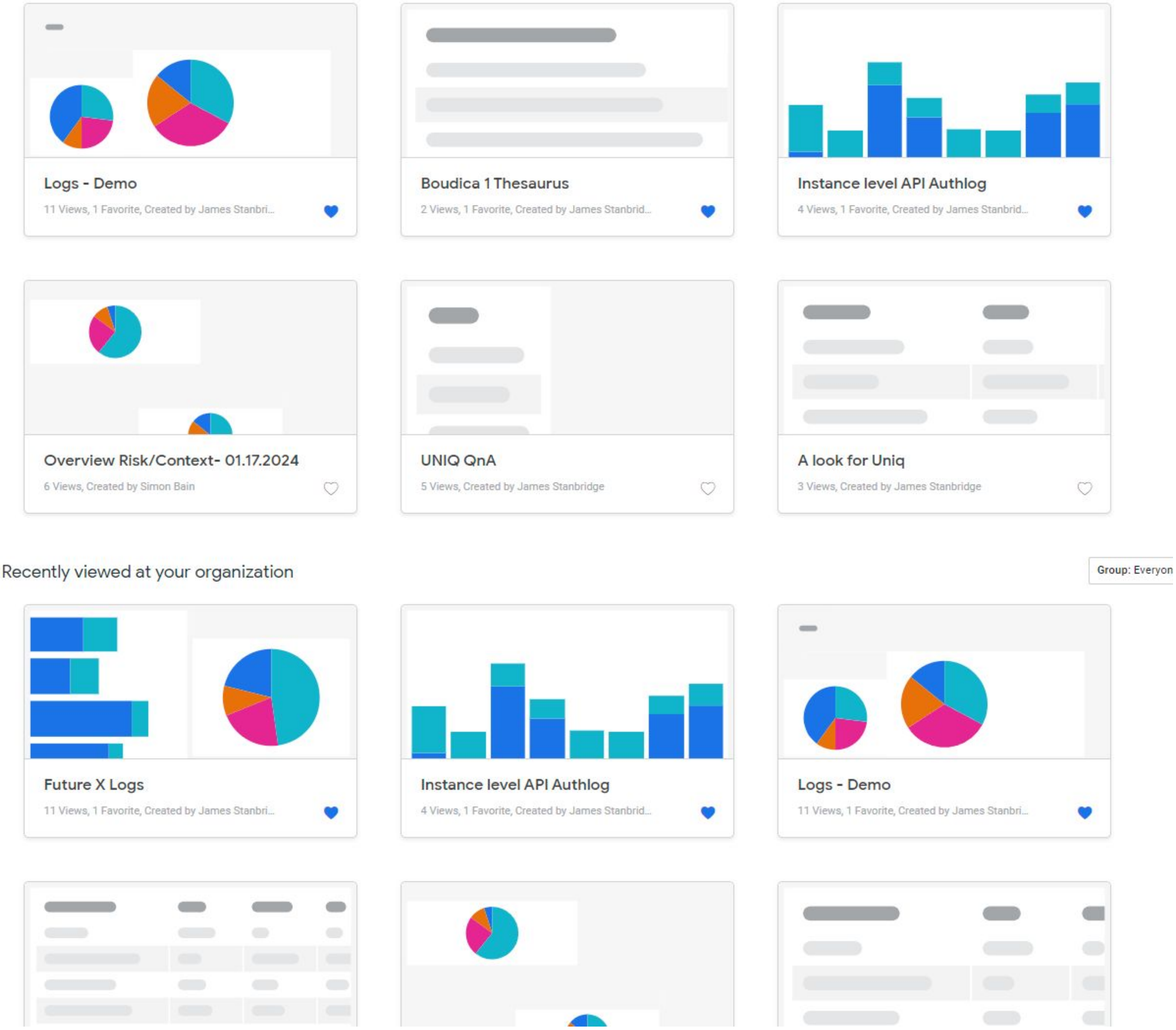
Dropblock connects easily to all Google tools via the admin panel and database connections.

Users gain the full functionality of these tools and the seamless collaboration and productivity workflow they are used to, while gaining the security and speed of OmniIndex's blockchain storage and analytics of encrypted data.

Looker

A user can utilize the entire feature set of Looker to manage and gain insights from their encrypted data without risk of exposure or third-party access. Including:

- Build and export encrypted data for further deep data science with Python, R, Prolog etc
- Build and export encrypted data models for BigQuery
- Create alerts on real-time encrypted data thresholds



Logs - Demo
11 Views, 1 Favorite, Created by James Stanbri...

Boudica 1 Thesaurus
2 Views, 1 Favorite, Created by James Stanbrid...

Instance level API Authlog
4 Views, 1 Favorite, Created by James Stanbrid...

Overview Risk/Context- 01.17.2024
6 Views, Created by Simon Bain

UNIQ QnA
5 Views, Created by James Stanbridge

A look for Uniq
3 Views, Created by James Stanbridge

Recently viewed at your organization

Group: Everyon

Future X Logs
11 Views, 1 Favorite, Created by James Stanbri...

Instance level API Authlog
4 Views, 1 Favorite, Created by James Stanbrid...

Logs - Demo
11 Views, 1 Favorite, Created by James Stanbri...

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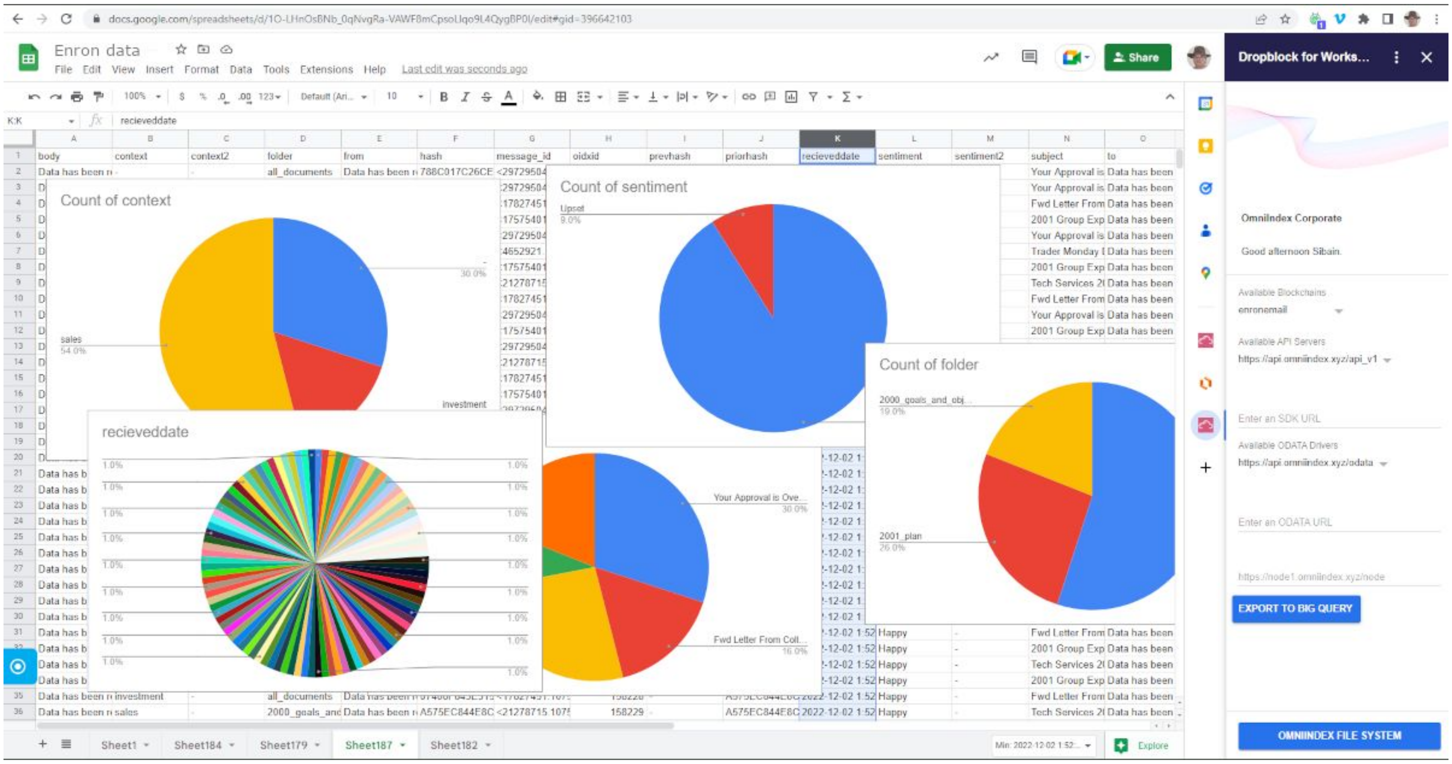
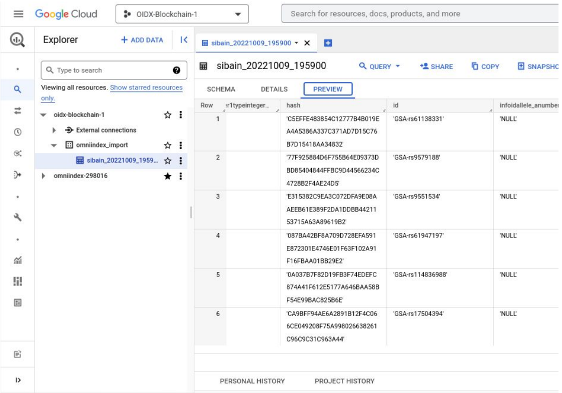

docs.google.com/spreadsheets/d/1O-IJHnOsBNb_0qNvgRa-VAWF8mCpsoLlqo9L4QygBP0I/edit#gid=396642103
Enron data
File Edit View Insert Format Data Tools Extensions Help Last edit was seconds ago
Share
recieveddate
body context context2 folder from hash message_id oidxid prevhash priorhash recieveddate sentiment sentiment2 subject to
Count of context
sales 54.0%
30.0%
investment
Count of sentiment
Upset 9.0%
Count of folder
2000_goals_and_obj... 19.0%
2001_plan 26.0%
recieveddate
1.0%
Your Approval is Ove... 30.0%
Fwd Letter From Coll... 16.0%
Sheet1 Sheet184 Sheet179 Sheet187 Sheet182
Explore
Dropblock for Works...
OmniIndex Corporate
Good afternoon Sibain.
Available Blockchains
enronemail
Available API Servers
https://api.omniindex.xyz/api_v1
Enter an SDK URL
Available ODATA Drivers
https://api.omniindex.xyz/odata
Enter an ODATA URL
https://node1.omniindex.xyz/node
EXPORT TO BIG QUERY
OMNIINDEX FILE SYSTEM

BigQuery

A user can add their Dropblock files and data to BigQuery to run SQL queries against their fully encrypted data.

To do this, a user simply opens the Dropblock extension in Sheets and chooses the ‘Data/Export to BigQuery’ option. This opens a query editor where they can run an SQL query against their fully encrypted data.

Once they click the ‘Run’ button, the OmniIndex API is called and data is exported to BigQuery. A table is then made with the blocks’ schematic automatically loaded prior to the data being inserted.



Row	:r1typeinteger...	hash	id	infoidallele_anumbei
1		'C5EFFE483854C12777B4B019EA4A5386A337C371AD7D15C76B7D15418AA34832'	'GSA-rs61138331'	'NULL'
2		'77F925884D6F755B64E09373DBD85404844FFBC9D44566234C4728B2F4AE24D5'	'GSA-rs9579188'	'NULL'
3		'E315382C9EA3C072DFA9E08AAEEB61E389F2DA1DDBB4421153715A63A89619B2'	'GSA-rs9551534'	'NULL'
4		'087BA42BF8A709D728EFA591E872301E4746E01F63F102A91F16FBAA01BB29E2'	'GSA-rs61947197'	'NULL'
5		'0A037B7F82D19FB3F74EDEFC874A41F612E5177A646BAA58BF54E99BAC825B6E'	'GSA-rs114836988'	'NULL'
6		'CA9BFF94AE6A2891B12F4C066CE049208F75A998026638261C96C9C31C963A44'	'GSA-rs17504394'	'NULL'

Private AI and ML

Dropblock also offers additional insights through its native Small Language Model (SLM) AI, and Machine Learning (ML).

The native AI, Boudica, does not require extensive training and can instead be adapted to instantly offer specialist insights by adding new ontologies. Potential areas include adding additional languages, tailoring analytic queries to a specific industry, and identifying threats.

For example, one of the most popular default options is 'Global Corporate Risk'. This can be used to automatically check the fully encrypted data in real-time for any term or chain of words that might indicate a compliance risk or suggest suspicious activity.

These insights are automatically generated in real-time and can be accessed via Dropblock's built-in AI chatbot. The chatbot can also be used for closed model bias interference, dynamic SLM learning, and ML analytics.

The in-database ML is powered by PostgresML and enables solutions including:

- The ability to run models directly on your existing data to avoid costly data movement and latency issues, resulting in faster predictions and insights.
- The ability to leverage the power of SQL to train and deploy models using familiar SQL commands, making it easily accessible for data analysts and DBAs without requiring specialized ML expertise.
- The ability to streamline your analytics pipeline by keeping everything within the database, reducing complexity and integration headaches.

PostgresML also prioritizes efficient and optimized resource management & operation. Including:

- Fewer network calls: By running within the database, PostgresML eliminates the need for constant communication with external services, lowering network overhead and latency.
- Simple, high-availability infrastructure: Leverage existing PostgreSQL replication and failover mechanisms, minimizing configuration complexity and infrastructure costs.
- Instant scalability: Easily scale your ML capabilities by adding more PostgreSQL nodes to your cluster, seamlessly extending your processing power.

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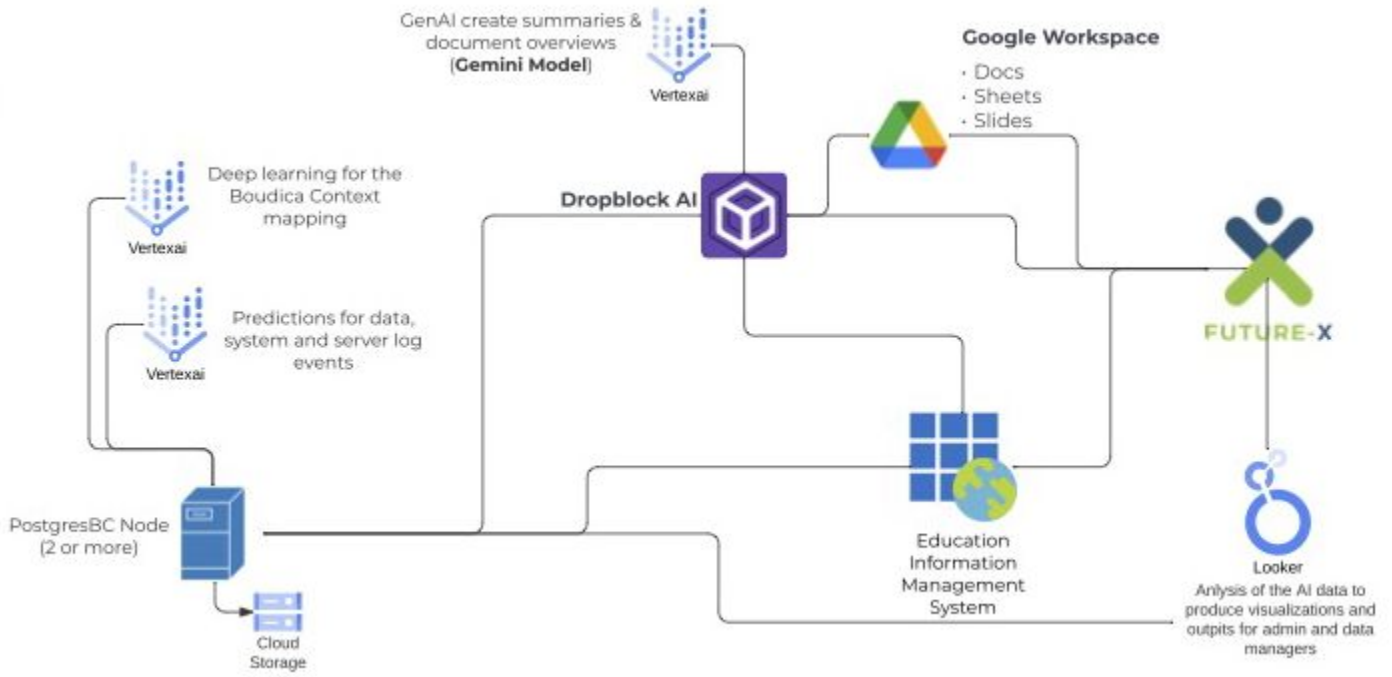
GenAI create summaries & document overviews (Gemini Model)
Vertexai
Google Workspace
· Docs
· Sheets
· Slides
Deep learning for the Boudica Context mapping
Vertexai
Dropblock AI
FUTURE-X
Predictions for data, system and server log events
Vertexai
PostgresBC Node (2 or more)
Cloud Storage
Education Information Management System
Looker
Anlysis of the AI data to produce visualizations and outpits for admin and data managers

Customer Architecture Diagram

Future-X Education are an OmniIndex customer. They use our solutions to securely store the educational data of students and teachers in Nigeria and analyze that fully encrypted data with Google Looker and Gemini AI as well as OmniIndex's AI and ML thanks to Dropblock.

They are subject to strict data regulations and compliance requirements and require the complete encryption and Web3 security that many finance institutions also require.

This diagram shows files and data stored within the OmniIndex solution with integrations to:

- Google Workspace (Via Dropblock - the OmniIndex Add-on for Workspace)
- Vertex AI Gemini Model
- Vertex AI Deep Learning
- Vertex AI Training
- Looker Analytics

By adding their data to Google's productivity and analytics tools with Dropblock, our financial customers are able to use Google Cloud to gain actionable real-time insights to drive profits and improve security without compromising governance or compliance requirements.

For example, they are able to perform real-time AI analytics on their encrypted data round the clock to identify patterns and anomalies in the data to reveal any potential fraud. As the data remains encrypted throughout, the insights can be generated without the sensitive and confidential information ever being exposed.

Dropblock enables customers to add a new pool of data to Google's industry-leading analytics and productivity tools to gain insights and drive profit while staying compliant with regulations and data security rules.

Dropblock is available on the Google Marketplace and there is a free Developer Platform available enabling a single user to test out the OmniIndex and Google solution and start gaining insights from fully encrypted data and ensure ransomware inoculation.

Google Cloud
Partner

Please get in touch to learn more about the OmniIndex Web3 cloud solutions.

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