1. Application Layer Logs (From your Python Backend)

These are the logs you explicitly print in your code (main.py). They drive your Business & Admin Dashboards.

Log Name	Purpose	Key Fields to Store (JSON)	Visualization in Kibana
User Activity Event	Tracks *who* is using the app and *what* they are asking.	client_ip, geo_location, platform, caption_topic	**Map** (User Locations), **Pie Chart** (Platform Popularity)
Prediction Outcome	Tracks the model's output to analyze trends.	predicted_day, predicted_hour, predicted_engagement, sentiment_score	**Heatmap** (Best Times Distribution), **Bar Chart** (Avg Engagement)
Latency/Performance	Monitors how fast the ML model is running.	execution_time_ms, model_version, endpoint	**Gauge Chart** (Avg Response Time), **Line Graph** (Latency over time)
Application Errors	Captures crashes or bugs in the python code.	error_type, stack_trace, failed_input	**Data Table** (Recent Error List)
Security Audit	Tracks interaction with the Vault.	event_type ("VAULT_ACCESS"), status ("SUCCESS"/"FAIL")	**Metric** (Count of Vault Connections)

2. Infrastructure Layer Logs (From Kubernetes)

*These logs are not written by you. They are generated by Kubernetes and Docker, and captured automatically by **Filebeat** or **Metricbeat** running in your cluster.*

Log Name	Purpose	What it tells you	Visualization in Kibana
Pod Status Events	Tracks lifecycle of your containers.	pod_name, event (Created, Started, Killing), message	**Timeline** (Pod Restarts/Crashes)
Container Metrics	Tracks resource usage (Crucial for HPA).	cpu_usage_nanocores, memory_usage_bytes	**Area Chart** (CPU Usage vs. Limit)
Ingress/Network Logs	Tracks traffic entering the cluster.	source_ip, request_path, response_code (404, 500)	**Counter** (Total Requests per Minute)
Node Health	Monitors the server hosting the cluster.	node_status (Ready/NotReady), disk_pressure	**Status Indicator** (Green/Red)